

ASHLAND CITY COUNCIL MEETING
Tuesday, September 10, 2019 – 5:30 PM
Ashland City Hall Council Chambers

Please silence all cell phones during the meeting

1. CALL TO ORDER

- A. Roll Call**
- B. Moment of Silence**
- C. Pledge of Allegiance**

2. APPROVAL OF AGENDA (Voice)

3. APPROVAL OF MINUTES

- A. Minutes of the August 27, 2019 City Council and Committee of the Whole Meetings**

4. CITIZEN PARTICIPATION PERIOD

5. MAYOR'S REPORT

- A. Announcements**

6. CONSENT AGENDA

- A. Operators' Licenses**
- B. Planning and Development Permit and Property Report, August 2019**
- C. Miscellaneous Minutes**

7. NEW BUSINESS

- A. Presentation on the International Joint Commission Listening Session on September 25, 2019 (*Councilor Ullman*)**
- B. Approve to Reallocate the Remaining Balance from the Kreher Park Bathroom 2019 Capital Improvement Project to be Used to Retain a Consultant for a Concept Planning Project For Kreher Park (*Parks and Recreation*) Roll**
- C. Approve a Resolution Adopting the Revised Ashland County All Hazards Mitigation Plan (*Mayor*) Voice**
- D. Approve a Request for a Financial Commitment in the 2020 City of Ashland Budget Towards a Regional Housing Study (*Mayor*) Roll**

E. Approve to Waive Bid Requirements and Purchase Badger Books Electronic Voting Equipment from Wisconsin Elections Commission (WEC) (Clerk) Roll

F. Approve to Waive Permit the Building Permit Fee for Roof Replacement at 618 Beaser Avenue. Applicant: CESA-12 (Planning) Voice

8. ADJOURNMENT

The City of Ashland does not discriminate on the basis of sex, race, creed, color, national origin, sexual orientation, age or disability in employment or provision of services, programs or activities.

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ASHLAND CITY COUNCIL MEETING MINUTES

Tuesday, August 27, 2019 – 5:30 PM

Ashland City Hall Council Chambers

Please silence all cell phones during the meeting

1. CALL TO ORDER

The Tuesday, August 27, 2019 Ashland City Council meeting was called to order by Mayor Debra Lewis, in the Ashland City Hall Council Chambers at 5:30 p.m.

A. Roll Call

Roll call was taken, a Moment of Silence was held, and the Pledge of Allegiance was recited.

PRESENT: Holly George, Matthew MacKenzie, Sarah Jackson, Kate Ullman, Ana Tochtermann, Wahsayah Whitebird, Kevin Haas, Charlie Ortman, Liz Franek, Dick Pufall, Jackie Moore

ABSENT: None.

ALSO PRESENT: Mayor Deb Lewis, City Administrator Brant Kucera, City Clerk Denise Oliphant, City Attorney Tyler Wickman, Police Chief James Gregoire, Planning Director Megan McBride, Finance Director Julie Vaillancourt, Planning Intern Lucas Phillips, and other concerned citizens.

B. Moment of Silence

C. Pledge of Allegiance

2. APPROVAL OF AGENDA

Haas moved, seconded by Pufall to approve the agenda as presented. The motion carried unanimously by voice vote.

3. APPROVAL OF MINUTES of the August 13, 2019 City Council and Committee of the Whole meetings

A. August 13, 2019 City Council and Committee of the Whole Meeting Minutes

Moore moved, seconded by Franek to approve the minutes of the August 13, 2019 City Council and Committee of the Whole meetings. The motion passed unanimously by voice vote.

4. CITIZEN PARTICIPATION PERIOD

The Clerk read the Rules for Citizen Participation, and the following offered their comments to the Council:

Zygmund Jablonski Jr, 916 6th Avenue West, spoke regarding the debt service limit as pertained to financing for the police facility, as was in the past for the fire station construction project.

Eric Lindell, 204 1/2 West Main Street, praised the investments of the City and the future of the community.

John Kovach, 718 East 11th Street, stated that although in favor of a new police facility, he disagreed with the site selection.

Jim Gregoire, spoke to Council regarding the time spent to date discussing the construction and financing of a new police facility, thanking them for their hard work and consideration, and asked for a decision at tonight's meeting.

5. MAYOR'S REPORT

A. Announcements

Lewis congratulated Officer Janecek on her recent marriage, and Officer Ovaska on the newest addition to their family. PW Director John Butler intended to supply a memo to Council but as he has been on vacation, he plans do this by the next Council meeting. Lewis passed out a handout from the UW-Madison Extension program and NWRPC inviting the community to a meeting on September 16, 2019 at the Bayfield County Court House to discuss a proposed grant application sought to fund the housing study. Lewis attended a kick-off along with Pufall earlier in the day to celebrate a grant which BART Transport Services received to fund two new electric buses and charging stations. Northland College is expecting its largest class with a record enrollment, and she welcomed these new citizens to our community. The Clean Sweep event went well last week at WITC-Ashland, and Lewis thanked those who volunteered their time to work that day.

6. CONSENT AGENDA

A. Operators' Licenses

The following individuals applied for an operators' license:

Kathrine Gurske
Emily Willoughby
Jean Hahn-Thomas
Taylor Lund
Casie Ehlers
Tammy Pufall

B. Miscellaneous Minutes

Franek moved, seconded by Haas approve the Consent Agenda. The motion passed unanimously by voice vote.

7. OLD BUSINESS

A. Approve a Resolution Authorizing the Construction of a New Police Facility to Replace the Existing Facility Located in City Hall, by Pursuing General Obligation Promissory Notes with a Ten-Year Term Which Includes a Balloon Payment in Year Ten, and Allows an Additional Ten-Year Term for a Total of Twenty (20) Years (Roll)

Summary Statement: On August 13, 2019 at Committee of the Whole meeting, the Finance Director was available to answer questions regarding the preference of a general obligation note with a 10-year balloon option. This item was brought back to the Committee of the Whole agenda due to the various questions regarding the lending options, before moving to the Council agenda for a final vote. Moore moved, seconded by Haas to approve to direct Administration to pursue a General Obligation promissory Note with a 10-year term, which includes a balloon payment in year 10 which allows an additional 10-year term for a total of 20 years, to forward to Council for approval on August 27, 2019. The motion carried 10-2 by roll call vote; opposed were Whitebird and Ortman.

The deficiencies in the police facility on the basement patrol level at City Hall and the 3rd floor Administrative space within City Hall were many and well known. An incomplete tabulation of the “well known” deficiencies included:

- Inefficient and limited communications between the police patrol division in the basement and the administrative offices on third floor;
- The lack of public access to the police facility during off hours;
- Frequent flooding of the basement following heavy rains that results in the presence of mold at times;
- Inadequate space, especially for large coordinated meetings with outside agencies, i.e. FBI, State of WI Department of Criminal Investigation, and others;
- Separate shower space for men and women officers is not available;
- Evidence processed on the third floor hinders response times for officers attempting to respond to calls from the evidence processing room;
- Existing evidence processing room as well as evidence room is not vented for officer safety when processing dangerous drugs such as Fentanyl and Methamphetamine;
- The condition of the existing basement facility is a health and safety hazard for employees and visitors to the station;
- The call volume and number of arrests has risen dramatically in the past few years while the number of officers has remained the same, creating greater pressure for efficiency.

To overcome these shortcomings, Council had been proactive in actively laying the groundwork for moving forward with a new station since 2015. City Administration continued to search for grants that may be applicable to the construction of a new station. The City attempted to work with our congressional delegation and state government in providing relief to local taxpayers in providing the needed facilities.

Cost: Discussions with the architect and engineer that the City had been working with on this project for the past few years, C&S Design, indicated that the approximate 9,900 square foot police facility and 4,950 square foot garage could be constructed for an estimated \$4.3 million. The structure as designed would incorporate sustainable features such as low energy windows and solar panels to generate electricity for the building, thus saving on utility costs in the long term. The City had been awarded a \$99,000 grant from the Public Service Commission of Wisconsin to assist with financing of the solar installation. For that cost, the City would be provided a structure that would have a lifetime of 50 – 70 years.

Construction Timetable: Conversations with C&S Design indicated that if authorization to begin the project were forthcoming from the Council, bidding of the project would be undertaken in December 2019, with bid opening approximately mid-January 2020, and with construction beginning in the Spring of 2020. The building would take approximately 12 months to complete and could be occupied by early 2021.

Financing Timetable: The City would work with Ehlers, Financial Advisors, to prepare a pre-sale report for issuance of the G.O. promissory note issue. Arrangements for the bidding were to begin before the end of 2019 and bid opening would be coordinated with the construction bid opening in mid-January 2020 as well.

Financing: The proposed financing plan would accomplish a number of items:

- It provided for the construction of a badly needed police facility
- It took advantage of historic low interest rates that would not continue forever
- It maintained a municipal G.O. debt borrowing capacity for unanticipated expenditures or emergencies at a reasonable level

Recommendation: To initiate the construction and financing of the long awaited and needed police facility in 2019/2020 to replace the outdated and unsafe facilities currently utilized by the department and consolidate them into one 21st century structure at a time of record low interest rates that should help mitigate the impact of the project on taxpayers. Adoption of the resolution would provide instruction and direction to staff to move forward with the police station project.

George moved, seconded by Haas to approve the resolution authorizing the construction of a new police facility to replace the existing facility located in City hall, by pursuing General Obligation Promissory notes with a ten-year term which includes a balloon payment in year ten, and allows an additional ten-year term for a total of twenty years. The motion passed 6-5 by roll call vote; opposed were MacKenzie, Whitebird, Ortman, Franek, and Pufall. **File #17523**

8. NEW BUSINESS

A. Approve to Retain a Qualified Firm for Wetland Delineation Services of the City-Owned Former Timeless Timber Site at 2200 Lake Shore Drive East (*Planning*) Roll

Summary Statement: Quotes were being solicited to retain services for wetland delineation of the City-owned former Timeless Timber site located at 2200 Lake Shore Drive East. All proposals received to date included a final report with findings, maps and all supporting information which were included in future Request for Qualifications/Proposals and also informed City plans for marketing the site. The proposals also included proper reporting of found wetlands to the WDNR and a site visit with WDNR staff if requested. Funding was not budgeted to perform these wetland delineation services in 2019, and therefore Common Council approval was needed to allocate funding to enter into an agreement with the qualified firm who submitted the lowest bid.

The City issued a Request for Qualifications (RFQ) for the site in 2018 in an attempt to attract a qualified developer who would submit a phased, comprehensive plan for the entirety of the site. No submissions were received in response to this RFQ. Having detailed information about the wetlands present on site would provide a clear picture of the buildability of the site and inform future marketing strategies. The Timeless Timber site was located in TID #9, which was the City's least successful TID and therefore the most in need of quality, substantial development. Since the last year for expenditures in TID #9 was 2021, it was important to get the wetland delineation completed in a timely manner so the Planning Department could work on actively marketing the site in 2020.

Moore moved, seconded by Jackson to approve to retain a qualified firm for wetland delineation services of the City-owned former Timeless Timber site at 2200 Lake Shore Drive East. The motion passed unanimously by roll call vote.

9. ADJOURNMENT

Moore moved, seconded by Whitebird to adjourn. The motion carried unanimously by voice vote.

Respectfully Submitted,

Denise Oliphant,
City Clerk

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COMMITTEE OF THE WHOLE MEETING MINUTES

The Common Council of the City of Ashland will meet as the Committee of the Whole on August 27, 2019 immediately following the City Council meeting which begins at 5:30 PM in the Ashland City Hall Council Chambers.

The following items will be considered:

The Tuesday, August 27, 2019 Committee of the Whole meeting was called to order by Council PResident, in the Ashland City Hall Council Chambers at 6:55 p.m.

1. Roll Call

PRESENT: Holly George, Matthew MacKenzie, Sarah Jackson, Kate Ullman, Ana Tochtermann, Wahsayah Whitebird, Kevin Haas, Charlie Ortman, Elizabeth Franek, Dick Pufall, and Jackie Moore.

ABSENT: None

ALSO PRESENT: Mayor Deb Lewis, City Administrator Brant Kucera, City Clerk Denise Oliphant, Police Chief Jim Gregoire, Planning Director Megan McBride, Planning Assistant Lucas Phillips, and other concerned citizens.

2. Council President's Report

President Ullman recently attended a Pow Wow at Bad River, among other Councilors, and encouraged others if they haven't been, to attend next year. She also worked at the Clean Sweep sponsored by Ashland County, and thanked Lissa Radtke for her work organizing the event.

3. Administrator's Report

Kucera thanked Council for their civility during the numerous discussions regarding constructing and financing a new police facility, and for their hard work and deliberation throughout his process.

4. Approval of Agenda

George moved, seconded by Haas to approve the agenda. The motion carried unanimously by voice vote.

5. New Business

A. Discussion and Possible Action Regarding Strategic Priorities (*Councilor Ullman*)

In order to provide guidance to the City Administrator and Department Heads as they prepare their draft budgets for the upcoming year, Council wished to discuss and vote to endorse additional priority areas. (Some priority areas may require changes to ordinances or other Council action, rather than budget allocation.) The list below reflects a compilation of suggestions made at the July 30th Committee of the Whole meeting. An asterisk indicates that these priorities were mentioned during the retreat or in the shared goals document created by Department Heads. Additional priorities may be introduced and voted on during the meeting.

Review infrastructure improvement plan created by Strand, and update 5-year Capital Plan: **a rate study will be done in the near future*

Pursue alternate sources of revenue for the City: **continuously undergoing*

Address affordable housing and homelessness: **financial contribution to a regional group; Housing Committee having continuous discussion, possibility of a future proposal a designated area in the City as rent free for homeless; include safe and affordable housing*

Continue to work towards property maintenance enforcement: **agreed by Council of importance to include with future budgeting*

****Increase trust in local government through improved communication and information: **not yet considered***

Better use of website: **working to put more staff time into this*

****Improve social media presence: **discussions held with staff***

Address sewage overflows: **studies in process*

****Lake shore revitalization/waterfront development: **in process; new hires (Butler, Green) focusing on this item, doing studies; unable to move forward yet; need more conversation***

****Finish Source Water Protection Plan: **not discussed yet***

****Begin implementation of 25 x 25 Plan: **the plan was just adopted, has not had discussions yet as to implementation; working on through Sustain committee***

****Evaluate and plan for climate resilience: **RE: I&I, more relation to infrastructure***

****Evaluate and improve bike and pedestrian infrastructure: **ongoing but no definitive plans; Sanborn Ave - \$ for bike lane unavail; PW comm looking for more signage/stripping; expectations need to be voiced when budgeting for a project in order to include lanes/sidewalks, etc.***

Evaluate public transportation needs: **not discussion to date; BART contribution; Whitebird - bus shelters? have been applied for by BART admin*

Facilities improvements to City Hall: **windows in Chambers done, looking into other projects*

Library renovation: **capital improvement plan being done for 2020 budget, yet to be reviewed*

Evaluate and improve security and access at all public buildings: **security measures done on 2nd, 3rd floors, future plans for BCC and others*

Downtown revitalization: **focusing on this currently & recent study*

Ullman asked for a motion from Council members endorsing specific items and it's importance to include with the Strategic Plan. George offered an emailed submission from Councilors to prioritize the items mentioned at the Council retreat. Whitebird asked to add an increase of the local minimum wage to the list as a priority. Ullman felt this was better served as a future agenda item versus included in the Strategic Plan. Motion made by George, seconded by Moore to endorse to continue to support to work towards property maintenance enforcement. When inquired by Ortman as to the influence of property maintenance on the budget, Kucera noted that some funds had been redirected from building inspector and reinvested in a full-time property maintenance personnel, and he plans this to continue into the 2020 budget. George later rescinded this motion as the discussion went in a different direction. Tochterman mentioned some items are already listed on the Strategic Plan, but appreciates the opportunity to have a voice on what should be focused on when updating the Plan. When questioned if this were the correct process to contribute toward the Strategic Plan, Kucera stated that the goals would be taken into account during the budget process and considered as funding were available.

George suggested Kucera possibly do a run-down on the posted list to review individually and discuss with Council*.

MacKenzie asked what our goal of this discussion was to be, as he was not able to see any of the items to have no importance for the City. Ullman is asking to identify items from the list for further discussion. As Kucera reviewed each item and the plans for implementation(responses in italic above), Ullman flagged some items ****** for future discussion at the Committee of the Whole level. Kucera mentioned the importance to include the funding for a Strategic Plan through the budget process.

B. Discussion and Possible Action Regarding the Next Steps toward Promoting and Integrating the Ojibwa Language within the City of Ashland (*Councilor Ullman*)

Ullman wanted to plan as to where discussions such as this topic should be housed, and the potential for creating an Ad-Hoc committee to address this.

Whitebird moved to form a special subcommittee of the Committee of the Whole in order to explore collaboration with the Bad River Community regarding Ojibwa language revitalization. Tochterman seconded. MacKenzie asked what the intention would be to follow up with previous discussion and investigate opportunities to address the above item, and would we place a time frame as to when to report back to the Committee of the Whole. Ullman felt this subcommittee would require a few months to discuss the potential.

Moore didn't feel the end of 2019 may not be enough time to allow for this subcommittee, and may want to extend their return to Committee into 2020. Lewis had concerns about adding another committee and the involvement of staff time to publicly notice meetings, and attend and document minutes, although she feels there is an importance of this collaboration. Franek suggested inviting the Bad River representatives to future Committee of the Whole meetings for discussion. Ullman also suggested for interested Council members to attend meetings at the Bad River facility. Tochterman questioned if it were ethical for a possible quorum attend their meetings; Lewis offered to look into this with the attorney.

Pufall moved to adjourn, although there was already a motion on the floor made by Whitebird to create a subcommittee. Ullman asked for a withdrawal of the motion and Whitebird agreed.

6. Adjournment

Moore moved, seconded by Ortman to adjourn. The motion carried unanimously by voice vote.

Respectfully Submitted,

Denise Oliphant,
City Clerk

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SUBJECT: Operators' Licenses

RECOMMENDATION: Approval

DEPARTMENT OF ORIGIN: City Clerk

CLEARANCES: Police Department

EXHIBITS:

EXPENDITURES REQUIRED:

AMOUNT BUDGETED:

APPROPRIATION REQUIRED:

TREASURER'S CERTIFICATE:

COMPLIANCE WITH ORDINANCE 51:

STATEMENT OF CONFORMANCE WITH COMPREHENSIVE PLAN OF RECORD:

SUMMARY STATEMENT:

The following individuals have applied for an operator's license:

Ashley M. Schraufnagel

Kasey L. Day

City of Ashland, Wisconsin

Department of Planning and Development, Monthly Report

Permit report for the month of August 2019

Permit type **Commercial-Additions,Remodeling,Al**

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7086	Dahl Property Management, LLC	801 Lake Shore Drive West	Remove and replace existing roof finish with similar materials. Contractor: Black Wolf Construction, LLC	\$65,556.00	\$50.00	718	8/8/2019
7090	Sud Family Limited Partnership	411 Ellis Avenue	Construct new ceiling along with interior cosmetic repairs (painting and carpet)	\$55,000.00	\$275.00	1973	8/9/2019
7092	Memorial Medical Center	1615 Maple Lane	Reduce size of existing windows and install new smaller windows	\$30,000.00	\$150.00	4893	8/9/2019
7109	Memorial Medical Center	1615 Maple Lane	Install new metal fascia on hospice building (1913 Beaser Avenue). Contractor: Arnie Mackey Construction (#973654)	\$9,000.00	\$45.00	4893	8/19/2019
7111	Synergy Community Cooperative	421 Sanborn Avenue	Remove and replace siding on principal structure. Contractor: Ben Miller with Grindstone Construction (#1229924)		\$50.00	3807	8/19/2019
7116	Cooperative Services Agency 12	618 Beaser Ave.	Remove existing chimneys and re-roof approximately 100sq. Chimneys to be removed to below roofline only. Contractor: Cedar Brook Construction	\$130,000.00	\$50.00	540	8/22/2019
7119	Duane Carlson	301 Main Street West	Remodel and retrofit building to develop a Domino's Pizza per approved plans. Contractors: Blakeman Plumbing (#000444), Electric (#1229100)	\$140,000.00	\$700.00	4261	8/26/2019
7124	CRW Properties, LLC	310 Stuntz Avenue	Repave existing parking lot and pave a 31' x 45' addition to parking lot	\$19,000.00	\$95.00	1761.1	8/27/2019
7128	MDP Properties LLC	210 Main St West	Remodel hallways including lighting, new doors, drywall and flooring. No structural alterations involved. Contractors: Pfeiffer Construction, Lakes Electric	\$55,000.00	\$75.00	1657	8/30/2019
Summary for 'Permit type' = Commercial-Additions,Remodeling,Alterations (9 detail records)							
Sum				\$503,556.00	\$1,490.00		

Permit type Commercial-Miscellaneous

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7103	City of Ashland (Public Works)	2020 6th Street East	Add insulation, new membrane & metal to main office, pre-treatment, UV treatment, 6th Ave lift station and main lift station. <i>Contractor: City of Ashland (#2500)</i>	\$234,430.00	\$0.00	3768	8/13/2019
7121	CRW Properties, LLC	310 Stuntz Avenue	Construct 20' x 20' freestanding deck on south side of property. Approx. 1ft in height with only 1 step. <i>Contractor: Crw Properties LLC</i>	\$4,000.00	\$50.00 Check	1761.1	8/27/2019
Summary for 'Permit type' = Commercial-Miscellaneous (2 detail records)							
Sum				\$238,430.00	\$50.00		

Permit type Demolition/Moving

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7081	Patti Buckmaster	923 14th Avenue West	Demolition of detached garage	\$1,900.00	\$0.00	3904	8/6/2019
7112	Adam Traaholt	900 9th Ave. West	Demolition of 2-car garage (22' x 26')	\$1,800.00	\$15.00 Cash	3011	8/20/2019
7115	Jeffrey Sutarik	107 9th Avenue East	Demolish 2-story principal structure (~30' x 50') and site restoration activities (topsoil placement, compaction and seeding). <i>Contractor: J. Sutarik LLC</i>	\$10,000.00	\$50.00 Check	1215	8/21/2019
Summary for 'Permit type' = Demolition/Moving (3 detail records)							
Sum				\$13,700.00	\$65.00		

Permit type Electrical

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7088	Nicholas and Megan Robertson	700 5th Ave. East	Install 215sf roof mounted solar array	\$11,000.00	\$75.00 Check	2394	8/8/2019
7104	Aaron and Katherine Swanson	3201 Farm Road	Electrical for installation of 600sf ground mounted solar array. Contractor: Mark Illick	\$40,000.00	\$75.00 Check	4970	8/13/2019
7113	Warren Kehn	620 3 rd ave west	Install roof mounted solar array. Contractor: Next Energy Solution (#131880)	\$10,000.00	\$75.00 Check	2204	8/21/2019
Summary for 'Permit type' = Electrical (3 detail records)							
Sum				\$61,000.00	\$225.00		

Permit type Misc Zoning Fees

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7095	Jeff Jolma Properties, LLC	3100 Ellis Ave	Development Permit to operate office space associated with online sale of art/furniture manufactured with tree boughs		\$75.00 Check	4982.02	8/9/2019
7108	Memorial Medical Center	2213 Beaser Avenue	Site Plan review fee to construct new 16' x 20' salt storage shed		\$150.00 Check	4927	8/19/2019
7126	Northern States Power	2400 Farm Road	Conditional use permit for enlarged sign for solar garden – Denied by plan commission		\$200.00 Check	4940	8/29/2019
7130	Richard Bloss	1100 East Lakeshore Drive	Conditional Use Permit application fee to operate vehicle repair/service use		\$200.00 Cash	1195	8/30/2019

Summary for 'Permit type' = Misc Zoning Fees (4 detail records)

Sum	\$625.00
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Permit type Residential-Accessory Structures

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7100	Aaron and Katherine Swanson	3201 Farm Road	Construct a 600sq ft solar PV ground mounted array on property located southwest of principal structure. Contractor: Next Energy Solution (#131880)	\$40,000.00	\$25.00 Check	4970	8/12/2019
7110	Richard & Mary Gierczic	812 Beaser Ave.	Remove existing garage and construct a new one - 24' x 36', Contractor: Economy Garages	\$27,143.00	\$43.20 Cash	624	8/19/2019
7114	Warren Kehn	620 3 rd ave west	Install new roof mounted solar array on principal structure. Contractor: Next Energy Solution (#131880)	\$10,000.00	\$25.00 Check	2204	8/21/2019
7123	Thomas & Victoria Pingel	103 14th Ave. E.	Building a garden shed 10'x12'	\$1,500.00	\$25.00 Cash	1455	8/27/2019

Summary for 'Permit type' = Residential-Accessory Structures (4 detail records)

Sum	\$78,643.00	\$118.20
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Permit type Residential-Miscellaneous

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
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Permit type Residential-Miscellaneous

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7085	Lauren Chantelois & C. Zifko	1514 Main St. W.	6' tall wood fence in backyard.	\$2,000.00	\$50.00 Cash	133	8/7/2019
7096	Scott Graham	2118 6th Street E	Two fences: 10' long x 6' high vinyl & 20' long x 6' high vinyl fence	\$500.00	\$25.00 Cash	3720	8/9/2019
7097	Adam Soroka & Mary Fogarty	1023 Ellis Ave.	Enlarge existing fenced in area by extending to be 10' closer to 11th Street West side of property. New portion will match existing	\$300.00	\$25.00 Cash	2762	8/12/2019
7101	John Butler & Victoria Peters	911 10th Ave. West	Install ~120 ft cedar fencing 6ft in height in rear yard	\$5,500.00	\$50.00 Check	3028	8/13/2019
7118	Betsy Westlund	113 8th Street East	Install additional fencing to connect to existing, will enclose back yard from home to garage		\$25.00 Check	2341	8/23/2019
7129	Elizabeth Andre & Tim Pavlish	908 9th Avenue West	Install new aluminium fence, 204 lineal feet, 5ft in height in side and rear yard	\$5,000.00	\$75.00 Check	3013	8/30/2019

Summary for 'Permit type' = Residential-Miscellaneous (6 detail records)

Sum	\$13,300.00	\$250.00
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Permit type Residential-Remodeling,Alterations,A

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7080	Barbara Lund	901 4th avenue west	Re-roofing the house with new shingles	\$20,000.00	\$40.00 Cash	2622	8/5/2019
7082	Chuck & Patricia Skoraczewski	900 Lake View Drive	Replace faulty siding with "Smart" siding on house	\$10,000.00	\$40.00 Cash	4830	8/6/2019
7083	Matthew and Sara Hudson	801 Chapple Avenue	Solar panels on the south and west sides of the house roof.	\$5,000.00	\$100.00 Cash	4439	8/6/2019
7084	Michael & Danelle Comer	621 Vaughn Ave.	New vinyl siding on house	\$14,000.00	\$40.00 Check	2250	8/7/2019

Permit type Residential-Remodeling,Alterations,A

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7087	Nicholas and Megan Robertson	700 5th Ave. East	Install 215sf roof mounted solar array	\$11,000.00	\$25.00 Check	2394	8/8/2019
7089	Kristy Heidenre & David Hollis	1019 6th Avenue West	Kitchen remodel including new cabinets, flooring, sink and dishwasher (no new plumbing fixtures). Contractor: Wintergreen	\$9,400.00	\$47.00 Check	2810	8/8/2019
7091	Jason & Sarah Holmes	910 Beaser Ave.	Replace asphalt shingles on residence, garage, and shed.	\$5,000.00	\$80.00 Check	655	8/9/2019
7094	James Munson	719 10th Street East	Metal vertical white siding on building.	\$1,200.00	\$40.00 Check	2699	8/9/2019
7099	Kay Price-Lee and Larry Lee	3505 CITY HEIGHTS RD	Replace existing 14' x 14' deck with an enclosed screened-in porch. No new electrical. Contractor: Sunspace Backyard	\$40,000.00	\$200.00 Check	4851.01	8/12/2019
7105	Jack and Tracey Hoglund	910 15th Avenue West	Remove and replace shingles on garage with metal roof	\$2,300.00	\$40.00 Check	640.1	8/14/2019
7106	David & Rae Demars	217 14th Ave. E.	Remove and replace existing asphalt shingles on roof of garage and principal structure	\$7,500.00	\$40.00 Check	1501	8/14/2019
7107	Troy and Tamara Mattson	606 20th Ave. W.	Remodeling kitchen, new exterior door, add on to deck, a new window.	\$4,400.00	\$25.00 Check	4481	8/16/2019
7117	Kevin and Carrie Alajoki	118 N. Prentice Ave.	Replace front steps with new wooden steps and 4' x 7' deck. Setbacks reduced based on average setbacks of neighboring properties within 200 feet	\$340.00	\$50.00 Check	1270	8/23/2019
7122	Gabriel and Stacey Miller	317 12th Avenue West	Complete tear off and replacement of existing roofing with asphalt shingles on principal structure. Contractor: Miller's Roofing & Siding (41370022)	\$8,990.00	\$40.00 Check	245	8/27/2019
Summary for 'Permit type' = Residential-Remodeling,Alterations,Additions (14 detail records)							
Sum				\$139,130.00	\$807.00		

Permit type Sign

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
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Permit type Sign

Permit #	Property Owner	Property Address	Description of work	Value of work	Permit fee	Parcel ID#	Date issued
7093	Ashland Lock & Key	220 Main Street East	Install 6.25sq ft projecting sign above front door on Main Street side of building. Small flood lights will illuminate the sign		\$50.00 Check	1624	8/9/2019
7120	CWO Properties, LLC	202 Prentice Ave	Install 3 new awnings on west side of building (43", 96", 43" in length), including one with sign copy (96" in length) for Sheer		\$50.00	1603	8/26/2019
7127	Northern States Power	2400 Farm Road	Sign permit to install freestanding sign 75 square feet in size along Farm Rd for Xcel Energy Solar Garden		\$50.00 Check	4940	8/29/2019
Summary for 'Permit type' = Sign (3 detail records)							
Sum					\$150.00		
Grand Total				\$1,047,759.00	\$3,780.20		

City of Ashland, Wisconsin

Monthly Property Report

Property report for the month of August 2019

Maintenance concern Accessory Structure

Date	Parcel ID#	Office Contact	Property Address	Amount of citation
8/2/2019	231	Chris Luebben	320 11th Ave. West	\$0.00
		Action taken	██████ Sent first letter giving until 7/1/19 to replace garage windows or blend in boarded up windows.	
8/5/2019	1360	Chris Luebben	511 Main Street East	\$0.00
		Action taken	██████ 8/5/19: Sent first letter giving until 8/28/19 to obtain a Bldg. Permit for the accessory structure (shed) in the parking lot.	
8/13/2019	2519	Chris Luebben	808 2nd Ave W	\$0.00
		Action taken	██████ 8/8/19: Sent first letter giving until 9/25/19 to put protective treatment on garage.	
8/29/2019	2484	Chris Luebben	801 5th Avenue East	\$0.00
		Action taken	██████ 8/29/19: Sent 3rd letter giving until 9/9/19 to store or dispose of the tires and toys on the garbage roof.	

Maintenance concern Garbage

Date	Parcel ID#	Office Contact	Property Address	Amount of citation
8/6/2019	2534	Chris Luebben	817 2nd Avenue West	\$0.00
		Action taken	██████ 8/6/19: Sent first letter giving until 8/26/19 to store household items & furnishings in an enclosed structure or property dispose	
8/6/2019	3062	Chris Luebben	1001 10th Avenue West	\$0.00
		Action taken	██████ 8/6/19: Sent first letter giving until 8/26/19 to store household items & furnishings in an enclosed structure or property dispose	
8/9/2019	576	Chris Luebben	722 15th Ave. W.	\$0.00
		Action taken	██████ 7/29/19: Sent first letter giving until 8/19/19 to remove stove & freezer from the yard - SENT TO WRONG ADDRESS.	
8/13/2019	3117	Chris Luebben	1100 Beaser Ave.	\$0.00
		Action taken	██████ 8/8/19: Sent first letter giving until 8/29/19 to remove clothes dryer from yard.	
8/14/2019	194	Chris Luebben	914 Main Street West	\$0.00
		Action taken	██████ 8/14/19: I emailed the owner about the overflowing dumpster and asked to have it cleaned up.	
8/14/2019	194	Chris Luebben	914 Main Street West	\$0.00
		Action taken	██████ 8/14/19: I emailed the owner about the overflowing dumpster and asked to have it cleaned up.	

8/26/2019	56 Chris Luebben	1222 Lake Shore Drive		\$0.00
	Action taken	[REDACTED]	8/22/19: Sent first letter giving until 9/3/19 to remove upholstered chair from public ROW/yard area.	
8/26/2019	407 Chris Luebben	523 Beaser Ave.		\$0.00
	Action taken	[REDACTED]	8/22/19: Sent first letter giving until 8/30/19 to clean up the garbage around the dumpster.	
8/29/2019	1792 Chris Luebben	306 13th Avenue East		\$0.00
	Action taken	[REDACTED]	8/29/19: Sent first letter giving until 9/4/19 to properly dispose of the upholstered chair.	

Maintenance concern Grass

Date	Parcel ID#	Office Contact	Property Address	Amount of citation
8/2/2019	3873	Chris Luebben	1201 9th Ave W	\$0.00
		Action taken	[REDACTED] 7/25/19: I left a door hanger that grass needs to be cut & weeds eliminated.	
8/2/2019	587	Chris Luebben	709 16th Ave. W.	\$0.00
		Action taken	[REDACTED] 6/6/19 at 1:21 pm: I left a door hanger that grass should be cut & weeds eliminated.	
8/2/2019	1711	Chris Luebben	308 3rd St. E.	\$0.00
		Action taken	[REDACTED] I spoke to the tenant about the long grass & weeds.	
8/2/2019	524	Chris Luebben	622 15th Ave. W.	\$0.00
		Action taken	[REDACTED] 7/22/19: I spoke to the owner about the long grass.	
8/19/2019	1341	Chris Luebben	307 Main St. East	\$0.00
		Action taken	[REDACTED] 8/15/19: Sent first letter giving until 9/3/19 to eliminate thistle weeds on property.	
8/26/2019	1514	Chris Luebben	204 12th Ave. E.	\$0.00
		Action taken	[REDACTED] 8/23/19: I left door hanger with letter giving until 8/26/19 to cut grass & eliminate the weeds.	

Maintenance concern Other

Date	Parcel ID#	Office Contact	Property Address	Amount of citation
8/1/2019	2502	Chris Luebben	805 3rd Avenue East	\$0.00
		Action taken	[REDACTED] 7/31/19: Sent 1st letter giving until 8/30/19 to remedy bed bugs & show receipt of extermination.	
8/1/2019	2502	Chris Luebben	805 3rd Avenue East	\$0.00
		Action taken	[REDACTED] 7/31/19: Sent 1st letter giving until 8/30/19 to remedy bed bugs & show receipt of extermination.	
8/26/2019	2230	Chris Luebben	306 6th Street West	\$0.00
		Action taken	[REDACTED] 8/22/19: Sent first letter to exterminate bed bugs.	

8/26/2019	55 Chris Luebben	1218 Lake Shore Dr.	\$0.00
	Action taken	[REDACTED] 8/22/19: Sent first letter giving until 9/3/19 to remove tires from yard.	
8/26/2019	307 Chris Luebben	401 17th Ave W	\$0.00
	Action taken	[REDACTED] 8/26/19: Sent first letter to make owner aware of strong, unpleasant odor coming from the property.	
8/28/2019	166 Chris Luebben	1215 3rd St. W.	\$0.00
	Action taken	[REDACTED] 8/26/19: Sent first letter to owner giving until 9/5/19 to remove the dumpster or get a permit from PW.	

Maintenance concern Principal Structure

Date	Parcel ID#	Office Contact	Property Address	Amount of citation
8/13/2019	2303	Chris Luebben	312 7th St. West	\$0.00
		Action taken	[REDACTED] 8/8/19: Sent first letter giving until 9/16/19 to repair the deteriorated wood steps.	
8/19/2019	2721	Chris Luebben	1022 7th Avenue East	\$0.00
		Action taken		
8/20/2019	242	Chris Luebben	320 12th Ave. W.	\$0.00
		Action taken	[REDACTED] 1/14/19: Sent first letter giving until 8/1/19 to protective coat the ext of the house, and replace some windows, fix front porch.	
8/20/2019	242	Chris Luebben	320 12th Ave. W.	\$0.00
		Action taken	[REDACTED] 1/14/19: Sent first letter giving until 8/1/19 to protective coat the ext of the house, and replace some windows, fix front porch.	
8/26/2019	242		320 12th Ave. W.	\$0.00
		Action taken	[REDACTED] 1/14/19: Sent first letter giving until 8/1/19 to protective coat the ext of the house, and replace some windows.	
8/26/2019	242		320 12th Ave. W.	\$0.00
		Action taken	[REDACTED] 1/14/19: Sent first letter giving until 8/1/19 to protective coat the ext of the house, and replace some windows.	

Maintenance concern Vehicle

Date	Parcel ID#	Office Contact	Property Address	Amount of citation
8/6/2019	3063	Chris Luebben	1000 11th Ave West	\$0.00
		Action taken	[REDACTED] 8/6/19: Sent first letter giving until 9/3/19 to move boats off grass & register boat with expried sticker WS 5384 BW (expired 2013).	
8/9/2019	259	Chris Luebben	311 Beaser Ave.	\$0.00
		Action taken	[REDACTED] Sent first letter giving until 9/4/19 to store the unreg vehicle (IL plate #L76 3360) in an encl structure or register it.	
8/13/2019	3118	Chris Luebben	1108 Beaser Avenue	\$0.00
		Action taken	[REDACTED] 8/8/19: Sent first letter giving until 9/4/19 to move vehs off grass and register the pickup truck.	

8/13/2019	4364 Chris Luebben	619 MacArthur Avenue	\$0.00
	Action taken	[REDACTED] 8/8/19: Sent first letter giving until 8/27/19 to remove goods from trailer in rear yard.	
8/14/2019	2533 Chris Luebben	823 2nd Avenue West	\$0.00
	Action taken	[REDACTED] 8/8/19: RV was parked on the grass in the City right-of-way. Was moved & gone before I sent a letter. RV back on grass on 8/16/19.	
8/14/2019	2533 Chris Luebben	823 2nd Avenue West	\$0.00
	Action taken	[REDACTED] 8/8/19: RV was parked on the grass in the City right-of-way. Was moved & gone before I sent a letter. RV back on grass on 8/16/19.	
8/19/2019	1450 Chris Luebben	123 14th Ave. E.	\$0.00
	Action taken	[REDACTED] 8/15/19: Sent 1st letter giving until 9/4/19 to move the van off the grass.	
8/19/2019	1567 Chris Luebben	221 Stuntz Ave.	\$0.00
	Action taken	[REDACTED] 8/15/19: Sent first letter giving until 9/4/19 to remove the unreg veh from the grass.	
8/29/2019	4367 Chris Luebben	605/607 Mac Arthur Ave	\$0.00
	Action taken	[REDACTED] 8/29/19: Sent first letter giving until 9/30/19 to license & plate the car.	
8/29/2019	4367 Chris Luebben	605/607 Mac Arthur Ave	\$0.00
	Action taken	[REDACTED] 8/29/19: Sent first letter giving until 9/30/19 to register Chevy pickup truck with MN plate number 487-HNN (exp	

**POLICE AND FIRE COMMISSION MEETING
ASHLAND FIRE DEPT MEETING ROOM**

July 1, 2019

1. Call to Order

The meeting was called to order at 5:15 p.m. by Gordon Gilbertson.

2. Roll Call

Present: Gordon Gilbertson, Ed Monroe, Sarah Nelson, and Matthew Horning

Absent: Kate Siegler

Also present: Police Chief Jim Gregoire, Fire Chief Dave Wegener

3. Approval of Agenda Items

A motion was made by Ed Monroe, seconded by Matt Horning, to approve the agenda items. The motion passed unanimously.

4. Approval/Review of Minutes from May 6, May 17, and June 17, 2019

A motion was made by Sarah Granley, seconded by Matt Horning, to approve the minutes from May 6, 2019, May 17, 2019 and June 17, 2019 as written. The motion passed unanimously.

5. Election of Officers

Gordy Gilbertson opened up nominations for Commission President. Sarah Granley made a motion to nominate Gordy Gilbertson for Commission President. Ed Monroe seconded the motion. The motion passed unanimously. Gordy Gilbertson asked if there were any other nominations, there being none, Gilbertson accepted the nomination for President.

Nominations were opened for Vice President. A motion was made by Gordy Gilbertson to nominate Ed Monroe as Vice President. The motion was seconded by Matt Horning and passed unanimously. Gilbertson asked if there were any other nominations for Vice President. There being none, Ed Monroe accepted the nomination for Vice President.

Nominations were opened for Commission Secretary. Gordy Gilbertson made a motion to nominate Sarah Granley as Commission Secretary. The motion was seconded by Ed Monroe and passed unanimously. There being no other nominations for Commission Secretary, Sarah Granley accepted the nomination.

Kathy Holevatz and Barb Henry were unanimously reappointed as recording secretaries to the Police and Fire Commission.

6. Police Department Report

A. Administrative Report

Chief Gregoire reviewed his report and mentioned the following highlights:

- APD is down six officers, 4 to injury and 2 retirements
- Two new officers were hired – one started June 28 and one starts July 6
- Only a few calls so far regarding Rainbow Event in Delta area (shoplifting)

- Reviewed a graph of arrests from the last month
- City Council postponed RDA regarding a new PD
- Last two weeks very busy with workers comp, filling shifts, hiring, etc.
- May 21 a region-wide active shooter drill was held a Bretting Mfg.
- Contract was signed for school liaison officer

A motion was made by Ed Monroe, seconded by Matt Horning to approve Chief Gregoire's report and place it on file.

7. Fire Department Report
A. Administrative Report

Chief Wegener reviewed his report. Highlights included:

- A well-attended retirement party was held for Wayne Chenier
- Reviewed call stats, very close to the same numbers as last year at this time
- June 12 Rescue Divas camp for girls was held
- AFD was awarded 2 grants for EMS advanced lifesaving equipment and self-contained breathing apparatus fire equipment
- May 29 a table-top training was held with TransCanada
- Training highlights were reviewed
- Five new staff members will be starting on July 8th

A motion was made by Matt Horning, seconded by Ed Monroe, to approve the Fire Department Report presented by Chief Wegener. The motion passed unanimously.

8. Next Meeting Date

The next regular meeting for the Police and Fire Commission was scheduled for Tuesday, September 3, 2019, at 5:15 p.m. at the Fire Department meeting room.

9. Closed Session as authorized by Wisconsin State Statute 19.85(1)(c) for:

- a. Probationary Report – Police Department**
- b. Update on Hiring, Probationary Report – Fire Department**

A motion was made by Ed Monroe, seconded by Sarah Granley to go into closed session. The motion passed unanimously.

10. Return to Open Session

A motion was made by Ed Monroe, seconded by Sarah Granley to return to Open Session. The motion passed unanimously.

11. Report Action Taken in Closed Session

The Commission approved Police Chief Gregoire's report on probation update of Chris Pupp and also the probation update of Dave Rekemeyer, and hiring update presented by Chief Wegener.

12. Adjournment

A motion was made by Matt Horning, seconded by Ed Monroe to adjourn. The motion passed unanimously and the meeting adjourned at 6:00 p.m.

Respectfully Submitted,

Kathy Holevatz,
Recording Secretary

Minutes of the City of Ashland Plan Commission

A meeting of the Plan Commission was called to order on **Tuesday, July 2nd, 2019**
at 6:30 p.m. in the City Hall Council Chambers.

PRESENT: John Beirl, Laurie Gregor, Katie Gellatly, Mayor Lewis

EXCUSED: David Mettillie, Matt Mackenzie

STAFF: Megan McBride

1) Call to Order and Roll Call

Mayor Lewis called the meeting to order at 6:30 p.m.

2) Approval of Agenda

Motion to approve the Agenda by Katie Gellatly. Seconded by Laurie Gregor. Passed unanimously.

3) Public Comment (non-agenda items)

No public comments.

4) Action Items

- a) Public Hearing and Vote on a Conditional Use Permit Amendment to allow fencing eight feet in height around the New Day Advocacy Center children's play area at 301 Ellis Avenue, zoned City Center (CC). Applicant: New Day Advocacy Center.**

Motion to go into public hearing by John Beirl, seconded by Katie Gellatly, passed unanimously.

Megan McBride confirmed that the Class 2 Public Hearing requirements were all followed. She explained that the reasoning behind requesting an 8 foot high fence and the change to a vinyl material is to provide increased privacy for the residents.

Tom Potterton, board president from New Day Advocacy Center was present, and spoke about the timeline for the opening of the Center, and provided information as to the layout and size of the play area. He said that the play area would be far enough from the intersection of Third St and Ellis Ave that it would not block the viewing triangle at the intersection, and the area would have security cameras and a security system. He is hopeful that the Center will be opening around September 1st.

Megan clarified that the previous time an amendment was requested for the 8 ft fence, no opposition had been received during that process.

Motion to go out of public hearing by John Beirl, seconded by Laurie Gregor, passed unanimously. Motion to approve Conditional Use Permit by John Beirl, seconded by Laurie Gregor, passed unanimously.

- b) Public Hearing and Vote on a Conditional Use Permit to construct a new 165' telecommunication tower for mobile service facilities at 2909 Toll Road, zoned Heavy Industrial (HI). Applicant: PI Tower Development, LLC and Verizon Wireless.**

Motion to go into public hearing by John Beirl, seconded by Laurie Gregor, passed unanimously.

Megan McBride confirmed that the Class 2 public hearing requirements were followed, and letters and emails were sent to adjacent property owners, including Ralph from Deltco, but she did not hear any concerns from them. She spoke as to the increased need for the ability to co-locate on these types of towers in this community, and stated that she did not see any negative impacts for the community.

Peter Schau from PI Tower Development answered questions regarding the relationships between the entities involved in the tower development.

Motion to go out of public hearing by Mayor Lewis, seconded by John Beirl, passed unanimously. Motion to approve Conditional Use Permit by Laurie Gregor, seconded by Katie Gellatly, passed unanimously.

c) Site Plan review for a 165' telecommunication tower to accommodate mobile service facilities at 2909 Toll Road, zoned Heavy Industrial (HI). Applicant: PI Tower Development, LLC and Verizon Wireless.

Megan McBride provided information regarding the proposed site plan, and how it has already been looked over by Public Works and the City's building inspector, and both of these parties are in favor of it. As the tower will be unmanned, there are not any concerns regarding increased traffic for the neighboring properties. Adequate landscaping will be provided on the site to preserve aesthetics.

Peter Schau from PI Tower Development clarified that there will not be blinking lights on the tower, which has been approved by the FAA.

Motion to approve Site Plan by Katie Gellatly, seconded by Mayor Lewis, passed unanimously.

5) Discussion Items

a) Updates on Waterfront Development Plan and Comprehensive Outdoor Recreation Plan updates

Megan McBride announced that the final WDP/CORP open house meeting will be held on July 11th at 5 pm at the Hotel Chequamegon. A stakeholder meeting will be held at 3:30 on the same date, prior to the open house.

Katie Gellatly asked if they will be providing information that has been gained from the previous open house meetings, and Megan McBride clarified that the stakeholder meeting will be for more specific questions based on the input gained, and the expertise from the contractors and City staff. She said that the preliminary plan has been put together based on the input gained from surveys, open houses, stakeholder input, and focus group meetings held throughout the City over the previous months.

John Beirl asked for updates on the Superfund site cleanup, and Mayor Lewis stated that the City is working with Xcel's consultants to put in the two boat launches without breaching the cap that has been placed on the contaminated site.

Mayor Lewis also said that the site will have parking, but it will not be paved for two years in order to allow for the site to settle.

Megan McBride provided updates on the proposed residential developments on the top floors at 509-513 Main Street, with proposed commercial development at the street level. The City is also trying to move forward with developments at the former Timeless Timbers site on

Highway 2. Plan commissioners were asked to brainstorm about potential commercial development for the north side of the Timeless Timbers site, while residential development is the hoped-for development on the south side of the site, in order to blend in with the residential development surrounding that side of the site.

John Beirl said that it appears that the realty market is moving very quickly right now. Laurie Gregor said that from what she has seen, there are a lot of younger, professional people moving into the area, and they are excited to move here.

6) Adjournment

Motion to adjourn by John Beirl. Seconded by Katie Gellatly. Passed unanimously.
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The meeting was adjourned at 7:15 p.m. Minutes by Lucas Phillips.

SUBJECT: Presentation on the International Joint Commission Listening Session on September 25, 2019 (*Councilor Ullman*)

RECOMMENDATION:

DEPARTMENT OF ORIGIN: Councilor Ullman

CLEARANCES: Council President

EXHIBITS:

1. Notice for International Joint Commission listening Session
2. City of Ashland Source Water Protection Plan (Draft) January 2018

FINANCIAL IMPACT: NA

SUMMARY STATEMENT:

Aidan Reilly of the Northland College Mary Griggs Burke Center for Freshwater Innovation will inform Council about the upcoming visit of the The International Joint Commission (IJC).

The (IJC) is a bi-national organization that addresses boundary water concerns between the U.S.A. and Canada. They are also committed under the Great Lakes Water Quality Agreement to assess water quality issues and recommend remediation and conservation measures.

The City of Ashland Source Water Protection draft plan from January 2018 is attached for review.

The IJC is going on a regional tour to gather first-hand insight from local citizens to facilitate their report on the progress of the Great Lakes Water Quality Agreement to the heads of State. With their western Lake Superior tour in September, they are making stops in Thunder Bay ON, Duluth MN and Ashland WI.

Ashland citizens will have a chance to tell the IJC what they value about the quality of Chequamegon Bay, Lake Superior and the Great Lakes on September 25, 2019. The listening session will be held at the Alvord Theater at Northland College starting at 7pm. The event is FREE but preregistration is encouraged at: <https://step-in-speak-out-lake-superior2.eventbrite.ca>

The event is hosted by the Mary Griggs Burke Center for Freshwater Innovation at Northland College. For questions, please contact Valerie Damstra at vdamstra@northland.edu or 715-682-1261.



STEP IN AND SPEAK OUT FOR THE GREAT LAKES

International Joint Commission Listening Session

WEDNESDAY • SEPTEMBER 25 • 7PM
Northland College Alvord Theatre



**Mary Griggs Burke Center
for Freshwater Innovation**
NORTHLAND COLLEGE

What do you value about the quality of Chequamegon Bay, Lake Superior, and the Great Lakes? The International Joint Commission wants to know.

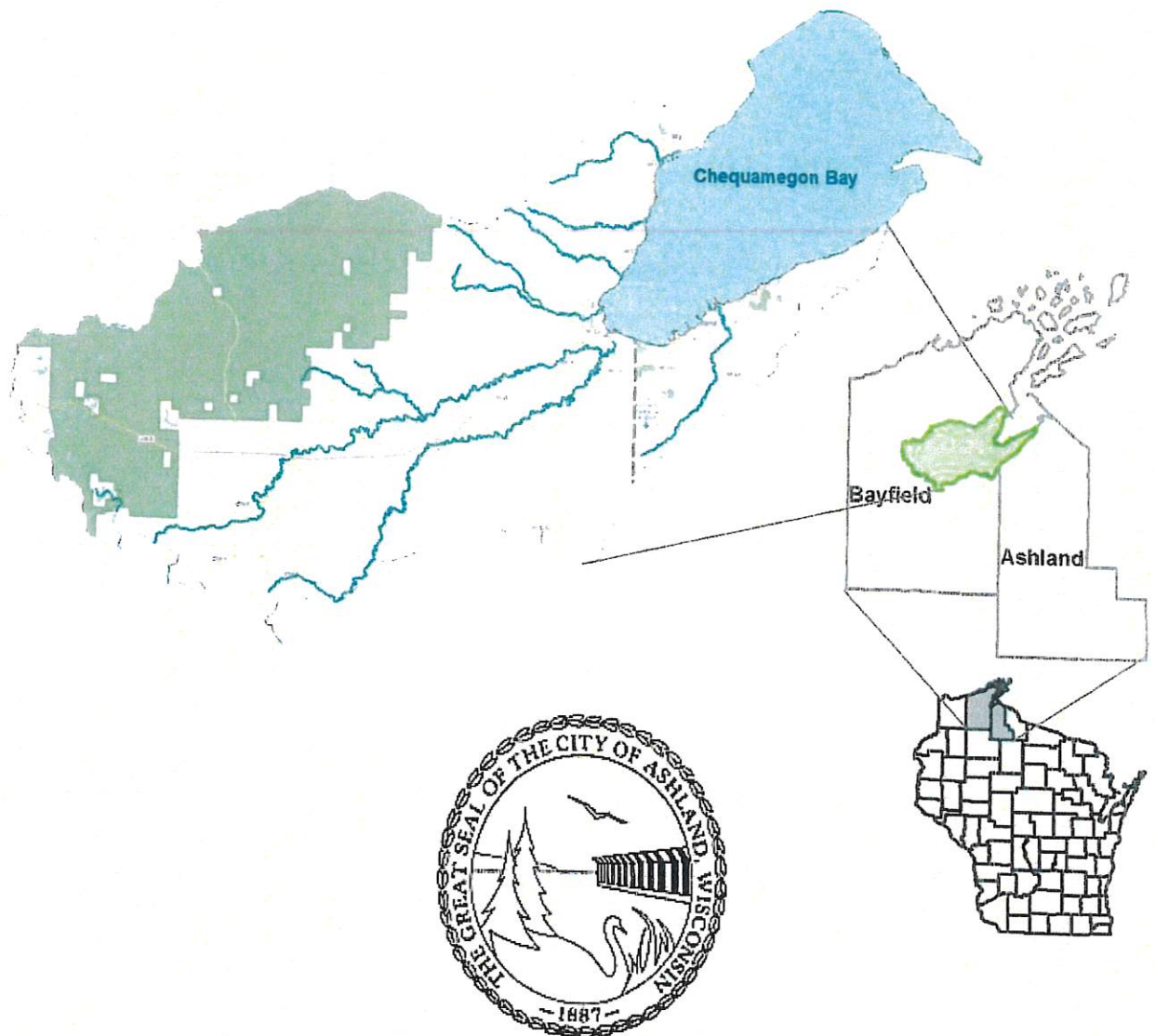
The International Joint Commission is a Canadian-US treaty organization that seeks to prevent and resolve issues facing the two countries' boundary waters.

This event is part of its consultation throughout the Great Lakes region to assess both countries' progress to accomplish the goals they agreed to in the 2012 Great Lakes Water Quality Agreement. To review the governments' latest progress report for their work under the agreement, please visit ijc.org

Please register for this FREE event: <https://step-in-speak-out-lake-superior2.eventbrite.ca>

CITY OF ASHLAND SOURCE WATER PROTECTION PLAN

Draft ~ January, 2018



Prepared By: The City of Ashland Source Water Protection Committee
 With Assistance from: Wisconsin Rural Water Association, Source Water Protection Program
 Andrew Aslesen, Source Water Specialist, AAslesen@wrwa.org
 Additional Assistance from Wisconsin Department of Natural Resources
 Date: —

Acknowledgments

The Ashland City Council initiated the development of the source water protection committee in March 2016. The committee consists of city staff & council members, Ashland & Bayfield County supervisors, Bad River Tribe & watershed association representatives, Northland College staff and state Department of Natural Resources Staff. Additional assistance was received from Wisconsin Rural Water Association, county and federal agency staff and interested local citizens. Collaboration and input from these individuals made this project possible. Thank you for the many hours spent working on the project, with particular recognition towards those volunteered their time.

City of Ashland, Ad Hoc Committee on Source Water Protection

- Kevin Brewster – Bad River Watershed – Advisory Role
- Dennis Clark– Public Works Director
- Mathew Cogger – UWEX, Ashland/Bayfield County - Advisory Role
- Alyssa Core or Designee – DNR Representative – Advisory Role
 - Bruce Moore – DNR Representative (Designated by Alyssa Core)
 - Mathew Jacobson – DNR Representative (Replaced Bruce Moore)
- Valerie Damstra – Chequamegon Bay Area Partnership Coordinator
- Carl Doersch - Ashland City Council Representative
- Mary Garness – Ashland City Administrator
- Mike Gardner – Advisory Role
- Richard Ketring – Ashland City Council Representative
- Randy Lehr – Mary Griggs Burk Center for Freshwater Innovation
 - Chris McNerney - Northland College (For Randy Lehr)
- Dennis Pocernich or Designee – Chair, Bayfield County Board of Supervisors
 - Jeff Silbert –Bayfield County Supervisor (Designated by Dennis Pocernich)
- Pete Russo or Designee– Ashland County Board of Supervisors
 - Tom Fratt - Ashland County LWCD (Designated by Pete Russo)
- Jack Schuster – Water Utility Director
- Naomi Tillison – Bad River Tribe Representative – Advisory Role

Additional participation from:

- Andrew Aslesen - Source Water Specialist, Wisconsin Rural Water Association
- April Kroner – City of Ashland Planning Director
- Ray Hyde – Former Public Works Director, City of Ashland
- Steve Oberle – Citizen, Bayfield County
- Michele Wheeler – DNR Representative-Advisory Role
- Tom Waby – Bay Area Regional Transit Director

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1 INTRODUCTION

Affordable, safe drinking water is essential to the health, development and stability of all communities. Treatment is used to maintain safe drinking water for surface water systems; however, the cost and quality of treated drinking water is a function of the pretreatment water quality. One of the best ways to ensure safe drinking water and reduce treatment costs is to develop a local source water protection program designed to protect the source of drinking water against potential contamination.

Source Water Protection (SWP) is the first line of defense in a multi barrier approach to reducing costs and providing safe drinking water. It focuses on protecting and improving water quality at the originating source before reaching the drinking water intake & undergoing treatment. SWP is accomplished using four main steps; assessment, planning, implementation and long term management. The first step, “assessment” was completed in March 2003 by the Wisconsin Department of Natural Resources (WDNR) and documented in the report *Source Water Assessment For Ashland Water Utility, Ashland, Wisconsin March 27, 2003*. A copy of Ashland’s source water assessment is available from the WDNR at <http://dnr.wi.gov/topic/drinkingwater/documents/SWAP/Ashland.pdf>. The source water assessment for Ashland suggests that the city should undertake source water protection by forming a SWP committee to plan and implement best management practices in the source water area to prevent source water contamination. This source water protection program is intended to put in place the remaining steps of planning, implementation and long term management.

In February 2016 due to an increase in public awareness about water quality concerns, city employees put together a list of potential source water protection committee members who could collaboratively develop a SWP plan for the City of Ashland. In March, 2016, the City Council voted to approve the formation of a SWP committee and development of the SWP plan. The city reached out to Wisconsin Rural Water Association (WRWA) for assistance with facilitating the SWP plan writing process. WRWA is a non-profit association of utilities that provides technical assistance to utilities. Ashland is a long time member of WRWA.

Source water is untreated water from streams, rivers, lakes and groundwater aquifers. Source water protection is a watershed based approach to protecting drinking waters sources and reducing treatment costs. A watershed isn’t limited to political boundaries such as township, county or state. Instead, it is simply an area of land that drains to a common point. Although we often manage land according to political boundaries, it makes more sense to plan and manage areas by the lay of the land, and all people living within a watershed play an important role in protecting their water (Sapper, 2002).

1.1 Integration with City of Ashland Planning (Comprehensive Plan & Strategic Plan)

Integration of the Ashland Source Water Protection Plan with the City of Ashland is done two ways, through city operations and through ordinances. Two city council members and several city staff members sit on the SWP committee. These individuals are tasked with implementing the plan by revising and updating the city's operating procedures and developing ordinances that improve and protect water quality in the Chequamegon Bay and the creeks leading to it.

1.2 Integration with Ashland & Bayfield Counties (Including Resource Management Plan)

Ashland and Bayfield Counties both have Land & Water Resource Management Plans. County Land & Water Resource Management Plans completed on a 10 year planning cycle and deal with protection of all natural resources, including surface water, groundwater, soil, forest, agriculture and wildlife habitat. While these planning efforts are all related, the Ashland source water protection plan takes a more focused look at surface water quality in Chequamegon Bay.

In Chapter VIII *Coordination* of the Ashland County plan, coordination with the City of Ashland with "increase collaboration on Lake Superior waterfront issues, stormwater management, invasive species and beach health" is specifically listed. The Bayfield County plan lists the City of Washburn and the City of Bayfield in their list of implementation partners. The City of Ashland should look for commonalities in the Ashland and Bayfield Counties' Land & Water Resource Management Plans and look for opportunities to participate in the regular planning cycle.

1.3 Integration with Other Planning Efforts (Tribal Governments and Entities and Non-Governmental Organizations)

Tribal government entities in the area include the Bad River Band of Lake Superior Chippewa, Red Cliff Band of Lake Superior Chippewa and the Great Lakes Indian Fish and Wildlife Commission. Prominent non-governmental organizations in the area include the Bad River Watershed Association, Chequamegon Bay Area Partnership, Sigurd Olson Environmental Institute and others. The Ashland City staff and SWP committee members should seek opportunities to coordinate these tribal and non-governmental organizations to improve and protect water quality in the Chequamegon Bay and get Chequamegon Bay as a drinking water "source water" included in planning efforts.

2 BACKGROUND

Source water refers to water from streams, rivers, lakes or underground aquifers that is used for drinking. The City of Ashland is located in northwest Wisconsin along the southern shore of Lake Superior and the city water utility relies solely upon water from Lake Superior's Chequamegon Bay to provide drinking water to the residents the city.

The first work done to protect Ashland's source of drinking water was the WDNR's Source Water Assessment completed in 2003. The Source Water Assessment delineated the source water area for Ashland's municipal water intake. The source water area is defined as the area that contributes source water to the public drinking water system. For Ashland, that includes land drained by Bono Creek, Boyd Creek, Fish Creek, Bay City Creek and multiple unnamed tributaries to Chequamegon Bay. Clay soils predominate throughout the watershed, causing erosion and runoff problems. Land cover is mostly naturally vegetated with some agriculture and the cities of Ashland and Washburn.

Figure 1 - Watershed Overview

2.1 Source Water Assessment Overview

A source water assessment provides not only an understanding of current conditions, but also serves as a predictive tool for source water management and protection efforts. This information can be used as a basis for voluntary, community-based barriers to drinking water contamination.

The 1996 amendments to the Safe Drinking Water Act required that states complete source water assessments for all public drinking water systems. The primary purpose of these assessments was to determine the relative susceptibility of each community's source water to contamination. Susceptibility is defined as the likelihood that a contaminant of concern will enter a public water supply at a level that may result in adversely impacting human health.

The source water assessment for the Ashland Water Utility was completed by the WDNR in 2003. It states that as with most surface water systems, Ashland's source water is impacted by the source water area and highly susceptible to contamination. The assessment identifies the confined nature of the Chequamegon Bay and erodible soils and land uses found in the source water area as the biggest factors affecting source water susceptibility. It concludes that contaminants of particular concern to Ashland's source water include microbial, volatile organic and synthetic organic contaminants as well as precursors of treatment by-products. It suggests that SWP efforts should focus on preventing contamination from agriculture and pasture land draining into Bono, Boyd and Fish Creeks, urban development in the city of Ashland and sites of historic contamination (page 2). The primary recommendation of the source water assessment is for the City of Ashland to develop a local source water protection program designed to protect Ashland's source water against potential contamination. A copy of Ashland's source water assessment is available from the WDNR at <http://dnr.wi.gov/topic/drinkingwater/documents/SWAP/Ashland.pdf>.

2.2 Source Water Protection Overview

Source water protection is the next step beyond the source water assessment. Source water protection begins when the local community decides to develop a program designed to protect the drinking water sources from potential contamination. It begins by forming a source water protection team to plan and implement best management practices in the source water area to prevent contamination. It is the first line of defense to reduce the chance that contamination will reach the end user. It reduces potential health risks and minimizes the cost of treating drinking water. Source water protection consists of the following steps

- **Delineate the source water protection area:** The source water protection area was delineated in the 2003 source water assessment and is described in section 2.2. This plan includes an additional "secondary" source water protection area described in section 2.3
- **Inventory known and potential source of contamination and determine susceptibility to contaminant source within the SWP area:** In order to protect the source water, we need to know what potential sources of contamination are threaten the water. Potential contaminant sources are evaluated in section 4.
- **Implement management measures to prevent, reduce, or eliminate risks to the source water:** The key to a successful plan is creating meaningful action. The implementation measures laid out in section 6 are designed to protect the drinking water source for Ashland and the surrounding communities.

- **Develop contingency planning strategies that address water supply contamination or service interruption emergencies:** In the event of a contamination event or emergency, section 7 outlines what actions need to be taken and lays out communication procedures. Emergency preparedness is an indispensable part of any drinking water protection program.

Protecting source water is everyone's responsibility, and everyone plays a role; including federal, state, & local government, the water utility, business and industry, non-governmental organizations and individuals. More information about SWP can be found at the following Wisconsin DNR and the EPA websites.

<http://dnr.wi.gov/topic/drinkingwater/sourcewaterprotection.html>

<https://www.epa.gov/sourcewaterprotection/source-water-protection-basics>

2.3 City of Ashland Water System Overview

The Ashland Water Utility pumps an average of around 600,000 gallons of water per day and serves more than 9,115 people through more than 3,000 service connections. Raw water is collected from the Chequamegon Bay through a 24 inch diameter pipeline that extends approximately one half mile into the bay. Water gravity feeds through the intake pipe into the collection chamber. From there it is pumped to the microfiltration building.

The microfiltration building was constructed in 2001 and consists of a 500 micron strainer to remove any large debris. Next water flows through four membrane microfiltration units. These remove particles as small as 0.2 microns in size. After filtration, finished water is treated with chlorine for disinfection and fluoride for dental health and flows to a ground storage reservoir which allows for sufficient contact time for the chlorine to completely disinfect the water. Additional treatment consists of adding small doses of Polyphosphate and Sodium Hydroxide. These chemicals have been successful at reducing the amount of lead that leaches into some residential customer's water if their homes still have lead pipes.

From the ground reservoir, three high-lift service pumps capable of pumping 840 gallon per minute each, discharge to the distribution system which contains 54 miles of main pipe that ranges from one inch to twenty-four inches in diameter. Storage for the water system is provided by a 1.4 million gallon standpipe, a half million gallon elevated water tower. All facilities are continuously monitored by computer through a telemetry system and physically checked daily for proper operation.

3 HYDROGEOLOGIC SETTING

Lake Superior is the largest freshwater lake in the world. It has 1,826 miles of shoreline and covers 31,700 square miles with a maximum depth of 1,332 feet. The Lakes' watershed drains approximately 49,300 square miles.

The Chequamegon Bay is a shallow sandy bay relatively isolated from Lake Superior by the Bayfield Peninsula to the northwest and Chequamegon Point to the northeast. The bay is connected to Lake Superior by a 2 mile stretch of open water between the tip of Chequamegon Point and Houghton Point on the Bayfield Peninsula. The Chequamegon Bay area watershed is a compilation of multiple watersheds that flow towards Lake Superior. The watershed includes nearly 1,500 square miles of land in Ashland, Bayfield and Iron counties. The watersheds contain more than 2,100 linear miles of rivers

and tributaries that travel from the Penokee Range to the south towards the Chequamegon Bay and Lake Superior to the north.

The Superior region contains portions of two distinct geologic provinces, the Lake Superior Lowland and the higher elevations of the Northern Highlands to the south. The geography of the region was shaped by glaciers that covered the area more than 20,000 years ago during the later period of the most recent glacial period. The northern highlands consist of sandy till of the Copper Falls Formation deposited by glacial meltwater. The sandy, coarse grained till allows much precipitation and snowmelt to infiltrate and supports less surface runoff to streams. As the glaciers retreated back to the north, they deposited till with much more silt & clay known as the Miller Creek Formation. The fine-grained, low permeability in these areas supports high surface runoff to streams (Clayton, 1984; Gotkowitz & Li, 2016). Surface runoff in the Fish Creek & Wittlesey Creek watersheds give the Chequamegon Bay a prominent cloudy red appearance during spring-melt and after heavy rains.

Figure 2 - Superior Region (From Clayton, 1984)

While the entire Chequamegon Bay area watershed and other factors such as lake-wide episodic events can affect water quality in the Bay, implementing SWP in the entire Lake Superior Watershed is not practical. To protect & improve water quality at a more practical scale, Ashland's source water area was delineated to include the local watersheds that discharge near Ashland's intake and have a more direct

impact on water quality in Chequamegon Bay. The Source Water Protection (SWP) area for Ashland is divided into Primary and Secondary SWP areas which are described below.

3.1 Primary Source Water Protection (SWP) Area

The Primary SWP area is the land that contributes a majority of the surface water flow to Chequamegon bay and most directly affects source water quality. It covers more than 200 square miles and includes land drained by Bono Creek, Boyd Creek, Fish Creek, Bay City Creek and multiple unnamed tributaries to Chequamegon Bay. Ashland's source water is most directly affected by runoff from the Fish Creek HUC 10 watershed & the Whittlesey Creek HUC12 watershed. The primary & secondary SWP areas are shown in Figure 3.

Figure 3 - Ashland Source Water Protection Area

3.2 Secondary Source Water Protection (SWP) Area

The Secondary SWP area includes adjoining subwatersheds outside of the Primary area that contribute less directly to the surface flow and water quality of Chequamegon Bay and Ashland’s source water quality. It is a much larger area than the Primary Area and includes the land drained by XXXX.

The Source Water Protection Committee for the City of Ashland includes representatives from Primary and Secondary Protection Areas and is actively seeking assistance from all local units of government, Tribes, organizations, and individuals in development and implementation of the Source Water Protection Program.

3.3 Impaired Waters List

Every two years, Section 303(d) of the Clean Water Act requires states to publish a list of all waters that do not meet water quality standards known as the Impaired Waters List. The water bodies in the primary SWP area listed as impaired are South Fish Creek, and unnamed tributary to South Fish Creek, Bay City Creek and Maslowski Beach. Bayview Park Beach was listed previously, but has been removed. The streams are impaired because of total phosphorus from rural and/or urban nonpoint source runoff. Maslowski Beach is impaired for E. coli. Additionally, Lake Superior is listed as impaired for PCBs and Mercury. Below is a table and a map of the impaired waters in the primary source water protection area.

Table 1. Impaired Waters.

Insert Table of Impaired Waters.

Figure 4 - Ashland Source Water Protection Area Impaired Waters List.

4 WATER SYSTEM SUSCEPTIBILITY ASSESSMENT

These are good examples of water quality targets that I found in a different plan (Lake Maumelle Watershed Management Plan, pg 25).

5 WATERSHED ASSESSMENT

The focus of the Watershed Assessment portion of the Source Water Protection Plan is to provide an overview of the causes and sources of pollution in the watersheds identified as the primary source water protection area that can negatively impact water quality in the Chequamegon Bay and the municipal water supply. This includes naturally occurring pollution sources as well as human caused rural and urban pollution sources.

5.1 Historic Sources of Pollution

5.1.1 Ashland/XCEL/Northern States Power Lakefront gas plant, marina lagoon (Superfund remediation site), City of Ashland.

Over a period of approximately 145 years (1845-1989), a portion of the Ashland waterfront between Ashland's Ellis Avenue and 7th Avenue East was the site of various industrial activities. Those activities included a manufactured gas plant (used to heat and light homes), a lumber mill, railroad car facilities, a municipal landfill and community wastewater treatment plant.

Soil and groundwater contamination was detected in 1989. Specific contaminants include tar, oil and other waste consisting of polyaromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and metals. Identified contamination extends to the site of the gas plant landward and 10 acres of lakebed on Chequamegon Bay. Site investigations and remediation work have been ongoing since 1994, and continue to this day.

As of late 2016, removal of contaminated soils at the site of the gas plant site and nearby Kreher Park have been completed, including ongoing treatment of contaminated groundwater beneath and lakeward of the site. WDNR is reviewing a proposal to remediate contaminated lakebed sediments through a "wet-dredging" process.

Details about the site's history and ongoing remediation efforts can be reviewed at EPA's Superfund web site: <https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0507952>

5.1.2 Historic land use changes from forest to clear cut timber harvesting to agriculture

The forests surrounding Ashland underwent a period of heavy logging from the 1882 to 1889. In 1987, Ashland and Bayfield counties produced more than 263 million board feet of lumber (Bro & Fratt, 2011). As the logging era slowed, immigrant laborers brought much of the cut-over land with hopes of establishing farms. Much of the agricultural development occurred from 1895 to 1920. The sandy soils in the headwaters of the watershed turned out to be unsuitable for growing crops, and in the early 1930's much of the land in the sandy headwaters area was purchased by the US government who established the Chequamegon-Nicolet National Forest. Additionally at that time, the Wisconsin legislature passed a Forest Crop Law that enabled tax benefits for long-term management of private forest lands.

The 1999 USGS study of North Fish Creek watershed, which makes up a  of the primary SWP area, looked at how flooding and sedimentation has changed in response to human caused land cover

changes. The study looked at field evidence as well as hydrologic and sediment transport models to show how the transition from forest to clear cutting to agriculture significantly altered the conditions of the watershed. The removal of forest cover increased surface runoff, which increased size and peaks of floods. In areas where the natural forest vegetation was permanently converted to agriculture (like much of the South Fish Creek watershed) substantial long term changes in flooding and sedimentation has occurred. Peak flood flows during peak agricultural land use (around 1928) were about 3 times greater and under current conditions 2 times greater than under pre-settlement forest cover.

Channel characteristics were also affected by the land use change. Post-settlement channel width has narrowed in the upper main stem and widened in the lower main stem.

5.1.3 DuPont Munitions Plant, Town of Barksdale

On the west side of Chequamegon Bay in the Town of Barksdale is the site of the former DuPont Munitions plant. The plant is located on Chequamegon Bay with State Highway 13 running northeast across the eastern edge of the property. It is bordered on the North by Nolander Rd and the west by Ondossagon Rd. Boyd Creek runs west to east through the center of the property. E.I. du Pont de Nemours and Company (DuPont) manufactured explosives on the 1,800-acre facility from 1905 till 1971. While in operation, waste was stored at various locations on site and went into Boyd Creek on the property and contamination levels in the creek were likely much higher and may have been harmful to wildlife and people; although sampling data from the time is limited.

As of June 2002, seventeen private wells of seventy two wells sampled near the property were contaminated with low levels of site related chemicals. These chemicals are not a public health hazard and do not pose a significant increased cancer risk. Treatment systems were installed on private wells to provide safe clean drinking water. In 1998 an investigation found 2,6-DNT contamination in sediment and water samples from Boyd Creek but the levels were very low and the consultant concluded that TNT and DNT isomers are not migrating from the site to Chequamegon bay at concentrations of concern.

Currently, available data indicates that contamination from the former DuPont facility is not migrating off site. A June 2002 investigation report indicate substantial contamination in soils and surface water of some former production areas that exceeds health-based screening values. As long as these contaminants don't migrate off site, it appears that the former DuPont facility poses little threat to Ashland's source water. More information on the site is located at the following link:
<http://www.tn.merrimac.wi.gov/agendas/DuPontPHA.pdf>

5.1.4 Early Development of Ashland Waterfront (through ~1950's)

Settlement in Ashland began around 1855 and the first railroad to Ashland was completed in 1877. The City was incorporated in March of 1887. The lumber and the iron ore industries were the dominant industries in Ashland during the late 1800's to the early 1900's. Modification of the shoreline began almost immediately, with a total of four ore docks built along Ashland's waterfront to accommodate loading of iron ore from the Gogebic range on to ships. The first ore dock in Ashland was built by the Milwaukee, Lake Shore and Western Railway in 1884. The second dock was built in 1888, but burned in 1924 and was dismantled in 1948. The largest ore dock was the Wisconsin Central ore dock built in 1916. It is 1,800 feet long 80 feet high and 59 feet wide and is located 1,000 feet southwest of where

Bay City creek empties into the bay. The dock was demolished in 2013, with only the concrete base left behind. The City is planning to redevelop the dock into a public space. In 1965, shipping of ore from Ashland ended.

5.2 Point Sources of Pollution

5.2.1 Municipal Wastewater Treatment Plant Effluent

Three municipalities discharge treated wastewater effluent into the Chequamegon Bay area: Ashland, Washburn, and the Greater Bayfield facilities. The required parameters and frequency of monitoring effluent differs among facilities. All monitor phosphorus at least weekly. Estimates of annual phosphorus loading as P mass (as pounds per year or lbs/yr) are calculated using mean daily flow of effluent (million gallons per day or MGD) and mean concentration of total P (milligrams per liter or mg/L). Phosphorus loading differs among years and among facilities (Figure X). It should be noted that estimated phosphorus loading presented here represents discharges from current facilities for years in which data is available to make the calculations. Discharges did occur prior to the first year noted in Figure X. For Ashland and Washburn facilities, permits did not require regular phosphorus measurements needed to make the calculations. The Greater Bayfield facility was constructed in 2005; data from 2006 on represents effluent from the new facility.

Ashland's annual phosphorus effluent has ranged from 1,493 to 2,547 between 1993 and 2015. Washburn's annual phosphorus effluent ranges from 926 to 2,419 lbs/year; however the highest estimated load occurred in 2011 when the biological processing was not functioning. During all other years, effluent from Washburn was below 1,600 lbs/year. The existing Greater Bayfield wastewater treatment plant treats wastewater from the City of Bayfield and the Pike's Bay Sanitary district. Estimated phosphorus loading from Bayfield ranges from 96 to 275 pounds/year. However, effluent volume varies greatly throughout the year, consistent with the seasonal nature of the population: more people live in the area in the summer months, and therefore the volume of wastewater treated is much higher during summer months.

Figure 5. Estimated phosphorus load from Ashland, Washburn and Greater Bayfield wastewater treatment plants.

5.2.2 City of Ashland Sanitary System

The City of Ashland's original wastewater treatment plant was constructed in 1954 near the city marina on Chequamegon Bay. In 1992 a new wastewater treatment plant was constructed in the eastern part of the city on the north side of Knight Rd. Wastewater is conveyed through the sanitary sewer system to the city's main lift station located at the edge of the Chequamegon Bay at 12th Ave. East. From there, six 150-horsepower pumps convey wastewater through a 24-inch force main to the treatment plant. Under normal conditions one or two pumps operate simultaneously; however during high flow events all six pumps can operate. Once wastewater enters the treatment facility it undergoes pre-treatment to remove large particles. From there it undergoes biological treatment in the plants two oxidation ditches. Raw wastewater is mixed with microorganisms that feed on bacteria and organic material. The microorganisms clump together to form a biological floc. Air and alum, a chemical that reduces phosphorus in wastewater, are added to process at this point. From the oxidation ditches, water enters the final clarifiers. Water comes through the center and slowly moves to the outside of the clarifier. This movement allows the biological floc to settle out and return to the oxidation ditches to continue the biological treatment process. Excess sludge is pumped to the sludge storage basin. Clean treated water flows over the outside edge of the clarifiers and is sent through a disinfection process using ultraviolet light. Finally, clean water is conveyed through the outfall line and is discharged to Chequamegon Bay near 29th Ave. E.

The normal sanitary flow for the City of Ashland is about 1 million gallons per day (MGD). The waste treatment facility has a maximum capacity of 3.84 MGD, so the system will handle 4 times the normal flow of the city. This allows most minor rain events to be processed through the waste treatment facility. Additionally, the system is complete with an 8 million gallon outdoor overflow basin where the heavy solids settle out and five floating aeration units provide an increase in oxygen levels to help the digestive process. This outdoor overflow basin absorbs most of the heavy rain events and the stored diluted sanitary water (since it is mixed with a significant amount of rain or snow melt) is metered back through the plant over the days following an event. All processed treated water is released to the Chequamegon Bay per the DNR approved permit.

like most cities, Ashland had common connections between the sanitary sewer system and storm sewer systems that contributed a significant inflow of stormwater during storm and snowmelt events. Most of these cross connections have been eliminated. In Ashland, like many other cities, most of the sanitary collection system has exceeded its lifetime and there are cracks and leaks in sanitary sewer pipes where groundwater can infiltrate into the sanitary system, which contributes to spikes in flow during major storm or snowmelt events. This increase in sanitary sewer flow during storm & snowmelt events is known as Inflow and Infiltration (I & I). During these events, sanitary flow can spike to 5 or 6 times above the wastewater treatment facilities capacity. When inflow exceeds the outdoor overflow basin's storage capacity, it bypasses treatment and is released directly to surface water. This is called a "sanitary sewer overflow", these releases are very infrequent. When they happen, the city is required to notify the DNR and public within specified timeframes and monitor the quality of the release. The monitoring during these events as required by the DNR includes the following: TSS (total suspended solids), BOD (biochemical oxygen demand), eColi, and PH.

Inflow and infiltration is the biggest issue facing the City of Ashland wastewater system and is the primary contributor to overflow releases. A more detailed discussion of I & I is included in the following section (5.2.3).

5.2.3 Sanitary Sewer Overflow Events/Inflow and Infiltration

Inflow and infiltration or I & I are terms used to describe the ways that stormwater and groundwater enter into the sanitary sewer systems. I & I water is called "clear water" (although it may be dirty) to distinguish it from normal sanitary sewage in the sanitary sewer system. Sanitary sewer systems are designed to carry wastewater from sanitary fixtures and drains such as toilets, dishwashers, sinks, or showers. A stormwater sewer is a pipe system designed to convey rainwater and snowmelt. Stormwater sewers are larger than sanitary sewers because they are designed to carry larger amounts of water. When clear water enters sanitary sewer systems, it must be transported and treated like sanitary wastewater. During dry weather the impact of I & I can vary from minimal to a significant portion of the sewer flow. Wet weather magnifies I & I sources. As rain or snowmelt events begin, I & I starts filling the sanitary sewer systems with clear water, eventually reaching or exceeding the sanitary sewer systems to capacity. Once it becomes overloaded, wastewater can flow backward through sanitary sewer pipes, sanitary fixtures or drains that are below the overload flow level, causing flooding basements or households and causing manholes to pop open releasing wastewater onto the street. When sanitary sewer flow at the WWTP exceeds excess storage capacity a sanitary sewer overflow event occurs.

Inflow is stormwater that enters into sanitary sewer systems at points of direct connection to the systems. Sources of inflow include footing/foundation drains, roof drains, downspouts, window well drains, outdoor basement stairwell drains, driveway drains, basement sump pumps and even streams. These sources are typically improperly or illegally connected to the sanitary sewer systems by direct connections or discharge into sinks or tubs that are directly connected. An improper connection lets water that should be entering the storm sewer system from sources other than sanitary fixtures and drains to enter the sanitary sewer system. Improper connections can be made in any type of building and contribute a significant amount of water to sanitary sewer systems. For an example, an eight inch sanitary sewer pipe can adequately move domestic wastewater flow from up to 200 homes, but only eight sump pumps operating at full capacity or six homes with downspouts connected to the sanitary sewer pipe will overload the capacity of the same eight inch sewer pipe. A single sump pump can contribute over 7,000 gallons of water to sanitary sewer system in a 24 hour period, the equivalent of the average daily flow from 26 homes.

Infiltration is groundwater that enters sanitary sewer systems through cracks and/or leaks in the sanitary sewer pipes or manholes. This may be caused by age related deterioration, loose joints, poor design, installation or maintenance errors, damage or root intrusion. Groundwater can enter these cracks or leaks wherever sanitary sewer systems lie beneath water tables or the soil above the sewer systems becomes saturated. On average, sanitary sewer pipes are designed to last up to 50 years depending on what type of material is used. Often sanitary sewer system pipes along with the lateral pipes attached to a building have gone much longer without inspection or repair and are likely to be cracked or damaged. The City has a large percentage of piping that is 130 years old.

All water entering a water treatment facility must be treated as sanitary wastewater causing an increase in operating costs proportional to the amount of I & I entering the sanitary sewer system. For example, the City of Ashland expended an additional \$95,000 just to handle the additional rain water collected during the July 2016 flooding event. By reducing I & I, capital and operating costs can be lowered and the lifetime-capacity of a treatment facility can be increased. Pumping systems involved

with wastewater treatment and transport operate 24 hours a day seven days a week; I & I puts an unneeded strain and shortens the life expectancy of these expensive pumping systems.

I & I problems are difficult to resolve because of the enormity of the infrastructure in place. The City has almost 60 miles of underground sanitary piping, with most pre-dating World War II, with some pipes over 100 years old. Much of which were installed with materials that are well beyond their expected service life and used methods of construction that are not state of the art for today's standards. Solving I & I problems by treating clear water introduced by I & I is not economically feasible because of the treatment plant operating cost and expense of wastewater treatment plant infrastructure. To reduce I & I, sanitary sewer system maintenance and capital projects to repair failing infrastructure will require significant investments. The reduction and control of I & I in sanitary sewer systems should be considered with regard to a disciplined, annual, long-term monitoring and maintenance program. The first step to resolving any I & I problems is determining how significant the problem is. An evaluation of the sewer system will determine the quantity of I & I, determine their sources and provide guidance to determine a cost effective corrective action plan. The City of Ashland has undertaken several of these steps already.

Periodically the City must monitor and measure their sanitary sewer system to maintain the integrity of the system and determine sources of I & I. Continuous monitoring is also beneficial to the cities and agencies so appropriate cost increases can be applied to particular sources that are heavy contributors to inflow and infiltration into the sanitary sewer system and develop plans that will require Council approval to have new developments pay their fair share of the infrastructure already in place for them. The city has taken significant steps to help reduce I & I and better manage excess flows. A large project was completed in 2008 that helped to reroute flows, significantly reducing the frequency of sanitary sewer overflows along the lakeshore. In 2009, a city-wide study was completed to identify and prioritize the areas of the city contributing the largest amounts of I & I. In 2011, nearly 8 miles of sewer was televised, and 231 manholes were inspected in Sewer Districts 7 and 8, the two districts with the greatest amount of I & I. In 2013, nearly \$550,000 of grant money was used to rehabilitate and replace 3,830 linear feet of public sewer and 72 manholes in the two districts, significantly reducing I & I. The City will continue with the methodical reduction of I & I on the publicly-owned portions of the sewer system. However, focusing only on publicly owned side of the system will likely not reduce I & I to acceptable levels due to failed infrastructure on the property owner's portion of the sanitary sewer system. I & I reduction in the privately owned portions of the sewer system will be pivotal to the overall success of the I & I removal program

5.2.4 Rural Septic System Overflow or Poorly Maintained Systems

Septic systems are used when centralized sewage treatment plants are not accessible in a community. They safely treat and dispose of wastewaters produced in the bathroom, kitchen, and laundry. These wastewaters may contain disease-causing germs and pollutants that must be treated to protect human health and the environment. Septic systems are usually a permanent solution to wastewater treatment and disposal. Therefore, they must be properly used, operated, and maintained by the homeowner to assure the long-term performance of these systems. Even when used as a temporary wastewater treatment solution until sewer lines are extended to a community, special care and maintenance are needed for septic systems so that they don't pose a risk to public health or the environment.

All of the wastewaters from the home should flow into the septic tank. Even waters from the shower, bathtub, and washing machine can contain disease-causing germs or environmental pollutants. As wastewater flows into the tank, the heavier solid materials settle to the bottom (forming a sludge layer), and the lighter greases and fats float to the top (forming a scum layer). The tank's primary purpose is to retain the solids. After a retention time of about two days, the liquid portion (the sewage effluent) flows out of the tank through the outlet pipe. The retention time is necessary for separation of the solids from the liquid and for anaerobic digestion of the solids to begin in the septic tank.

The purpose of the drainfield is to deliver the liquid sewage effluent to the soil. The real treatment of the wastewater occurs in the soil beneath the drainfield. Sewage effluent flows out of the tank as a cloudy liquid that still contains many disease-causing germs and environmental pollutants. Effluent flows into the perforated pipe in the trenches, passes through the holes in the pipe, and then trickles down through the gravel to the soil. The soil absorbs some of the smaller germs, such as viruses, until they are destroyed. The soil can also retain certain chemicals, including phosphorus and some forms of nitrogen.

Both the septic tank and the drainfield must be properly maintained for the standard conventional septic system. With conscientious maintenance, the system should work correctly for many years. Such maintenance begins with water use and waste disposal habits. Your family will determine which materials enter the system, so you should establish family rules for proper use and maintenance. The suggestions outlined in the box will save you anguish and money when applied to most conventional systems.

Much of the land in the SWP area outside of the Cities of Ashland & Washburn is not served by municipal sewer. Residents & businesses in unsewered areas rely on private onsite wastewater treatment systems (septic systems). State law requires sanitary permits for any structure that has water receptacles (i.e. sinks, faucets, showers, toilets, wash machines). Additionally, the state requires that a licensed master plumber perform the installation. Types of septic systems include conventional in-ground systems, at grade or mound systems, Aerobic Treatment Systems (ATU) & holding tanks.

Domestic sewage handled by septic systems typically includes contaminants such as nitrate, phosphorus, pathogens such as bacteria & viruses, dissolved metals, detergents, and solvents. When working properly, soils bind up a majority of the metals & phosphorus, nitrate is diluted in groundwater and pathogens & solvents are degraded or die off in the soil. However, improperly functioning systems can be a source of pollution to groundwater, which can then make its way to surface water. Improperly functioning Septic systems can be caused by poor design or construction, overloading or inadequate maintenance.

In Bayfield County, the planning and zoning office issues sanitary permits for private on-site wastewater treatment systems in the county. In-ground and mound systems are required to be pumped and reported to the County every **three** years. Maintenance & reporting requirements for holding tanks and ATU's are based on usage.

In Ashland County the planning and zoning office issues sanitary permits for private on-site wastewater treatment systems in the county; In-ground and mound systems are required to be pumped every **three** **(Talk to the new Ashland County zoning administrator about this)** years Ashland County.

5.2.5 Incidental Spills of Hazardous Materials

Incidental spills of hazardous materials could potentially reach the water supply. While such risks cannot be entirely eliminated, they can be reduced and managed. Sources of hazardous material spills can be divided into fixed and mobile (transportation) sources. Within each group, events can be further distinguished as posing a major or a minor risk. Major risks have the potential to release large quantities of material of significant toxicity directly into watercourses.

Major Fixed sources include gas stations, agricultural co-ops or manufacturing operations that handle or store large quantities of hazardous materials. The City should ensure that adequate spill control plan is in place for such facilities as required by federal and state laws. Minor fixed sources involve small quantity releases of things like herbicides, gasoline, waste oil or other chemicals that may occur at residences, farms or commercial properties. While a single event may be a minor concern, the cumulative effect of many small releases throughout the watershed could result in problems for the water supply. Minor releases can be addressed through landowner education, provision of convenient hazardous waste disposal options and disconnecting paved area drainage from streams.

Major mobile sources are associated with highways, railways and pipelines. US Highway 2 crosses the source water protection area and goes through the City of Ashland and Enbridge Line #5 traverses east-west across the source water protection area. There is one railroad owned by Canadian National that goes from Ashland south to Marengo Junction where it splits and goes east to Ironwood and south to Mellen. The line is currently out of service, and it is not known whether there are plans to bring it back online. A catastrophic accident involving a chemical tanker truck on a bridge over a stream draining to Chequamegon bay has a low probability but could result in a major impact to the water supply. Mitigating these risks is done several ways. 1)ensuring that there is adequate emergency response capability. 2)limiting hazardous material transport on highways closest to the bay. 3)Retrofit bridges and drainage ditches on bridge approaches to provide spill containment. This option is expensive and would need to be done to balance risk vs. cost and prioritize areas of greatest risk.

Built in 1953, the 645-mile, 30-inch-diameter Enbridge #5 pipeline carries up to 540,000 barrels per day of petroleum products to eastern Canada from Superior. It traverses east/west across Ashland and Bayfield Counties and crosses many major tributaries to Lake Superior. The National Wildlife Federation obtained records from the federal Pipeline Hazardous Materials Safety Administration that show Line 5 has spilled more than 1 million gallons of oil and gas liquids in at least 29 incidents since 1968. From the records, only one of the 29 recorded incidents was detected by a remote pipeline detection system. By contrast, 15 releases were detected by local personnel or the public. An online mapping system found [here](#) shows the location, cause, date and amount released from each incident. The spill nearest to Ashland was near Saxon in 1972, when around 14,700 gallons was released due to an equipment failure.

5.2.6 Illicit Release of Ship Ballast Water

5.3 Nonpoint Sources of Pollution - Watershed Contributions to the Chequamegon Bay

Nonpoint-source (NPS) pollution is a term used to describe pollution resulting from many diffuse sources. NPS pollution comes from everyday landuse activities throughout watersheds. It is caused by

rain or snowmelt runoff moving over and through the ground. This runoff carries sediment, nutrients and other pollutants to ditches and small drainages, and then to river systems. As runoff increases, stream discharge increases, and with it the load of sediment, nutrients and other pollutants.

NPS pollution has generally been identified as originating from “urban” or “rural” activities. It is important to note however, those distinctions are blurred by the large land base and small population of the City of Ashland and the profound effects that rural development can have on the delivery of NPS pollution to surface waters. For instance, runoff from rural roads or rural construction sites may be of equal importance to the runoff from city streets, city construction sites and other urban impervious surfaces. With that being said, the best way to differentiate the issue is still to divide it into urban and rural NPS pollution. For the purpose of this report the term “urban” refers to the developed portions of the City of Ashland and other municipalities within the source water protection area and “rural” being defined by exclusion as the area that is not-urban (this can include undeveloped areas within the corporate limits of a city or village).

For decades, land management initiatives have recognized that accelerated runoff is a major concern for water quality in the region, and a mantra to “slow the flow” has guided conservation efforts. This approach recognizes that the rate and amount of runoff and resulting stream discharge as overland flow is influenced by conditions throughout contributing watersheds, including soils, topography and land use. The heavy clay soils that line the coast in Wisconsin’s portion of the Lake Superior basin allow little infiltration. Therefore runoff is substantial in these areas. Steeper areas lead to a faster rate of runoff. Increasing amounts of open land as pasture, cropland, harvested forest areas and urban/residential accelerate overland flow. The amount of wetlands, lakes and stormwater retention in a watershed also influence runoff and stream discharge, with greater storage holding back overland flow and lowering discharge.

Land use in the Primary Source Water Protection Area is summarized in Figure X using WisCLAND2 dataset that was completed in August of 2016 (WDNR and WSCO 2016). This dataset describes land cover throughout the state using a combination of remotely sensed imagery and field verification to ground truth those images. The primary source water protection area is primarily forested, with a greater proportion of development in lower reaches of the watersheds along Chequamegon Bay. Agricultural and pasture land cover is most concentrated in the South Fish Creek watershed (Figures 5 & 6).

Figure 6. WISCLAND 2 land use in the primary source water area by watershed.

Figure 7. WISCLAND percentage of land cover in the primary source water area by subwatershed.

5.4 Urban Nonpoint Sources of Pollution

The City of Ashland is the largest and most significant urban area in the primary SWP area, with the City of Washburn being the second largest. Stormwater in urban areas is conveyed to the bay through storm sewer infrastructure and numerous ravines and the streams that flow to the bay. In Ashland, about 25% of the urbanized area discharges to the lower three miles of Bay City Creek, with the rest of the storm sewers discharging directly to Chequamegon Bay or ravines that flow to the bay or Fish Creek Slew (Bro et. al., 2011).

Effective stormwater management often occurs by using a holistic system management approach. This approach takes into account the effectiveness of each stormwater practice, the costs of each practice, and resulting overall cost and effectiveness rather than looking at each practice in isolation. Some individual practices may not be effective alone but, in combination with others, may provide a key function in highly effective systems.

Stormwater runoff is generated from many different land surfaces and is impacted by the behaviors and activities of individuals, households, and the public. These common individual behaviors have the potential to generate stormwater pollution including:

- littering,
- disposing of trash and recyclables,
- disposing of pet-waste,
- applying lawn-chemicals,
- washing cars,
- changing motor-oil, and
- disposing leftover paint and household chemicals.

Convincing people to change their behaviors and properly dispose of materials can control such pollution. It is important that the public be aware of the significance of their behavior and that their actions can either pollute or protect our waterways. The benefits of public education efforts cannot be understated, especially for urban stormwater pollution.

Encouraging community participation, forming partnerships, and combining efforts of other groups in the community will encourage everyone to work towards the same stormwater goals. Public involvement builds on community capital—the wealth of interested citizens and groups—to help spread the message to:

- prevent stormwater pollution;
- undertake group activities that highlight storm drain pollution, and
- contribute volunteer community actions to restore and protect local water resources.

Phase II MS4s are required to follow all state, tribal, and local public notice requirements when implementing their stormwater program. Public involvement also includes creating opportunities for direct action, educational, and volunteer programs such as tree planting days, volunteer monitoring programs, storm drain marking, or stream clean-up programs.

Preventing pollutants from entering a waterway is less expensive than restoring a waterway after it's been polluted. Therefore, programs should first focus on preventing pollution before it happens. BMPs under each of the minimum measures, but especially under this pollution prevention category, focus on preventing pollutants from contacting stormwater.

Municipal activities such as winter road maintenance, minor road repairs, and other infrastructure work, automobile fleet maintenance, landscaping and park maintenance, and building maintenance can release pollutants into MS4s that ultimately discharge to nearby waterbodies. Municipal facilities can also be sources of stormwater pollutants if BMPs are not in place to contain spills, manage trash, and handle non-stormwater discharges. Sweeping parking lots and streets and cleaning storm drains can prevent pollutants from entering nearby waterways.

Further information on urban stormwater management can be found at the EPA's website:

<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu>

5.4.1 Urban runoff entering the city's storm sewer system

The storm sewer system is most impacted by runoff from impervious surfaces such as roofs and pavement. Water flows off these surfaces and into sewer inlets and drainage ways rapidly, carrying pollutants and sediment with it. The best way to reduce nonpoint source pollution in the city's storm sewer system is by reducing the volume and speed of runoff entering the system, a concept known as "slow the flow". Implementing stormwater Best Management Practices (BMPs) will help reduce both the volume and the speed of stormwater.

As the city develops new land, or re-develops older parts of the city, there should be special considerations for areas where paved roads and parking lots area required. The city could enact requirements that the minimum amount of pavement necessary be used and runoff from paved surfaces & rooftops should pass through filter strips, swales or bioretention facilities before it enters storm sewers, ditches or waterways.

5.4.2 Streambank erosion along open channels within the city (Bay City Creek, other streams & ravines leading to the bay)

Another strategy for reducing sediment and pollution loading to chequamegon bay is prevention of streambank erosion. MSA studied the issue of stream bank erosion along open channels within the City of Ashland in 2007 (McClure, 2007). The study identified 107 locations of significant stream bank erosion contributing approximately 242 tons/year of sediment and 15.6 pounds/year of phosphorous to the bay. McClure identified 5 major sites that each contribute approximately 40% of the total sediment load, and recommended that the city prioritize and implement repairs to those 5 sites. Unfortunately, the city never took any action to fix the sites which were identified and reduce sediment runoff to the bay.

5.4.3 Construction sites

Land disturbance during both residential & commercial construction projects exposes bare soil which can erode during storm events. Sediment runoff rates from construction sites can be 10-20 times greater than agricultural lands. To prevent degraded water quality in streams and lakes near construction sites, it is necessary to decrease the amount of sediment that runs off during a storm event. This includes diverting storm water around disturbed or exposed construction site areas as well as trapping sediment and controlling the transport of sediment off site. It is important to have procedures for implementing proper pollutant control measures before development starts. Just as

important, is having procedures for site inspection and enforcement of control measures. Erosion control plans contain specific practices to reduce erosion, divert storm water from disturbed or exposed construction site areas and trap and control the transport of sediment.

The Wisconsin DNR Storm Water Program regulates storm water discharges from construction sites that disturb one acre or more of land through clearing, grading, excavating or stockpiling of fill material. For these projects the landowner can request coverage under the Construction Site Storm Water Runoff General Permit No. WI-S067831-5 by submitting an application to the DNR called a Water Resources Application for Project Permits (WRAPP). Landowners submitting a WRAPP agree to comply with all the permit requirements.

5.4.4 Excess yard fertilizer, herbicide & pesticide use

Residential and commercial urban development typically consists of impervious surface from buildings, driveways & parking areas mixed with turf grass and landscaping. Fertilizer, herbicide & pesticides are used on lawns and gardens for the purpose of growing green grass and weed control. These lawn chemicals can be conveyed over lawns and gardens to waterways through the urban stormwater system. The extent to which fertilizer and lawn chemicals are applied is not known; however it is important to note the excess use could be an important threat to water quality in the bay.

Commercial/Industrial Control

Controlling excess fertilizer and lawn chemicals from commercial and industrial development focuses on BMPs for reducing over application and minimizing the amount that reaches surface water through good stormwater management practices. These are the same strategies found in section 5.4 & 5.4.1 above.

Residential

Controlling excess fertilizer and lawn chemicals from residential development focuses on reducing over application and implementing small scale BMPs at the residence designed to slow the flow from the property to the municipal storm sewer system. These can include rain barrels to capture and retain runoff from rooftops or rain gardens that capture and infiltrate stormwater before reaching the storm sewer system.

5.4.5 Road Salt Usage

Substantial application of road salt in the U.S. began in the 1940s increasing to an annual average of 19.5 metric tons /year early 2000's. Chloride, a key component of road salt, is soluble, highly mobile in water, and, at high concentrations, can be toxic to aquatic vegetation and wildlife. Increasing trends in chloride concentrations have been observed in water bodies of the U.S. and attributed, at least in part, to road salt influence. Road deicing by cities, counties and state agencies accounts for a significant portion of salt applications, but salt is also used by many public and private organizations and individuals to deice parking lots, walkways and driveways. As urban land cover increases, applications of road salt for deicing is likely to increase.

A 2015 USGS study looked at chloride trends in urban streams in the Northern U.S. (Corsi, et. al, 2015). The study found that flow-normalized concentrations estimated from 1980 to 2010 for 19 streams had

increasing chloride concentrations at almost every site. For the more urban sites, concentration increases were greatest in winter periods but summer periods also experienced increases. Increasing trends were also found in the less urban watersheds, with concentrations during the winter being greater or similar to summer. A notable finding of the study is that the rate of chloride concentration increase outpaced that of urbanization, so urban land cover alone cannot account for increasing chloride trends. This may be attributed to several potential factors. First, it is possible that more salt was applied per unit urban area during the latter portion of the study period than during the early portion. This appears likely given that road salt sales in the northern U.S. outpaced the rate of increase in urban land cover by 40% during the study period. Second, the continued road salt input to the shallow groundwater system and inability of the system to recover to background concentrations before the next deicing season begins results in an increase in the chloride concentrations of shallow groundwater. Chloride is slowly discharged to the stream, as indicated by increasing summer concentrations.

-->Insert Paragraph About Local Conditions

The nature of salt presence in the environment makes this issue difficult to address. Common stormwater practices rely on settling or filtration of particulate matter. Since salt dissolves readily in water, these management practices do not remove salt from runoff, making the only reliable way to reduce the impact of road salt on surface water to reduce applications. There are techniques that have been documented for reduction of road salt application. Some of these practices include salt management planning, training programs for most effective use, pre-wetting of granular salt to maximize salt retention on paved surfaces, applicators that are calibrated and vary by ground-speed, anti-icing that reduces bonding between snow and pavement and makes plowing more effective, and more efficient predictions of icing conditions to inform deicing activities (Fay et al., 2013). In addition, there are a number of alternative chemicals that have been used. These alternative chemicals commonly include other chloride-containing salts such as magnesium chloride or calcium chloride, organic salts such as calcium magnesium acetate, potassium acetate, or sodium acetate, different variations of salt brines, and organic deicers such as glycols. Unfortunately, none of these options are without potential environmental impact as well. All of these alternative deicers have varying degrees of associated aquatic toxicity (Environment Canada, 2001).

5.5 Rural Nonpoint Sources of Pollution

Non-point source (NPS) pollution originating from the un-developed and sparsely developed land within the SWP is considered Rural NPS pollution. Rural NPS pollution is even more difficult to control because the sources are more spread out over the landscape and cross multiple jurisdictional areas. Rural areas in the primary source water protection area include land under the jurisdiction of the City of Ashland, Ashland County & Bayfield Counties.

This section breaks NPS pollutants of primary concern into three categories; sediment, nutrients and pathogens. While these three categories are looked at separately, it is important to note that they are all related. For example, certain nutrients and pathogens travel with sediment. Additionally, certain pollutant sources such as land spreading of waste and agricultural runoff are given their own section.

For each pollutant, it is important to think about how they move with surface water runoff, as a dissolved load, suspended load or bed load.

There have been several studies conducted in the Chequamegon Bay region that look at NPS pollution loading to the bay. Some of these reports are specific to the primary or secondary source water protection areas; however even the studies that are not locally specific contain valuable insight into the type and extent of NPS pollution loading to Chequamegon Bay. Several of these reports also contain recommendations to reduce the pollutant, and when provided are summarized in Appendix B.

5.5.1 Sediment Transport & Loading

Nonpoint Source Pollution studies conducted in the SWP area focus heavily on characterization of the amount and source of sediment being carried downstream and delivered to surface waters. This is fitting given the flashy hydraulic characteristics of the area and the highly erodible nature of the silt & clay soils. The primary sources of concern for sediment loading include:

- Sediment load from eroding stream banks and bluff erosion.
- Sediment-laden runoff from clear-cut timber stands
- Sediment-laden runoff from row crops/cultivated fields
- Erosion from road/stream intersections (culverts and bridges - fully functioning or damaged)

Include Fitzpatrick graphic (sediment inputs/outputs)

5.5.2 Nutrient Transport & Loading

The clay soils of the lower elevations of the North and South Fish creek watersheds hold water better than the sandy outwash in the higher elevations making them quite suitable for agriculture (Bro & Fratt, 2011).

5.5.3 Pathogen (Bacteria & Viruses) Transport & Loading

5.5.4 Land Spreading of Waste

The WDNR Wastewater Program regulates land spreading activities for wastewater and wastewater generated solids from different sources, including:

- Municipal – Wastewater Treatment Plant (WWTP) sewage sludge (NR 204)
- Septage – servicing of private sewage systems (NR 113)
- Industrial – land treatment of industrial liquid wastes and by-product solids and sludges (NR 214)

In general, WDNR determines the suitability of a requested land application site based upon land owner agreement to accept, soil type/characteristics and description, permeability, depth to groundwater/bedrock, slope, proximity to waterways and other landscape features (ie ditches, sinkholes, etc.). Approved application rates and time of year may be limited based on the soil type,

wastewater characteristics (what kind of waste and strength) to be land spread, and the nutrient needs of the crop.

Wastewater characterization varies by waste type/source. Septage, holding tank or septic tank characteristics values are established using historic default values for nitrogen at a rate not to exceed the agronomic need for the crop grown.

Industrial and Municipal wastewater characterization is source specific, and WPDES permit required sampling is necessary to determine appropriate agronomic rates of application for nitrogen. Additional permit required sampling may be required for compliance with other potential pollutants of concern and limited by application rate. Such additional and re-occurring sampling may include: chloride, sodium, potassium, phosphorus, metals, bacteria, or other priority pollutants as required by specific code.

Site management plans outline the timing and volume of material that can be spread to meet the conditions of the appropriate code. The type of crop and crop year for any approved fields is a consideration in site management plans. Planning application must also be coordinated to meet the needs and operational considerations of the landowner/farmer to compliment a farms nutrient management plan or other logistical needs.

Reporting of all WDNR regulated land application activity is required annually. Specific department forms are generated for the facility or hauler to complete and submit per the conditions of the appropriate regulating code. Examples of data recorded on these forms include fields used, number of acres used, and gallons applied by waste type on each field.

Winter spreading is permissible for septage (NR 113) and industrial (NR 214). However, application is conditionally site specific to slopes between 0 – 2%. Other site considerations are evaluated during approval, such as the potential for runoff to surface water. Additional conditions may be included such as increased site separation distance or other requirements. Application on sites during a precipitation event is not explicitly prohibited. However, current soil conditions and future weather forecast need to be evaluated prior to application and need to be taken into consideration by the applicator to ensure site runoff from the application does not occur. Site conditions are typically addressed within the approved management plan as application during saturated soil conditions is environmentally detrimental and will likely result in loss of use of the field by the farmer.

From 1996 to 2016, a total of 4,931.5 acres have been permitted for land spreading in the Primary and Secondary Source Water Protection Area (Figure 8). In 2016, the number of permitted sites actively utilized for land spreading was much smaller than the amount permitted over the 20-year time period from 1996-2000. The WDNR provided Wisconsin Pollutant Discharge Elimination Systems (WPDES) data from the 2016 calendar year on the distribution and volume of land spreading in the source water protection area (Figure 9). In 2016, a total of 412.3 acres were approved for land spreading of waste in the Primary and Secondary SWPP area (Table 2). Waste spreading occurred on 366.2 acres, totaling 1,975,678 gallons. Septage was the only type of waste applied in the Primary Source Water Area, and was the most common type of waste applied throughout the both Primary and Secondary Source Water Protection Areas overall at 77% of the total acreage and over 90% by volume. Industrial waste from the Flambeau River Paper mill was spread on one site near Mellen. The only municipal waste spread was from the Village of Mason. The watersheds with the highest amounts of land spreading are the Headwaters North Fish Creek, Whittlesey Creek-Frontal Chequamegon Bay, Troutmere

Creek-Marengo River, and Fish Creek-Frontal Chequamegon Bay.

Figure 8. General locations of fields with WPDES permits for land spreading from 1996 to 2016 in the City of Ashland's Primary and Secondary Source Water Protection Areas.

Figure 9. WPDES permit provided volume of waste land spread in 2016 in the City of Ashland's Primary and Secondary Source Water Protection Area.

Table 2. Discharge amounts of land spreading in each HUC 12 watershed located in the SWPP in 2016.

Watershed (HUC 12)	SWPP Area	Waste Type	# of Acres approved for spreading	# of Acres Applied	Discharge Amount (gal)
Beartrap Creek – Frontal Chequamegon Bay	Primary	Septage	5	5	6,100
Fish Creek - Frontal Chequamegon Bay	Primary	Septage	39 ¹	40	298,971
Whittlesey Creek - Frontal Chequamegon Bay	Primary	Septage	69.1	69.1	356,757
Headwaters North Fish Creek	Primary	Septage	53	53	553,993
Primary Source Water Area Total			166.1	172.1	1,215,821
Lower Tyler Forks	Secondary	Septage	30	5	3,000

Copper Falls State Park - Bad River	Secondary	Industrial	67.7	67.7	29,059
Devils Creek - Bad River	Secondary	Septage	8	8	54,150
Marengo River	Secondary	Septage	32	27	59,200
White River Flowage - White River	Secondary	Septage	57.1	52.1	99,400
White River Flowage - White River	Secondary	Municipal	14.5	14.5	144,300
Troutmere Creek - Marengo River	Secondary	Septage	36.9	20	338,618
Secondary Source Water Area Total			246.2	194.3	727,727
Overall Total			412.3	366.4	1,943,548

¹ Data on acres approved not available for one site. 39 acres is the known amount of approved acres.

5.5.5 WPDES Permitted Agricultural Operations

6 GROUNDWATER ASSESSMENT

6.1 Introduction

The primary focus of the City of Ashland source water protection program is protecting the city's surface water intake. However, the planning committee believes it is important to acknowledge the use of groundwater as the source of drinking water for residents in the SWP area not connected to municipal water. The protection measures that benefit source water quality in the bay also benefit groundwater quality in the SWP area. SWP requires partnerships that cross political and municipal water service area boundaries, therefore groundwater source protection is discussed in the following section.

6.2 Area Groundwater Studies

There are several groundwater studies that cover all or part of the Ashland SWP area. A brief summary of each report is given and links are provided to each report.

Groundwater and wells in agricultural regions of Bayfield County, Wisconsin-WGNHS Technical Report 2.2016

In 2016, the Wisconsin Geological and Natural History Survey was commissioned by the Large-Scale Livestock Study Committee and the Bayfield County Board of Supervisors to study the groundwater resources in two agricultural regions of Bayfield County. The study results are outlined in a report available on the WGNHS Website. Much of the Fish & Whittlesey Creek watersheds are included in the "eastern agricultural region".

The report identifies the sand & gravel upland regions and the silt & clay lowland regions and the implications they have on groundwater & surface water quality. Areas underlain by low permeability fine-grained glacial deposits of the Miller Creek Formation have increased runoff to streams. Livestock operations and manure management within these areas have a greater potential to affect surface-water quality. In areas underlain by the sandier Copper Falls Formation more precipitation and snowmelt tends to infiltrate and livestock operations and manure management have a greater potential to impact groundwater quality. Site-specific groundwater quality monitoring systems can be designed using the water table maps & hydrogeologic cross sections developed by the report.

Well construction is an important factor in a well's vulnerability to contamination from the surface. A majority of the wells in the eastern agricultural region are completed in the sand & gravel deposits. Wells completed at greater depths, beneath thicker deposits of fine-grained material have more protection from surface contamination than shallower wells. Well water quality is very site specific and it is suggested that well owners test water quality annually, particularly for bacteria and nitrate.

The full report is available at the following link: <http://wgnhs.uwex.edu/pubs/tr002/>

Figures 2 & 3 from the report are included below. They show the study area along with surficial geologic deposits and well construction.

6.3 Groundwater Overview & Use

7 SOURCE WATER PROTECTION PLAN IMPLEMENTATION

7.1 Historic Source Pollution Load Reductions

7.2 Point Source Pollution Load Reductions

7.2.1 Point Source Pollution Load Reductions

7.2.2 City of Ashland Sanitary System Load Reductions

7.2.3 Sanitary Sewer Overflow/Inflow and Infiltration Reduction

The first step to managing the I & I issue is to measure the extent of problem. To help determine where I & I into a sanitary sewer system is occurring the City is planning additional and significant work to locate and record information relating to a variety of issues including but not limited to observed overflows, measured or observed surcharges, reported bypasses, customer backup complaints, and chronic maintenance activities. In addition to flow monitoring there are other tests that will be used to identify sources of inflow and infiltration. These tests include dye and smoke testing and visual inspection. Smoke or dye testing works by introducing either smoke or dye into the sanitary sewer system and determining where it comes out. Visual inspection can be done with remote television monitoring devices and used to look for cracks or other damage in a sewer pipe. When sources of I & I are discovered, the city will make plans to take appropriate action to resolve the problem within the current financial ability of the utility. This includes fixing or replacing damaged or leaky sewer pipes and notifying property owners of improper connections. The utility is planning a significant increase in sanitary system inspection in 2017 and 2018 that will be used to prepare a project for 2019. It is extremely important that the City Council directs additional funds to address the sanitary system in the coming years. The city administration should look for grant opportunities, and evaluate weather customer service rates should be adjustmented.

PRIVATE PROPERTY INSPECTIONS

In 2013, the City of Ashland implemented a private property I & I program to reduce I & I and improve operations of the sanitary sewer system. This program was initiated because of basement backups and sanitary sewer overflow events. Private property inspections are completed by city staff during a half-hour appointment where city staff look for illegal or inappropriate connections to the sanitary sewer system such as sump pumps, area drains, foundation drains, and downspouts. The current plan includes a multi-year inspection program, starting in the sewer districts with the greatest amount of I & I.

7.2.4 Rural Septic System Overflow or Poorly Maintained Systems Load Reductions

7.2.5 Incidental Spills of Hazardous Materials Reductions

7.2.6 Illicit Release of Ship Ballast Water Reductions

7.3 Urban Nonpoint Source pollution Load Reductions

7.3.1 Urban Runoff Load Reductions

Stormwater Utility

Managing storm water quality is no longer an option—it is a requirement, particularly for communities located adjacent to pristine water resources. As such,

Municipal stormwater management programs are becoming an important part of a community's infrastructure and overall operational costs. As comprehensive stormwater management programs grow in complexity they begin to resemble electric, water and wastewater utility systems. It is becoming increasingly common to consider stormwater management as a public utility.

Currently there are about 30 stormwater utilities in Wisconsin. They have been developed by municipalities as an equitable way of paying for stormwater management requirements imposed by federal law. A stormwater utility provides a community with a stable funding source that more fairly and equitably collects revenue from those who are creating the need for services. Under the current property tax system homeowners pay about 70 percent of the cost of municipal services. However, a larger percentage of stormwater facilities and programs are focused on the problems caused by runoff from large commercial and industrial impervious areas. A stormwater utility makes everyone pay their fair share of the cost of stormwater management (source: *League of Wisconsin Municipalities*).

A stormwater utility (like water and wastewater) provides a service to the public supported by charging fees to its users. The services include: (1) drainage, (2) flood damage protection, (3) water quality management, and (4) erosion and sediment control. The fee is based on the amount of stormwater runoff that properties generate (i.e., like the meters that measure water consumption).

A successful program provides a far more equitable way of generating revenue to cover municipal expenditures associated with the aforementioned services for two main reasons: (1) fees are based on use, and (2) *all* properties pay – including those that are tax exempt. This generally shifts financial tax burden away from homeowners and some businesses.

As stated above, over 30 communities in Wisconsin have utilities, and surveys indicate that many more are considering it out of necessity. Both the City Washburn and the City of Superior have implemented utilities to cover stormwater related expenditures. Creation of a stormwater utility ultimately should be the future long-term end goal of the City of Ashland.

In 2006 the City interviewed firms interested in assisting the City with studying the possible creation of a stormwater utility. Three firms presented their qualifications at the meeting: OMNNI Associates, MSA Professional Services, and SEH. Based on qualifications and project approach, MSA was selected to assist with completion of a feasibility study to perform a land use analysis and then estimate what the utility rates would be for various properties throughout the community and assist in revealing the financial impacts to the City's operational budget, and how the utility might provide funding to

construct and improve our stormwater management infrastructure. A feasibility study was completed by the consulting firm MSA in June, 2007, and identified a number of benefits of creating a Stormwater Utility include the following:

- It will help protect our environment, Lake Superior and the health and welfare of our citizens by providing the financial means for better management of stormwater and other surface water discharges.
- It will contribute to the costs of maintaining the City's infrastructure by spreading those costs on an equitable basis.
- Existing taxpayers will not be the sole contributors to the utility; the costs will be shared by all users with approximately 31% borne by property tax-exempt entities.

At the time of the study, it was estimated that the annual revenue requirement for an Ashland Stormwater Utility was \$555,000. This would result in an Equivalent Residential Unit (ERU) charge of approximately \$5.00 per month for an ERU of 3,160 square feet of impermeable surface. The enabling ordinance, operating policies and final revenue requirement were anticipated to be developed for future Council approval prior to June of 2009 in anticipation of billing for the second one-half of 2009. On November 18, 2008, the City Council voted in opposition of creating a stormwater utility.

Since that time, the Wisconsin Legislature has made it very difficult for municipalities to implement or adopt any new fees. On or after July 2, 2013, if a municipality adopts a new fee or increases fees to cover services (which were partly or wholly funded in 2013 by property tax levy), that municipality must reduce its levy limit in the current year by the amount of the new fee or fee increase, less any previous reductions. This also applies to payments in lieu of taxes. The end result is that if a stormwater utility is created there will be no new revenues to allocate to stormwater improvements as the City would have to reduce the total levy elsewhere. A legislative amendment would be necessary to make it beneficial for the City to pursue the creation of a stormwater utility. Although the creation of a stormwater utility is not feasible at this time, a long-term priority with a funding strategy will need to be developed in order to provide a means for implementation that does not further diminish available resources for other City priority programs.

7.3.2 Streambank Erosion Within the City Load Reductions

7.3.3 Construction Site Load Reductions

7.3.4 Excess Yard Fertilizer, Herbicide & Pesticide Use Reductions

7.3.5 Road Salt Usage Load Reductions

7.4 Rural Nonpoint Source pollution Load Reductions

The primary organizations conducting work on rural NPS issues are the county Land & Water Conservation Departments (LWCD), whose role it is to provide assistance protecting natural resources in their county.

The history of the LWCD started in 1937 with Chapter 92 of the state statutes which formed Wisconsin's Soil Conservation District and enabled the state to receive technical assistance from the federal Soil Conservation Service (now the Natural Resources Conservation Service). Through the 1940s and 1950s,

most of Wisconsin's counties formed conservation districts which remained in place until Chapter 92 was revised. In 1982 the conservation districts were abolished and their authority was transferred to the newly created Land Conservation Committee (LCC), which is part of the county board and possesses legislative authority. The primary role of the LCC is to create and implement county conservation programs as well as state and federal conservation programs. The LWCD implements the county programs which include planning and technical assistance for natural resource conservation. The knowledge and expertise of both Bayfield and Ashland County LWCD were instrumental in developing this section of the plan.

7.4.1 Sediment Load Reductions

7.4.2 Nutrient Load Reductions

7.4.3 Pathogen Load Reductions

7.4.4 Land Spreading Load Reductions

7.4.5 WPDES Permitted Agricultural Operations Load Reductions

7.5 Management Measures to Achieve Groundwater Source Protection

7.6 Ordinances & Regulations

7.7 Education & Outreach

7.8 Administration and Oversight

8 CONTINGENCY / COMMUNICATION PLAN

8.1 Introduction

8.1.1 Purpose

This plan provides guidance for City of Ashland to communicate with agencies and the public in case of a spill, contamination event, or other situation that poses a potential threat to public health and safety.

The procedures and responsibilities described in this plan apply to all City of Ashland public water systems. Specific contact details for individual systems are provided in the corresponding Facility Emergency Response Plan.

8.1.2 Regulatory Requirements

Enter Wisconsin code # ??? that requires public water systems to develop a "communications plan that documents the manner in which the public water utility, working in concert with state and local emergency response agencies, shall notify the local health agencies and the public of the initial spill or contamination event and provide updated information related to any contamination or impairment of

the source water supply or the system's drinking water supply, with an initial notification to occur in any event no later than thirty minutes after the public water system becomes aware of the spill, release or potential contamination of the public water system."

8.2 Roles And Responsibilities

The communication team listed in the attached summary for each water system will be responsible for working cooperatively with the City of Ashland management team and partner agencies to notify the public in a situation that poses a potential threat to public health and safety. The team will also provide updated information related to the situation as appropriate.

8.2.1 Designated spokesperson

The Designated Spokesperson (or Designee) serves as the Public Information Officer (PIO) for the City of Ashland and is authorized to speak on behalf of the City of Ashland to partner agencies, the public, and the news media. The City of Ashland President or Designated Spokesperson may authorize and/or direct others to issue information that has been approved by the management team.

Additional responsibilities include:

- Announce risk level (using Tiers system) that applies to public notifications
- Issue news releases, updates, and other information regarding the incident/event using appropriate information venues (e.g., emergency notification systems, local news outlets, social media, website, etc.)
- Ensure that news releases are sent to local health agencies and the local news media in the affected area
- Respond to questions from the news media and others regarding the incident / event
- Participate in news conferences and interviews to provide information and updates, as available and appropriate

8.2.2 Supporting roles

Other members of the communication team are expected to be familiar with the plan and provide support throughout the public notification and event response process, including coordinating with the management team to:

- Collect information needed to investigate, analyze, and characterize the incident / event
- Provide information to the management staff to support response decisions and actions
- Assist the management staff in handling event response and communication duties

Supporting team members are not authorized to speak on behalf of the City of Ashland unless designated by the Designated Spokesperson or President.

8.2.3 Interagency coordination

The Designated Spokesperson, President and other members of the communication team will coordinate with PIOs from other agencies on statements, updates, joint press conferences, etc. as needed. Message coordination between emergency response agencies, health agencies and water utilities is important when responding to an incident/event.

8.3 Communication Procedures

8.3.1 TIERS Reporting system

City of Ashland intends to use the *Tiered Incident / Event Reporting System* (TIERS) as established by the City of Ashland for communicating with agencies and the public in situations that may threaten water quality. TIERS provides a multi-level notification framework, which escalates the communicated threat level commensurate with the drinking water system risks associated with a particular incident or event. The five-tiered **A-B-C-D-E** risk-based incident response communication format is summarized in the following table.

**TIERS
Categories Reporting**

Tier	Category	Risk Level	Tier Summary
A	Announcement	Low	The water system is issuing an announcement to the public and public agencies about an incident or event that may pose a threat to public health and safety. Additional information will be provided as it becomes available.
B	Boil Water Advisory	Moderate	Water system users are advised to boil any water to be used for drinking or cooking, due to possible microbial contamination. The system operator will notify users when the boil water advisory is lifted.
C	Cannot Drink	High	System users should not drink or cook with the water until further notice. The water can still be used for showering, bathing, cleaning, and other tasks. More information on this

			notice will be provided as soon as it is available.
D	Do Not Use	Very High	The water should only be used for flushing commodes and fire protection until further notice. More information on this notice will be provided as soon as it is available.
E	Emergency	Extremely High	The water should not be used for any purpose until further notice. More information on this notice will be provided as soon as it is available.

Note: The terminology used in the above table is based on that used by CITY OF ASHLAND. Risk levels for each TIERS category are general in nature and do not represent the actual risk level for a specific incident.

Communication templates for each TIERS category are attached and discussed in Section 3.3.

8.3.2 Communication Flow Chart

The attached flow chart illustrates how the City of Ashland plans to respond when it receives a report that a spill, release, or other contamination event may have occurred.

Upon initial notification of the incident/event, managers and operators will collect information and verify the need for further investigation. If there is an indication that the incident/event poses a risk to public health and safety, and the initial facts about the incident support it, the City of Ashland will issue a public notification consistent with the threat level based on available information. The initial notification will be provided by the Designated Spokesperson (or Designee) to the public and local health agencies within thirty (30) minutes of determining that the incident/event poses a potential risk to public health and safety.

In addition to issuing a notice, City of Ashland personnel and partner agencies will continue to investigate and characterize the threat and communicate updates as appropriate. Several iterative cycles may occur after the initial threat assessment including further investigation, response actions, and elimination or mitigation of the threat resulting in a return to normal operations. Communication activities during this period will include:

- We appreciate the patience of our customers as we work to understand and resolve the situation.
- Our team is w Initial notification using TIERS advisory levels
- Notification to the City of Ashland's source water protection and communication teams
- Periodic information updates for agencies and the media/public as information becomes available
- Modifications to the applicable advisory tier, as necessary

After the threat level is reduced and operations return to normal, the City of Ashland will review communications regarding the Incident/event and modify the plan, if appropriate.

8.3.3 Core messages and actions

Clear, consistent, and timely messages are important for effectively communicating information about an incident/event with the public. These messages should include only relevant information and clear actions presented in positive terms (e.g., “stay calm” instead of “don’t panic”). Repeating a message often helps the audience retain the information.

Message

Development

- What happened? (who, what, where, why, when, how)
- What is being done to address it?
- What are the health impacts, if any?
- What are customers instructed to do, if anything?
- When and where will information updates be available?
- When will the problem be resolved?

The City of Ashland has developed a series of templates for developing messages associated with each TIERS advisory level. The Center for Disease Control (CDC) has also developed a template that can be used in any type of emergency and includes guidelines for risk communication principles and message components. These templates are attached for reference; however, messages will be developed based on the circumstances present at the time.

Message coordination between emergency response agencies, health agencies and water utilities is important when responding to an incident/event. As often as possible, announcements and updates should be made jointly by the City of Ashland and its local, regional, state and/or federal partners.

Key points when communicating during an incident/event include the following:

- The health and safety of our customers and our employees is our number one priority. working on the matters we have identified so far, with the information available to us at this time.
- Our source water protection team and our employees are working very hard to investigate the situation and will help provide possible resolutions to matters we find during the investigation.
- We are working with our partners at the local, state, and federal level to resolve the situation as quickly and as safely as we can.

Communications Plan

- We are focused on dealing with the situation based on the facts available to us at this time; we are not in a position to speculate about a variety of possible scenarios that do not exist

presently.

- We welcome any information people may have on the situation we are investigating today.

8.3.4 Communication Methods

Communications with the public may be provided by several different methods depending on the situation. The City of Ashland will notify customers potentially affected by an incident/event using one or more of the following options:

- Code RED emergency notification system (phone, text and email)
- Local media (press release, press conference, updates)
- County emergency alert system where available
- Website and social media (Facebook, Twitter)
- Door-to-door/door hangers
- Posted notices

Primary and alternate designated locations for media interviews and/or press conferences are identified in the attached summary for each water system. The location(s) selected may vary based on the circumstances of an incident/event and will be communicated to the media as a situation develops.

8.4 Resources

The following attachments to this Communications Plan provide additional resources:

- Attachment 1: Event Response Flowchart
- Attachment 2: Core Message Templates

Communications Plan Attachment 1:

Communications Plan Attachment #2

PUBLIC NOTIFICATION PHONE MESSAGE SCRIPT

The following is an important message from the City of Ashland about a potential contamination event that poses a potential threat to your local water system. The City of Ashland was notified of a [description of incident] that has entered the [source water name], which is the source of your local water supply. Due to recent changes in state law, public water systems are required to notify the public within 30 minutes after determining that the incident poses a risk to public health and safety. We are working with [emergency responders/state health officials/agency names] to gather critical information needed to determine the risk to the water system and the appropriate response actions, if necessary. We will provide an update as soon as more information is available. No drinking water advisories have been issued at this time. Thank you for your attention to this message as we work to ensure the quality of your water. No additional information is available at our customer service center at this time.

CITY OF ASHLAND ISSUED NOTICE – LEVEL A PUBLIC WATER SYSTEM ANNOUNCEMENT

A WATER SYSTEM INVESTIGATION IS UNDERWAY

On _____ at ____:____AM/PM, the City of Ashland Public Water System began investigating an incident that may affect local water quality.

The incident involves the following situation at this location:

There are no restrictions on water use at this time. As always, if water system customers notice anything unusual about their water – such as abnormal odors, colors, sheen, etc. – they should contact the water system at _____.

At this time there is no need for concern if you have consumed or used the water.

Regular updates will be provided about this Announcement as water system staff continue their investigation. Again, there are no restrictions on water use at this time.

State Water System ID# _____ Date Distributed: _____

9 REFERENCES

- Clayton, L., 1984 *Pleistocene Geology of the Superior Region, Wisconsin*: Wisconsin Geological and Natural History Survey, Information Circular Number 46.
- Corsi, S.R., De Cicco, L.A., Lutz, M.A., Hirsch, R.M., 2015 River chloride trends in snow-affected urban watersheds: increasing concentrations outpace urban growth rate and are common among all seasons: *Science of The Total Environment*, Volume 508, 1 March 2015.
- Environment Canada, 2001 *Priority Substances List Assessment Report Road Salts*: Environment Canada, Health Canada, Accessed Online January 2018.
- Fey, L. Shi, X., Huang, J., 2013 *Strategies to mitigate the impacts of chloride roadway deicers on the natural environment*: National Cooperative Highway Research Program, Transportation Research Board.
- Gotkowitz, M.B., Li, Y., 2016 *Groundwater and wells in agricultural regions of Bayfield County, Wisconsin*: Wisconsin Geological and Natural History Survey, Technical Report 2.2016.
- Wisconsin Department of Natural Resources, 2003 *Source Water Assessment for Ashland Water Utility*: WDNR, Source Water Assessment Program.
- Wisconsin Department of Natural Resources, Wisconsin State Cartographer's Office. 2016. *Wisland 2 Land Cover Database of Wisconsin*, Version 2.0. Madison, WI
<http://dnr.wi.gov/maps/gis/data/landcover.html>.

Appendix A – Potential Contaminant Source Inventory,

appendix B – Summary of relevant studies conducted in Lake Superior basin characterizing the amount and source of sediment being delivered to surface waters.

Literature review and summary by Tom Fratt, Ashland County LWCD, July 2017.

Blodgett, D.L., 2009, Modeling Flood Flow Reduction for Bluff Erosion Mitigation Using Upland Runoff Attenuation on North Fish Creek, Bayfield County, WI, A Best Management Practice Implementation Location Prioritization. MS Thesis, University of Wisconsin-Madison Water Resources Engineering.

Problem Summary

§ North Fish Creek is a highly compromised watershed. Prior to European settlement, natural distributed storage in the uplands was substantially greater than what currently exists. Some sub-basins were undoubtedly well-drained and contributed some flashy runoff, but quickly draining area and runoff intensity for a given intensity and duration storm were much lower than current day conditions.

§ The few floods that historically did exceed the existing upland storage were likely similar to modern flashy hydrographs but would have required a much larger—less frequent—storm to generate similar runoff quantities.

§ As forestry and agriculture became the dominant watershed-wide land uses, large runoff events became more frequent. Very large floods in the first part of the 20th century compromised historical river bed and bank armoring causing the development of the current, easily eroded channel.

§ Without some intervention to change the watershed hydrologic response, it is very unlikely that the river channel will re-develop sufficient armoring to withstand the current intensity duration characteristics of the watershed.

Conclusions and Recommendations

§ Instream methods to protect major eroding clay bluffs have been one appropriate approach. Focused on reducing the sediment contributions from only a few of the largest sources. As occurred in 2005, large flood events will continue to cause bank erosion in areas that can overwhelm the instream practices, negating these efforts.

§ For this reason, the, upland runoff attenuation (temporary detention storage) has been evaluated as another USGS–UW–Madison recommendation to reduce erosion and sedimentation. Detention that retards upstream flood peaks long enough to remove them from the most damaging portion of an event is a simple, proven concept that must be implemented carefully. For this form of storage to be systematically and economically efficient, three factors must be satisfied:

- 1) Sufficient storage must be available without unreasonable earth work requirements.
- 2) Land cover in the storage zone must be suitable for temporary inundation.
- 3) The storage must receive flood flow that would contribute to watershed peak flow.

Bro, K.M., Fratt, T.W., 2011, Fish Creek Watershed Restoration and Management Plan, Ashland County Land and Water Conservation Department, Ashland, Wisconsin

§ The most extensive analysis of streambank stability in the watershed was a study by Fitzpatrick and others in 1999. In addition to the study of sediment and flows in the North Fish Creek watershed, a watershed sedimentation model was used to estimate sedimentation prior to European settlement in the 1870's and during the peak of agricultural development from the mid-1920's to the mid-1930's.

§ It was estimated that during the height of agricultural development, sediment loads were 5 times larger and peak floods were 3 times larger than the pre-settlement level. With reforestation and adoption of agricultural conservation practices, modern bluff erosion has been reduced to scouring at the base of the bluff near river bends - primarily during flood events when the speed and volume of water is greatest.

§ During flood events, the creek undercuts the bank, and the entire bluff face above it becomes unstable. When the ground is saturated or water is seeping from the face of the bluff, massive blocks of soil may slump into the creek and be carried downstream.

§ Sediment is the major water quality problem known for North Fish Creek, and bluff erosion is the greatest source of the sediment. As sediment moves downstream it can cover the gravel substrates that provide spawning areas for trout and living space for important riffle invertebrates. The creek carries sand, silt, and clay downstream to the lower part of the watershed during flood events, depositing it in the floodplain or along the stream banks.

§ As sediments accumulate along the stream banks, they create a barrier between the stream channel and its floodplain. One effect of this "bank building" is in the greatly reduced capability of the stream to spread out across the floodplain and dissipate energy during regular high flows. Other consequences of this bank building is that the stream is narrowed, forcing even faster flows that increase downward cutting of the stream channel, and ultimately depositing more sediment in the lower reaches of the creek and in Chequamegon Bay.

§ Continued conversion of pasture and cropland to forest along with the addition of runoff detention basins, and bank or in-stream stabilization projects along the upper main stem of North Fish Creek will help reduce peak floods and ultimately reduce erosion and sedimentation.

§ While there are high bluffs along the upper main stem of South Fish Creek, these bluffs are not as sandy as the upper main stem of North Fish Creek. A preliminary analysis of bluff erosion along this portion of South Fish Creek estimated that the high eroding bluffs contribute 6,400 metric tons of sediment per year to the creek.

§ The City of Ashland contracted for a similar analysis of sediment from bank and bluff erosion along Bay City Creek and smaller creeks that flow directly to Chequamegon Bay (McClure 2007). These creeks are considerably shorter in length and generally have bluff heights lower than those on Fish Creek. The stream banks and bluffs in the City of Ashland study were estimated to erode more than 219 metric tons of sediment and 7.1 kilograms of phosphorus per year.

§ Unlike the study in North Fish Creek, the analysis for South Fish Creek and in the City of Ashland did not estimate the amount of sediment that would be deposited on floodplains or within the channels.

§ Overall, the amount of sediment eroding from bluffs and high banks in North Fish Creek, South Fish Creek, and the City of Ashland channels are estimated to exceed 72,000kg/km²/year. Assuming the delivery rate of sediment to Chequamegon Bay is similar to that estimated for North Fish Creek (67%), over 48,000kg/km²/year of sediment is deposited in Lake Superior from the Fish Creek watershed. This rate of sediment loading is among the highest in Wisconsin for Great Lakes tributaries, and is

comparable to the rate of sediment loading from the Nemadji River watershed 64 kilometers (40 miles) to the west.

Fitzpatrick, F.A., Knox, J.C., Whitman, H.E., 1999, Effects of Historical Land-Cover Changes on Flooding and Sedimentation, North Fish Creek, Wisconsin: USGS Water-Resources Investigations Report 99-4083

§ North Fish Creek, a 122- square kilometer tributary to Chequamegon Bay of Lake Superior in Wisconsin. It is an important recreational fishery that is potentially limited by the loss of aquatic habitat caused by accelerated erosion and sedimentation. Although most of the land in the drainage basin is forested, large floods in the past have contributed to severe erosion problems. Potential accelerated sedimentation rates near the mouth of North Fish Creek also may be affecting fish and waterfowl habitats in Fish Creek Slough.

§ Flooding and sedimentation are common problems for many southern Lake Superior tributaries, and Wisconsin shorelines and streams are known to be major contributors of sediment to Lake Superior. North Fish Creek was a focus of a cooperative study between the U.S. Geological Survey and the Wisconsin Department of Natural Resources to determine how flooding and sedimentation characteristics for similar Lake Superior tributaries may have changed in response to changes in land cover after European settlement of the region in the 1870's. Rates of and responses to human-influenced runoff and erosion were compared to those expected from natural changes in climatic conditions and relative water level of Lake Superior.

§ North Fish Creek is naturally susceptible to large floods and erosion problems because of its geologic setting. Surficial deposits in its basin consist mainly of red clay, with some areas of sandy deposits along the northern and southwestern edges of the basin. The sandy deposits also are present beneath the red clay and are exposed in many of the 25-meter-high bluffs along the stream. These bluffs are highly susceptible to erosion where they are undercut by flowing water. Soils developed in the red clay have a very low infiltration rate (0.25 cm/hr). The rate of precipitation and (or) snowmelt, however, commonly exceeds 0.25 cm/hr; therefore, North Fish Creek naturally is considered a "flashy stream" with frequent, large floods. In contrast, soils developed in the sandy deposits have an infiltration rate of 19 cm/hr and have minimal surface runoff. Ground-water recharge in the sandy areas supplies abundant springs that discharge to North Fish Creek. The flow from these springs accounts for the exceptionally high base flow in the creek.

Fitzpatrick, F.A., Peppler, M.C., Schwar, H.E., Hoopes, J.A., Deibel, M.A., 2004, Monitoring Channel Morphology and Bluff Erosion at Two Installations of Flow-Deflecting Vanes, North Fish Creek, Wisconsin, 2000-03: U.S. Geological Survey Scientific Investigations Report 2004-5272.

§ North Fish Creek is similar to many northern Wisconsin tributaries to Lake Superior in providing some of the highest sediment loads observed in the Great Lakes. Results from a historical geomorphic study of North Fish Creek (Fitzpatrick et. al. 1999) indicated that the majority of the total sediment load of North Fish Creek (67 percent, about 15,000 tons/year) originates from 17 eroding bluffs, 60' to 160' high, along meander bends through the upper main stem.

§ Channel down-cutting (incision) also is a problem along the upper main stem and contributes 18 percent of the total sediment load. Upland erosion only contributes a small amount of sediment to the main stem (5 percent) because the watershed is mainly forest and grassland. Even though the amount of upland erosion is small, flood peaks are possibly 2.5 times higher and runoff volumes larger than when the watershed was completely forested before European settlement.

§ Bluff erosion occurred before European settlement, but appears to be accelerated because of increased flood peaks, runoff volumes, and related channel incision rates.

§ The upper main stem of North Fish Creek is an important fishery resource for native brook trout and introduced potamodromous Coho salmon and steelhead (rainbow) trout. Upstream controls on bluff erosion are needed to reduce downstream sediment transport (potential scour effects) and sedimentation (covering of spawning beds).

§ Bluff failures typically are rotational or translational landslides but also have characteristics of debris avalanches and earth flows depending on the amount of clay and water content in the failing section and trees near the top edge of the bluff. Failures occur episodically and are related to flood events, freeze/thaw cycles, or periods of intense rainfall or snowmelt. During floods, the base, or toe, of the bluff is eroded by flowing water, which causes the bluff face to steepen and the upper part of the bluff to eventually fail from mass wasting and gravitational forces.

Figure 2. Annual sediment budget for North Fish Creek, Wis. (Fitzpatrick and others, 1999). All inputs and outputs are in tons per year. Arrow thickness is proportional to the amount of sediment input or output.

Fitzpatrick, F.A., Peppler, M.C., Saad, D.A., Pratt, D.M., and Lenz, B.N., 2015, geomorphic, flood, and groundwater-flow characteristics of Bayfield Peninsula streams, Wisconsin, and implications for brook-trout habitat: U.S. Geological Survey Scientific Investigations Report 2014–5007, 80 p., <http://dx.doi.org/10.3133/sir20145007>.

Table 8. Relative contributions of sediment from seven sources to Bayfield Peninsula streams, Wisconsin.

	Upland %	Road crossings %	Bluffs and terraces %	Banks %	Incision along main stem %	Feeder channels%	Gullies%
Cranberry River.	0	10	35	15	10	25	5
Bark River	0	15	20	10	20	20	15
Raspberry River.	Nd*	Nd*	Nd*	Nd*	Nd*	Nd*	Nd*
Sioux River	5	5	50	10	15	10	5
Whittlesey Creek	5	5	55	10	10	10	5
N. Fish Ck. (Fitzpatrick 1998)	5	0	67	6	18	0	4
N. Fish Ck. (updated, this study)	5	5	50	10	15	10	5

Nd = Not Determined

Sources of Sediment

§ Bluff and terrace erosion are major contributors of sediment to the Sioux River, Whittlesey Creek, and North Fish Creek.

§ Upland sources of sediment from surface sheet erosion, rill development, or head cutting is negligible because the uplands (of these six watersheds) are mainly forested (fig. 8).

§ Forested uplands contribute more runoff than they did before Euro-American settlement because of a reduction in interception (forests are younger), roughness (less ground cover and organic material), and infiltration (organic horizon on the forest floor is thinner). Presently, large woody debris (LWD) is absent in most channels, which was a source of roughness in pre-settlement channels, including main stems and feeder tributaries.

§ As flow is concentrated in the narrower channels of upper main stems, signs of incision are present, indicating that erosion of the upper main-stem channels is a source for sediment. As the streams flow through the steep slopes associated with postglacial shorelines, valleys are confined and conditions are optimal for bluff and terrace erosion in meander bends that intersect valley or terrace sides.

§ Bluff and terrace erosion in Whittlesey Creek and the Sioux River was similar to that observed in North Fish Creek (range in reach altitude from about 890 to 660' in the Sioux River and 880 to 670' in Whittlesey Creek, and was the main source of sediment to downstream reaches of these rivers.

§ Unimproved logging roads and road crossings provide local sources of sediment.

§ Erosion of bluffs at meander bends is episodic and thus hard to measure on a year-to-year basis, especially water-caused toe erosion at the base of the bluffs. In the Sioux River and Whittlesey Creek, however, exposed terraces and bluffs are common (about 30 actively eroding bluffs or terraces were observed in the helicopter video footage). Landslides and failures of large bluff sections are episodic but can be long-term sources of sediment. A typical small block failure with a size of about 30' x 50' x 5' can contribute 300 tons of sediment. A typical size of a landslide for larger streams like the Sioux River and North Fish Creek may be 100' long by 150' high by 15' thick (9,000 tons). Most of the sediment from these landslides is moved downstream within a few years after the failure. Downstream effects from a single landslide may last for years or decades as the sand load is transported episodically in waves during large floods. It is not known exactly how long it takes for downstream reaches to adjust to this episodic dump of sand and gravel. In addition, the non-vegetated vertical bluff faces are prone to rill and gully erosion. The prevalence of gravel bars and channel widening downstream of every eroding bluff and terrace is evidence of their large contribution of sediment.

§ Another important source of sediment during runoff events is small ephemeral feeder channels that bisect the entrenched valley sides. Observations of several of the feeder channels on the Cranberry River, Sioux River, and North Fish Creek during the 2003 snowmelt event indicated that the channels were incised beginning about one-third to two-thirds of the way down the valley's side slopes. Flow from melting snow became turbid in the channels at this point, and erosion was concentrated on the channel bed.

§ Overbank deposition of sand and natural levee formation are common features downstream of reaches with bluff and terrace erosion, and downstream of reaches with narrow valleys and bedrock controls. The accumulation of overbank sediment leads to a loss of flood-plain storage for smaller floods (concentrating flood flows) and causes subsequent increases in the probability of bank erosion, block failure, and avulsion. Thus, even though the channel may not be incising, it functions like an incised or entrenched stream by concentrating flood flows to downstream reaches.

§ The five studied Bayfield streams have shorter depositional or aggradational reaches near their mouths than North Fish Creek. Main stems with more stream length and lower slopes near their mouths have more potential for some sediment from upstream sources to be deposited in overbank areas and within the channel before being carried out to Lake Superior. Whittlesey Creek, which has the steepest profile, the steepest overall slope, and a relatively short aggradational zone near its mouth is more likely than the other studied streams to deliver sediment directly to Lake Superior.

§ Every Bayfield stream has sand deposits that have accumulated in floodplains and channels during the last 125 years. Even if all eroding bluffs and terraces were stabilized, road crossings were improved, and incision and gullying were abated, it may take decades or centuries for the sand to move through the entire river system because there is still ample and available sand stored in floodplain and channel deposits.

Leaf, A.T., Fienen, M.N., Hunt, R.J., and Buchwald, C.A., 2015, *Groundwater/Surface-Water Interactions in the Bad River Watershed, Wisconsin*: U.S. Geological Survey Scientific Investigations Report 2015–5162, 110 p., <http://dx.doi.org/10.3133/sir20155162>.

§ The groundwater system in the Bad River Watershed provides the primary source of drinking water to its inhabitants and sustains numerous cold and cool-water habitats. The hydrogeology of the area is complex and has not been well studied to date. Understanding of the regional groundwater-flow system and groundwater/surface-water interactions is important to the Bad River Band and other stakeholders, as they seek to protect and manage the watershed in the face of climate change, a proposed open-pit iron mine in the Penokee Hills, and other concerns.

§ The Bad River Watershed encompasses the cultural homeland of the Bad River Band of Lake Superior Chippewa and the largest remaining wild rice beds in the Great Lakes Basin. The groundwater system provides the primary drinking-water source for the Bad River Band and other inhabitants, sustains numerous coldwater and coolwater habitats, and may be important to the wild rice beds in the Bad River and Kakagon sloughs. Understanding of the regional groundwater-flow system and groundwater/surface-water interactions is important to the Bad River Band and other stakeholders, as they seek to protect and manage the watershed in the face of climate change and changes in land use within and outside of the Reservation boundaries.

Lenz, B.N., Saad, D.A., Fitzpatrick, F.A., 2003, *Simulation of Groundwater Flow and Rainfall Runoff with Emphasis on the Effects of Land Cover, Whittlesey Creek, Bayfield County, Wisconsin, 1999-2001*, USGS Water-Resources Investigations Report 03–4130

§ As in many Wisconsin tributaries to Lake Superior, aquatic habitat in Whittlesey Creek is possibly degraded because of accelerated runoff and associated sedimentation problems that have potentially resulted from agriculture, forestry practices, and development of roads (Red Clay Interagency Committee, 1967).

McClure, Seth, 2007, *City of Ashland Stormwater Utility Preliminary Feasibility Study, Ashland, Wisconsin*. MSA Project No. 06270601.

§ The report summarizes the findings of stream bank erosion along all of the open channels within the City of Ashland with defined banks that outfall to Lake Superior. The inspection of the over 10 miles of stream bank was conducted by Seth McClure of MSA Professional Services over two three-day periods in 2008. Four soil samples were taken to assess the amount of phosphorus deposited into Lake Superior from the City's open channels. Previously unnamed channels referred to in this report are referenced by the street or structure near their outfall into Lake Superior.

§ Several channels were found to have been backfilled and no longer had outlets to Lake Superior. These channels are labeled as abandoned, and one segment is labeled as "Not Assessed" due to lack of safe access to the private land.

§ In addition to assessing locations of significant erosion, locations of deadfall obstructing the flow of the streams and areas of significant dumping were also mapped.

- § The evaluation was completed using the method outlined in the document, "Pollutants Controlled Calculation and Documentation for Section 319 Watersheds Training Manual" by L.J. Steffen, 1982. As reproduced in the 2003 Wisconsin NRCS Field Office Technical Guide (FOTG).
- § The soils along the stream banks within the City were found to be primarily sandy clays. The FOTG does not have an option for estimating erosion for sandy clays. The US Department of Agriculture soil triangle gives very similar particle size distributions for sandy loams and sandy clays, and sandy clays have a similar unit weight as sandy loams. For the purposes of this assessment the unit weight of sandy loam was used, and the maximum values for Soil Density and Lateral Recession Rate were used to produce the most "conservative" estimates.
- § The study identified 107 locations of significant stream bank erosion totaling 2,304 feet of stream back.
- § Total erosion from the 107 locations is approximately 242 tons/year, yielding a phosphorus load of 15.6 pounds/year.
- § For comparison, preliminary findings of the water quality modeling completed as part of this project indicate that the total non-point source sediment load (TSS) from the urban areas of the City is 500 tons/year with a total phosphorous load of 3,156 pounds/year.
- § There are 5 major sites that each contribute over 9 tons/year of sediment to Lake Superior. Together these sites comprise approximately 40% of the total sediment load. There are other 11 sites that each contribute approximately 5 tons/year of sediment. Collectively these 16 sites account for over 60% of the total sediment load. To extend this further, 80% of the total sediment load comes from 23 sites that each contribute more than 2 tons of sediment per year (21% of all the sites).
- § The stream bank erosion documented in this study represents a significant sediment load but a minor phosphorous load when compared to the "urban" portions of the City.
- § The consultant recommended that the City implement repairs to the 5 priority sites that are contributing 40% of the sediment and phosphorus to Lake Superior from within the City limits.
- Robertson, D.M., Saad, D.A., Heisey, D.M., 2006, Present and Reference Concentrations and Yields of Suspended Sediment in Streams in the Great Lakes Region and Adjacent Areas: U.S. Geological Survey Scientific Investigations Report 2006-5066**
- § Suspended sediment and siltation are the most common stressors affecting streams throughout the United States (U.S. Environmental Protection Agency, 1998). Suspended sediment reduces the clarity in streams and affects sight-feeding fish; it also interferes with water-treatment processes and recreational uses of streams. Excessive siltation can bury and suffocate fish eggs and bottom-dwelling organisms. In addition to in-stream effects, excessive sediment loading causes sedimentation problems in many downstream lakes and harbors and water-clarity problems in nearshore areas.
- § The source of much of the sediment and associated nutrients in streams is from upland and streambank erosion. High erosion rates are usually thought to be associated with agricultural activities; however, studies have shown erosion rates to be strongly related to the type of soil and the slope of the terrain in the basin. Therefore, suspended sediment concentrations in streams are a function of the

soil type, slope of the terrain, and land use in the basin. The load of sediment transported in streams is a function of the concentrations of suspended sediment and the volume of water moving through the stream; therefore, in addition to the factors affecting sediment concentration, precipitation and the resulting runoff also are important factors.

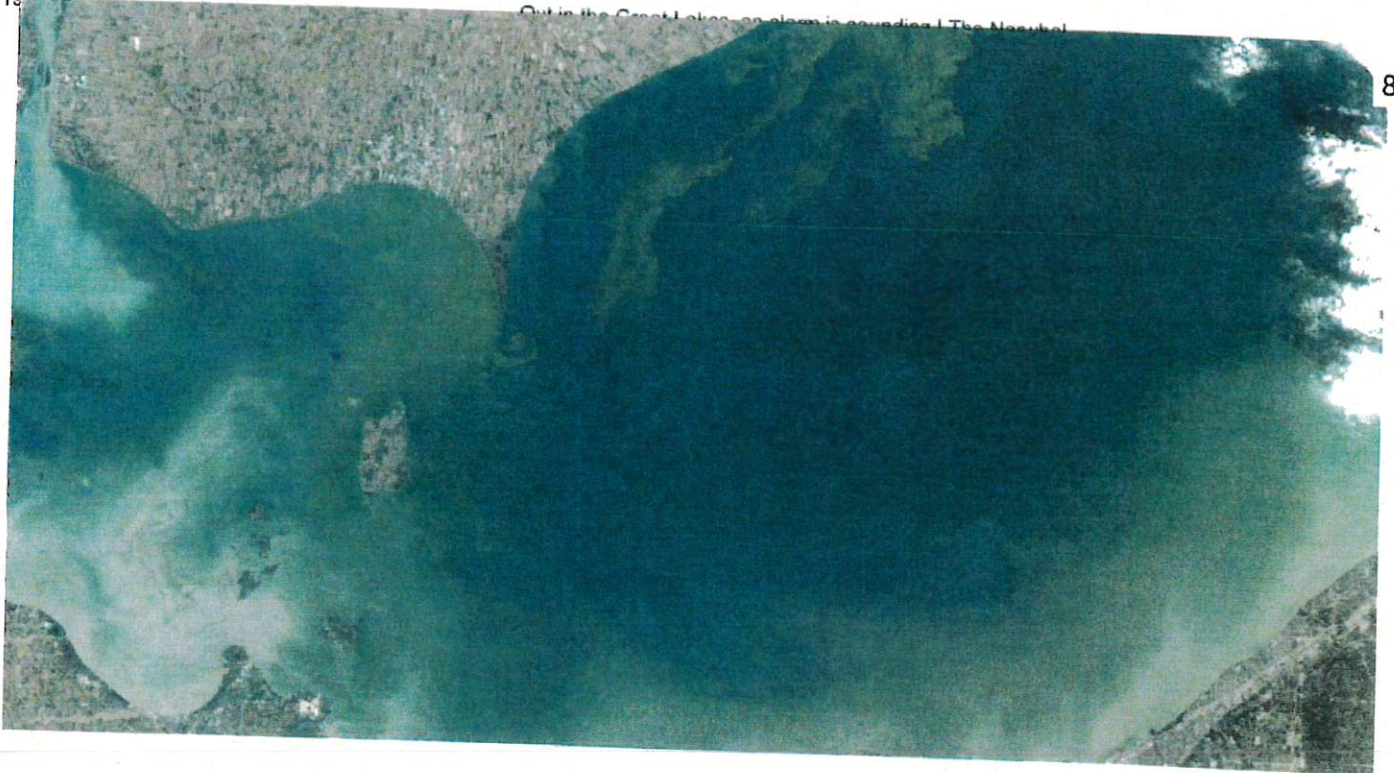
§ The most effective way to attain the designated uses of streams impaired by sediments is to reduce the contributions from human activities rather than try to reduce natural loadings. Natural sediment loads and their response to human activities are expected to vary because of the regional differences in the factors affecting concentrations and loads of suspended sediment. Basins that are substantially affected by human activities could be more appropriately identified by quantifying reference water quality, enabling prioritization of remedial actions.

Additional Resources

Fitzpatrick, F.A., 1998, Geomorphic and hydrologic responses to vegetation, climate, and base level changes, North Fish Creek, Wisconsin: Madison, Wis., Geography Dept., University of Wisconsin-Madison, Ph.D. dissertation, 275 p.

Red Clay Interagency Committee, 1967, Erosion and sedimentation control on the red clay soils of northwestern Wisconsin: Madison, Wis., Soil Conservation Board, 23 p.

Wisconsin Department of Natural Resources, 1996, A nonpoint source control plan for the Whittlesey Creek Priority Watershed Project: Wisconsin Department of Natural Resources Publication WR-474-96, 55 p.



IN-DEPTH

Out in the Great Lakes, an alarm is sounding



For researchers with a keen eye, rising temperatures, invasive species and a changing fish population all tell the tale of a system in peril

[Greg Mercer](#) • Oct 10, 2018

🕒 7 min read

John Casselman doesn't need to consult 70-plus years of climate data to know the Great Lakes are undergoing some dramatic and troubling changes.

He just follows the fish.

Casselman, a biologist at Queen's University, has been studying climate change in the Great Lakes Basin longer than almost anyone else in his field, tracking the connection between water temperature and fish populations.

Fish have long been biologists' best indicators of the Great Lakes' health, through decades of battles against pollution. Now, Casselman says, they're telling us a concerning story about climate change, too.

"The fish are telling us that these changes are real. If we don't pay attention to this, it's at our peril," Casselman, former scientist for Ontario's Ministry of Natural Resources, told *The Narwhal*.

The Great Lakes are 1.6 degrees Celsius warmer than they were in the 1940s, according to daily temperature readings from the City of Belleville's pumping station that draws water from the Bay of Quinte.

For fish, that's a significant change that affects all aspects of their physiology, from spawning rates to growth to feeding patterns. Casselman's research shows rising temperatures have caused a two-and-a-half fold decrease in the population of cold water fish such as northern pike or trout, while fueling a population boom for warm water fish such as bass.

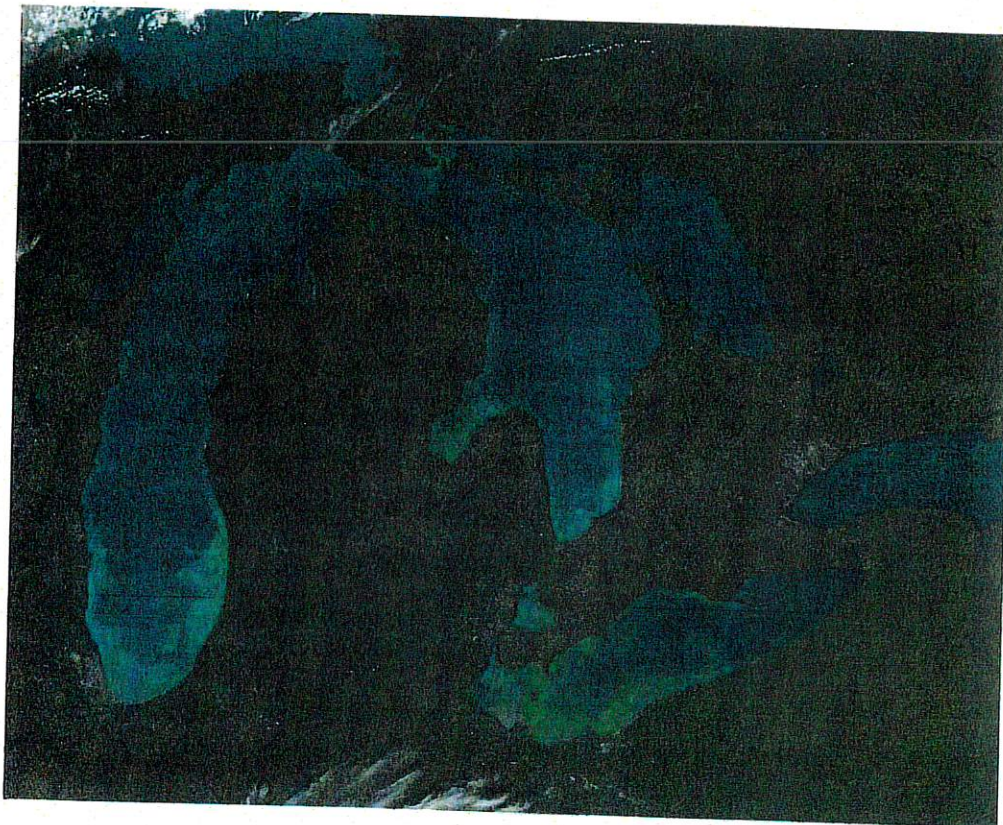
“We’re seeing significantly more warm water fish, and for cool water fish, like pike or walleye, it’s becoming precarious,” he said. “In many places, lake fish and trout in inland lakes have simply disappeared.”

Now there’s new evidence the pace of the warming may be quickening.

This summer, researchers in a laboratory on the edge of the Detroit River began seeing an alarming spike in the readings coming back from a network of buoys spread across the lakes.

The report, from the [Great Lakes Institute for Environmental Research](#) at the University of Windsor, showed increases of 3 degrees Celsius above the long-term average for surface water temperatures in some parts of the Great Lakes. Increases like that, if sustained across the system, would be devastating to cold-water fish populations.

It’s caught the attention of climatologists who worry about the implications on the entire Great Lakes ecosystem — from impacts on fish stocks and toxic algae blooms to shrinking ice cover and more aggressive invasive species.



Light blue streaks in Lake Michigan and Lake Huron, left and top right, are due to high winds drawing up sediment. The light green hues in Lake Erie, bottom right, and in a small bay of Lake Huron are due to algae blooms which build on the waters surface when winds are calm. Photo: [NASA Earth Observatory](#)

For those who earn a living on the Great Lakes, the warming trend is one of their most pressing issues.

“It’s quite concerning,” said Kevin Reid, a biologist with the Ontario Commercial Fisheries’ Association. “Although we expect the industry to be viable going forward, we just don’t know what that’s going to be like. There’s so much uncertainty because of all the change that’s occurring.”

In some areas of the Great Lakes, commercial fishers are already starting to change the way they harvest fish because of climate change. Along the western shore of Lake Erie, fishing crews have switched to setting their nets only in the early morning, because as the water warms through the day they’re reporting smaller and smaller catches.

“The quality of the fish is degraded, because the water is so warm,” Reid said.

In parts of Lake Michigan, cold water species such as ciscoes have all but vanished. Larger algae blooms, fueled by warmer water, are also becoming a more pressing issue.

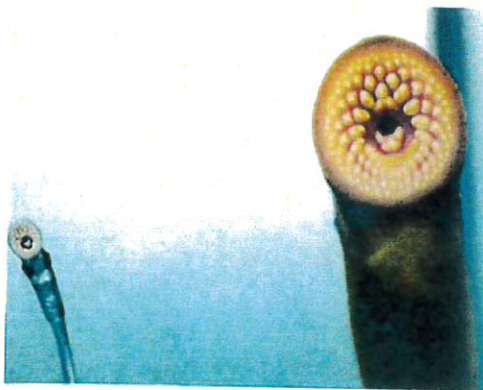
Although the toxins from algae haven't been shown to be harmful to fish, they cause problems for the gill nets fishers use. In the colder waters of Lake Superior, where there hasn't been a history of algae blooms, scientists are reporting increasing outbreaks.

Biologists also worry what the warming Great Lakes mean for invasive species, from Asian Carp to zebra mussels, which along with overfishing and pollution have already threatened dozens of native fish species.

One of the biggest threats is sea lampreys, which entered Lake Ontario through shipping canals in the 19th century and almost caused the collapse of the lower Great Lakes fishery by the late 1950s.



A mature male parasitic sea lamprey found in the Great Lakes. Sea lampreys, which are native to the Atlantic Ocean parasitize other fish by sucking their blood and bodily fluids. Photo: A. Miehl / Great Lakes Fishery Commission



Sea lampreys (which are essentially 340 million-year-old demogorgons of the sea) do not usually kill their host fish in the Atlantic Ocean where species co-evolved. However, because sea lampreys were only recently introduced into the Great Lakes system, they often kill the species of fish they parasitize there. Photo: T. Lawrence / Great Lakes Fishery Commission



A sea lamprey was found on this salmon, caught at the Rogers City Salmon Derby. According to the Great Lakes Fishery Commission, lampreys prey on a wide variety of Great Lakes fish including lake trout, brown trout, lake sturgeon, lake whitefish, ciscoes, burbot, walleye, catfish, and Pacific salmonids including Chinook and coho salmon and rainbow trout/steelhead. Photo: M. Gaden / Great Lakes Fishery Commission

Out in the Great Lakes, an alarm is sounding. The lampreys, which are parasitic, are becoming more numerous and more aggressive, leading some to wonder if current lamprey control programs should be dramatically expanded.

"The Great Lakes are quite susceptible to invasive species. As the lakes become warmer and winter becomes warmer, those species could find the lakes even more hospitable and spread even more rapidly throughout the system," said Marc Gaden, an adjunct assistant professor at the University of Michigan who is also communications director of the Great Lakes Fishery Commission.

"Then there's the distinct possibility that the Great Lakes could become more hospitable to invaders from places that we hadn't considered. Those would be really lethal, because the lakes could have no defense. It would be a one-two punch for native species."

The lakes' natural defense against some invasive species — harsh, cold winters — is also weakening.

Ice coverage on the Great Lakes has declined an average of 71 per cent over the past 40 years, according to the American Meteorological Society.

That's caused increased evaporation and more frequent and intense storms that batter shorelines and fish habitat.

Combine all this with shifts in the lower-end of the food chain, with shrinking populations of forage-based fish such as alewife that feed larger species, and you've got an ecosystem under immense stress. Whether people realize or not, the changes happening in the Great Lakes will eventually reach their communities, Gaden said.

For fisheries worth millions to local economies, there's a lot on the line.



Biologists from the U.S. Fish and Wildlife Service hold a lake sturgeon caught in the Great Lakes. Sturgeon are listed as threatened in the Great Lakes and are estimated to be at just one per cent of historical levels. Photo: Justin Chiotti / [USFWS](#)

"Changes in the fish community do affect people. They affect recreational fishers, subsistence fishers and commercial fishers. Losses to any of those communities have severe economic consequences," Gaden said. "There are concerns that these kind of wholesale changes in the environment would have repercussions that folks don't always think about."

Casselman, meanwhile, has been warning for years about the impact of climate change on the Great Lakes' fish. He just hopes the broader public is finally ready to take that warning seriously.

"The fish are trying to tell us something," he said. "They were the indicators that told us about pollution. They were the indicators that told us about acid rain. Fish can be the indicators that tell us climate change is real."

Lake Erie. Photo: NASA Earth Observatory

PUBLISHED BY

Greg Mercer

Greg Mercer is a Guelph, Ontario-based journalist who has reported from Haiti, Brazil, London and across Canada. His work has...

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SUBJECT: Approve to Reallocate the Remaining Balance from the Kreher Park Bathroom 2019 Capital Improvement Project to be Used to Retain a Consultant for a Concept Planning Project For Kreher Park (*Parks and Recreation*) Roll

RECOMMENDATION: Approval

DEPARTMENT OF ORIGIN: Parks & Recreation

CLEARANCES: Administrator
Public Works
Finance
Planning and Development

EXHIBITS: 1. Excerpt of minutes, May 28, 2019

EXPENDITURES REQUIRED: \$14,999

AMOUNT BUDGETED: \$ 0

APPROPRIATION REQUIRED: \$15,000

TREASURER'S CERTIFICATE:

COMPLIANCE WITH ORDINANCE 51: The item complies with Ordinance 51

STATEMENT OF CONFORMANCE WITH COMPREHENSIVE PLAN OF RECORD: This item conform with several plan on record: CORP, Waterfront Redevelopment and Authentic Ashland

SUMMARY STATEMENT:

City staff are wishing to reallocate 2019 Capital Improvement Plan funding from the reconstruction of Kreher Park bathrooms and use it to hire a consultant to create a concept drawing/master plan for the whole Kreher Park area for redevelopment.

The concept drawing would include updates/redevelopment opportunities for the current Kreher RV Park, beach area, pavilion, playground, Superfund Site and the Ashland Ore Dock.

City staff is desiring this drawing/plan to help with planning of future CIP budgets, grant opportunities and work schedules.

Agenda Item 7D: Approve to Reallocate Capital Improvement Plan (CIP) Funds from the Kreher Park Bathroom Project to the H. Pearson Plaza Repair

Staff sought approval to used funds budgeted for renovating the Kreher RV Park bathroom to instead install stamped concrete at the H. Pearson Plaza Park.

During the June 18, 2018 storm, the H. Pearson Plaza Park was damaged by excessive rainfall. FEMA would assist with fixing the groundwork, but only for the amount of money it would cost to reinstall the brick pavers. Staff determined to use poured and stamped concrete for resiliency as concrete would hold up better than pavers if another rain storm event were to happen. Staff believes the stamped concrete would also be more accessible and more aesthetically pleasing than the pavers.

This was a federally funded public construction project, so the City would have to go through the Federal Procurement Requirements and seek bids for this project. By mid-summer, Council would have the opportunity to approve the contractor to do the project. This was something the Public Works staff were not able to do.

The Parks and Recreation Committee approved the reallocation and recommended Council approve the Option B style.

Moore moved, seconded by George to approve to reallocate Capital Improvement Plan funds from the Kreher Park Bathroom Project to the H. Pearson Plaza Repair. The motion passed 10-1 by roll call vote; Whitebird abstained.

SUBJECT: Approve a Resolution Adopting the Revised Ashland County All Hazards Mitigation Plan
(Mayor) Voice

RECOMMENDATION: Approval

DEPARTMENT OF ORIGIN: Mayor

CLEARANCES: Ashland County hazard Mitigation Plan Committee
City Attorney

EXHIBITS: 1. Proposed Resolution
2. Hazard Mitigation Plan, Ashland County

EXPENDITURES REQUIRED: NA

AMOUNT BUDGETED:

APPROPRIATION REQUIRED: NA

TREASURER'S CERTIFICATE: NA

COMPLIANCE WITH ORDINANCE 51: Section 51.26 (b) of Chapter 51, Ashland City Ordinances, permit the Mayor and/or Clerk to schedule items directly for Council action when a timely decision is needed by the City. The City Clerk has chosen to direct this item directly to Council pursuant to the authority granted to her in Chapter 51, Ashland City Ordinances.

STATEMENT OF CONFORMANCE WITH COMPREHENSIVE PLAN OF RECORD: NA

SUMMARY STATEMENT:

An adopted All Hazards Mitigation Plan is required by F.E.M.A. as a condition of future grant funding for mitigation projects. The City of Ashland participated jointly in the planning process with Ashland County and other local units of government to prepare the revised All Hazards Mitigation Plan which will reside permanently in the Ashland County Emergency Management office.

**RESOLUTION BY THE COMMON COUNCIL FOR THE CITY OF ASHLAND,
WISCONSIN ADOPTING THE ASHLAND COUNTY ALL HAZARDS MITIGATION
PLAN**

WHEREAS, the Common Council for the City of Ashland recognized the threat that natural hazards pose to people and property within the community; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted All Hazards Mitigation Plan is required by REMA as a condition of future grant funding for mitigation projects; and

WHEREAS, the City of Ashland participated jointly in the planning process with Ashland County and the other local units of government within the County to prepare the All Hazards Mitigation Plan which will reside permanently in the Ashland County Emergency Management office and copies of which will be made available at the City's Administrative offices.

NOW, THEREFORE BE IT RESOLVED, that the Common Council for the City of Ashland adopts the Ashland County All Hazards Mitigation Plan as an official plan of the City; and

BE IT FURTHER RESOLVED, that the Ashland County Emergency Management Department will submit, on behalf of the City of Ashland, the adopted All Hazards Mitigation Plan to Wisconsin Emergency Management and Federal Emergency Management Agency officials for final review and approval and minor changes made to the plan upon the advice of the Office of Wisconsin Emergency Management and the Federal Emergency Management Agency will not require re-adopting this resolution.

PASSED: September 10, 2019

Councilperson

ATTEST: _____
Denise Oliphant, City Clerk

Debra S. Lewis, Mayor

APPROVED AS TO FORM:

Tyler W. Wickman, City Attorney



Hazard Mitigation Plan

Ashland County, Wisconsin

Original Plan Date – September, 2018

EPTEC, INC
Lenora G. Borchardt
7027 Fawn Lane
Sun Prairie, WI 53590-9455
608-834-0802
LenoraBorchardt@hotmail.com

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Acronyms

ACE	Army Corps of Engineers
ADA	Americans with Disabilities Act
ARC	American Red Cross
ARES	Amateur Radio Emergency Services
ASCS	Agriculture Stabilization and Conservation Service
ASL	Above Sea Level
ASPR	Assistant Secretary for Preparedness and Response
BIA	Bureau of Indian Affairs
CAD	Computer Aided Dispatch
CAR	Communities-at-Risk
CBRNE	Chemical, Biological, Radiological, Nuclear, or Explosive
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CI	City
CO	County
CTH	County Highway
DFIRM	Digital Flood Insurance Rate Map
DHS	U.S. Department of Homeland Security
DNR	Wisconsin Department of Natural Resources
DOD	U.S. Department of Defense
DOT	Department of Transportation
DPW	Department of Public Works
DTM	Digital Terrain Maps
EAP	Emergency Assistance Program or Emergency Action Plan
EF	Enhanced Fujita Scale
EHS	Extremely Hazardous Substance
EM	Emergency Management
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EOC	Emergency Operations Center
EOP	Emergency Operating Procedure
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
F	Fahrenheit or Fujita Scale
FCC	Federal Communications Commission
FCIC	Federal Crop Insurance Corporation
FD	Fire Department

Introduction and Background

FEMA	Federal Emergency Management Agency
FIRMS	Flood Rate Insurance Maps
FMA	Flood Mitigation Assistance
FmHA	Farmers Home Administration
FOIA	Freedom of Information Act
FOUO	For Official Use Only
FSA	Farm Service Agency
GA	General Aviation
GIS	Geographic Information System
HazMat	Hazardous Materials
HazMit	Hazard Mitigation
HAZUS	Hazards United States
HAZUS-MH	Hazards United States Multi-hazard
HMGP	Hazard Mitigation Grant Program
HUD	U.S. Department of Housing and Urban Development
HVA	Hazard Vulnerability Analysis
HWY	Highway
ICS	Incident Command System
L	Liter
LE	Law Enforcement
LEPC	Local Emergency Planning Committee
LIDAR	Laser Imaging Detection and Ranging
LPDM	Lagrangian particle dispersion
LWCD	Land and Water Conservation Department
MABAS	Mutual Aid Box Alarm System
MAP	FEMA's Risk Mapping, Assessment and Planning
MHz	Megahertz
MMI	Modified Mercalli Intensity Scale
MOU	Memorandum of Understanding
MPH	Miles Per Hour
MSDS	Material Safety Data Sheet
NFIA	National Flood Insurance Act
NFIF	National Flood Insurance Fund
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NIDIS	National Integrated Drought Information System
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service

NRP	National Response Plan
NWS	National Weather Service
PA	Public Address (System)
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
PH	Public Health
PSA	Public Service Announcement
POW	Plan of Work
RACES	Radio Amateur Civil Emergency Service
RES1	Single Family Dwelling
RES2	Manufactured Housing
RFC	Repetitive Flood Claims
SARA	Superfund Amendments and Reauthorization Act
SBA	Small Business Administration
SMART	Spatial Management, Analysis and Resource Tracking
SPI	Standardized Precipitation Index
SRL	Severe Repetitive Loss
STH	State Highway
TN	Township
UASI	Urban Area Security Initiative
USDA	U.S. Department of Agriculture
USFS	U.S. Forestry Service
USGS	U.S. Geological Survey
UW	University of Wisconsin
UW Ext	University of Wisconsin – Extension Office
VHF	Very High Frequency
VI	Village
WEM	Wisconsin Emergency Management
WISP	Wisconsin Irrigation Scheduling Program

Introduction and Background

This Hazard Mitigation Plan is intended to provide strategies for reducing susceptibility to future damage to public and private infrastructure in the county. The Ashland County Emergency Management Office applied for and received a hazard mitigation plan update grant in 2017. This grant program is sponsored by the U.S. Department of Homeland Security - Federal Emergency Management Agency (FEMA) and is administered by the Wisconsin Department of Military Affairs - Wisconsin Emergency Management (WEM). The Bad River Band of the Lake Superior Tribe of Chippewa Indians (hereafter known as the "Bad River Band") was invited to attend as part of the workgroup but has created and maintains its own hazard mitigation process. The procedures utilized in preparing this plan are based on guidance provided by FEMA and WEM and should therefore be considered consistent with the requirements and procedures in the Disaster Mitigation Act of 2000.

Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (P.L. 93-228, as amended) is the impetus for involvement of state and local governments in evaluating and mitigating natural hazards as a condition of receiving federal disaster assistance. The Federal Emergency Management Agency (FEMA) rules for implementing Section 409 are in 44 CFR Part 206 Subpart M.

Section 409 states that the county is obligated to try to reduce damage susceptibility to any hazard that has received relief funding in the past. Developing a hazard mitigation plan provides an opportunity for communities to meet this requirement by developing strategies for reduction of potential losses from future natural disasters. Hazard mitigation planning is the process of developing a set of actions designed to reduce or eliminate long-term risk to people and property from hazards and their effects. Completion of this plan should put Ashland County in an advantageous position when competing for pre- and post-disaster mitigation project dollars because projects have been pre-identified. The cooperation of government, private and volunteer agencies is essential in mitigation efforts and over the long term it is hoped that implementation of this plan will save taxpayer dollars because less money is needed for post-disaster recovery activities. Furthermore, mitigation planning measures incorporated in economic or community development goals support more comprehensive and effective government. This

plan evaluates the risks that all natural hazards pose to the citizens and property of Ashland County by presenting:

- A profile and analysis of past hazardous events
- An assessment of vulnerability of community assets
- Potential hazard mitigation strategies
- Methods for building community support and ensuring plan adoption

Plan Overview

The Ashland County Hazard Mitigation Plan provides background information on Ashland County and identifies those hazards that have occurred or could occur in the county. It includes a description of each hazard, its frequency of occurrence, appropriate actions in case of emergency and possible steps to mitigate the hazard. These hazards are the basis for the development of all county emergency plans.

A well-prepared plan allows emergency management to act swiftly and efficiently in the event of a hazard, reducing the damage and the cost incurred from displacing residents and businesses. Hazard mitigation activities will be emphasized in the plan as a major component of overall emergency management. The plan is intended to provide strategies for reducing future damages to public and private infrastructure in the county, including flood damage.

Previous Planning Efforts and Legal Basis

The Ashland County Emergency Management Office has completed and regularly updates a hazard vulnerability analysis (HVA). This HVA identifies all likely natural and technological hazards that might or have occurred within the county and is based on the State of Wisconsin's HVA. The local HVA does not generally include detailed mitigation strategies for the identified hazards.

There have also been plans and ordinances completed by individual Ashland County departments or municipalities which were used as reference materials for this plan, including:

Ashland County¹

011-2016-90	An Ordinance Repealing the Ashland County Shoreland Amendatory Ordinance and Adopting the Ashland County Shoreland Protection Ordinance
003-2014-81	An Ordinance to Impose a Moratorium on Land Use Permits Within Shoreland Zoning Areas in the Town of La Pointe Pending Study of Possible Legislative Action
006-2013-78	Zoning Ordinance Regarding Metallic Mineral Mining And Reclamation
006-2013-79	Metallic Mineral Mining Impact Ordinance
011-2013-80	Bulk Sampling and Non-Ferrous Metallic Mineral Prospecting Ordinance
004-2008-66	Floodplain Ordinance
001-2003-46	An Ordinance Amending Ashland County's Private Sewage System Ordinance
007-2002-44	An Ordinance Amending Ashland County's 1934 Zoning Ordinance
008-2001-39	Ordinance Amending Ashland County Zoning Ordinance Map
001-1999-22	An Ordinance Amending Ashland County's Floodplain Zoning Ordinance And Adopting Day Lake Floodwater Flow Profile, Flood Crest Summary Data Table And Hydraulic Shadow Map For 100 Year Flood (No Dam)
April 13, 1987	Ashland County Flood Plain Zoning Ordinance
May 22, 1986	Emergency Government Ordinance For Ashland County, Wisconsin

City of Ashland²

451-480	Public Lands & Natural Resources
741-780	Building & Electrical Inspectors & Codes
781-830	Zoning

City of Mellen³

01-06	An Ordinance to Adopt a Comprehensive Plan
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¹ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/2018-04-20_Updated_ASHLAND_COUNTY_ORDINANCES.pdf

² <https://www.coawi.org/administration/city-clerk/ordinances/>

³ [https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Mellen - policy.pdf](https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Mellen_-_policy.pdf)

Town of Agenda ⁴

12-2005-17 An Ordinance to Adopt a Comprehensive Plan

Town of Ashland ⁵

10112005 An Ordinance to Adopt a Comprehensive Plan

Town of Chippewa ⁶

2006-1 An Ordinance to Adopt a Comprehensive Plan

Town of Gingles ⁷

20061 An Ordinance to Adopt a Comprehensive Plan

Town of Gordon ⁸

2006-003 An Ordinance to Adopt a Comprehensive Plan

Town of Jacobs ⁹

35 An Ordinance to Adopt a Comprehensive Plan

Town of La Pointe ¹⁰

Part II. 205 Building Construction

Part II. 227 Conservancy Area

Part II. 375 Sewers and Sewage Disposal

Town of Marengo ¹¹

11.306 An Ordinance to Adopt a Comprehensive Plan,
December 10, 2006

Town of Morse ¹²

121305 An Ordinance to Adopt a Comprehensive Plan,
December 10, 2006

⁴ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Agenda_-_policy.pdf

⁵ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Ashland_-_policy.pdf

⁶ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Chippewa_-_policy.pdf

⁷ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Gingles_-_policy.pdf

⁸ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Gordon_-_policy.pdf

⁹ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Jacobs_-_policy.pdf

¹⁰ <http://www.townoflapointewi.gov/cms/files/2015-TOC.pdf>

¹¹ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Marengo_-_policy.pdf

¹² https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Morse_-_policy.pdf

Town of Peeksville¹³

Unnumbered An Ordinance to Adopt a Comprehensive Plan,
December 10, 2006

Town of Shanagolden¹⁴

Unnumbered Ordinance to Adopt a Comprehensive Plan

Town of White River¹⁵

Ordinance 2006-11 An Ordinance to Adopt a Comprehensive Plan

Village of Butternut¹⁶

Chapter 6	Public Works
Chapter 7	Utilities
Chapter 8	Building Regulations
Chapter 9	Planning and Zoning
Chapter 10	Health and Sanitation

The local HVA serves as the starting point for the hazard mitigation plan. Other data on historical events is gathered from the National Weather Service's storm report database, recent news reports, local resources (e.g., website; local community ordinances; local plans such as the comprehensive plan, stormwater management plans), the FEMA Region V mitigation survey and from the memories of the local planning team members. Team members are presented with this educational background data and asked to rank their concern (likelihood of future occurrences and amount of disruption/damage should it occur) on a five-point scale (very high, high, medium, low, very low). From that, team members, members of the community, survey respondents and other planning participants are asked to determine hazard mitigation strategies that might benefit their communities. Local existing plans are referenced again at this time, with the members and authors of these plans (e.g., comprehensive, stormwater management) serving as core members of the workgroup committee. The selected mitigation strategies are recorded and detail in each chapter as well as in the table in Appendix D.

¹³ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Peeksville_-_policy.pdf

¹⁴ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/Shanagolden_-_background.pdf

¹⁵ https://co.ashland.wi.us/vertical/sites/%7B215E4EAC-21AA-4D0B-8377-85A847C0D0ED%7D/uploads/White_River_-_policy.pdf

¹⁶ <http://butternutwi.com/PDF/TABLE%20OF%20CONTENTS%20.pdf>

Mitigation strategies are reviewed over the five years of the plan's life by the leadership staff from the applicable departments (e.g., Emergency Management, Sheriff's Office/Communications, Highway, Land and Water Conservation, Zoning) with the elected leaders from the jurisdictions to triage projects and determine what can and should be done within the planning period. These options are usually discussed in open meetings prior to implementation, as required by Wisconsin state law. The determining factor for most projects is obviously budget availability. The units of government have several options for funding implementation including grants, special taxing authority (for the project and/or any matching funds), general purpose revenue from existing budgets, and regulatory authority, which can be used to require that an individual or business complete the project using their funds. The units of government use or improve, if necessary, the mechanisms described above to ensure the implementation of hazard mitigation ideas.

Plan Preparation, Adoption and Maintenance

The Ashland County Emergency Management Director contracted with Emergency Planning, Training and Exercise Consulting (EPTEC, Inc.) to draft this plan. A Hazard Mitigation Committee was organized to oversee the completion of this plan. The committee members include:

- Dorothy Tank, Ashland County Emergency Management
- Matt Erickson, Ashland County Highway Department
- Emmer Shields, Ashland County Highway Department
- Jim Hnath, Chief Deputy, Ashland County Sheriff's Office
- David McGuire, Ashland Co. Sheriff's Office-Communications
- Tom Fratt, Ashland County Land Conservation
- Josh Rowley, Ashland County Zoning
- Sharon Campbell, City of Ashland
- Patrick Colgrove, Town of Gingles
- Louis Carl, Town of Jacobs
- Ben Shram, Town of LaPointe
- Mike Ollanketo, Town of Marengo
- Jeff Ehrhardt, Town of Morse
- Dan Stricker, Town of Morse
- Chip Fareberg, Town of Shanagolden
- Matthew Granger, Town of White River
- Lissa Radke, Bad River Tribe
- Jennifer Croonborg-Murphy, Wisconsin Department of Natural Resources

- Diane Berweger, Bayfield Electric
- Bill Johnson, Bayfield Electric
- Bob Lahti, Bayfield Electric
- Ben Orysen, Price Electric
- Lenora Borchardt, EPTEC, Inc. (Contractor)

An informational brochure was created and copies were distributed throughout the community at local community gathering points such as municipal halls, libraries, etc. Meetings were held with chief elected officials from each municipality to explain and gather input regarding the program (e.g., previous occurrences, mitigation strategies.) The FEMA Region V survey was sent to every Ashland County city, village and town clerk for distribution to the elected officials for discussion, review and completion. Key county departments (i.e., planning, zoning, highway, Sheriff's) also received the survey with a request for completion; the completed county and municipal surveys were compiled and the results, along with the cover letter, are in Appendix G.

The committee met several times, first to evaluate and incorporate input from local officials and then to review and provide input on the progress of the plan. A public notice was placed in the newspaper to invite members of the public, local officials, academia and business and industry leaders to review the plan. A working draft of the plan was distributed to the county Emergency Management Directors from adjacent counties (i.e., Iron, Price, Sawyer, Bayfield). Comments received were reviewed and incorporated into the plan as appropriate. A copy of the mitigation brochure and a list of meeting dates and informational sessions to gather public and official input can be viewed in Appendix G.

The Ashland County Hazard Mitigation Plan Workgroup reviewed the past events records (generally gathered from the National Weather Service) and a consensus was reached on the anticipated probability of future events. This probability was designated as "very high," "high," "medium," "low" or "very low" by the workgroup based on their evaluation and experience with the data.

The workgroup also, after reviewing the draft plan, selected the potential mitigation projects, which are listed in Appendix D (Summary of Mitigation Strategies) and discussed in more detail in each chapter's Hazard Mitigation Strategies section. The workgroup participants were given the *Mitigation Ideas: Possible Mitigation Measures by Hazard Type* (Mitigation Ideas, FEMA-R5, 9/02) booklet as an aid to generating ideas. All of the ideas generated during the workgroup meetings were incorporated into the plan and

can be found in the Hazard Mitigation Strategies section of each chapter and are summarized in Appendix D. Based on the information collected, each of these projects was assigned a "very high," "high," "medium," "low" or "very low" priority based on the workgroup's internal consensus assessment during a discussion of the balances of risk, reward, cost effectiveness (cost benefit) and likelihood of local will and funding (local or grant) to complete the strategy.

The municipal leaders were briefed regarding the need to formally adopt this plan as a prerequisite for future mitigation funding eligibility. A draft was sent to Wisconsin Emergency Management (WEM) for review and tentative approval. Based on WEM's comments, a final draft plan was completed and was forwarded to FEMA for determination of approvability. Once deemed approvable by FEMA, a general meeting was held to review the plan with members of the public, local officials, academia and business and industry leaders. Information and adoption paperwork was provided to the municipal leaders advising them of the need to formally adopt this plan as a prerequisite for future mitigation funding eligibility.

The resolution was passed by the Ashland County Board; the Cities of Ashland and Mellen; the Village of Butternut; and the Towns of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River. Scanned copies of the adoption resolutions can be found in Appendix C. The final plan has been submitted to WEM for review and certification and notice of acceptance has been received of FEMA plan approval as of XXX.

The Disaster Mitigation Act of 2000 requires the monitoring, evaluation and updating of the hazard mitigation plan every five years. This hazard mitigation plan is designed to be a "living" document and therefore will be reviewed and updated within five years from its approval date. The Ashland County Hazard Mitigation Plan Workgroup will provide leadership and guidance throughout the plan's life cycle (i.e., monitoring, evaluating and updating). Updates will allow municipal leaders and the public to provide input into the process. The public will be notified of this opportunity via legal public notices.

The process for integrating hazard mitigation actions into other planning mechanisms will be led by the County Emergency Management Director. As she receives information between the five-year update periods (e.g., comprehensive or capital improvement plans) that might be included, it will be added to

Appendix H: Inter-Revision Updates. Ashland County Emergency Management maintains responsibility and is the point of contact for all issues (e.g., monitoring, updating and evaluating the effectiveness) regarding this plan. Municipalities can contact the County Emergency Management Director to add updated local information to Appendix H at any time. Furthermore, the county Emergency Management Director may solicit updates from the plan's stakeholders (county offices, municipalities, the public, etc.). The solicitation would seek to determine if there are new elements for the mitigation plan as well as any plans (new or updates) in which the mitigation plan can and/or will be used as a source plan. Comments will be received and discussed at the county's Emergency Management committee meeting. Note that after a disaster, the Emergency Management committee may also meet to discuss mitigation strategies that might be applicable. These same stakeholders will be invited to fully participate in the five-year plan update, which will be detailed in the updated plan documents and will fully conform to FEMA's requirements.

During the plan's lifecycle, the county and incorporated municipalities will consider the strategies listed in Appendix D as they annually prioritize "regular" maintenance projects, as they set their annual budgets, after a disaster period and as grants become available that might help off-set the costs of some of the strategies listed within the plan. The latter will be instigated by notice of these opportunities by the County Emergency Management Director. These projects will be reported in the annual letter to the County Emergency Management Director. The Director will keep and compile the inter-revision data for inclusion in the five-year update, which will be coordinated through County Emergency Management beginning at least 18 months prior to expiration and at which time they will report on their progress towards meeting the hazard mitigation goals. The update will bring together many of the same workgroup members as well as any new stakeholders (e.g., elected officials, businesses, academia, members of the public) who respond to the invitation to participate and have an interest in mitigation planning.

The plan participants also recognize this document as an important planning tool within the community and will use this plan as a reference as they complete and update community ordinances and other planning such as zoning, shoreland, floodplain, wetland, park and recreation, sustainability, and farmland preservation. They will also refer to it as they are involved in the planning and other preparedness activities of the municipalities. Many of these plans are

on a regular updating cycle and as emergency management is notified that they are up for renewal, they will provide any relevant planning materials (from the hazard mitigation plan and any additional information received since the plan's approval). Municipalities with planning departments are also encouraged to refer to the mitigation plan in their zoning updates, flood and shoreland planning and in their comprehensive plans. After this plan has passed its reviews from Wisconsin Emergency Management (WEM) and the Federal Emergency Management Agency (FEMA) and is approved, the county and its municipalities will have working copies. Ashland County Emergency Management will also refer to this plan in their emergency preparedness activities.

Physical Characteristics of Ashland County

General Community Introduction

Ashland County covers approximately 2,300 square miles or 800,000 acres with rivers, streams and lakes accounting for about 1,250 square miles of the total. Ashland County is home to approximately 16,142 people according to the 2011 US Census Bureau estimate¹⁷.

Ashland County lies within the Lake Superior Lowland geographical province to the north and the Northern Highland geographical province to the south. The Lake Superior Lowland in Wisconsin occupies portions of Douglas, Bayfield and Ashland counties in the northwestern corner of the state. Its area is about 1,250 square miles, not including the 2,400 square miles more in Wisconsin that is submerged beneath the waters of Lake Superior. Its altitude ranges from less than 1,000 feet above to about 300 feet below sea level, and it rises 150 to 350 feet above and goes 600 to 900 feet below the level of Lake Superior, which stands 602 feet above sea level. In topography this province is chiefly a plain.

The Northern Highland belongs to a great upland area that stretches northward in Canada to Labrador and Hudson Bay. It has a strong southward slope and, as the highland is shield-shaped and gently arches, it also has east and west components of slope. The slant of a medial line from the northern to the southern border is less than six feet to the mile. The portion of the Northern Highland in the area of Wisconsin glaciation forms a striking contrast with the Driftless Area. There is no residual soil. Instead, there is a transported, glacial soil. Rapids and waterfalls are abundant in the streams. There are large undrained inter-stream areas. Lakes and swamps are found everywhere. The drainage pattern is most irregular, resembling nothing systematic, as is perfectly normal for so youthful a drainage system. Three principal sorts of topographic forms are found, (a) the terminal or recessional moraines, (b) the ground moraine, and (c) the outwash deposits. In various parts of the Northern Highland the thickness of the glacial material in terminal moraines varies from 75 to 100 feet. It has a probable maximum of 350 feet, in the Wisconsin Valley moraine north of Merrill, Lincoln County, and perhaps as much as 500 or 600 feet west of Ashland. The material is, variably, unassorted till or stratified sand and gravel. The till, or boulder clay, is

¹⁷ <http://quickfacts.census.gov/qfd/states/55/55003.html>

made up of fine clay, sand and sub-angular, striated boulders of various sorts. It is un-assorted because deposited directly by the melting ice. The stratified sand and gravel is material carried by streams from the melting glacier and is, therefore, assorted. The surface form of the terminal and recessional moraines is sometimes a smooth, broad-topped ridge, sometimes a hilly mass of knobs and kettles, the latter often containing lakes and small swamps.¹⁸

Ashland County is bordered on the east by Iron County, on the south by Price County and Sawyer County, on the west by Bayfield County and on the north by Lake Superior.

In Wisconsin, there are three types of sub-county, full-service local government units: towns, which are unincorporated, and villages and cities, which are incorporated. Ashland County contains the Bad River Tribe; the Cities of Ashland and Mellen; the Village of Butternut and the Towns of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden and White River. (See Appendix A for a map of Ashland County.) The County and all municipalities except for the Towns of Agenda, Chippewa and Sanborn have adopted the plan. (Copies of the adoptions can be found in Appendix B.)

Geology

The present physiography of Ashland County is due largely to the glaciers that originated in northern Canada near Hudson Bay. The county is divided into two distinct drainage basins at the St. Lawrence Seaway Continental Divide. The Bad River and its tributaries drain most of the northern half of the county to Lake Superior and onward to the St. Lawrence Seaway and the Gulf of St. Lawrence. The Chippewa River and its tributaries drain to the Mississippi River and the Gulf of Mexico.

The Lake Superior Lowlands contain glacial lacustrine red clays or clay till (till is an unstratified glacial drift consisting of clay, sand, gravel, and boulders intermingled). These clays can be found on the historic lake plain adjoining present day Lake Superior. These clays were laid down under the waters of a much larger glacial lake that once occupied the Lake Superior Basin and surrounding areas. This calcareous red clay till soil is finely textured, resulting in very poor

¹⁸ <http://www.wisconline.com>

drainage. Streams cut very deep v-shaped valleys into the clay; some ranging anywhere from 40 to 100 or more feet below the level of the plain. The Apostle Islands were once covered by glacial lake waters. The ice sheet re-advanced over the islands after the clay was laid down, and in many places covered the clay with low ridges of red sand and silt.

Just south of the Lake Superior Lowland, the land surface is hilly and rough. Some of the hills are ridge-like accumulations of glacial sand, gravel, boulders, clay and silt, known as moraines. They were deposited by the ice sheet as it paused for a while or as it changed position slightly. Kettle shaped depressions can be found along the hills and ridges. Some of the hills are comprised of trap rock (hardened lava flows) and are narrow ridges with very steep rock walls. Waterfalls can occur where streams leave the lava formations and enter the clay plains. Copper Falls is a good example.

The Penokee Iron Range extends 80 miles beginning in Ashland County, through Iron County, and into Michigan where it is known as the Gogebic Iron Range. The Iron Range is about one-half to one mile-wide and rises to 1,872 feet above sea level at Mt. Whittlesey near Mellen. The elevation at the City of Ashland is 671 feet above sea level, while Lake Superior sits at 602 feet above sea level. Extending south from the Penokee Range is a rolling area of generally low relief with glacial deposits forming the greatest irregularities. Glacial outwash soils, well sorted sand or sand and gravel deposited by water melting from the glacier exist in the area and loose rock is common.¹⁹

Topography

Wisconsin lies in the upper Midwest between Lake Superior, the upper peninsula of Michigan, Lake Michigan and the Mississippi and Saint Croix Rivers. Its greatest length is 320 miles and greatest width 295 miles for a total area 56,066 square miles. Glaciation has largely determined the topography and soils of the state, except for the 13,360 square miles of driftless area in southwestern Wisconsin. The various glaciations created rolling terrain with nearly 9,000 lakes and several areas of marshes and swamps. Elevations range from about 600 feet above sea level along the Lake Superior and Lake Michigan

¹⁹ Ashland County Land and Water Resources Management Plan, 2009

shores and in the Mississippi floodplain in southwestern Wisconsin to nearly 1,950 feet at Rib and Strawberry Hills.

The Northern Highlands, a plateau extending across northern Wisconsin, is an area of about 15,000 square miles with elevations from 1,000 to 1,800 feet. This area has many lakes and is the origin of most of the major streams in the state. The slope down to the narrow Lake Superior plain is quite steep. A comparatively flat, crescent-shaped lowland lies immediately south of the Northern Highlands and embodies nearly one-fourth of Wisconsin. The eastern ridges and lowlands to the southeast of the Central Plains are the most densely populated and have the highest concentration of industry and farms. The uplands of southwestern Wisconsin west of the ridges and lowlands and south of the Central Plains make up about one-fourth of the state. This is the roughest section of the state, rising 200 to 350 feet above the Central Plains and 100 to 200 feet above the Eastern Ridges and Lowlands. The Mississippi River bluffs rise 230 to 650 feet.

The Lake Superior Lowland in Wisconsin occupies portions of Douglas, Bayfield and Ashland counties in the northwestern corner of the state. Its area is about 1250 square miles, not including the 2400 square miles more in Wisconsin that is submerged beneath the waters of Lake Superior. Its altitude ranges from less than 1000 feet above to about 300 feet below sea level, and it rises 150 to 350 feet above and goes 600 to 900 feet below the level of Lake Superior, which stands 602 feet above sea level. In topography this province is chiefly a plain.²⁰

Topographic elevation in Ashland County ranges from approximately 671 feet above mean sea level in Ashland and along the Lake Superior coastline to 1,872 feet at Mount Whittlesey, which is located southeast of Mellen in the Town of Morse.

Climate

The Wisconsin climate is typically continental with some modification by Lakes Michigan and Superior. Winters are generally cold and snowy and summers are warm. About two-thirds of the annual

²⁰ <http://www.uwex.edu/sco/state.html>

precipitation falls during the growing season; this is normally adequate for vegetation although there are occasional droughts. The climate favors dairy farming and the primary crops are corn, small grains, hay and vegetables. Storm tracks generally move from west to east and southwest to northeast.

The average annual temperature varies from 39°F in the north to about 50°F in the south with statewide extreme records of 114°F (Wisconsin Dells, 7/13/1936) and minus 55°F (Couderay, 2/2/1996 and 2/4/1996). During more than one-half of the winters, temperatures fall to minus 40°F or lower and almost every winter temperatures of minus 30°F or colder are reported from northern stations. Summer temperatures above 90°F average two to four days in northern counties and about 14 days in southern districts. During marked cool outbreaks in summer months, the central lowlands occasionally report freezing temperatures.

The freeze-free season ranges from around 80 days per year in the upper northeast and north-central lowlands to about 180 days in the Milwaukee area. The pronounced moderating effect of Lake Michigan is well-illustrated by the fact that the growing season of 140 to 150 days along the east-central coastal area is of the same duration as in the southwestern Wisconsin valleys. The short growing season in the central portion of the state is attributed to a number of factors, among them an inward cold air drainage and the low heat capacities of the peat and sandy soils. The average date of last spring freeze ranges from early May along the Lake Michigan coastal area and southern counties to early June in the northernmost counties. The first autumn freezes occur in late August and early September in the northern and central lowlands and in mid-October along the Lake Michigan coastline, however a July freeze is not entirely unusual in the north and central Wisconsin lowlands.

The long-term mean annual precipitation ranges from 30 to 34 inches over most of the Western Uplands and Northern Highlands, then diminishes to about 28 inches along most of the Wisconsin Central Plain and Lake Superior Coastal area. The higher average annual precipitation coincides generally with the highest elevations, particularly the windward slopes of the Western Uplands and Northern Highlands. Thunderstorms average about 30 per year in northern Wisconsin to about 40 per year in southern counties and occur mostly in the summer. Occasional hail, wind and lightning damage are also reported.

The average seasonal snowfall varies from about 30 inches at Beloit to well over 100 inches in northern Iron County along the steep western slope of the Gogebic Range. Greater average snowfall is recorded over the Western Uplands and Eastern Ridges than in the adjacent lowlands. The mean dates of first snowfall of consequence (an inch or more) vary from early November in northern localities to early December in southern Wisconsin counties. Average annual duration of snow cover ranges from 85 days in southernmost Wisconsin to more than 140 days along Lake Superior. The snow cover acts as protective insulation for grasses, autumn seeded grains, alfalfa and other vegetation.²¹

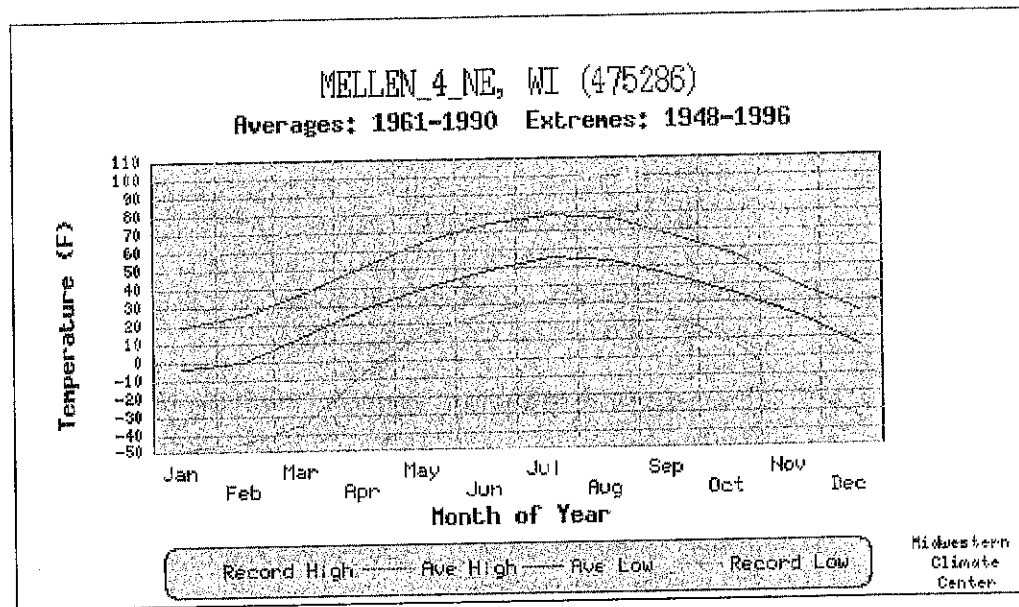
The average growing season is defined as the number of days following the last 32°F freeze in the spring through the beginning of fall. Ashland County's growing season averages 105 days with a range of 87 to 127 days. Ashland County's median date of last frost in the spring is May 31st and the median date of the first frost in the fall is September 18th.

Climate Normals	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Ave Daily High (F°)	19.9	27.1	36.8	50.2	64.8	73.9	79.3	77.1	67.8	56.2	38.2	24.8
Ave Daily Low (F°)	-0.4	4.8	17.0	28.6	39.3	49.0	55.1	53.7	45.1	34.2	22.2	7.3
Growing Degree Days	0	1	13	91	263	403	543	506	311	133	18	0
Heating Degree Days	1715	1374	1182	768	412	138	48	71	267	614	1044	1517
Cooling Degree Days	0	0	0	0	10	31	116	83	10	0	0	0
Ave Precipitation (")	1.26	0.81	1.86	2.07	2.74	3.65	4.03	3.93	3.70	2.51	2.36	1.10
Ave Snowfall (")	14.9	8.9	9.9	4.1	0.0	0.0	0.0	0.0	0.0	0.2	7.6	12.4

Data from the weather station at Ashland Exp Farm, latitude 46°34' N, longitude 90°58' W, elevation 650 ft.²²

²¹ <http://www.aos.wisc.edu/~sco/>

²² <http://www.wisconline.com/counties/ashland/climate.html>

Climate Normals and Growing Season Summary²³

In 2012, the Wisconsin Department of Health Services (DHS), Bureau of Environmental and Occupational Health (BEOH) was awarded a grant to study and prepare for anticipated climatic effects of the public's health. The Wisconsin Climate and Health Profile Report highlights evidence-based data related to extreme weather events, corresponding health outcomes and the development of projects and best practices to adapt to and prepare for future extreme weather events.

Over the past 60 years Wisconsin has become warmer and wetter, especially during the winter months. Evidence and research drawn from the Wisconsin Initiative on Climate Change Impacts (WICCI) suggest that climate-sensitive human health impacts will likely be affected by precipitation changes, heat extremes, drought, winter weather changes, disease vectors, surface water and groundwater. Those most vulnerable to these changes include the very young, elderly, persons with chronic disease (e.g., asthma), persons of low socio-economic status, persons with mental health issues and those who are socially isolated.

Possible impacts during the four seasons include:

²³ Data Provided by the Midwestern Regional Climate Center <http://mcc.sws.uiuc.edu/>

- Spring - More frequent and intense rain events may lead to more flooding with health impacts such as stress and mental health disorders; foodborne and waterborne illnesses; injuries; drowning; and death.
- Summer - Southern Wisconsin may experience approximately 28 more days exceeding 90 degrees Fahrenheit. Health impacts can include heat stress, respiratory disease, allergic reactions and death.
- Fall - Extended periods of warming could cause more drought with health impacts including water and food insecurity; respiratory distress; allergic reactions; and death.
- Winter - Warmer winters might cause more ice, sleet and rain. Health impacts may include traffic accidents, power outages, injuries and death.²⁴

Hydrology

The land in Wisconsin drains into Lake Superior, Lake Michigan and the Mississippi River. The Mississippi and St. Croix Rivers form most of the western boundary. About one-half of the northwestern portion of the state is drained through the Chippewa River, while the remainder of this region drains directly into the Mississippi or St. Croix Rivers and into Lake Superior. The Wisconsin River has its source at a small lake nearly 1,600 feet above mean sea level on the Upper Michigan boundary and drains most of central Wisconsin. Most of its tributaries also spring from the many lakes in the north, except for the Rock River, a Mississippi River tributary which flows through northern Illinois, eastern Wisconsin and drains into Lake Michigan. The sub-continental divide traverses the county in a north-south direction in the eastern tier of communities, separating the county between the Mississippi River and the Great Lakes-St. Lawrence River drainage systems.

Most of the streams and lakes in the state are ice-covered from late November to late March. Snow covers the ground in practically all the winter months except in extreme southern areas. Flooding is most frequent and most serious in April due to the melting of snow and spring rains. During this period, flood conditions are often aggravated by ice jams which back up the flood waters. Excessive

²⁴ *Wisconsin Climate and Health Profile Report*, 2014, WI Department of Health Services, Bureau of Environmental and Occupational Health <http://www.dhs.wisconsin.gov/publications/P0/P00709.pdf>

rains of the thunderstorm type sometimes produce tributary flooding or flash flooding along the smaller streams and creeks.²⁵

Groundwater reservoirs are recharged by direct precipitation. Spring is a prime time for recharge because evapotranspiration is low and melting snow and rainfall infiltrate and percolate the water table on unfrozen ground. Fall is another prime time for high recharge. During the summer, groundwater levels drop because precipitation is lower causing losses to evaporation and transpiration to exceed precipitation. In addition, groundwater is lost to surface waters by discharge in the form of springs.²⁶ The winter period normally lacks infiltration because of frozen ground.

Within Ashland County, there are 85 lakes, 96 flowages, and 548.1 miles of streams, of this number there are 257.7 miles of streams that are classified as trout streams. There are two different watersheds in Ashland County. Streams located in the northern basin flow into Lake Superior and streams in the southern portion of the county (south of the Great Divide) flow into streams that eventually enter the Mississippi River.

Groundwater resources constitute an extremely valuable element of the natural resource base of Ashland County. The groundwater reservoir not only sustains lake levels and provides the base flow of streams in the county but also comprises a major source of water for domestic, municipal and industrial water users. Like surface water, groundwater is susceptible to depletion in quantity and to deterioration in quality.

Wisconsin is a state with a large quantity of groundwater and is a critical resource both statewide and within the county. It is the main source of drinking water for 70% of Wisconsin residents and 95% of Wisconsin communities. From 1979 to 2005, total water use in Ashland County has increased from 3.2 million gallons per day to 4.5 million gallons per day. The increase in total water use is due primarily to an increase in industrial use; commercial usage has decreased by half. The proportion of county water use supplied by groundwater increased from 22.4% in 1979 to almost 42% in 2002 and decreased to 17.6% in 2005.²⁷ There have not been any concerns about the availability of good quality groundwater in the majority of the County. According to the Ashland and Bayfield County

²⁵ <http://www.uwex.edu/sco/state.html>

²⁶ DeVaul, 1967

²⁷ <https://wi.water.usgs.gov/gwcomp/find/ashland/index.html>

Land and Water Resource Management Plan, groundwater is found under nearly the entire county and is generally of very good quality.²⁸

The state has nearly 11,500 public water systems which meet the daily water needs of about 4 million people. Public water systems that are owned by a community are called municipal water systems and Ashland County has four:²⁹

- Ashland Water Utility
- Butternut Waterworks
- Glidden Sanitary District
- Mellen Water Utility

In addition to the public water systems, about 850,000 private wells provide drinking water to Wisconsin's population. Unlike public water systems, protection and maintenance of a private well is largely the responsibility of homeowners.

The source of drinking water for the City of Ashland is Lake Superior, but groundwater is the primary source of drinking water for most Ashland County residents, conveyed through private wells or municipal water systems. As with 70% of the state, the sand and gravel aquifer is the main source of groundwater. This aquifer includes primarily glacial deposits of unconsolidated sand and gravel. It is not a continuous layer, but rather is deposited in lenses or layers of sand and gravel interspersed with other fine-grained or low permeability deposits. As a result, well yields vary and depend primarily on the permeability and thickness of the sand and gravel at a particular location. The Status of Groundwater Quantity Report states that groundwater in general is abundant in Ashland County.³⁰

Ashland County obtains all of its domestic drinking water from groundwater sources, including both municipal and private wells. Recharge of the County's aquifers is derived almost entirely from locally occurring precipitation, giving our citizens control over, and responsibility for, their groundwater. Ways to protect groundwater include:

- Wellhead Protection Plans and Ordinances: Wellhead protection plans are developed to achieve groundwater pollution prevention measures within public water supply wellhead areas. A wellhead protection plan uses public

²⁸ Ashland County Comprehensive Plan, 2009

²⁹ <https://wi.water.usgs.gov/gwcomp/find/ashland/watersystems.html>

³⁰ WDNR, 1997

involvement to delineate the wellhead protection area, inventory potential groundwater contamination sources, and manage the wellhead protection area. All new municipal wells are required to have a wellhead protection plan. A wellhead protection ordinance is a zoning ordinance that implements the wellhead protection plan by controlling land uses in the wellhead protection area. Of the four municipal water systems, only Butternut has a wellhead protection plan and none have a wellhead protection ordinance.

- Animal Waste Management Ordinances: Most Wisconsin counties, including Ashland County, have adopted an animal waste management ordinance that applies to all unincorporated areas of the county (areas outside of city and village boundaries). While the purposes of such ordinances vary among counties, a key purpose is often to protect the groundwater and surface water resources. This is accomplished by regulations such as:
 - Permitting of animal waste storage facilities;
 - Permitting of new and expanding feedlots;
 - Nutrient management;
 - Prohibiting:
 - Overflow of manure storage structures;
 - Unconfined manure stacking or piling within areas adjacent to stream banks, lakeshores, and in drainage channels;
 - Direct runoff from feedlots or stored manure to waters of the state;
 - Unlimited livestock access to waters of the state where high concentrations of animals prevent adequate sod cover maintenance.
- Nitrate - Aquifers that are close to the land surface have limited natural protection which makes them vulnerable to pollution. From 1990-2006, 100% of 56 private well samples collected in Ashland County met the health-based drinking water limit for nitrate-nitrogen ($\text{NO}_3\text{-N}$) – i.e., no samples were above the 2 mg/L (or parts per million). See the map in Appendix A for the sampling locations.

In 2006, the Wisconsin DNR and DATCP reported that $\text{NO}_3\text{-N}$ is the most widespread groundwater contaminant in Wisconsin and that the nitrate problem is increasing both in

extent and severity with 80% of nitrate inputs originate from manure spreading, agricultural fertilizers, and legume cropping systems. Septic systems can also be a significant nitrate source in densely populated areas, areas where fractured bedrock is near the surface, or areas with coarse-textured soils. Additionally, concentrations of $\text{NO}_3\text{-N}$ in private wells frequently exceed the drinking water limit. For example, in 2005 11.6% of 48,818 private wells exceeded the nitrate limit.

Land use affects nitrate concentrations in groundwater with a study of over 35,000 private well samples being three times more likely to be unsafe to drink due to high nitrate in agricultural areas, especially those with sandy areas/highly permeable soils, than in forested areas. Groundwater with high nitrate from agricultural lands is more also more likely to contain pesticides than groundwater with low nitrate levels.

- Pesticides - A pesticide is any substance used to kill, control or repel pests or to prevent the damage that pests may cause. Included in the broad term "pesticide" are herbicides to control weeds, insecticides to control insects, and fungicides to control fungi and molds. Pesticides are used by businesses and homeowners as well as by farmers, but figures for the amounts and specific types of pesticides used are not generally available on a county-by-county basis. A 2005 report indicates that approximately 13 million pounds of pesticides are applied to major agricultural crops in Wisconsin each year, including over 8.5 million pounds of herbicides, 315,000 pounds of insecticides, one million pounds of fungicides, and 3 million pounds of other chemicals (this last category applied mainly to potatoes). The report also shows that herbicides are used on 100% of carrots for processing, 99% of potatoes, 98% of cucumbers for processing, 98% of soybeans, 97% of field corn, 89% of snap beans for processing, 87% of sweet corn, and 84% of green peas for processing. Insecticides are used on 97% of potatoes, 96% of carrots, and 88% of apples. Fungicides are used on 99% of potatoes, 88% of carrots, and 89% of apples.

A 2002 study estimated that 12% of private drinking water wells in the region of Wisconsin that includes Ashland County contained a detectable level of an herbicide or herbicide metabolite. Pesticides occur in groundwater

more commonly in agricultural regions, but can occur anywhere pesticides are stored or applied. There are no atrazine prohibition areas in Ashland County.

- Arsenic - Arsenic is an element that occurs naturally in some of Wisconsin's aquifers and may contaminate well water drawn from those aquifers. It is a particular problem in parts of the Fox River valley of northeastern Wisconsin. However, arsenic has been detected in wells in every county in Wisconsin, and arsenic concentrations greater than the drinking water limit of 10 µg/L (micrograms per liter, or parts per billion) have been documented in 51 of Wisconsin's 72 counties. 100% of four private well samples collected in Ashland County met the health standard for arsenic. Of the four water samples analyzed for arsenic in Ashland County, none have detectable arsenic and no samples are greater than the recently reduced drinking water limit of 10 µg/L (or parts per billion). Most private wells in the county have unknown arsenic levels.
- Contaminated Groundwater and/or Soil - Properties that were or are contaminated with hazardous substances can be found using the WDNR's Bureau for Remediation and Redevelopment Tracking System (BRRTS).³¹ Ashland County has 18 open leaking underground storage tank (LUST) sites which have contaminated soil and/or groundwater with petroleum, which includes toxic and cancer-causing substances. However, given time, petroleum contamination naturally breaks down in the environment. There are 12 environmental repair (ERP) sites which are sites other than LUSTs that have contaminated soil and/or groundwater. Examples include industrial spills or dumping, buried containers of hazardous substances, and closed landfills that have caused contamination. There is also one Voluntary Party Liability Exemption (VPLE) site.

³¹ <https://dnr.wi.gov/topic/Brownfields/botw.html>

- Concentrated Animal Feeding Operations (CAFO) - There are no concentrated animal feeding operations (i.e., greater than 1,000 animal units) in Ashland County.³² CAFOs are required under their Wisconsin Pollutant Discharge Elimination System (WPDES) permits to practice proper manure management and ensure that adverse impacts to water quality do not occur. Permit applicants must submit detailed information about the operation, a manure management plan, plans and specifications for all manure storage facilities, and a completed environmental analysis questionnaire. Once a WPDES CAFO permit is issued, operators must comply with the terms of the permit by following approved construction specifications and manure spreading plans, conducting a monitoring and inspection program, and providing annual reports. Other potential groundwater contaminants from agriculture include fertilizers and pesticides. Large amounts of nitrogen fertilizers are used when fields are planted continuously with corn, and they can leach into groundwater as nitrate.³³
- Licensed Landfills and Superfund Sites – There are no licensed landfills and one Superfund site in Ashland County. The superfund site is the Ashland/NSP Lakefront Site in Ashland, WI.

In 1980, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund law. The Superfund law created a tax on the chemical and petroleum industries, which went into a trust fund to help pay for cleaning up abandoned or uncontrolled waste sites. The U.S. Environmental Protection Agency (EPA) administers the Superfund trust fund and works closely with state and local governments and tribal groups to remediate sites that may endanger public health or the environment. The contamination at many of these sites was created years ago when environmental regulations

³² https://www.dnr.state.wi.us/topic/AqBusiness/data/CAFO/cafo_cty.asp?CountyChoice=Ashland&Submit=Submit

³³ <https://dnr.wi.gov/topic/AqBusiness/CAFO/>

were virtually nonexistent and companies dumped or emitted hazardous materials freely into the environment. Years later the threat to humans and the ecosystems remains so great that the sites need to be cleaned up.

Since much of this contamination was caused many years ago, it can be hard to find the parties responsible, or the parties responsible may be unwilling or unable to pay for the cleanup. In these cases, the Superfund trust fund can be used to pay for most of the cleanup process. States must pay for a portion of such cleanups. CERCLA also provides EPA with enforcement tools to compel those responsible for causing the contamination to pay for the cleanup, including the issuance of administrative orders. If the trust fund is used, then EPA and the state may go to court to recover their expenditures from those who are responsible.

- Cleanup -
 - Petroleum Environmental Cleanup Fund Award - The Petroleum Environmental Cleanup Fund Award (PECFA) program was created in response to enactment of federal regulations requiring release prevention from underground storage tanks and cleanup of existing contamination from those tanks. PECFA is a reimbursement program returning a portion of incurred remedial cleanup costs to owners of eligible petroleum product systems, including home heating oil systems. As of May 31, 2007, \$8,488,678 have been reimbursed by the PECFA fund to clean up 69 petroleum-contaminated sites in Ashland County. This equates to \$514 per county resident, which is greater than the statewide average of \$264 per resident.
 - Nitrate Removal Systems – No municipal water systems in Ashland County have spent money to reduce nitrate levels. As of 2005, over 20 municipal water systems in Wisconsin have spent over \$24 million reducing nitrate concentrations in municipal water systems.

WDNR's Outstanding and Exceptional Resource Waters Program provides a designation for Wisconsin's cleanest waters. An outstanding resource water is defined as a lake or stream that has excellent water quality, high recreational and aesthetic value, high quality fishing and is free from point source or non-point source pollution. An exceptional resource water is defined as a stream that exhibits the same high quality resource values as an outstanding resource water but that may be impacted by point source pollution or that may have the potential for future discharge from a small sewer community. Outstanding resource waters in Ashland are:³⁴

- Bad River Slough - All
- Kakagon Slough - All
- N Fork Flambeau River - All

Exceptional resource waters in Ashland are:³⁵

- Augustine Creek - Above Augustine Lake Road at T43N R1W S36
- Ballou Creek - T44N R2W S11- S12
- Bosner Creek Upstream from junction with feeder @ T41N R1E S17
- Devils Creek - All
- Hildebrandt Creek (tributary to Butternut Creek) - All
- Krause Creek - All
- Pine Creek - All
- Spring Brook - All
- Troutmere Creek - All
- Tyler Forks - Around Gehrman Creek at T45N R2W S15
- White River - Above the Bad River Indian Reservation

Ashland County contains parts of nine watersheds contributing to Lake Superior: Bayfield Peninsula Southeast Fish Creek, Lower Bad River, White River, Potato River, Marengo River, Tyler Forks, Upper Bad River and Montreal River). Water quality in the basin is generally good, although localized point-source pollution from municipal and industrial wastewater discharges have had a negative effect. Other issues, such as pollution from stormwater drains, runoff from farm fields and feedlots, and erosion from logging and construction-sites, have contributed to degraded habitat and water quality in some Ashland County streams. Additional nonpoint source pollution arises

³⁴ http://dnr.wi.gov/topic/SurfaceWater/oerw/orwerw_county.pdf

³⁵ http://dnr.wi.gov/topic/SurfaceWater/oerw/orwerw_county.pdf

from erosion of stream banks, ditches, and lakeshores as a result of fast runoff from rain and snow events. Rapid overland flows cause streams and other channels to cut down and straighten, which in turn decreases the ability of adjacent wetlands and floodplains to store and filter water. Human changes to the landscape that increase the amount of impervious surface (buildings, parking lots, etc.) or that change drainage patterns (roads, culverts, wetland fills, etc.) further intensify the erosion problems.

Within Ashland County parts of six watersheds drain toward the Mississippi River: Upper South Fork Flambeau River, Lower North Fork Flambeau River, Butternut Creek, Upper North Fork Flambeau River, East Fork Chippewa River, and West Fork Chippewa River.³⁶

Soil Types

A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil. According to the Ashland County Forest 10-Year Plan (1996), the soils of the County are largely derived from the weathering of the glacial drift deposits and show a great variation within relatively short distances. Water action, wind, and the accumulation and incorporation of organic material since the glacial period have modified the soils. Soil types within the County are not generally found in extensive continuous areas of any one soil classification, but are scattered in smaller groupings. The majority of the soils in the county are loamy and silt, soils over loamy till, and sandy loam soils over outwash plains. The basic soil components are sand, gravel, silt, clay, and organic material. The different soil types are composed of various combinations of each component.³⁷

An Ashland County soil survey, the "Soil Survey of Ashland County, Wisconsin,"³⁸ was prepared by the Natural Resources Conservation Service³⁹ and can provide very specific details on the county's soil types.

³⁶ Ashland County Land and Water Resource Management Plan, 2009

³⁷ Ashland County Comprehensive Plan, 2006

³⁸ Soil Survey of Ashland County, 2006

³⁹ https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/wisconsin/WI003/0/Ashland_WI.pdf

³⁹ <http://websoilsurvey.nrcs.usda.gov/app/>

Wetlands

From the sedge meadows of southern Wisconsin to the spruce bogs in the north, wetlands cover a wide array of landscapes. They share in common the ability to support aquatic or "water loving" plants, and provide habitat for more species of plants and animals than any other type of landscape in Wisconsin. Habitat is not their only functional value. Wetlands can also store water to prevent flooding, purify water, protect lake and stream shores from eroding and provide recreational opportunities for wildlife watchers, anglers, hunters and boaters.⁴⁰

Because wetlands provide many benefits to the environment, several municipal, state and federal ordinances/regulations protect wetland areas. The basic concept associated with these laws is that wetland areas on any property cannot be disturbed without a permit. Wetlands store flood waters and filter water from precipitation before it enters lakes and streams. Some wetlands also recharge local groundwater aquifers. By slowing water movement, wetlands reduce the likelihood that heavy rainfall or spring snowmelt will cause erosion and flooding. Wetlands retain eroded soil and hold nutrients that would otherwise promote excessive weed growth and algae blooms in lakes and streams. These nutrients, when held in the wetlands, produce a heavy growth of vegetation that provides nesting sites, food and cover for waterfowl, small mammals and many other types of wildlife. Wetlands also provide recreational opportunities for humans (wildlife observation, hiking, hunting, etc.)

There are three basic factors in determining whether or not a property is a wetland:

- The presence of water at, near or above the surface (hydrology).
- Water present long enough to sustain aquatic plant life (hydrophytic vegetation).
- Soils indicative of wet conditions (hydric soils).

Figuring out what is or is not a wetland can be extremely confusing if you only associate "wetlands" with the presence of water. It is possible that a property could have standing water for a portion of the year and still not be a wetland and it is also possible that a true wetland with all three of the above characteristics may never have water present above the land surface.

⁴⁰ <http://dnr.wi.gov/wetlands>

Wetlands perform an important set of natural functions, which make them particularly valuable resources lending to overall environmental health and diversity. Some wetlands provide seasonal groundwater recharge or discharge. Those wetlands that provide groundwater discharge often provide base flow to surface waters. Wetlands contribute to the maintenance of good water quality, except during unusual periods of high runoff following prolonged drought by serving as traps, which retain nutrients and sediments, thereby preventing them from reaching streams and lakes. They act to retain water during dry periods and hold it during flooding events, thus keeping the water table high and relatively stable. They provide essential breeding, nesting, resting, and feeding grounds and predator escape cover for many forms of fish and wildlife. These attributes have the net effect of improving general environmental health; providing recreational, research and educational opportunities; maintaining opportunities for hunting and fishing and adding to the aesthetics of an area.

Wetlands pose severe limitations for urban development. In general, these limitations are related to the high water table and the high compressibility and instability, low bearing capacity and high shrink-swell potential of wetland soils. These limitations may result in flooding, wet basements, unstable foundations, failing pavements and failing sewer and water lines. Moreover, there are significant and costly onsite preparation and maintenance costs associated with the development of wetland soils, particularly in connection with roads, foundations and public utilities.

The DNR has profiled larger wetland areas in the county. The Bad River-Kakagon Slough is mainly located in the Town of Sanborn and on the Bad River Reservation. It contains major wetland communities including emergent marsh, coastal fen, coastal bog, tamarack swamp, and shrub swamp. There are 18 rare elements of bird, fish, or plant habitat that have been identified. These rare elements are included in the Wisconsin Heritage Inventory, located later in this element. The second identified large wetland complex is the Long Island-Chequamegon Point area. This is Lake Superior's most extensive, and least disturbed coastal barrier spit. Many types of plants and animals are found here. There are 15 rare elements of beetle, bird, community, grasshopper, and plant that have been identified for the area. These can also be found in the Wisconsin Heritage Inventory. The third large wetland area that has been identified is the Big Bay wetland, located in the Town of La Pointe. This area is located within a state park and a town park and has been designated as a state natural area. There are 22 rare elements of

bird, butterfly, community, and plants that are found here. These rare elements are listed in the Wisconsin Heritage Inventory.⁴¹

There are two main levels of jurisdiction (often overlapping) concerning wetlands in Ashland County are the Wisconsin Department of Natural Resources and municipal zoning agencies. The Land Use Planning and Zoning Department has jurisdiction over wetlands in county zoning plans while wetlands within city or village boundaries are also subject to the appropriate municipality's regulations. According to the Wisconsin Wetlands Inventory⁴², Ashland County contains 168,388 acres of wetland, comprising 25.2% of the County's total land area, and 3.1% of the State's wetlands. This data is based on aerial photography and includes only wetlands larger than two acres. As a result, the wetland acreage numbers are likely to undercount the existing wetland area.

Natural Areas

Natural areas in Ashland County include the following:

Apostle Islands National Lakeshore

The Apostle Islands National Lakeshore consists of 21 of the 22 Apostle Islands plus a 12-mile strip of mainland shoreline. Camping is allowed on 19 islands (with permits only). The islands beckon to explorers and vacationers who enjoy quiet, sandy beaches, rocky shorelines with sea caves carved by wind and water, island lighthouses, historical interpretive areas, wildlife viewing and wilderness camping. The Apostle Islands National Lakeshore year-around headquarters is housed in a restored brownstone building in Bayfield. Private sailors, boaters and kayakers can travel around the archipelago and explore the fantastic sea caves carved into sandstone cliffs along the islands and the mainland shoreline.

Big Bay State Park

Located on Madeline Island, the largest of the Apostle Islands, Big Bay State Park is the northernmost state park in Wisconsin. The park has a 55-site family campground, an indoor group camp, several picnic areas, over five miles of hiking trails, a mile-and-a-half-long sand beach, self-guided nature trails and naturalist programs. Camping reservations are recommended.

⁴¹ Ashland County Comprehensive Plan, 2016. <https://ashland.uwex.edu/ashland-county-community-development/comprehensive-plan/>

⁴² <https://dnr.wi.gov/topic/wetlands/acreage.html>

City of Ashland

Ashland is a city of parks. One of the most impressive is Prentice Park with 100 acres of old forest, walking trails, artesian wells, and boardwalk along Fish Creek Slough. Prentice Park facilities include campsites, a pavilion and a playground. Bayview Park on Ashland's east end features a spectacular view of the old lighthouse at the end of the Ashland breakwater. Facilities at Bayview Park include a playground, swimming beach, fishing pier and picnic areas. Kreher Park has RV campsites, a swimming beach, pavilion, playground and a boat ramp. Ashland is also proud of their new "Waterfront Trail" that takes you through a scenic walking tour of Ashland and the Chequamegon Bay from the East side of town to the West side of town.

Chequamegon-Nicolet National Forest

The Chequamegon-Nicolet National Forest in Northwest Wisconsin has 850,000 acres of gently rolling terrain shared by Ashland and Bayfield Counties, and provides a variety of scenic landscapes, recreational activities, and is home to several hundred wildlife species. It provides endless trails for the outdoor enthusiast - snowmobiling, ATVing, biking, hiking. Camping is allowed throughout the national forest with certain restrictions.

Copper Falls State Park

At Copper Falls State Park, canyons, streams, waterfalls, swimming beach, picnic area with a log shelter, miles of self-guided nature trails, a family campground plus walk-in and backpack campsites are available for visitors. Copper Falls, located just northeast of the city of Mellen, is a 29-foot waterfall which marks the first drop of the Bad River as it flows through steep-walled gorges of rugged and awesome splendor.

Morgan Falls/St. Peter's Dome

This scenic area is located about 13 miles west of Mellen and 6 miles south of Sanborn in the Penokee Range. The 1,600-foot red granite dome is the highest point in the Chequamegon-Nicolet National Forest. On a clear day, you can see Lake Superior 20 miles to the north. At the south fork of Morgan Creek, a small stream of water cascades 70 feet down the face of a rock cliff to a small shaded pool. It is half-mile hike from the parking area to Morgan Falls, and beyond the falls, about one mile to the top of St. Peter's Dome.

Penokee Scenic Overlook & Trail

Penokee Scenic Overlook offers a breathtaking view of the Penokee Mountain Range and the Chequamegon-Nicolet National

Forest. Located on County Highway GG, between Mellen and Clam Lake, this overlook has a platform area for viewing with benches and interpretive signage. Stairs lead from the parking lot to the overlook, less than one-fourth mile away.

State Natural Areas are designated by the Department of Natural Resources to protect outstanding examples of native natural communities, significant geological formations, and archaeological sites. State Natural Areas also provide the last refuges in Wisconsin for rare plants and animals.

In 1995, 25 elk were released into the Chequamegon National Forest as part of a monitoring project. The DNR is now responsible for monitoring the herd, which has grown to approximately 80-90 elk. In Ashland County, their primary range includes the portions of the towns of Gordon, Shanagolden, Marengo, Morse, and Chippewa.

Hoffman Lake Hay Creek Wildlife Area

This area encompasses a total of 13,784 acres and is located in Ashland and Iron counties. The area in Ashland County is roughly half of the total acreage and lies in the Town of Agenda. The area is managed by the DNR primarily for wildlife, with the objective of maximizing the aspen acreage in the area. According to the DNR, there are 52 species of songbirds, bear, beaver, grouse, deer, snowshoe hares, and wolves that benefit from the aspen habitat either directly or indirectly.

The White River Wildlife Area

This area encompasses an area of approximately 1,000 acres and is located in the Town of Gingles. Unlike the Hoffman Lake Hay Creek Wildlife Area this area does not have a master plan and is basically unmanaged. The main goal for the area is to provide and maintain a winter deer-yarding area. The wildlife area provides winter deer habitat with steep pine ravines, aspen, white pine, and red pine stands. The White River flows through the northern part of the wildlife area and the County snowmobile trail travels around the west side of the property.

Nature Conservancy

In 1997, the Nature Conservancy acquired 1,043 acres near Caroline Lake in Ashland County from George-Pacific Corporation. This area is located in the Town of Morse. Caroline Lake forms the headwaters of the Bad River, which flows into the Kakagon-Bad River Slough.

This area provides important habitat for many species of birds and contains a large variety of forested area, wetlands, and lake areas. The area is open to the public and is also used as a research area for Northland College students.

Nature Conservancy/Bad River Band of Lake Superior Tribe of Chippewa Indians

In 2003, the Nature Conservancy of Wisconsin transferred 21,322 acres of forested land in the Chequamegon Bay Area to the Bad River Band of Lake Superior Tribe of Chippewa Indians. The lands that were included in this transaction are composed of multiple parcels that range in size from 20 to 3,500 acres and are covered mostly by forests and wetlands. The Conservancy and the Tribe have signed a memorandum of understanding describing the two parties' working relationship on this conservation project.

Madeline Island Wilderness Preserve

The Madeline Island Wilderness Preserve is working to protect wilderness areas and open land on Madeline Island. By preserving this space they will protect the diversity of the natural ecosystems and their plant and animal life. The group strives to promote awareness and appreciation of nature. The Wilderness Preserve is located on approximately 2,240 acres of land.

Big Bay Town Park

This Town Park is located on Madeline Island and is found about seven miles from LaPointe. The Park is adjacent to Big Bay State Park. There is no fee for daily use and there are 40 primitive campsites on a first-come, first-served basis. The Park provides trail access to trails in Big Bay State Park.

Vegetation

Mostly balsam fir and white spruce dominate in the northwest portions of the county. In the central part of the county, white maple, hemlock, and yellow birch predominate. Black spruce, tamarack and cedar form a band of conifer swamps that leads northeastward from the southeast corner.⁴³

⁴³ <http://www.wisconline.com/counties/Ashland/index.html>

Demographics

Human Settlement Patterns

The first evidence of human settlement in the Mississippi River Region was approximately 11,000 years ago, following closely the withdrawal of the Wisconsin glacier. These earliest known "Paleo-Indians" were hunter-gatherers that traveled in small nomadic family groups. This Ice Age era was known geologically as the Pleistocene period.

Between 1670 and 1680, the first Europeans to visit this land were the French traders to establish trading and military posts in the name of France, and the Jesuits to bring Christianity to the native inhabitants. Because the French made no definite settlement of the territory they yielded their rights to the English in 1761, who claimed possession until after the Revolutionary War. By the Treaty of 1835, the Indian tribes gave up their homeland and were moved to the country west of the Mississippi.

The Bad River Reservation in northwestern Wisconsin is the largest Chippewa reservation in the state. The reservation boundaries include lands in Ashland and Iron counties, 17 miles of Lake Superior shoreline and over 100 miles of rivers and streams. The Bad River Reservation is 124,655 acres of primarily undeveloped and wilderness land, of which 57,884 acres are in trust.

The Chippewa (also known as the Ojibwe or Anishinabe) Indians of present-day Wisconsin are the descendants of a northern Algonquian people who originally lived in an extensive area mainly north of lakes Superior and Huron. They began migrating across the Great Lakes region long before Europeans arrived. As the European fur trade penetrated into the Great Lakes region, the Chippewa moved from the backwoods and upriver areas and established villages at points of trade.

Soon after the organization of the new territory, a land cession treaty was signed that secured approximately half of the present state of Wisconsin from the Chippewa, Sioux, and Winnebago Indians. Officials sought the land cession to enable lumbering on a large scale along eastern tributaries of the Mississippi River. The land cession treaty of 1837 provided legal access to these lands.

After lumbering began, reports of copper deposits along the shores of Lake Superior led federal officials to push for new land cessions from the Chippewa Indians. Following the treaty of 1842, copper mining boomed and the region led the world in copper production by 1890.

The Treaty of 1854 finalized the ceding of the land south of Lake Superior. The treaty also established reservations for various bands, including Bad River, located on the south shore of Lake Superior and Madeline Island. The influx of white settlers progressively displaced the Chippewa from their traditional use of the ceded lands.⁴⁴

La Pointe County was established 19 Feb. 1845. Ashland County was split off from it on 27 Mar. 1860, and on 12 Apr. 1866 La Pointe County changed its name to Bayfield County; the name change became effective on May 1, 1866, according to state law.⁴⁵

Population

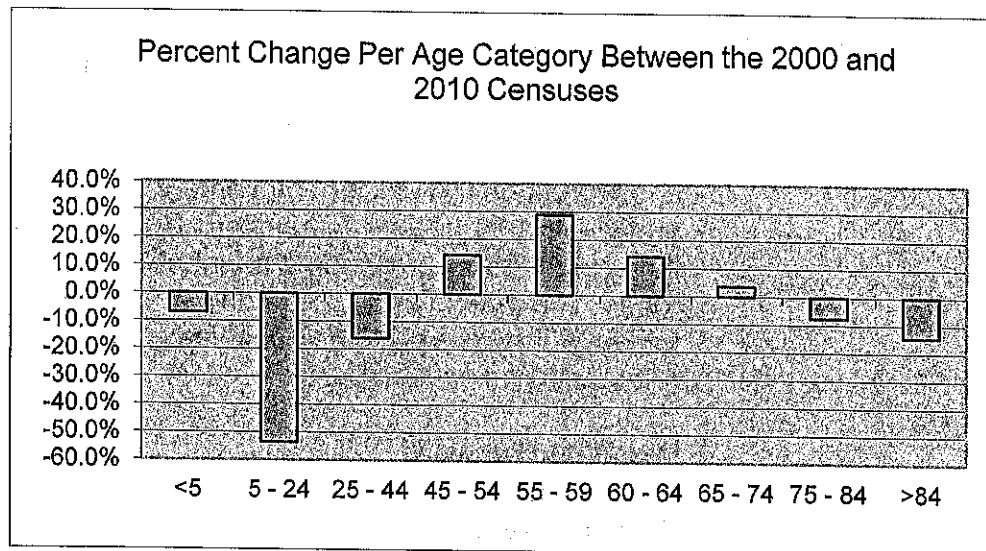
In recent decades, the Ashland County population has declined slightly. In the 2010 U.S. Census, the county was home to 16,157 people and according to the 1 July 2017 U.S. Census Bureau estimate⁴⁶, there were 15,500 people residing in Ashland County for a loss of 4.1%.

According to the 2012-2016 U.S. census estimate, there were 6,670 households in Ashland County with an average of 2.30 people per household. The 2012-2016 U.S. census numbers indicate that the median household income was \$40,297 and that the per capita income is \$22,270. Approximately 14.5% of the people live below the poverty line. The 2017 census estimate also indicated that there were approximately 9,655 housing units within the county as of 1 July.

⁴⁴ <http://wi.tribes.wi.gov/docview.asp?docid=19076&locid=57>

⁴⁵ <http://www.wisconsinhistory.org/dictionary/index.asp>

⁴⁶ <https://www.census.gov/quickfacts/fact/dashboard/ashlandcountywisconsin,US/PST120217>



According to the 2010 U.S. Census, the majority of people in Ashland County reported that they were white (83.7%) with 82.3% stating they were white alone. People of Hispanic or Latino origin were counted as a subcategory of those reporting that they were white. Those reporting as two or more races were 3.6%. The Bad River Chippewa Reservation is located on 124,655 acres of land in Ashland and Iron Counties. American Indians account for 11.6% of the population of Ashland County. Black or African American alone and Asian alone were each 0.5%;

Other miscellaneous demographic information reported by the census bureau is detailed below. These figures identify potential needs for special consideration in a disaster response or in recovery operation planning and implementation:

- People under 5 years old: 5.6%
- People under 18 years old: 22.0%
- People over 65 years old: 19.1%
- Females: 49.7%
- Foreign born: 1.1%
- People with a disability, under 65 years old: 10.9%

Ashland County contains the Cities of Ashland and Mellen, the Village of Butternut, and the Towns of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River. Odanah is located in the Bad River Chippewa Reservation.

Transportation Network

To help for current and future traffic conditions, it is useful to categorize roads based on their primary function. Arterials accommodate the efficient movement of vehicles, while local streets provide the land access function. Collectors serve both local and through traffic by providing a connection between arterials and local roads. The map in Appendix A shows the various roads in the county and how they are classified according to the Wisconsin Department of Transportation (WisDOT):

Interstate Highways

- None

Principal Arterial

- State Highway 13
- US Highway 2

Minor Arterial

- State Highway 77 (East & West)

Major Collector

- Chippewa Trail
- County Highway C, E, F, GG, H (a.k.a. Black Shanty Rd; Big Bay Rd), M and N
- Lakeview Dr
- Old Odanah Rd
- State Highway 112, 118, 137, and 169

Minor Collector

- Agenda Rd
- Bay Rd
- Beaver Lake Rd
- Blemel Rd
- County Highway C (Minersville east to STH 13)
- Creamery Rd
- Forest Rd 163
- Forest Rd 164
- Gordon Lake Rd
- Government Rd
- Hagen Rd
- Kempf Rd
- Lake Dr
- Leonard York Dr
- Maple Ridge Rd
- Mineral Lake Rd
- Park St

- Right of Way Rd
- Sportsman Dr
- Vista Rd

All other public roads in the county that are not classified by the WisDOT are considered to be local roads.

Ashland County has a good transportation network. Ashland County has maintained these roads along with others to provide a safe and efficient transportation system. With continued maintenance, these roads will continue to serve the population effectively.

Airports, aviation, and aviation-related industries play a significant role in the economic success of many Wisconsin communities. Within Ashland County there are 2 airports. John F. Kennedy Memorial in the Town of Gingles is classified as a Transportation/Corporate (TC-C) Airport and on Madeline Island there is an airport classified as a general aviation (GA) airport. The City of Ashland and Ashland County jointly operate the John F. Kennedy Memorial Airport, and Bayfield County contributes some funds to help support its operation. The airport has two paved aircraft. The airport is primarily used for business and recreational uses.⁴⁷

Land Use and Development Trends

Ashland County is a mixed-use community. Ashland County has some natural areas that will not be developed and some rural farming areas. The county was experiencing slow growth on par with other demographically similar Wisconsin counties until the economic "Great Recession" that began in 2008, which halted growth and actually constricted the community activity in some areas. Since then, recovery and growth trends have mirrored the recovery of the general national, state and regional economy.

Current land use is variable and includes residential, commercial, industrial, agricultural, wetlands, woodlands and unused rural/open lands. The following information has been summarized from the Ashland County Comprehensive Plan, 2016. A majority of land space is taken up by woodlands or open space (94%). The next two

⁴⁷ Ashland County Comprehensive Plan, 2006

largest land uses in the County (aside from water) are infrastructure (1.61%), parks and recreation (1.15%), and residential (2.46%). Commercial uses in the County account for a very small portion of uses. The residential areas can be found scattered throughout the County.

Land Use ⁴⁸	2006 (Acres)	2013 (Acres)
Residential	-	16,572
Commercial	-	1,714
Manufacturing	-	454
Agricultural	-	45,815
Infrastructure	10,754	-
Parks and Recreation	7,682	-
Woodlands and Open Space (incl. agriculture)	627,920	-

The Wisconsin Department of Revenue (WDOR) tax assessment data classifies the land use in Ashland County as follows⁴⁹:

- *Agricultural (Includes WDOR categories of Forest, Agricultural Forest and Other)* - Lands devoted primarily to agriculture, small-scale agricultural forestation and lands that are producing, or are capable of producing, commercial forest products (as defined by State of Wisconsin Statute 70.05) and other supporting activities. Also includes lands containing dwelling units and related improvements associated with agricultural use. This category does not include forests or woods that are in parks or that are not being forested under WDOR definitions.
- *Residential* - Lands containing dwelling units and related improvements not associated with agricultural use.
- *Commercial* - Lands, including improvements, devoted primarily to commercial operations, including, but not limited to dining, lodging, and retail sales establishments.
- *Manufacturing* - Lands, including improvements, devoted primarily to manufacturing and industrial operations, including, but not limited to, assembling, processing, and fabricating.
- *Undeveloped* - Lands generally unfit for any of the aforementioned uses, including, but not limited to, parks,

⁴⁸ https://ashland.uwex.edu/files/2016/03/Volume-1_FINAL_2016.pdf, p8-110

⁴⁹ <https://www.revenue.wi.gov/SLFReportsassessor/2017socASHf.pdf>

hunting grounds, wetlands, ponds, gravel pits, and road rights of way.

**Land Uses Changes Based on 2017 WDOM
Ashland County Tax Assessment Data⁵⁰**

Land Use Category	2016 Equalized Value	2017 Equalized Value	Percent Change
Agricultural	\$4,219,300	\$4,311,800	2%
Agricultural Forest	\$10,773,600	\$10,215,300	-5%
Forest	\$141,011,300	\$131,578,100	-7%
Residential	\$817,657,600	\$823,831,900	1%
Commercial	\$170,014,300	\$173,968,700	2%
Manufacturing	\$18,328,700	\$18,540,800	1%
Undeveloped	\$8,157,500	\$8,159,100	0%
Other	\$12,801,400	\$12,482,200	0%
Total	\$1,182,963,700	\$1,183,087,900	4%

The mission of the Ashland County Zoning Department is to: ⁵¹

- Promote and protect the public health, safety, convenience and welfare;
- Further the maintenance of safe and healthful conditions;
- Prevent and control water pollution;
- Protect spawning grounds, fish and aquatic life;
- Control building sites, placement of structures and land uses;
- Prevent overcrowding of any natural resource such as a lake, river or stream;
- Preserve shore cover and natural beauty;
- Promote the better uses of natural resources.

To that end, the following projects were identified by the municipalities for potential future development and/or improvement within the county:

- Town of Ashland:
 - Kornstead Road.
 - North York Road – The hills are a rock ledge and some blasting is needed.

⁵⁰ <https://www.revenue.wi.gov/Pages/EQU/2017-expeqv.aspx>

⁵¹ <https://co.ashland.wi.us/zoning>

- Delfield Road – Silver Creek. This road was washed out year ago and in the last flood it went out again. Currently, Silver Creek is washing out the road along the side of the bridge because every time we get high water, the creek changes its course.
- Town of Gingles: Hegstrom Road – refurbish one mile of roadway from Beaser Rd. to Hwy 112.
- Town of La Pointe: Town Dock Expansion project will involve adding one lane to the town dock along with a passenger waiting area and an additional ferry landing.

Public Safety Support

The Ashland County Communications Center (ACC) is a 9-1-1 Public Safety Answering Point (PSAP) and Dispatch Center for Ashland County. The communications center is staffed with five 9-1-1 dispatcher and one communications center controller.

The departments listed below provide ongoing training to their staff and participate in periodically scheduled disaster exercises with area hospitals, other emergency medical services, law enforcement, fire services and emergency management.

Medical

The Ashland County Office of Emergency Management, city and county emergency services responders, hospital emergency staff and various departments have developed medical and mass casualty plans. These plans will be used in the event of a disaster. Ashland County communities are served by a complete range of health facilities and health professionals. Some communities in Wisconsin have been designated by the U.S. Department of Health and Human Services as a Health Professional Shortage Area (HPSA). Either a geographic area or a specific population can be designated as an HPSA. This designation is used to determine eligibility for at least 34 federal programs, and state programs. According to the Wisconsin Office of Rural Health, portions of Ashland County have been designated as HPSA. About 20 percent of the U.S. population lives in areas designated as a shortage area.

Health care facilities available to County residents include the Ashland Clinic, Grandview Health System Clinic, Marshfield Clinic, Memorial Medical Center, Flambeau Hospital, Chequamegon Clinic,

Main Street Clinic and many other health care providers for specialized treatment. The County Human Services Department is available to serve social and health needs.

Ashland County has one operating hospital that provides care to county residents.⁵² Memorial Medical Center (MMC) is a Critical Access Hospital with 64 full-time physicians on staff and 425 employees. Located in the City of Ashland, MMC serves as a regional medical referral center for patients from seven northwestern Wisconsin counties and the neighboring Gogebic County of Michigan. MMC offers inpatient and outpatient services including medical-surgical, intensive care, obstetrics including Labor, Delivery, Postpartum and Recovery (LDPR) suites, behavioral health services and 24-hour emergency care. In addition, the Bad River Health Clinic in Odanah, on the Bad River Chippewa Reservation, has a part time doctor, a full time nurse practitioner, a pharmacist and several nurses.

Ashland County relies on a mix of volunteer, paid-on-call and paid staff to provide pre-hospital emergency medical services (See Ashland County Ambulance Zones Map in Appendix A for district boundary details.) Details for pre-hospital medical units and their licensing levels are listed below⁵³:

- **Ashland Fire Department** - License Level: Paramedic with Critical Care Endorsement
- **Butternut First Responders** - License Level: Emergency Medical Responder
- **Glidden Area Emergency Medical Service** - License Level: Emergency Medical Responder
- **Madeline Island Ambulance** - License Level: Emergency Medical Technician
- **Mellen Fire & Rescue Department** - License Level: Emergency Medical Technician

Fire Service

Ashland County is served by the following fire departments:⁵⁴

⁵² <https://www.dhs.wisconsin.gov/guide/hospitaldir.pdf>

⁵³ <https://www.dhs.wisconsin.gov/ems/provider/ashland.htm>

⁵⁴ <https://www.firedepartment.net/directory/wisconsin/ashland-county>

- Ashland Fire Department
- Bad River Volunteer Fire Department
- Butternut Volunteer Fire Department
- Four Town Fire Association
- La Pointe Volunteer Fire Department
- Marengo Valley Fire Department
- Mellen Fire & Rescue

Refer to Appendix A for a map of the fire districts in Ashland County.

Law Enforcement

The Sheriff is the chief law enforcement officer in the county and is responsible for the protection of life and property within the boundaries of Ashland County. The Sheriff's Office provides law enforcement service to unincorporated areas of the county or to those jurisdictions that do not maintain full time police service. Ashland County is serviced by a 911 Emergency Response System that is operated by the Sheriff's Department. The Ashland County Sheriff's Department patrols the County. The City of Mellen, Town of La Pointe, Bad River Reservation, and the City of Ashland all have their own police services.⁵⁵ Also, the Wisconsin State Patrol provides limited coverage from their northwest region office in Spooner.⁵⁶ See the Ashland County Law Enforcement District Map in Appendix A for district boundary details.

Special Teams

Hazardous materials (HazMat) response is performed by Type II and Type III Teams in the Northwest Task Force.⁵⁷ Wisconsin Emergency Management contracts and manages twenty-two Regional Hazardous Materials Response Teams. The teams are divided into Task Forces: Northeast Task Force, Northwest Task Force, Southeast Task Force and the Southwest Task Force. These Task Forces are then divided into Type I, Type II and Type III teams, all with complimentary capabilities and training requirements.

⁵⁵ <https://wilenet.org/html/directory/Law%20Enforcement%20Directory%202018-2-15.pdf>

⁵⁶ <http://wisconsindot.gov/Documents/about-wisdot/who-we-are/dsp/dsp-regions-map.pdf>

⁵⁷ http://emergencymanagement.wi.gov/training/docs/Regional_Hazardous_Materials_Resp_Teams_Map.pdf

The Wisconsin Hazardous Materials Response System may be activated for an incident involving a hazardous materials spill, leak, explosion, injury or the potential of immediate threat to life, the environment, or property. The Wisconsin Hazardous Materials Response system responds to the most serious of spills and releases requiring the highest level of skin and respiratory protective gear. This includes all chemical, biological, or radiological emergencies.

Local (County) Hazardous Materials Response Teams respond to chemical incidents which require a lower level of protective gear but still exceed the capabilities of standard fire departments. Forty counties, including Ashland County, currently have Level 4 Hazardous Materials Response Teams. Those teams may provide assistance to surrounding counties and are approved by the Local Emergency Planning Committees.⁵⁸

Archaeological and Historical Resources

The National Register of Historic Places also includes a listing of locations in Ashland County.⁵⁹ As mitigation projects are considered, the county is committed to ensuring that archaeological and historical sites are preserved.

Historic Sites ⁶⁰		
Historic Site Name	Address	Municipality
Apostle Islands Lighthouses	N and E of Bayfield on Michigan	Bayfield
Ashland County Courthouse	201 W. 2 nd Street	Ashland
Ashland Harbor Breakwater Light	2 mi. N of Bay City Ck.	Ashland
Bass Island Brownstone Company Quarry	N of La Point on Basswood Island	La Pointe
Beaser School	612 Beaser Ave	Ashland
Big Bay Sloop (shipwreck)	ASI#025547, Address restricted	La Pointe
Chapple and MacArthur Avenues Residential Historic District	622 Chapple Ave	Ashland
Coole Park Manor	351 Old Fort Rd	La Pointe

⁵⁸ <http://emergencymanagement.wi.gov/epcra/hazmat.asp>

⁵⁹ <https://nationalregisterofhistoricplaces.com/wi/ashland/state.html>

⁶⁰ <https://npgallery.nps.gov/NRHP/SearchResults/>

Historic Sites ⁶⁰		
Historic Site Name	Address	Municipality
Copper Falls State Park	WI 169, 1.8 mi NE of Mellen	Morse
Ellis School	310 Stuntz Ave	Ashland
Glidden State Bank	216 First Street	Jacobs
Hadland Fishing Camp	N of La Pointe on Rocky Island	La Pointe
La Pointe Indian Cemetery	S Old Main Street	La Pointe
La Pointe Light Station	Long Island in Chequamagon Bay	Bayfield
Lucerne (shipwreck)	Address restricted	La Pointe
Manitou Camp	Manitou Island, Apostle Islands National Lakeshore	La Pointe
Marina Site	Address restricted	La Pointe
Marion Park Pavilion	Marion Park	Glidden
Marquette (shipwreck)	5 mi E of Michigan Island, Lake Superior	La Pointe
Mellen City Hall	Bennett and Main Streets	Ashland
Memorial Hall	1511 Ellis Ave	Ashland
Moonlight (shipwreck)	Address restricted	La Pointe
Morty Site (47AS40)	Address restricted	Bayfield
Noquebay (schooner-barge) Shipwreck Site	Address restricted	La Pointe
Old Ashland Post Office	601 West Second St	Ashland
P-Flat Site (47AS47)	Address restricted	Bayfield
Pretoria (schooner-barge) Shipwreck Site	Address restricted	Bayfield
R.G. Stewart (shipwreck)	Address restricted	La Pointe
Rocky Island historic District	Apostle Islands National Lakeshore	La Pointe
Security Savings Bank	212-214 W 2 nd Street	Ashland
Soo Line Depot	Third Ave W at Fourth St	Ashland
T.H. Camp (shipwreck)	Address restricted	La Pointe
Trout Point Logging Camp	Address restricted	Bayfield

Historic Sites ⁶⁰		
Historic Site Name	Address	Municipality
Union Depot	417 Chappie Ave	Ashland
Wakefield Hall	1409 Ellis Ave	Ashland
West Second Street Historic District	W 2 nd St from Ellis Ave to 6 th Ave	Ashland
Wheeler Hall, Northland College	1411 Ellis Ave	Ashland
Wilmarth School	913 3 rd Ave W	Ashland
Wilmarth, Lewis C. and Caroline, House	622 Chappie Ave	Ashland
Winston-Cadotte Site	Address restricted	La Pointe

The Wisconsin Historical Society maintains a list of archaeological sites and cemeteries known as the Archaeological Site Inventory Database (ASI); this list is available to governmental agencies upon request. These sites cover an extended period of time, and include campsites/villages/communities, cabins/homesteads, sugar mapling sites, cemetery/burial/ mounds, trading/fur posts, mill/sawmills and kilns.

All of these sites have been reported to the State Historical Society of Wisconsin and are protected sites. If there is concern that a mitigation project will impact one of these or any other identified or suspected archeological site, the county will work with the proper authorities to ensure that all applicable laws and regulations are followed.

Hazard Analysis and Previous Mitigation Projects

The following sections identify those hazards that have occurred or could occur in Ashland County. Each includes a description of a hazard and its frequency of occurrence. Also included is a section that describes the general vulnerabilities of the community and its infrastructure to each particular type of hazard. More detailed and specific analyses will be conducted as projects are identified for inclusion in grant applications. As part of the application process, the methodology of data collection and future development patterns will be addressed. Estimates of potential dollar losses and the methodology used to arrive at those estimates will also be described during this application process.

Wisconsin Emergency Management (WEM) completed and regularly updates the State Hazard Mitigation Plan, which was last revised in October, 2016. This plan describes the hazards that have occurred or are most likely to occur within the state and includes the frequency of occurrence, potential impacts and suggested actions to mitigate the hazard. This plan is the basis for the development of all emergency management plans and is distributed upon revision to county emergency government directors and other stakeholder agencies.

The Ashland County Emergency Management Director develops and annually updates a listing of all hazards that have occurred or could occur within the county. This listing includes the definition, frequency of occurrence and actions to mitigate the hazard. In general, the threat of most hazards is consistent throughout the county. The hazards where there are differences identified within the county are flooding (including dam failure), wildfire, coastal erosion and landslide.

For this plan the Ashland County Hazard Mitigation Plan Workgroup reviewed the past events records and an internal workgroup consensus was reached on the anticipated probability of future events. This probability was designated as "very high," "high," "medium," "low" or "very low" by the workgroup based on their evaluation and experience with the data.

Hazard	Likelihood of Occurrence	Severity of Effects if It Does Happen	Misc. Notes
Coastal Erosion	5	5	In 2017, wave action destroyed 20-30' of coast, impacting housing, tourism, business, and transportation. This impacted the City of Ashland, Madeline Island/Town of LaPointe, and the Town of Sanborn
Drought	3	4 – agriculture 2 – general population	
Earthquake	1	1	
Floods:			
• Flash Flood	5	5	
• River Flood	5	5	
• Dam Failure	2	2	
Wildland Fire	4	6	Clam Lake Community Wildfire Protection Plan was created for portions of Ashland and Bayfield Counties ⁶¹
Landslide	5	5	5
Severe Temperature:			
• Heat	3	2	
• Cold	3	2	
Hail	3	3	
Lightning	2	2	
Thunderstorm	2	2	
Tornado/High Wind	4	5	
Winter (Snow & Ice)	4	3	

⁶¹ <http://www.nwrpc.com/DocumentCenter/View/666>

Hazard	Likelihood of Occurrence*	Severity of Effects if It Does Happen*	Misc. Notes
Utility Failure			
• Electrical	2	4	
• CI	4	5	
Ashland Water			
• CI	5	5	
Ashland Sewer			
• Xcel	2	4	
Natural Gas			
• Glidden Sanitary	4	5	
• TN	2	4	
LaPointe Sewer			
• CI Mellen Water	2	4	
• CI Mellen Sewer	2	4	
• VI	2	4	
Butternut Water			
• VI	2	4	
Butternut Sewer			

The emphasis in the following sections is on mitigation activities for each hazard as a major component of overall emergency management. Mitigation or prevention activities reduce the degree of long-term risk to human life and property from natural and man-made hazards. The cooperation of government, academia, the private sector and volunteer agencies is essential in mitigation efforts. Ashland County Emergency Management is committed to working with municipalities and the private sector to ensure that county mitigation information is shared and it is incorporated into their planning as appropriate.

Each community will be given a copy of the plan to use as a reference during their own preparedness activities (i.e., planning, training, permitting, zoning). Communities that have their own comprehensive plan will reference this mitigation plan and its contents in the next

scheduled plan update. Municipalities that do not have comprehensive plans either are under the purview of and request assistance from the Ashland County Zoning or have their own planning departments. Members of the County Zoning Department and municipal planning departments were included on the Hazard Mitigation Workgroup and are aware of the benefits and requirements to utilizing this plan as they go about their preparedness activities.

Ashland County and its municipalities have an interest in identifying, planning and completing hazard mitigation projects including these (listed below), which received supplemental funding. It was also noted by the workgroup that there are several opportunities for grant funding from various federal and state resources including:

Community Development Block Grant (CDBG) - The U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant-Disaster Recovery Assistance provides flexible grants to help cities, counties and states recover from Presidentially-declared disasters, especially in low-income areas, subject to availability of supplemental appropriations. In response to disasters, Congress may appropriate additional funding for the CDBG program as disaster recovery grants to rebuild the affected areas and provide crucial seed money to start the recovery process. Since CDBG Disaster Recovery assistance may fund a broad range of recovery activities, HUD can help communities and neighborhoods that otherwise might not recover due to limited resources. Disaster Recovery grants often supplement the disaster programs of FEMA, the SBA and the U.S. Army Corps of Engineers (i.e., these funds can be used for the local matching requirement of other federal grants).⁶²

CDBG Emergency Assistance Program (EAP) Projects:

- EAP #89195.05 CI of Ashland \$500,000 - Rehabilitation of damaged housing units, replacement of wells and septic systems, demolition and clearance of hazardous structures, construction of replacement housing units or acquisition/relocation
- EAP #16-01 Ashland County, in conjunction with Bayfield, Burnett, Douglas, Iron, Price, Sawyer, Washburn Counties, \$2,350,000. Rehab housing units; repair public facilities, business assistance

⁶²http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/drsi

It was noted by the workgroup that there are several opportunities for grant funding from various federal and state resources including:

- **HMGP** - The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under the Presidential major disaster declaration is available in all areas of the state following a Presidential disaster declaration.⁶³

Hazard Mitigation Grant Program (HMGP) Projects Funded in Ashland County

- FEMA-4288-WI-DR and FEMA-4383-WI-DR, 2018, Ongoing, amount to be determined
- **PDM** - The Pre-Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, Territories, Indian Tribal governments, and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future major disaster declarations.⁶⁴

Pre-Disaster Mitigation (PDM) Projects and/or Plans Funded in Ashland County⁶⁵

- 2010C CI of Ashland \$51,020 - New In planning process
- **FMA** - The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). The Repetitive Flood Claims (RFC) program has the goal of reducing flood damages to individual properties for which one or more

⁶³ <http://www.fema.gov/hazard-mitigation-grant-program>

⁶⁴ <http://www.fema.gov/pre-disaster-mitigation-grant-program>

⁶⁵ Note that several grants to the State of Wisconsin/WEM are listed when searching for Ashland County projects. These state projects are deemed as benefiting the state's counties but are not listed in this plan because they were not directly received by the county.

claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund (NFIF) in the shortest period of time.⁶⁶

- **406 Mitigation** – The Public Assistance-Section 406 Mitigation Funding may be considered by FEMA in a federal disaster declaration to fund mitigation measures to a public facility damaged by the event that enhance the facility's ability to resist similar damage in future events. This funding is authorized under Section 406 of The Robert T. Stafford Disaster Relief and Emergency Assistance Act and provides discretionary authority to fund mitigation measures in conjunction with the repair of the disaster-damaged facilities, which usually present themselves during the repair efforts. The mitigation measures must be related to eligible disaster-related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. This work is performed on the parts of the facility that were actually damaged by the disaster and the mitigation provides protection from subsequent events. Mitigation measures must be determined to be cost-effective, technically feasible, and in compliance with statutory, regulatory and executive order requirements. In addition, the measure cannot cause a negative impact to the facility's operation, surrounding areas, or susceptibility to damage from another hazard.⁶⁷ Ashland County has not received any 406 Mitigation grants.
- **Municipal Flood Control Grant Program** - This Wisconsin Department of Natural Resources (DNR) grant is available to all cities, villages, towns, tribes and metropolitan sewerage districts. Assistance is provided with items such as the acquisition of property, vacant land, structure removal, flood proofing, administrative support and others.⁶⁸ Ashland County has not received any grants from the Municipal Flood Control Grant Program.
- **Dam Removal Grant Program** - This Wisconsin DNR grant is available to all cities, villages, towns, tribes and metropolitan sewerage districts and provides 100% of eligible project costs up to a maximum of \$50,000 to remove a dam. Assistance is provided with items such as: the acquisition of property, vacant

⁶⁶ <http://www.fema.gov/flood-mitigation-assistance-program>

⁶⁷ <http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0>

⁶⁸ <http://dnr.wi.gov/Aid/MunFloodControl.html>

Hazard Analysis and Previous Mitigation Projects

land, structure removal, flood-proofing, administrative support and others.⁶⁹ Ashland County has not received any dam removal grants.

⁶⁹ <http://dnr.wi.gov/aid/damremoval.html>

All Hazards

One of the bedrock principles of emergency management is to approach issues from an all-hazards perspective. This is generally very cost effective because it accomplishes preparedness and/or mitigation goals for many types of disasters with one resource. Some of the all hazards mitigation projects that Ashland County would like to accomplish are detailed in the following sections.

The planning committee also used the all hazards approach to identify mitigation goals for the county and all of its municipalities. The purpose hazard mitigation plan is to identify hazard areas, to assess the risks, to analyze the potential for mitigation and to recommend mitigation strategies where appropriate. Potential mitigation projects will be reviewed using criteria that stress the intrinsic value of the increased safety for people and property in relation to the monetary costs to achieve this (i.e., a cost-benefit analysis). With that in mind, the planning goals for this entire plan, as determined by the mitigation planning committee were:

- **Objective 1:** To preserve life and minimize the potential for injuries or death.
- **Objective 2:** To preserve and enhance the quality of life throughout Ashland County by identifying potential property damage risks and recommending appropriate mitigation strategies to minimize potential property damage.
- **Objective 3:** To promote countywide planning that avoids transferring the risk from one community to an adjacent community, where appropriate.
- **Objective 4:** To identify potential funding sources for mitigation projects and form the basis for FEMA project grant applications.

Vulnerability

Perhaps the largest risk that falls under the all-hazards banner is the continuing challenge of securing funding to keep up with the rapid technological changes and advances in the public safety communications infrastructure. When departments cannot communicate with each other, they cannot be effectively coordinated in a disaster which could cause potential delays in providing critical services to citizens in need.

Another vulnerability is the fact that not all agencies that work together in disaster response and recovery can communicate with one another (i.e., are interoperable). Local first response agencies are generally able to communicate with one another but communications-related issues will remain ongoing challenges as technologies evolve and departments acquire equipment suitable for their response.

Also, it is a continuing challenge to ensure that emergency services can notify the public in a timely manner. Because of the nature of modern society, adequate notification requires multiple outlets but managing the usage, cost and updates of these systems is an ongoing project for all communities.

Hazard Mitigation Strategies

In general, most of the projects that can be done with current budgetary dollars are not capital improvement projects and are not very expensive. Projects that require significant capital outlays are, for the most part, grant-dependent. Since the profile (e.g., economic, geographic) of an area may change between the identification of a project in this plan and the availability of grant funds, projects will be identified within the plan and be slated for detailed study and analysis at such time as grants become available. The detailed study will identify the types and numbers of existing and future structures, the potential dollar losses to vulnerable structures and the lead agency or department who will manage the project. At that point, grant-eligible projects will be evaluated using the appropriate grant criteria for factors such as:

- Overall benefit to the community
- Economic feasibility (i.e., a cost-benefit analysis)
- Compliance with environmental, social justice and other laws

Most of the hazard mitigation strategies listed below are not "bricks and mortar" changes. Rather, they are enhancements to computer and radio equipment and plans that allow better communication with the public in times of crisis and therefore do not reduce effects for existing or future buildings and infrastructure.

Public Alert and Notification

Public alert and notification plans are vital in a time of crisis to reduce property damage and human casualties. An advance plan allows the appropriate authorities to perform their emergency duties in an efficient manner. Ashland County will maintain the following:

- Facilities, systems and procedures to activate warning and communication capabilities. Ashland County Emergency Management and Sheriff's Office will explore an emergency notification system to alert residents to potential emergency situations.
- Systems to support communications, including:
 - Sirens to warn the public. All sirens are municipally-owned; the county dispatch center can test/tone some of them but some can only be activated by the municipality. The City of Ashland would like to install three (3) additional sirens, the City of Mellen would like one (1) siren, and the Sanitary District/Towns of Jacobs and Glidden would like one (1) additional siren.
 - Telephone and radio to notify public personnel.
 - Local television, radio and newspaper connections to spread warning information.
 - The City of Ashland Information Technology Department will establish and equip a public access television station to be available in emergencies and establish a 3-1-1 System. Ashland County Police Department will install message boards for traffic control.
 - Local law enforcement, fire and rescue communications.
 - An emergency communications center.
 - Ashland County and the City of Ashland Parks and Recreation Department, Police and Fire Departments will host community education classes and additional forms of outreach on Family Disaster Planning, Supply Kits, weather education and Community Emergency Response.

During an emergency, the general public receives information by sirens, NOAA weather radio, local broadcast or printed media and if needed by door-to-door notification by emergency services personnel and a mobile public address system. It should be noted that the ability to use the NOAA weather radio system for an expanded list of emergency messages is a positive move that makes this alert and warning tool even more valuable. As a result, Ashland County Emergency Management, along with its municipal partners, will continue to promote increased use of these radios among the public, especially rural residents, by sponsoring public information campaigns that point citizens to vendors. The county emergency management office will also support similar campaigns sponsored by the National Weather Service.

Ashland County should be capable of the following:

- Disseminate emergency warning and notification to the public through its county-wide warning systems,
- Support emergency management operations.
- Provide adequate warning and communication systems, and
- Plan for alternative means and resources in the event of a warning or communication system breakdown.

Ashland County will prepare facilities, systems and procedures to activate warning and communication. During an emergency, Ashland County will deliver prompt and accurate warnings to businesses and residents.

Interoperable Communications

The county budget to maintain communications systems has thus far been sufficient and it as technology improves and additional interoperability grant funding is made available, Ashland County Emergency Management, the dispatch center and the county's municipalities will monitor and improve the system as able (e.g., technology costs are reduced over time). Overall, two-way radio system coverage is fair with good coverage in the north and poor coverage in the south (with some dead spots). Potential projects include:

- Ashland County would like to improve the communications systems to include:

- Fire/EMS and Law Enforcement communicate on two parallel systems, which can introduce barriers to open communication.
- Explore text notification of emergency responders in conjunction with the Ashland County Sheriff's Office.
- Additional towers (2-3) are needed to improve communications.
- Ashland County Sheriff's Office will continue to improve coverage and interoperability for first responder communication systems.
- Ashland County Sheriff's Office will start working on the next generation of 911 Center capabilities in this planning period.
- Ashland County Highway Department and Sheriff's Office will upgrade the North Tower to a WISCOM-compliant building with a back-up generator. Equipment to patch the Ashland County VHF system to WISCOM may also be required. It should be noted that WISCOM is monitored in dispatch but the county is not wholly adopting it.
- Ashland County Highway Department will establish a "511-type" system for Ashland County travelers to send in information on roads, etc.

Website

Geographic information system (GIS) mapping data is available from the Ashland County website.⁷⁰ Base data is accessible to county departments and citizens via this site. The City of Ashland DPW maintains its own GIS mapping parcel database and discussions will begin with the newly-hired County GIS Coordinator (July, 2018) to discuss consolidation so that there is only one parcel base maintained.

The County Emergency Management Office has a general webpage to post links to disaster-specific information from FEMA, to volunteer, etc. In recognition of the importance of this communication tool,

⁷⁰ <http://www.co.ashland.wi.us/>

especially in pre-planning activities, county offices will review their web pages to ensure that important information and links for general preparedness topics are available from agencies such as the Department of Homeland Security/FEMA, the American Red Cross and Wisconsin Emergency Management. The county will also look for ways to publicize the website so that community members will know what valuable information is there. Ashland County Emergency Management will update websites, review existing links and add mitigation links to their websites.

Community Preparedness

Ashland County will continue to build and improve their comprehensive preparedness program which plans, trains, exercises, and equips emergency response agencies. They will work with the municipalities to complete the following preparedness programs that will also support mitigation goals:

- Ashland County Emergency Management with the Sheriff's Office want to build and equip county emergency facilities (e.g., Emergency Operations Center/EOC, Alternate Communications Center, Mobile Command Post/MCP, Alternate EOC, Emergency Shelters) of adequate size and capabilities.
- Host community education classes and other forms of outreach on Family Disaster Planning, Supply Kits, weather education and Community Emergency Response with Bad River Emergency Management Office and municipal police and fire departments.
- Train Emergency Response personnel and Emergency Response Teams in NIMS. Organizing and bringing NIMS compliance up to date in conjunction with municipal emergency response departments.
- The Ashland County Highway Department will:
 - Develop and distribute seasonal transportation specific safety information
 - Develop strategic storage areas for storage of disabled vehicles/ personnel for hazardous situations.

- Purchase Spill Response Kits in 55 gallon barrels (one kit in each satellite Highway Shop).
- Work with Ashland County Emergency Management to formalize inter-governmental agreements between the Highway Department and the municipalities.
- City of Ashland
 - Create and Adopt an Emergency Operations Plan (EOP) for the City of Ashland.
 - Develop a Continuity of Operations/Continuity of Government (COOP/COG) plan to allow for the continuity of municipal operations that will ensure the essential functions of an organization can operate during and after an emergency incident. Plan to include methods to maintain normal operating systems (i.e., data, communications, transportation) and ensure that the city continues to have access to multiple modes of transportation (rail, marine, highway, air...) in an emergency situation.
 - Adopt a Post Disaster Recovery Ordinance.
 - Coordinate with County Emergency Manager, city and county emergency personnel, and representatives from nursing homes, schools, and hospitals to assess storm safety procedures/emergency care procedures.
 - Provide airport with portable hangers for equipment and storage, fuel storage and refueling capabilities; ensure security and properly maintained runways to include installing methods to deter birds and wildlife at the airport.
 - Construct an Emergency Operations Center (EOC) for the Police and Fire Departments.
 - Develop an evacuation plan, including emergency shelters and evacuation routes for Ashland residents and maintain a public transportation system to move people around during emergency or evacuate areas in a disaster with assistance from the police and fire departments.

- Host community education classes or other forms of outreach on Family Disaster Planning, Supply Kits, weather education and Community Emergency Response with the police and fire departments.
- Ashland Public Works Department will:
 - Ensure that GIS mapping is available to emergency operations personnel and is routinely updated, including for problematic areas
 - Increase municipal fuel storage capacity for emergency operations
 - Improve roadways that currently do not allow safe access for emergency vehicles
 - Plan, design and construct an east-side loop in Ashland
 - Perform a study to develop an emergency source of supply of potable water and develop an emergency source of potable water.
- The Department of Planning & Development will:
 - Continue enforcement of the city's ordinances to guide development away from hazardous areas
 - Update the comprehensive plan to account for hazard mitigation.
- The Information Technology Department will:
 - Obtain computer systems and software to assist with emergency planning.
 - Establish (\$10,000) and equip (\$30,000/annually) a public access television studio to be available in emergencies.
- Village of Butternut
 - Coordinate with County Emergency Manager, village and county emergency personnel, and representatives

from nursing homes, schools, and hospitals to assess storm safety procedures/emergency care procedures.

- Develop an evacuation plan, including emergency shelters and evacuation routes for Village of Butternut residents with the village fire department.

- Town of Jacobs

- Perform a study to develop an emergency source of supply of potable water.

Coastal Erosion/Landslides

Characteristics

Coastal erosion is defined as the wearing-away of land and the loss of beach, shoreline, or dune material over a period of time as a result of natural coastal processes or human influences. Characteristics such as supply of sand and processes such as lake level change, currents, tides, waves, and wind are natural factors that contribute to the rate of erosion. Human-caused contributors to erosion include dredging tidal entrances, jetty and groin construction, hardening shorelines with seawall, revetments, beach nourishment, construction of harbors and sediment-trapping dams in the river tributaries. Coastal erosion affects Wisconsin along the shoreline of Lakes Michigan and Superior. Along the Great Lakes, cyclical changes in lake levels, disruption of long shore transport of beach building material, and storms all influence the rate of erosion. According to the National Research Council, a congressionally chartered, non-profit organization that provides science and technology advice, annual variability in wave climate and lake levels causes the rates of bluff and dune erosion along the shores of the Great Lakes to vary from near zero to tens of feet per year.

Coastal erosion is usually a gradual process, and sudden incidents prompting emergency action are rare. Such rare events include strong storms with high winds or heavy wave action that can cause sudden failure of bluffs.

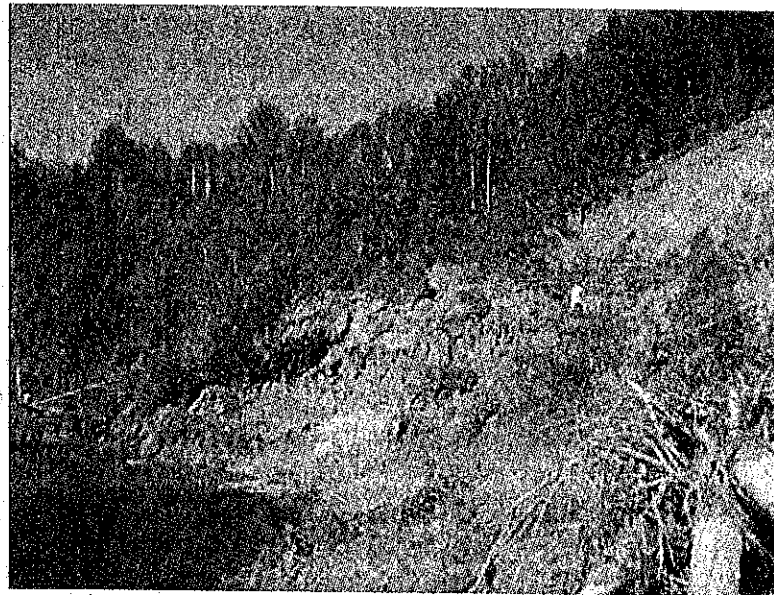
All 15 coastal counties in Wisconsin experience erosion, flooding, and damage to shoreline structures. Coastal erosion is a naturally occurring process that can accelerate during times of high water or wave action. For example, bluff erosion is more likely to occur during major storm events due to wave action upon the shoreline. The effects of wave-induced erosion are usually greater during those periods when the level of water is high. Coastal property owners are acutely aware of hazards during periods of high-water levels and especially right after a damaging storm or a bluff failure, but this awareness can fade over time if low lake levels slow the erosion rate. Lake levels were above long-term averages from 1996 to 1998. The last period of significantly higher lake levels was in 1985 to 1986, resulting in \$16 million of documented damage to public facilities alone.⁷¹ The map in Appendix A illustrates the erosion risk

⁷¹ WCMP, 1992

in the 15 coastal counties. Record snowfall in northern Wisconsin in 1996 was followed by near record high-water levels in 1997. However, unusually mild weather and light snowfall in the winters of 1998-1999 and 1999-2000 began to drop the lake levels once again to below long-term averages. These trends continued throughout the 2000-2007 period where record low Lake Superior water levels were set for the months of August and September in 2007.

During the 2008 year, the entire Great Lakes basin received above average precipitation. As a result, both Lake Superior and Lake Michigan water levels have risen from record or near record low levels to levels within 0.5 to 1.0 feet from their long term averages.

Many areas of the Wisconsin Great Lakes coast are vulnerable to bluff erosion. On the Lake Superior shore, bluff erosion is more localized. Vulnerability is highest along the high clay bluffs running from Bark Point in Bayfield County to Wisconsin Point in Douglas County, and from Iron County to the White River in Ashland County.⁷²



Coastal erosion with landslide on the Bad River Indian Reservation

All 15 coastal counties in Wisconsin experience some coastal flooding. Water levels in the Great Lakes fluctuate on both a seasonal and long-term basis. Seasonally, the lakes are at their lowest levels during the winter when much of the precipitation is held on land as snow and ice and the open lake evaporation dominates. The highest seasonal levels are during the summer when snowmelt from the spring thaw and summer rains contributes to the water

⁷² Springman and Born, 1979

supply. Long-term variation of lake levels depends on precipitation and evaporation trends in the Great Lakes watershed. Lake levels rise when net water supply exceeds outflow and above average lake levels can persist for extended periods even after the conditions that caused them have ended.⁷³

The water volume of the Great Lakes is large and outflow from natural outlets is limited. Flow regulation structures exist in Lakes Ontario, Michigan and Superior, but their influence is limited by their size. Controlled releases strive to simulate long-term averages in an effort to serve multiple interests. The source of about 40% of Lake Superior's annual water supply is from the snowpack around its shores. Lakes Michigan and Huron get up to 30% of their yearly supply from Superior's snowmelt when it flows into the lower lakes.⁷⁴

Frequency of Occurrence

All of Wisconsin's coastal counties experience coastal erosion. The coastal erosion county-level analysis risk assessment provides additional information on the risk of coastal erosion. The high qualitative ranking for coastal erosion is a function of rainfall and local conditions.

Fifteen counties border the Great Lakes in Wisconsin. Coastal counties account for 19% of the area of the State. The Great Lakes coast in Wisconsin can be divided into three sections based on population density characteristics. The southern four counties (Kenosha, Racine, Milwaukee, and Ozaukee Counties) have the greatest population density with 1,218 people per square mile. Much of the southeast Wisconsin coast is part of the urban corridor that stretches between Milwaukee and Chicago. The southern counties include the coastal cities of Milwaukee, Racine, Kenosha, Cudahy, Oak Creek, Mequon, St. Francis, and Port Washington. The northern section of the Lake Michigan coast contains seven counties (Sheboygan, Manitowoc, Kewaunee, Door, Brown, Oconto, and Marinette) and has a moderate population density of 101 people per square mile. This section includes the coastal cities of Green Bay, Sheboygan, Manitowoc, Marinette, Two Rivers, Sturgeon Bay, Oconto, Algoma, and Kewaunee. Much of the shoreline fronts Green Bay. Door County possesses the most extensive Great Lakes

⁷³ State of Wisconsin Hazard Mitigation Plan, 2008

⁷⁴ Detroit Free Press, March 18, 2000

shoreline in Wisconsin at 240 miles. The northwestern section borders on Lake Superior and includes the counties of Douglas, Bayfield, Ashland and Iron. This section has a low population density of approximately 14 people per square mile.⁷⁵

Vulnerability

Existing maps depicting rates of coastal erosion and the FEMA HAZUS-MH inventory of structures in the coastal zone provided the basis for estimating the potential vulnerability and losses from this hazard. The number and types of structures subjected to high and low risk of erosion were determined from these data. The erosion risk zones were established based on the distance in miles from the Coastal Area Boundary.

The high erosion risk zone is defined as the area within 1/4 mile of the Coastal Area Boundary; the low erosion risk is 1/2 mile from the boundary. In Ashland County, there are 937 residential structures, 32 commercial structures, and 5 government structures within the high erosion risk zone. There are 1,873 residential structures, 34 commercial structures and 5 government structures in the low erosion risk zone.⁷⁶

Hazard Mitigation Strategies

The goal of coastal erosion mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to coastal erosion. Increased population growth and development can also increase the risk and vulnerability as property values increase and areas that may once have been undeveloped are now developed. Because coastal erosion is more site-specific, the effect of increased development and population growth is more easily measured in terms of risk and vulnerability. Careful and strict enforcement of shore land and floodplain ordinances will be the key to preventing loss in these areas.

⁷⁵ State of Wisconsin Hazard Mitigation Plan, 2008

⁷⁶ State of Wisconsin Hazard Mitigation Plan, 2008



Coastal erosion with landslide in Ashland County.

Selected hazard mitigation strategies include:

Ashland County:

- Ashland County will continue to support the municipalities with coastal erosion mitigation measures as requested.
- Evaluate options for updating zoning ordinances on coastal and inland waterways, focusing on 92F and transitional soils. Educate the community on this concern.

City of Ashland:

- Develop a grading ordinance that specifies grades for new construction.
- Create a dredge spoil basin to permit harbor dredging to occur.

Town of LaPointe (Madeline Island):

- Add rip rap (rock) to Madeline Island to protect roads/stabilize shorelines from coastal erosion from high water, high wind, and wave inundation.

Drought and Dust Storms

Two types of drought occur in Wisconsin: agricultural and hydrologic. Agricultural drought is a dry period that reduces crop yields. Hydrologic drought is a dry period of sufficient length and intensity to affect lake and stream levels and the height of the groundwater table. These two types of drought may, but do not necessarily, occur together.



Agricultural drought in a Wisconsin corn field in 2012.

Dust storms result from a combination of high winds and dry, loose soil conditions. While high winds and periods of drought have each occurred in Ashland County, there has never been a recorded dust storm event. Since natural hazards that have occurred in the past are more likely to occur in the future, it is unlikely that a dust storm event will occur in Ashland County. This assertion is further bolstered by the fact that there is very little irrigation done within the county and that the soils in Ashland County are not prone to blowing. While there are concerns about topsoil erosion and some mitigation activities may be planned that would reduce the effects of these types of events, they will not be a major focus of this plan.

Physical Characteristics

The understanding that a deficit of precipitation has different impacts on groundwater, reservoir storage, soil moisture, snowpack and streamflow led to the development of the Standardized Precipitation Index (SPI) in 1993. The SPI quantifies the precipitation deficit for multiple time scales. These time scales reflect the impact of drought on the availability of the different water resources. Soil moisture conditions respond to precipitation anomalies on a relatively short

scale. Groundwater, streamflow, and reservoir storage reflect longer-term precipitation anomalies. For these reasons, the SPI is calculated for 3-, 6-, 12-, 24- and 48-month time scales.

The SPI calculation for any location is based on the long-term precipitation record for a desired period. This long-term record is fitted to a probability distribution, which is then transformed into a normal distribution so that the mean SPI for the location and desired period is zero. Positive SPI values indicate greater than median precipitation and negative values indicate less than median precipitation. Because the SPI is normalized, wetter and drier climates can be represented in the same way and wet periods can also be monitored using the SPI.

The classification system shown in the SPI values table (below) defines drought intensities resulting from the SPI. The criteria for a drought event are also defined for any of the time scales. A drought event occurs any time the SPI is continuously negative and reaches an intensity of -1.0 or less. The event ends when the SPI becomes positive. Each drought event, therefore, has a duration defined by its beginning and end and an intensity for each month that the event continues. The positive sum of the SPI for all the months within a drought event can be termed the drought's "magnitude."⁷⁷

2.0+	Extremely wet
1.5 to 1.99	Very wet
1.0 to 1.49	Moderately wet
-0.99 to 0.99	Near normal
-1.0 to 1.49	Moderately dry
-1.5 to -1.99	Severely dry
-2.0 and less	Extremely dry

The Palmer Index is an older scale and is used more often by governmental organizations. It is effective in determining long-term drought (i.e. over several months) and is not as good with short-term forecasts (i.e., weeks.) It uses a zero as normal; drought is shown in terms of negative numbers and excess moisture is reflected by positive figures. The future incidence of drought is highly unpredictable and may also be localized, making it difficult to determine probability with any accuracy.

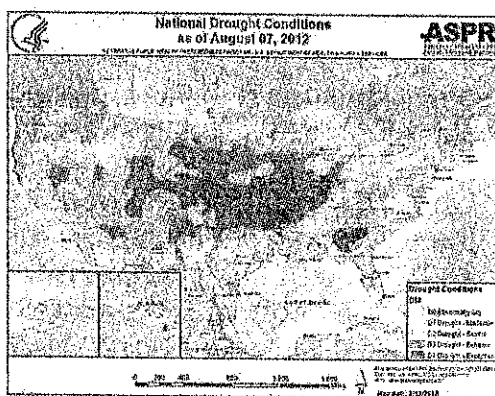
⁷⁷ <http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/spi.html>

Drought conditions may vary from below-normal precipitation for a few weeks to a severe lack of normal precipitation for several months. Drought primarily affects agricultural areas because the amount and timing of rainfall has a significant impact on crop production. The severity of a drought cannot therefore be completely measured in terms of precipitation alone but must include crop yields.

Frequency of Occurrence

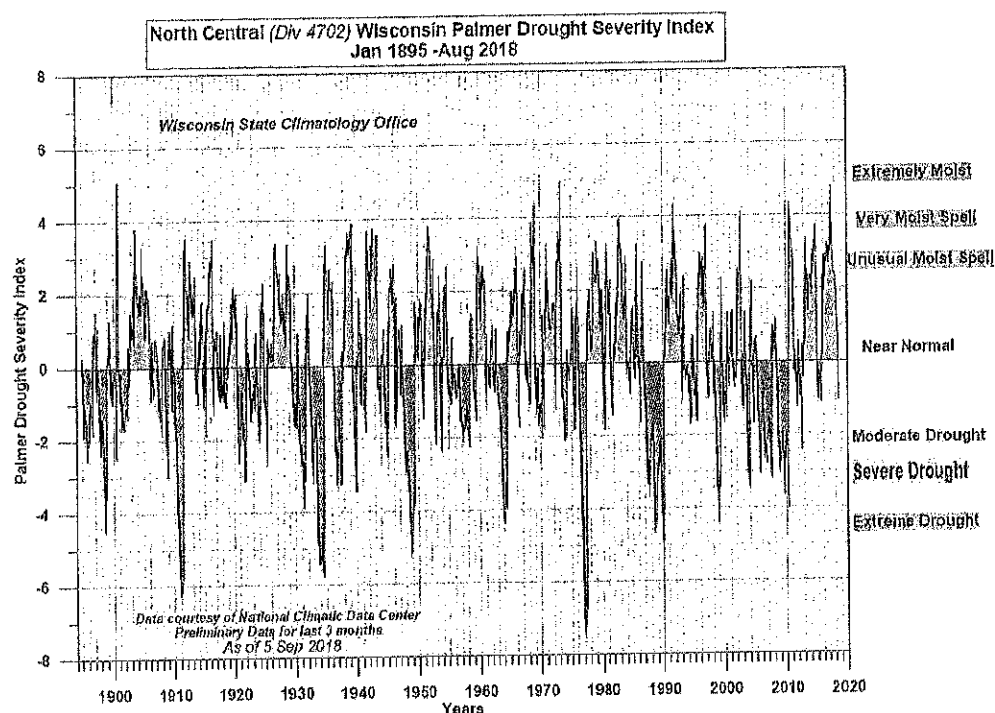
Drought is a relatively common phenomenon in Wisconsin and has occurred statewide in 1895, 1910, 1939, 1948, 1958, 1976, 1988, 1992, 2003 and 2005. The 1976 drought received a Presidential Emergency Declaration with damage to 64 Wisconsin counties, including Ashland. Estimated losses of \$624 million primarily affected the agricultural sector.

The 2012 heat wave resulted in significant droughts across more than half the country as well as increases in heat related illnesses and deaths. July, 2012 was the hottest month in US history, eclipsing the record set during the heart of the Dust Bowl in 1936. The worst of the heat was in the Midwest, the Plains and along the Eastern Seaboard. Most of the contiguous US had record and near-record warmth for the seven-month period, except the Pacific Northwest, which was near average. The August 7, 2012 Drought Monitor map shows 52.27% of the United States and Puerto Rico in moderate drought or worse. The southern half of the state of Wisconsin ranged from D0 (Abnormally Dry) to D3 (Extreme Drought) with Ashland County not exhibiting significant drought conditions.⁷⁸



⁷⁸ 2012 Heat & Drought Federal Report, HHS ESF 8, UPDATE #2, U.S. Department of Health and Human Services, Assistant Secretary for Preparedness and Response

The Palmer Index chart for the years between January 1895 and August 2018 in North Central Wisconsin, which includes Ashland County follows.⁷⁹



As can be seen from the frequency table above, Ashland County regularly experiences drought to at least a moderate level two to three times every ten years. While drought is a regular occurrence, it is generally very difficult to predict with any accuracy but according to the Wisconsin Hazard Mitigation Plan, "the NWS and National Integrated Drought Information System (NIDIS) are improving methodology to accurately forecast drought conditions. Both organizations use a combination of current and historical precipitation, streamflow, ground water, and crop data to perform short-term and long-term forecasts."⁸⁰

On July 15, 2005, the Governor declared a drought emergency for the entire state of Wisconsin. This declaration, the first since August 2003, allowed farmers access to additional water for crop irrigation. The summer of 2012 was also extremely hot and dry across much of the United States, including Wisconsin. A table showing the drought events recorded by the National Weather Service for Ashland County can be found in Appendix B.

⁷⁹ <http://www.aos.wisc.edu/~sco/clim-watch/graphics/pdsi-ts-02-1.gif>

⁸⁰ State of Wisconsin Hazard Mitigation Plan, p. 3-100

Considering past occurrences, it can be surmised that Ashland County has a medium probability of drought occurrence in the future and the likelihood of damage due to drought is considered high for agricultural losses and low for other types of losses.

Vulnerability

Drought generally impacts farm output by reducing crop yields and the health and product output (e.g., milk) of livestock. As a result, a drought could impact the economy of the entire county. Dust storms impact farms in the long term by blowing away the top levels of soil, which are the richest. This could economically impact the county by reducing its long-term viability for farming. The concern for agricultural losses due to drought is difficult to estimate because each incident will impact the county differently based on the length of the drought, when it occurs in the planting season and which crops were planted in various locations in that particular season but one can see, by looking at the agricultural statistics listed below, that this sector is an important part of the Ashland County economy and that the losses could be considerable:

- Average size of farms: 259 acres
- Average value of agricultural products sold per farm: \$27,455
- Average value of crops sold per acre for harvested cropland: \$40.80
- The value of livestock, poultry, and their products as a percentage of the total market value of agricultural products sold: 85.25%
- Harvested cropland as a percentage of land in farms: 38.36%
- Average number of cattle and calves per 100 acres of all land in farms: 12.02
- Corn for grain: 768 harvested acres
- Vegetables: 15 harvested acres
- Land in orchards: 11 acres⁸¹

Drought is also a major risk factor for wildfire and can reduce the amount of surface water available for recreational activities (e.g., boating, fishing, water skiing) and for wildlife. This is important because, for example, low water levels can lead to an outbreak of disease (e.g., botulism) in migratory bird pools.

Prolonged drought can also impact the groundwater reserves. This can reduce the ability of the municipal water services and rural

⁸¹ http://www.city-data.com/county/Ashland_County-WI.html

individuals on wells to draw adequate fresh water. This may especially impact rural homeowners who tend to have wells that are not drilled as deeply as municipal wells. In Ashland County, the population that lives outside of the cities and villages are generally on well water. There could also be a safety risk during dust storms if they are severe enough to reduce the visibility of the roadways for drivers.

Hazard Mitigation Strategies

The goal of drought and dust storm mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events. Mitigation strategies for periods of drought include preparing informational releases and plans for farmers and homeowners that can be used if needed. Municipalities and the county will work together to ensure that drought considerations are included in emergency plans and will provide emergency information to non-farm concerns as needed.

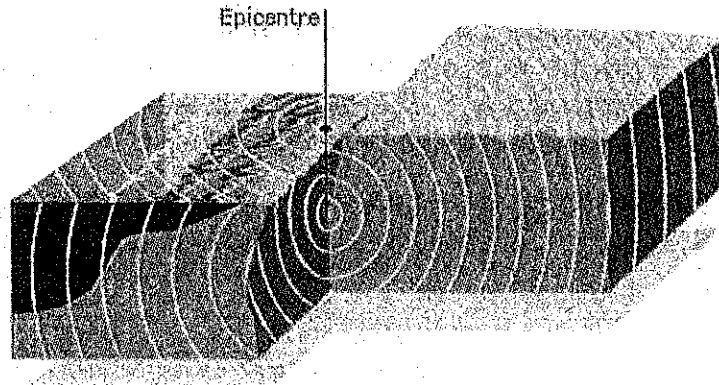
The hazard mitigation strategies listed above primarily involve providing information on water conservation measures to farmers and the public. Water conservation will ensure that the resource is available for critical residential, business and agricultural uses (e.g., drinking, food irrigation, manufacturing, firefighting). The Public Works Department for the Cities of Ashland and Mellen, the Village of Butternut and the Sanitary District/Town of Jacobs will:

- Complete water conservation and savings outreach measures.

Since drought and dust storms are not hazards that affect buildings or traditional infrastructure (e.g., bridges, culverts) these strategies did not need to be designed to reduce damages to existing or future buildings and infrastructure.

Earthquakes

An earthquake is a shaking or sometimes violent trembling of the earth which results from the sudden shifting of rock beneath the earth's crust. This sudden shifting releases energy in the form of seismic waves (wave-like movement of the earth's surface.)⁸²



Physical Characteristics

Earthquakes can strike without warning and may range in intensity from slight tremors to great shocks. They can last from a few seconds to over five minutes and they may also occur as a series of tremors over a period of several days. The actual movement of the ground during an earthquake is seldom the direct cause of injury or death. Casualties usually result from falling objects and debris because the shocks have shaken, damaged or demolished buildings and other structures. Movement may trigger fires, dam failures, landslides or releases of hazardous materials that compound an earthquake's disastrous effect.

Earthquakes are measured by two principle methods: seismographs and human judgment. The seismograph measures the magnitude of an earthquake and interprets the amount of energy released on the Richter Scale, a logarithmic scale with no upper limit. For example, an earthquake measuring 6.0 on the Richter Scale is ten times more powerful than a 5.0 and 100 times more powerful than a 4.0. This is

⁸² http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/earthquake_guide.pdf

a measure of the absolute size or strength of an earthquake and does not consider the effect at any specific location. The Modified Mercalli Intensity (MMI) Scale measures the strength of a shock at a particular location (i.e., intensity.)

A third less often used way of measuring an earthquake's severity involves comparing its acceleration to the normal acceleration caused by the force of gravity. The acceleration due to gravity, often noted "g," is equal to 9.8 meters per second. Peak Ground Acceleration (PGA) measures the rate of change of motion relative to the rate of acceleration due to gravity and is expressed as a percentage. These three scales can be roughly correlated, as expressed in the table that follows:⁸³

Earthquake PGA, Magnitude and Intensity Comparison Table			
PGA [%g]	Magnitude [Richter]	Intensity [MMI]	Description [MMI]
<0.17	1.0 - 3.0	I	I. Not felt except by a very few under especially favorable conditions.
0.17 - 1.4	3.0 - 3.9	II - III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 - 9.2	4.0 - 4.9	IV - V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing cars rock noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 - 5.9	VI - VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
34 - 124	6.0 - 6.9	VII - IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
>124	7.0 and higher	VIII or higher	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any [masonry] structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

⁸³ Wald, Quitoriano, Heaton and Kanamori, 1999

Most of Wisconsin's occurrences have not been severe, with only one registering 5.1 on the Richter Scale.

Frequency of Occurrence

Earthquakes that have affected Wisconsin from 1899 to 1987 are listed in the table that follows. The most severe earthquake in Wisconsin was the record earthquake of 1811, centered along the New Madrid Fault. Most earthquakes that do occur in Wisconsin are very low in intensity and can hardly be felt. These very minor earthquakes are fairly common, occurring every few years. Events of moderate magnitude have occurred in locations in Illinois and Michigan. Those and other stronger earthquakes centered in other parts of the country have been felt primarily in Southern Wisconsin.

Date	Location	Latitude North	Longitude West	Maximum Intensity	Magnitude
10/12/1899	Kenosha	42° 34'	87° 50'	II	3.0
3/13/1905	Marinette	45° 08'	87° 40'	V	3.8
4/22/1906	Shorewood	43° 03'	87° 55'	II	3.0
4/24/1906	Milwaukee	43° 03'	87° 55'	III	--
1/10/1907	Marinette	45° 08'	87° 40'	III	--
5/26/1909	Beloit	42° 30'	89° 00'	VII	5.1 (max)
10/7/1914	Madison	43° 05'	89° 23'	IV	3.8
5/31/1916	Madison	43° 05'	89° 21'	II	3.0
7/7/1922	Fond du Lac	43° 47'	88° 29'	V	3.6
10/18/1931	Madison	43° 05'	89° 23'	III	3.4
12/6/1933	Stoughton	42° 54'	89° 15'	IV	3.5
11/7/1938	Dubuque	42° 30'	90° 43'	II	3.0
11/7/1938	Dubuque	42° 30'	90° 43'	II	3.0
11/7/1938	Dubuque	42° 30'	90° 43'	II	3.0
2/9/1943	Thunder Mountain	45° 11'	88° 10'	III	3.2
5/6/1947	Milwaukee	43° 00'	87° 55'	V	4.0
1/15/1948	Lake Mendota	43° 09'	89° 41'	IV	3.8
7/18/1956	Oostburg	43° 37'	87° 45'	IV	3.8
7/18/1956	Oostburg	43° 37'	87° 45'	IV	3.8
10/13/1956	South Milwaukee	42° 55'	87° 52'	IV	3.8
1/8/1957	Beaver Dam	42° 32'	98° 48'	IV	3.6
2/28/1979	Bill Cross Rapids	45° 13'	89° 46'	--	<1.0 MoLg
1/9/1981	Madison	43° 05'	87° 55'	II	--
3/13/1981	Madison	43° 37'	87° 45'	II	--
6/12/1981	Oxford	43° 52'	89° 39'	IV-V	--
2/12/1987	Milwaukee	42° 95'	87° 84'	IV-V	--
2/12/1987	Milwaukee	43° 19'	87° 28'	IV-V	--
6/28/2004	Troy Grove, IL	41° 46'	88° 91'	IV	4.2

Also in Wisconsin, a 2012 article published in the Milwaukee Journal-Sentinel discussed an incident in Waupaca County that was not an earthquake as traditionally discussed and understood. This episode is highlighted in this plan because it was widely reported in the state and could be a concern for Ashland County citizens:⁸⁴

A 1.5-magnitude earthquake was recorded at 12:15 a.m. March 20 beneath Clintonville, according to the National Earthquake Information Center. The center is operated by the U.S. Geological Survey.

The U.S. Geological Survey said several days of booms and vibrations that rattled windows and nerves last week likely were caused by a swarm of small earthquakes.

Scientists at the Wisconsin Geological and Natural History Survey in Madison said the low-intensity seismic activity could have been produced by a phenomenon known as postglacial rebounding.

Granite bedrock beneath eastern Waupaca County is slowly adjusting to a great weight being lifted off it when the last glacier melted more than 10,000 years ago. As the granite stretches, rising only a few millimeters a year, it can crack to relieve pressure, according to David Hart, a geophysicist at the Wisconsin Geological and Natural History Survey.

As it cracks, one piece slides or shifts places, releasing enough energy to create a seismic wave that rises to the surface.

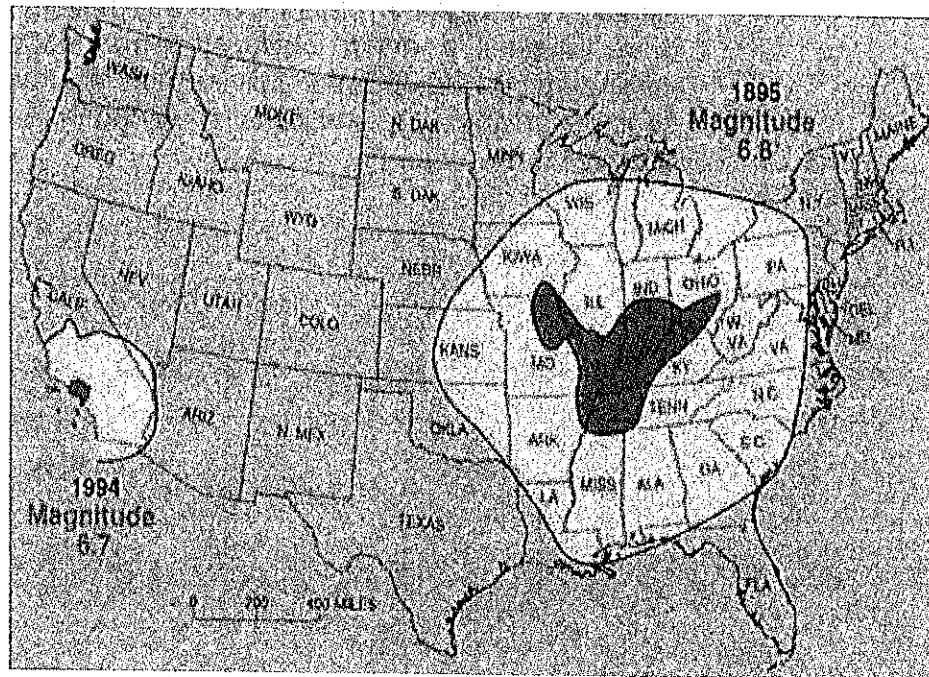
There is no known geologic fault beneath central Wisconsin so the postglacial rebounding is the only thing stretching the bedrock crust in the state, Hart said.

This phenomenon was widely reported in local, state and national news and drew interest from the public.

The nearest major active fault is the New Madrid Fault, stretching along the central Mississippi River Valley in Missouri. In recent years, considerable attention has focused on seismic activity in the New Madrid seismic zone that lies within the central Mississippi Valley, extending from northeast Arkansas through southeast Missouri, western Tennessee and western Kentucky to southern Illinois. Scientists at the Center for Earthquake Information have computed a set of probabilities that estimates the potential for different magnitude earthquakes to occur at the New Madrid Fault.

⁸⁴ <http://www.jsonline.com/news/wisconsin/rumbling-booming-resumes-in-clintonville-6e4p9o8-144653925.html>

Even an 8.3 magnitude earthquake at the New Madrid Fault, however, would cause only minor damage in the southeastern corner of Wisconsin. At this time it is not possible to predict the exact date, duration or magnitude of an earthquake.



As seen on the map in Appendix A, the earthquake threat to Ashland County is considered low (the 50-year acceleration probability is 2%.) Minor damage (e.g., cracked plaster, broken windows) from earthquakes has occurred in Wisconsin but most often the results have been only rattling windows and shaking ground. There is little risk except to structures that are badly constructed. Most of the felt earthquakes reported have been centered in other nearby states. The causes of these local quakes are poorly understood and are thought to have resulted from the still-occurring rebound of the earth's crust after the retreat of the last glacial ice. The likelihood of damage from an earthquake is also very low.

Vulnerability

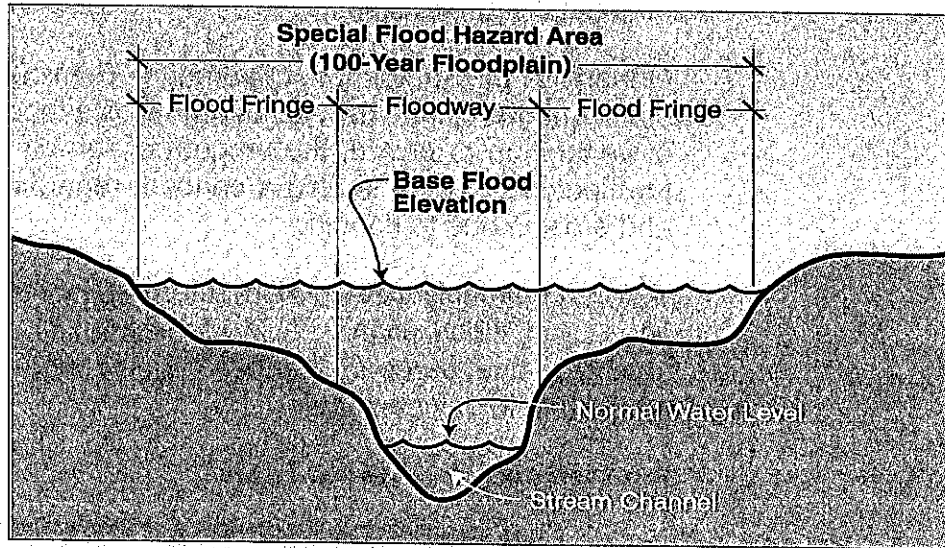
Any impact in the community from earthquake would likely be due to a few broken windows and personal effects that fell in the earthquake. The damage to critical infrastructure and buildings would be negligible although there could be indirect effects from any unlikely losses to the electrical grid, transportation routes/goods shipments and pipelines.

Hazard Mitigation Strategies

Since Ashland County is not likely to suffer directly from a severe earthquake and the community impacts are not considered significant, mitigation planning for this hazard is not necessary. If there is ever a need, obviously emergency resources will be mobilized but the goal for this section of the plan is therefore to educate on the very low risks of earthquake damage in Ashland County.

Flooding and Dam Failure

Flooding is defined as a general condition of partial or complete inundation of normally dry land (i.e., the floodplains) caused by the overflow of inland waters or the unusual and rapid accumulation or runoff of surface waters from any source. Floodplains are the lowlands next to a body of water that are susceptible to recurring floods.⁸⁵



Floods are common in the United States, including Wisconsin, and are considered natural events that are hazardous only when adversely affecting people and property.

Physical Characteristics

Major floods in Wisconsin have usually been confined either to specific streams or to locations that receive intense rainfall in a short period of time.

Flooding that occurs in the spring due to snow melt or during a period of heavy rain is characterized by a slow buildup of flow and velocity in rivers and streams over a period of days. This buildup continues until the river or stream overflows its banks, for as long as a week or two, then slowly recedes. Generally the timing and location of this

⁸⁵ FEMA, August 2001

type of flooding is fairly predictable and allows ample time for evacuation of people and property.

For prediction and warning purposes, floods are classified by the National Weather Service into two types: those that develop and crest over a period of approximately six hours or more and those that crest more quickly. The former are referred to as "floods" and the latter as "flash floods". Flash flooding occurs solely from surface run-off that results from intense rainfall. Flash flooding occurs less frequently in Wisconsin than flooding associated with spring snow melt but it is unpredictable.

Generally the amount of damage from flooding is a direct consequence of land use. If the ground is already saturated, stripped of vegetation or paved, the amount of run-off increases, adding to the flooding. There is also a concern regarding the loss of topsoil and erosion due to flooding.

Terms commonly used when referring to flooding are "100-year flood" and "flood plain." A "100-year flood" is defined as a flood having a one percent chance of being equaled or exceeded in magnitude in any given year.

Flood Probability Terms Table⁸⁶

Flood Recurrence Intervals	Percent Chance of Occurrence Annually
10 year	10.0%
50 year	2.0%
100 year	1.0%
500 year	0.2%

The Wisconsin Department of Natural Resource (DNR), working with local zoning offices, has designated flood plain areas as those places where there is the greatest potential for flooding. Flooding may also occur due to a dam breach or overflow. Dams are barriers built across a waterway to store, control or divert water; a dam failure is a failure of the dam that causes downstream flooding. Failures may be

⁸⁶ State of Wisconsin Hazard Mitigation Plan, 4-28.

caused by technological events (e.g., materials failure) or by natural events (e.g., landslide, earthquake) with flooding being the most common result.



White River Dam – wide-area view of basin and surrounding improvements

According to the Wisconsin Department of Natural Resources (WDNR) Dam Safety Program there are approximately 3,800 dams in existence in the State of Wisconsin. Since the late 19th century, more than 700 dams have been built, then washed out or removed. Since 1967, approximately 100 dams have been removed. Almost 60% of the dams in Wisconsin are owned by a former company or private individual, 9% by the State of Wisconsin, 17% by a municipality such as a township or county government and 14% by other ownership types.

The federal government has jurisdiction over most large dams in Wisconsin that produce hydroelectricity - approximately 5% or nearly 200 dams. The Wisconsin Department of Natural Resources regulates the rest of the dams. A dam with a structural height of over 6 feet and impounding 50 acre-feet or more, or having a structural height of 25 feet or more and impounding more than 15 acre-feet is classified as a large dam. There are approximately 1,160 large dams in the State of Wisconsin.

Ashland County has 40 small, uncontrolled agricultural dams included in the Wisconsin Department of Natural Resources (DNR) database.⁸⁷

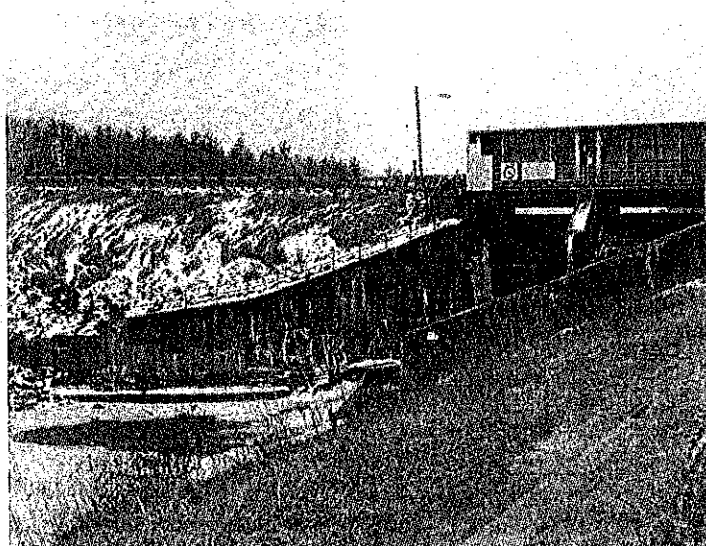
Dam Official Name	Size	Latitude	Longitude	Owner Type	Waterway Name (Downstream City)
RUSSELL DAM		46.0265113	-90.4855556		BUTTERNUT CREEK
DAY	LARGE	46.17735	-90.91219	US FOREST SERVICE	WEST FORK CHIPPEWA
WHITETAIL WATERS	SMALL	46.4990525	-90.8210886	PRIVATE	ROCK CREEK
HUDSON BAY	LARGE	46.2668187	-90.8652737	COUNTY	BRUNSWEILER RIVER
UPPER CLAM LAKE	SMALL	46.1539368	-90.9149158	PRIVATE	WEST FORK CHIPPEWA RIVER
GLIDDEN DAM		46.1367146	-90.5757292		E FK CHIPPEWA RIVER
PALET	SMALL				
UIHLEIN	LARGE	46.3347297	-90.7667238	PRIVATE	TR TROUT BROOK
ELM HOIST WILDLIFE	LARGE	46.495152	-90.7063287	PRIVATE	TR BAD
MELLEN WATERWORKS	SMALL	46.2966696	-90.6356802	CITY	
STEIGER	SMALL	46.0377913	-90.3849685		RAPID CREEK
LINDQUIST, WESLEY	SMALL	46.3937031	-90.7543097	PRIVATE	TR-BRUNSWEILER
CAROLINE LAKE	SMALL	46.2678611	-90.5614512		BAD RIVER
MELLEN DAM # 1	LARGE	46.3496112	-90.660413		BAD RIVER
STANGLE, HENRY	SMALL	46.0123136	-90.481636	PRIVATE	TR PARKER LAKE
KENYON	SMALL	46.0847331	-90.66474	PRIVATE	TR EAST FORK CHIPPEWA RIVER
YANKEE, ERVIN	SMALL	46.5255655	-90.8794939		OUTLET TO POND 4
SAWMILL DAM		46.010502	-90.4938869		BUTTERNUT CREEK
HANSON, MARTIN	SMALL	46.3219389	-90.8111789	PRIVATE	OUTLET BEAVER DAM LAKE
ENGLISH LAKE DAM	SMALL	46.315546	-90.7685032		ENGLISH LAKE
UPPER TORCH DAM		46.1533906	-90.8576688		TORCH RIVER
BASS LAKE DAM		46.3633638	-90.7766436		BASS LAKE
LAKE THREE	LARGE	46.3172241	-90.8580015	US FOREST SERVICE	SPRING BROOK TRIB.
HANSON, MARTIN	SMALL	46.5510806	-90.7189035	PRIVATE	TR RINS CREEK
DAY	SMALL	46.1638757	-90.902274	DOT	WEST FORK CHIPPEWA RIVER
TOBIN, MARTIN	SMALL	46.4000768	-90.7485923	PRIVATE	TR-MARENGO RIVER
JOKINEN, PAUL A.	SMALL	46.3073085	-90.6374558	PRIVATE	TR-DEVILS CREEK
SCHRAUFNAGEL, WM AND JAYNE	SMALL	46.5248512	-90.8880448	PRIVATE	TR-BEAR TRAP CREEK
BRUNSWEILER CREEK	LARGE	46.330601	-90.8072376	PRIVATE	BRUNSWEILER
MARTIN HANSON	LARGE	46.3334261	-90.7871515	PRIVATE	TR BRUNSWEILER
LOWER TORCH DAM		46.1124611	-90.8860314		TORCH RIVER
LAKE GALILEE	SMALL	46.2858602	-90.6038101	PRIVATE	MINNOW
HOLT, RICHARD AND LAURA	SMALL	46.5249299	-90.8789066	PRIVATE	TR-BEAR TRAP CREEK

⁸⁷ <https://dnr.wi.gov/damsafety/damSearch.aspx>

Dam Official Name	Size	Latitude	Longitude	Owner Type	Waterway Name (Downstream City)
MELLEN LIGHTING CO. DAM	LARGE	46.3238975	-90.6576365		BAD RIVER
WHITE RIVER	LARGE	46.4975	-90.90944	UTILITY	WHITE
SHANAGOLDEN DAM		46.1152838	-90.6263608		E FK CHIPPEWA RIVER
GEFFERT, EDWIN	SMALL	46.3401413	-90.7697391	PRIVATE	TR TROUT BROOK
DEAD HORSE SLOUGH	LARGE	46.1551387	-90.8577021	DOT	
FAWN LAKE					
FAWN LAKE					

Most of these dams are small, mill-type dams under the jurisdiction of the DNR and are also privately owned. None of these dams could handle the volume of water generated by a 100- or 500-year flood without overtopping. These dams are inspected by the Wisconsin Department of Natural Resources (DNR) and the largest are required to have an Emergency Action Plan (EAP) and failure analysis on them. There are no dams in other counties that pose a significant flooding risk to the citizens of Ashland County. Some dams of note include:

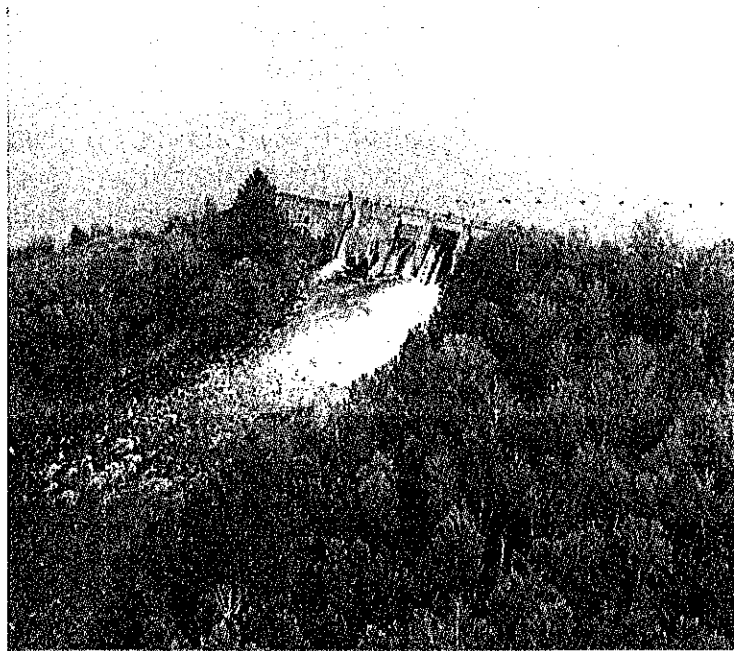
- Dry Lake Dam (Clam Lake) – is federally-owned currently but management is being transferred to the property owners' association.
- White River Dam – is a privately-owned dam that generates power for Xcel Energy. This dam is computer monitored but during previous power outages, the dam has filled and overtopped. It is considered a low-risk dam and it has an Emergency Action Plan (EAP) associated with it.



- Hudson Bay Dam (near Marengo) – is a privately-owned dam that is managed by Ashland County but has some maintenance needs. The dam has passed recent inspections.



- Turtle Flambeau Reservoir Dam (Iron County) – a breach in this dam would affect approximately 20 homes in the Town of Agenda on North Short and South Short Lane.



- Day Lake Dam – is a federally-owned dam with an EAP.

One potential effect of flooding is erosion. Erosion is defined as the removal of soil by the force of waves, currents and/or ice at a lakeshore or stream bank or by the power of wind or water on open

land. Erosion is a natural process that can be accelerated by natural disasters (e.g., flooding, heavy rains, strong winds, drought) or by human activity (e.g., removal of plants/trees, tilling.) Because of the many waterways in Ashland County, there is concern about ensuring the stabilization of the shorelines.

Watersheds

Ashland County has 15 watersheds. The maps in Attachment A show the watershed boundaries and 100-year floodplains for the entire county. Ashland County river systems drain to two major basins, the Lake Superior Basin on the northern side of the county, the Upper Chippewa River Basin on the southern part of the county. Everything north of the sub-continental divide is part of the Great Lakes-St. Lawrence River drainage system. Everything south of the sub-continental divide drains to the Mississippi River. The following sections provide additional detail on the watersheds within each basin. Most of the information presented has been compiled from DNR "State of the Basin" reports.

Lake Superior Basin

Bayfield Peninsula Southeast Watershed (LS07)

The Bayfield Peninsula Southeast Watershed covers 192,960 acres. About 24 percent of this watershed lies in northwestern Ashland County. This watershed includes the eastern half of the Bayfield Peninsula and most of the Apostle Islands. The entire mainland is within Bayfield County but the Apostle Islands (except Eagle, Sand, York and Raspberry Islands) are considered part of Ashland County. All of the Apostle Islands except for Madeline Island are under the management of the National Park Service.

The WDNR's Natural Heritage Inventory Database documents that many water-dependent endangered, threatened or special concern species and/or communities are associated with the Apostle Islands. Several priority coastal wetland sites are found on the Apostle Islands including Big Bay on Madeline Island, Outer Island Sandspit and Lagoon and the Stockton Island Tombolo. The Apostle Islands include habitat identified by the Lake Superior Binational Program as important to the integrity of the Lake Superior ecosystem.

Fish Creek Watershed (LS08)

The Fish Creek Watershed covers 100,096 acres and about 25 percent of the watershed lies in northeast Ashland County. Seventy-five percent of the Fish Creek watershed lies within Bayfield County. The Ashland County portion of the watershed has a surface hydrologic connection to the rest of the watershed only in a small area that drains to the Fish Creek sloughs west of Ashland. The Elks Club Golf Course and associated developments all drain to the sloughs. The rest of the watershed in Ashland County contains Bay City Creek, which flows through the City of Ashland and numerous small streams that outlet directly to Lake Superior. Several of these small streams are completely within the city of Ashland where they function as stormwater drains for the city.

Lower Bad River Watershed (LS09)

The Lower Bad River Watershed covers 79,296 acres all in Ashland County. The borders of this watershed have changed over the years for ecosystem management purposes. Much of the Lower Bad River watershed falls within the Bad River Band of Lake Superior Chippewa Indian Reservation. The 16,000 acre Kakagon/Bad River Sloughs receive a large amount of water flowing from and through Ashland and Bayfield Counties. These sloughs are identified as one of the priority wetlands in the Lake Superior Basin. The Kakagon/Bad River Sloughs contain 10 distinct natural communities. The area is one of the largest coastal wetlands in Lake Superior and has been identified by the Lake Superior Binational Program as important to the integrity of the Lake Superior ecosystem.

White River Watershed (LS10)

The White River Watershed covers 229,760 acres and about 33 percent of this watershed is in Ashland County. It flows from its modest origin in Douglas County, through Bayfield County and Ashland County to its confluence with the Lower Bad River Watershed (LS09). The WDNR's White River Wildlife Area can be found east of Highway 13 in Ashland County. This area protects forest habitat and fisheries and is managed for wildlife.

Potato River Watershed (LS11)

The Potato River watershed covers 115,136 acre as of which 19 percent lies in Ashland County. This watershed has its origin in the Gogebic Range in Iron County and flows from east to northwest where it enters the Bad River. The watershed is largely forested and mostly managed for multiple-use, including commercial production. Metallic mining was common in this region and for many years was one of the largest copper and iron mining areas in the world.

Marengo River Watershed (LS12)

The Marengo River Watershed covers 139,200 acres and 67 percent lies in Ashland County. This watershed originates in the granite outcroppings of the Gogebic Range within the Chequamegon National Forest of Ashland and Bayfield County. The watershed contains large tracts of agricultural land, composed of sands and red clays of old Glacial Lake Duluth. Many lakes, wetlands and small feeder streams can be found throughout this watershed.

The U.S. Forest Service Brunsweller River Gorge Special Management Area is unique in the basin. It is a mile-long river gorge with cascading rapids, granite cliffs, hemlock, white pine and upland cedar forests containing many rare plants. The headwaters of the Brunsweller River are also home to the USFS Spider Lake Black Ash Swamp Research Natural Area, which protects a high quality northern hardwood swamp. The USFS also manages St. Peter's Dome Area, which contains a unique geologic feature in an exposed granite dome with shaded cliffs, deep stream gorges, older hemlock forest and several rare plant species.

Tyler Forks Watershed (LS13)

The portion of the Tyler Forks watershed in Ashland County is relatively small, only 25 percent – most of it lies within Iron County; it covers 50,432 acres. All of the named streams in this watershed support trout populations but sparse data exist on the fish populations or land use impacts. While a large percentage of the watershed is managed as county forest, livestock, barnyards and cropland were considered pollutant threats in the Ashland County portion of the watershed.

Upper Bad River Watershed (LS14)

The Upper Bad River Watershed covers 86,208 acres with about 89 percent in Ashland County. This watershed flows from its origin at Caroline Lake, a property owned by The Nature Conservancy (TNC), through the community of Mellen to its confluence with Tyler Forks at Copper Falls State Park. The USFS also manages McCarthy Lake and Cedars Research Natural Area at the headwaters of the Iron River to protect high quality old growth white cedar, hemlock and white pine forest, northern sedge meadow, headwater streams and a small undeveloped lake. Caroline Lake, managed as a demonstration area for watershed protection and forest best management practices, is also considered a priority wetland site in

the Lake Superior Basin by the WDNR and an area having lake-wide significance by the Lake Superior Bi-national Program.

Montreal River Watershed (LS15)

Only 6 percent of the 144,832 acre Montreal River Watershed lies in Ashland County. This watershed stretches from the headwaters of the Montreal River, along the border with Michigan, down to Lake Superior and along the shore to the Kakagon Sloughs. Much of the Lake Superior shoreline in this watershed falls within the boundaries of the Bad River Indian Reservation. Much of the watershed within Iron County was heavily influenced by hard rock mining.

Upper Chippewa River Basin

Upper South Fork Flambeau River Watershed (UC10)

Less than 1% of this 178, 549 acre watershed is in Ashland County within the extreme southeast corner of the Town of Agenda. The majority of the watershed is in Price County, with additional acreage in Iron, Vilas and Oneida Counties.

Lower North Fork Flambeau River Watershed (UC11)

The Lower North Fork Flambeau River Watershed covers 98,541 acres. Ten percent of the Lower North Fork Flambeau River watershed is found in Ashland County, primarily within the Town of Chippewa.

Butternut Creek Watershed (UC12)

Butternut Creek Watershed covers 49,706 acres. Sixty percent of the Butternut Creek watershed is found in Ashland County, within the Towns of Chippewa, Agenda and Peeksville. Butternut Creek flows through Butternut Lake and enters the North Fork of the Flambeau River. Butternut Lake, a eutrophic lake, is part of the statewide Long-Term Trend Monitoring program. A portion of Butternut Creek upstream of the lake is listed as Class III trout water in the Wisconsin Trout Stream Book. This segment is marginal as trout water.

Upper North Fork Flambeau River Watershed (UC13)

The Upper North Fork Flambeau River Watershed covers 101,257 acres. Thirty-four percent of this watershed is within Ashland County with the remainder found in Iron and Price Counties. This watershed begins at the Turtle Flambeau Flowage in Iron County and flows through southern Ashland County. Many small streams, mostly trout waters, feed the North Fork of the Flambeau. Generally, this watershed shows excellent water quality and little or no known organic pollution. This is a mostly forested watershed.

East Fork Chippewa River Watershed (UC21)

The East Fork Chippewa River Watershed covers 195,300 acres of which 70 percent lies in Ashland County. This watershed has 17 listed trout streams, more than any other watershed in the Upper Chippewa River Basin. Mostly covered by wetland and forest, nonpoint source pollution is probably not widespread here, but agriculture is scattered throughout the watershed. No use information is available for many of the watershed's streams, and with the exception of the East Fork of the Chippewa River, current water quality data for most of these streams is lacking. The part of the watershed located in the Chequamegon National Forest in southwestern Ashland County has also had very little fisheries survey work. Glidden and Shannagolden are the only two communities in the watershed.

West Fork Chippewa River Watershed (UC23)

The West Fork Chippewa River Watershed covers 182,257 acres and 39 percent lies in Ashland County. This watershed includes the drainage of the West Fork Chippewa River above the Chippewa Flowage, a portion of the headwaters are found in Ashland County. Day Lake Flowage, Twin Lakes, Woodtick Lake, Dead Horse Slough, Dingdong Creek, Clam Lake, Mud Lake, West Torch River, East Torch River, Moose River, Black Creek, Upper Clam Lake, Little Clam Lake, and McLaren Lake all comprise this watershed in Ashland County.

Floodplain Regulations

Floodplain regulations have been in place in the cities, towns and villages of Ashland County for many years. The Department of Natural Resources requires that each municipality approve regulations that meet DNR guidelines. These regulations and guidelines result from the value of Wisconsin lakes and waterways and a desire to preserve them and to protect the people who reside near them. Unregulated development can lead to loss of lives and property during floods.

Chapter 614, Laws of Wisconsin 1965, requires counties to adopt regulations giving all lands within 300 feet of navigable rivers or streams protection from haphazard development. Under this legislation, Ashland County has adopted a zoning ordinance which

gives a measure of protection to watersheds. The law protecting flood plains was created to meet the following objectives:

- Reduce the hazards to life and property from flooding.
- Protect flood plain occupants from a flood which is or may be caused by their own land use, which is or may be undertaken without full realization of the danger.
- Protect the public from the burden of extraordinary financial expenditures for flood control and relief.

Encroachment on flood plains, including structures or fill, reduces the flood-carrying capacity.

Frequency of Occurrence

Wisconsin has experienced several major floods during the last two decades. The 1973 and 1986 floods revealed that no flood plains or urban areas in Wisconsin can be considered safe from damages.

Ashland County does have a history of flooding problems. Ashland County has been included in six Presidential Disaster Declarations requests for flooding, the most recent of which are detailed below:⁸⁸

- FEMA-DR-1284-WI: On August 16, 1999, the President declared a major disaster as a result of high winds and severe storms that occurred July 4, 1999 to July 31, 1999. The declaration was granted for Public Assistance.
- FEMA-DR-1332-WI: On June 24, 2000, the President declared a Major Disaster as a result strong storms. The declaration was granted for Public Assistance.
- FEMA DR-1369-WI: On May 11, 2001, the President declared a major disaster as a result of severe storms and flooding that began on April 10th. The declaration was granted for Public Assistance.
- FEMA DR-4076-WI: On August 2, 2012, the President declared a major disaster as a result of severe storms and flooding during the period of June 19-20, 2012.
- FEMA DR-4141-WI: On August 8, 2013, the President declared a major disaster as a result of severe storms, flooding, and mudslides during the period of June 20-28, 2013.

⁸⁸ <https://www.fema.gov/disasters>

- FEMA DR-4276-WI: On August 9, 2016, the President declared a major disaster as a result of severe storms and flooding during the period of July 11-12, 2016.
- FEMA DR-4383-WI: On August 10, 2018, the President declared a major disaster as a result of severe storms, straight-line winds, and flooding during the period of June 15-19, 2018.

Ashland County has had no repetitive loss properties reported by the National Flood Insurance Program.

Tables showing the flood and flash flood events recorded by the National Weather Service can be found in Appendix B.⁸⁹ A careful review of the geography and history of flooding in Ashland County leads to the conclusion that there is a very high probability of flooding in the future and a very high probability of damage and losses due to flooding. This flooding could occur due to urban stream flooding, flash flooding or, less likely, due to a dam failure.

Vulnerability

As can be seen in the Frequency Section, Ashland County has had severe flooding that has reached the level of a Presidential Stafford Act emergency declaration in four of the last six years (2012, 2013, 2016, 2018). The thunderstorms that have generated this flooding have also generated damaging winds, land/mudslides, and/or hail. In the 2018 incident, an Ashland County resident died after water reaching six-to-eight feet (6'-8') deep submerged his vehicle. Infrastructure losses included sinkholes, washouts, land/mudslides and other damage.⁹⁰



⁸⁹ <http://bsa.nfipstat.fema.gov/reports/1040.htm>

⁹⁰ <https://fox61.com/2018/06/19/one-dead-after-flooding-in-wisconsin-and-michigan/>

After flooding, whether caused by a storm or dam failure, there is often damage. Potential vulnerabilities due to flooding events can include flooded public facilities and schools, many of which are the community's shelters needed when individual housing is uninhabitable. Utilities are also vulnerable in floods, which can bring down electric lines/poles/transformers, telephone lines and can disrupt radio communications. The loss of communications can impact the effectiveness of first response agencies, which need to communicate via two-way radio to mount emergency response and recovery activities. The public media communications utilized by emergency managers to provide timely and adequate emergency public information can also be impacted.

Residential structures may suffer from flooded basements, damaged septic systems and damaged functionals (e.g., HVAC systems, clothes washers and driers). Homes may also be impacted by sewer back-up and, if the home is not properly cleaned after a flood, bacterial growth and mold may impact the home's air quality and cause illness among the occupants.

Businesses can suffer building and equipment damage similar to homes. Businesses may lose expensive product stored in basement or other low areas as well as the ability to operate from their facility. If the facility must close, its owners and employees will most likely suffer economic hardships beyond what their personal losses may have entailed. Agricultural business losses involve the loss of standing crops and harvests that are damaged by flooded storage facilities in the immediate time period. On a longer time scale, the erosion of topsoil by floodwaters can degrade the land and impact future crop yields.

Perhaps one of the most expensive types of flood damage is that to roadways, which are washed out, inundated and/or covered by debris, blocking access to emergency and general public traffic.

Appendix A contains maps depicting the floodplain and a map highlighting the critical facilities in Ashland County. Appendix F contains excerpts from the Ashland County HAZUS report. HAZUS-MH uses state-of-the-art geographic information system (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. FEMA HAZUS-MH data were used to estimate the number of structures located within the one-percent chance, or 100-year floodplain, based upon Flood Insurance Rate Maps (FIRMs) published by the Federal

Emergency Management Agency (FEMA), the results of which are outlined in the report.

Hazard Mitigation Strategies

The purpose of the flood mitigation portion of the plan is to identify areas that are particularly susceptible to flooding, assess the risks, analyze the potential for mitigation and recommend mitigation strategies where appropriate. With that in mind, the plan goals are:

- Goal 1: To reduce, in a cost effective manner using a cost-benefit analysis, the loss of lives and property due to these events. Another part of this goal is to promote safety and health in areas that have been or are prone to be flooded.
- Goal 2: To preserve and enhance the quality of life throughout Ashland County by identifying potential property damage risks and recommending appropriate mitigation strategies to minimize potential property damage during/due to flooding.
- Goal 3: To promote countywide planning that avoids transferring the risk from one community to an adjacent community.
- Goal 4: To continue encouraging all Ashland County communities' participation in the NFIP so that all county residents have access to affordable flood insurance coverage.
- Goal 5: To identify potential funding sources for mitigation projects and form the basis for project grant applications through FEMA's Pre-Disaster Mitigation (PDM) and/or Flood Mitigation Assistance (FMA) programs.

Ashland County and its municipalities are committed to remaining compliant with the requirements of the National Flood Insurance Program (NFIP) and all other state and federal laws. According to the NFIP, the following communities participate in the program:

- Ashland County. Please note that the county participation covers the unincorporated municipal areas (i.e., the towns)
- Cities of Ashland and Mellen and the Village of Butternut.

There are no areas in Ashland County which have had special flood areas identified by FEMA but are not in the NFIP program. One hazard mitigation strategy selected is to inform the public about the availability of flood insurance; this task will be carried out by County Emergency Management.

Short term actions that can lessen the effects of flooding include:

- Issuance of early warnings through flood advisory bulletins,
- Dissemination of instructions to the public through the media.
- Preparation of congregate care facilities.
- Evacuation of people and property.

Temporary protective measures such as sandbagging, protection of buildings and other structures and cut-off of gas and electricity may also be implemented. Presently, Ashland County has quick access to a limited stock of sandbags to assist with flood containment. The county is looking to invest in a sand bag filler and waste blocks.

The current emphasis in flood mitigation is on long-range actions. Such actions include the adoption of proper floodplain zoning ordinances and land-use planning. The Ashland County Zoning Department will lead this effort, working with FEMA to complete county-wide floodplain mapping updates and incorporate floodplain mapping in city and county GIS. They may apply for grants to assist with the additional costs. It should be noted that current flood maps are on the county's website for the public.⁹¹

Ashland County has a history of expensive damage to buildings and infrastructure due to floods. In addition to the strategies listed previously (i.e., in the All Hazards chapter) that deal with public information and planning, Ashland County Emergency Management, Highway, Zoning, and Land Water Conservation Departments will work together with the towns and other municipalities, as necessary/requested, to make current and future buildings and infrastructure more disaster-resistant by:

- Use its maps and hydrology studies to ensure that properties at risk are identified and, as available, appropriate grants are sought and secured to mitigate losses. Good data also ensures that decision-makers can create and enforce appropriate zoning and/or building regulations to make any new structures disaster-resistant.

⁹¹ <http://ashlandcowi.wgxtreme.com/>

- Targeting old structures for buy-out and convert the land to open, public lands. This also eliminates future damages by preventing building on this land.
- Pre-identifying infrastructure (roads, bridges, culverts, shoulders) prone to flooding and directing current and future budgetary dollars towards making the infrastructure disaster-resistant as it is scheduled for routine maintenance.
- County Land Conservation and Zoning as well as the City of Ashland DPW will work together to incorporate soils mapping (completed by the NRCS) into city and county's GIS.
- Perform routine bridge inspection and maintenance
- Continue to monitor private onsite wastewater treatment systems (POWTS)
- Complete capital improvement plans to prioritize local roads that are routinely exposed to flooding.
- Work with municipalities to conduct flood evaluations
- Actively search for funding options for dam control and maintenance around the dams
- Cap unused/out-of-service wells to prevent contamination
- Complete an assessment of what groundwater capabilities, quality, and flow direction are for future development.
- Develop strategies for municipal DPWs to begin documenting road repairs to create a historical record of potential mitigation project areas.

Additional mitigation measures within the county include:

- City of Ashland:
 - Complete capital improvement plans to prioritize local roads that are routinely exposed to flooding.
 - Replace non-code compliant water lines and fire hydrants

- Upgrade and make inspections of the city water intake pipe in Lake Superior
- Review/Update/Adopt a storm water management ordinance
- Perform routine bridge inspection and maintenance
- Replacement of lead water services at all public properties
- Create an Emergency Response Plan for utilities (water and sanitary) and pipeline breaks
- Complete investments, testing, and maintenance of water and sewer systems to ensure that they are operating within health standards and codes.
- Continue to monitor private onsite wastewater treatment systems (POWTS)
- Cap unused/out-of-service wells to prevent contamination
- Develop a Debris Management Plan.
- City of Mellen
 - Cap unused/out-of-service wells to prevent contamination
 - Create well head protection plans.
- Village of Butternut
 - Cap unused/out-of-service wells to prevent contamination
 - Seal manhole covers. This started in 2012 and there are approximately two (2) done per year
 - Raise Minnesota Street between 2nd and 4th
 - Study and develop strategy options to manage storm water run-off from State Highway 13, which flows downhill on Minnesota and Michigan Streets (and floods their cross-streets

- Clean ditching to Butternut Creek
- Conduct hydrology study of Butternut Creek
- Town of Agenda
 - Complete recommended flood mitigation measures to forestall future flooding problems on Silver Creek Road.
- Town of Ashland
 - Consider potential solutions to make North York Road safer for vehicular traffic. This road is built on ledge rock and a portion (between sections 31-32) was built so that there are dangerous blind spots at the top of a hill from one direction and around the curve from another direction.
- Town of Jacobs
 - Create well head protection plans
- Town of LaPointe
 - Update road projects including:
 - East of Old Fort Road/Casper Road intersection – rip rap and raise roadbed 4" over existing culvert
 - Replace three 40' culverts (with 2" larger plastic along with rip rap and raising road crown) at North Shore ½ mile northeast of Benjamin Blvd. Intersection.
- Town of Morse
 - Update road projects including:
 - Lake Drive culvert replacement
 - Fisher Road culvert replacement
 - Minnie Creek Road culvert replacement
 - Lake Galilee dual culvert replacement

- Sackett Road – adding Meder Lake outlet culvert
- Conley Road – replace damaged culvert
- Wrege Road – replace undersized culvert
- Town of Sanborn
 - Review potential strategies to manage growth and flooding issues on Caville Road.

Additionally, the City of Ashland identified flooding hazard mitigation strategies specifically targeted to maritime, recreational and commercial concerns, including:

- Maintain the Ashland breakwater on Lake Superior
- Work with the US Army Corps of Engineers to ensure that the federal navigation channel into Chequamegon Bay is maintained
- Work with the US Army Corps of Engineers to ensure that the “KIYI Dock” adjacent to the “Soo Line Oredock” is maintained
- Maintain the “Soo Line Oredock”
- Work with Xcel Energy to ensure that the Ashland power plant channel/dock are maintained.

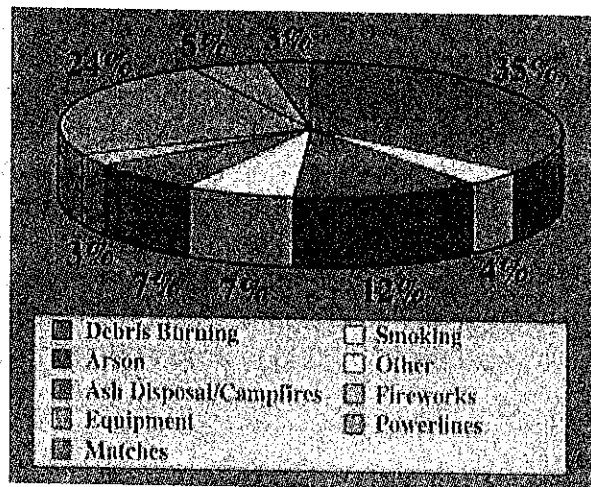
Forest and Wildfires

Wildfire (fires in forested, open, and/or agricultural land) season in Ashland County begins in March and continues through November, although fires can occur at any time during any month of the year. The fall season carries the highest risk of cropland fires (fields are stubble) while the spring season is riskiest for grassland fires (before new growth develops). Generally speaking, however, fires are more likely to occur whenever vegetation is dry as a result of a winter with little snow or a summer with sparse rainfall.

The Wisconsin Department of Natural Resources (DNR) is responsible for forest fire protection on approximately 18 million acres of forest and wildland in Wisconsin. The U.S. Forest Service maintains forest fire protection on two million acres of this land while local fire departments retain responsibility for the remaining wooded acreage.

Physical Characteristics

According to the DNR, there are approximately 1,500 fires annually that burn over 5,000 acres of the land that they protect; 98% of these fires are human-caused. It should be noted that these figures do not include areas of the state where a local fire department has primary responsibility for service.⁹²



⁹² <https://dnr.wi.gov/topic/ForestFire/causes/index.html>

The estimates of total forest-land in Ashland County range from over 531,000 acres to nearly 539,000 acres depending on the source of information and the year. This amount represents over 80% of the total land in the county. About 50% of the total forest lands are publicly-owned and managed for multiple or special uses. The publicly owned forests include nearly 217,000 acres of national forest, 43,000 acres of county and municipal forest, and nearly 13,000 acres managed by the WDNR (2007-2008 Wisconsin Blue Book, and USDA Forest Service 1996). All of the publicly owned forest is managed using best management practices. The Ashland County forest system is the most productive county forest in the state, providing the largest financial return to the county per acre owned. (Ashland Land and Water Resource Management Plan, 2009)

The Apostle Islands National Lakeshore, Big Bay State Park, Chequamegon-Nicolet National Forest, Copper Falls State Park, Morgan Falls/St. Peter's Dome, Hoffman Lake Hay Creek Wildlife Area, White River Wildlife Area, Nature Conservancy, and Madeline Island Wilderness Preserve are the natural areas in Ashland County. Local fire departments are responsible for fire protection in these open acreage areas although state and US Forest Service firefighting assets would provide mutual aid assistance in the state-owned and federal-owned lands.

Frequency of Occurrence

While the total number of open fires in Wisconsin has decreased over the years, the potential danger to lives and property remains due to the increased encroachment of development into previously open lands. Overall, the probability of a forest or wildfire in Ashland County is high due to the large portion of forested lands in Ashland County. The probability of damage from forest or wildfire is considered very high. There has been one state-wide wildfire event recorded since 1950 by the National Weather Service. This event occurred on 23 April 1994 and caused no injuries or deaths but did cause \$500,000 in crop and property damage (each).

Vulnerability

Forest and wildfires can impact the ecology of the open lands. Ashland County, which has multiple federal, state, county, and municipal forests, would be impacted by a wildfire since a disruption

from fire could erase the usability of this habitat for wildlife and/or recreational purposes for many years.

In 2003, the National Association of State Foresters produced a Field Guidance for Identifying and Prioritizing Communities-at-Risk (CAR). The purpose of the guide was to provide states with a nationally consistent approach for assessing and displaying the risks to communities from wildfire. The DNR, in cooperation with its federal and tribal partners, began working on the statewide assessment of Communities-at-Risk in 2004.

Communities-at-Risk is a model to identify broad areas of the state that are at relatively high exposure to resource damage due to wildfire. Results of the model can then be used by local governments developing Community Wildfire Protection Plans (CWPP) and by the DNR to reduce local risks of wildland fire by prioritizing hazard mitigation and fire protection efforts.

The approach used in this risk assessment model is based on the "Methodology" section of the NASF Field Guidance document which recommends assessing and mapping four factors:

- Historic Fire Occurrence
- Hazard
- Values Protected
- Capabilities

Modifications to this methodology were made to fit the GIS mapping data layers available for Wisconsin. The Wisconsin DNR uses three factors to assess Communities-at-Risk to wildfire damage:

- Hazard – the relative likelihood that an ignited wildfire will achieve sufficient intensity to threaten life or property based on land cover type and historic fire regime.
- WUI (Values at Risk) – the relative vulnerability of each 2000 census block to wildfire damage based on housing density and spatial relationship with undeveloped vegetation based on housing density and proximity to vegetation (Wisconsin's Wildland-Urban Interface). Wisconsin's WUI was layered with a weighted vegetation layer to accentuate proximity to flammable vegetation.
- Ignition Risk – the relative likelihood of a wildfire ignition within a given 30-m pixel based on historic fire occurrence, population density and proximity to a potential ignition source.

Models were developed in GIS to create statewide grids representing each of the three weighted {Hazard (40%), WUI (30%) and Risk (30%)} inputs. This composite grid represents communities-at-risk (CAR) on a 0-9 scale of threat, with zero representing no threat and nine a very high threat. The data was then represented by municipal civil divisions (MCDs), which are city and village boundaries. Quantitative markers were assigned for five threat levels: very low, low, moderate, high, and very high and those MCD's determined to have a high or very high threat of wildfire were considered CARs. 337 communities met the requirements for being "at risk."

Communities in Wisconsin vary considerably in size. This is particularly evident in a north-south pattern, with larger more rural towns in northern Wisconsin and smaller, more urban towns in southern Wisconsin. Because of this variation in size, the potential for missing areas of high risk due to smoothing out by other parts of the town was greater for larger towns. For this reason, WI DNR incorporated a "Community of Concern" category to identify those towns that have portions of their town in high risk of wildfire but were not otherwise included as a Community-at-Risk. A Community of Concern was determined to be an area of at least two contiguous square miles at high or very high risk; 237 communities were named as Communities of Concern.⁹³

As can be seen on the map in Appendix A, in Ashland County, one community, the Town of White River, was identified as "Communities at Risk – High." The communities identified as "Communities of Concern" include:

- City of Ashland
- Town of Ashland
- Town of Gingles
- Town of Jacobs
- Town of Marengo
- Town of Sanborn
- Town of Shanagolden

Hazard Mitigation Strategies

Government at all levels is developing mitigation programs in fire control and firefighting tactics with the goal of protecting lives and property from loss due to forest and wildfire. Local fire departments attend regular trainings on firefighting tactics to keep their skills

⁹³ Wisconsin State Hazard Mitigation Plan.

honed. The County Emergency Management Department assists local departments and their staff with available grant applications for training, exercising, equipment and planning as able and requested.

The Wisconsin Department of Natural Resources (DNR) and emergency management department also partner with the local fire departments to provide information about fire safety and other mitigation strategies to the public (e.g., protecting structures from wildfires), especially during Fire Safety Week in October of each year. Local communities participate in the Firewise Program, which provides presentations to landowners, landscapers, builders, etc. on sound building practices and yard clearances to improve structural defensible space.

Additionally, the county and its municipalities would like to:

- Explore options for increasing the number of fire danger signs in the county (there are three currently.)
- Continue to cut back brush from the right-of-ways, especially in federal forests.

The hazard mitigation strategies listed above primarily involve providing information on general fire safety measures to the public for residential and commercial structures and providing ongoing training to the firefighters who fight these types of fires.

The US Forest Service has an office in Glidden and Visitor's Center in Ashland. In conjunction with the Emergency Management Department, they have completed CWPPs (Community Wildfire Protection Plans). The DNR has a service center in Ashland and field stations in Ashland and Mellen. If there was a large wildfire for which local firefighters would request state assistance, the DNR might be able to provide limited assistance based upon their deployment level at that time. The DNR conduct joint training activities with local departments to prepare for larger wildfires.

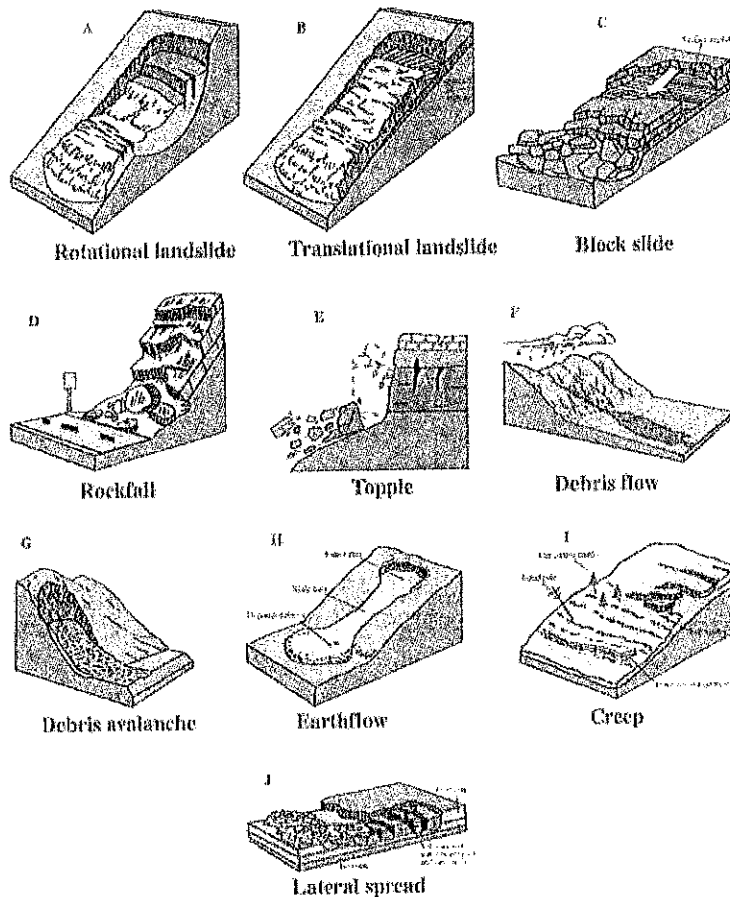
The City of Ashland will also:

- Install additional dry hydrants.
- Address the blight in the community by demolition of vacant, abandoned and substandard buildings.
- Continue to enforce the Property Maintenance Ordinance.

Landslide

The term landslide includes a wide range of ground movement such as rock falls, deep failure of slopes and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there may be other contributing factors. Factors likely to be seen in Ashland County include:

- erosion by rivers or lakes creating over-steepened slopes
- rock and soil slopes being weakened through saturation by snowmelt or heavy rains
- excess weight from the accumulation of rain or snow, stockpiles of rock or ore, waste piles or from man-made structures stressing weak slopes to failure⁹⁴



⁹⁴ http://landslides.usgs.gov/html_files/nlic/page5.html and <https://editors.eol.org/ecearth/wiki/Landslide>

Physical Characteristics

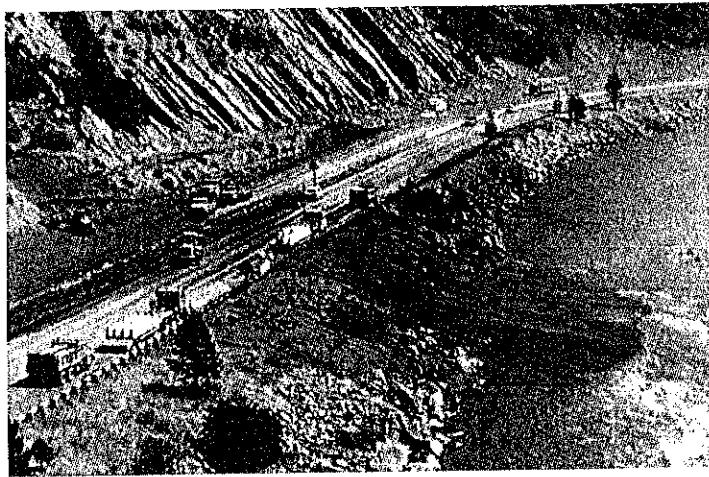
Landslides may include any combination of natural rock, soil or artificial fill and are classified by the type of movement and the type of material. The types of movement are slides, flows, lateral spreads and falls and topples; a combination of two or more landslide movements is a complex movement:

- Slides: straight or rotating downward displacements along one or more failure surfaces of soil or rock as a single intact mass or a number of pieces
- Flows: a rapid, downhill mass movement of a "slurry" comprised of loose soil, rocks, organic matter, air and water
- Lateral spreads: large movements of rock, fine-grained soils or granular soils distributed laterally
- Falls and Topples: masses of rocks or material that rapidly detach from a steep slope or cliff that free-fall, roll or bounce.

Almost any steep or rugged terrain is susceptible to landslides under the right conditions. The most hazardous areas are steep slopes on ridges, hills and mountains; incised stream channels and slopes excavated for buildings and roads. Slide potentials are enhanced where slopes are destabilized by construction, heavy rainfall, floods or river erosion. Debris flows generally occur during intense rainfall on water saturated soil. Surface runoff channels along roadways and below culverts are common sites of debris flows.

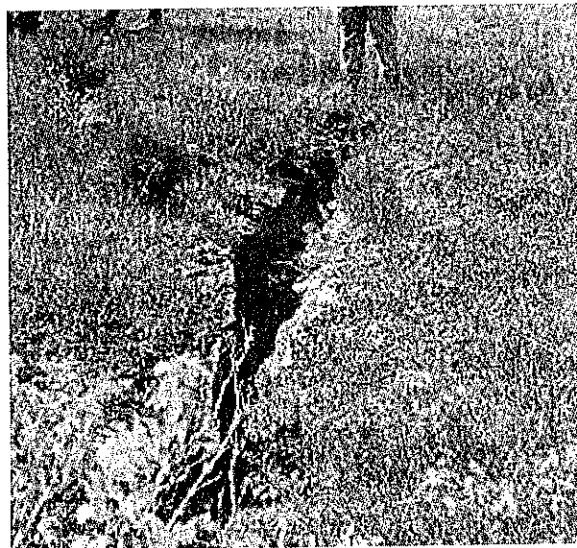
Landslides often occur together with other major natural disasters thereby exacerbating relief and reconstruction efforts:

- Floods and landslides are closely related and both involve precipitation, runoff and ground saturation that may be the result of severe thunderstorms.
- Landslides into a reservoir may indirectly compromise dam safety or a landslide may even affect the dam itself.
- Wildfires may remove vegetation from hillsides, significantly increasing runoff and landslide potential.



Landslide from fire damage in CO⁹⁵

Sinkholes can form naturally in areas with karst geology (i.e., areas with limestone or other bedrock that can be dissolved by water). As the limestone rock under the soil dissolves over time from rainfall or flowing groundwater, a hollow area may form underground into which surface soil can sink. Sinkholes also can be caused by human activity such as collapsed, abandoned underground mines. Even though sinkholes have not been a factor in any natural disaster, identifying areas with karst conditions is important for not only public safety and protection of structures but because karst features provide direct conduits to groundwater. Areas with karst conditions are vulnerable to groundwater contaminants from pollutants entering a sinkhole, fissure or other karst feature.



Enlarged fracture in Brown County, WI⁹⁶

⁹⁵ http://landslides.usgs.gov/html_files/landslides/slides/slide15.htm

⁹⁶ <http://www.uwex.edu/wgnhs/enlargedjoint.htm>

Frequency of Occurrence

According to the U.S. Geological Survey, landslides are a widespread geologic hazard, occurring in all 50 states where they cause on average \$1 to \$2 billion in damages and more than 25 fatalities annually. Landslides pose serious threats to highways; railroads and structures that support fisheries, tourism, timber harvesting, mining and energy production. Expanding urban development and other land uses have increased the incidence of landslide disasters in the United States.

With all of the recent flooding, mudslides, and other land movements as a result of severe storms in recent county history, there is a newly heightened concern, with the likelihood of occurrence and severity of effect both considered very high.

Vulnerability

The most likely consequences of landslides in Ashland County would be damage due to land movement (mudslides, landslides) as a result of erosion due to severe storms (i.e., wind and rain action). This can lead to undermining structures such as homes, businesses, roadways and railroads causing economic losses and possible injury to residents and the community.

Hazard Mitigation Strategies

The goal of landslide mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events. Although the physical cause of many landslides cannot be removed, geologic investigations, good engineering practices and effective enforcement of land-use management regulations can reduce landslide hazards. Ashland County will continue to work with its municipal partners to ensure that areas at risk of landslide are identified and mitigation strategies are employed as appropriate.

This coordination and cooperation among the private sector and various state, county and municipal planning and zoning departments will reduce effects on existing and future buildings and infrastructure by ensuring that safety is regulated and engineered into them.

Severe Temperatures

Characteristics

Temperature extremes can cause disruption of normal activities for the population, property loss and even the loss of life, especially among the more vulnerable members of our population such as children and the elderly.

Physical Characteristics: Heat

Heat emergencies are a result of the combination of very high temperatures and very humid conditions.

NOAA's National Weather Service

Heat Index
Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	86	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	113	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

☐ Caution
 ☐ Extreme Caution
 ☐ Danger
 ☐ Extreme Danger

The Heat Index estimates the relationship between these two conditions and reports them as a danger category, as can be seen in the following table⁹⁷:

⁹⁷ FEMA, 1997; NWS, 1997

Heat Index and Disorders Table			
Danger Category		Heat Disorders	Apparent Temperatures [°F]
IV	Extreme Danger	Heatstroke or sunstroke imminent.	>130
III	Danger	Sunstroke, heat cramps, or heat exhaustion likely; heat stroke possible with prolonged exposure and physical activity.	105-130
II	Extreme Caution	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and physical activity.	90-105
I	Caution	Fatigue possible with prolonged exposure and physical activity.	89-90

The major risks to people due to extreme heat are:

- Heatstroke – a potentially lethal medical emergency where the ability of a person to thermo-regulate is compromised resulting in the rise of the body's core temperature to above 105°F (Fahrenheit).
- Heat Exhaustion – a less threatening medical condition where the victim complains of dizziness, weakness and/or fatigue. The victim may have a normal or slightly elevated temperature and usually can be successfully treated with fluids.
- Heat Syncope – a sudden "faint" or loss of consciousness usually brought on by exercising in warmer weather than one is accustomed to, usually no lasting effect.
- Heat Cramps – muscular cramping brought on by exercising in warmer weather than one is accustomed to, no lasting effect.

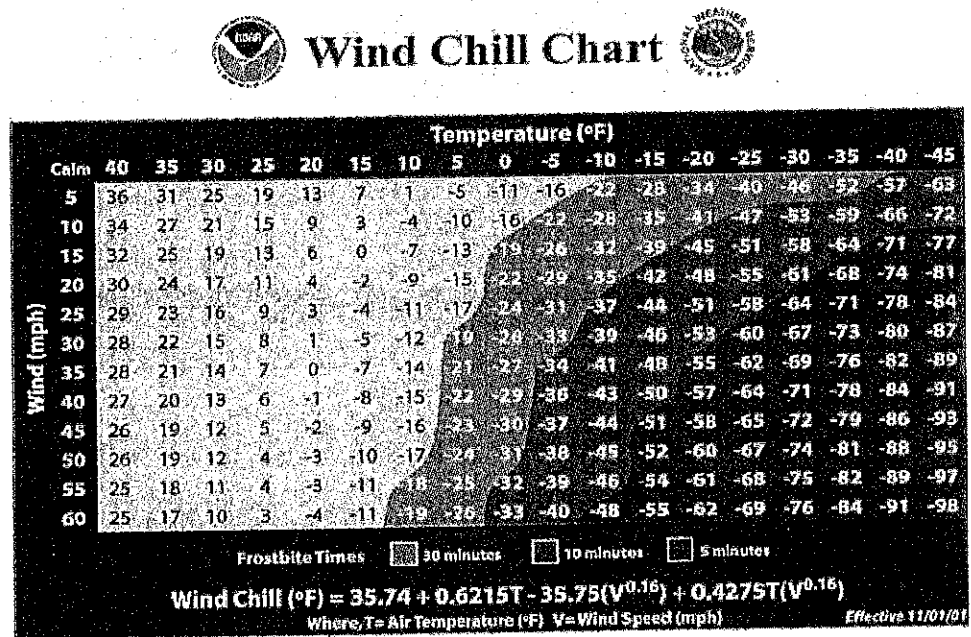
Extreme heat conditions may also affect pets and livestock, decreasing agricultural output by the latter. Crops may suffer reduced yield due to extremely hot conditions.

Physical Characteristics: Cold

Wind chill is a relationship between wind and cold that is based on the rate of heat loss from exposed skin. As the wind speed

Severe Temperatures

increases, heat is drawn from the body, driving down skin temperature and eventually core body temperature. The following table illustrates this relationship.⁹⁸



The major risks to people due to extreme cold are:

- Hypothermia – occurs when, due to exposure to cold, the body is unable to maintain its proper core temperature. It may occur in temperatures above freezing and may lead to death.
- Frostbite – describes local cooling, usually to an extremity, which occurs when exposure to cold air or liquid causes constriction of the blood vessels. There are three degrees of frostbite:
 - Frostnip – brought on by direct contact with a cold object or exposure to cold air or water. Tissue damage is minor and response to treatment is usually very good.
 - Superficial Frostbite – involves the skin and subcutaneous layers.

⁹⁸ National Weather Service: <https://www.weather.gov/safety/cold-wind-chill-chart>

- Freezing – is deep frostbite in which the skin, subcutaneous layers and deeper structures (e.g., muscles, bone, deep blood vessels, organ membranes) of the body are affected and can become frozen.
- Chilblains - lesions that occur from repeated/chronic exposure of bare skin to temperatures of 60°F or lower.
- Trench foot – a condition that occurs when the lower extremities remain in cool water for a prolonged period of time.

Frequency of Occurrence: Heat

Wisconsin has been affected by several bouts of extreme heat including during the Dust Bowl period from 1934-1936. Other heat events occurred in 1979, 1995, 2001, 2011 and 2012.

Tables showing the excessive heat and heat events recorded by the National Weather Service in Ashland County ⁹⁹ can be found in Appendix B.

According to the State of Wisconsin Hazard Mitigation Plan, extreme heat is the number-one weather killer in Wisconsin with most of the heat deaths attributed to major heat waves. The workgroup felt that there was a low likelihood of occurrence in any given year and the severity of damages also has a low likelihood of probability.

Frequency of Occurrence: Cold

Wisconsin regularly has extreme cold temperatures as part of its winter climate. Tables that outline extreme cold/wind chill and cold/wind chill events which have been recorded by the National Weather Service in Ashland County¹⁰⁰ can be found in Appendix B.

After examining this data, the workgroup believed that cold and/or extreme cold has a medium likelihood of occurrence in any given year. Since there are no crops out during the winter and most properties (homes, businesses, barns) are insulated for this climate, the severity of effects is low.

⁹⁹ <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=55%2CWISCONSIN>
^{49 & 100} <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=55%2CWISCONSIN>

Vulnerability

There has been a trend toward higher temperatures that is expected to continue. As with drought, periods of high temperatures can cause decreased poultry and bovine production rates, which impacts the economy of the community's large agricultural base.

More frequent and longer sub-zero stretches have been noted during the winter. These, coupled with concerns about utility failures, can disrupt agriculture, particularly with water supply disruption and with wind chill effects posing a risk to livestock and farmer health. Temperature extremes also pose significant problems for functional needs populations such as the elderly, the young, and the disabled. The primary general effects of extreme cold consist of water lines and mains freezing and breaking, disrupting water supply; shutting down of rural bus lines due to safety risks for children; and school closings, most often due to wind chill concerns.

Vulnerability to temperature extremes is generally assessed on an individual basis with the most vulnerable sections of our community's population having the greatest risk. These people may include the elderly, the very young and the chronically ill. People from economically disadvantaged backgrounds, especially those listed in the categories above, are even more vulnerable since they are least able to afford the cost of adequate heating or air conditioning systems.

It should be noted that the propane shortage experience in, primarily, northern Wisconsin, including Ashland County, in the winter of 2012-13 highlighted issues with utility reliability. The workgroup recognized that utility failures will exacerbate both the likelihood of occurrence and the severity of effects of extreme temperature incidents.

Ashland County social services agencies are aware of many of these people who reside in our communities and they, along with the public health department, have plans and access to economic assistance programs to help these people in times of concern.

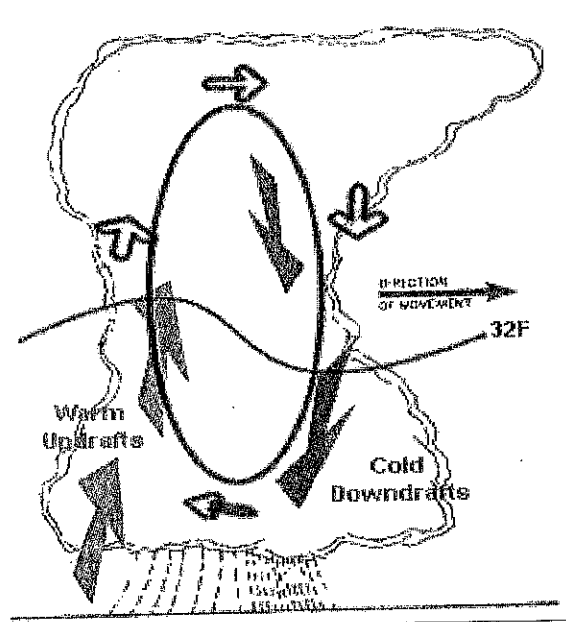
Hazard Mitigation Strategies

The goal of severe temperature mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events. Temperature extremes are difficult for a community to mitigate and the risks are to the health and safety of citizens, animals and crops. There are no strategies that need to be employed to reduce damages to buildings and infrastructure and the county and its municipalities will continued to monitor the impact of climate change to communities.

Ashland County Emergency Management participates in the statewide public information campaigns for Winter and Heat Awareness Weeks each year in spring and fall and they provide links to personal preparedness information on their website and in other public relations venues/forums.

Storms: Hail

Studies of thunderstorms indicate that two conditions are required for hail to develop: sufficiently strong and persistent up-draft velocities and an accumulation of liquid water in a super-cooled state in the upper parts of the storm. Hailstones are formed as water vapor in the warm surface layer rises quickly into the cold upper atmosphere. The water vapor is frozen and begins to fall; as the water falls, it accumulates more water vapor. This cycle continues until there is too much weight for the updraft to support and the frozen water falls too quickly to the ground to melt along the way. The graphic below depicts hail formation¹⁰¹:



Injury and loss of life are rarely associated with hailstorms, however extensive property damage is possible, especially to crops.

¹⁰¹ NWS, January 10, 2003

Physical Characteristics

Hail may be spherical, conical or irregular in shape and can range in size from barely visible in size to grapefruit-sized dimensions. Hailstones equal to or larger than a penny are considered severe.¹⁰²

Hail Size Estimates	
Size	Inches in Diameter
Pea	1/4 inch
Marble/mothball	1/2 inch
Dime/Penny	3/4 inch
Nickel	7/8 inch
Quarter	1 inch
Ping-Pong Ball	1 1/2 inch
Golf Ball	1 3/4 inches
Tennis Ball	2 1/2 inches
Baseball	2 3/4 inches
Teacup	3 inches
Grapefruit	4 inches
Softball	4 1/2 inches

Hail falls in swaths that can be from twenty to one hundred miles long and from five to thirty miles wide. A hail swath is not a large continuous path of hail but generally consists of a series of hail cells that are produced by individual thunderstorm clouds traveling in the same area.

Frequency of Occurrence

Hailstorms usually occur from May through August and Wisconsin averages two or three hail days per year. Ashland County, as can be seen in the map in Appendix A, has a medium probability of hail occurrence in Wisconsin and the likelihood of damage due to hail is also medium.

Most hail damage occurs in rural areas because maturing crops are particularly susceptible to bruising and other damage caused by hailstones. The four months of hailstorm activity correspond to the growing and harvesting seasons for most crops. A table showing the

¹⁰² NWS, January 10, 2003

hail events recorded by the National Weather Service in Ashland County¹⁰³ can be found in Appendix B.

Vulnerability

Hail, typically occurring in conjunction with thunderstorms and lightning, can damage many types of infrastructure. Public and private vehicles (e.g., campers, boats, cars, trucks) are liable to have their windshields cracked, bodies dented and paint damaged as a result of hail. This damage can occur, depending on the size of the hail, whether the vehicle is moving through the storm or is stationary. Hail on the roadway can also cause vehicles to slide off the road. Vehicle damage and iced roadways are of particular concern when you consider the need for emergency vehicles such as police cars, fire trucks and ambulances to quickly move to assist victims in a disaster.

Hail can also damage critical infrastructure such as street signs, electric lines/poles/transformers, telephone lines and radio communication equipment. These pieces of infrastructure are needed by both first response agencies and the general community to ensure safe transport; warm, safe homes and good internal and external communications abilities.

Residential and business properties are liable to receive damage to signs, siding, billboards, trees and windows. Manufactured housing is particularly vulnerable to damage due to its lower construction standards.

Hail can be particularly damaging to agricultural concerns, including farm buildings, standing crops and livestock.

Hazard Mitigation Strategies

The goal of mitigating for hail is to reduce the amount of financial loss due to these incidents. Insurance is the most widely used adjustment for crop and property damages due to hail. Hail crop insurance is available from two sources: commercial stock and mutual companies and the Federal Crop Insurance Corporation (FCIC). Farmers rarely

¹⁰³ <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=55%2CWISCONSIN>

purchase insurance coverage up to the full value of the losses that would result from a severe hailstorm.

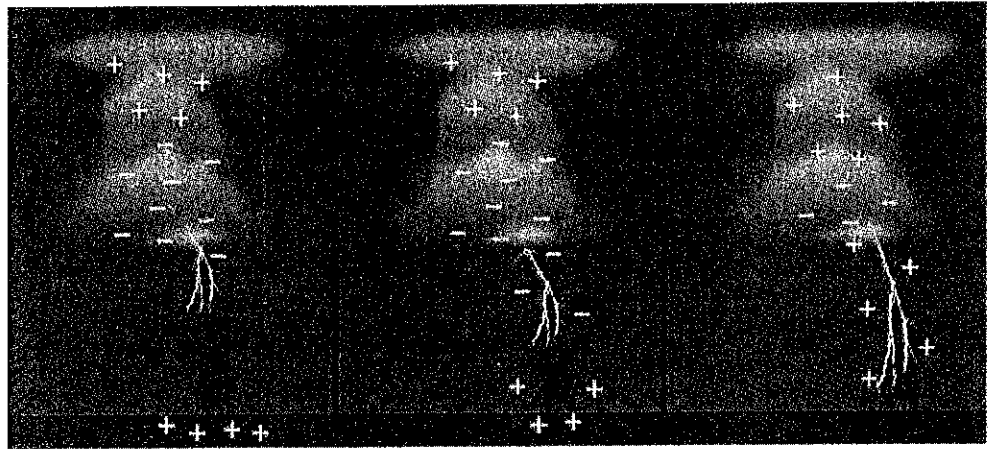
The Ashland County Emergency Management Office provides hail information to the public as part of the spring severe weather awareness week. The office also provides information about hail on the website and in display racks. Federal emergency assistance is available in the form of low-interest loans when a Presidential Disaster is declared or when the United States Department of Agriculture (USDA) declares that a county is eligible for aid. Damage from hailstorms alone is generally not extensive enough to invoke a disaster declaration.

The hazard mitigation strategies listed above primarily involve providing information on safety measures and insurance to the public for agricultural concerns and residential and commercial structures. These measures provide basic safety information but, since there is little one can do to prevent hail damage, these measures will do little to reduce damages to existing or future buildings and infrastructure but the recommended insurance may make recovery easier.

Storms: Lightning

Lightning is a phenomenon associated with thunderstorms; the action of rising and descending air separates and builds-up positive and negative charge areas. When the built-up energy is discharged between the two areas, lightning is the result.

Formation of Lightning¹⁰⁴



Lightning may travel from cloud to cloud, cloud to ground, or if there are high structures involved, from ground to cloud.

Physical Characteristics

The temperatures in a lightning stroke rise to 50,000°F (Fahrenheit). The sudden and violent discharge which occurs in the form of a lightning stroke is over in one-millionth of a second.

Lightning damage occurs when humans and animals are electrocuted, fires are caused by a lightning stroke, materials are vaporized along the lightning path or sudden power surges cause damage to electrical or electronic equipment. Lightning, an underestimated hazard, kills more people in an average year than do hurricanes or tornadoes.

¹⁰⁴ University Corporation for Atmospheric Research [UCAR]

Frequency of Occurrence

Nationwide, forty-five percent of the people killed by lightning have been outdoors, about sixteen percent were under trees, six percent were on heavy road equipment and thirty-three percent were at various unknown locations. Less than ten percent of the deaths involved individuals inside buildings; these deaths were primarily due to lightning-caused fires.

Wisconsin has a high frequency of property losses due to lightning. Insurance records show that annually one out of every fifty farms has been struck by lightning or had a fire which may have been caused by lightning. Generally, rural fires are more destructive than urban fires because of limited lightning protection devices, isolation, longer response times and inadequate water supplies. Ashland County has a low probability of lightning occurrence at any one location within it. This was determined by recognizing that lightning usually happens in conjunction with thunderstorms, and that Wisconsin and Ashland County generally have several severe thunderstorms per summer. The likelihood of damage due to lightning is considered low.

A table showing the lightning events recorded by the National Weather Service (NWS) in Ashland County¹⁰⁵ can be found in Appendix B. This table from the NWS is obviously not reporting all of the incidents of lightning strikes but those with notable/reportable losses from the past and can reasonably be inferred to show that there is exposure to potential future losses.

Vulnerability

Lightning, which often occurs in conjunction with thunderstorms and hail, can damage many types of infrastructure, including electric lines/poles/transformers, telephone lines and radio communication equipment. These pieces of infrastructure are needed by both first response agencies and the general community to ensure safe transport; warm, safe homes and good internal and external communications abilities.

Residential and business properties are liable to receive damage either as a result of a lightning strike causing a fire or other type of direct damage or by overloading electronic equipment (e.g., computers, televisions) that have not been properly connected to a

¹⁰⁵ <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=55%2CWISCONSIN>

surge protector. The latter concern is especially important to business and government, which in modern America rely on computers and other electronic equipment to manage the large amounts of data manipulated in our information-based economy.

Lightning can damage agricultural assets including farm buildings, standing crops and livestock. It is also one of the major sources of ignition for forest and wildfires.

Hazard Mitigation Strategies

The goal of lightning mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events. The two primary ways to effectively reduce lightning losses are modifying human behavior and protecting structures (e.g., using fire resistant materials in building construction). The use of fire resistant materials will make existing buildings and future construction less likely to catch fire or will minimize fire damage and spread due to lightning strike. Surge protectors limit data losses.

The Ashland County Emergency Management Office has awareness and educational materials in a display rack and online that inform the public of safety procedures to follow during a lightning storm. Severe summer weather safety information is also emphasized during Tornado Awareness Week. Price and Bayfield Electric Co-ops plan to install four lightning arresters for every mile of line and every transformer/ substation residence and continue ongoing maintenance to keep right-of-way clear for at least 20 feet.

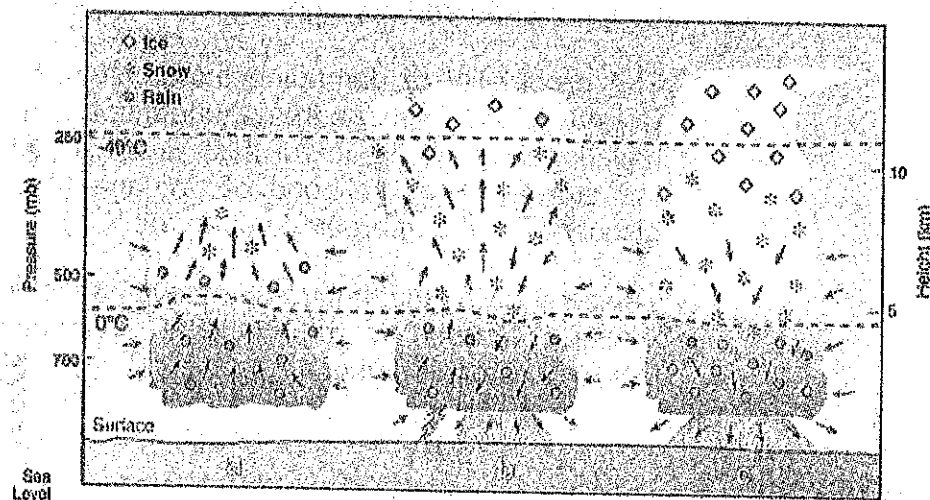
Storms: Thunderstorms

There are three distinct stages of development for thunderstorms (birth, growth, maturity), each of which can be seen in the following schematic.¹⁰⁶

In the first stage of development, an updraft drives warm air up beyond condensation levels where clouds form.

The second stage of development occurs as levels of water vapor in the expanding cloud rise past saturation and the air cools sufficiently to form solid and liquid particles of water. At this point, rain or snow begins to fall within the cloud.

A thunderstorm's mature stage is marked by a transition of wind direction within the storm cells. The prevailing updraft which initiated the cloud's growth is joined by a downdraft generated by precipitation. Lightning may occur soon after precipitation begins. Hail and tornadoes may also develop during this stage.



Physical Characteristics

A thunderstorm often is born, grows, reaches maturity and dies in a thirty-minute period. The individual thunderstorm cell often travels between thirty and fifty miles per hour. Strong frontal systems may create one squall line after another, each composed of many

¹⁰⁶ National Weather Service - Flagstaff

individual thunderstorm cells. These fronts can often be tracked across the state from west to east with a constant cycle of birth, growth, maturity and death of individual thunderstorm cells.

Frequency of Occurrence

Thunderstorm frequency is measured as the number of days per year with one or more incidents. There are approximately 100,000 thunderstorms in the United States every year and approximately 10% of those are considered severe (i.e., has at least $\frac{3}{4}$ " hail, winds of at least 58 mph or a tornado). Most Wisconsin counties, average between 30 and 40 thunderstorm days per year although a portion of southwestern and south-central Wisconsin average 40 to 50 thunderstorm days per year. In Ashland County there are typically several severe thunderstorms per year. In Wisconsin, Ashland County has 5 events documented of hurricane-force thunderstorm winds between 1970 and 2001. Hurricane-force winds are greater than or equal to 75 miles per hour. Thunderstorms can occur throughout the year with the highest frequency during the months of May through September. The majority of storms occur between the hours of noon and midnight.

The probability of damaging thunderstorms occurring in Ashland County is low. Damage from thunderstorms usually is a result of the hail, lightning, winds and/or flash flooding that can occur as part of the storm. The likelihood of damage from these causes is in discussed in the appropriate chapters.

Tables showing the thunderstorm events that have been recorded in Ashland County by the National Weather Service in Ashland County¹⁰⁷ can be found in Appendix B.

Vulnerability

Thunderstorms, which often produce hail and lightning and may occasionally spawn tornadoes, high wind storms or flash flooding, can damage many types of infrastructure. Ashland County's thunderstorm vulnerabilities due to associated hail, lightning, winds and flood waters are discussed in the other hazard chapters of this plan.

¹⁰⁷ <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=55%2CWISCONSIN>

Hazard Mitigation Strategies

The goal of thunderstorm mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events. Ashland County Emergency Management has developed severe weather safety information that it disseminates to the public in a display rack and online with the goal of protecting the lives and property of citizens. During Tornado Awareness Week, there is extensive media coverage of safety tips.

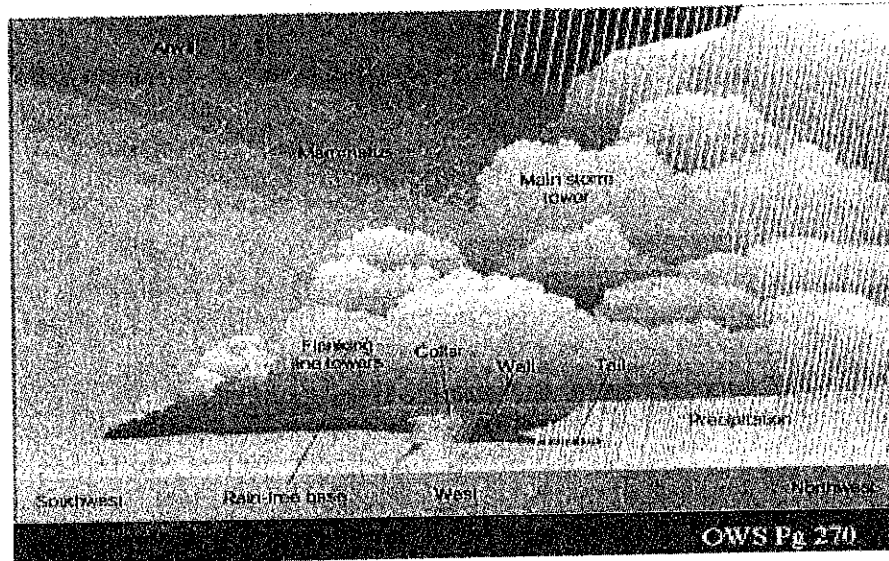
The Price and Bayfield Electric Co-ops also have selected a strategy to keep the right-of-way clear to at least 20 feet. The Bayfield Co-op keeps 20' on each side of overhead lines and 10' for underground lines clear at Highbridge at a cost of about \$285,000. They spend about \$400,000 annually on brushing.

The Price Co-op cleared to 15' wide on single-phase and 20' on multi-phase lines at a cost of \$600,000 - \$700,000; they are considering going to a 7-10 year cycle for clearance.

The damage to buildings and infrastructure in a thunderstorm is generally caused by components of the storm such as hail, flooding, lightning or wind. A discussion of strategies to reduce effects on existing and future buildings and infrastructure is discussed in the chapters that discuss each of these components in detail.

Storms: Tornadoes and High Winds

A tornado is a violently rotating funnel-shaped column of air. The lower end of the column may or may not touch the ground. Average winds in the tornado are between 173 and 250 miles per hour but winds can exceed 300 miles per hour. It should also be noted that straight-line winds may reach the same speeds and achieve the same destructive force as a tornado.

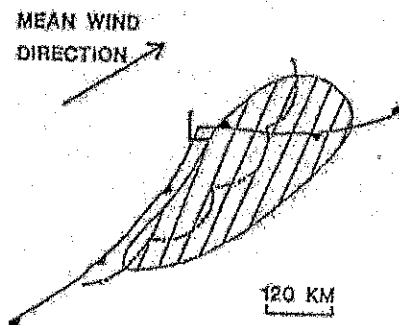


A derecho is a widespread, long-lived, violent, convectively-induced straight-line windstorm that is associated with a fast-moving band of severe thunderstorms usually taking the form of a bow echo. Derechos blow in the direction of movement of their associated storms; this is similar to a gust front except that the wind is sustained and generally increases in strength behind the "gust" front. A warm weather phenomenon, derechos occur mostly in summer, especially July, in the northern hemisphere. They can occur at any time of the year and occur as frequently at night as in the daylight hours.

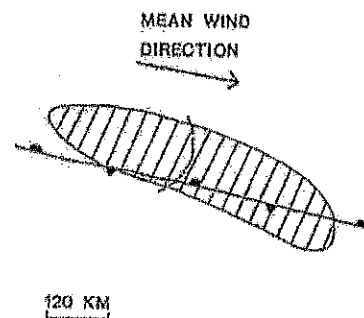
The traditional criteria that distinguish a derecho from a severe thunderstorm are *sustained* winds of 58 mph during the storm as opposed to gusts, high and/or rapidly increasing forward speed and geographic extent (typically 250 nautical miles in length). In addition, they have a distinctive appearance on radar (bow echo); several unique features, such as the rear inflow notch and bookend vortex

and usually manifest two or more downbursts. There are three types of derechos:¹⁰⁸

- **Serial:** Multiple bow echoes embedded in a massive squall line typically around 250 miles long. This type of derecho is usually associated with a very deep low. Also because of embedded supercells, tornadoes can easily spin out of these types of derechos.
- **Progressive:** A small line of thunderstorms take the bow-shape and can travel for hundreds of miles.
- **Hybrid:** Has characteristics of a serial and progressive derechos. Hybrid derechos are associated with a deep low like serial derechos but are relatively small in size like progressive derechos.
- **Low dewpoint derecho:** A derecho that occurs in an environment of comparatively limited low-level moisture, with appreciable moisture confined to the mid-levels of the atmosphere. Such derechos most often occur between late fall and early spring in association with strong low pressure systems. Low dewpoint derechos are essentially organized bands of successive, dry downbursts.



Serial Derecho



Progressive Derecho

¹⁰⁸ <http://en.wikipedia.org/wiki/Derecho>

Physical Characteristics

Tornadoes are visible because low atmospheric pressure in the vortex leads to cooling of the air by expansion and to condensation and formation of water droplets. They are also visible as a result of the airborne debris and dust in its high winds. Wind and pressure differential are believed to account for ninety percent of tornado damage in most cases. Because tornadoes are associated with storm systems, they usually are accompanied by hail, torrential rain and intense lightning.

Tornadoes typically produce damage in an area that does not exceed one-fourth mile in width or sixteen miles in length. Tornadoes with track lengths greater than 150 miles have been reported although such tornadoes are rare.

Tornado damage severity is measured by the Fujita Tornado Scale, which assigns an "F" ("Fujita") value from 0 – 5 to denote the wind speed.

The Fujita Tornado Scale ¹⁰⁹		
Category	Wind Speed	Description of Damage
F0	40-72 mph	Light damage. Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage to sign boards.
F1	73-112 mph	Moderate damage. The lower limit is the beginning of hurricane speed. Roof surfaces peeled off; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
F2	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	158-206 mph	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
F4	207-260 mph	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off; cars thrown and large missiles generated.
F5	261-318 mph	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100-yards; trees debarked.

On 1 February 2007, the National Weather Service began rating tornadoes using the EF-scale. It is considerably more complicated than the F-scale and it will allow surveyors to create more precise assessments of tornado severity. Below is a comparison between the Fujita Scale and the EF Scale:

Fujita Scale	Derived EF Scale	Operational EF Scale
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¹⁰⁹ FEMA, 1997

F Number	Fastest 1/4 mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

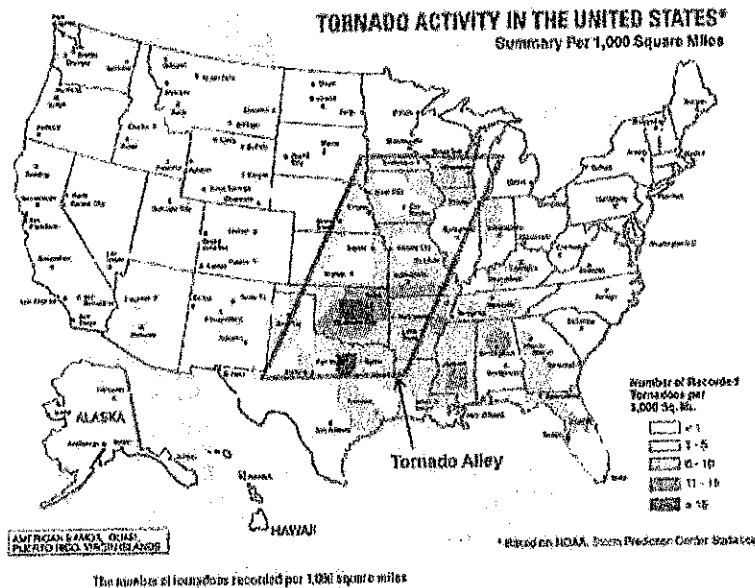
Downburst Characteristics

Downburst damage is often highly localized but resembles damage caused by a tornado. In some cases, even an experienced investigator cannot identify the nature of a storm without mapping the direction of the damaging winds over a large area. There are significant interactions between tornadoes and nearby downbursts.

A classic downburst example occurred on 4 July 1977 when a severe thunderstorm moved across Northern Wisconsin. Extensive areas of tree and property damage, somewhat like a tornado, were reported. After an aerial survey was completed to map both direction and F-scale intensity of the damaging winds it was determined that no evidence of a tornado was found anywhere within the path of the damage swath, which was 166 miles long and 17 miles wide. The survey revealed that there were scattered local centers from which straight-line winds diverged outward. These local wind systems were identified as downbursts with at least 25 specific locations recognized by the low-flying aircraft.

Frequency of Occurrence

Wisconsin lies along the northern edge of the nation's tornado belt, which extends north-eastward from Oklahoma into Iowa and across to Michigan and Ohio. Winter, spring and fall tornadoes are more likely to occur in southern Wisconsin, than in northern counties including Ashland County.



Wisconsin's tornado season runs from the beginning of April through September with the most severe tornadoes typically occurring in April, May and June. Tornadoes have, however, occurred in Wisconsin during every month of the year. Many tornadoes strike in late afternoon or early evening but they do occur at other times. Deaths, injuries and personal property damage have occurred and will continue to occur in Wisconsin.

Tables showing the frequency of high winds, funnel clouds and tornadoes as reported by the National Weather Service can be found in Appendix B.¹¹⁰ The probability of Ashland County being struck by a tornado or high winds in the future is high and the likelihood of damage from future incidents is very high. All parts of Ashland County are equally susceptible to tornadoes.

Vulnerability

Injury to people is a primary concern in tornado and high wind events. Two of the highest risk places are mobile home parks and campgrounds; Ashland County has several of each type of property. Both have high concentrations of people in a small area, generally have structures that provide less protection than standard construction homes generally do not provide storm shelters. Other places of concern during these types of events include critical emergency facilities such as hospitals and public works/highway

¹¹⁰ <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=55%2CWISCONSIN>

garages, police stations and fire departments, which contain equipment and services needed by the public after a tornado.

Mobile Home Parks ¹¹¹

Park Name	Location
Kenwood Terrace	Ashland
Whispering Pines	Ashland
Kreher RV Park	Ashland
Eids MHP	Marengo

Campgrounds ^{112 113 114}

Campground Name	Location
Apostle Islands National Lakeshore	La Pointe
Big Bay State Park	Madeline Island
Prentice Park	Ashland
Kreher Park	Ashland
Chequamegon-Nicolet National Forest	Ashland County
Copper Falls State Park	Mellen
Northern Lure Resort & Campground	Glidden
Wildwood Haven Resort and Campground	Mellen
Day Lake Campground	Glidden

¹¹¹ <http://www.mobilehome.net/mobile-home-park-directory/wisconsin/county/ashland-county>

¹¹² <https://www.travelashlandcounty.com/parks/>

¹¹³ http://www.wisconline.com/attractions/WI_campgroundsNW.html

¹¹⁴ <https://www.visitashland.com/plan-your-visit/recreation/camping-kayaking/>

Top O' the Morn Resort and Campground	Iron River
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Schools, in addition to holding children, are the major type of structure used as community disaster shelters and their loss might therefore affect the community on several levels (e.g., the death or injury of children, the loss of a community housing shelter). School gymnasiums are often the specific location of the community shelter but they are especially vulnerable in tornadoes because the large-span roof structure is often not adequately supported.

Community infrastructure such as power lines, telephone lines, radio towers and street signs are often vulnerable to damage from tornadoes and high winds and can be expensive to replace. The loss of radio towers that hold public safety communications repeaters can adversely impact the ability of first responders to mount an effective response; damage to towers that hold public media equipment may adversely impact the ability to distribute adequate public information.

Residential property is likely to have siding and roofing materials removed, windows broken from flying debris and garages blown down due to light construction techniques. Perhaps one of the largest types of loss on private property is due to tree damage, which is generally not covered by federal disaster assistance.

Business properties are at risk for having damage to infrastructure including signs, windows, siding and billboards. Agricultural buildings, such as barns and silos, are also generally not constructed in a manner that makes them wind resistant, which can lead to the loss of livestock and harvest. Standing crops are also at risk from high winds and tornadoes.

Hazard Mitigation Strategies

The goal of tornado and high wind mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events. Ashland County has a history of damage to buildings and infrastructure due to tornadoes and high winds. Some strategies below will deal with public information and alert and notification while others will enable the community to make current and future buildings and infrastructure more disaster-resistant by enacting more "bricks and mortar" solutions.

An effective warning system is the single most important resource for alerting the public to a tornado hazard, which is critical to the main goal of saving lives and reducing property losses. Forecasting of tornadoes is difficult, however, because of the suddenness of their onset, their relatively short duration, the extreme variability of a tornado striking area, limited knowledge of tornado dynamics and the limitations of the weather observation system.

During the past several years, there has been a statewide Tornado Awareness Week in late March or April. Media information packets are distributed to reemphasize and alert the public to tornado warning procedures. Ashland County actively promotes tornado safety public information as well as other summer severe weather public awareness and educational efforts, including applicable links on the county website.

Ashland County Emergency Management Department with assistance from municipality administrations, is making an effort to identify "safe rooms" for golf courses, campgrounds, parks, mobile home parks, youth care and community areas. If none can be located, the plan is to build safe rooms with available grant funding.

The County Zoning Department wants to work with the municipalities to revise the mobile home ordinance to require tie-downs.

The City of Ashland would also like to complete a warning siren study to determine number of necessary sirens to cover the community and implement findings of Warning Siren Study.

Storms: Winter

Due to its position along the northern edge of the United States, Wisconsin, including Ashland County, is highly susceptible to a variety of winter weather storm phenomena.



31" of snow fell in Ashland County on December 23, 2013.¹¹⁵

Physical Characteristics

The National Weather Service descriptions of winter storm elements are:

- Heavy snowfall - Accumulation of six or more inches of snow in a 12-hour period or eight or more inches in a 24-hour period.
- Blizzard - An occurrence of sustained wind speeds in excess of 35 miles per hour (mph) accompanied by heavy snowfall or large amounts of blowing or drifting snow.
- Ice storm - An occurrence of rain falling from warmer upper layers of the atmosphere to the colder ground, freezing upon contact with the ground and exposed objects near the ground.

¹¹⁵ http://www.ashlandwi.com/news/article_7b65c580-6c3c-11e3-a34b-001a4bcf887a.html

- Freezing drizzle/freezing rain - Effect of drizzle or rain freezing upon impact on objects with a temperature of 32 degrees Fahrenheit or below.
- Sleet - Solid grains or pellets of ice formed by the freezing of raindrops or the refreezing of largely melted snowflakes. This ice does not cling to surfaces.
- Wind chill - An apparent temperature that incorporates the combined effect of wind and low air temperatures on exposed skin.

In Wisconsin, the winter storm season generally runs from November through March and Wisconsin residents are most familiar with heavy snowstorms, blizzards, sleet and ice storms. The majority of Wisconsin snowfalls are between one and three inches per occurrence, although heavy snowfalls that produce at least ten inches may occur four or five times per season. Northwestern Wisconsin, including Ashland County, encounters more blizzards than the southeastern portions of the state.

Damage from ice storms can occur when more than half an inch of rain freezes on trees and utility wires, especially if the rain is accompanied by high winds. Another danger comes from accumulation of frozen rain pellets on the ground during a sleet storm, which can make driving hazardous.

Frequency of Occurrence

Annual snowfall in Wisconsin varies between thirty inches in southern counties to one hundred inches in the north. Ashland County averages approximately 73 inches of snow annually. Storm tracks originating in the southern Rockies or Plains states that move northeastward produce the heaviest precipitation, usually six to twelve inches. Low-pressure systems originating in the northwest (Alberta) tend to produce only light snowfalls of two to four inches. Snowfalls associated with Alberta lows occur more frequently with colder weather.

Although massive blizzards are rare in Wisconsin, blizzard-like conditions often exist during heavy snowstorms when gusty winds cause blowing and drifting of snow. Near blizzard conditions existed in Wisconsin in January 1979 when record snowfalls were recorded in many areas and wind speeds gusted to over thirty miles per hour.

Storms: Winter

Both ice and sleet storms can occur at any time throughout the winter season from November to April. Ice storms of disastrous proportions occurred in central Wisconsin in February 1922 and in southern Wisconsin in March 1976. A Presidential Disaster Declaration occurred as a result of the 1976 storm. Utility crews from surrounding states were called in to restore power, which was off for up to ten days in some areas. Other storms of lesser magnitude caused power outages and treacherous highway conditions.

Winter storms in the county seem to be increasingly associated with ice instead of or in addition to snow, particularly early in the season. Recovery from ice events can be very expensive, with power line and other infrastructure repairs. The probability that there will be severe winter storms in Ashland County is high and the likelihood that those storms will cause significant damage is also high. The tables of snow and ice events in Appendix B¹¹⁶ show that there is little property damage but this does not take into account the public costs of managing the snow and ice as well as the costs of managing utility repair to power, telephone and water lines.

Vulnerability

Winter storms present a serious threat to the health and safety of affected citizens and can result in significant damage to property. Heavy snow or accumulated ice can cause the structural collapse of homes, commercial buildings and agricultural structures; down power lines or isolate people from assistance or services by impeding transportation by the general public, emergency responders and public transportation resources.

The loss of electrical service and/or the blocking of transportation routes can adversely affect the ability of commercial enterprises to conduct business. This economic injury may be felt by both the business owner and employees unable to work during this period.

Hazard Mitigation Strategies

The goal of winter storm mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events.

¹¹⁶ <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=55%2CWISCONSIN>

Winter safety information is prepared and distributed to the media and the public by the Ashland County Emergency Management Department during Winter Awareness Week in November and is also available from the website.

The Ashland County Highway Department is responsible for much of the response to and recovery from winter storm events. Since response to winter storms is primarily a government and/or corporate function comprised of tasks such as clearing roads of snow and ice and repairing downed utility lines (discussed in the next chapter), there are reasonable measures that can be employed to reduce damages to existing or future buildings and infrastructure.

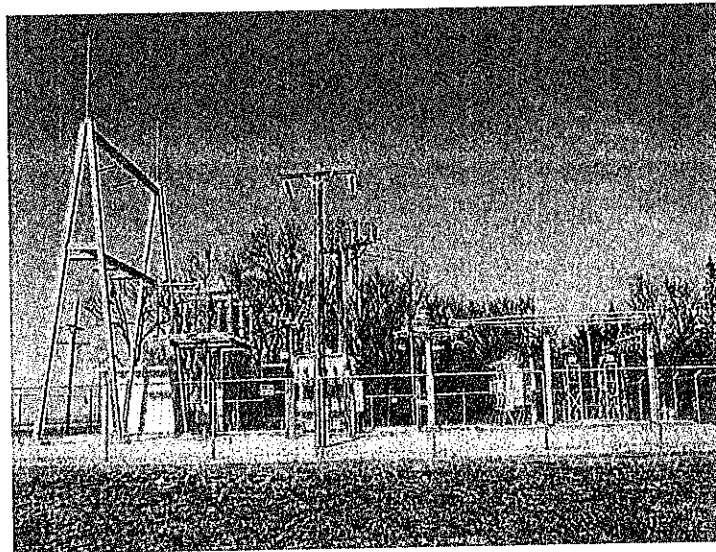
The Highway Department will ensure right-of-way clearing on county roads and the use of living snow fences to act as windbreaks. The department will also continually evaluate the salt/sand/wet agent mix of winter road agents for all of the participating municipalities to balance safety, costs, and environmental impacts. This is important because the use of too much road salt damages land and water plants, can injure animals/fish that eat the salt, and contaminates water, both inland and Lake Superior. Ashland County uses less salt than many in Wisconsin because they use wetting agents (e.g., beet juice, brine, magnesium chloride) to help maximize the effectiveness of the salt so that less can be applied. The Highway Department also sells salt and sand to the municipalities, some of which cannot use the wetting agents because they are not effective on the towns' gravel roads.

Utility Failure

A utility emergency is a disruption to the building services, usually defined as electrical power, water, natural gas and/or sewage that restricts the ability of people to safely occupy the facility. Electrical power or natural gas outages are often caused by a fuel shortage caused by an oil embargo, power failure or natural disaster. Disruptions to the water and sewage systems are often the direct result of a natural disaster (e.g., flooding) or are indirect losses due to another failure (e.g., a power outage disrupts the pumping of water and/or sewage).

Physical Characteristics

Modern society is very dependent on electrical power for normal living and is therefore quite disrupted by loss of power. Most power outages last about fifteen minutes to one hour. If longer, the utilities will inform the local news media of the anticipated duration of the outage. The Price Electric Co-operative (Co-op) covers a large portion of southern Ashland County. The Bayfield Electric Co-op and Price cover rural areas and Xcel Energy covers mostly the population clusters (e.g., cities and villages). Xcel Energy also provides natural gas service to some portions of the county.



Electrical substation

Thunderstorms with lightning are a possible cause of power failure. Fuel shortages can be caused by localized imbalances in supply. Labor strikes, severe cold weather or snowstorms also can cause a local shortage.

The water and sewage systems are most often a function of a municipal system and are usually found in more urbanized areas. Rural water is often provided by individual wells found on each property and sewage is managed by a septic system, also found on each individual property. Both municipal and individual systems are vulnerable to flooding, which can overwhelm the sewage systems and contaminate both municipal and private wells. Both types of systems are also vulnerable to electrical power loss because the electrical system powers the pumps and lift stations that move and treat the water and sewage.

Frequency of Occurrence

Ashland County has several short power outages (i.e., lasting less than six hours) per year but does not have a history of extended power outages. The possibility always exists that a man-made or natural disaster could affect the power system for an extended period of time.

In general, Ashland County has a low likelihood of utility failures with a high risk of negative consequences. Obviously, power outages are more likely to occur and the severity is greater in areas of higher human population (i.e., urban areas) but the loss of power to rural customers, while affecting fewer people, generally lasts longer and can be as life-threatening, especially if a person with special needs (e.g., the elderly, the young, those on special medical equipment) is involved.

Vulnerability

The failure of a utility to function can have wide-ranging impact in Ashland County. People, especially special needs populations, in residential properties may not be able to safely live in their homes because of inadequate heat, the inability to cook, the inability to manage waste, etc. While there are generally back-up generators on sewage lift stations in Ashland County, other utilities may also be non-operational due to damaged infrastructure, which can be very expensive to replace and/or repair. Businesses, including the utilities

themselves, may lose money due to the inability to produce goods and services for which they can bill and they may be non-operational due to damaged infrastructure, which can be very expensive to replace and/or repair. Critical infrastructure such as hospitals, schools and governmental facilities may not be able to operate or may have to operate at a reduced capacity due to the loss of utility services. EPCRA facilities may not be able to adequately control and contain their chemicals and there may be a release of hazardous materials that can impact people or the environment.

Agricultural assets may be impacted by the loss of utilities because extreme temperatures reduce the volume of livestock products and products such as milk may not be able to be properly stored.

Finally, transportation on roadways may become unsafe due to the loss of directional and street lights.

Hazard Mitigation Strategies

The goal of utility failure mitigation activities is to reduce, in a cost effective manner, the loss of lives and property due to these events. Ashland County has worked directly with the utility companies and emergency management responders in formulating emergency management plans. During a fuel or power shortage, residents, schools, industry and businesses will be asked to take measures to conserve fuel. If the fuel shortage reaches a critical stage, all non-essential facilities will be closed and contingency plans will be activated.

In the event of a prolonged power outage, Ashland County has generators available to provide power for radio communication and EOC operation. Evacuation and shelter arrangements have been prepared in case of a severe power outage. Currently countywide emergency shelters only have emergency back-up power (e.g., to exit lights), which is not adequate to fulfill the needs of evacuees. It should be noted that schools are often top choices as community disaster shelters but few of the county's schools have back-up generators. Currently, the only place in the county with sufficient power to operate air handling units is the EOC.

The county and its municipalities would like to obtain a service map from Price and Bayfield Electric Co-ops to use for emergencies and to share with the 9-1-1 Dispatch Center. The communities would also like to conduct a needs assessment to evaluate the needs,

budget, and begin projects for emergency back-up systems for community facilities around the county (to include emergency shelters). They would like to explore possible options including back-up generators, outdoor/mobile generator receiver panels, and other options.

The City of Ashland, City of Mellen, Village of Butternut, and unincorporated Glidden (in the Town of Jacobs) have sanitary sewer services. Most residences and businesses in towns rely on private septic systems and wells. Much of the County is served by private wells and septic systems. The City of Ashland, City of Mellen and the Village of Butternut have water services.

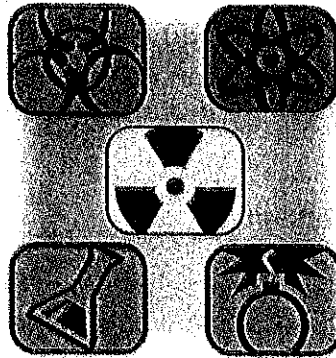
- City of Ashland
 - Work with utilities to place new local electrical distribution lines underground where applicable.
 - Conduct a needs assessment to evaluate the needs, budget and begin project for emergency backup systems (computer or mechanical) for the city's water treatment plant.
 - Evaluate the condition of older sewer infrastructure to ensure failures do not create cascading flooding issues.
 - Update facility maintenance plan for wastewater.
 - Replace all of the leaking/substandard sewer mains
- Village of Butternut
 - Insulate water mains
 - Replace all of the leaking/substandard sewer mains
 - Install a back-up generator for the sewer system.
- City of Mellen
 - Replace all of the leaking/substandard sewer mains
- Town of Jacobs Sanitary District
 - Replace all of the leaking/substandard sewer mains

Utility Failure

- Bayfield Electric Co-op
 - Bury overhead power lines where feasible to increase reliability. Project locations may include Odanah (Town of Sandborn) and Highbridge (Towns of Ashland and Marengo).
- Price Electric Co-op
 - Towns of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville, and Shanagolden: Conduct a study on line load and loss.
 - Town of Jacobs (Glidden): Upgrade wire, poles, arresters, and cut-outs to pinpoint outages from the Glidden substation to the Forest Service.

Non-Natural Disasters

As the communities in Ashland County completed their risk assessments, some non-natural disasters came to light. The communities decided to include an additional chapter in this plan so that there could be one location for reference regarding these concerns.



Civil Disturbance/Terrorism

Ashland County is concerned about the possibility of civil disturbance, terrorism or other intentional acts of violence in the community.

Physical Characteristics

Terrorism or "intentional acts of violence" is defined as the use of violence or the threat of violence to cause fear and intimidation to the community and/or government. This can be accomplished using explosives, weapons, biological agents, cyber-attacks, food supply tampering and other means.

Frequency of Occurrence

Intentional acts of violence are, unfortunately, very common but for the purposes of this plan we are discussing those that are large-scale and draw a large amount of response resources and/or community and media attention. The difference between these events and terrorism is that they may be personal in nature (e.g., school or workplace violence) versus having a political goal, as is seen in terrorism. Terrorism and intentional acts of violence incidents are rare and in general, Ashland County has a very low likelihood of occurrence with a high risk of damage, death or injury due if an incident does occur.

Vulnerability

Terrorism and large-scale intentional acts of violence are rare but when they do occur, they tend to very costly in terms of lost life, injuries, property damage and response costs.

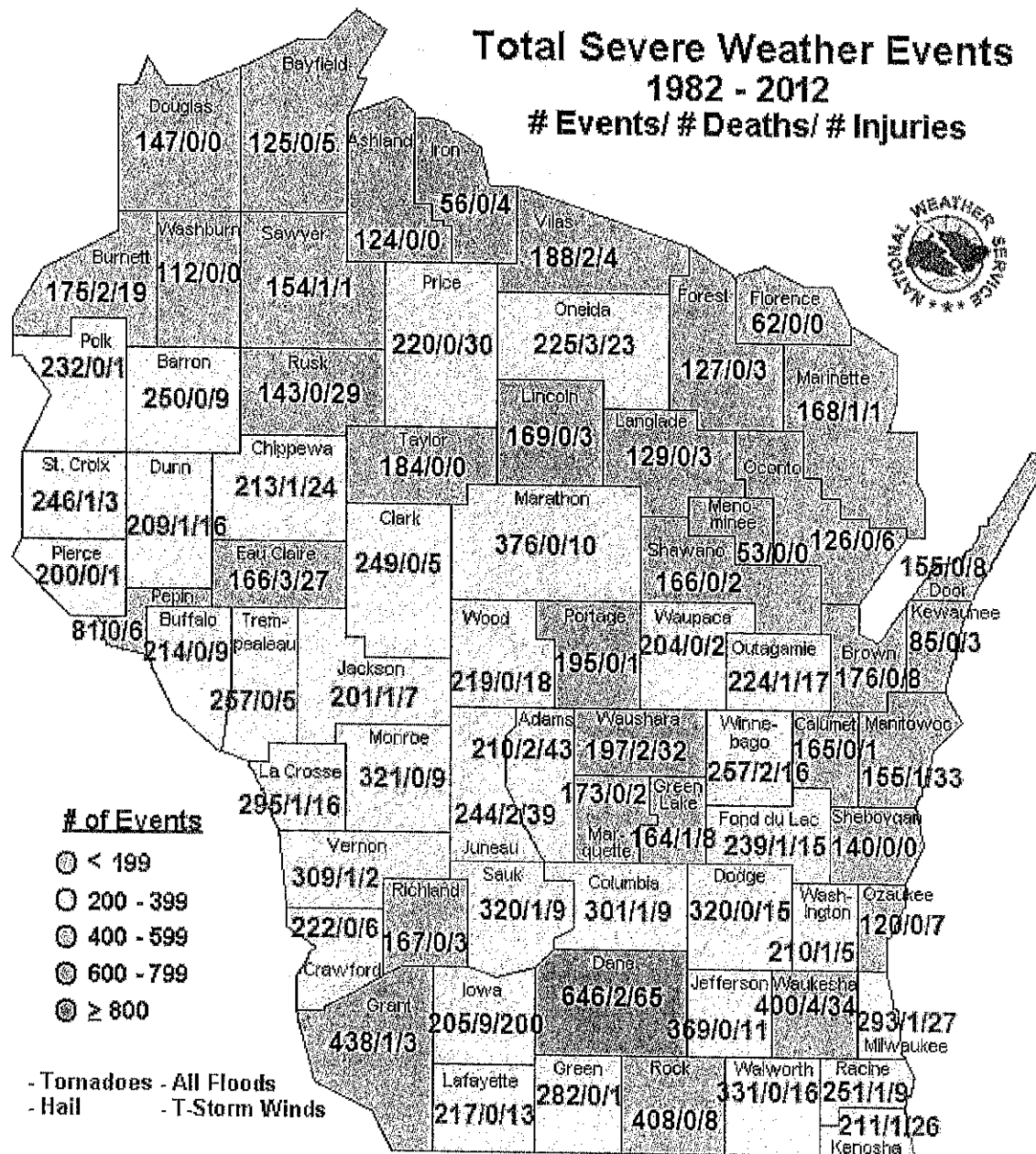
Hazard Mitigation Strategies

The goal of terrorism and intentional acts of violence incident mitigation activities is to reduce, in a cost effective manner, the loss of lives, injuries, and property damage due to these events. Hazard mitigation strategies include:

- City of Ashland
 - Complete planning for civil disturbance, terrorism and radiological emergencies.
 - Increase security measures in public buildings, including at Police Department and city administrative facilities.
 - Provide redundant municipal data systems for operation of municipal facilities and municipal operations.
 - Complete proper ventilation and mold elimination in public buildings.
 - Obtain surge protection at municipal facilities.
- Village of Butternut
 - Obtain security alarms, fire alarms and video cameras for municipal facilities.
- Town of Jacobs/Sanitary District.
 - Obtain security alarms, fire alarms and video cameras for municipal facilities.

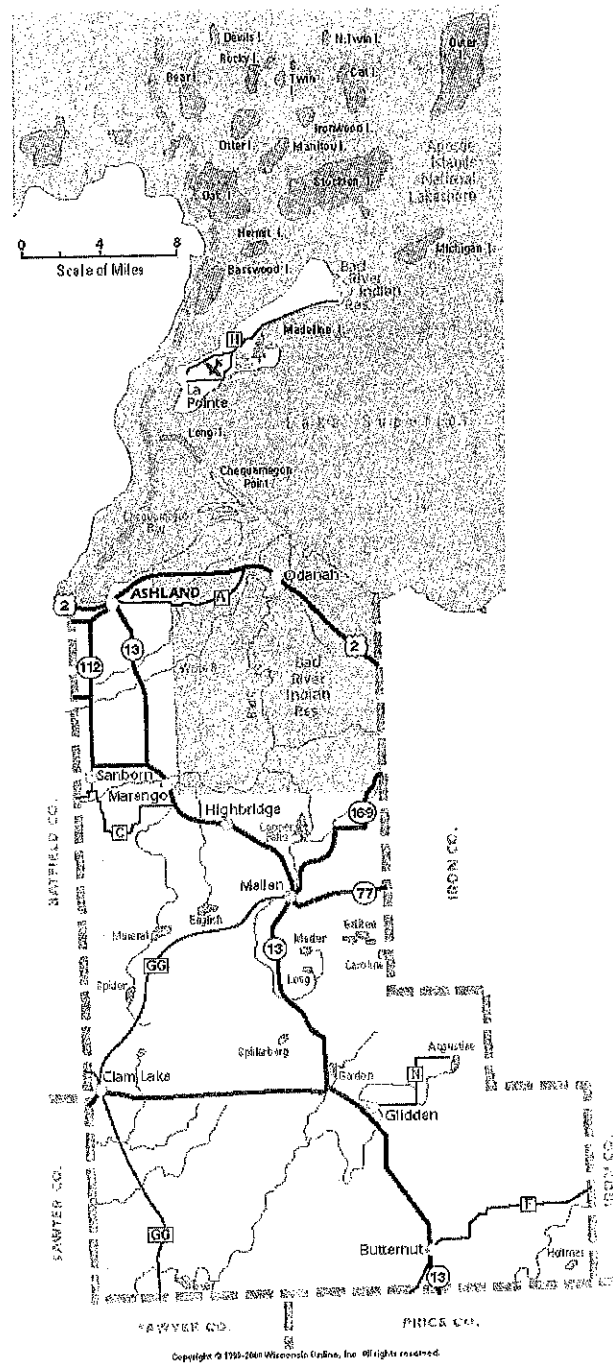
Appendix A: Maps Get revised maps from WEM

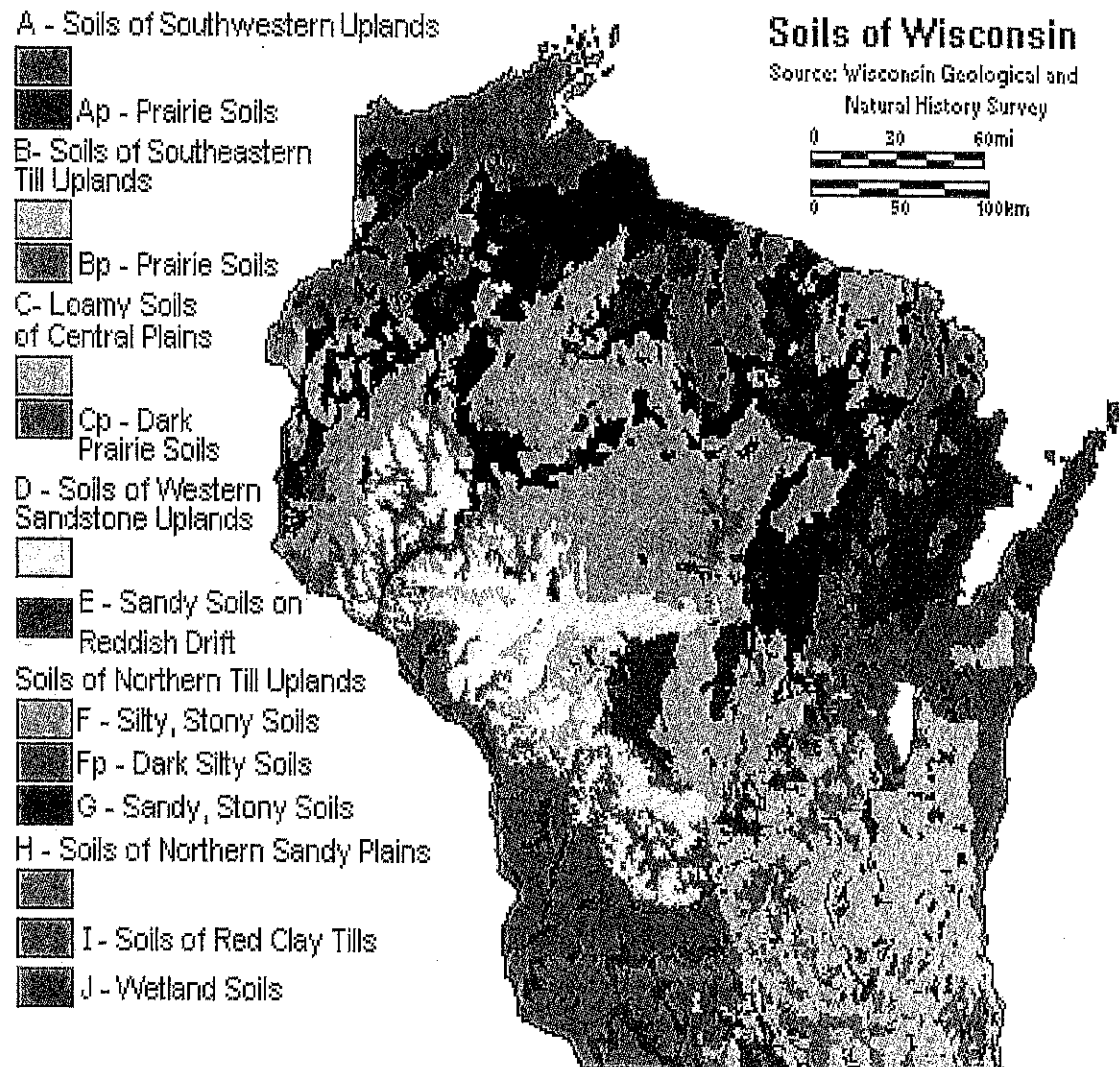
Wisconsin Total Severe Weather Events¹¹⁷



¹¹⁷ Wisconsin Emergency Management, State Hazard Mitigation Plan

Ashland County Base Map

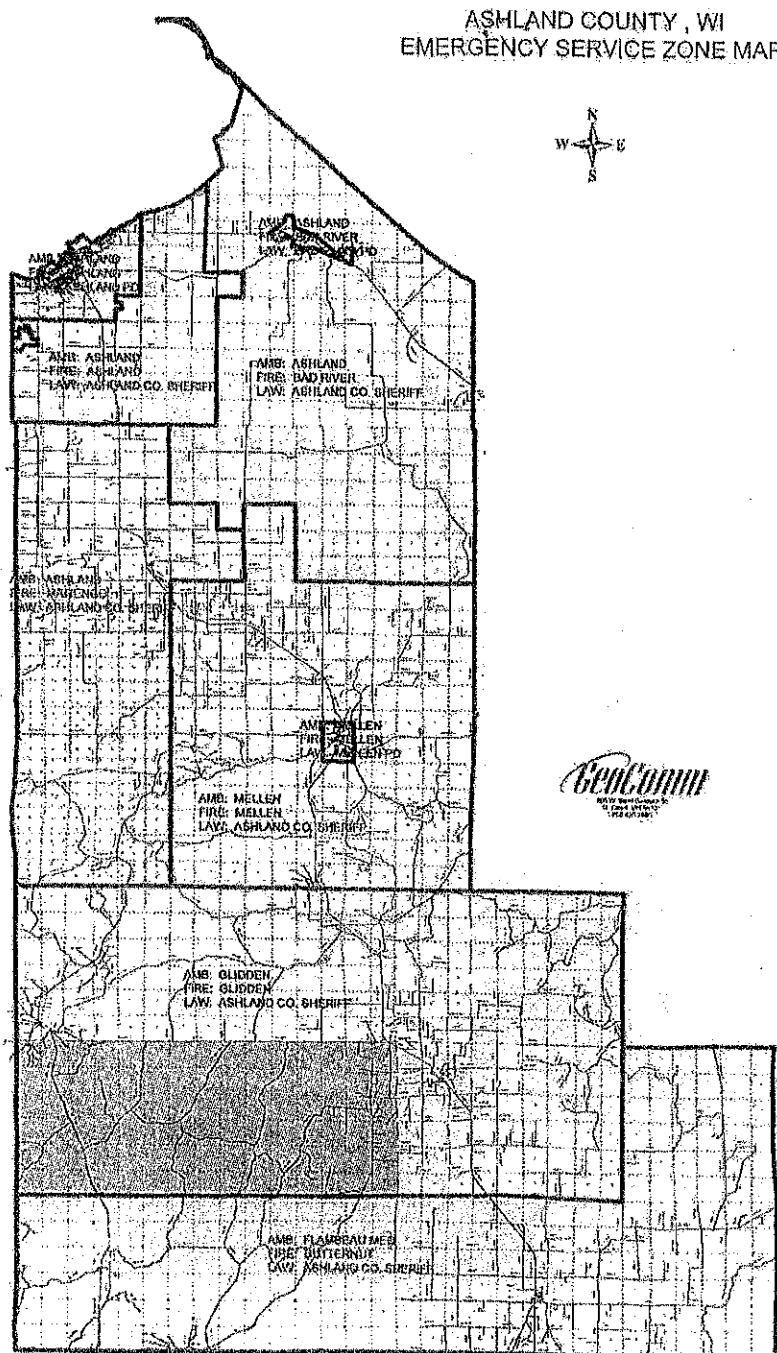


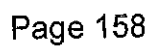
Soils Types¹¹⁸

¹¹⁸ Source: *Soils of Wisconsin* compiled by F. D. Hole, 1973; Wisconsin Geological and Natural History Survey Map, scale (approx.) 1: 3,150,000.

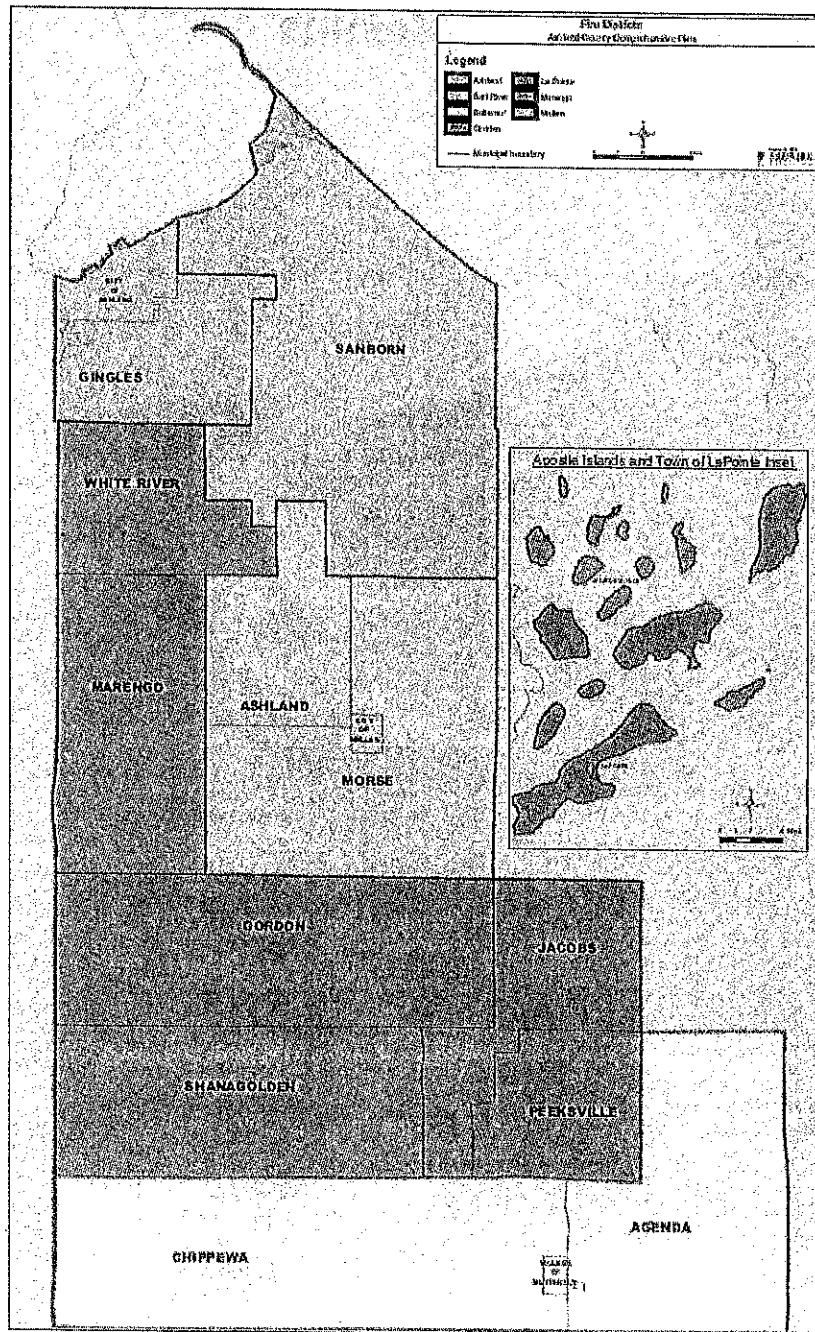


Ashland County Emergency Service Zone Map



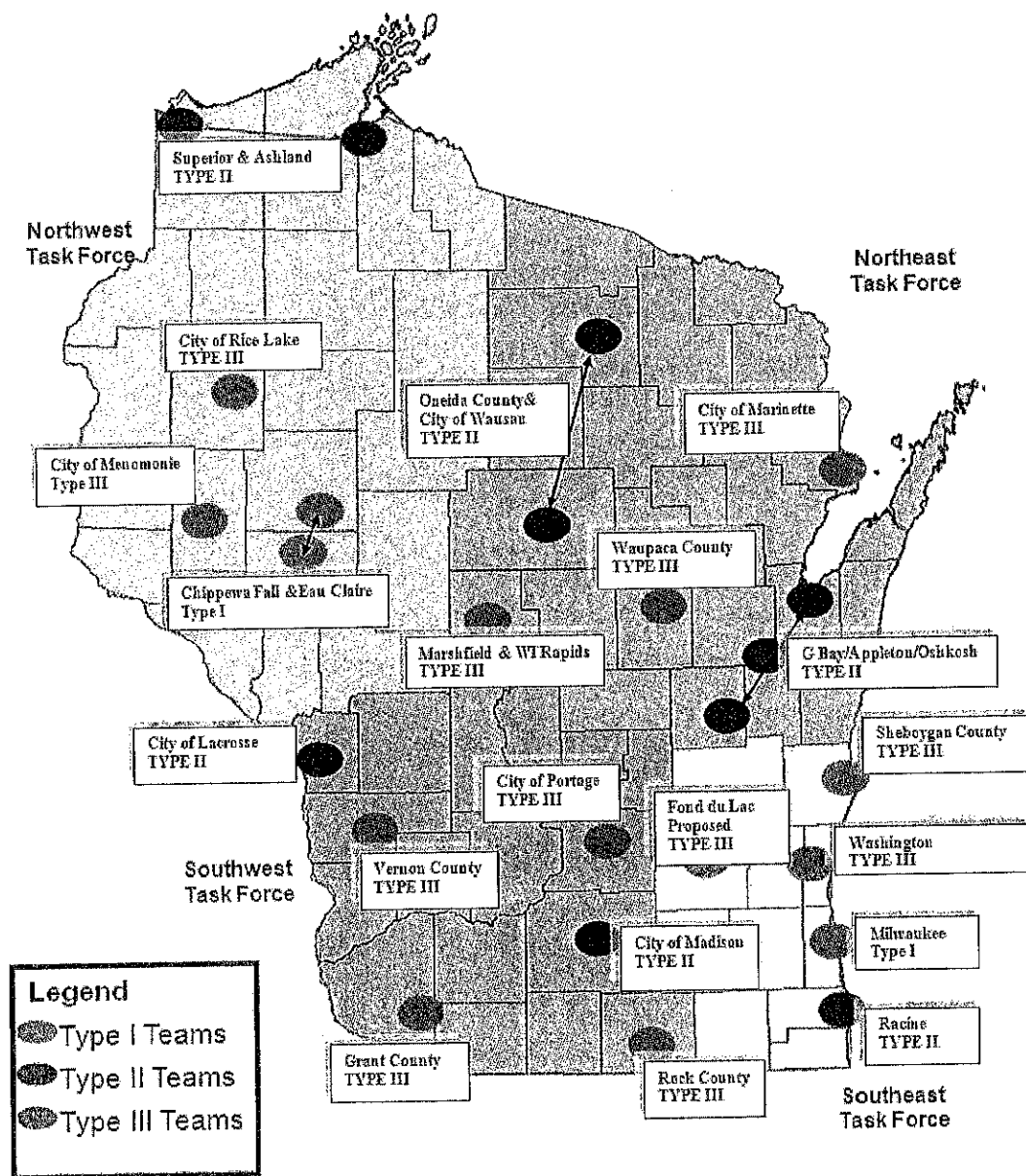


Ashland County Fire Districts



Wisconsin Hazardous Materials Response System¹¹⁹

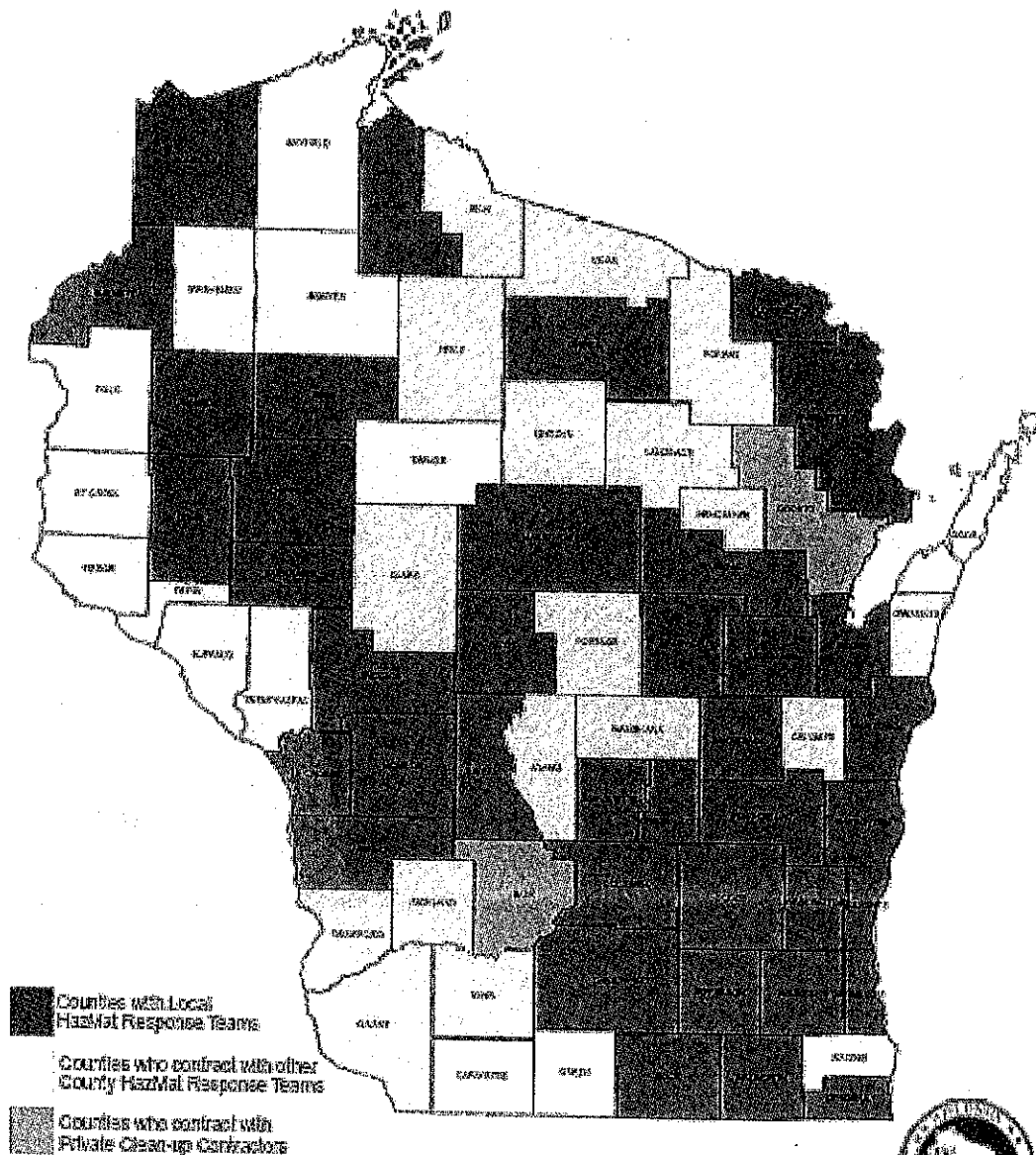
Wisconsin Hazardous Materials Response System



¹¹⁹ http://www.emergencymanagement.wi.gov/training/docs/Regional_Hazardous_Materials_Resp_Teams_Map.pdf

Wisconsin Hazardous Materials Response Teams¹²⁰

Wisconsin's County HazMat Response Teams



March 14, 2014

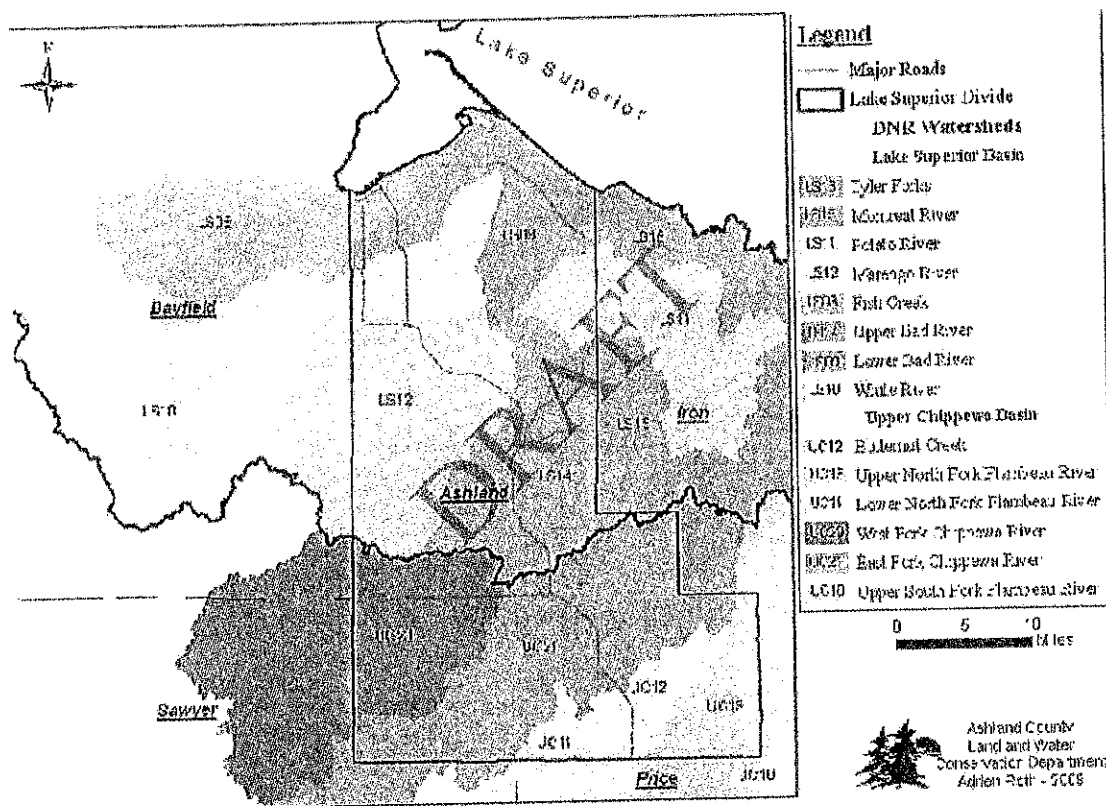
9-03, Page 1 of 1



¹²⁰ http://www.emergencymanagement.wi.gov/training/docs/County_Hazardous_Materials_Resp_Teams_Map.pdf

Ashland County Watersheds

Figure G: Ashland County Watersheds - Mainland



Please note - the 17 Apostle Islands within Ashland County are considered part of the Bayfield Peninsula SE watershed, not depicted in Figure G.

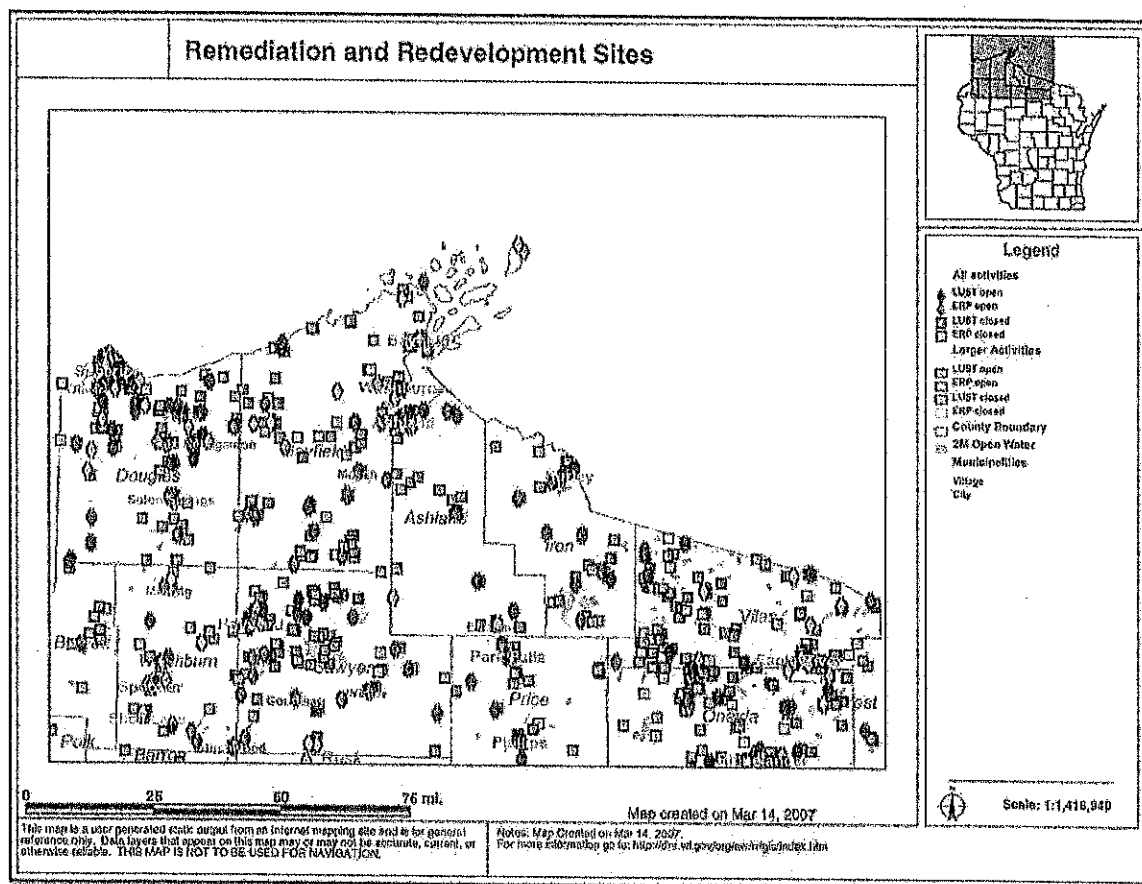
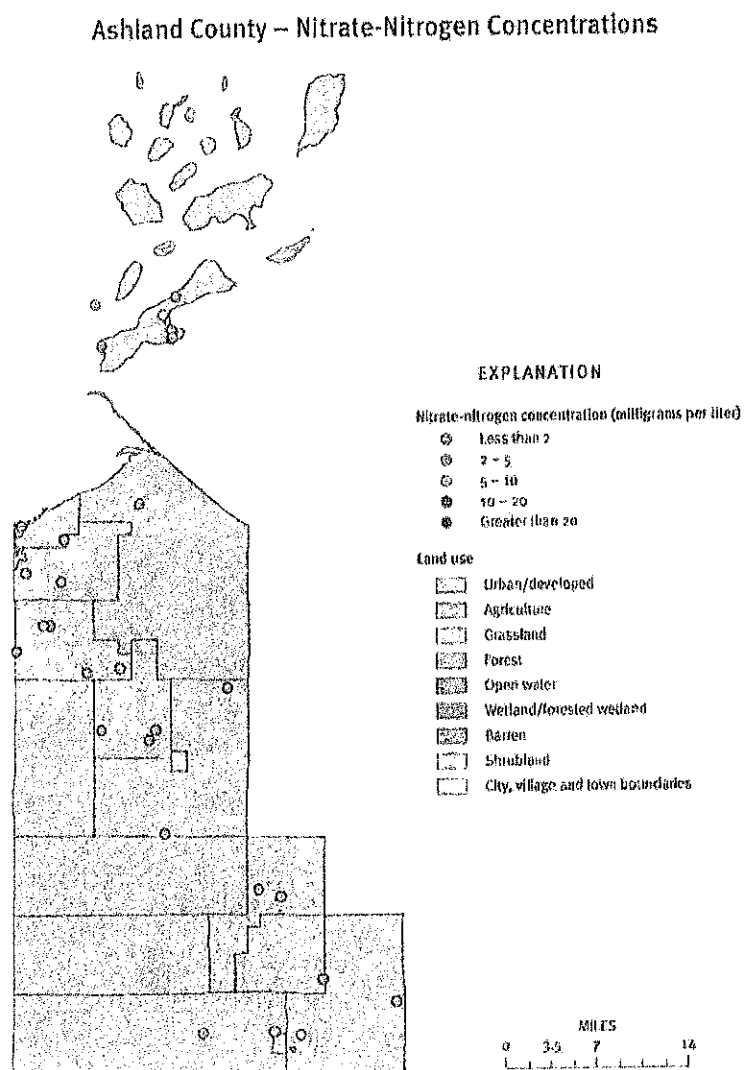
Ashland County Sites of Contaminated Soil/Groundwater¹²¹

Figure created for the "Protecting Wisconsin's Groundwater Through Comprehensive Planning" web site, 2007, <http://wi.water.usgs.gov/gwcomp/>

¹²¹ <https://dnr.wi.gov/botw/SetUpBasicSearchForm.do>

Ashland County Nitrate-Nitrogen Concentrations¹²²



Private well nitrate-nitrogen data presented on this map should not be considered comprehensive. Data are from sampling conducted during 1985-2004 as reported by the Wisconsin Department of Natural Resources, the Wisconsin Department of Agriculture, Trade and Consumer Protection, and the Central Wisconsin Groundwater Center. Data collected at other times or by other sources are not included.

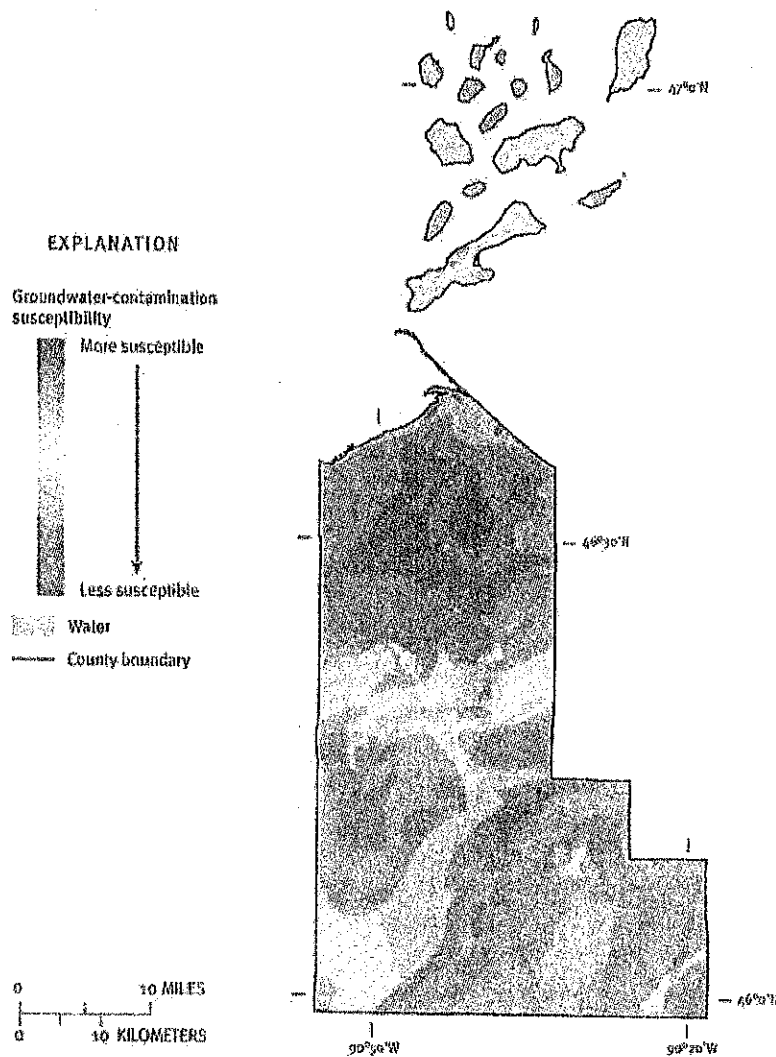
land cover data: Wisconsin Department of Natural Resources, 1998, WISLAND land cover (WLCW93a) 1991-1993, available at <http://from.dnr.state.wi.us/maps/gis/data/landcover.html>

Figure created by Raquel Mishowski, University of Wisconsin-Stevens Point, Center for Land Use Education, for the "Protecting Wisconsin's Groundwater Through Comprehensive Planning" web site, 2007, <http://ui.water.usgs.gov/gwcomp/>

¹²² <https://wi.water.usgs.gov/gwcomp/find/ashland/nitrate.html>

Ashland County Groundwater Contamination Susceptibility¹²³

Ashland County – Groundwater-Contamination Susceptibility Analysis



This groundwater-contamination susceptibility map is a composite of five resource characteristic maps, each of which was derived from generalized statewide information at small scales, and cannot be used for any site-specific purposes.

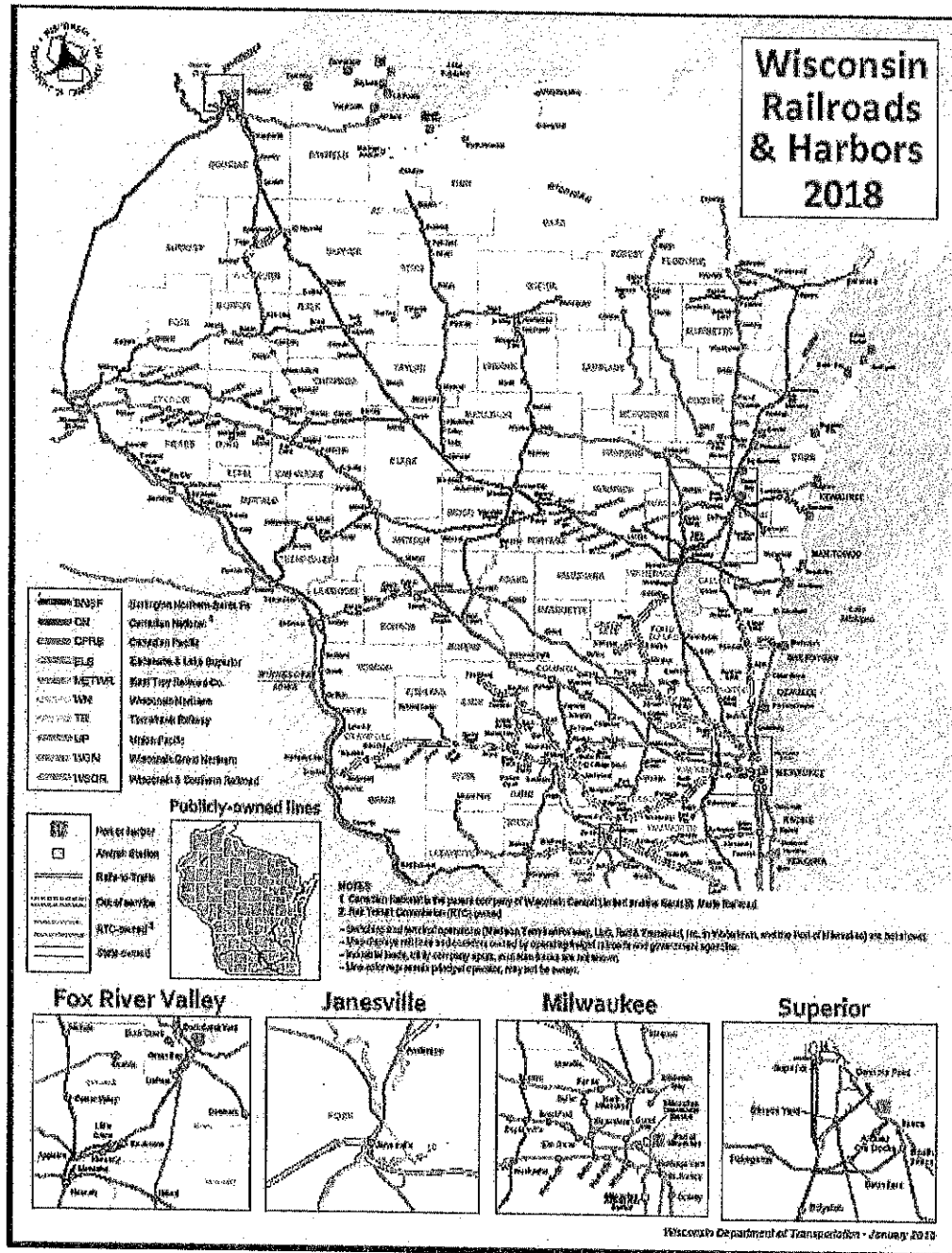
Map source: Schmidt, R.R., 1987, Groundwater contamination susceptibility map and evaluation Wisconsin Department of Natural Resources, Wisconsin's Groundwater Management Plan Report 5, PUBL-WR-177-87, 27 p.

Figure created for the "Protecting Wisconsin's Groundwater Through Comprehensive Planning" web site, 2007, <http://wi.water.usgs.gov/gwcomp/>

¹²³ <https://wi.water.usgs.gov/gwcomp/find/ashland/susceptibility.html>

Appendix A: Maps

Wisconsin Railroads and Harbors¹²⁴

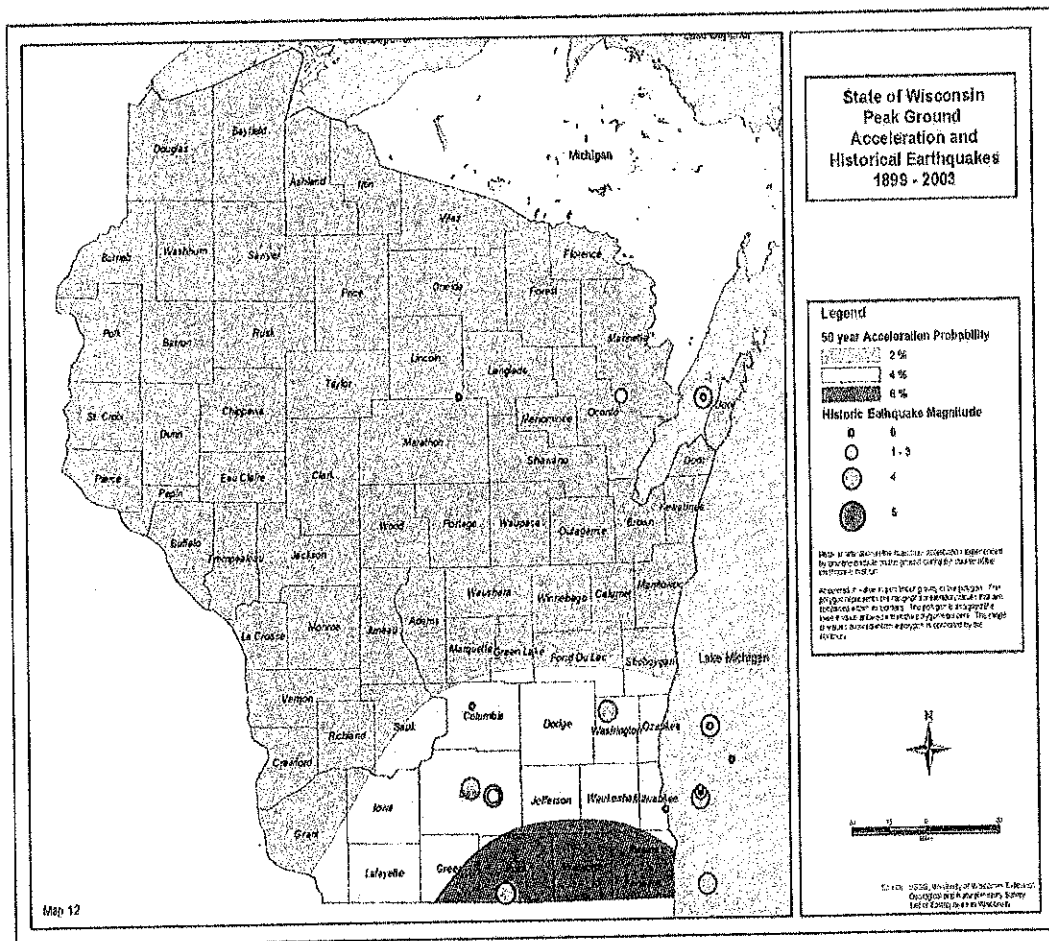


¹²⁴ <http://wisconsin.gov/Documents/travel/rail/railmap.pdf>

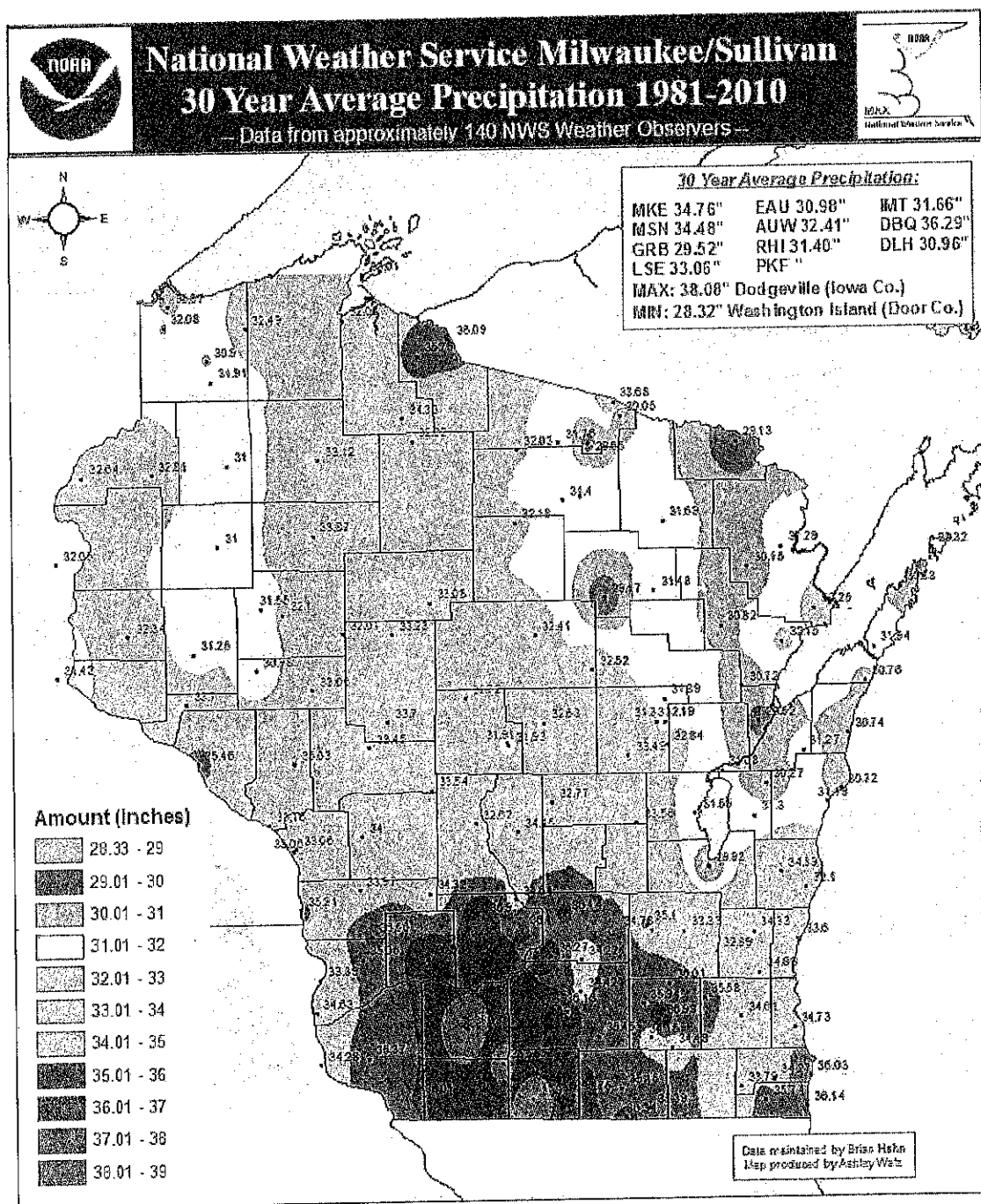
Appendix A: Maps

Earthquakes in Wisconsin¹²⁵

Peak Ground Acceleration Contours and Historical Earthquakes in Wisconsin

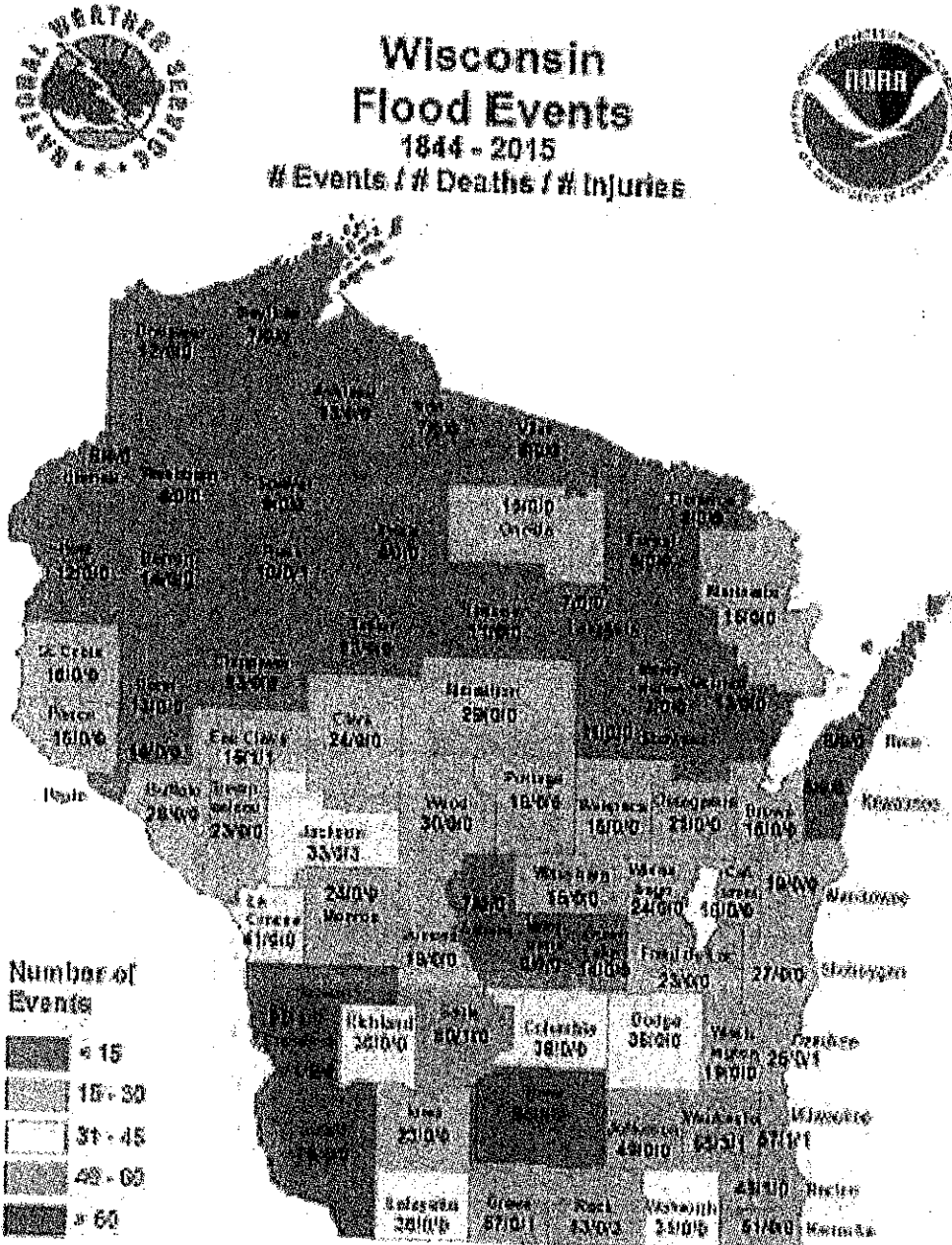


Wisconsin Annual Precipitation¹²⁷



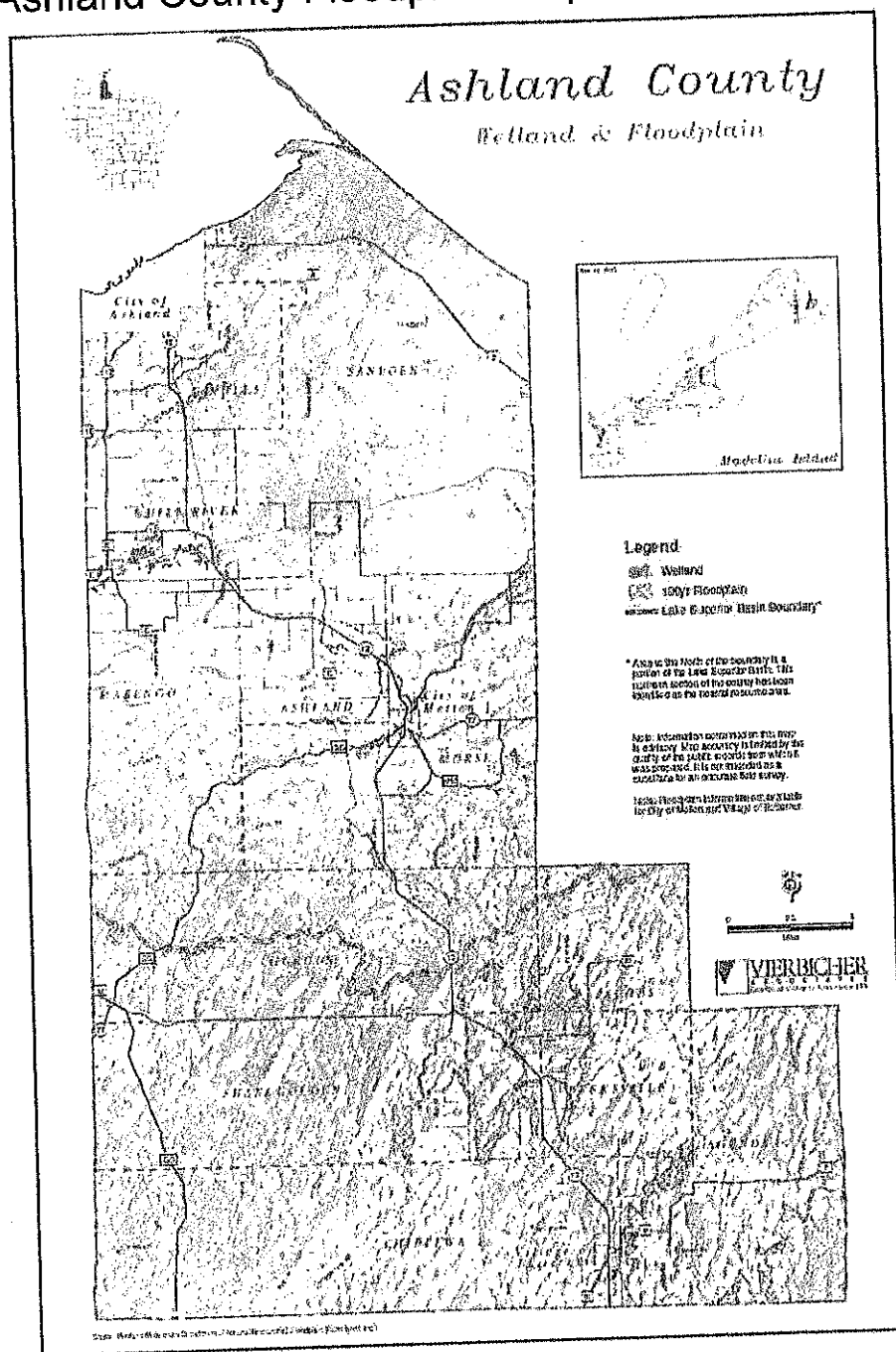
¹²⁷ http://www.crh.noaa.gov/images/mkx/climate/avg_30_year_precip.png

Wisconsin Total Flood Events¹²⁸

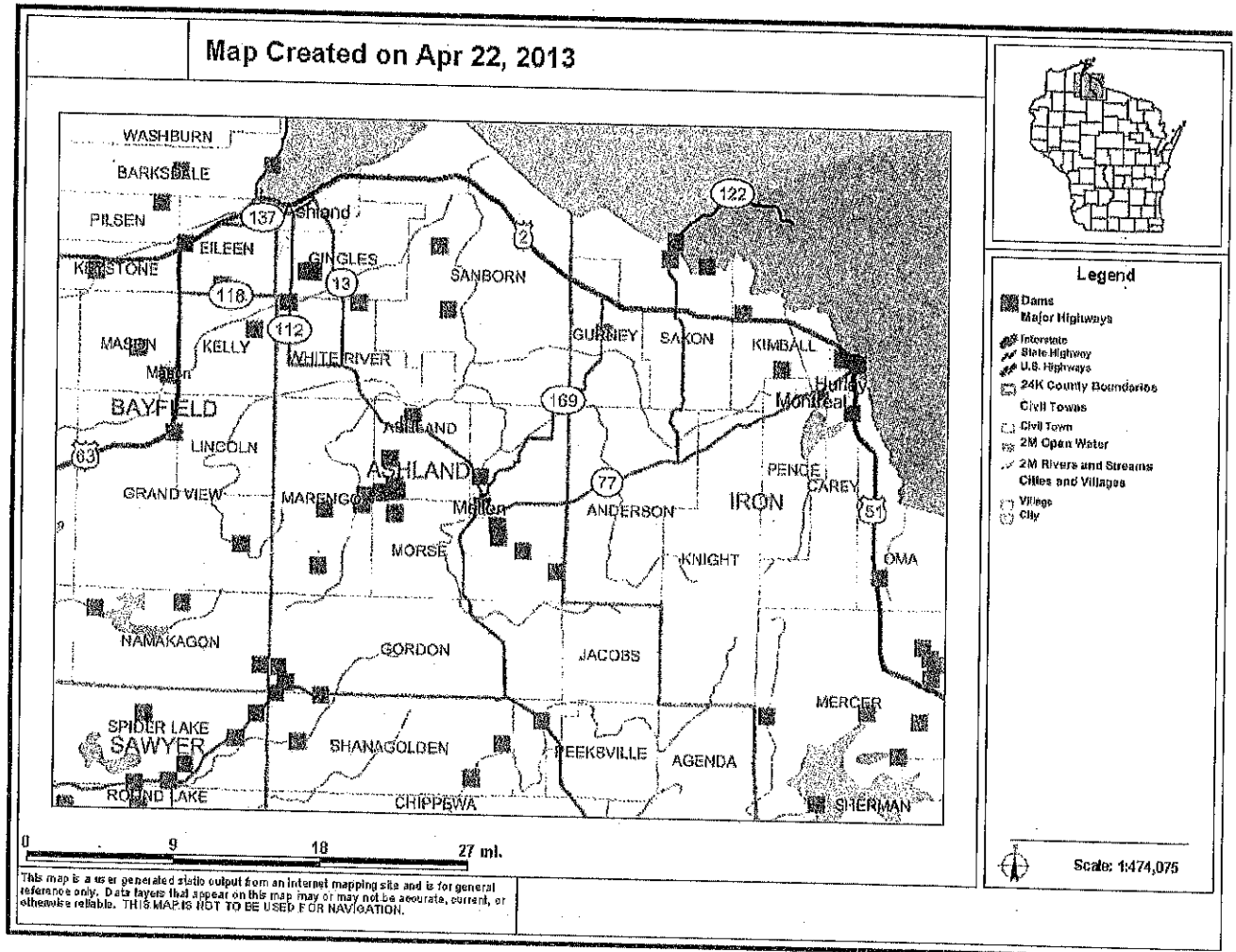


¹²⁸ Wisconsin Emergency Management, State Hazard Mitigation Plan

Ashland County Floodplain Map

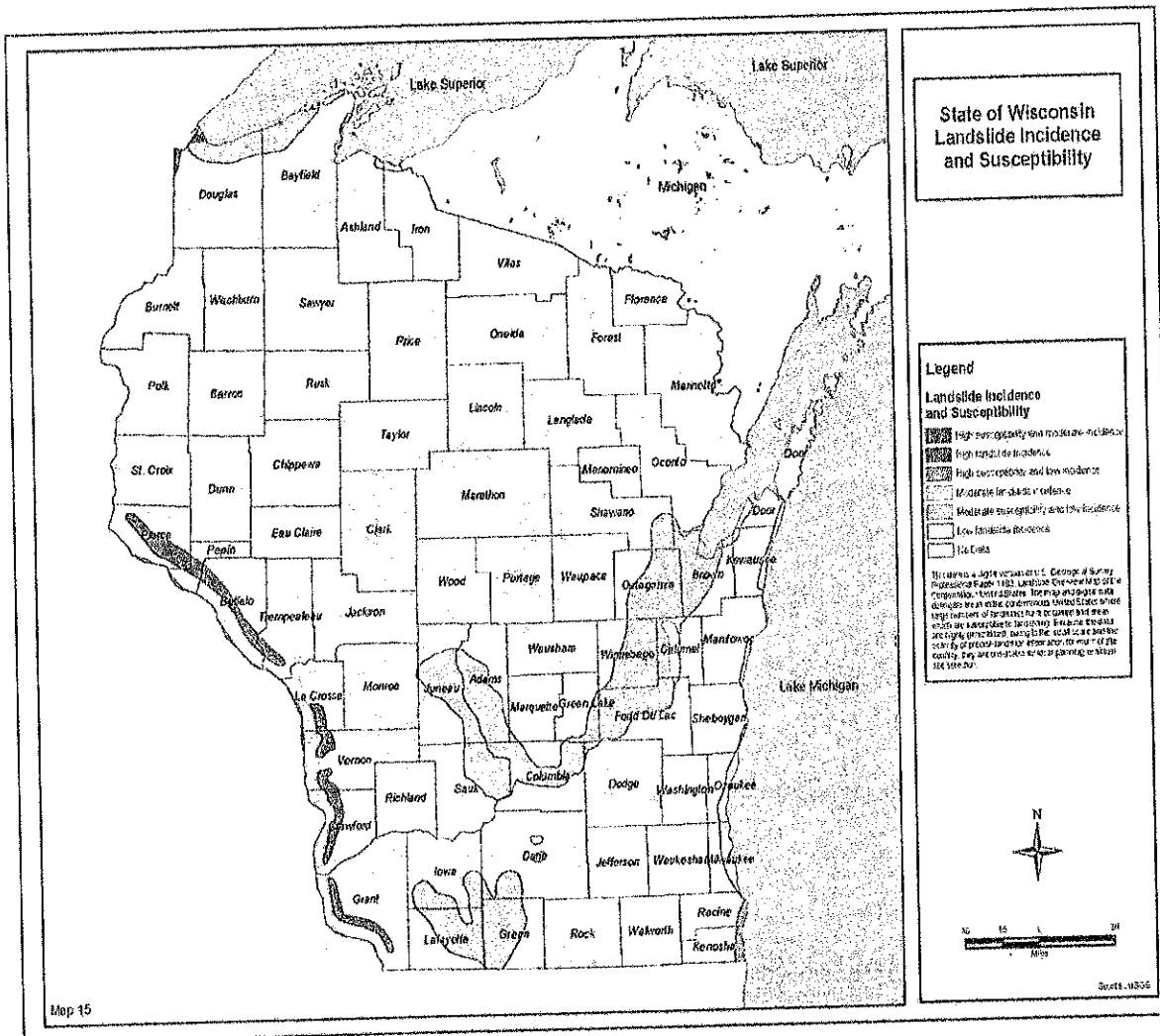


Ashland County Dams¹²⁹



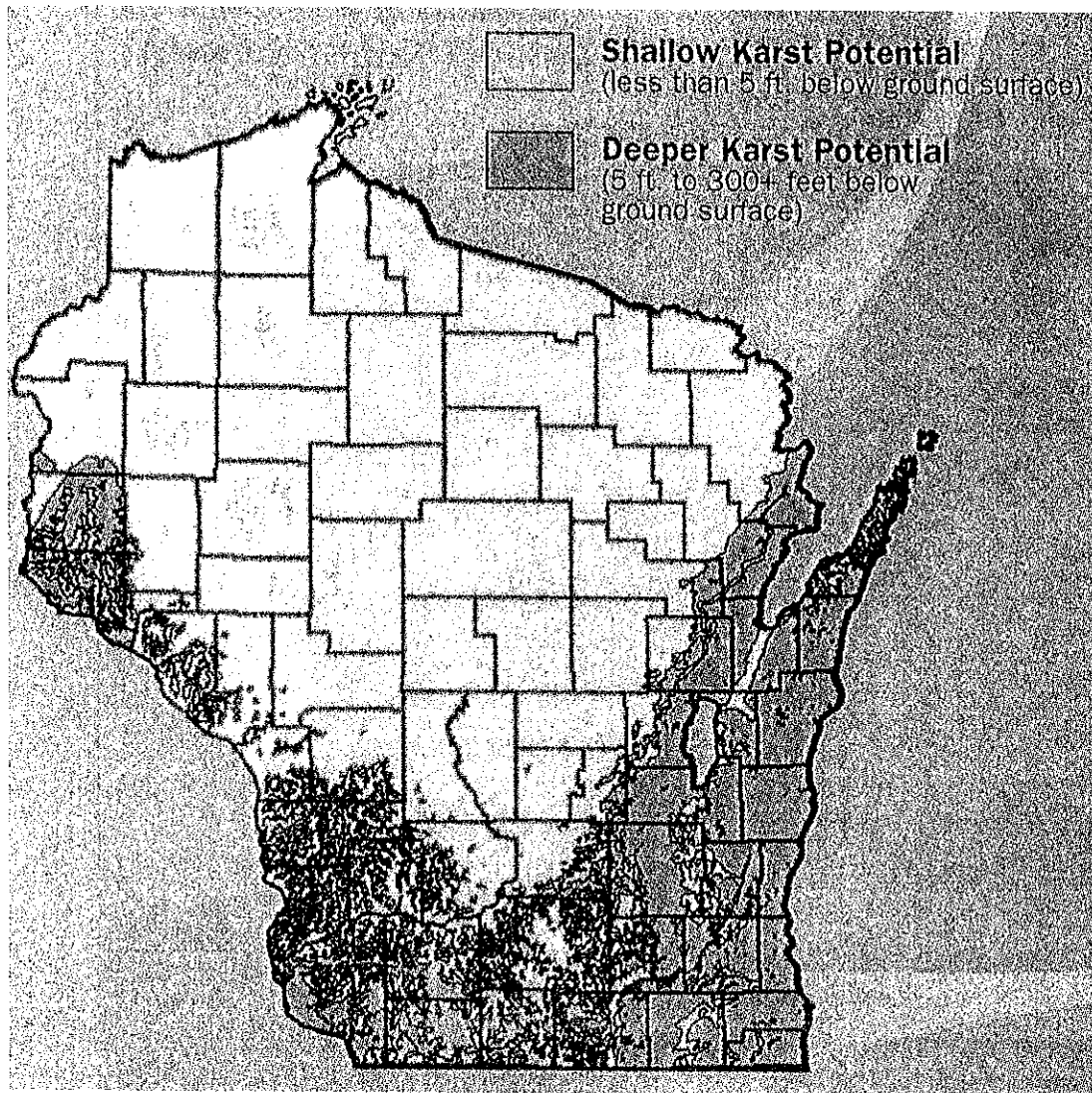
¹²⁹ <http://dnrm.wisconsin.gov/imf/imf.jsp?site=SurfaceWaterViewer>

Landslide Incidence and Susceptibility¹³⁰



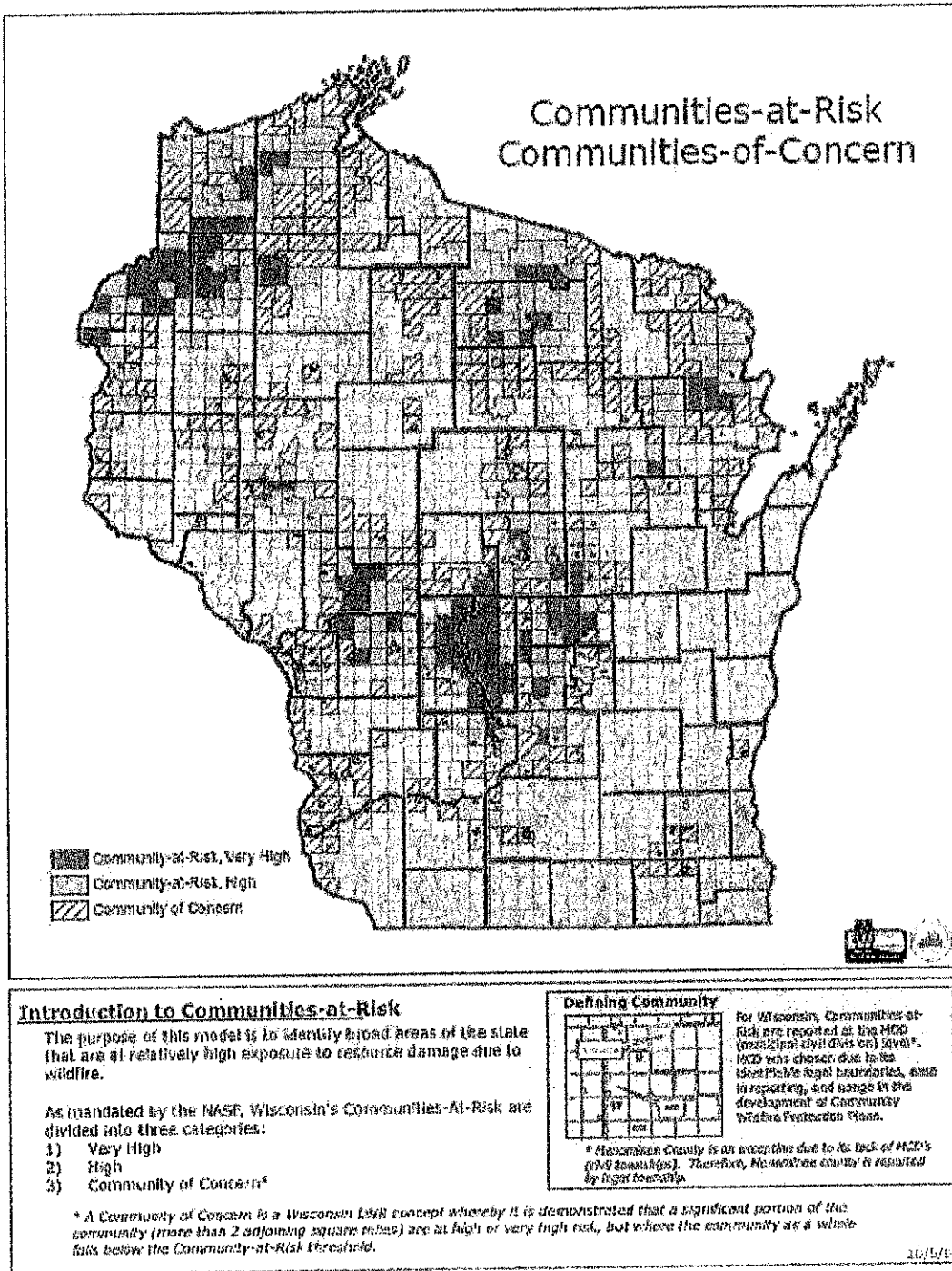
¹³⁰ Wisconsin Emergency Management, State Hazard Mitigation Plan
Page 174

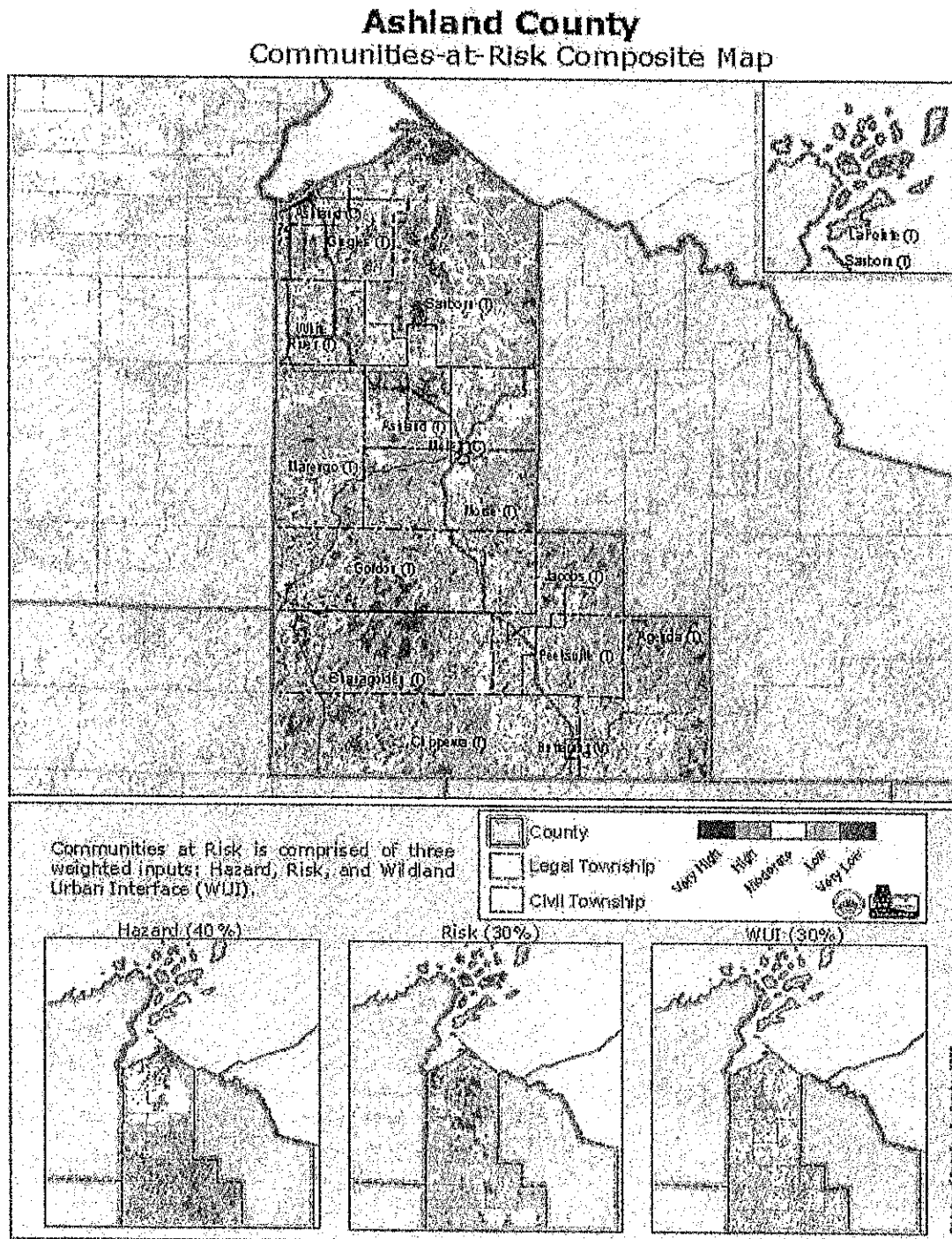
Karst Potential¹³¹



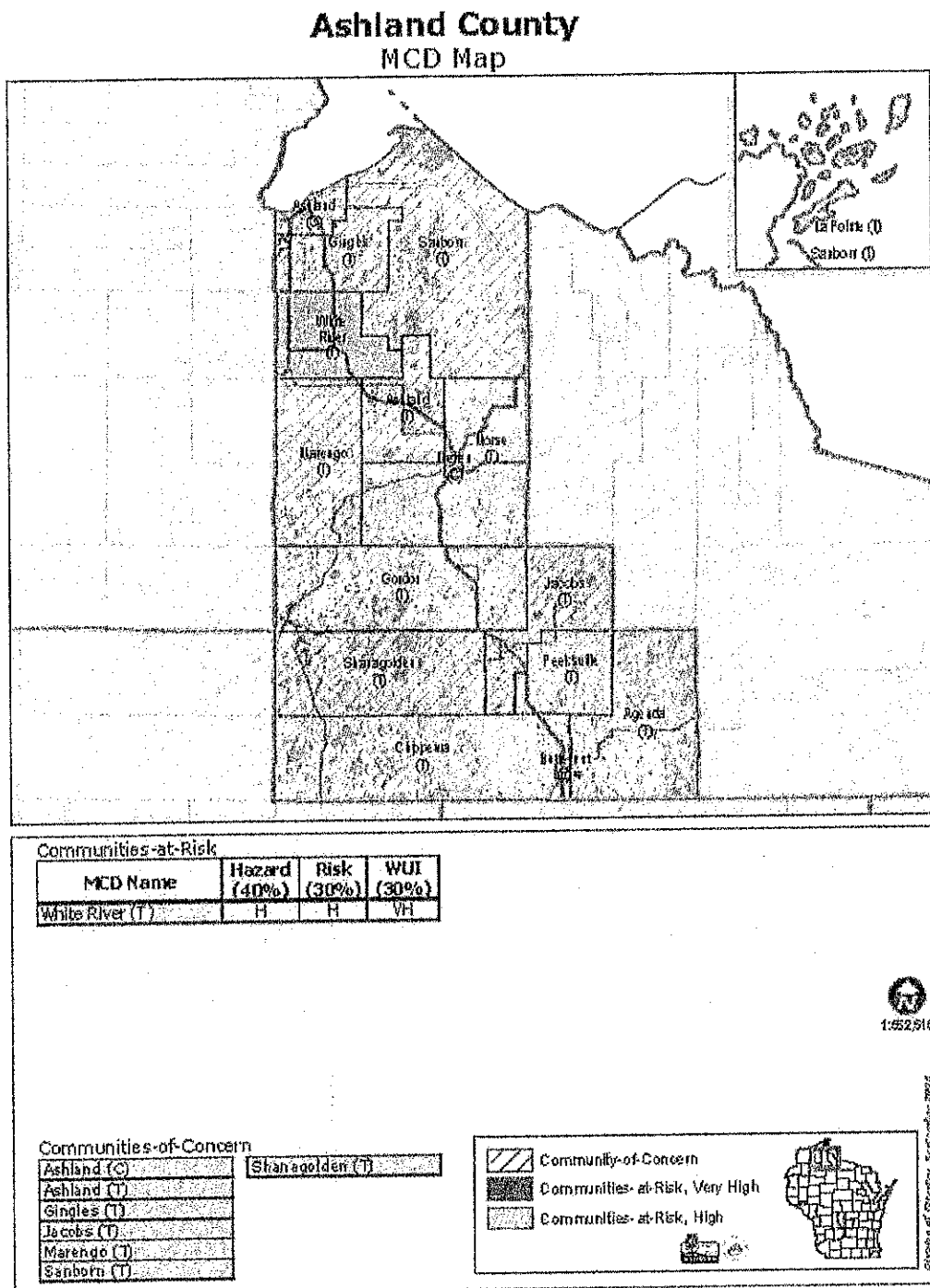
¹³¹ Wisconsin Emergency Management, State Hazard Mitigation Plan

Wildfire Communities-at-Risk¹³²

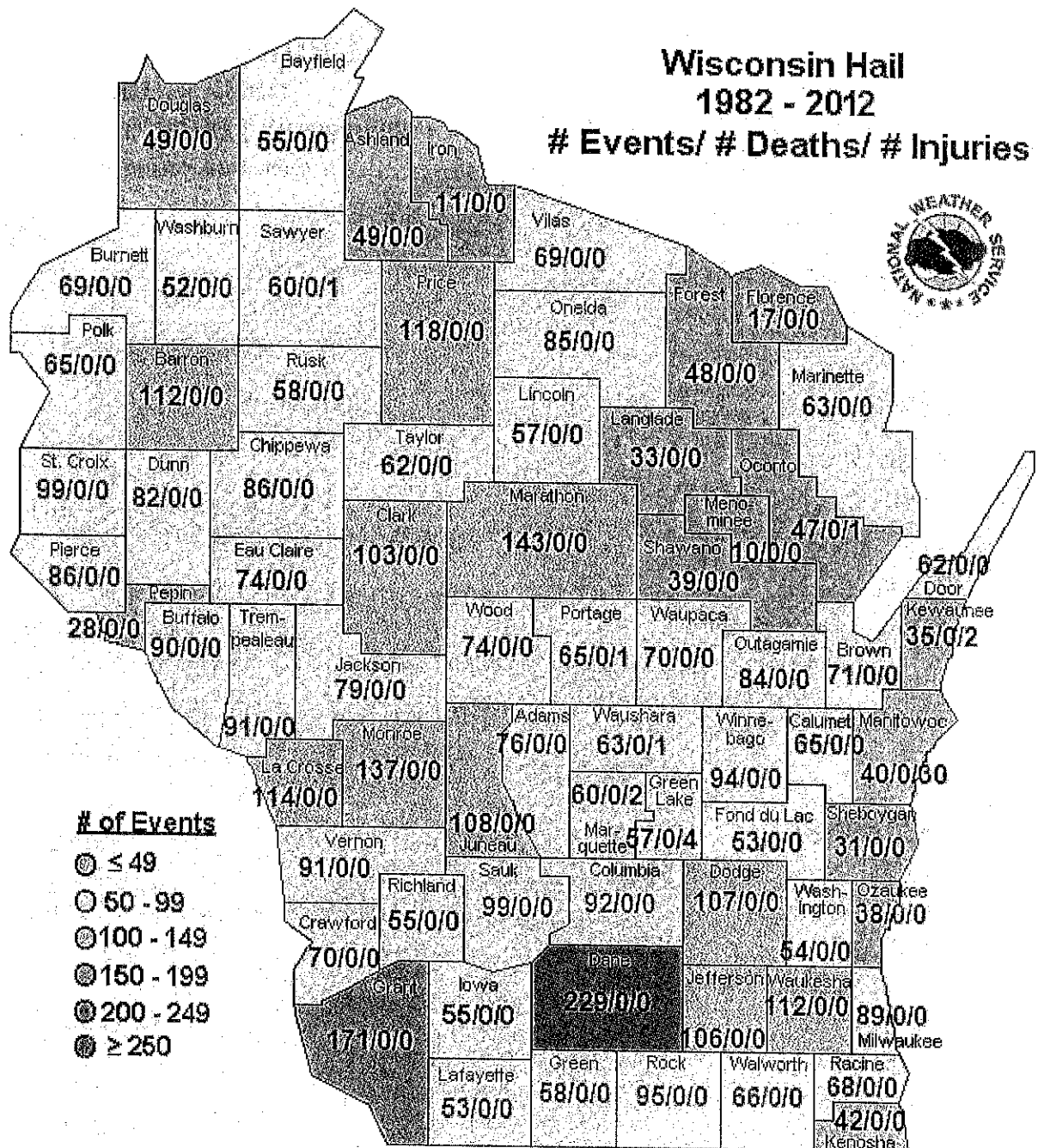


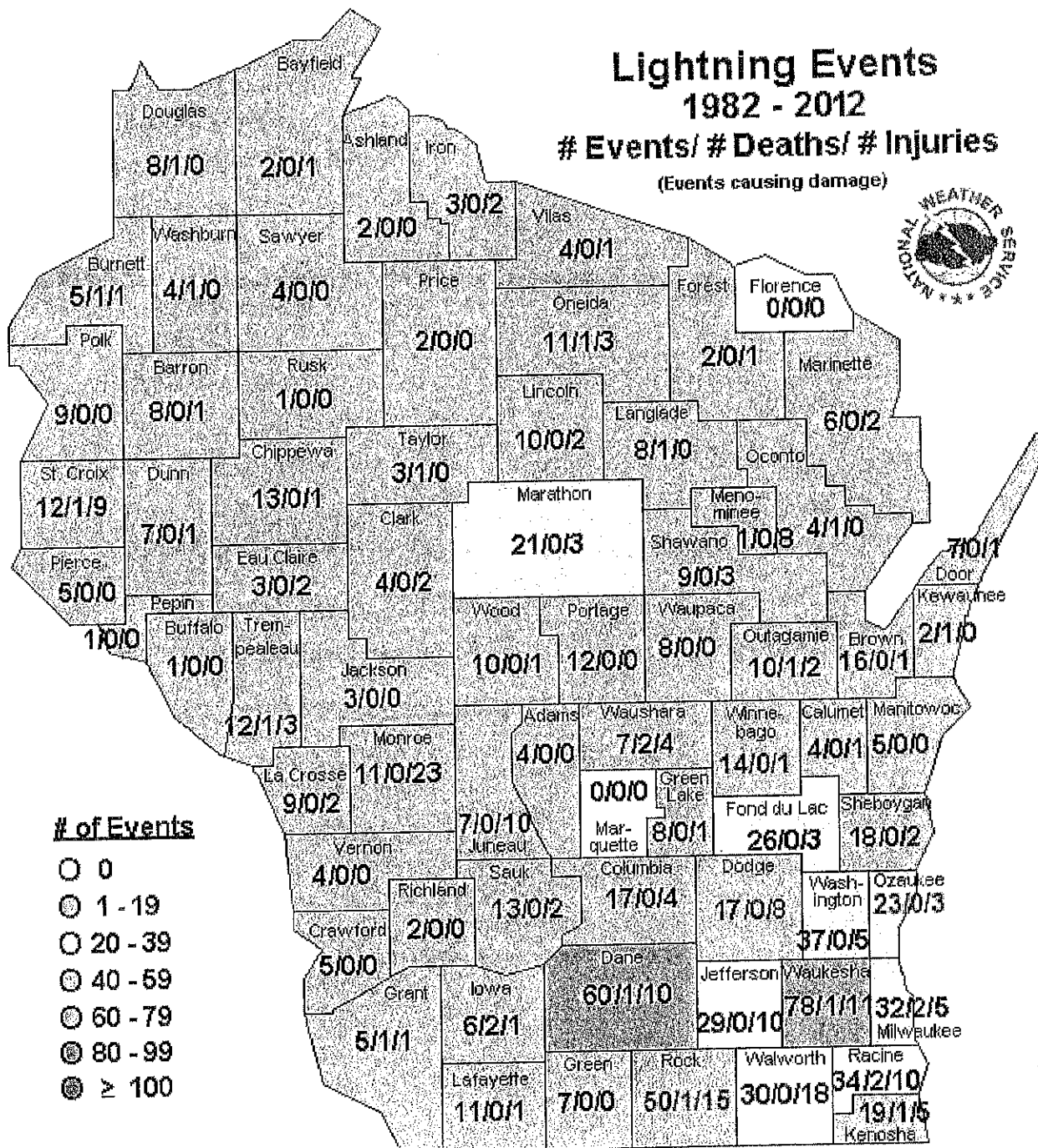
Wildfire Communities-at-Risk Composite Map¹³³¹³³ Wisconsin Department of Natural Resources

Wildfire Communities-at-Risk Municipal Map¹³⁴

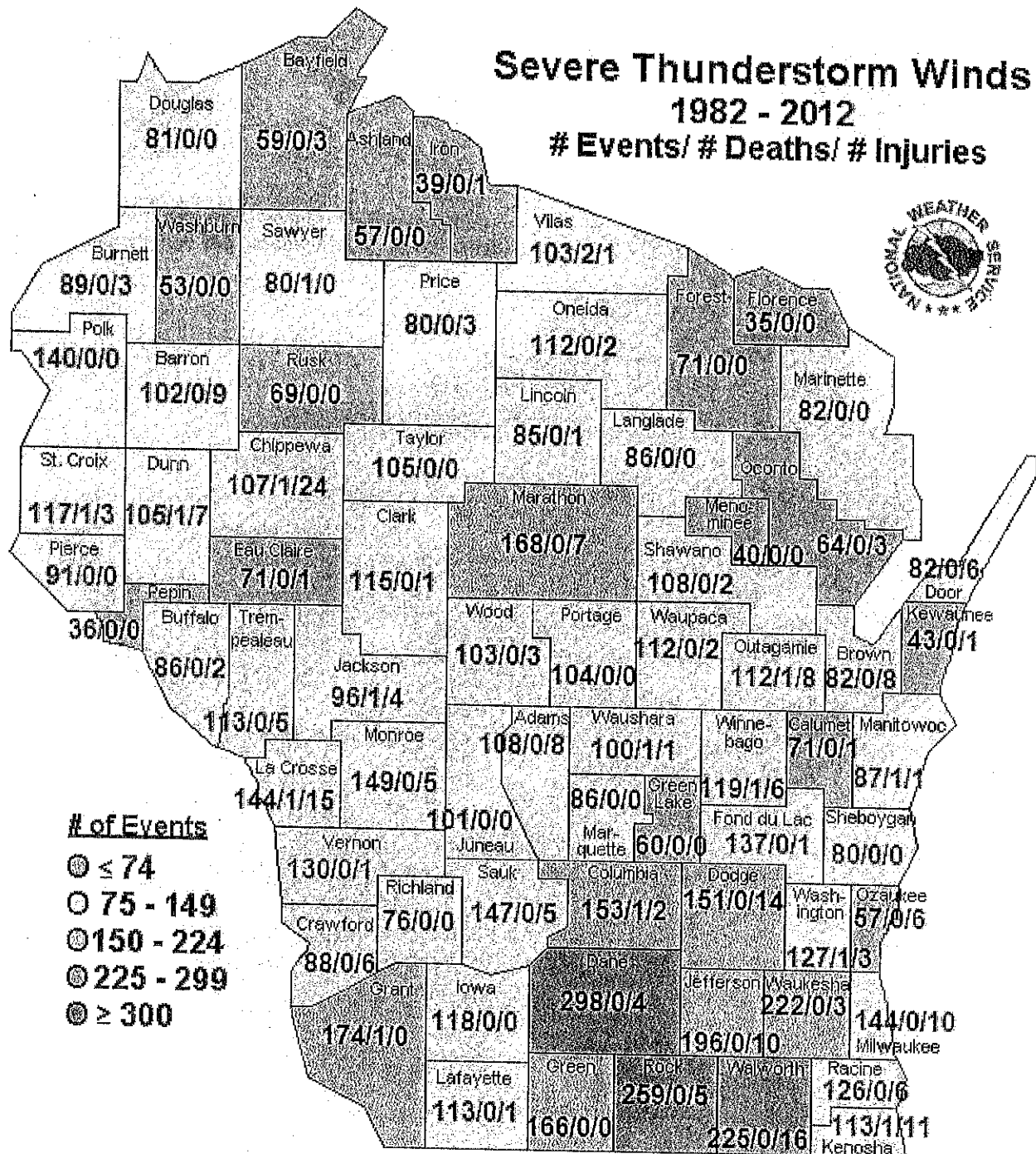


Wisconsin Hail 135



Wisconsin Lightning¹³⁶

¹³⁶ Wisconsin Emergency Management, State Hazard Mitigation Plan
Page 180

Wisconsin Severe Thunderstorm Winds¹³⁷¹³⁷ Wisconsin Emergency Management, State Hazard Mitigation Plan

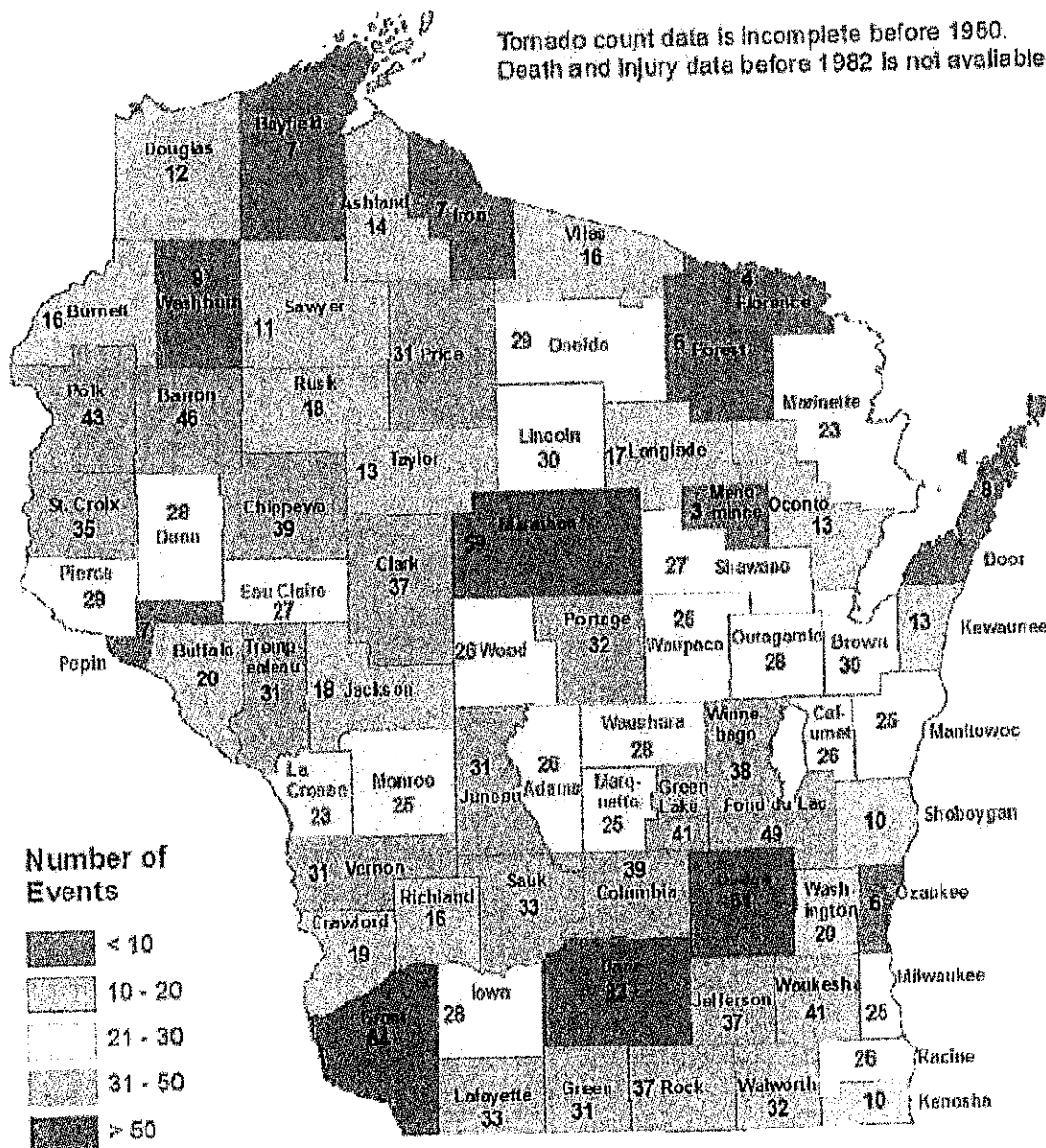
Wisconsin Tornadoes (1844-2017)¹³⁸



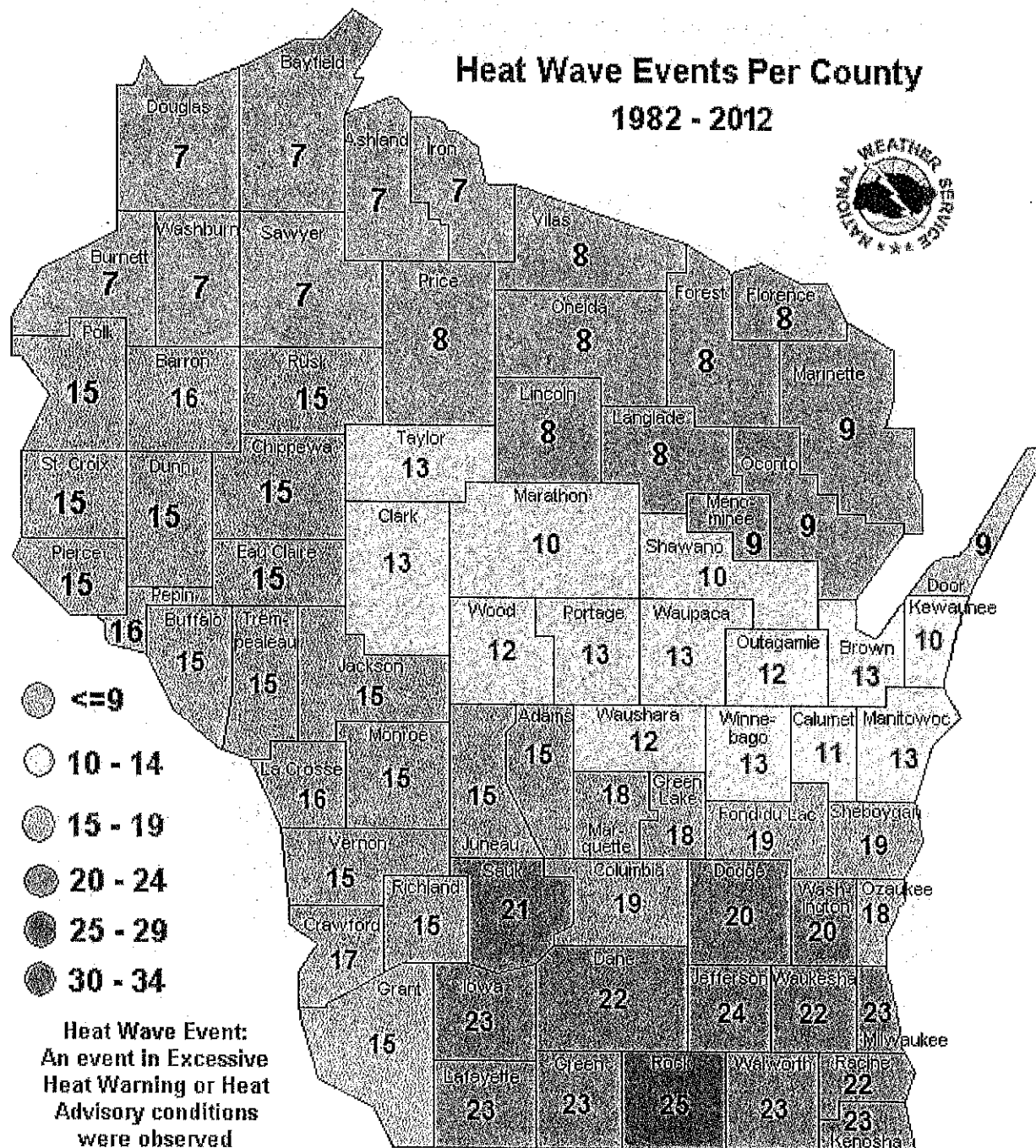
Wisconsin Tornado Events 1844 - 2017



Tornado count data is incomplete before 1950.
Death and injury data before 1982 is not available.

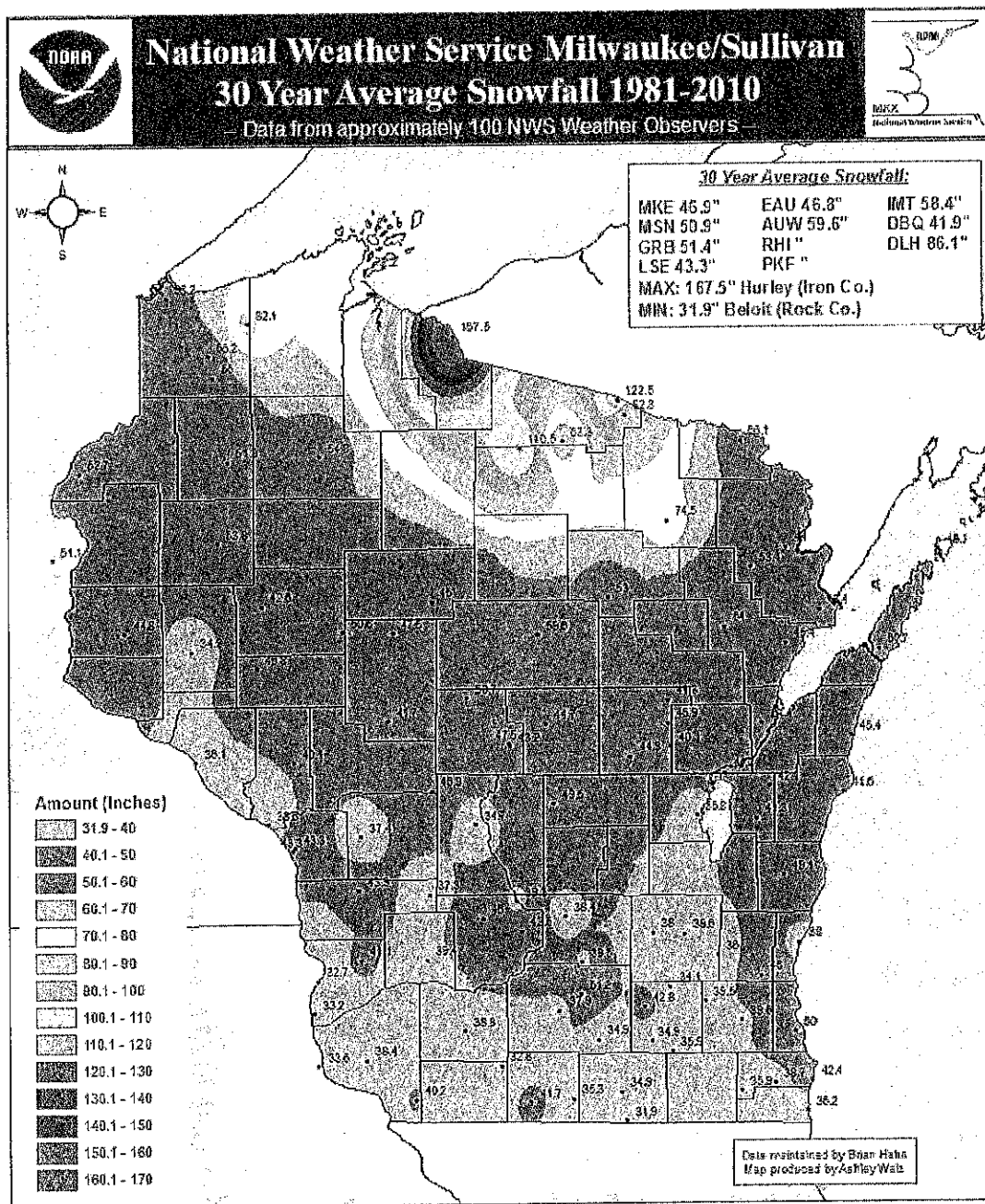


¹³⁸ National Weather Service – Milwaukee Sullivan Office

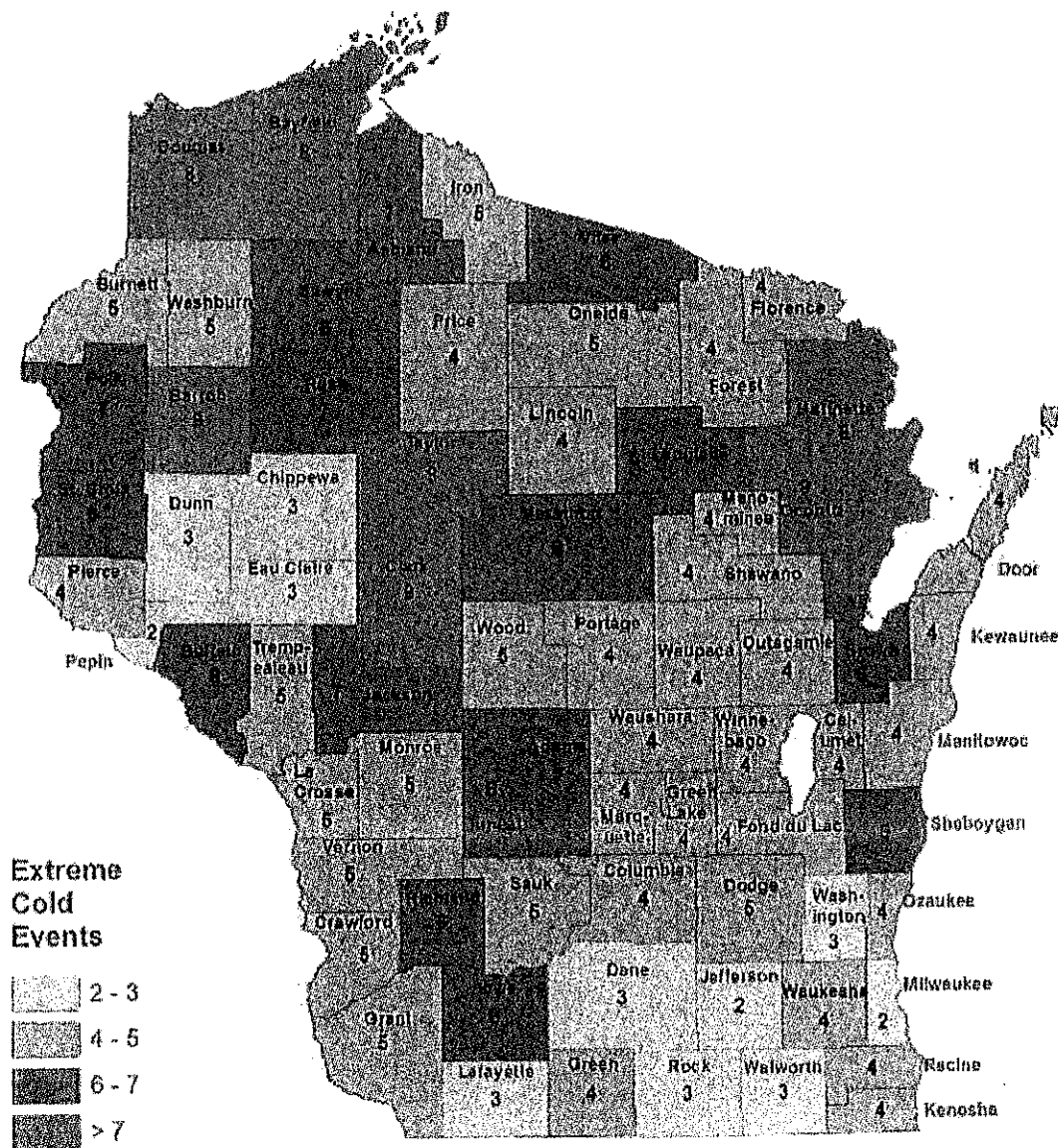
Wisconsin Heat Wave Events¹³⁹¹³⁹ Wisconsin Emergency Management, State Hazard Mitigation Plan

Appendix A: Maps

Wisconsin Average Snowfall¹⁴⁰



¹⁴⁰ http://www.crh.noaa.gov/images/mkx/climate/avg_30_year_snowfall.png

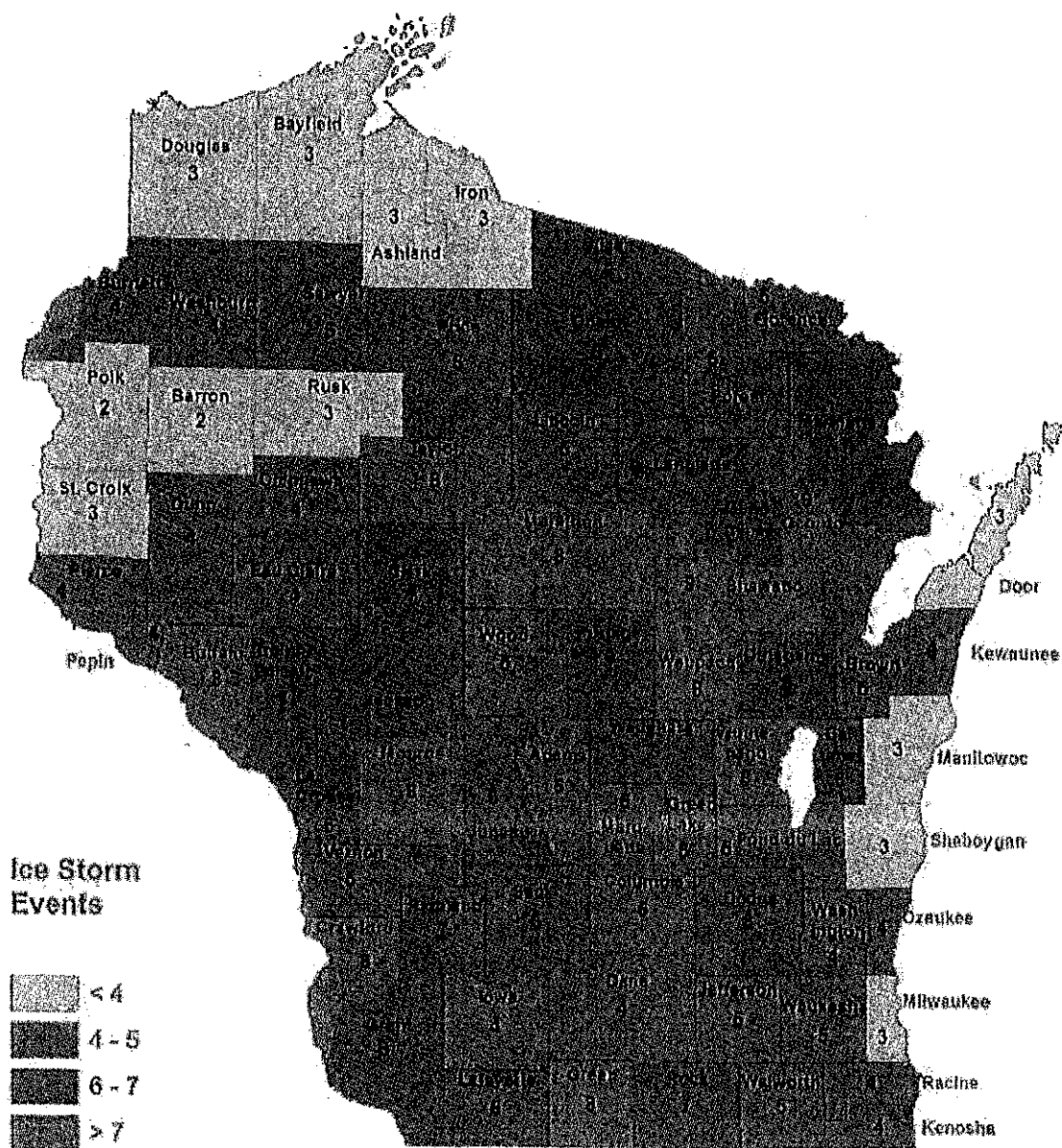


Wisconsin Ice Storm Events¹⁴³



Wisconsin Ice Storm Events

Winter 1982-83 - Winter 2017-18



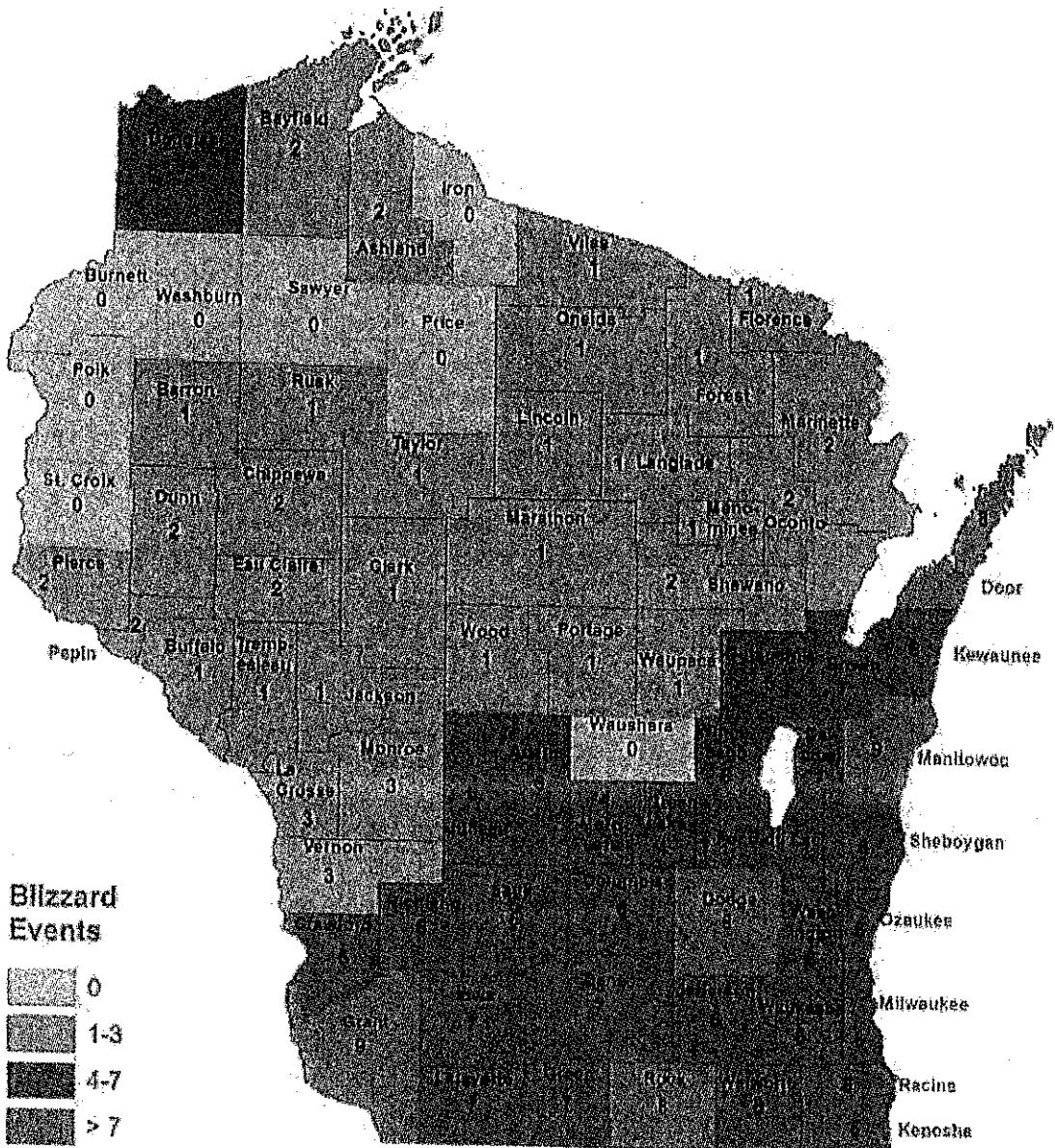
¹⁴³ National Weather Service – Milwaukee Sullivan Office

Appendix A: Maps

Wisconsin Blizzard Events¹⁴⁴

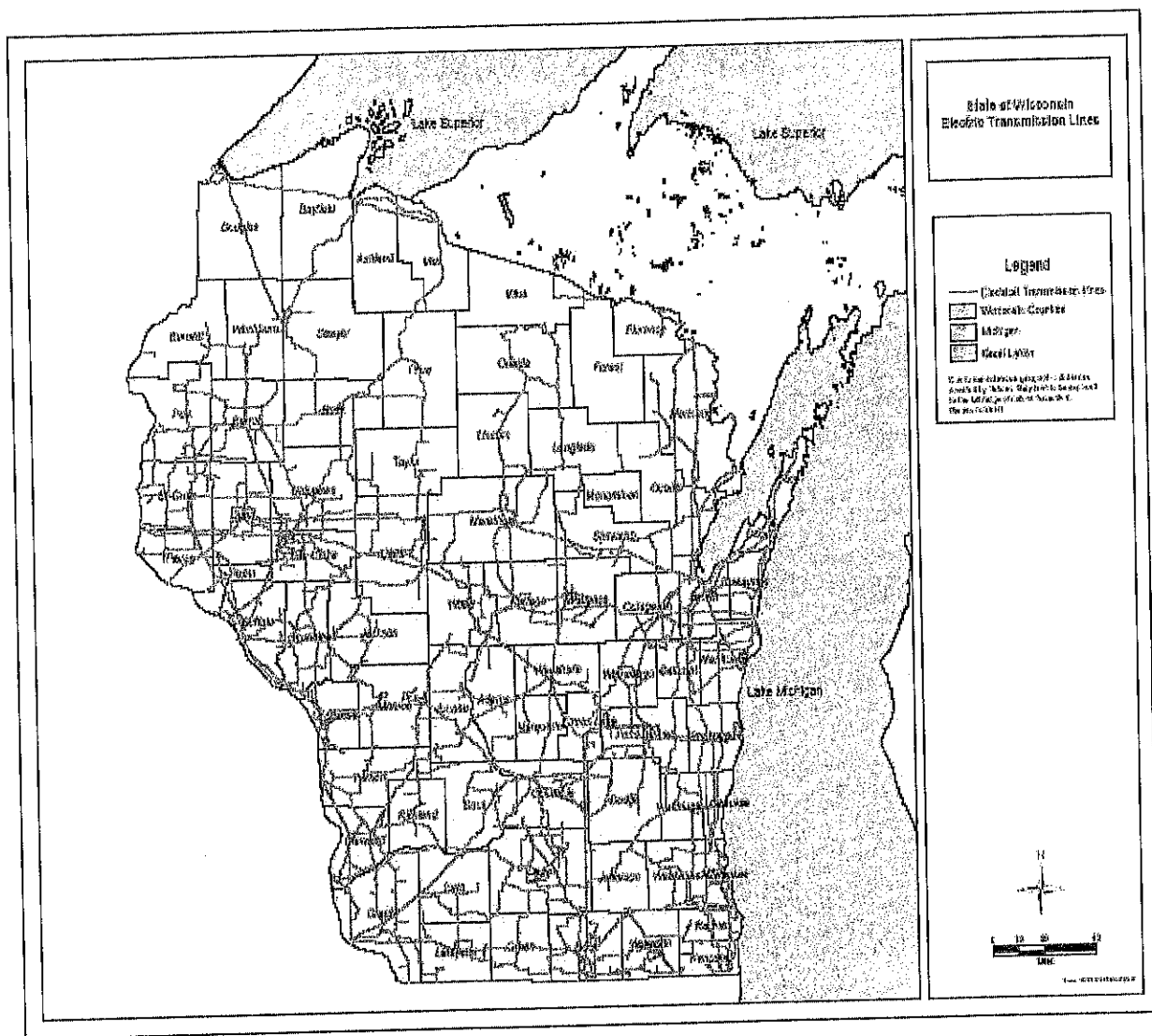


Wisconsin Blizzard Events Winter 1982-83 - Winter 2017-18



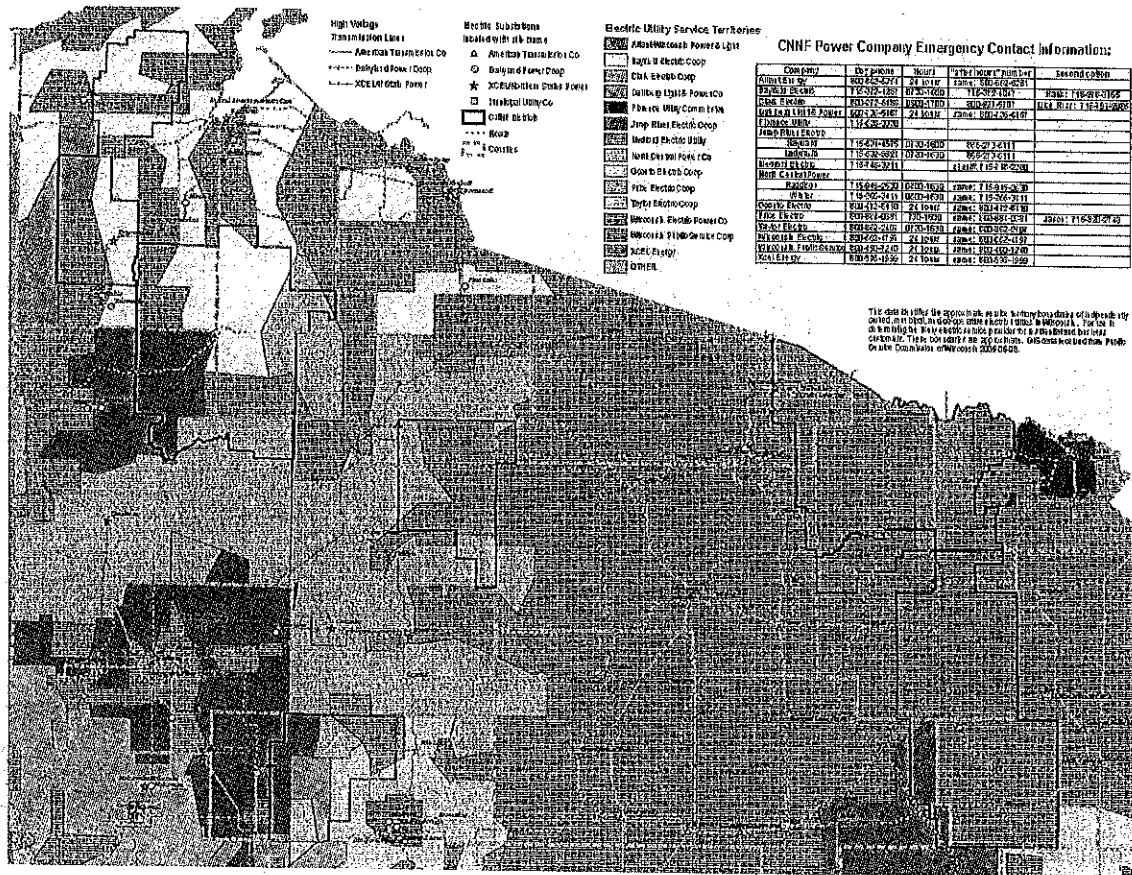
¹⁴⁴ National Weather Service – Milwaukee Sullivan Office

Electric Transmission Lines¹⁴⁵

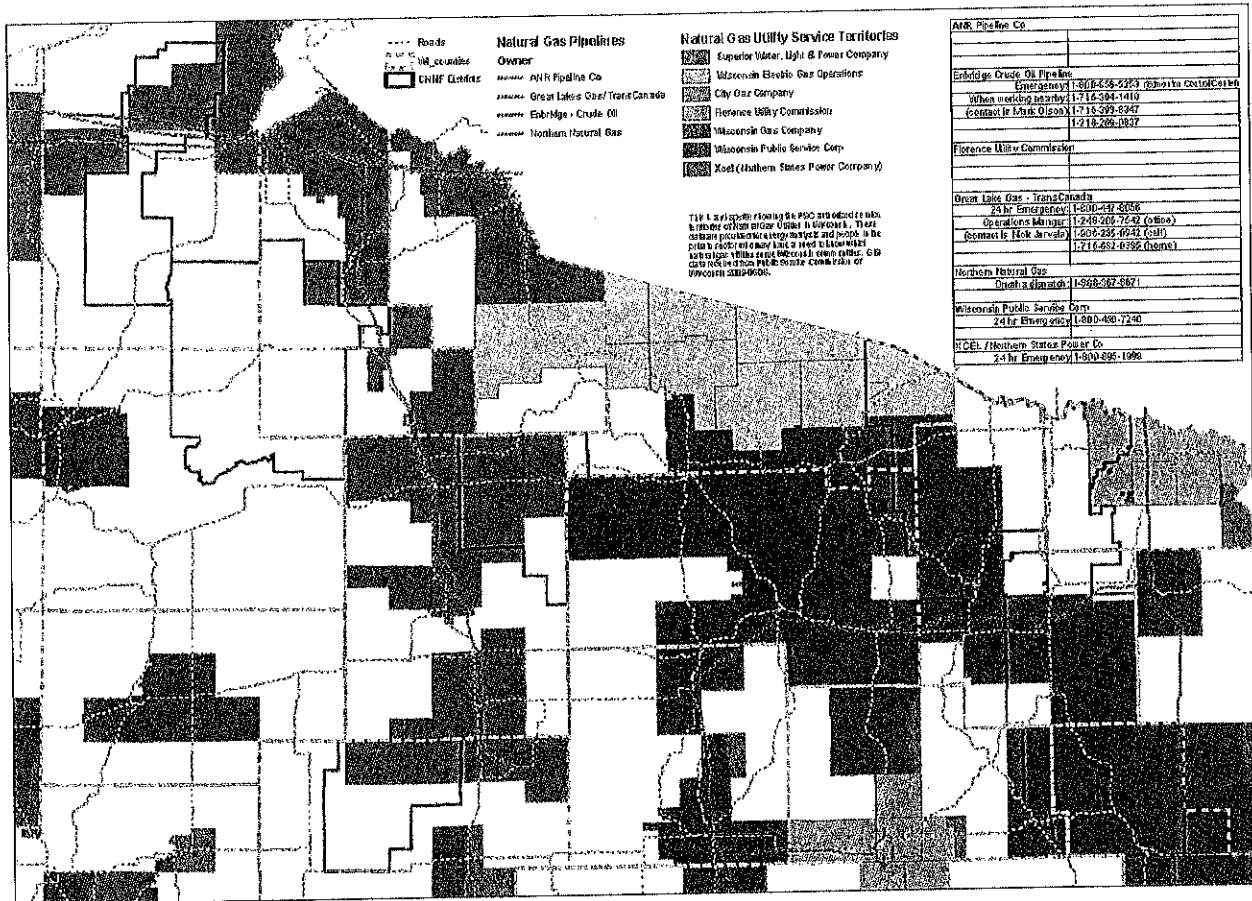


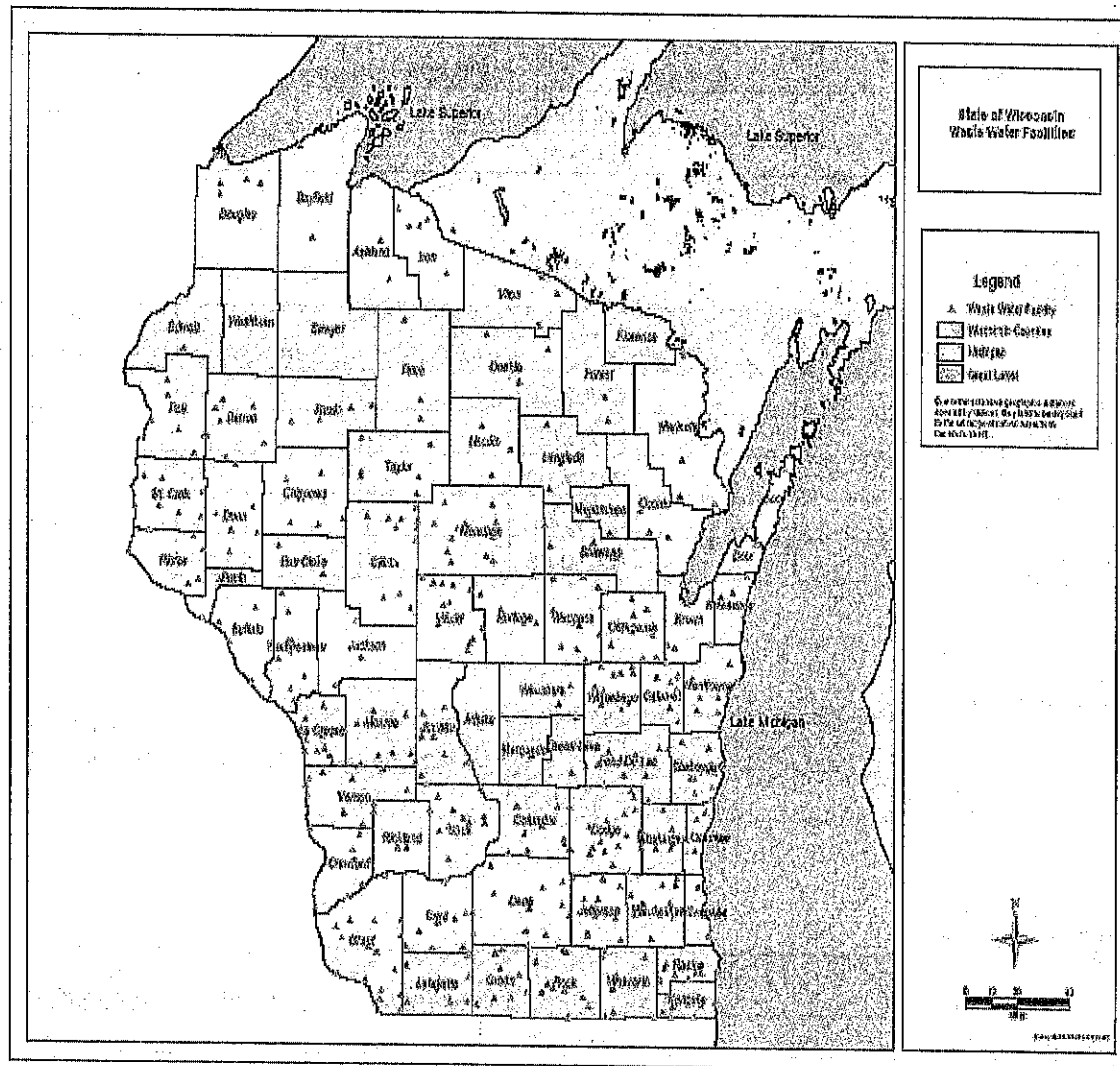
¹⁴⁵ Wisconsin Emergency Management, State Hazard Mitigation Plan
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Electrical Power Service Areas



Natural Gas Service Areas



Wastewater Facilities¹⁴⁶

¹⁴⁶ Wisconsin Emergency Management, State Hazard Mitigation Plan

Appendix B: Frequency of Occurrence

BLIZZARD

<i>Location</i>	<i>Date</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
ASHLAND COUNTY	04/10/08	0	0	0	0
ASHLAND COUNTY	04/15/18	0	0	0	0

COLD/WIND CHILL

<i>Location</i>	<i>Date</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
ASHLAND COUNTY	02/02/96	0	0	0	0
ASHLAND COUNTY	01/15/97	0	0	0	0
ASHLAND COUNTY	01/14/05	0	0	0	0
ASHLAND COUNTY	02/17/08	0	0	0	0
ASHLAND COUNTY	02/10/08	0	0	0	0

DENSE FOG

<i>Location</i>	<i>Date</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
ASHLAND COUNTY	None Reported	0	0	0	0

DROUGHT

<i>Location</i>	<i>Date</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
ASHLAND COUNTY	07/11/06	0	0	0	0
ASHLAND COUNTY	08/01/06	0	0	0	0
ASHLAND COUNTY	11/01/07	0	0	0	0
ASHLAND COUNTY	02/01/07	0	0	0	0
ASHLAND COUNTY	05/01/07	0	0	0	0
ASHLAND COUNTY	06/01/07	0	0	0	0
ASHLAND COUNTY	07/01/07	0	0	0	0
ASHLAND COUNTY	08/01/07	0	0	0	0
ASHLAND COUNTY	09/01/07	0	0	0	0
ASHLAND COUNTY	02/10/09	0	0	0	0

Appendix B: Frequency of Occurrence

ASHLAND COUNTY	03/01/09	0	0	0	0
ASHLAND COUNTY	04/01/09	0	0	0	0
ASHLAND COUNTY	05/01/09	0	0	0	0
ASHLAND COUNTY	06/01/09	0	0	0	0
ASHLAND COUNTY	07/01/09	0	0	0	0
ASHLAND COUNTY	08/01/09	0	0	0	0
ASHLAND COUNTY	09/01/09	0	0	0	0
ASHLAND COUNTY	10/01/09	0	0	0	0
ASHLAND COUNTY	11/01/09	0	0	0	0
ASHLAND COUNTY	12/01/09	0	0	0	0
ASHLAND COUNTY	01/01/10	0	0	0	0
ASHLAND COUNTY	02/01/10	0	0	0	0
ASHLAND COUNTY	03/01/10	0	0	0	0
ASHLAND COUNTY	04/01/10	0	0	0	0
ASHLAND COUNTY	05/01/10	0	0	0	0
ASHLAND COUNTY	06/01/10	0	0	0	0

EXCESSIVE HEAT					
Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	None Reported	0	0	0	0

EXTREME COLD/WINDC					
Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	01/30/08	0	0	0	0
ASHLAND COUNTY	01/13/09	0	0	0	0
ASHLAND COUNTY	1/4/14	0	0	0	0
ASHLAND COUNTY	01/27/14	0	0	0	0
ASHLAND COUNTY	02/27/14	0	0	0	0
ASHLAND COUNTY	03/01/14	0	0	0	0
ASHLAND COUNTY	01/05/15	0	0	0	0

FLASH FLOOD					
Location	Date	Deaths	Injuries	Property Damage	Crop Damage
IRON ZONE	04/18/96	0	0	0	0

Appendix B: Frequency of Occurrence

PRICE ZONE	04/18/96	0	0	0	0
ASHLAND ZONE	04/18/96	0	0	0	0
ASHLAND ZONE	04/19/96	0	0	0	0
BAYFIELD ZONE	04/19/96	0	0	0	0
DOUGLAS ZONE	04/19/96	0	0	0	0
IRON ZONE	04/19/96	0	0	0	0
ASHLAND COUNTY	07/24/05	0	0	0	0
ASHLAND COUNTY	06/14/12	0	0	0	0
ASHLAND COUNTY	06/14/12	0	0	0	0
ASHLAND COUNTY	07/11/16	0	0	\$1,000.00	0
ASHLAND COUNTY	07/11/16	0	0	\$1,000.00	0
ASHLAND COUNTY	07/11/16	0	0	\$1,000.00	0
ASHLAND COUNTY	07/11/16	0	0	\$1,000.00	0
ASHLAND COUNTY	07/11/16	0	0	\$0.00	0

FLOOD					
Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND ZONE	04/02/97	0	0	0	0
ASHLAND ZONE	04/05/97	0	0	0	0
ASHLAND ZONE	04/14/02	0	0	\$189,000.00	0
GLIDDEN	06/22/12	0	0	0	0
BIRCH	04/30/13	0	0	0	0
ODANAH	05/01/13	0	0	0	0
MARENGO	07/14/16	1	0	0	0
PEEKSVILLE	05/16/17	0	0	0	0

FUNNEL CLOUD					
Location	Date	Deaths	Injuries	Property Damage	Crop Damage
BUTTERNUT	06/22/10	0	0	0	0

HAIL						
Location	Date	Diameter (Inches)	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	03/26/91	1.75	0	0	0	0
ASHLAND COUNTY	05/27/91	1.75	0	0	0	0

Appendix B: Frequency of Occurrence

BUTTERNUT	05/30/94	0.75	0	0	0	0
GLIDDEN	07/16/97	0.75	0	0	0	0
MARENGO	06/16/01	1	0	0	0	0
MELLEN	06/16/01	0.75	0	0	0	0
GLIDDEN	07/21/02	1	0	0	0	0
GLIDDEN	07/30/02	.75	0	0	0	0
GLIDDEN	07/30/02	1	0	0	0	0
BUTTERNUT	04/18/04	1	0	0	0	0
GLIDDEN	04/18/04	1	0	0	0	0
GLIDDEN	04/18/04	1	0	0	0	0
BUTTERNUT	06/05/05	1	0	0	0	0
LA POINTE	10/23/04	0.75	0	0	0	0
BUTTERNUT	06/05/05	1	0	0	0	0
MELLEN	08/09/05	1	0	0	0	0
ASHLAND	07/16/06	0.75	0	0	0	0
ASHLAND	07/28/06	0.75	0	0	0	0
ASHLAND	05/14/07	0.88	0	0	0	0
ASHLAND	05/23/07	0.88	0	0	0	0
BUTTERNUT	05/25/07	0.75	0	0	0	0
HIGH BRIDGE	05/25/10	0.88	0	0	0	0
BUTTERNUT	05/25/10	0.88	0	0	0	0
CLAM LAKE	05/22/10	0.88	0	0	0	0
CLAM LAKE	05/22/10	1	0	0	0	0
MARENGO	07/27/10	1.75	0	0	0	0
HIGH BRIDGE	07/27/10	0.75	0	0	0	0
HIGH BRIDGE	07/27/10	1	0	0	0	0
HIGH BRIDGE	07/27/10	1.75	0	0	0	0
MELLEN	07/27/10	1	0	0	0	0
MELLEN	07/27/10	1.5	0	0	0	0
ASHLAND	08/13/10	0.88	0	0	0	0
MARENGO	04/10/11	1.75	0	0	0	0
ODANAH	04/10/11	3	0	0	\$1,500.0	0
ODANAH	04/10/11	1.25	0	0	0	0
ODANAH	04/10/11	1.75	0	0	0	0
BUTTERNUT	05/22/11	1	0	0	0	0
MELLEN	05/20/12	1	0	0	0	0
ASHLAND	08/01/12	0.88	0	0	0	0
ODANAH	08/01/12	1	0	0	0	0
ODANAH	08/01/12	0.75	0	0	0	0

Appendix B: Frequency of Occurrence

ASHLAND	07/29/14	0.88	0	0	0	0
HIGH BRIDGE	07/29/14	0.75	0	0	0	0
BUTTERNUT	06/08/15	0.75	0	0	0	0
BUTTERNUT	06/09/15	1	0	0	0	0
LA POINTE/MEDELINE I	07/12/15	0.88	0	0	0	0
HIGH BRIDGE	05/16/17	1.5	0	0	0	0
ASHLAND	07/06/17	1	0	0	0	0

HEAT

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	07/16/11	0	0	0	0
ASHLAND COUNTY	07/20/16	0	0	0	0

HEAVY RAIN

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	NONE REPORTED	0	0	0	0

HEAVY SNOW

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	01/17/96	0	0	0	0
ASHLAND COUNTY	01/26/96	0	0	0	0
ASHLAND COUNTY	01/28/96	0	0	0	0
ASHLAND COUNTY	02/26/96	0	0	0	0
ASHLAND COUNTY	03/23/96	0	0	0	0
ASHLAND COUNTY	11/09/96	0	0	0	0
ASHLAND COUNTY	12/14/96	0	0	0	0
ASHLAND COUNTY	12/18/96	0	0	0	0
ASHLAND COUNTY	12/23/96	0	0	0	0
ASHLAND COUNTY	12/30/96	0	0	0	0
ASHLAND COUNTY	1/4/97	0	0	0	0
ASHLAND COUNTY	01/05/97	0	0	0	0
ASHLAND COUNTY	01/10/97	0	0	0	0
ASHLAND COUNTY	01/22/97	0	0	0	0
ASHLAND COUNTY	01/25/97	0	0	0	0

Appendix B: Frequency of Occurrence

ASHLAND COUNTY	03/13/97	0	0	0	0
ASHLAND COUNTY	05/11/97	0	0	0	0
ASHLAND COUNTY	12/04/97	0	0	0	0
ASHLAND COUNTY	12/29/97	0	0	0	0
ASHLAND COUNTY	01/08/98	0	0	0	0
ASHLAND COUNTY	01/12/98	0	0	0	0
ASHLAND COUNTY	01/13/98	0	0	0	0
ASHLAND COUNTY	03/13/98	0	0	0	0
ASHLAND COUNTY	12/29/98	0	0	0	0
ASHLAND COUNTY	01/02/99	0	0	0	0
ASHLAND COUNTY	01/26/99	0	0	0	0
ASHLAND COUNTY	02/16/99	0	0	0	0
ASHLAND COUNTY	11/23/99	0	0	0	0
ASHLAND COUNTY	02/15/00	0	0	0	0
ASHLAND COUNTY	12/17/00	0	0	0	0
ASHLAND COUNTY	12/18/00	0	0	0	0
ASHLAND COUNTY	12/21/00	0	0	0	0
ASHLAND COUNTY	12/23/00	0	0	0	0
ASHLAND COUNTY	12/29/00	0	0	0	0
ASHLAND COUNTY	01/26/01	0	0	0	0
ASHLAND COUNTY	02/08/01	0	0	0	0
ASHLAND COUNTY	02/24/01	0	0	0	0
ASHLAND COUNTY	03/11/01	0	0	0	0
ASHLAND COUNTY	10/25/01	0	0	0	0
ASHLAND COUNTY	02/20/02	0	0	0	0
ASHLAND COUNTY	02/24/02	0	0	0	0
ASHLAND COUNTY	02/25/02	0	0	0	0
ASHLAND COUNTY	02/03/03	0	0	0	0
ASHLAND COUNTY	03/27/03	0	0	0	0
ASHLAND COUNTY	11/22/03	0	0	0	0
ASHLAND COUNTY	12/15/03	0	0	0	0
ASHLAND COUNTY	1/11/04	0	0	0	0
ASHLAND COUNTY	02/01/04	0	0	0	0
ASHLAND COUNTY	03/05/04	0	0	0	0
ASHLAND COUNTY	11/26/04	0	0	0	0
ASHLAND COUNTY	12/12/04	0	0	0	0
ASHLAND COUNTY	01/21/05	0	0	0	0
ASHLAND COUNTY	02/27/05	0	0	0	0

Appendix B: Frequency of Occurrence

ASHLAND COUNTY	02/28/05	0	0	0	0
ASHLAND COUNTY	11/16/05	0	0	0	0
ASHLAND COUNTY	12/10/05	0	0	0	0
ASHLAND COUNTY	02/24/06	0	0	0	0
ASHLAND COUNTY	03/12/06	0	0	0	0
ASHLAND COUNTY	12/22/06	0	0	0	0
ASHLAND COUNTY	02/13/08	0	0	0	0
ASHLAND COUNTY	03/31/08	0	0	0	0
ASHLAND COUNTY	04/11/08	0	0	0	0
ASHLAND COUNTY	12/20/08	0	0	0	0
ASHLAND COUNTY	02/02/09	0	0	0	0
ASHLAND COUNTY	12/11/10	0	0	0	0
ASHLAND COUNTY	12/20/10	0	0	0	0
ASHLAND COUNTY	03/22/11	0	0	0	0
ASHLAND COUNTY	04/27/11	0	0	0	0
ASHLAND COUNTY	11/19/11	0	0	0	0
ASHLAND COUNTY	12/03/11	0	0	0	0
ASHLAND COUNTY	01/01/12	0	0	0	0
ASHLAND COUNTY	01/11/12	0	0	0	0
ASHLAND COUNTY	02/28/12	0	0	0	0
ASHLAND COUNTY	11/22/12	0	0	0	0
ASHLAND COUNTY	12/09/12	0	0	0	0
ASHLAND COUNTY	12/09/12	0	0	0	0
ASHLAND COUNTY	12/09/12	0	0	0	0
ASHLAND COUNTY	12/09/12	0	0	0	0
ASHLAND COUNTY	04/10/13	0	0	0	0
ASHLAND COUNTY	04/22/13	0	0	0	0
ASHLAND COUNTY	05/02/13	0	0	0	0
ASHLAND COUNTY	12/04/13	0	0	0	0
ASHLAND COUNTY	02/20/14	0	0	0	0
ASHLAND COUNTY	03/17/14	0	0	0	0
ASHLAND COUNTY	04/03/14	0	0	0	0
ASHLAND COUNTY	04/16/14	0	0	0	0
ASHLAND COUNTY	11/10/14	0	0	0	0
ASHLAND COUNTY	12/15/14	0	0	0	0
ASHLAND COUNTY	12/26/15	0	0	0	0
ASHLAND COUNTY	02/02/16	0	0	0	0
ASHLAND COUNTY	02/16/16	0	0	0	0
ASHLAND COUNTY	03/16/16	0	0	0	0

Appendix B: Frequency of Occurrence

ASHLAND COUNTY	04/07/16	0	0	0	0
ASHLAND COUNTY	02/24/17	0	0	0	0
ASHLAND COUNTY	10/27/17	0	0	0	0
ASHLAND COUNTY	01/22/18	0	0	0	0
ASHLAND COUNTY	2/29/18	0	0	0	0
ASHLAND COUNTY	02/19/18	0	0	0	0
ASHLAND COUNTY	02/22/18	0	0	0	0
ASHLAND COUNTY	02/24/18	0	0	0	0
ASHLAND COUNTY	03/31/18	0	0	0	0

HIGH WIND

Location	Date	KTS	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	05/09/11	60	0	0	\$2,000.00	0
ASHLAND COUNTY	10/27/17	52	0	0	0	0

ICE STORM

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	02/01/99	0	0	0	0
ASHLAND COUNTY	01/29/01	0	0	0	0
ASHLAND COUNTY	04/16/03	0	0	0	0
ASHLAND COUNTY	12/30/04	0	0	0	0

LIGHTNING

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND	07/01/11	0	0	\$80,000.00	0

STRONG WIND

Location	Date	KTS	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	09/15/04	40	0	0	\$1,000.00	0
ASHLAND COUNTY	10/26/10	45	0	0	\$5,000.00	0

Appendix B: Frequency of Occurrence

THUNDERS TORM						
Location	Date	KTS	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	06/12/90	0	0	0	0	0
ASHLAND COUNTY	09/13/90	0	0	0	0	0
ASHLAND COUNTY	05/27/91	90	0	0	0	0
ASHLAND COUNTY	06/27/91	0	0	0	0	0
ASHLAND COUNTY	07/07/91	0	0	0	0	0
BUTTERNUT	07/01/96	50	0	0	0	0
MELLEM	07/13/97	50	0	0	0	0
ODANAH	07/13/97	50	0	0	0	0
GLIDDEN	07/13/97	50	0	0	0	0
BUTTERNUT	05/15/98	52	0	0	0	0
BUTTERNUT	06/25/98	61	0	0	0	0
BUTTERNUT	08/23/98	55	0	0	0	0
CLAM LAKE	06/06/99	50	0	0	0	0
MARENGO	06/06/99	65	0	0	0	\$150,000.00
ASHLAND	07/05/99	52	0	0	0	0
ASHLAND	07/23/99	50	0	0	0	0
BUTTERNUT	07/25/99	52	0	0	0	0
MELLEN	07/30/99	87	0	0	0	0
GLIDDEN	07/30/99	50	0	0	0	0
MELLEN	08/14/00	50	0	0	0	0
BUTTERNUT	08/14/00	50	0	0	0	0
BUTTERNUT	08/14/00	52	0	0	0	0
LA POINTE	08/08/01	50	0	0	0	0
GLIDDEN	07/21/02	50	0	0	0	0
BUTTERNUT	07/27/02	60	0	0	0	0
BUTTERNUT	07/20/03	50	0	0	0	0
ASHLAND	06/27/05	50	0	0	0	0
BUTTERNUT	06/29/05	60	0	0	0	0
GLIDDEN	06/30/05	60	0	0	0	0
GLIDDEN	08/09/05	60	0	0	0	0
ASHLAND	09/13/05	51	0	0	0	0
CLAM LAKE	07/29/06	50	0	0	0	0
ASHLAND	07/29/06	50	0	0	0	0
MELLEN	07/30/06	50	0	0	0	0
ASHLAND	06/18/07	52	0	0	0	0
MELLEN	07/26/07	52	0	0	0	0
ASHLAND	05/17/08	52	0	0	0	0

Appendix B: Frequency of Occurrence

MELLEN	07/14/10	52	0	0	0	0\$2,000
CLIDDEN	07/14/10	50	0	0	0	\$500.00
GLIDDEN	07/27/10	50	0	0	0	0
ODANAH	08/13/10	50	0	0	0	\$3,000.00
BUTTERNUT	05/22/11	55	0	0	0	0
BUTTERNUT	05/22/11	70	0	0	0	\$10,000.00
BUTTERNUT	05/22/11	50	0	0	0	0
MARENGO	07/01/11	70	0	0	\$0.00	\$50,000.00
SANDBORN	07/01/11	81	0	0	0	0
ASHLAND	07/01/11	52	0	0	0	0
ASHLAND	07/01/11	52	0	0	0	0
BUTTERNUT	07/01/11	60	0	0	0	0
BUTTERNUT	09/12/11	50	0	0	0	0
ODANAH	07/02/12	54	0	0	0	0
ASHLAND	07/22/14	54	0	0	0	0
ASHLAND	07/22/14	65	0	0	0	0
ASHLAND ARPT	07/21/16	70	0	0	0	0
ASHLAND	07/21/16	70	0	0	0	0
LA POINTE MADELINE I	07/21/16	70	0	0	0	0
LA POINTE MADELINE I	07/21/16	70	0	0	0	0
LA POINTE MADELINE I	07/21/16	70	0	0	0	0
LA POINTE MADELINE I	07/21/16	70	0	0	0	0

TORNADO						
Location	Date	Strength	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND CO	09/16/92	F0	0	0	\$25,000.00	0
CLAM LAKE	05/12/98	F0	0	0	0	0
MORSE	07/27/10	EF2	0	0	0	0
PEEKSVILLE	07/27/10	EF0	0	0	0	0
ASHLAND	08/11/14	EF)	0	0	0	0

WINTER STORM					
Location	Date	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND COUNTY	3/8/02/11/05	0	0	0	0
ASHLAND COUNTY	12/31/06	0	0	0	0

Appendix B: Frequency of Occurrence

ASHLAND COUNTY	01/01/07	0	0	0	0
ASHLAND COUNTY	03/01/07	0	0	0	0
ASHLAND COUNTY	04/03/07	0	0	0	0
ASHLAND COUNTY	12/01/07	0	0	0	0
ASHLAND COUNTY	12/22/07	0	0	0	0
ASHLAND COUNTY	12/13/08	0	0	0	0
ASHLAND COUNTY	03/10/09	0	0	0	0
ASHLAND COUNTY	12/08/09	0	0	0	0
ASHLAND COUNTY	12/24/09	0	0	0	0
ASHLAND COUNTY	02/10/13	0	0	0	0
ASHLAND COUNTY	12/25/16	0	0	0	0

WINTER WEATHER

<i>Location</i>	<i>Date</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
ASHLAND COUNTY	04/12/96	0	0	0	0

Appendix C: Plan Adoption

This plan has been approved by the Federal Emergency Management Agency (FEMA) and Wisconsin Emergency Management (WEM). It has been adopted by Ashland County, its major municipal bodies and many of the unincorporated municipalities (i.e., towns). Scanned copies of the approvals and those municipalities that adopted this plan follow.

Appendix C: Plan Adoption



STATE OF WISCONSIN DEPARTMENT OF MILITARY AFFAIRS DIVISION OF EMERGENCY MANAGEMENT

Debra M. Subin
Administrator

Scott Walker
Governor

December 3, 2018

Ms. Dorothy Tank, Director
Ashland County Emergency Management
220 6th Street East
Ashland, WI 54806

Dear Ms. Tank:

Wisconsin Emergency Management (WEM) has reviewed the *Ashland County Hazard Mitigation Plan*. The Federal Emergency Management Agency (FEMA) and WEM have also signed a Program Administration by States operational agreement, dated November 9, 2017, allowing WEM to review local mitigation plans to ensure they meet the required criteria for a multi-jurisdiction hazard mitigation plan outlined in 44 CFR Part 201. Upon review, Ashland County has met the required criteria for a multi-jurisdictional hazard mitigation plan.

The county and participating jurisdictions *must now adopt* the plan in order to have a FEMA-approved hazard mitigation plan and be eligible for funding through the Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and the Flood Mitigation Assistance program.

I have enclosed a copy of the Local Mitigation Plan Review Tool for your records.

If you have any questions, please call me at (608) 242-3214 or Katie Sommers at (608) 242-3222.

Sincerely,

Margaret Zickel
Disaster Response and Recovery Planner
Wisconsin Emergency Management

Enclosures

Cc: Randy Books, Northwest Regional Emergency Management Director
Anita Smith, Northwest Regional Emergency Management Office Operations Associate
Lenora Borchardt, EPTEC, Inc

2400 Wright St. PO Box 7865 Middleton, WI 53707-7865 24 Hour Emergency Hotline 1-800-943-0033

Appendix D: Report on Previous Mitigation Strategies

Summary of Mitigation Strategies						
Hazard Type	Mitigation Measures	Costs of Project	Responsible Management	Project Timetable	Project Priority	Community(ies) Benefitting
All Hazards	Coordinate with County Emergency Manager, city and county emergency personnel, and representatives from nursing homes, schools, and hospitals to assess storm safety procedures/emergency care procedures.	Annual budget offset by grant funding	ACEM Dept./ Police Department/ Fire Department	Ongoing	Low	City of Ashland
	Host community education classes or other forms of outreach on Family Disaster Planning, Supply Kits, weather education and Community Emergency Response.	Annual budget offset by grant funding	Parks & Recreation Department / Fire Department / Police Department	Biannual - early winter and summer	Medium	VI of Butternut
	Maintain a public transportation system to move people around	\$100,000	Administration/ Fire Department/	Ongoing	Medium	Ashland Co.; Bad River Tribe; CI of Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River
						City of Ashland
						Need to open talks with BART/Lakeshore buses for

Appendix D: Report on Previous Mitigation Strategies

during emergency or evacuate areas in a disaster.	Grant funding	Police Department Transportation Department	Ongoing	High	Bad River	coverage 24 hours 365 days a year incident coverage with numbers. Keep going forward.
	\$12,000 Annual budget offset by grant funding	ACEM Dept./ Fire Department/ Police Department			Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	CI of Ashland: This training will also include all department heads, City Administrator, elected officials, Department of Public Works and Mayor of Ashland to understand responsibilities during an emergency, incident command procedures. Done in other municipalities as needed/personnel change. Keep going forward.
	Ensure that GIS mapping is available to emergency operations personnel and is routinely updated.	Public Works Department	Ongoing	Low	City of Ashland	Updates are done annually. Keep going forward.
	Establish public access television station to be available in emergencies.	Information Technology Department	1-2 years	High	City of Ashland	Not accomplished. Will examine in next planning period.
	Equip public access television studio to be available in emergencies.	Information Technology Department	1-2 years	High	City of Ashland	Equipment may include Emergency Alert System suite. Not accomplished. Will examine in next planning period.

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Establish 3-1-1 System.	Unknown	Information Technology Department/ACSO	Unknown	Medium	City of Ashland	Non-emergency municipal services information center. Diverts routine inquiries from 911. Not accomplished. Will examine in next planning period.
Construct an Emergency Operations Center (EOC) for Police and Fire Department.	\$5,000,000 Grant funding	Fire Department/Police Department	1-5 years	High	City of Ashland	New Ashland Fire Department training room will need additional funding to make completely operational. Will examine in next planning period.
Create and Adopt an Emergency Operations Plan (EOP) for the City of Ashland.	\$150,000 Grant funding	City of Ashland	1-2 years	High	City of Ashland	Not accomplished. Will examine in next planning period.
Complete GIS mapping of problematic areas.	Annual budgets	Public Works Department	1-2 years	Medium	City of Ashland	Keep going forward – will be ongoing as requests for mapping are requested
Increase municipal fuel storage capacity for emergency operations.	\$100,000 Capital budget or grant funding	Public Works Department	1-2 years	Medium	City of Ashland	Ongoing-continue to examine in next planning period.
Establish more 9-1-1 lines to the Dispatch Center.	Unknown. Grant funding	ACSO	Unknown	Medium	City of Ashland	The Communications Center upgrade is ongoing. In April, 2017, center went from 4 lines/2 stations to 5 lines/3 stations. County spent \$192K on Moducom Radio/911 System (3 positions); \$58k on two dispatch radio consoles; and \$18k for the dispatch room refurbishment for a total of \$268k. Remove.
Adopt a Post Disaster Recovery Ordinance.	\$500 Annual budget offset by grant funding	Administration	1-2 years	Medium	City of Ashland	Not accomplished. Will examine in next planning period.
Provide airport with portable hangers for equipment and storage, fuel storage and	\$500,000 Grant funding	JFK Memorial Airport Staff & Commission	1-5 years	Medium	City of Ashland	Not accomplished. Will examine in next planning period. To include COOP/COG planning.

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refueling capabilities; ensure security and properly maintained runways.									
Continued enforcement of the city's ordinances to guide development away from hazardous areas.	\$50,000 Annual budget	Department of Planning & Development	Ongoing	High	City of Ashland	Ongoing project. Keep going forward.			
Develop a plan to allow for the continuity of municipal operations that will ensure the essential functions of an organization can operate during and after an emergency incident. Plan to include methods to maintain normal operating systems (i.e., data, communications, transportation).	\$5,000 Annual budget offset by grant funding	City of Ashland	1-2 years	High	City of Ashland	Not accomplished. Will examine in next planning period.			
Install methods to deter birds and wildlife at airport.	\$10,000 Annual budget offset by grant funding	JFK Memorial Airport Staff & Commission	Ongoing	Medium	City of Ashland	Not accomplished. Will examine in next planning period.			
Improve roadways that currently do not allow safe access for emergency vehicles.	\$400,000 Capital or annual budget offset by grant funding Unknown	Ashland Public Works Department Bad River Roads Dept.	1-5 years	Medium	City of Ashland Bad River	As ongoing road improvements are made, emergency personnel are included in the design process. Ongoing and will keep going forward.			
Develop an evacuation plan, including emergency shelters and evacuation routes for Ashland residents.	Unknown. Annual budget offset by grant funding.	Fire Department/ Police Department/ ACEM Dept.	5 years	High	City of Ashland	Not accomplished. Will examine in next planning period. There is thought that this should be part of the Ashland County Strategic Plan.			

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		Annual budget	BREM/Fire		High	Bad River	^^See note
		Annual budget	Butternut Fire Department		High	VI of Butternut	No formal plan written however there is ongoing access in all directions going out of town.
	Update the comprehensive plan to account for hazard mitigation.	\$10,000 Annual budget or grant funding	Department of Planning & Development	complete		City of Ashland	Comp Plan Update completed, Feb 2017. Comp plans are good for 10 years and will be dropped from the next plan because it will not be due then.
	Formalize and adopt a procedure for rental inspections and licensing.	\$0 - \$67,000 annually. Annual budget	Department of Planning & Development	complete		City of Ashland	Created Rental Registration Ordinance 2016; State now restricts cities from having rental inspection/licensing programs, only registration so will be dropped .
	Plan, design and construct an east-side loop in Ashland.	\$10M Grant funding	Public Works Department	10-15 years	Medium	City of Ashland	Little access on east side for disaster problems. Route would connect US Hwy 13 to the east side of Ashland, providing another access around Bay City Creek. Route is needed as it would serve as a detour route if existing routes across Bay City Creek are blocked.
							Not accomplished. Will examine in next planning period.
	Construct an Emergency Services Center for police, fire, EMS and emergency management.	Unknown	Bad River Police, Fire, EMS, EM	1-5 years	High	Bad River	Current fire facilities and emergency vehicle garages are either substandard or non-existent
	Create Emergency Response Plan.	Unknown. Offset by grant funding	ACEM Dept./ Bad River Tribe EM Office	1-3 years	High	Bad River	^^See note at the end of this Appendix ^^See note at the end of this Appendix

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Ensure that the city continues to have access to multiple modes of transportation (rail, marine, highway, air).	Unknown. Annual budget offset by grant funding	Department of Planning & Development / Public Works Department / Administration / JFK Memorial Airport / Harbor Master	Ongoing	Medium	City of Ashland	Multiple modes continue to be available. Will keep going forward as an ongoing project.
Perform a study to develop an emergency source of supply of potable water.	\$30,000 Grant funding	Public Works Department	1-5 years	High	City of Ashland	Not accomplished. Will examine in next planning period.
		Public Works Department			Cl of Mellen	Not done. City can reroute or tap an alternate supply. Remove.
		Sanitary District			VI of Butternut	No study was completed but the Village of Butternut is now served by two wells located far from each other, reducing potential contamination. This will be removed from the list going forward.
Develop an emergency source of potable water supply.	\$250,000 Grant funding Unknown	Public Works Department Bad River Water & Sewer	5-10 years	High	TN of Jacobs	Not accomplished. Will examine in next planning period.
					City of Ashland	Not accomplished. Will examine in next planning period.
					Bad River	^^See note at the end of this Appendix
Obtain computer systems and software to assist with emergency planning.	\$35,000 Annual budget offset by grant funding Unknown	Administration / IT Department / Fire Department / Police Department BREM/IT Depts.	1-2 years 5 years	High	City of Ashland	Use ICS forms used by the federal government on all incidents. Will examine other needs during next planning period.
					Bad River	^^See note at the end of this Appendix

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Update websites and review links (to include adding mitigation links) to the Ashland County and Bad River Tribe Emergency Management Offices' websites.	Annual budget	ACEM Dept./ Bad River Tribe EM Office	Ongoing	High	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Updated quarterly to reflect seasonal hazards. Municipalities link to the county web page for information. Keep going forward as an ongoing project.
Sirens: Village of Butternut	\$15-20,000 Department of Commerce Grant	ACSO - Communications Village of Butternut	Install Spring 2012	High	Village of Butternut	Meeting with county and vendor to scope project. Part of trailer complex project (12 units – West Road and South 6 th Street) – brought forward by Village President. Sirens cover whole village. Project was completed and operational by June 2012. Remove
Weather tone and fire tone (dual siren) – Town of La Pointe/Madeline Island		Town of LaPointe		Medium	Town of La Pointe/Madeline Island	Only other siren in county activated by dispatch and by local township. Does not cover the whole island but most of population center.
- City of Ashland x3 - City of Mellen x1		City of Ashland City of Mellen		Medium Medium	City of Ashland City of Mellen	County dispatch operates monthly testing of both siren systems April-October. Remove

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Sanitary District of TN of Jacobs/Glidden x 1			TNs of Peeksville, Jacobs, Shanagolden and Gordon		Medium	TNs of Peeksville, Jacobs (Glidden-unincorp.), Shanagolden and Gordon	Not accomplished due to funding limitations. Will examine in next planning period.
	• NOAA weather radios for rural populations.	\$25/unit	ACEM & ACPH Depts.	As grants available	Medium - High	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Comprises about half the population The PH Dept. annually licenses Airbnb rentals and is providing weather radio info for licensing. Info is also provided on cell phone weather apps. Not accomplished because of funding limitations. Will examine in next planning period.
	NOAA weather radios for 1,200 tribe members.	\$25/unit NOAA grant	Tribal Emergency Management Coordinator	As grants available	Medium -High	Bad River Tribe	NOAA weather radios may be many citizens' only means of early warning in community. ^^See note at the end of this Appendix
	Explore an emergency notification system to alert residents to potential emergency situations.	\$10,000	ACEM Dept./ACSO Communications Center	As grants available	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Ashland County had a contract with the Code Red system but it was cut from the county budget because many communities did not sign-up and it was too expensive. Will examine as funding allows in next planning period.

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Continue to improve coverage and interoperability for first responder communication systems.	Unknown. Potential grant funding.	ACSO	Ongoing	Medium	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River • Fair throughout county; good in the north, poor in south. There are some dead spots. • Fire/EMS and LE- two parallel systems. • Additional towers needed (2-3) • No WISCOM. WISCOM is monitored by dispatch but the county is not wholly adopting. It is on a commercial tower. • Costs will be known as technological solutions are chosen. • Technology costs will reduce over time. Keep as ongoing work is needed.
Explore text notification of emergency responders.	READYWI USFS ACSO	ACEM Dept./ ACSO Communications Center	As grants available	Medium	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River Ashland County Dispatch has been providing dispatch to local and state agencies covering the county as a supplement to paging. e-Dispatch is a text system that operates over the cell network. It can blast pages for multiple responders and has some usage. Will continue progress to text messaging notifications as funding is available. Keep going forward.
Acquire five Global Emergency Telecommunication Service (GETS) Cards.	\$0	ACEM Dept.	2012	High	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs Ashland County Emergency Management and Bad River Emergency Management have GETS cards already and they are tested regularly. Will add a stock of

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							generic municipality cards to the county's inventory for emergency use. This was accomplished. There are 5 GETS cards dedicated for municipalities. This will be dropped.	of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River
							Current center is 16'x25' conference room. Can be added onto Ashland County's Law Enforcement Center by design of structure. There may be the possibility of a larger EOC if the new jail facility is approved by the tax payers. Keep going forward.	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River
							May consider large Mobile Command Post (MCP) or the Hwy Shop The county continues to equip the MCP trailer as funding allows. This will be kept going forward.	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River

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Upgrade communication systems for 911 Center.	\$250,000	ACSO	5 years	High	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	• Telephone and CAD related. • Next generation- accept text messages and other upgrades. Radio upgrades would add \$60,000 Telephone, CAD and other upgrades completed in 2017-18. The county will start working on the next generation 9-1-1 center capabilities in this planning period. Keep going forward.
					Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	This tower supports regular, normal communications on existing system and will not be adapted for WISCOM use. Approximately \$13k for generator upgrade. EM applying for FEMA mitigation grant in 2018 for a stand-alone generator at the North Tower. Awards have not been made as of this date. This will be kept going forward.
					Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Base data accessible to county departments and citizens (in house or contracted) City of Ashland PW maintains its own GIS mapping parcel database – should work to consolidate with County so only one entity maintains parcel base.
Upgrade North Tower to WISCOM-compliant building with back-up generator.	\$400,000/ with \$50,000 grant funding	Ashland County Highway Dept./ ACSO	1-5 years	Low	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
Seek solution to consolidate and update GIS mapping.	Unknown	ACSO / 911 Dispatch Center/ ACEM Dept./ Planning and Development/ USFS	5 years	Medium	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, and	

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							Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Ashland County has hired a grant-supported, GIS Coordinator (July 2018) which should aid coordination. Keep going forward.
Establish a "511-type" system for Ashland County for travelers to send in information on roads, etc.	\$100,000 grant funding	Ashland County Highway Dept.	1-5 years	High	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River		Ashland County departments (Highway, GIS, Communication, EM) coordinating and setting up process to report road closures following the June 2018 rain event. Keep going forward.	
Develop strategic storage areas for storage of disabled vehicles/ personnel for hazardous situations.	\$30,000 if state-owned land /grant funding	Ashland County Highway Dept.	1-5 years	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	With "Blue Phones" for communication. Not accomplished but the new abandoned vehicle ordinance has helped reduce this issue. Remove.		
Develop and distribute seasonal transportation specific safety information.	\$5,000 grant funding	Ashland County Highway Dept./ ACEM Dept./	1-5 years	High	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs		Press releases are regularly released. Keep going forward as an ongoing project.	

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Construct joint (Sheriff's Office and Highway) south tower for communication.	\$25,000	Ashland County Highway Dept./ ACEM Dept./ ACSO	1-3 years	High	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River DNR is transferring ownership of the tower and building to the county. Project is completed as of November 2012. Remove.
Establish alternate Emergency Operations Center communication back-up at County Highway Department in Highbridge.	Unknown. Annual budget or grant funding as available	Ashland County Highway Dept./ ACEM Dept.	1-5 years	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River This is ongoing and will be rolled into a similar objective to expand and upgrade EOC, alternate EOC, and COOP capabilities.

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Purchase Spill Response Kits in 55 gallon barrels. Put one kit in each satellite Highway Shop.	\$25,000 grant funding	Ashland County Highway Dept.	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	\$5,000/kit, 5 kits - No fire department has kits of this size but have some materials good for smaller spills. Broom, shovel, hazmat bags, binoculars, absorbents, etc. Not accomplished due to funding limitations. Will examine in next planning period.
Purchase and store emergency supplies at County Highway facilities.	TBD	Ashland County Highway Dept./ ACEM Dept./ ACSO / municipalities	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Food, office supplies, COOP/GOG supplies, cots, blankets, etc. This is ongoing and will be rolled into a similar objective to expand and upgrade EOC, alternate EOC, and COOP capabilities.
Establish eligibility list of local contractors with MOUS and contingency contracts.	Annual budget	Ashland County Highway Dept./ USFS/ACEM Dept.	Ongoing	Medium /High	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, and White River	This was not done. Major disasters occurred in 2012, 2013, 2016 & 2018 so there was no time. County has recognized through these experiences that it was easier to use local government mutual aid. Strategy will be adjusted going forward to establish more formal inter-governmental agreements

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							Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	between Co Highway and the municipalities as a high priority.
Coastal Erosion and Landslides	Develop a grading ordinance that specifies grades for new construction.	\$500 Annual budgets		Department of Planning & Development / Public Works Department	1-2 years	High	City of Ashland	No progress yet. Will keep going forward.
	Dredge local harbor to insure coal delivery to local power plant.	\$1,000,000 Grant funding	N/A	Department of Planning & Development / Public Works Department / Administration / Harbor Master			City of Ashland	Coal no longer used by power plant. Remove.
	Create a dredge spoil basin to permit harbor dredging to occur.	\$600,000 Grant funding	1-5 years	Department of Planning & Development / Public Works Department / Administration / Harbor Master	High		City of Ashland	Uncertain of desires to continue to dredge. Will discuss. Keep going forward.
	Complete a study to determine landslide and erosion threats to the Bad River Watersheds.	Unknown	1-5 years	Bad River Natural Resources	Medium		Bad River	- Slope slippage may endanger major pipelines passing through Bad River. - River bank failure may lead to blockage and potential for flooding The tribal portion of this will go into their plan but the county is going to rework this strategy to focus on their zoning ordinances going forward.
Drought and Dust Storms	Complete water conservation and savings outreach measures.	\$12,000 grant funding Unknown	5 years	Public Works Department	High		City of Ashland CI of Mellen,	It has been very wet over this past plan period and this has not been an issue. Ongoing as needed and funding available. Keep going forward.

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Flooding and Dam Failure	Track metered water use to prioritize domestic use (over irrigation, industry) in the event of drought.	Annual budget Unknown	Public Works Department Bad River, Mellen and Butternut Depts. of Public Works/ Town of Jacobs	Ongoing 5 years	Medium	VI of Butternut, Sanitary District TN of Jacobs City of Ashland Bad River, City of Mellen, VI of Butternut, TN of Jacobs Sanitary District	• Every public water system • Acquired tracking data by PSC • Water usage is reported monthly to the DNR This will be rolled into the previous measure going forward.
	Complete capital improvement plans to prioritize local roads that are routinely exposed to flooding.	Annual budget	CI Ashland Public Works Department Ashland Co. Highway Dept.	1-2 years	High	City of Ashland TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Not many routine projects but will continue to monitor going forward.
	*Complete citywide wetland mapping and incorporate into City's GIS.	\$80,000 Annual budget or grant funding Annual budget	Public Works Department / Planning & Development Department Bad River EM	1-5 years	High	City of Ashland	• GIS Complete. Remove.
	*Work with FEMA to complete county-wide floodplain mapping update. Incorporate floodplain mapping in city and county GIS.	Unknown. Annual budgets offset by	Ashland County Zoning Department	1-2 years	High	Bad River Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda,	Has GIS person mapping for wetlands. EPA approved • Water standards and concerns on mining issues. • Flood mapping completed and on Ashland County website.

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		grant funding				Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River Bad River Tribe	Current version is 1971. Maps were updated in Summer, 2018 (with the exception of Clam Lake). In 2018 will also do coastal floodplain mapping to include a wave run-up study for the FEMA maps. Some houses may be shown to be in that area. Keep going forward. Bad River does not have floodplain map. ACE might have already designated area floodplain and altered development patterns. ^^See note at the end of this Appendix
City and Land Conservation Department will work together with the USDA to complete countywide soils mapping update. Incorporate soils mapping in city and county's GIS.	Unknown Annual budgets offset by grant funding	City of Ashland Public Works Department / County Land Conservation and County Zoning	1-2 years	High		Ashland Co.; Bad River Tribe; Cts of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River City of Ashland	Countywide soils mapping has been completed by NRCS and is easily available on the internet, however, this information has not been incorporated in the City and County GIS systems Soils mapping was completed and that portion will be removed. Incorporating the soils maps were not finished and this portion will be brought forward . Currently storage capacity is adequate. Will be removed .
Add to the city's water storage capacity through obtaining an additional reservoir.	\$2.25 M grant funding	Public Works Department	10 years	Medium		City of Ashland	Ongoing with all Capital Projects. Will be kept going forward .
Replace non-code compliant water lines and fire hydrants.	\$20 M grant funding	Public Works Department	15 years	High		City of Ashland	Not accomplished. Will examine in next planning period .
Upgrade and make inspections of City water intake pipe in Lake Superior.	\$300,000 grant funding	Public Works Department	5 years	High		City of Ashland	

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*Review/Update/Adopt a storm water management ordinance.	Unknown. Annual budget	Public Works Department	1-2 years	Medium	City of Ashland	Not accomplished. Will examine in next planning period.
Adopt best management practices for storm water catch basins, outfalls, jetties and conveyance systems.	Unknown. Annual or capital budget	Public Works Department / Planning & Development Department	1-5 years	Medium	City of Ashland	"Capacity, Management, Operation, Maintenance for Sewer System" adopted 2/14/17 and includes overflow response plan. Remove. DNR required. Remove
Obtain street jetter for storm sewers.	\$385,000 Annual or capital budget	Public Works Department	10 years	Low	City of Ashland	Completed. Remove
Perform routine bridge inspection and maintenance.	Annual budget	Wisconsin DOT / Ashland County Highway Department & municipalities	Ongoing	Medium	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Bridge inspections are required every 1-2 years. HWY Dept. facilitates all inspections and keeps records (not including federal roads). Done and kept as an ongoing project.
Replacement of lead water services at all public and private properties.	\$1,000,000 grant funding	Public Works Department /	As funding available	High	City of Ashland	Ongoing funding from WI DNR allowed removal of lead service on the private side.
*Adopt building codes, subdivision regulations, zoning ordinances that mitigate	Annual budget	Planning & Development Department	Complete		City of Ashland	Keep going forward. Ordinances/regulations established to mitigate/prevent flooding. Remove

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flooding – backflow preventers in building laterals.							All sanitary districts have to have backflow preventers and monitor continually. This was therefore done in Ashland, Butternut, Glidden, and Mellen. Remove
	Create an Emergency Response Plan for utilities (water and sanitary) and pipeline breaks.	Annual budget	Public Works Department	1-5 years	High	City of Ashland	Completed at the waste water review with the water utility Remove
			Public Works Department	1-5 years	Medium	Bad River and VI of Butternut	Both have ERP and are updating. Kept because it is ongoing.
	Continue to monitor POWTS (Private Onsite Wastewater Treatment Systems).	Unknown. Annual budget	Ashland County Zoning Department	Ongoing	High	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Done on an ongoing basis and will be kept going forward.
Complete investments, testing and maintenance of water and sewer systems to insure they are operating within health standards and codes. *Educate residents about the National Flood Insurance Program (NFIP).			BR National Resources			Bad River Tribe	
		Unknown. Annual budget	Public Works Department	Ongoing	High	City of Ashland	Not accomplished. Will examine in next planning period.
		Annual budgets; offset by grant funding	ACEM Dept./ City of Ashland Department of Planning & Development; BR EM	Annually	Low	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland,	This was done during the planning period. An increased number of homes are being affected by flooding and not all of them are in a floodplain.

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							Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Keep going forward as an ongoing project.
Complete a hydrology study for Fischbach Road Bridge in the Town of Jacobs.	Unknown	ACEM Dept.	5 + years	Low			Town of Jacobs	- Homes and businesses flood behind bridge. The bridge is abandoned and the Town would like it removed. It is believed to contribute to the flooding of the downtown area of Glidden. - The Land & Water Conservation Department has completed a topographic survey of area and would coordinate bridge removal and floodplain restoration if a funding source could be found.
Seal manhole covers in Village of Butternut.	\$5,000	Village of Butternut Dept. of Public Works	1-5 years	High			Village of Butternut	Bridge was removed in 2017. Remove. Starting 2012
Raise Minnesota St. between 2 nd and 4 th .	\$200,000	Village of Butternut Dept. of Public Works	1-5 years with grant funding	Medium			Village of Butternut	Kept as an ongoing project. Village project to have 2 done each year.
Study and develop strategy options to manage storm water run-off from State Highway 13 that flows downhill on Minnesota and Michigan	Unknown	Village of Butternut Dept. of Public Works, WI DOT, Ashland Co Highway Dept.	Ongoing	Medium			Village of Butternut	Not accomplished due to funding limitations. Will examine in next planning period. Is an ongoing project and will be kept going forward.

Appendix D: Report on Previous Mitigation Strategies

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						Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
Work with local municipalities to conduct flood evaluations.	Unknown	ACEM Dept./ AC HWY, AC P&Z, local municipalities	Ongoing	Medium		Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Approach from drainage perspective As towns need help, the county will assist. Keep as an ongoing project.
Actively search for funding options for dam control and maintenance around the dams.	Unknown	LWCD w/ Ashland Co Highway Dept., AC P&Z, WI DNR, as appropriate	Ongoing	Low		Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn,	LWCD would be involved if there is a water quality or erosion control concern. As a need is identified, the departments will coordinate. Keep as an ongoing project.

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Cap unused/out of service wells to prevent contamination.	Annual budget	LWCD and municipalities	Ongoing	Med-High	Shanagolden, and White River Ashland Co.; Bad River Tribe; CI of Mellen; the VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River City of Ashland	- The LWCD & WI DNR have had cost-share available on an annual basis for well closures. - An inventory should be completed – mostly on private lands. - LCD has an educational role Keep going forward as an ongoing project.
	Create well head protection plans.	Annual budget	Ongoing	High	CI of Mellen; VI of Butternut; TN of Jacobs (Glidden)	- There are many unused/out of service/improperly closed wells within the City of Ashland. No inventory exists - EPA requires for groundwater systems. - VI of Butternut completed plans in 2012. Remove Done annually with Mellen Utilities. Will be kept going forward.
	Do an assessment of what groundwater capacities, quality and flow direction are for future development.	Unknown. As grants available. (USFS, USGS, WI DNR, ACE)	1-5 years	High	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe,	For water and mega farms as well as potential metallic mining operations Not accomplished. Will examine in next planning period.

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							Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
*Will continue to explore if residents express interest in flood mitigation measures (e.g., buyouts, elevations, floodproofing, etc.) county-wide.	Annual budget	ACEM Dept.	Ongoing	Medium			Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	FEMA's PDM & FMA grants are potential funding sources for buyout. Ongoing as needed; keep going forward.
Develop a Debris Management Plan.	\$5,000 Grant Funding	Department of Planning & Development / Public Works Department / Administration / Police Department / Fire Department	1-2 years	High			City of Ashland	Not accomplished. Will examine in next planning period. Will include a county plan in next plan as well.
Work with towns to establish flood-prone improvement plan and educate towns.	Annual budgets	Municipalities w/ Ashland County Highway Dept. as appropriate	Ongoing	High			Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse,	Combining this strategy with other similar strategies and carrying forward.

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	Reconstruct/redesign flood-prone highways including STH 169 and CT N.	TBD Grant only	Ashland County Highway Dept./ WISDOT/ municipalities and township roads	Ongoing	Medium	Peeksville, Sanborn, Shanagolden, and White River Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Elevations were done but there were no clear solutions so this project will be dropped .
	Create a flood dam mitigation plan with local agencies, map culverts, etc. So when there is a flooding problem, traffic can be rerouted. Also create a means to notify neighboring towns, so they will be able to manage increased maintenance needs from the diversions.	Annual budgets	Ashland County Highway Dept./ ACEM Dept.	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Land Description (GIS mapping) Combining this strategy with other similar strategies and carrying forward .
	Purchase stock supply of culverts for local municipalities to replace bridges that wash out in a disaster.	TBD Grant funded	Ashland County Highway Dept./ municipalities	1-5 years	High	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda,	No local jurisdictions store culverts. It is difficult to stock culverts of proper size. The reason many have washed out is due to inadequate design and flood flow

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									modeling. Proper planning and design is needed to select the correct structure type and dimensions. "Temporary culverts" are rarely replaced until there is another wash-out. This strategy will be dropped going forward. The WI DNR requires this to be done. There is continuing education with the towns but it is done at the county. EM is working with the towns to create a binder documenting road maintenance annually. Will be kept going forward.
	Develop strategies for municipal public works departments to begin documenting road repairs to create a historical record of potential mitigation project areas.	Annual budget	ACEM and Highway Depts., Municipal Public Works Depts.	1-5 years	Medium – High	Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River Town of Ashland			North York Road is built on ledge rock. A particular section of North York Road between section 31 & 32 was constructed on a rock outcropping creating a dangerous section of road to navigate. There are total blind spots at the top of the hill from one direction and around the curve from another direction. Not accomplished. Will examine in next planning period. - Continually washes out. - Have done a rough hydrology study that shows drainage of
	Consider potential solutions to make North York Road safer for vehicular traffic.	TBD Grant funded	Town of Ashland	1-5 years	High				
	Complete recommended flood mitigation measures to forestall future flooding problems on Albert Mattson Road.	TBD Grant funded (applying	Town of Ashland and AC Highway Dept.	1-5 years	High	Town of Ashland			

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						4.6 acres of land through one 4 foot and one 5 foot culvert. Estimating 1326 cu'/second of water flowing through the area based on a 25 year storm. Recommending four 92"x 97" Quonset culverts to appropriately manage the flow. This was done as of 2014. Remove
	Complete recommended flood mitigation measures to forestall future flooding problems on Silver Creek Road.	TBD Grant funded (applying for a PDM project grant in 2012)	Town of Agenda and AC Highway Dept.	1-5 years	High	Town of Agenda
						- Continually washes out. - Proposing to replace one large culvert (37"x 52') with two 4 ft. culverts which will be longer than the current one. (Due to the high frequency of washouts, it will be easier to maintain 2 smaller culverts.) - They will also add rip rap with shoot outs to help divert the water coming down the hill from eroding the road. - There will also be an installation of a cross culvert to divert water before the large culvert currently in place. - Special consideration and permission for this project area granted by the DNR as this is a trout stream. - The town may be forced to close the road after the next storm damage if mitigation cannot be funded. Not accomplished. Will examine in next planning period.

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Forest Fires and Wildfires	Identify ownership of Kornstead Rd (federal or town) and coordinate to create a plan for mitigation of recurrent washout.	TBD Grant funded	TNs of Ashland & Morse with US Forest Service and AC Highway Dept.	1-5 years	Medium	Towns of Ashland and Morse	- This road is on bedrock and regularly washes out. There are no ditches or other drainage structures. - It is unclear who owns the road. This created issues with repair and mitigation during the 2012 Stafford Act disaster declaration. - Possible solutions include raising the roadbed. In 2016 the USFS determined that all roads within the federal forest are owned by the USFS. This makes the USFS responsible for all damages to this road. USFS has implemented a process with the towns on how to report and repair damages (Reference Cooperative Road Agreement and Road Project Agreement) Done as of 2016.
	Install additional dry hydrants.	\$50,000 grant funding Unknown	Public Works Department / Fire Department Bad River Fire	As needed	Medium	City of Ashland Bad River	Have 8-10 in the county Remove
	Install additional dry hydrants.	\$50,000 grant funding Unknown	Public Works Department / Fire Department Bad River Fire	As needed	Medium	City of Ashland Bad River	^^See note at the end of this Appendix Have 8-10 in the county Not accomplished. Will examine in next planning period.
	Address blight in community by demolition of vacant, abandoned and substandard buildings.	Unknown. Annual budget or grant funding	Planning & Development Department	Ongoing	High	City of Ashland	Working to establish budgeted funds to acquire properties and conduct demolitions. Will examine in next planning period.

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Continue to enforce Property Maintenance Ordinance.	Annual budget	Planning & Development Department	Ongoing	High	City of Ashland	Yes – continuing and increasing enforcement on structures. Keep going forward
Develop Unified Development Ordinance.	Annual budget	City of Ashland Planning	2012	High	City of Ashland	Streamlined ordinance. Safe rooms, flood, etc. Adopted 1/10/12. Remove
Create, publish and distribute Ashland County structure protection map booklets.	\$10,000	DNR/ USFS/ ACEM Dept.	2014, as grants allow	High	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	- Enables responding resources to know amount of structures to evacuate and protect, better groups structures for easier suppression management, shows locations of dry hydrant and water sources as well, pursue funding through grants and DNR - Similar to Sawyer County mapping booklets. Ashland County and the WI DNR created Emergency Response Map books for first responder agencies in 2017 and distribution was completed in 2018. Remove.
Use physical fire towers manned during peak season for early detection; provide airplane coverage to augment tower locations for fire detection.	Annual budget	DNR/ USFS	Ongoing	High	Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	The WI DNR is decommissioning fire towers. Remove

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Complete CWPPs (Community Wildfire Protection Plans).	Unknown - varies based on size	USFS/ ADEM Dept.	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Currently a project is beginning for Ashland, Bayfield and Sawyer Counties in the Townships of Namakagon, Spider Lake, Cable, Grand View, Gordon and Shanagolden to identify and mitigate hazard fuels within these areas. Other areas can be examined for potential CWPP development "Clam Lake Community Wildfire Protection Plan" (v. 2013) was created to include communities from Ashland and Bayfield Counties. In 2018 it was extended to include communities from Sawyer County. Remove
Continue conducting the community prevention program activities.	Annual budget	USFS/ DNR/ Local Fire Departments/ ADEM, AC Dispatch, Bad River EM	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Public outreach and education on wildfire prevention, Smokey Bear appearances in schools/community events, etc. Currently conducting education through the ASC during Fire Prevention Month in October of each year Done annually. Keep going forward.
Continue conducting FireWise Programs.	Annual budget	USFS/ DNR/ Local Fire Departments/ Bad River EM	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs	- Fuel reduction mitigation program. - Provide presentation to landowners, landscapers, builders, etc. on sound building

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							of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	practices and yard clearances to improve structural defensible space. Done annually. Keep going forward.
	Continue wildfire emergency operations training and interagency coordination initiatives.	Annual budget	USFS/ DNR/ Local Fire Departments/ Bad River EM	Ongoing	High		Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Put on training for fire departments on wildfire suppression and safety. Work together to insure NIMS/ICS in place and practice implementation. After Action Reviews conducted after incidents to further improve effectiveness. Done annually in spring. Keep going forward.
Severe Temperatures	As part of a public information campaign, place severe temperature safety materials in county display rack and on the website for winter and summer seasons.	Annual budget	ACEM Dept./ Bad River EM	Ongoing	Medium		Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden and White River	The Ashland County website has been deemed the official site for information. Links to the Sheriff's Facebook page will facilitate public information campaigns. Done annually. Keep going forward.

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Storms: Hail, Lightning and Thunderstorms	Install four lightning arresters for every mile of line and every transformer/ substation residence.	\$70 per \$2,000 overhead	Price and Bayfield Electric Co-ops	Ongoing	Low-Med	PEC: TNs of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville, Shanagolden BEC: TNs of Ashland, Gingles, Gordon, Marengo, Morse, Sanborn, Shanagolden, White River	Lightning blows out arrester and not house, transformers. Lifespan is 25-30 years. Visibly locate the ones that are out (time consuming). Bayfield Co-op: This is built into systems with transformers so it will not be done in their service area. Price Co-op: portions are done starting with high-volume areas with a focus on feeders out of the Glidden substation. Spent \$1million in line rebuilds to increase redundancy.
	As part of a public information campaign, place thunderstorm, hail and lightning safety materials in county display rack and on the website for spring.	Annual budget	ACEM Dept./ Bad River EM	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Drop going forward. Postings are on the Ashland County website with links to the Sheriff's Facebook page. Keep as an ongoing project.
	Ongoing maintenance to keep right-of-way at least 20 feet clear.	Up to \$100,000 for contractors to clear	Price and Bayfield Electric Co-ops	Ongoing	High	PEC: TNs of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville, Shanagolden BEC: TNs of Ashland, Gingles,	Bayfield Co-op: keep 20' each side of overhead and 10' underground clear at Highbridge at a cost of about \$285k. Spend about \$400k annually on brushing. More is being done in 2019. Keep as an ongoing project

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Storms: Tornadoes and High Winds	Promote tornado awareness, including home safety measures (include website) during a spring public information campaign.	Annual budget	ACEM Dept./ Bad River EM	Ongoing	Medium	Gordon, Marengo, Morse, Sanborn, Shanagolden, White River	Price Co-op: cleared to 15' wide on single phase and 20' on multi-phase at a cost of \$600k - \$700k. Looking to go to a 7-10 year cycle. Keep going forward. Done annually in spring and on websites and Facebook. Keep going forward.
						Ashland Co.; Bad River Tribe; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
						CI of Ashland	None identified.
						VI of Butternut	Consider for the newly-built mobile home park in Butternut.
Identify storm shelters for golf courses, campgrounds, parks and mobile home parks.		\$100,000 Grant funding	Police Department / Fire Department	1-5 years	High	Ashland Co.; CI of Mellen; TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	The newly developed bathrooms at Kreher park, Prentice park, Maslowski beach, sunset park (Pamida beach) all have the capability to function as "safe rooms".
						Administration	
						Ashland Co EM with municipalities	

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	Identify and/or build safe rooms.	Grant funding	Bad River EM	5 years	High	Bad River Tribe	Mobile homes, youth care and community areas as well as parks/campsites Will keep, as funding available, as an ongoing item. ^^See note at the end of this Appendix
	Encourage use of and provide for mobile home tie-downs.	Grant funding	Bad River EM/ Administration/ Housing	1-3 years	High	Bad River	Not completed. Will add the county and all municipalities and keep this item going forward.
	Revise the mobile home ordinance to require tie-downs.	Annual budget	Department of Planning & Development	1-2 years	Medium	CI of Ashland	Estimated three needed Should fall to EM not the Fire and Police department
	Complete a warning siren study to determine number of necessary sirens to cover the community.	\$10,000 Grant funding	Police Department / Fire Department	1-2 years	High	CI of Ashland	Will keep going forward.
	Implement findings of Warning Siren Study.	\$50,000 Grant funding	Police Department / Fire Department	1-5 years	High	CI of Ashland	This may be shifted to the public works department
	Update Tree Management Plan.	\$25,000 Annual budgets; offset by Grant funding	Public Works Department	1-2 years	Medium	CI of Ashland	Not completed. Will keep going forward.
	As part of a public information campaign, place winter and cold weather safety materials in county display rack and on the website for winter.	Annual budget	ACEM Dept./ Bad River EM	Ongoing	Medium	Ashland Co.; Bad River Tribe; CIs of Ashland and Meilen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville,	Completed. Remove
	Storms: Winter						Postings are on the Ashland County website with links to the Sheriff's Facebook page. Kept as an ongoing project.

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	Ensure right of way clearing on county roads and living snow fence to act as windbreak.	Annual budget	AC Highway	Ongoing	High	Sanborn, Shanagolden, and White River Ashland Co.; Bad River Tribe; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	This was done as an ongoing project and will be kept going forward.
	Complete maintenance to keep right-of-way at least 20 feet clear.	Up to \$100,000 for contractors to clear	Price and Bayfield Electric Co-ops	Ongoing	High	PEC: TNs of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville, Shanagolden BEC: TNs of Ashland, Gingles, Gordon, Marengo, Morse, Sanborn, Shanagolden, White River	This will be removed and kept under Thunderstorms section.
	Utility Failure	Study on line load and loss.	Price Electric Co-op	1-5 years	Medium	TNs of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville and Shanagolden	Benefits all customers (see service map). Transformer failure and line burn down (line overloaded and physically burns down). Done on some lines but ongoing project expected to cost \$30k more over 2-3 years.

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	Obtain service map from Price and Bayfield Electric Co-ops.	Annual budget	ACEM Dept., Price and Bayfield Electric Co-ops	2012	High	PEC: TNs of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville, Shanagolden BEC: TNs of Ashland, Gingles, Gordon, Marengo, Morse, Sanborn, Shanagolden, White River	- Price Electric Co-op covers a large portion of southern Ashland County. - Bayfield Electric Co-op and Price Electric Co-op cover rural areas. Xcel covers most populated clusters but also extends into rural area. Bayfield and Price Co-ops: This was not done because there is no Ashland Co. GIS person. This position will be filled in 2018 and then will be done and continually updated as an ongoing project. - Encouraged with new development projects where feasible Not accomplished. Will examine in next planning period. ^^See note at the end of this Appendix Not accomplished. Will examine in next planning period. Not accomplished. Will examine in next planning period. - Bigger class pole with 9' class wire reduces load loss due to resistance. - Will keep going from various substations in service area until it is completed.
	Work with utilities to place new local electrical distribution lines to be placed underground where applicable.	Unknown. Annual budgets; offset by grant funding	Public Works Department / Planning & Development Department	Ongoing	High	CI of Ashland	
	Emergency backup systems for lift station, preschool facilities, and others as identified by needs assessment.	Unknown	Bad River Water & Sewer Facilities/ Administration	1-5 years	High	Bad River Tribe	
	Insulate water mains.	Annual budget	VI of Butternut Public Works Department	1-5 years	Medium	VI of Butternut	
	Install a back-up generator for the sewer system	Unknown. As grants available	VI of Butternut Public Works Department	1-5 years	Low	VI of Butternut	
	Upgrade wire, poles, arresters, cut outs, software (NISC) to pinpoint outages. Glidden substation to Forest Service (4 miles north of Glidden), 3 phase job.	\$600,000 Annual budget (self or contract)	Price Electric Coop	2014	Medium	TN of Jacobs (Glidden)	

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						Will take about 25-30 years, growth dependent.
						Two phases are done and one is left (9.25 mi) to upgrade the wire and poles. The software is updated. It will cost \$525 for the last phase and will take 5 years. This will be kept as an ongoing project.
						Backup generator is needed for the fuel depot at the highway because no public gas stations have backup generators.
						Ashland County Sheriff's Office currently does not use the highway shop for fuel. In an emergency this fuel resource would have to be used since no gas stations have generator back-up.
						City of Ashland Police & Fire fuel up at the City's DPW which does not have generator back-up on their fuel system.
						Four backup generators needed for schools for the general population. Four portable generators needed with hard wired combo panels to upgrade the facilities to accommodate the generators.
						The CI of Mellen has back-up generators for all water and sewer pumps as of 2017.

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							VI of Butternut	Backups needed for lift station, school, senior facility and gas station. Will be kept as an ongoing project. Not accomplished. Will examine in next planning period.
Conduct a needs assessment to evaluate the needs, budget and begin project for emergency backup systems (computer or mechanical) for the city's water treatment plant.	\$120,000 Grant funding	Public Works Department	1-5 years	High	City of Ashland			- Many problems with older infrastructure: sewer (1800's) and storm sewer (80 years old). - Pockets of iron "rot" issues. Will be kept as an ongoing issue. Not accomplished. Will examine in next planning period.
Evaluate the condition of older sewer infrastructure to ensure failures do not create cascading flooding issues.	Annual budget	Public Works Department	Ongoing	Medium	City of Ashland			3-4 projects completed with grant funds.
Replacement of all leaking/substandard sewer mains.	\$6,000,000 Grant funding	Public Works Department / Public Works Department	As funding available	High	City of Ashland			
	Unknown. Grant funding	Public Works Department		Medium	VI of Butternut			
	Unknown. Grant funding	Public Works Department		Medium	City of Mellen and TN of Jacobs Sanitary District			
Update facility maintenance plan for wastewater.	Unknown	Public Works Department	1-3 years	High	City of Ashland			Leaks in system.
Bury overhead electrical lines.		Bayfield Electric Co-op	5 years					Not accomplished. Will examine in next planning period.
								In the past five years, BEC has buried about 1 million feet of lines to total about 700 miles of 200

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Civil Disturbance/ Terrorism							miles total in their service area. It costs about five times as much to bury as to string overhead. They spent \$450k just in 2017.
							This will be kept as an ongoing strategy.
	Complete planning for civil disturbance, terrorism and radiological emergencies.	\$15,000 Annual budgets or grant funding	Police Department / Fire Department	Ongoing	High	City of Ashland	Need to form a committee to continue moving forward with this initiative. Radiation is already being monitored by the Ashland Fire Department • Not accomplished. Will examine in next planning period.
	Increase security measures in public buildings, including at Police Department and city administrative facilities.	\$50,000 Annual budgets or grant funding	Public Works / Parks & Recreation Department / Police Department / Fire Department / Library / JKF. Memorial Airport / Administration / IT Department	1-2 years	High	City of Ashland	- Panic Buttons being installed on 1st floor of city hall - Newly built Ashland Fire station utilizes key card access to enter the facility for increased security Will examine in next planning period.
	Obtain security alarms, fire alarms and video cameras for municipal facilities.	\$250,000 Annual budgets or grant funding Unknown	Public Works Department / IT Department VI of Butternut Dept. of Public Works	10-15 years 1-2 years	Medium Medium	City of Ashland VI of Butternut	City hall had new alarms installed 2 years ago. Remove Alarms on well house and tower

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		Unknown	Public Works Departments	5 years	Medium	City of Mellen and TN of Jacobs Sanitary District	Concerned about protection measures for the well houses/potable water system. Drop The City of Mellen has back-up alarms (in case of loss) for all wells and sewer systems. TN of Jacobs does not have this and will carry forward. Not accomplished. Will examine in next planning period.
	Provide redundant municipal data systems for operation of municipal facilities and municipal operations.	\$225,000 Annual budgets or grant funding	IT Department	1-5 years	High	City of Ashland	Not accomplished. Will examine in next planning period.
	Complete proper ventilation and mold elimination in public buildings.	\$20,000 (annually) Annual or capital budgets	Facilities Department	Ongoing	High	City of Ashland	Not accomplished. Will examine in next planning period.
	Obtain surge protection at municipal facilities.	\$500,000 Grant funding	Public Works Department / IT Department	1-5 years	Medium	City of Ashland	Not accomplished. Will examine in next planning period.

EM Dept. = Ashland County Emergency Management Department

UW Ext = University of Wisconsin – Ashland County University of Wisconsin Extension Office

* Designates an element that supports the NFIP.

^^ The original plan was done in conjunction with the Bad River Tribe. After completion, the Tribe decided not to join the county plan and created their own hazard mitigation plan. The elements were left here, as it was presented in the original document but there will be no reporting element in this section because the tribe never adopted this plan and is no part of this process, as they created their own plan.

AMENDMENT

Amending the approved 2014 Hazard Mitigation Plan

November 9, 2016

The Ashland County Hazard Mitigation Plan as written fulfills the requirements of the Disaster Mitigation Act of 2000, which is administered by the Federal Emergency Management Agency (FEMA). The act requires all Hazard Mitigation Plans be updated every five years. This is an amendment to the approved 2014 Hazard Mitigation Plan.

This amendment is being created because, since the completion and adoption of the approved plan, new concerns and/or projects have been brought to the county's attention, in part as a result of the events that generated the federal Stafford Act disaster declaration (DR-4276 Wisconsin Severe Storms and Flooding, incident period 7/11-12/16¹⁴⁷). Ashland County and the affected municipalities would like to amend the plan before the next scheduled update (2019) to reflect these concerns, to record and document possible hazard mitigation strategies, and to make the communities eligible for any potential grant assistance that may be available.

Realizing that identifying our community's risk and working collectively toward the prevention of disaster in our community is in everyone's best interest, Ashland County Emergency Management has taken the lead on this amendment.

Flooding and Dam Failure

Background

Ashland County, due to its geographical positioning and soil composition, has variations in terrain that make various areas susceptible to the destabilization of the land when in flood conditions (i.e., landslides). The conditions that contribute to this destabilization occur at widespread and various locations throughout the county.

Flash flooding and torrential rains occurred overnight on Monday, July 11, 2016 when 8-12 inches of rain fell in a matter of hours across northern Wisconsin. On

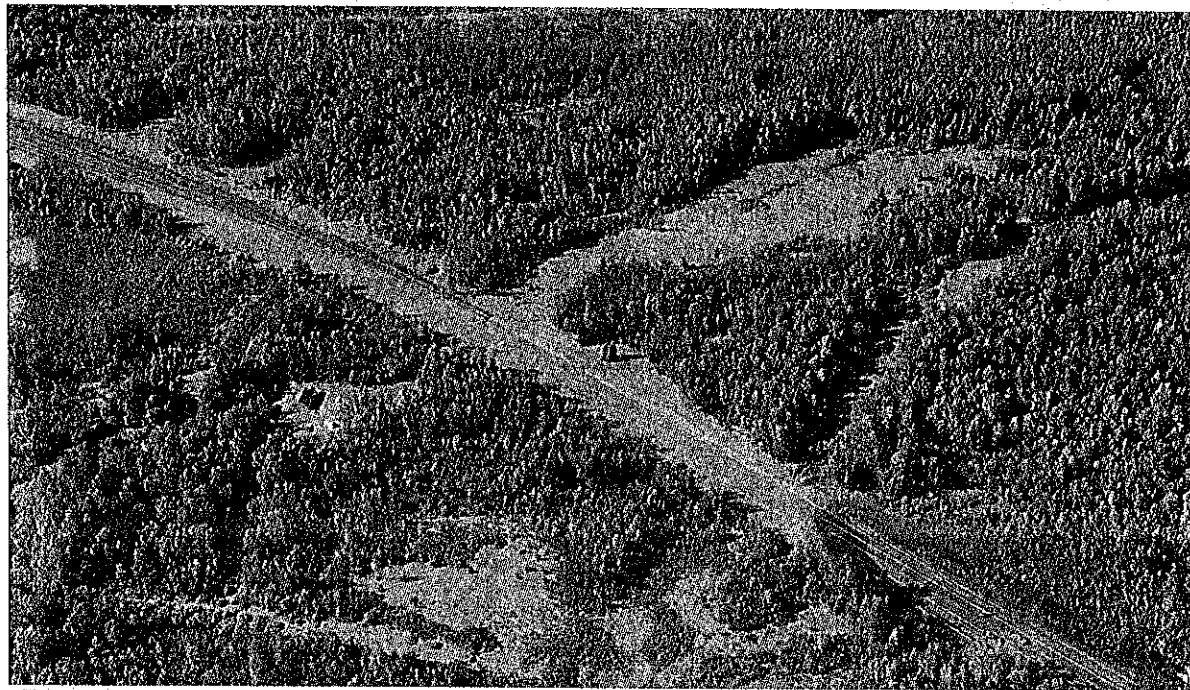
¹⁴⁷ <https://www.fema.gov/disaster/4276>

Appendix D: Report on Previous Mitigation Strategies

July 12, Governor Scott Walker declared a State of Emergency for eight counties: Ashland, Bayfield, Burnett, Douglas, Iron, Price, Sawyer and Washburn.¹⁴⁸

As the recovery process continues, the county has become aware of properties that are at risk of further damage due to landslide conditions and there may be additional properties for which landslide risk and/or damage becomes apparent over time.

Overall, this flooding was devastating to Ashland County and its municipalities. Aside from the individual and public property damage, over 30 people were stranded and required rescue in Iron County and there were three deaths from flash flooding, including one of the elected Town Supervisors for the Town of Marengo in Ashland County. Damages are still being finalized but are expected to run in the millions of dollars.



Example of flood damage in Ashland County, Wisconsin. Photo: ReadyWisconsin/Civil Air Patrol

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¹⁴⁸ <http://ready.wi.gov/flooding/NorthernWI2016.asp>

¹⁴⁹ <http://floodlist.com/america/usa/wisconsin-minnesota-floods-july-2016>

Appendix D: Report on Previous Mitigation Strategies

Hazard Mitigation Strategies

Ashland County has been working with individual property owners, Wisconsin Emergency Management (WEM), the Federal Emergency Management Agency (FEMA), and the Natural Resources Conservation Services (NRCS) to evaluate properties at landslide risk as they have been made aware of the concern. Currently there are three properties that have been identified and evaluated by NRCS engineers. All are single-family homes and there is one each in the Towns of Ashland, Marengo, and Morse.

Ashland County would like to continue appropriate mitigation strategies for these three properties as well as any that may arise in the future. These strategies would include working with technical partners to conduct engineering studies of the areas of concern and to create solution options based on those results. Solutions may include activities such as buy-outs, relocations, and/or stabilization. The county will also work with landowners and other stakeholders to select and complete technically-sound solutions that meet a cost-benefit analysis.

The cost for these projects is unknown at this time but the county would like to explore any possible grant assistance available from state and/or federal programs. The project would be managed by the affected municipality in partnership with Ashland County. The timetable would be as funding becomes available and the benefitting communities would be Ashland County and all of its municipalities. Of the three projects currently being discussed, the engineers have recommended that homeowners in the Town of Ashland property vacate the premises because it is too unsafe for occupation; solutions for that property are a very high concern. The other two properties, as well as any future landslide concerns would be rated as a high concern, unless otherwise recommended after review of the technical data.

Utility Failure

Hazard Mitigation Strategies

The existing strategies read:

Ashland County and all of the incorporated (city and village) and non-incorporated (town) municipalities: *“Conduct a needs assessment to evaluate the needs, budget and begin project for emergency backup systems for community facilities around the county. Explore possible options including backup generators, outdoor/mobile generator receiver panels, etc.”*

Appendix D: Report on Previous
Mitigation Strategies

- Village of Butternut: *"Install a back-up generator for the sewer system."*
- City of Ashland: *"Conduct a needs assessment to evaluate the needs, budget and begin project for emergency backup systems (computer or mechanical) for the city's water treatment plant."*

Bad River Tribe: *"Emergency backup systems for lift station, preschool facilities, and others as identified by needs assessment."*

Community leaders from all of the municipalities would like to further extend this strategy by stating that they would like to put generators in a variety of public buildings such as:

- Schools, recognizing that these facilities are dispersed through the community and currently serve as emergency shelters for community members in times of disaster.
- Fire/Police/EMS Halls and other and Government buildings to support emergency response agency's tactical needs, Emergency Operations Centers (EOC) and to support Continuity of Government/Continuity of Operations (COOP/COG) critical functions.
- Critical Infrastructure such as lift stations which support basic community health, sanitation, and support needs.

The cost for these projects is unknown at this time but is expected to be variable based on the needs of the individual project. It would be managed by the local incorporated municipalities or Ashland County in unincorporated areas. Ashland County Emergency Management would provide support for all applications. The priority on this project continues to be medium, and all of the communities would benefit; the timetable would be as funding becomes available.

Reporting: The projects listed in this amendment continue to be evaluated for completion and will be rolled into the new plan.

Appendix E: Summary of Mitigation Strategies

Summary of Mitigation Strategies						
Hazard Type	Mitigation Measures	Costs of Project	Responsible Management	Project Timetable	Project Priority	Community(ies) Benefitting
All Hazards	Coordinate with County Emergency Manager, city and county emergency personnel, and representatives from nursing homes, schools, and hospitals to assess storm safety procedures/emergency care procedures.	Annual budget offset by grant funding	ACEM Dept./ Police Department/ Fire Department	Ongoing	Low	City of Ashland
	Host community education classes or other forms of outreach on Family Disaster Planning, Supply Kits, weather education and Community Emergency Response.	Annual budget offset by grant funding	Parks & Recreation Department / Fire Department / Police Department	Biannual - early winter and summer	Medium	City of Ashland
			ACEM Dept./ Police Department/ Fire Department			Ashland Co.; CI of Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River

Appendix E: Summary of Mitigation Strategies

Maintain a public transportation system to move people around during emergency or evacuate areas in a disaster.	\$100,000 Grant funding	Administration/ Fire Department/ Police Department	Ongoing	Medium	City of Ashland	Need to open talks with BART/Lakeshore buses for coverage 24 hours 365 days a year incident coverage with numbers.
Train Emergency Response personnel and Emergency Response Teams in NIMS. Organizing and bringing NIMS compliance up to date.	\$12,000 Annual budget offset by grant funding	ACEM Dept./ Fire Department/ Police Department	Ongoing	High	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Will be done in all municipalities as needed/personnel change.
Ensure that GIS mapping is available to emergency operations personnel and is routinely updated.	\$15,000 Annual budget offset by grant funding	Public Works Department	Ongoing	Low	City of Ashland	Updates are done annually.
Establish public access television station to be available in emergencies.	\$10,000 Annual budget offset by grant funding	Information Technology Department	1-2 years	High	City of Ashland	
Equip public access television studio to be available in emergencies.	\$30,000 Grant funding	Information Technology Department	1-2 years	High	City of Ashland	Equipment may include Emergency Alert System suite.
Establish 3-1-1 System.	Unknown	Information Technology Department/ ACSO	Unknown	Medium	City of Ashland	Non-emergency municipal services information center. Diverts routine inquiries from 911.
Construct an Emergency Operations Center (EOC) for Police and Fire Department.	\$5,000,000 Grant funding	Fire Department/ Police Department	1-5 years	High	City of Ashland	New Ashland Fire Department training room will need additional

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Appendix E: Summary of Mitigation Strategies

							funding to make completely operational
Create and Adopt an Emergency Operations Plan (EOP) for the City of Ashland.	\$150,000 Grant funding	City of Ashland	1-2 years	High	City of Ashland		
Complete GIS mapping of problematic areas.	Annual budgets	Public Works Department	Ongoing	Medium	City of Ashland		
Increase municipal fuel storage capacity for emergency operations.	\$100,000 Capital budget or grant funding	Public Works Department	1-2 years	Medium	City of Ashland		Continuing to review
Adopt a Post Disaster Recovery Ordinance.	\$500 Annual budget offset by grant funding	Administration	1-2 years	Medium	City of Ashland		
Provide airport with portable hangers for equipment and storage, fuel storage and refueling capabilities; ensure security and properly maintained runways.	\$500,000 Grant funding	JFK Memorial Airport Staff & Commission	1-5 years	Medium	City of Ashland		To include COOP/COG planning.
Continued enforcement of the city's ordinances to guide development away from hazardous areas.	\$50,000 Annual budget	Department of Planning & Development	Ongoing	High	City of Ashland		Ongoing project.
Develop a plan to allow for the continuity of municipal operations that will ensure the essential functions of an organization can operate during and after an emergency incident. Plan to include methods to maintain normal operating systems (i.e., data, communications, transportation).	\$5,000 Annual budget offset by grant funding	City of Ashland	1-2 years	High	City of Ashland		

Appendix E: Summary of Mitigation Strategies

Install methods to deter birds and wildlife at airport.	\$10,000 Annual budget offset by grant funding	JFK Memorial Airport Staff & Commission	Ongoing	Medium	City of Ashland	
Improve roadways that currently do not allow safe access for emergency vehicles.	\$400,000 Capital or annual budget offset by grant funding	Ashland Public Works Department	Ongoing	Medium	City of Ashland	As ongoing road improvements are made, emergency personnel are included in the design process. Ongoing and will keep going forward.
Develop an evacuation plan, including emergency shelters and evacuation routes for Ashland residents.	Unknown. Annual budget offset by grant funding. Annual budget	Fire Department/ Police Department/ ACEM Dept. Butternut Fire Department	5 years	High	City of Ashland VI of Butternut	Not accomplished. Will examine in next planning period. There is thought that this should be part of the Ashland County Strategic Plan. No formal plan written however there is ongoing access in all directions going out of town.
Plan, design and construct an east-side loop in Ashland.	\$10M Grant funding	Public Works Department	10-15 years	Medium	City of Ashland	Little access on east side for disaster problems. Route would connect US Hwy 13 to the east side of Ashland, providing another access around Bay City Creek. Route is needed as it would serve as a detour route if existing routes across Bay City Creek are blocked.
Ensure that the city continues to have access to multiple modes of transportation (rail, marine, highway, air).	Unknown. Annual budget offset by grant funding	Department of Planning & Development / Public Works Department / Administration / JFK Memorial	Ongoing	Medium	City of Ashland	Multiple modes continue to be available.

Appendix E: Summary of Mitigation Strategies

	Perform a study to develop an emergency source of supply of potable water.	\$30,000 Grant funding	Airport / Harbor Master	1-5 years	High	City of Ashland	Updated quarterly to reflect seasonal hazards. Municipalities link to the county web page for information.
	Develop an emergency source of potable water supply.	\$250,000 Grant funding	Public Works Department	5-10 years	High	TN of Jacobs City of Ashland	
	Obtain computer systems and software to assist with emergency planning.	\$35,000 Annual budget offset by grant funding	Administration / IT Department / Fire Department / Police Department	1-2 years	High	City of Ashland	
	Update websites and review links (to include adding mitigation links) to the Ashland County Emergency Management websites.	Annual budget	ACEM Dept./	Ongoing	High	Ashland Co.; Cis of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
	Sirens: • City of Ashland x3 • City of Mellen x1 Sanitary District of TN of Jacobs/Glidden x 1		City of Ashland City of Mellen TNs of Peeksville, Jacobs, Shanagolden and Gordon		Medium Medium Medium	City of Ashland City of Mellen TNs of Peeksville, Jacobs (Glidden-unincorp.), Shanagolden and Gordon	

Appendix E: Summary of Mitigation Strategies

NOAA weather radios for rural populations.	\$25/unit	ACEM & ACPH Depts.	As grants available	Medium – High	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Comprises about half the population. The PH Dept. annually licenses Airbnb rentals and is providing weather radio info for licensing. Info is also provided on cell phone weather apps.
Explore an emergency notification system to alert residents to potential emergency situations.	\$10,000	ACEM Dept./ ACSO Communications Center	As grants available	Medium	Ashland Co. CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Ashland County had a contract with the Code Red system but it was cut from the county budget because many communities did not sign-up and it was too expensive.
Continue to improve coverage and interoperability for first responder communication systems.	Unknown. Potential grant funding.	ACSO	Ongoing	Medium	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn,	- Fair throughout county; good in the north, poor in south. There are some dead spots. - Fire/EMS and LE- two parallel systems. - Additional towers needed (2-3) - No WISCOM. WISCOM is monitored by dispatch but the county is not wholly adopting. It is on a commercial tower.

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							Shanagolden, and White River	- Costs will be known as technological solutions are chosen. - Technology costs will reduce over time.
Explore text notification of emergency responders.	READYWI USFS ACSO		ACEM Dept./ ACSO Communications Center	As grants available	Medium		Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	- Terrain and large space issues make it difficult to get notified and manage notifications. - Ashland County Dispatch has been providing dispatch to local and state agencies covering the county as a supplement to paging. - e-Dispatch is a text system that operates over the cell network. It can blast pages for multiple responders and has some usage.
Build and equip county emergency facilities of adequate size and capabilities to include: - Emergency Operations Center (EOC) - Alternate Communications Center - Mobile Command Post - Alternate EOC - Emergency shelters	\$1.5 M		ACEM Dept./ ACSO	5 years	Medium		Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	- Current center is 16'x25' conference room. - Can be added onto Ashland County's Law Enforcement Center by design of structure. - There may be the possibility of a larger EOC if the new jail facility is approved by the tax payers. - May consider large Mobile Command Post (MCP) or the Hwy Shop - The county continues to equip the MCP trailer as funding allows. - Should include adequate materials for COOP activations

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Upgrade communication systems for 911 Center.	\$250,000	ACSO	5 years	High	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	The county will start working on the next generation 9-1-1 center capabilities in this planning period.
Upgrade North Tower to WISCOM-compliant building with back-up generator.	\$400,000/ with \$50,000 grant funding	Ashland County Highway Dept./ ACSO	1-5 years	Low	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	This tower supports regular, normal communications on existing system and will not be adapted for WISCOM use. Approximately \$13k for generator upgrade. EM applying for FEMA mitigation grant in 2018 for a stand-alone generator at the North Tower. Awards have not been made as of this date.
Seek solution to consolidate and update GIS mapping.	Unknown	ACSO / 911 Dispatch Center/ ACEM Dept./ Planning and Development/ USFS	5 years	Medium	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn,	- Base data accessible to county departments and citizens (in house or contracted) - City of Ashland PW maintains its own GIS mapping parcel database – should work to consolidate with County so only one entity maintains parcel base.

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								Ashland County has hired a grant-supported, GIS Coordinator (July 2018) which should aid coordination.
Establish a "511-type" system for Ashland County for travelers to send in information on roads, etc.	\$100,000 grant funding	Ashland County Highway Dept.	1-5 years	High	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River			Ashland County departments (Highway, GIS, Communication, EM) coordinating and setting up process to report road closures following the June 2018 rain event.
Develop and distribute seasonal transportation specific safety information.	\$5,000 grant funding	Ashland County Highway Dept./ ACEM Dept./	1-5 years	High	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River			Press releases are regularly released.
Purchase Spill Response Kits in 55 gallon barrels. Put one kit in each satellite Highway Shop.	\$25,000 grant funding	Ashland County Highway Dept.	Ongoing	Medium	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa,			\$5,000/kit, 5 kits (Broom, shovel, hazmat bags, binoculars, absorbents, etc.) - No fire department has kits of this size but have some

Appendix E: Summary of Mitigation Strategies

								Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	materials good for smaller spills.
	Formalize inter-governmental agreements between the Highway Dept. and the municipalities.	Annual budget	Ashland County Highway Dept./ ACEM Dept., municipalities	Ongoing	Medium /High			Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
Coastal Erosion and Landslides	Develop a grading ordinance that specifies grades for new construction.	\$500 Annual budgets	Department of Planning & Development / Public Works Department	1-2 years	High			City of Ashland	
	Create a dredge spoil basin to permit harbor dredging to occur.	\$600,000 Grant funding	Department of Planning & Development / Public Works Department / Administration / Harbor Master	1-5 years	High			City of Ashland	Uncertain if desires to continue to dredge. Will discuss.
	Evaluate options for updating zoning ordinances on coastal and inland waterways focusing on 92F and transitional soils. Educate the community on this concern	Annual budget	AC LCD, P&Z	5 years	Medium			Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa.	Concerned about 92F soils and transitional soils (e.g., sand over clay). LCD has mapped these soils but the county is allowing structures to be placed on them.

Appendix E: Summary of Mitigation Strategies

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Appendix E: Summary of Mitigation Strategies

									do coastal floodplain mapping to include a wave run-up study for the FEMA maps. - Some houses may be shown to be in that area. - Countywide soils mapping has been completed by NRCS	Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River
	Incorporate soils mapping in city and county's GIS.	Unknown				City of Ashland Public Works Department / County Land Conservation and County Zoning	1-2 years	High	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
	Replace non-code compliant water lines and fire hydrants.	\$20 M grant funding				Public Works Department	15 years	High	City of Ashland	Ongoing with all Capital Projects.
	Upgrade and make inspections of City water intake pipe in Lake Superior.	\$300,000 grant funding				Public Works Department	5 years	High	City of Ashland	
	*Review/Update/Adopt a storm water management ordinance.	Unknown. Annual budget				Public Works Department	1-2 years	Medium	City of Ashland	
	Perform routine bridge inspection and maintenance.	Annual budget				Wisconsin DOT / Ashland County Highway Department & municipalities	Ongoing	Medium	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn	Bridge inspections are required every 1-2 years. HWY Dept. facilitates all inspections and keeps records (not including federal roads).

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								Shanagolden, and White River	
Replacement of lead water services at all public properties.	\$1,000,000 grant funding	Public Works Department /	As funding available	High	City of Ashland	Funding from WI DNR allowed removal of lead service to private properties.			
Create an Emergency Response Plan for utilities (water and sanitary) and pipeline breaks.	Annual budget	Public Works Department	1-5 years	High	City of Ashland	Completed at the waste water in review with the water utility			
Continue to monitor POWTS (Private Onsite Wastewater Treatment Systems).	Unknown. Annual budget	Public Works Department	1-5 years	Medium	VI of Butternut	Has an ERP and are updating.			
		Ashland County Zoning Department	Ongoing	High	Ashland Co.; CIs of Ashland and Meilen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Done on an ongoing basis.			
Complete investments, testing and maintenance of water and sewer systems to ensure they are operating within health standards and codes.	Unknown. Annual budget	Public Works Department	Ongoing	High	City of Ashland				
*Educate residents about the National Flood Insurance Program (NFIP).	Annual budgets; offset by grant funding	ACEM Dept./ City of Ashland Department of Planning & Development; BR EM	Annually	Low	Ashland Co.; CIs of Ashland and Meilen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville,	An increased number of homes are being affected by flooding and not all of them are in a floodplain.			

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									Sanborn, Shanagolden, and White River	
Seal manhole covers in Village of Butternut.	\$5,000	Village of Butternut Dept. of Public Works	1-5 years	High					Village of Butternut	Started in 2012 Village project to have 2 done each year.
Raise Minnesota St. between 2 nd and 4 th .	\$200,000	Village of Butternut Dept. of Public Works	1-5 years with grant funding	Medium					Village of Butternut	
Study and develop strategy options to manage storm water run-off from State Highway 13 that flows downhill on Minnesota and Michigan Sts., which floods their cross streets.	Unknown	Village of Butternut Dept. of Public Works, WI DOT, Ashland Co Highway Dept.	Ongoing	Medium					Village of Butternut	
Clean ditching to Butternut Creek.	\$10,000	Village of Butternut Dept. of Public Works	1-5 years	High					Village of Butternut	Starting in 2012 and is an ongoing project.
Conduct hydrology study of Butternut Creek.	Unknown. As grants available	Village of Butternut Dept. of Public Works	1-5 years	High					Village of Butternut	
Review potential strategies to manage growth and flooding issues on Caville Road.	Unknown. As grants available	Town of Sanborn Board/	Ongoing	Low					Town of Sanborn	- Decades of flooding in Old Odanah. New Odanah is still expanding, thus creating additional problems. (i.e., sanitary system overflowing.) - Repetitive small road and home flooding. - Designated re-route of US 2 because of flooding.
Purchase a sandbag filler and waste blocks.	\$40,000; As grants available	Ashland Co & local municipalities	1-5 years	High					Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe,	- Unsuccessful in past grant applications - Need 100+ waste concrete blocks for help with flooding (~\$40/per block)

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							Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
	Work with local municipalities to conduct flood evaluations.	Unknown	ACEM Dept./ AC HWY, AC P&Z, local municipalities	Ongoing	Medium		Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Approach from drainage perspective. As towns need help, the county will assist. May include a dam flood mitigation plan with local agencies, map culverts, etc. So when there is a flooding problem, traffic can be rerouted. Also create a means to notify neighboring towns, so they will be able to manage increased maintenance needs from the diversions.
	Actively search for funding options for dam control and maintenance around the dams.	Unknown	LWCD w/ Ashland Co Highway Dept., AC P&Z, WI DNR, as appropriate	Ongoing	Low		Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	LWCD would be involved if there is a water quality or erosion control concern.
	Cap unused/out of service wells to prevent contamination.	Annual budget	LWCD and municipalities	Ongoing	Med-High		Ashland Co.; CI of Mellen; the VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon,	- The LWCD & WI DNR have had cost-share available on an annual basis for well closures. - An inventory should be completed – mostly on private lands.

Appendix E: Summary of Mitigation Strategies

									- Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River - City of Ashland	- LCD has an educational role - There are many unused/out of service/improperly closed wells within the City of Ashland. No inventory exists
									CI of Mellen; TN of Jacobs (Glidden)	- EPA requires for groundwater systems. - Done annually with Mellen Utilities.
									Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	For water and mega farms as well as potential metallic mining operations
									Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	FEMA's PDM & FMA grants are potential funding sources for buyout.

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							Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
							Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNS of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	FEMA's Federal Insurance & Mitigation Administration's Advanced Assistance programs (e.g., CR Mitigation Activities: Flood Diversion & Storage or CR Mitigation Activities: Floodplain and Stream Restoration) may be of assistance.
							Ashland County City of Ashland	
							Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNS of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	The WI DNR requires this to be done. There is continuing education with the towns but it is done at the county. EM is working with the towns to create a binder documenting road maintenance annually.

						Peeksville, Sanborn, Shanagolden, and White River	
Consider potential solutions to make North York Road safer for vehicular traffic.	TBD Grant funded	Town of Ashland	1-5 years	High		North York Road is built on ledge rock. A particular section of North York Road between section 31 & 32 was constructed on a rock outcropping creating a dangerous section of road to navigate. There are total blind spots at the top of the hill from one direction and around the curve from another direction.	- Continually washes out. - Proposing to replace one large culvert (37"x 52") with two 4 ft. culverts which will be longer than the current one. (Due to the high frequency of washouts, it will be easier to maintain 2 smaller culverts.) - They will also add rip rap with shoot outs to help divert the water coming down the hill from eroding the road. - There will also be an installation of a cross culvert to divert water before the large culvert currently in place. - Special consideration and permission for this project area granted by the DNR as this is a trout stream. - The town may be forced to close the road after the next storm damage if mitigation cannot be funded.
Complete recommended flood mitigation measures to forestall future flooding problems on Silver Creek Road.	TBD Grant funded (applying for a PDM project grant in 2012)	Town of Ashland and AC Highway Dept.	1-5 years	1-5 years			

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	Update Road projects including:	\$171,000	Town of Morse	1-3 years	High-Very High	Town of Morse	
	• Lake Drive culvert replacement • Fisher Road culvert replacement • Minnie Creek Road culvert replacement • Lake Galilee dual culvert replacement • Sackett Road adding Meder Lake outlet culvert • Conley Road replace damaged culvert • Wrege Road replace undersized culvert						
	Update Road projects including:	\$30,000	Town of LaPointe	1-2 years	High	Town of LaPointe	
	• East of Old Fort Rd/Casper Rd intersection – rip rap and raise roadbed 4" over existing culvert • Replace three 40' culverts (with 2" larger plastic along with rip rap and raising road crown) at North Shore 1/2 mile northeast of Benjamin Blvd. intersection						
Flooding: Maritime Recreational/ Commercial	Maintain Ashland breakwater maintenance	Federal funding \$450,000	US Coast Guard	July 2018	High	City of Ashland	
	Federal Navigation channel maintained by US ACOE into Chequamegon Bay	Federal Funding	US Coast Guard	2023	Medium	City of Ashland	
	City of Ashland "KIYI Dock" maintained by US ACOE adjacent to "SooLine Oredock"	Federal Funding	Harbor Master	2023	High	City of Ashland	

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	City of Ashland "Soo Line Oredock" maintained by City of Ashland	Municipality Funding	Harbor Master	2023	High	City of Ashland	
	Xcel Energy Ashland power plant channel/dock	Private	Xcel	2023	Low	Xcel	
Forest Fires and Wildfires	Install additional dry hydrants.	\$50,000 grant funding	Public Works Department / Fire Department	As needed	Medium	City of Ashland	Have 8-10 in the county
	Address blight in community by demolition of vacant, abandoned and substandard buildings.	Unknown. Annual budget or grant funding	Planning & Development Department	Ongoing	High	City of Ashland	Working to establish budgeted funds to acquire properties and conduct demolitions.
	Continue to enforce Property Maintenance Ordinance.	Annual budget	Planning & Development Department	Ongoing	High	City of Ashland	Continuing and increasing enforcement on structures.
	Continue conducting the community prevention program activities.	Annual budget	USFS/ DNR/ Local Fire Departments/ ACEM, AC Dispatch	Ongoing	Medium	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Public outreach and education on wildfire prevention, Smokey Bear appearances in schools/community events, etc. Currently conducting education through the ASC during Fire Prevention Month in October of each year
	Continue conducting FireWise Programs.	Annual budget	USFS/ DNR/ Local Fire Departments	Ongoing	Medium	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Ashland, Chippewa, Gingles, Gordon,	• Done annually • Fuel reduction mitigation program. • Provide presentation to landowners, landscapers, builders, etc. on sound building practices and yard clearances

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						Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	to improve structural defensible space.
	Continue wildfire emergency operations training and interagency coordination initiatives.	Annual budget	USFS/ DNR/ Local Fire Departments	Ongoing	High	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Put on training for fire departments on wildfire suppression and safety. Done annually in spring. Work together to insure NIMS/ICS in place and practice implementation, After Action Reviews conducted after incidents to further improve effectiveness.
	Explore options for increasing the number of fire signs in the county (there are three currently).	Unknown	ACEM, USFS	2 years	Medium-High	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
	Continue to cut back brush from the right-of-ways especially in federal forests.	Unknown	Fire Departments, utilities	Ongoing	Medium	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland,	You cannot cut down trees in federal forest so brush cutting is essential to fire protection.

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Severe Temperatures	As part of a public information campaign, make severe temperature safety materials publically available.	Annual budget	ACEM Dept.	Ongoing	Medium	Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	The Ashland County website has been deemed the official site for information. Links to the Sheriff's Facebook page will facilitate public information campaigns.
Storms: Hail, Lightning and Thunderstorms	As part of a public information campaign, make thunderstorm, hail and lightning safety materials publically available.	Annual budget	ACEM Dept.	Ongoing	Medium	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden and White River	Postings are on the Ashland County website with links to the Sheriff's Facebook page.
	Ongoing maintenance to keep right-of-way at least 20 feet clear.	Up to \$100,000 for	Price and Bayfield Electric Co-ops	Ongoing	High	PEC: TNs of Agenda, Chippewa, Gordon, Jacobs, Shanagolden, and White River	Bayfield Co-op: keep 20' each side of overhead and 10' underground clear at Highbridge at a cost of about \$285k. Spend about \$400k

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Storms: Tornadoes and High Winds		contractors to clear				Morse, Peeksville, Shanagolden BEC: TNs of Ashland, Gingles, Gordon, Marengo, Morse, Sanborn, Shanagolden, White River	annually on brushing. More is being done in 2019. Price Co-op: cleared to 15' wide on single phase and 20' on multi- phase at a cost of \$600k - \$700k. Looking to go to a 7-10 year cycle.
	As part of a public information campaign, make tornado and high wind safety materials publically available.	Annual budget	ACEM Dept.	Ongoing	Medium	Ashland Co.; Cis of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Done annually in spring and on websites and Facebook.
	Identify storm shelters for golf courses, campgrounds, parks and mobile home parks.	\$100,000 Grant funding	Police Department / Fire Department	1-5 years	High	CI of Ashland	None identified.
		Grant funding	Administration	5 years	High	VI of Butternut	Consider for the newly-built mobile home park in Butternut.
		Grant funding	Ashland Co EM with municipalities	5 years	Medium	Ashland Co.; CI of Mellen; TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	The newly developed bathrooms at Kreher Park, Prentice Park, Maslowski Beach, Sunset Park (Pamida Beach) all have the capability to function as shelters

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	Revise the mobile home ordinance to require tie-downs.	Annual budget	Planning and Zoning, municipalities	1-2 years	Medium	Ashland Co.; Cls of Ashland and Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	
	Complete a warning siren study to determine number of necessary sirens to cover the community.	\$10,000 Grant funding	Police Department / Fire Department	1-2 years	High	CI of Ashland	Estimated three needed Should fall to EM not the Fire and Police department
	Implement findings of Warning Siren Study.	\$50,000 Grant funding	Police Department / Fire Department	1-5 years	High	CI of Ashland	This may be shifted to the public works department
	As part of a public information campaign, make winter and cold weather safety materials publically available.	Annual budget	ACEM Dept.	Ongoing	Medium	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	Postings are on the Ashland County website with links to the Sheriff's Facebook page.
Storms: Winter	Ensure right of way clearing on county roads and living snow fence to act as windbreak.	Annual budget	AC Highway	Ongoing	High	Ashland Co.; Cls of Ashland and Mellen; VI of Butternut and TNs	

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	Continually evaluate the salt/sand/wet agent mix of winter road agents for all communities to balance safety, cost, and environmental impacts.	Annual budget	AC Highway	Ongoing	Medium	of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River	The use of too much road salt damages land and water plants, can injure animals/fish that eat the salt, and contaminates water (inland and Lake Superior). Ashland County uses less salt than many in WI with wetting agents (beet juice, brine, magnesium chloride helping to use less salt). HWY sells salt/sand to the municipalities, many of which can't use wetting agents because of gravel roads.
						TNs of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville and Shanagolden	- Benefits all customers (see service map). Transformer failure and line burn down (line overloaded and physically burns down). - Done on some lines but ongoing project
Utility Failure	Study on line load and loss.	\$30,000	Price Electric Co-op	3 years	Medium	PEC: TNs of Agenda, Chippewa, Gordon, Jacobs, Morse, Peeksville, Shanagolden BEC: TNs of Ashland, Gingles, Gordon, Marengo,	- Price Electric Co-op covers a large portion of southern Ashland County. - Bayfield Electric Co-op and Price Electric Co-op cover rural areas.
	Obtain service map from Price and Bayfield Electric Co-ops.	Annual budget	ACEM Dept., Price and Bayfield Electric Co-ops	2012	High		

Appendix E: Summary of Mitigation Strategies

								• Xcel covers most populated clusters but also extends into rural area. • Ashland Co. hired a GIS person in 2018 • Encouraged with new development projects where feasible • Bayfield Electric Co-op received a Section 404 hazmit grant (FEMA-4288-DR-WI) on 3/27/18 for \$988,210.40 for bury overhead power lines at four sites.
	Work with utilities to place new local electrical distribution lines to be place underground where applicable.	Unknown. Annual budgets; offset by grant funding	Public Works Department / Planning & Development Department	Ongoing	High	CI of Ashland		• Morse, Sanborn, Shanagolden, White River
	Insulate water mains.	Annual budget	VI of Butternut Public Works Department	1-5 years	Medium	VI of Butternut		
	Install a back-up generator for the sewer system	Unknown. As grants available	VI of Butternut Public Works Department	1-5 years	Low	VI of Butternut		
	Upgrade wire, poles, arresters, and cut outs to pinpoint outages from the Glidden substation to Forest Service.	\$525,000 Annual budget (self or contract)	Price Electric Coop	5 years	Medium	TN of Jacobs (Glidden)		• Bigger class pole with 9' class wire reduces load loss due to resistance. • Will keep going from various substations in service area until it is completed. • Will take about 25-30 years, growth dependent. • Two phases are done and one is left (9.25 mi) to upgrade the wire and poles. The software is updated.
	Conduct a needs assessment to evaluate the needs, budget and begin project for emergency backup systems for community	\$150,000 Annual or capital budget or	Public Works Department / Parks & Recreation	10 years	Medium	Ashland Co.; CIs of Ashland and Mellen; VI of Butternut and TNs		Backup generator is needed for the fuel depot at the highway because no public gas stations have backup generators.

Appendix E: Summary of Mitigation Strategies

	facilities around the county (to include emergency shelters). Explore possible options including backup generators, outdoor/mobile generator receiver panels, etc.	grant funding	Department / Police Department / Library / JKF Memorial Airport			of Agenda, Ashland, Chippewa, Gingles, Gordon, Jacobs, LaPointe, Marengo, Morse, Peeksville, Sanborn, Shanagolden, and White River Cis of Ashland VI of Butternut	Ashland County Sheriff's Office currently does not use the highway shop for fuel. In an emergency this fuel resource would have to be used since no gas stations have generator back-up. City of Ashland Police & Fire fuel up at the City's DPW which does not have generator back-up on their fuel system. Four backup generators needed for schools for the general population. Four portable generators needed with hard wired combo panels to upgrade the facilities to accommodate the generators. Backups needed for lift station, school, senior facility and gas station.
	Conduct a needs assessment to evaluate the needs, budget and begin project for emergency backup systems (computer or mechanical) for the city's water treatment plant. Evaluate the condition of older sewer infrastructure to ensure failures do not create cascading flooding issues.	\$120,000 Grant funding Annual budget	Public Works Department Public Works Department	1-5 years Ongoing	High Medium	City of Ashland City of Ashland	Many problems with older infrastructure: sewer (1800's) and storm sewer (80 years old).

Appendix E: Summary of Mitigation Strategies

Civil Disturbance/ Terrorism	Replacement of all leaking/substandard sewer mains.	\$6,000,000 Grant funding	Public Works Department / Public Works Department	As funding available	High	City of Ashland	Pockets of iron "rot" issues.
	Update facility maintenance plan for wastewater.	Unknown. Grant funding	Public Works Department		Medium	VI of Butternut	3-4 projects completed with grant funds.
	Bury overhead power lines where feasible to increase reliability. Projects may include: - Odanah - Highbridge	Unknown. Grant funding	Public Works Department		Medium	City of Mellen and TN of Jacobs Sanitary District	
		Unknown	Public Works Department	1-3 years	High	City of Ashland	Leaks in system.
		Unknown	Bayfield Electric Co-op	5 years	High	TN Sanborn	These are in the woods where it is brushy, hard to maintain, subject to fires, and to tree damage.
		\$28k for 4 miles				TNs Ashland and Marengo	
	Complete planning for civil disturbance, terrorism and radiological emergencies.	\$15,000 Annual budgets or grant funding	Police Department / Fire Department	Ongoing	High	City of Ashland	Need to form a committee to continue moving forward with this initiative. Radiation is already being monitored by the Ashland Fire Department
	Increase security measures in public buildings, including at Police Department and city administrative facilities.	\$50,000 Annual budgets or grant funding	Public Works Department / Parks & Recreation Department / Police Department / Fire Department / Library / JKF Memorial Airport / Administration / IT Department	1-2 years	High	City of Ashland	- Panic Buttons being installed on 1st floor of city hall - Newly built Ashland Fire station utilizes key card access to enter the facility for increased security

Appendix E: Summary of Mitigation Strategies

Obtain security alarms, fire alarms and video cameras for municipal facilities.	\$250,000 Annual budgets or grant funding	Public Works Department / IT Department	10-15 years	Medium	City of Ashland	City hall had new alarms installed 2 years ago
	Unknown	VI of Butternut Dept. of Public Works	1-2 years	Medium	VI of Butternut	Alarms on well house and tower
	Unknown	Public Works Departments	5 years	Medium	TN of Jacobs Sanitary District	Concerned about protection measures for the well houses/potable water system.
Provide redundant municipal data systems for operation of municipal facilities and municipal operations.	\$225,000 Annual budgets or grant funding	IT Department	1-5 years	High	City of Ashland	
Complete proper ventilation and mold elimination in public buildings.	\$20,000 (annually) Annual or capital budgets	Facilities Department	Ongoing	High	City of Ashland	
Obtain surge protection at municipal facilities.	\$500,000 Grant funding	Public Works Department / IT Department	1-5 years	Medium	City of Ashland	

Appendix F: HAZUS Vulnerability Assessment

Overview

This Appendix has two sections. The first section provides the most current information provided by the HAZUS flooding assessment created by Wisconsin Emergency Management (WEM) and provided to the county for planning purposes. Attachment 1 of this Appendix contains a new HAZUS analysis provided by the Northwest Regional Planning Commission as part of a flooding study done after the historic 2016 flooding.

Identify Hazards¹⁵⁰

Ashland County covers 1,044 square miles and contains 1,602 census blocks. There are over 7,000 households with a population of 16,866. Ashland County consists of 3 cities, 2 villages and 31 towns. There are an estimated 7,767 buildings in the region with a total building replacement value (excluding contents) of 1,425 million dollars (2006 dollars). Approximately 98.7% of the buildings (and 72.1% of the building value) are associated with residential housing.¹⁵¹

Ashland County is located in north-central Wisconsin on the south shore of Lake Superior. The county's boundaries include approximately one-third of the portion of Lake Superior within Wisconsin. From the Iron County line to the area just east of Honest John Lake are clay bluffs with a narrow sand beach on the lake edge. The shoreline from the bluffs to the Bayfield County line is low sand beach dunes. The 70-foot high bluffs and the beach sand dune formations of the Lake Superior shoreline are easily eroded by wave action.

Low-lying areas along Lake Superior are subject to periodic flooding due to high lake levels in combination with wind setup and wave run-up. Wave action has resulted in considerable erosion along the shores of Madeline Island.

Flooding along the streams has resulted in damage to residential, commercial, industrial and agricultural land and buildings.

¹⁵⁰ From Ashland County's Flood Insurance Studies as part of the Federal Insurance Administration flood insurance program and All Hazard Mitigation Plan, prepared as part of the County's Pre-Disaster Mitigation plan

¹⁵¹ 2000 Census Bureau Data

Appendix F: HAZUS Vulnerability Assessment

HAZUS-MH Hazard Analysis

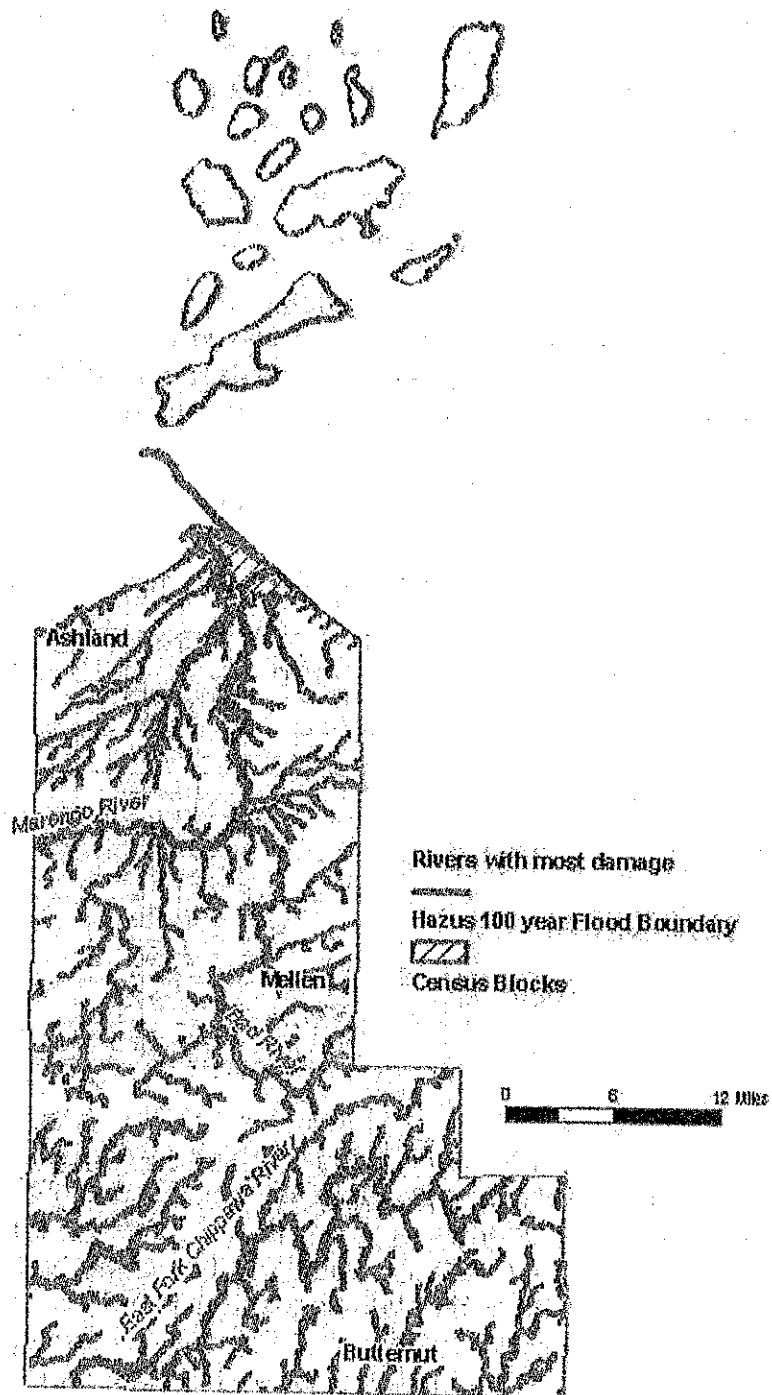
Flood analysis for Ashland County was performed using HAZUS-MH MR3 released in July 2007. The bundled aggregated general building stock was updated to Dun & Bradstreet 2006. Building valuations were updated to R.S. Means 2006. Building counts based on census housing unit counts are available for RES1 (single-family dwellings) and RES2 (manufactured housing) instead of calculated building counts.

The site specific inventory (specifically schools, hospitals, fire stations, Emergency Operation Centers and police stations) was updated using the best available statewide information.

HAZUS-MH was used to generate the flood depth grid for a 100-year return period calculated for 1 square mile drainage areas. The riverine model was determined from a user provided USGS 30m DEM and peak discharge values obtained for 2 reaches tabulated in three Flood Insurance Studies for Ashland County (City of Ashland 1977, City of Mellen 1986 and Unincorporated Areas 1977).

Figure 1 depicts the flood boundary from the HAZUS-MH analysis. The majority of flooding in Ashland County occurs along the Bad River, the Marengo River and the East Fork Chippewa River.

Figure 1: Ashland County HAZUS-MH Analysis (100-Year Flood)



Appendix F: HAZUS Vulnerability Assessment

HAZUS-MH Aggregate Loss Analysis

HAZUS-MH was used to estimate the damages for a 100-year flood event in Ashland County. An estimated 33 buildings will be damaged totaling in \$8 million in building losses and \$18 million in total economic losses. The total estimated number of damaged buildings, total building losses, and estimated total economic losses are shown in Table 1.

HAZUS-MH estimates 3 census blocks with losses exceeding \$1 million. The distribution of losses is shown in Figure 2.

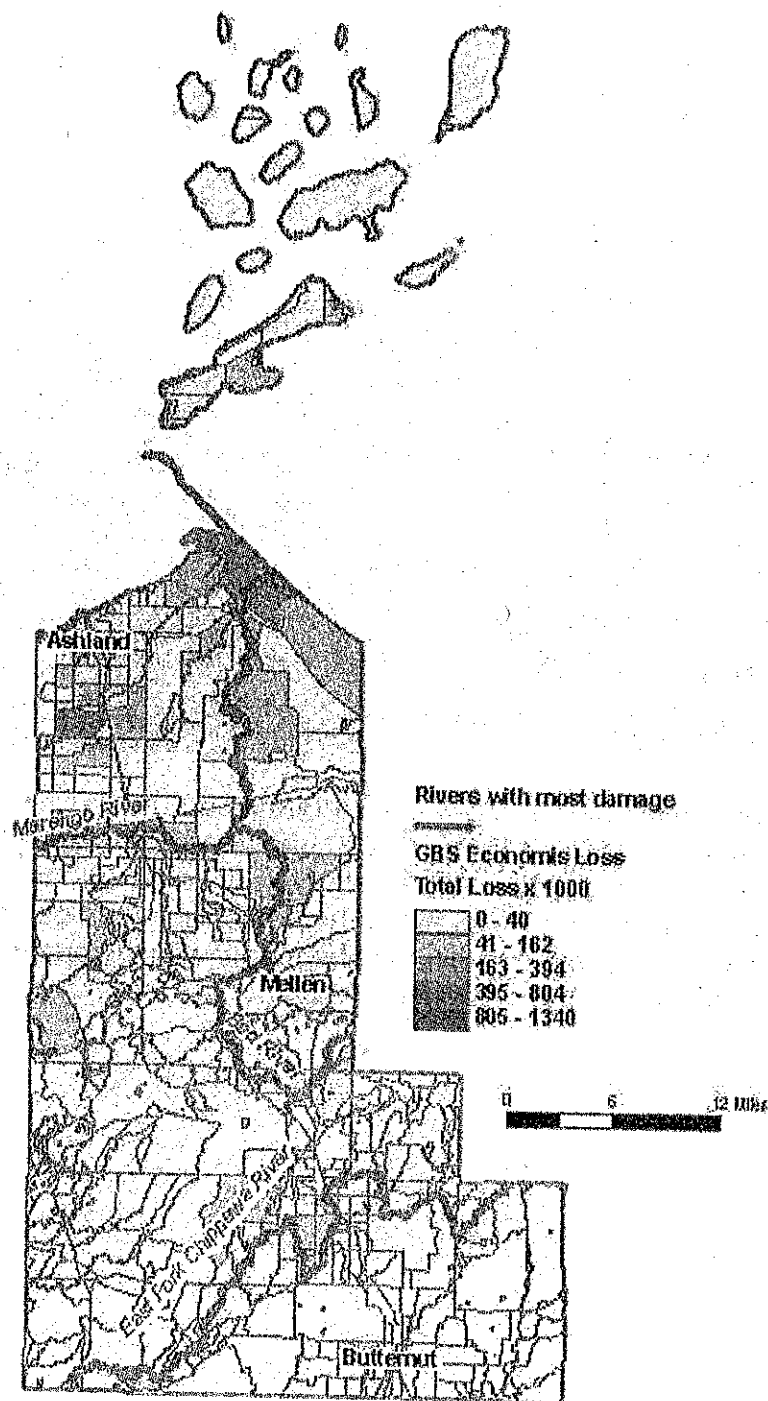
HAZUS-MH aggregate loss analysis is evenly distributed across a census block. Census blocks of concern should be reviewed in more detail to determine the actual percentage of facilities that fall within the flood hazard areas. The aggregate losses reported in this study may be under or overstated. Examples are provided in Figure 3.

Table 1: Ashland Total Economic Loss - 100-Year Flood

General Occupancy	Estimated Total Buildings	Total Damaged Buildings	Total Building Exposure X 1000	Total Economic Loss X 1000	Building Loss X 1000
Agricultural	1	0	\$6,278	\$184	\$46
Commercial	70	0	\$254,351	\$4,507	\$1,151
Education	0	0	\$16,942	\$445	\$74
Government	5	0	\$18,375	\$580	\$59
Industrial	22	0	\$74,157	\$1,189	\$319
Religious/Non-Profit	3	0	\$27,093	\$476	\$63
Residential	7,666	33	\$1,027,537	\$10,670	\$6,264
Total	7,767	33	\$1,424,733	\$18,051	\$7,976

The reported building counts should be interpreted as degrees of loss rather than as exact numbers of buildings exposed to flooding. These numbers were derived from aggregate building inventories which are assumed to be dispersed evenly across census blocks. HAZUS-MH requires that a predetermined amount of square footage of a typical building sustain damage in order to produce a damaged building count. If only a minimal amount of damage to buildings is predicted, it is possible to see zero damaged building counts while also seeing economic losses.

Figure 2: Ashland Total Economic Loss - 100-Year Flood



Appendix F: HAZUS Vulnerability Assessment

Figure 3a: Flood Damage Exposure in Ashland

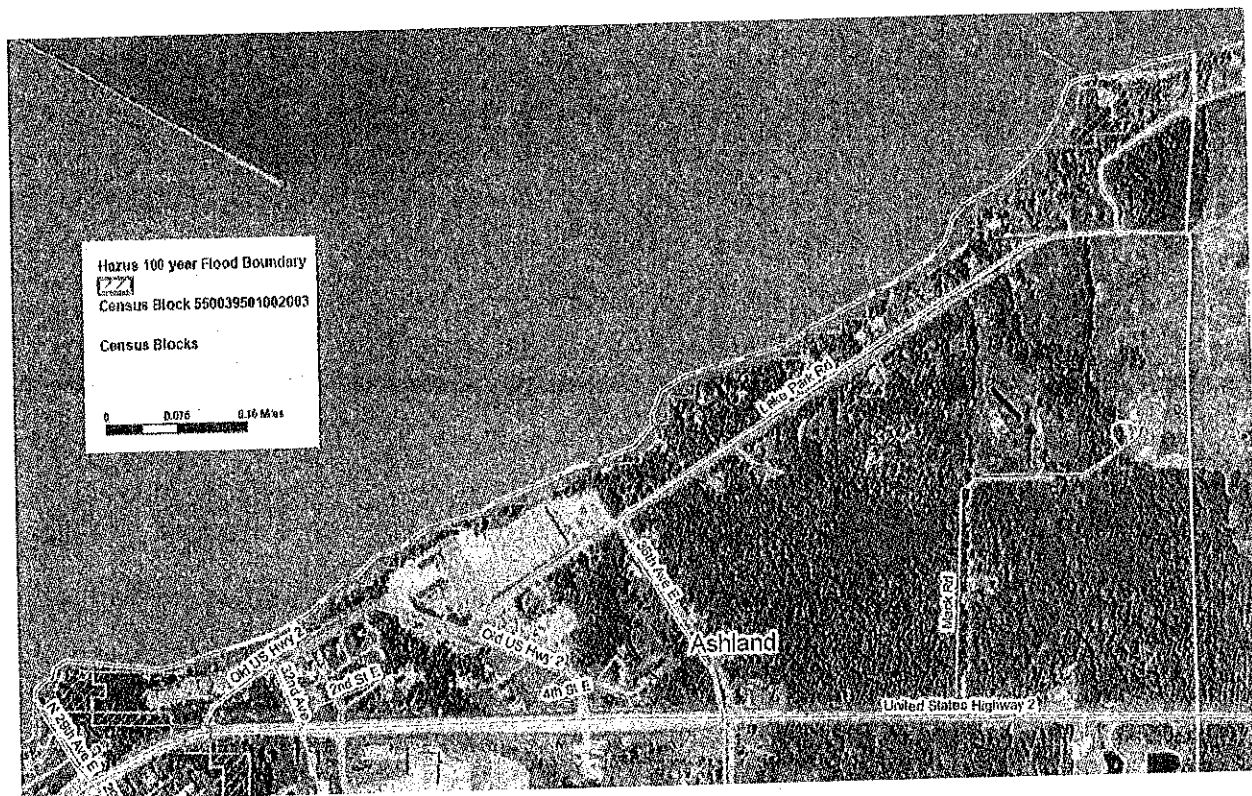


Figure 3a shows census blocks overlaid with the flood boundary and orthophoto of Ashland. Census block 550039501002003 has an estimated building loss of \$530 thousand with a combined replacement cost of \$1.34 million. HAZUS-MH estimates that 3 residential buildings are within the calculated flood boundary for this block. However, the overlay of the flood boundary with the aerial photo shows that only 1 building is within the calculated flood boundary for this block.

Appendix F: HAZUS Vulnerability Assessment

HAZUS-MH Essential Facility Loss Analysis

Essential facilities encounter the same impacts as other buildings within the flood boundary: structural failure, extensive water damage to the facility, and loss of facility functionality (i.e. a damaged police station will no longer be able to serve the community).

The HAZUS-MH analysis identified 0 essential facilities that may be subject to flooding. A list of the essential facilities within Ashland County is included in Table 2.

Table 2: Ashland Essential Facility Loss - 100-Year Flood

Class	Building Count	At Least Moderate Damage	At Least Substantial Damage	Loss of Use
Care Facilities	5	0	0	0
EOC	0	0	0	0
Fire Stations	6	0	0	0
Police Stations	8	0	0	0
Schools	21	0	0	0
Total	40	0	0	0

HAZUS-MH Shelter Requirement Analysis

HAZUS-MH estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS-MH also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 222 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 139 people (out of a total population of 16,866) will seek temporary shelter in public shelters.

HAZUS-MH State Property Loss Analysis

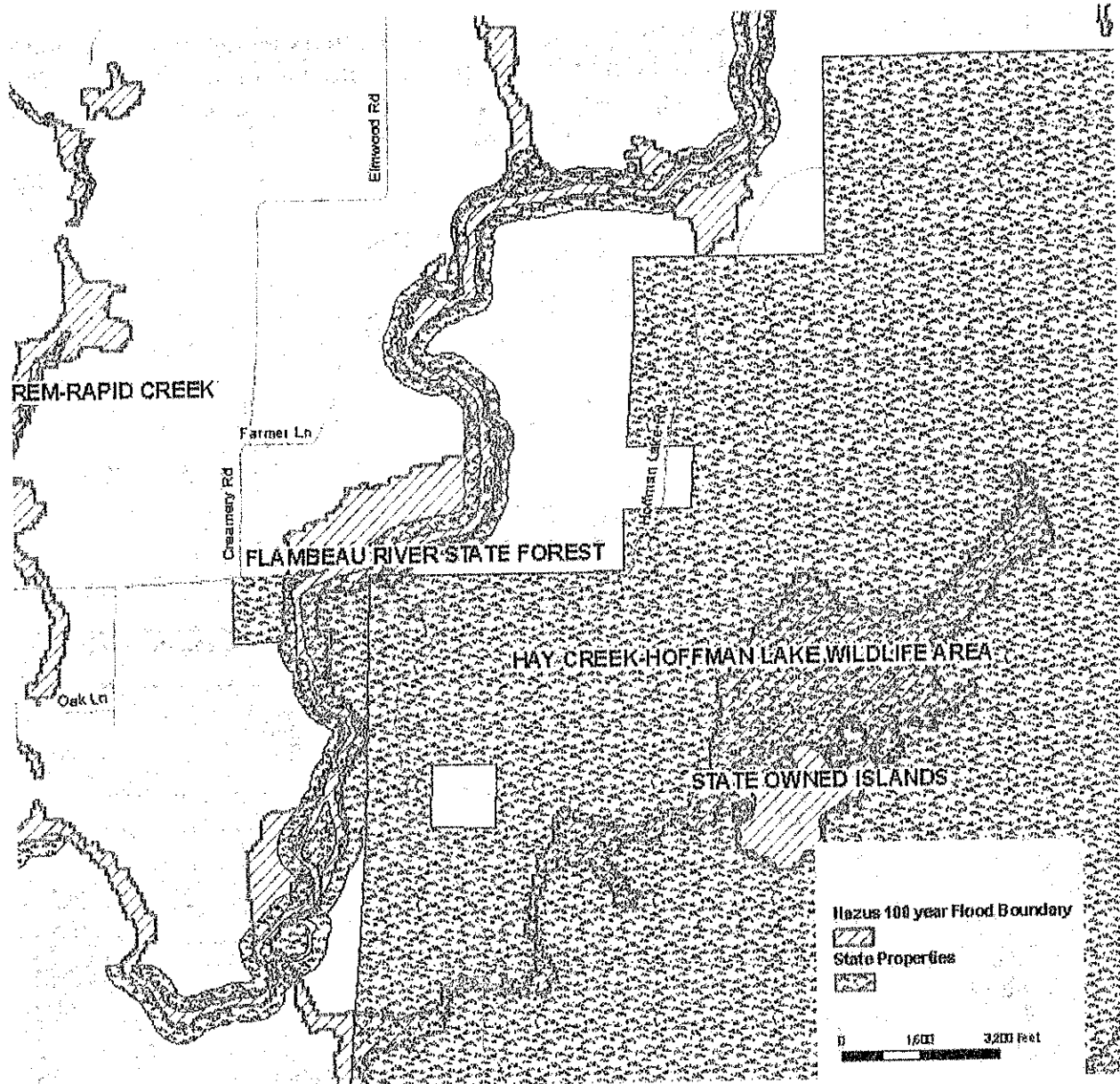
The flood boundaries were overlaid with State of Wisconsin property boundaries as provided by the Department of Natural Resources within Ashland County. Table 3 provides the names of state properties that overlay with the HAZUS-MH flood boundary. Figures 4a and 4b show examples of the inundated areas.

Table 3: Ashland State Property Flood Inundation

State Property	Percent Inundated	Acres Inundated
Hay Creek-Hoffman Lake Wildlife Area	8.4%	484.7
Flambeau River State Forest	41.6%	309.2
Copper Falls State Park	8.2%	270.2
White River Wildlife Area-Ashland	25.1%	239.2
Rem-rapid Creek	71.4%	21.1
Gift Lands	10.6%	14.1
White River Fishery Area-Bayfield	4.5%	11.7
North Country Nat'l Scenic Trail	24.5%	9.0
Big Bay State Park	0.4%	8.6
Devils Creek Fishery Area-Ashland	54.7%	7.1
State Owned Islands	7.8%	0.1
South Shore Lake Superior Fish	85.5%	0.1

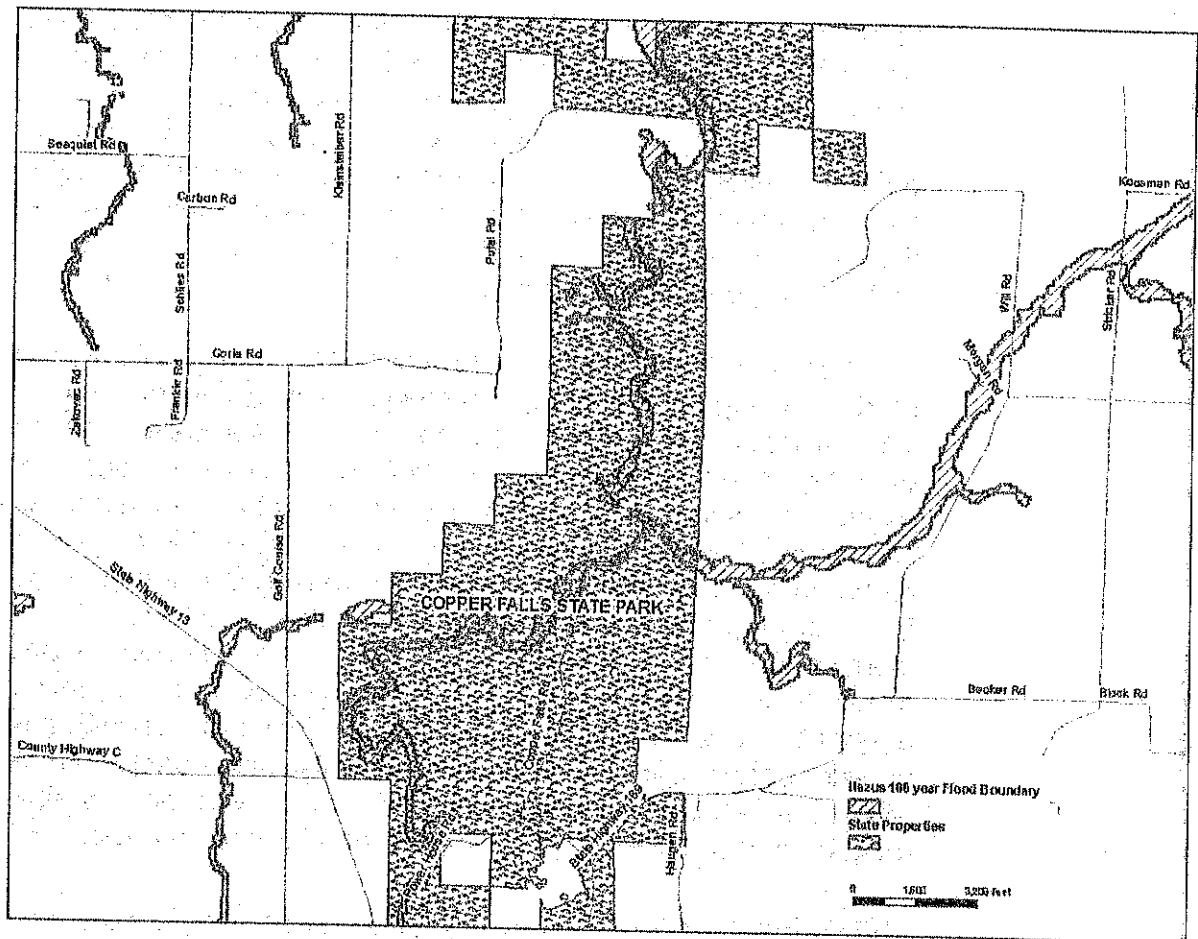
Appendix F: HAZUS Vulnerability Assessment

Figure 4a: Boundary of 100-Year Flood Overlaid with State of Wisconsin Properties



Appendix F: HAZUS Vulnerability Assessment

Figure 4b: Boundary of 100-Year Flood Overlaid with State of Wisconsin Properties

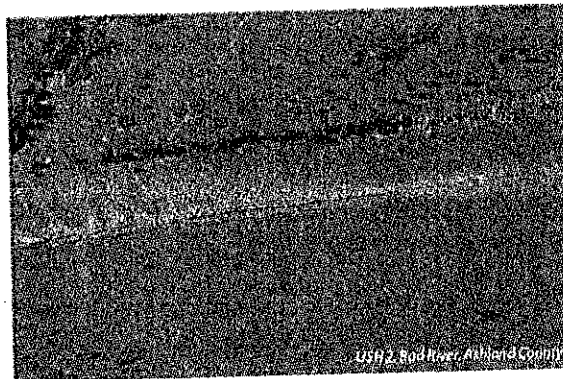


Attachment 1: Northwest Wisconsin Flood Impact Study

In November 2018, the Northwest Regional Planning Commission (NWRPC) released the *Northwest Wisconsin Flood Impact Study*, which is an analysis of a 2016 flooding event in the northwest area of Wisconsin. The report was prepared using federal funds and is publicly available.¹⁵² The content of this attachment is a synopsis of the material contained within the study. Readers should reference the links provided for more detailed information and analysis as well as to read the study in its entirety.

The *Northwest Wisconsin Flood Impact Study* replicated the process model developed under a 2013 project for Taylor County, Wisconsin. This process model used FEMA's HAZUS software to estimate potential flood losses and to identify structures, businesses, economic assets and community infrastructure impacted by a historic flood event. HAZUS is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes, allowing for the identification of vulnerable areas that may require planning consideration. Understanding flood risk will allow communities to assess the level of readiness and preparedness to deal with a flood disaster before it occurs. Model results will provide decision makers with the information and tools needed to decide on how to allocate resources for most effective and efficient response and recovery.

During the period of July 11-12, 2016, multiple rounds of severe thunderstorms impacted seven counties in Northwest Wisconsin including Ashland, Bayfield, Burnett, Douglas, Iron, Sawyer and Washburn, and the Bad River Band of the



Lake Superior Chippewa Tribe. The area was struck by historic severe storms and flooding that caused severe flood events throughout the region. Damage to homes and businesses across

¹⁵² <http://www.nwrpc.com/CivicAlerts.aspx?AID=178>

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the region was substantial, with over \$2.6 million in losses reported. Damage to public infrastructure was even more significant, with \$38 million reported.

During a 24-hour period the region received historically heavy rainfall, with 8 to 12 inches of precipitation falling in some areas. Some of the most intense rainfall occurred in a swath extending from northern Burnett County, northeasterly through northern Iron County. Heavy rains quickly caused rivers to rise to, in some cases, historic levels. A U.S. Geological Survey (USGS) stream gage on the Bad River near Odanah (Ashland County) rose from 300 cubic feet per second to a record peak streamflow of 40,000 cubic feet per second in only 15 hours. In addition to the heavy rainfall, a bow echo windstorm moved across northern Iron County and caused tremendous damage at Saxon Harbor. The marina and campground were devastated by the floodwaters of Oronto Creek, a steep-gradient Lake Superior tributary which had been rerouted during harbor construction in 1965.

The heavy rainfall caused flash flooding across the region, which caused widespread and severe damage to roads and infrastructure, homes, businesses, and public facilities. In Ashland County, floodwaters overtopped U.S. Highway 2, resulting in the temporary closure of a major thoroughfare across northern Wisconsin. Travel across much of northwestern Wisconsin was not advised due to inundated roadways and washouts. The timing of these storms also coincided with the peak of tourist season in the region. Tragically, there were four lives lost as a result of the storm.

With many of the major transportation corridors closed, long detours were necessary to navigate through the impacted region affecting residents and commerce. While highway crews were busy addressing road and bridge impacts, local emergency managers were busy assessing losses at harbors and marinas on Lake Superior.

The Bad River Nation was also severely impacted by the storm. More than 46 homes within reservation boundaries were affected by flooding, ten of which were completely destroyed. In the wake of the storm, the reservation was completely cut off from regular access to food, water, and medical supplies. The fish hatchery and wild rice operations of the Bad River Tribe also sustained major damage.

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Region-wide, the flood event impacted over 350 homes and left behind tens of millions of dollars in public sector damage.

In response to the disaster, the State of Wisconsin Emergency Operations Center was elevated to a Level 1 (full activation). On July 12, 2016, a state of emergency was declared for the affected counties and state agency resources were directed to support response and recovery efforts. On August 9, 2016, a Presidential Disaster Declaration for public assistance was granted for the counties of Ashland, Bayfield, Burnett, Douglas, Florence, Iron, Sawyer, and Washburn, and the Bad River Band of the Lake Superior Chippewa. The severe flooding also impacted the agricultural industry in northwest Wisconsin, resulting in crop losses and reduced yields. Consequently, an agricultural disaster declaration was designated on September 29th, 2016 for the counties of Ashland, Bayfield, and Iron, as well as the five neighboring counties of Douglas, Price, Sawyer, Vilas and Washburn.

The study indicated that 140 homes and businesses in Ashland County were affected or had minor damage and two sustained major damage for a total of \$500,000. Total losses for damage to public infrastructure in the county were \$7.3M. Ashland County received \$66M in Emergency Assistance Program Grants.

Table 1: 2016 Northwest Wisconsin Flood, Damage to homes/businesses

County	Affected/Minor Damage	Major Damage	Destroyed	Total
Ashland	140	2	0	\$500,000
Bad River Band	30	6	10	\$1,004,000
Bayfield	20	10	0	\$150,000
Douglas	2	0	0	\$500
Iron	13/1	12/2	0	\$235,000/\$40,000
Sawyer	112	0	0	\$100,000
Washburn	6	0	1	\$500,000
TOTAL	323/1	39/2	11	\$2,629,500

Transportation infrastructure was heavily damaged when flood waters rose above the surface of roads and bridges. Many primary and secondary arterial roadways and culverts were washed out in the wake of the elevated water level experienced over a short time period. One of the region's most critical economic assets, Saxon Harbor, was completely destroyed and the major roadways bisecting northern Wisconsin were completely shut down. Business disruption and impacts to commerce were also significant as many communities were left completely isolated due to road closures.

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These counties had not anticipated, nor were they prepared to respond to, an event of this historic magnitude.

The study used hydrologic analysis, with the objective being to calculate rainfall-runoff characteristics for watersheds and to identify discharge values in streams. The results of this analysis concluded that 1,022 structures would be impacted under the 100-year scenario and 1,318 structures under the 500-year scenario. A 100-year flood has an annual exceedance probability of 1%, meaning it's likely to occur once every 100 years. The annual exceedance probability of a 500-year flood is 0.2%, meaning an event at this magnitude is likely to occur once every 500 years. Region-wide, loss estimates under the 100-year scenario were \$15.2M and \$24.0M under the 500-year scenario. The model estimates that 12 critical community assets/facilities would be impacted under the 100-year scenario and 17 under the 500-year scenario.

Table 5: ESTIMATED LOSSES BY COUNTY, 100-YR FLOOD EVENT

County	Structures Impacted	Estimated Building Losses	Estimated Content Losses	Estimated Inventory Losses	Debris Generated (tons)
ASHLAND	92	\$ 582,162	\$ 456,098	\$ 47,840	1,002
BAYFIELD	78	\$ 796,776	\$ 340,748	\$ -	1,139
BURNETT	138	\$ 2,034,886	\$ 923,344	\$ 31,034	1,508
DOUGLAS	67	\$ 644,579	\$ 632,320	\$ -	506
IRON	45	\$ 399,383	\$ 579,651	\$ 13,681	682
SAWYER	396	\$ 7,640,836	\$ 5,867,389	\$ 204,919	6,001
WASHBURN	206	\$ 3,129,779	\$ 1,865,586	\$ 41,355	2,205
GRAND TOTAL	1022	\$ 15,228,401	\$ 10,665,137	\$ 438,829	13,043

Table 6: ESTIMATED LOSSES BY COUNTY, 500-YR FLOOD EVENT

County	Structures Impacted	Estimated Building Losses	Estimated Content Losses	Estimated Inventory Losses	Debris Generated (tons)
ASHLAND	114	\$ 875,091	\$ 738,537	\$ 124,599	1,408
BAYFIELD	114	\$ 1,610,034	\$ 611,690	\$ 207	1,848
BURNETT	180	\$ 2,767,118	\$ 1,449,384	\$ 38,815	1,993
DOUGLAS	100	\$ 1,120,682	\$ 733,852	\$ -	943
IRON	48	\$ 249,664	\$ 196,964	\$ 9,924	443
SAWYER	475	\$ 11,874,777	\$ 8,857,823	\$ 318,409	12,054
WASHBURN	287	\$ 5,500,003	\$ 3,620,578	\$ 188,619	3,493
GRAND TOTAL	1,318	\$ 23,997,369	\$ 18,217,828	\$ 681,573	22,182

Roughly 80% of the potentially affected structures are single family homes. Estimated impacts to businesses were notable in both return

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periods, with more than 8% of potentially affected structures classified as either commercial or industrial. Most businesses potentially impacted tend to be small businesses, although some larger businesses were also identified. Potential impacts to general government services include wastewater treatment facilities, town halls, Wisconsin Department of Natural Resource (DNR) facilities, and park/recreation assets. Critical assets which are potentially impacted include electrical substations and dams.

100- and 500-year flood loss estimates for Ashland County, as determined by the NWRPC study, are shown in the tables below.

ASHLAND COUNTY

HAZUS 100-YEAR FLOOD LOSS ESTIMATES - ASHLAND COUNTY

Municipality	Structures Impacted	Estimated Building Losses	Estimated Content Losses	Estimated Inventory Losses	Debris Generated (tons)
C. OF MELLON	17	\$ 74,485.00	\$ 77,857.00	\$ 7,326.00	234
T. OF AGENDA	2	\$ 33,789.00	\$ 11,815.00	\$ -	13
T. OF ASHLAND	1	\$ -	\$ -	\$ -	0
T. OF CHIPPEWA	21	\$ 207,821.00	\$ 72,067.00	\$ -	144
T. OF GINGLES	1	\$ 7,859.00	\$ 2,607.00	\$ -	1
T. OF GORDON	8	\$ 78,125.00	\$ 20,285.00	\$ -	117
T. OF JACOBS	10	\$ 31,921.00	\$ 46,933.00	\$ 10,413.00	125
T. OF MARENGO	1	\$ -	\$ -	\$ -	5
T. OF MORSE	1	\$ 34,286.00	\$ 19,186.00	\$ -	7
T. OF PEEKSVILLE	2	\$ 3,415.00	\$ 1,204.00	\$ -	7
T. OF SANSBORN	2	\$ 4,978.00	\$ 1,871.00	\$ -	7
T. OF SHANAGOLDEN	3	\$ 4,627.00	\$ 1,829.00	\$ -	15
T. OF WHITE RIVER	1	\$ -	\$ -	\$ -	1
V. OF BUTTERNUT	22	\$ 185,853.00	\$ 200,411.00	\$ 30,181.00	316
GRAND TOTAL	92	\$ 582,182.00	\$ 466,095.00	\$ 47,840.00	1002

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HAZUS 500-YEAR FLOOD LOSS ESTIMATES - ASHLAND COUNTY

Municipality	Structures Impacted	Estimated Building Losses	Estimated Content Losses	Estimated Inventory Losses	Debris Generated (tons)
C. OF MELLE	12	\$ 66,218.00	\$ 112,561.00	\$ 12,514.00	237
T. OF AGENDA	2	\$ 50,609.00	\$ 17,150.00	\$ -	21
T. OF ASHLAND	2	\$ 7,995.00	\$ 3,149.00	\$ -	3
T. OF CHIPPEWA	24	\$ 283,895.00	\$ 85,891.00	\$ -	431
T. OF GINGLES	1	\$ 8,987.00	\$ 2,844.00	\$ -	1
T. OF GORDON	8	\$ 88,271.00	\$ 25,071.00	\$ -	115
T. OF JACOBS	16	\$ 86,810.00	\$ 264,883.00	\$ 36,561.00	426
T. OF MARENGO	3	\$ 7,590.00	\$ 1,396.00	\$ -	22
T. OF PEESVILLE	2	\$ 7,226.00	\$ 2,551.00	\$ -	7
T. OF SANBORN	12	\$ 127,432.00	\$ 70,234.00	\$ -	55
T. OF SHANAGOLDEN	4	\$ 41,208.00	\$ 14,072.00	\$ -	20
T. OF WHITE RIVER	2	\$ -	\$ -	\$ 12,201.00	3
V. OF BUTTERNUT	26	\$ 97,900.00	\$ 138,444.00	\$ 53,823.00	325
GRAND TOTAL	114	\$ 675,051.00	\$ 738,537.00	\$ 124,598.00	1,408

As a result of this event, and as a component of the project, the NWRPC has also developed a mapping application to allow viewing of the results found in their analysis of the flood event.^{153 154} The application provides users with access to nearly all of the data developed in this project, including:

- HAZUS-derived Flood Depth (100-year and 500-year flood events)
- Occupancy classified building footprints within ¼ mile of the HAZUS flood boundary, with corresponding structural and content losses
- Location of critical facilities/infrastructure within the study region.
- Impacted road segments due to flood event
- Probable culvert locations (derived using LiDAR and USDA Agricultural Conservation Planning Framework software)

Critical community facilities include those that provide essential emergency services to the community and should be functional after a flood. These facilities include hospitals, police stations, fire stations, emergency medical services and educational institutions. Critical infrastructure is defined as the transportation and utility infrastructure that provides communities with communications,

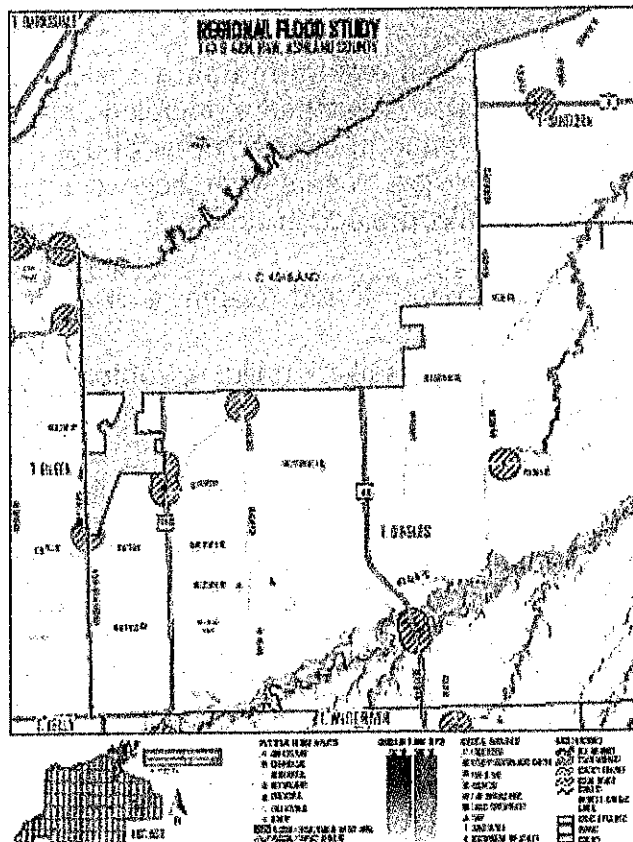
¹⁵³ <http://nwrpcmaps.nwrpc.com/edaflood100/>

¹⁵⁴ <http://nwrpcmaps.nwrpc.com/edaflood500/>

Appendix F: HAZUS Vulnerability Assessment

water, power, mobility and other necessities for both continuity of governance and economic health.

The application includes several widgets which allow users to add their own spatial/tabular data to the map, make measurements, change base maps (e.g. aerial photos, topography, street maps), print, search for specific locations or addresses, and share the map on social media (or embed in their own websites). A user guide was also developed for people unfamiliar with use of a web-based mapping application.¹⁵⁵ Technical information about the application and how the information was implemented can be found on the NWRPC website.¹⁵⁶ An example of a map that can be generated from the application is below, showing a township within the county along with potential impacts and 100- and 500-year flood depths.



¹⁵⁵ <https://www.nwrpc.com/DocumentCenter/View/1491>

¹⁵⁶ <http://www.nwrpc.com/DocumentCenter/View/1504>

Appendix G: Community Input

Ashland County believes in the importance of gathering public input from interested parties in the community. To achieve this goal, the Emergency Management Office took every opportunity available to utilize various methods to publicize the opportunity for people to participate in the planning process and to gather input from interested parties. The table that follows outlines the major opportunities that were created to discuss the plan. The table includes dates of workgroup meetings, meetings with public officials and media opportunities for the all-hazards pre-disaster mitigation plan.

DATE	SUMMARY OF OPPORTUNITY
January 2018	The project brochure was put in public places informing people of the project and mitigation in general
1/5/18	Initial press release to the public inviting people from the general public to become part of the PDM workgroup
1/8/18	Survey on mitigation ideas, development, etc. sent to all municipalities and applicable county departments. The letter with the survey (see below) requests that municipalities discuss the survey and mitigation at their meetings, which per the WI Open Meetings Law, is noticed to the public, with an agenda, prior to the meeting. Meetings are open to the public and minutes are also publically posted after the meeting.
2/7/18	Ashland County Towns Association Meeting – provided a training workshop on hazard mitigation and the planning process as well as introduced this plan and requested workgroup participation with elected officials; each town in the county was invited and requested to participate.
2/20/18	Workgroup Meeting
3/26/18	Workgroup Meetings with the Sheriff's Office/9-1-1 Communications, the Ashland County Highway Department, and with the municipalities and other county departments.
3/27/18	Workgroup Meetings (via conference call) with Bayfield Electric and Price Electric power companies.
2/10/2018	Contiguous county emergency management directors (i.e., Bayfield, Iron, Price, and Sawyer) were provided draft copies of the plan and an opportunity to comment.
	Public notice released notifying the public of the open comment period on the draft plan

Appendix G: Community Input

	Press release sent notifying the public of the end of the plan and the open comment period. Printed in several community papers (see scans following).
	Adoption meetings at municipalities, which per the WI Open Meetings Law, are noticed to the public, with an agenda, prior to the meeting. Meetings are open to the public and minutes are also publically posted after the meeting. See samples of agendas and minutes following. Adoptions are in Appendix C.

One of the main ways people were made aware of the plan was the publication of a brochure (following) that was widely distributed in the public buildings around the community including the City/County Courthouse and the library. The purpose of this brochure was to provide a general overview of the mitigation planning process, the impetus for planning and the scope of the final result.

5 January 2018

For More Information, Contact Dorothy Tank (715-685-7640 ext. 456)
For Immediate Release

Ashland County Receives A Hazard Mitigation Planning Update Grant

(Ashland, WI) Ashland County, like the rest of the State of Wisconsin, is vulnerable to a variety of disasters. Wisconsin has incurred disaster-related damages totaling nearly \$3 billion in the last three decades, with almost half of that occurring in the 1990s alone. These losses can be reduced through mitigation activities. It is estimated that for every dollar spent on mitigation, \$2 to \$3 in future damages can be avoided. Hazard mitigation breaks the cycle of damage and repair.

Mitigation actions reduce or eliminate the long-term risk to human life and property from hazards. These preventative actions can be simple such as elevating a furnace in a basement that sometimes has water on the floor. Mitigation can also have a comprehensive approach such as relocating buildings out of the floodplain or strengthening critical facilities to prevent wind damage and provide stronger shelter.

In an effort to better prepare Ashland County to manage its vulnerability to disaster, Dorothy Tank, Ashland County Emergency Management Director, applied for and received a hazard mitigation planning update grant. This goal of this grant is to update an approvable plan, which will serve as a roadmap that outlines potential cost-effective hazard mitigation activities, some of which might be available for future grant funding.

The plan is designed to look at the risks and vulnerabilities that the county faces from natural disaster and to highlight mitigation strategies that might reduce future losses. As part of this planning process, Tank is assembling a workgroup to review and guide the planning activities. The workgroup is reviewing initial background information about Ashland County and has begun identifying strategies that might help.

Tank stated, "I am very excited about this part of the planning process. The input from the workgroup can have long-lasting impacts, making Ashland County safer and more disaster resistant."

FEMA has recognized the importance of having members of the community involved in the process and Tank would like to ensure that all interested members of the community have an opportunity to provide input into the plan. If you are interested in more information about the plan or would like to provide input into the plan, please contact Dorothy Tank at 715-685-7640 ext. 456.

year: Palceek, Joe Robinson

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Glidden Enterprise Newspaper, Initial project press release, 21 February 2018

County Receives Hazard Mitigation Planning Grant

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In an effort to better prepare Ashland County to manage its vulnerability to disaster, Dorothy Tank, Ashland County Emergency Management Director, applied for and received a hazard mitigation planning update grant. The goal of this grant is to update an approvable plan, which will serve as a roadmap that outlines potential cost-effective hazard mitigation activities, some of which might be available for future grant funding.

The Ashland County award totals \$21,236.00. How this will break down is FEMA will provide 75%

of the funds (\$23,427.00), and the State will provide 12.5% of the funds (\$3,904.50). The remaining 12.5% (\$3,904.50) is the required local (county) match.

The plan is designed to look at the risks and vulnerabilities that the county faces from natural disaster and to highlight mitigation strategies that might reduce future losses. As part of this planning process, Tank is assembling a workgroup to review and guide the planning activities. The workgroup is reviewing initial background information about Ashland County and has begun identifying strategies that might help.

Tank stated, "I am very excited about this part of the planning process. The input from the workgroup can have long-lasting impacts, making Ashland County safer and more disaster resistant."

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Schedule of Events

Sunday, February 25th

Mellen Rod And Gun Fishing Contest at Lake Calilee. Fishing 8:00 a.m. to 3:00 p.m.

Date: 8 January 2018

To: Town, Village or City Leader
County Department Manager

From: Dorothy Tank, EM Director

Re: Hazard Mitigation Plan Update

Ashland County, like the rest of the State of Wisconsin, is vulnerable to a variety of disasters. Wisconsin has incurred disaster-related damages totaling nearly \$3 billion in the last three decades, with almost half of that occurring in the 1990s alone. These losses can be reduced through mitigation activities. It is estimated that for every dollar spent on mitigation, \$2 to \$3 in future damages can be avoided. Hazard mitigation breaks the cycle of damage and repair.

Mitigation actions reduce or eliminate the long-term risk to human life and property from hazards. These preventative actions can be simple such as elevating a furnace in a basement that sometimes has water on the floor. Mitigation can also have a comprehensive approach such as relocating buildings out of the floodplain or strengthening critical facilities to prevent wind damage and provide stronger shelter.

In an effort to better prepare Ashland County to manage its vulnerability to disaster Ashland County Emergency Management applied for and received a hazard mitigation planning update grant. This goal of this grant is to complete an approvable updated plan, which will serve as a roadmap that outlines potential cost-effective hazard mitigation activities, some of which might be available for future grant funding.

The plan is designed to look at the risks and vulnerabilities that the county faces from natural disaster and to highlight mitigation strategies that might reduce future losses to life and property. As part of this planning process, I need your help.

The first step is asking that you please place an item on your **next** municipal meeting agenda to complete the attached survey. This very short survey will help us to identify the concerns that you have in your municipality and to capture ideas that you have for making your community safer and more disaster resistant. Please return your completed surveys to me **by February 28th**.

After receiving your surveys, the information will be incorporated into the draft plan, which is being guided by a workgroup of interested agencies and public members. I would like to extend an offer for anyone from your leadership council, your municipal staff or your general community to contact me if they would like to join the workgroup.

Finally, after the workgroup has a final draft, we will be sending copies of the plan to each of you for final review and adoption. It is important to note two things:

- Adoption of this plan will not cost your community anything. You will not be committing to completing any of the projects listed; instead it is a list of triaged ideas that can be accomplished should the funding and will to complete them become available.
- If you do not adopt this plan, your community will not be eligible to apply for and receive mitigation project funding in the future.

Let me thank you in advance for the assistance that you are providing. This small investment of your time will help make our community a safer, healthier and more disaster-resistant community for years to come.

If you are interested in more information about the plan or would like to provide input into the plan, please feel free to contact me at (715) 685-7640 ext. 456 or by email at dorothy.tank@ashlandcountysheriff.us.

ASHLAND COUNTY, WISCONSIN

NATURAL HAZARDS PREPAREDNESS & MITIGATION QUESTIONNAIRE

1. In the past five years, has your community experienced a natural disaster such as a severe windstorm, flood, wildfire, earthquake, etc.?

Event	When event last occurred:				
	Within past year	1-5 years ago	5-15 years ago	More than 15 years ago	Never
Drought		TN: La Pointe 2014	TN: Peeksville	TN: Marengo	TN: Sanborn
Dust Storm					TN: La Pointe TN: Marengo TN: Peeksville TN: Sanborn
Earthquake					TN: La Pointe TN: Marengo TN: Peeksville TN: Sanborn
Flood	TN: Jacobs TN: La Pointe 2017 TN: Marengo TN: Morse TN: Peeksville	CI: Mellen TN: Agenda TN: Ashland TN: Chippewa TN: Gingles TN: Gordon TN: Marengo TN: Morse TN: Peeksville TN: Sanborn TN: Shanagolden TN: White River	TN: Agenda TN: Gingles TN: Peeksville	TN: Agenda TN: Gordon TN: Peeksville	
Lakeshore Erosion	TN: La Pointe	TN: La Pointe			TN: La Pointe TN: Peeksville TN: Sanborn
Landslide/ Debris Flow	TN: Marengo	CI: Mellen TN: Ashland TN: Sanborn TN: White River			TN: La Pointe TN: Peeksville
Wildfire		TN: Sanborn			TN: Peeksville
Windstorm/ Tornado	TN: Morse TN: Sanborn	TN: Gingles TN: Marengo TN: Sanborn TN: White River	TN: Ashland TN: Gordon TN: La Pointe 2007, 2010 TN: MORSE	TN: La Pointe 1991 TN: Peeksville	
Severe Winter Storm	TN: Morse TN: Peeksville	TN: Ashland (ice) TN: Chippewa TN: Marengo TN: Peeksville	CI: Mellen TN: Peeksville TN: Sanborn	TN: Peeksville	

2. For which of the following natural disasters do you think your community is at risk? (Check the appropriate box for each hazard.)

Event	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Drought		TN: Ashland	TN: Marengo TN: Morse	TN: La Pointe TN: Peeksville	TN: Agenda TN: Chippewa TN: Gordon
Dust Storm					TN: Agenda TN: Chippewa TN: Gordon TN: La Pointe TN: Marengo TN: Peeksville
Earthquake					TN: Agenda TN: Chippewa TN: Gordon TN: La Pointe TN: Marengo TN: Peeksville
Flood	TN: Ashland TN: Gingles TN: Jacobs TN: Morse TN: Peeksville TN: Sanborn	CI: Mellen TN: Agenda TN: La Pointe TN: Marengo TN: White River	TN: Chippewa TN: Gordon TN: Shanagolden		
Erosion	TN: Agenda TN: La Pointe TN: Morse	TN: Marengo	TN: Chippewa TN: Peeksville	TN: Agenda TN: Gordon	
Landslide/ Debris Flow	TN: Agenda	CI: Mellen	TN: La Pointe	TN: Marengo TN: Peeksville	TN: Agenda TN: Chippewa TN: Gordon
Wildfire	TN: Morse	TN: Chippewa TN: Peeksville	TN: La Pointe	TN: Agenda TN: Marengo	TN: Gordon
Windstorm/ Tornado	TN: Gingles TN: Morse	TN: Ashland TN: La Pointe TN: White River	TN: Agenda TN: Chippewa TN: Marengo TN: Peeksville TN: Shanagolden		TN: Gordon
Severe Winter Storm/ Ice Storm	TN: Gingles TN: Morse	CI: Mellen TN: Ashland TN: Chippewa TN: La Pointe TN: Marengo TN: Peeksville	TN: Gordon TN: Jacobs	TN: Agenda	

3. Has your community had damage to facilities or infrastructure? If yes, please describe the damage. (e.g., roads, public buildings, utilities)

CI MELLEN – 1. Washed out roads due to flooding; 2. Flooded pump house (utilities); 3. Some damage to residential/public buildings due to flooding

TN AGENDA – Yes. We have experienced ditch erosion and culvert washouts and displacement in spring thaw and periods of heavy rain.

TN ASHLAND – Damaged houses and other buildings, fences many roads and utility poles and bridges on State Hwy 1; also farmlands

TN CHIPPEWA – Roads washed out

Appendix G: Community Input

TN GINGLES – Yes. Damaged culverts drains and roadway. Trees blown down in R.O.W. from 2016 wind storms

TN GORDON – Our roads were damaged along the sides of roads being washed away

TN JACOBS – Roads, Culverts, Ditches

TN LA POINTE – Undermining and eroding of roads close to the shore. Due to the lake height there are also problems with undermining of structures on the lakeshore, such that owners are considering moving the structures back away from the shore.

TN MARENGO – Significant damage to all TN roads 2011 (Millions of \$). Several other storms have done thousands of dollar damage over the past 5 years

TN MORSE – Major road damage in 2016 due to flooding

TN PEEKSVILLE – Road washouts

TN SANBORN – No Answer

TN SHANAGOLDEN – We had roads wash out

TN WHITE RIVER – We had damage to a number of roads during the flood in July 2016.

4. What facilities or infrastructure in your community do you think are especially vulnerable to damage during a natural disaster?

CI MELLE – 1. Water/sewer plant/systems; 2. Homes/buildings near rivers

TN AGENDA – Our roads and our overhead power network

TN CHIPPEWA – Roads; Bridges

TN GINGLES – Roadways

TN GORDON – For our township, it would be the roads that would be the most effective

TN JACOBS – Roads, Culverts, Ditches

TN LA POINTE – Town and county roads. The town's dock, depending upon the type of disaster. Lake levels impacting structures on the shores.

TN MARENGO – Roads, Bridges, Culverts

TN MORSE – Our gravel roads are highly susceptible to heavy rain run-off.

TN PEEKSVILLE – Washouts on roads

TN SANBORN – Church, Odanah, Caville Rd. Hatchery

TN SHANAGOLDEN – I think roads washing out and strong winds that would blow trees.

TN WHITE RIVER – Sosin Road, Tapani Road

5. How important do you think each of the following projects are in mitigating (i.e., lessening the impacts of) a natural disaster in your community?

Appendix G: Community Input

Project	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	CI: Mellen TN: Ashland TN: Chippewa TN: Gingles TN: Gordon TN: Jacobs TN: La Pointe TN: Peeksville	TN: Marengo TN: MORSE TN: Sanborn TN: White River	TN: Agenda TN: Sanborn TN: Shanagolden		
Protecting critical facilities (hospitals, fire stations, etc.)	CI: Mellen TN: Chippewa TN: Gingles TN: Gordon TN: Jacobs TN: La Pointe TN: Morse TN: White River	TN: Agenda TN: Marengo TN: Shanagolden	TN: Peeksville TN: Sanborn		
Preventing development in hazard areas	CI: Mellen TN: Gordon TN: Jacobs TN: Peeksville	TN: Chippewa TN: Gingles TN: La Pointe TN: Marengo TN: Morse TN: Shanagolden TN: White River	TN: Agenda TN: Sanborn		
Enhancing the function of natural features (streams, wetlands)	CI: Mellen TN: Agenda TN: Ashland TN: Gordon TN: Jacobs TN: Morse TN: Sanborn	TN: Chippewa TN: Gingles TN: La Pointe TN: Marengo	TN: Peeksville TN: Shanagolden TN: White River		
Protecting historical and cultural landmarks	CI: Mellen TN: Ashland TN: Gordon TN: Jacobs TN: La Pointe TN: Sanborn	TN: Agenda TN: Chippewa TN: Gingles TN: Peeksville	TN: Marengo TN: Morse TN: Shanagolden	TN: White River	
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses	CI: Mellen TN: Ashland TN: Chippewa TN: Gordon TN: Jacobs TN: Marengo TN: Morse TN: Peeksville TN: Sanborn	TN: Agenda TN: La Pointe TN: Shanagolden TN: White River	TN: Gingles		
Protecting and reducing damage to utilities	CI: Mellen TN: Agenda TN: Ashland TN: Chippewa TN: Gordon TN: Jacobs TN: La Pointe TN: Marengo TN: Morse TN: Sanborn TN: White River	TN: Gingles TN: Peeksville TN: Shanagolden			
Strengthening emergency services	CI: Mellen TN: Ashland TN: Chippewa TN: Gingles TN: Gordon	TN: Agenda TN: La Pointe TN: Peeksville			

Appendix G: Community Input

	TN: Jacobs TN: Marengo TN: Morse TN: Sanborn TN: Shanagolden TN: White River				
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6. Do you have any community building projects (e.g., subdivisions, office/industrial parks, roads) slated to be built in the near future? If so, please describe it (e.g., project name, location, type, size)?

CI MELLEEN – No

TN AGENDA – No

TN ASHLAND – Kornstead Road in the town of Ashland; We need help because it's some ledge and we can't do it by ourselves. We also have quite a few other roads that we need help fixing

TN CHIPPEWA – No

TN GINGLES – Hegstrom Road re-furbish 1 mile of the road way from Beaser Rd. to Hwy 112.

TN GORDON – No

TN JACOBS – No

TN LA POINTE – Town Dock Expansion project will involve adding one lane to the town dock along with a passenger waiting area and an additional ferry landing.

TN MARENGO – None

TN MORSE – No

TN PEEKSVILLE – N/A

TN SANBORN – No

TN SHANAGOLDEN – No

TN WHITE RIVER – None

7. What ideas do you have for your community to mitigate natural disasters?

TN AGENDA – Improve our culvert capacity in the vulnerable areas to prevent future washouts and stream pollution. Encourage utility

companies to clear right of ways and promoter underground utilities
TN ASHLAND – Town of Ashland roads. North York Road – The hills are a rock ledge. The townships cannot fix it themselves. We need help; it should be fixed by road builders. Some blasting is needed. Delfield Road – Silver Creek. This road years ago was washed out and the last flood it went out again. Right now Silver Creek is washing out the road along the side of the bridge because every time we get high water, the creek changes its course. Someone will have to fix it for the town of Ashland because the DNR will have to decide what to do with the creek.

TN CHIPPEWA – Nothing

Appendix G: Community Input

TN GINGLES – Nothing at this time

TN GORDON – No answer

TN JACOBS – Receive large amount of grants to build up roads and bridges

TN LA POINTE – Work with states and federal authorities to lower the lake level.

TN MARENGO – We need better flooding policies that reflect today's reality so that we do not replace the same structure over and over again.

TN MORSE – Identify areas that potentially will need mitigation and fix as existing funding allows.

TN PEEKSVILLE – Document trouble areas

TN SANBORN – Preparation for next disaster, using data from flood of as reference.

TN SHANAGOLDEN – We try to keep our roads in good condition and ditched to prevent washout.

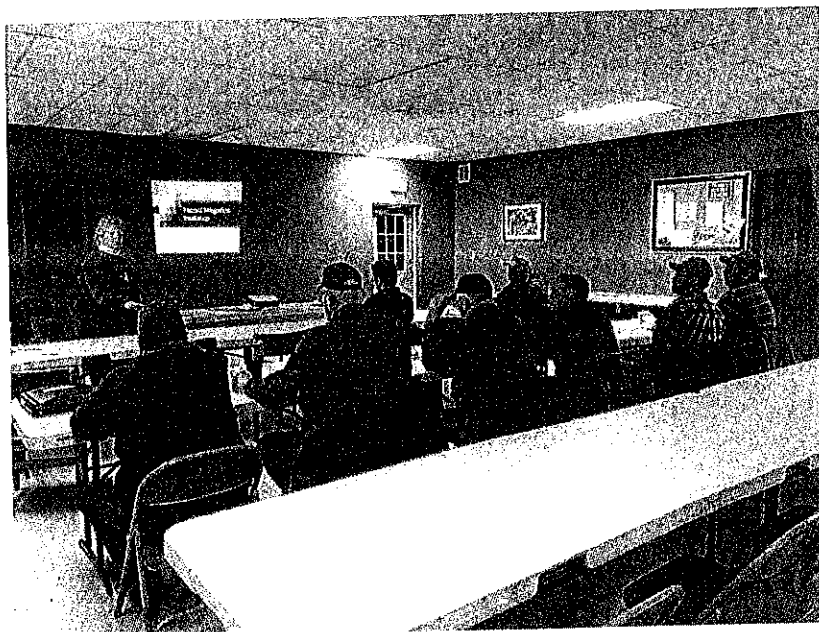
TN WHITE RIVER – Any roads that end up under water because they are close to or go across a river it is a good idea to blacktop those. We had it done years ago to Mika Rd and Nortunen Rd. and they help up during the flood. That is what we want to do with Sosin Rd.

Appendix G: Community Input

SIGN-IN

Event: Hazmit Plan Date: 2/7/2018 Location: Town of Morse
Update Meeting & Town's Hall

Name (Please Print)	Agency/Department	Email/Phone Number
Matthew Granger	Town of White River	mgranger@windem.com 715-413-0166
Louis Carl	Town of Jacobs	L Carl chairman@yahoo.com 715-663-0077
Dan Stricker	Morse	Sport 15669@gmail.com 715-681-0543
Jeff Ehrhardt	Morse	ehardtjr@gmail.com 715-574-8007
Mike Ollon Keto	Town of Moreau	715-278-3531 meollan@hotmail.com
Patrick Colgrove	Gingles	715-709-5592 patrickcolgrove@hotmail.com
BEN SCHRAM	Town of LaPointe	715-209-0199 parkerperrison@townoflapointe.wis.gov
Chip Foreberg	Town of SHANAGOLDEN	715-663-0031
Dorothy Tank	Ashland County Emerg. Mgmt. Dir.	715-685-7640 ext 456 dorothy.tank@ashlandcountysheriff.wis



SIGN-IN

Event: Mitigation Plan
Workgroup Date: 2-20-2018 Location: Ashland County
Sheriff's Office

Name (Please Print)	Agency/Department	Email/Phone Number
Jeff Ehrhardt	Town of Morse	chrhardtjeff@gmail.com 715-274-8088
Josh Rowley	Baring	715-682-2098
Bill Johnson	Bayfield Electric	715-372-4257
Diane Berweger	Bayfield Electric	diane.berweger@bayfieldelectric.com 715-372-4257
David McGuire	Ashland Communication	david.mcguire@ashlandcountysheriff.com 715-685-7690 x478
Matt Erickson	Ashland Co. Hwy	matt.erickson@co.ashland.wi.us 715-209-4798
Matt Granger	Town of White River	mgranger@h.windward.com 715-413-0166
Sharon Campbell	City of Ashland	scampbell@co.wi.org 715-682-7061
Lissa Radke	Bad River Tribe	environmental@badriver-nsn.gov
LENORA Borckardt	FPTEC	
Dorothy Tank	Ashland County EM Director	dorothy.tank@ashlandcountysheriff.us
Jim Hurd	Ash. County SHERIFF	jim.hurd@ashlandcountysheriff.us
Tom Fratt	Ashland County Land Conservation	tom.fratt@co.ashland.wi.us

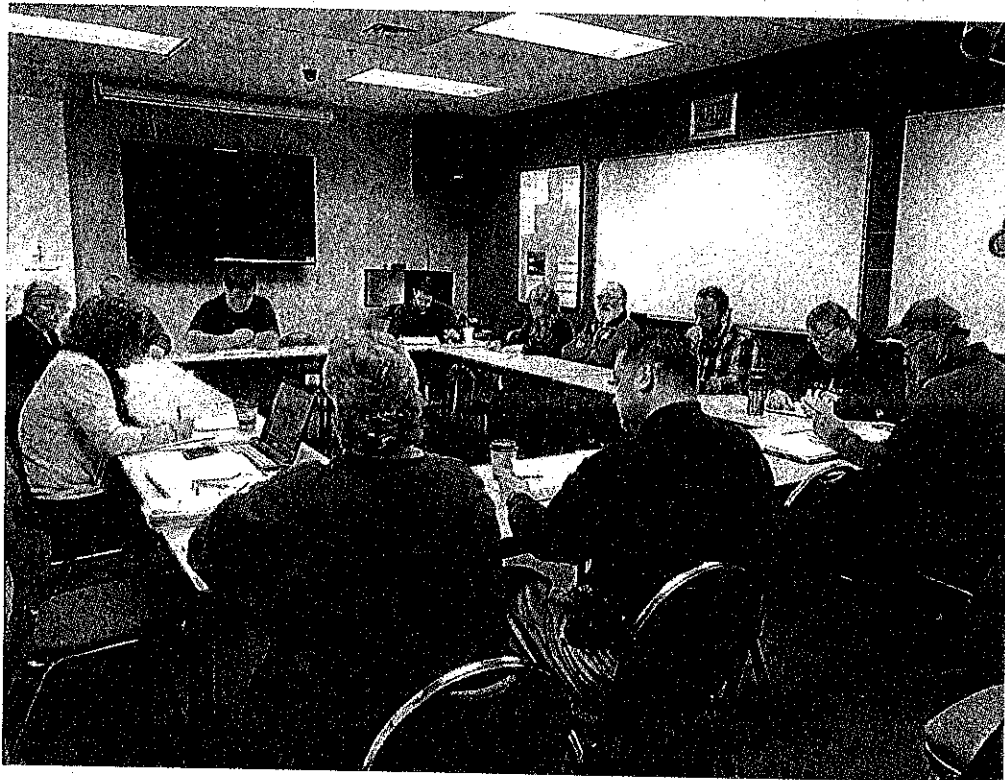
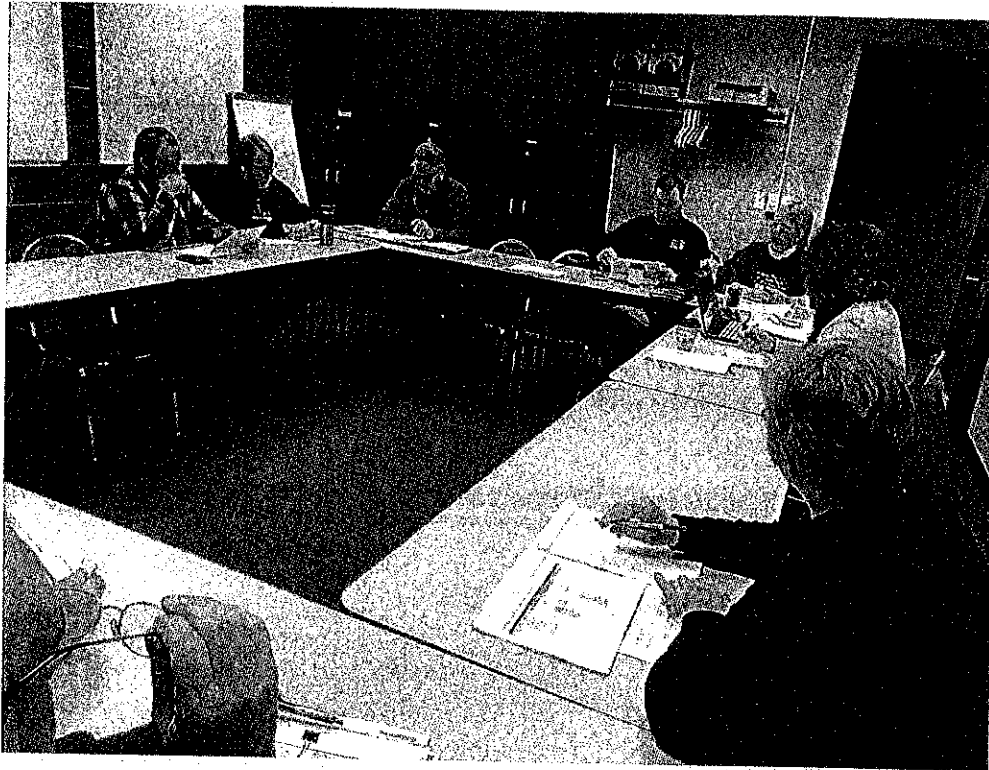
Appendix G: Community Input

1000 - Noon

SIGN-IN

Event: Ashland Co HazMat Mtg Date: 26 MAR 18 Location: ACSO

Name (Please Print)	Agency/Department	Email/Phone Number
LENDRA BORUWART	EPBEC	
Dorothy Tark	Ashland Co. EM	dorothy.tark@ashlandco.wisconsin.gov 715-685-7640 ext 456
John Pawley	Zoning	
Tom Frost	Land Conservation	
Lissa Radtke	Bad River Band	environmental@badriver-wis.gov
JENNIFER CROMBORG MURPHY	WDNR	jennifer.cromborgmurphy@wisconsin.gov
Matt Granger	Town of White River	mgranger@h.windoc.com
Jeff Ehrhardt	Town of Morse	ehardtjeff@gmail.com



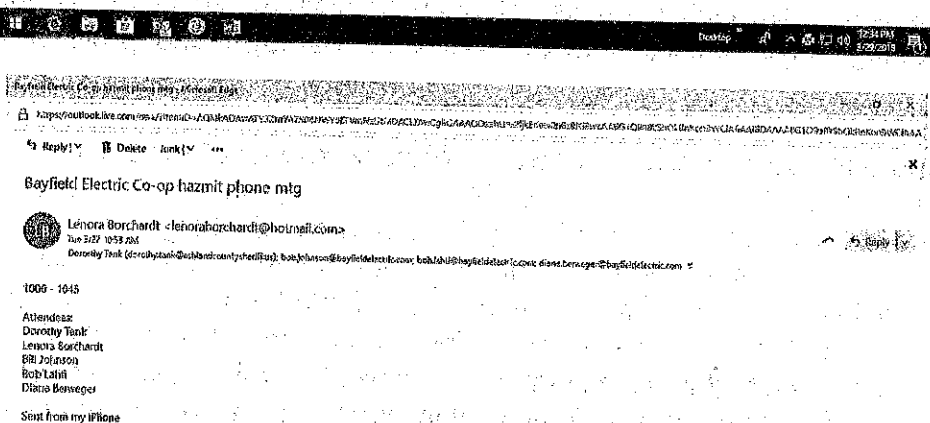
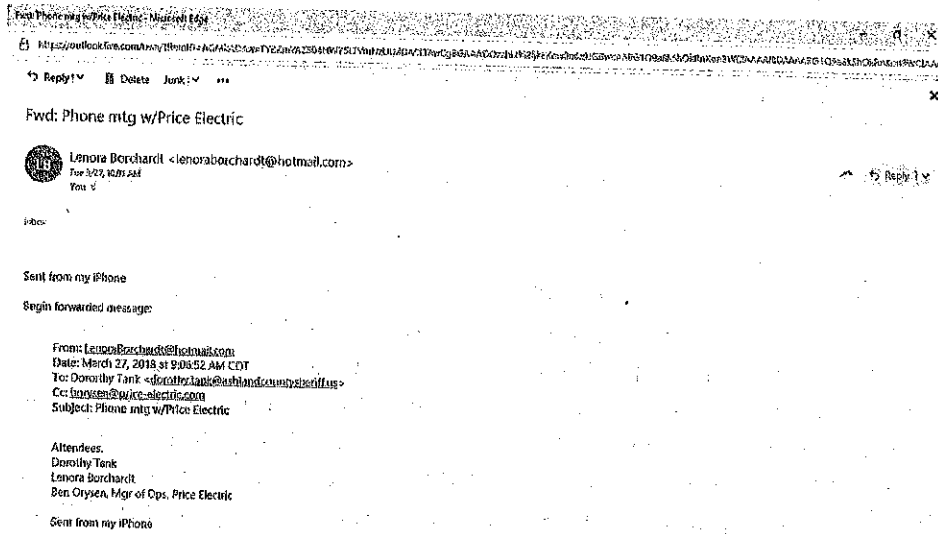
Appendix G: Community Input

SIGN-IN

Event: ASHLAND CO Herd # Date: 26 MAR 18 Location: ACSO

	Name (Please Print)	Agency/Department	Email/Phone Number
0830-0930	David McGuire	Ashland County Dispatch	david.mcguire@ashlandcounty-sheriff.us 715-685-7640 x478
	LENDRA BOREHART	EPTEC	
	Dorothy Tank	Ashland County Emergency Management	dorothy.tank@ashlandcounty-sheriff.us 715-685-7640 ext. 450
1400-15:30	LENDRA BOREHART	EPTEC	
	Matt Erickson	Ash Co Hwy	matt.erickson@co.ashland.wi.us
	EMMER SHIELDS	" " "	ashcohighway@yahoo.com
	Dorothy Tank	Ashland Co. EMT	dorothy.tank@ashlandcounty-sheriff.us 715-685-7640 ext. 450

Appendix G: Community Input



24 January 2019

For More Information, Contact Dorothy Tank, (715) 685-7640
For Immediate Release

**ASHLAND COUNTY DRAFT HAZARD MITIGATION PLAN UPDATE
AVAILABLE FOR REVIEW**

(Ashland, WI) Ashland County, like the rest of the State of Wisconsin, is vulnerable to a variety of disasters. Wisconsin has incurred disaster-related damages totaling \$3 billion in the last three decades but future losses can be reduced through mitigation activities. A recent study by the Multi-hazard Mitigation Council shows that each average dollar spent on mitigation saves society in excess of six dollars. Since 1993 more than 400 disasters have occurred in the United States, affecting communities in all 50 states, costing the country over \$500 million dollars per week and killing over 24,000 people.

Mitigation actions reduce or eliminate the long-term risk to human life and property from hazards. These preventative actions can be as simple as elevating a furnace in a basement that sometimes has water on the floor. Mitigation can also have a comprehensive approach such as relocating buildings out of the floodplain or strengthening critical facilities to prevent wind damage and provide stronger shelter.

In an effort to better prepare Ashland County to manage its vulnerability to disasters, Ashland County Emergency Management applied for, received and has completed a Pre-Disaster Mitigation (PDM) update planning grant. This plan update will serve as a roadmap that outlines potential cost-effective hazard mitigation activities, some of which might be available for future grant funding. The updated plan outlines the risks and vulnerabilities that the county faces from natural disaster and highlights mitigation strategies that might reduce future losses. The completed draft hazard mitigation plan update is available during business hours at the emergency management office, 220 Sixth Street East, Ashland, for review and public comment until XX Month 2019.

Public Notice

Ashland County has completed the draft of a Hazard Mitigation Plan Update, prepared in accordance with the Disaster Mitigation Act of 2000 (Public Law 106-390; DMA2K). The draft is available for public review and comment during business hours at the emergency management office at 220 Sixth Street East, Ashland, until XX Month 2019.

If you have questions related to this notice or its application in Ashland County, call the Ashland County Emergency Management office at (715) 685-7640.

GOVERNMENTAL & PUBLIC INPUT

Planning creates a way to solicit and consider input from diverse interests. Successful community mitigation begins with a commitment from government officials throughout the county.

Involving stakeholders is essential to building community-wide support for the plan. In addition to emergency managers, the planning process involves other government agencies (e.g., zoning, floodplain management, public works, community and economic development), businesses, civic groups, environmental groups and schools. Vital information provided by these groups helps insure that the plan is workable within the framework of the community's priorities.

ADOPTION OF THE PLAN

Local units of government participating in a multi-jurisdictional planning process must adopt the final plan for the municipality to be eligible for future mitigation funds including grants available through FEMA. Local units (i.e., towns, villages, cities) that do not participate would be ineligible to receive such funds until such time that they meet these requirements and adopt a plan.

HISTORY

Floods and storms have killed over 2,000 people in the U.S. in the last decade. Hundreds of disasters have occurred in the past 25 years, costing the country millions of dollars every week.

MITIGATION PLANNING FACTS

- ▶ A 2017 study has shown that mitigation saves society an average of \$8 for every \$1 spent through federal agency grant programs.
- ▶ The rigorous building standards adopted by 20,000 communities across the country are saving the nation more than \$1.1 billion a year in prevented flood damages.
- ▶ Hazard mitigation plans and projects reduce overall risks to the population and structures while also reducing reliance on funding from actual disaster declarations.
- ▶ According to the National Oceanographic and Atmospheric Administration, 2017 was the costliest year ever for weather and climate disasters in the United States, totaling \$215 billion in disasters. That's \$5.9 million dollars every week!

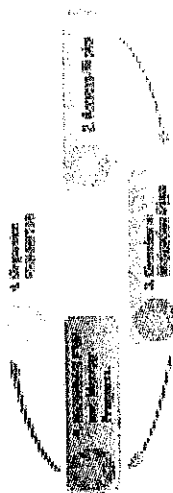
NOTES:

For further information please contact:

Ashland County
Emergency Management
220 South Street East
Ashland, WI 54806
(715) 835-7540 ext. 456

Pre-Disaster Mitigation Planning

*Creating Safe,
Sustainable
Communities*



Prepared by:

Ashland County Emergency Management
220 South Street East
Ashland, WI 54806
(715) 835-7540 ext. 456

WHAT IS HAZARD MITIGATION?

Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards.

Floods, ice storms, tornados and forest/wild fires - these are all functions of the natural environment and only become hazardous when they threaten our built environment with destruction. These hazards will occur one day. When this happens, the results can be appreciably different from past outcomes if our community takes action today.

RISK REDUCTION

The goal of risk reduction is to reduce the risk to life and property, which includes existing structures and future construction, in the pre- and post-disaster environments. This is achieved through regulations, local ordinances, land use and building practices and mitigation projects that reduce or eliminate long-term risk from hazards and their effects.

WHY DEVELOP A PLAN?

Mitigation plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction and repeated damage. The planning process is as important as the plan itself. It creates a framework for risk-based decision-making to reduce damages to lives,

property and the economy from future disasters.

State, tribal and local governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288), as amended by the Disaster Mitigation Act of 2000, provides the legal basis for state, local and tribal governments to undertake a risk-based approach to reducing risks from natural hazards through mitigation planning.

Like many other people, the residents of Westley, Texas didn't think much about flooding. Besides, it had not flooded in Mexico for 46 years. It wasn't until the heavy summer rains came that residents realized flooding can hit anyone at any time. After the flooding badly affected crops here they had to do something to mitigate.

REQUIRED INFORMATION

- Flood maps
- Identification of potential hazards
- History of occurrences
- Hazard impact projections
- Location of critical facilities
- Identification of high-risk facilities (schools, fire station, nursing homes, etc.)
- Location of repetitive loss structures
- Development & prioritization of mitigation projects
- Other materials as identified

HAZARD MITIGATION PLANNING PROCESS

1. **Organize Resources-** From the start, communities should draw the resources needed for a successful mitigation planning process. Essential steps include identifying and organizing interested members of the community, particularly those with the technical expertise required during the planning process.
2. **Assess Risks-** Communities next need to identify the characteristics and potential consequences of natural hazards. It is important to understand how much of the community can be affected by specific hazards and what the likely impacts would be for important community assets.
3. **Develop a Mitigation Plan-** Armed with an understanding of the risks posed by natural hazards, communities need to determine what their priorities should be and then look at possible ways to avoid or minimize the undesired effects. The result is a natural hazard mitigation plan and strategy for implementation.
4. **Implement the Plan & Monitor Progress-** Communities can bring the plan to life in a variety of ways ranging from implementing specific mitigation projects to changes in the day-to-day operation of the local government. To ensure the success of an on-going program, it is critical that the plan remains effective. Thus, it is important to conduct periodic evaluations and make revisions as needed.

Appendix H: Inter-Revision Updates

This plan will undergo major revisions every five years per the FEMA requirements. Ashland County has recognized that there may be information that should be added to the plan between the five year updates but that the costs of continuous updates, printing and distribution can be excessive. This section is designed to hold that information that is gathered between the five year updates. It is felt that only having to reproduce and distribute one section between updates will lessen the costs to the county.

Potential Areas of Concern Identified:

- No additional concerns have been identified to date

SUBJECT: Approve a Request for a Financial Commitment in the 2020 City of Ashland Budget Towards a Regional Housing Study (*Mayor*) Roll

RECOMMENDATION: Approval

DEPARTMENT OF ORIGIN: Mayor

CLEARANCES: City Administrator

EXHIBITS:

1. Invitation to Participate, UW Madison Extension, August 29, 2019
2. Bayfield & Ashland County Regional Housing Study Project Overview, Aug 29, 2019
3. Letter of Financial Commitment for Ashland/Bayfield County Regional Housing Study

EXPENDITURES REQUIRED: \$ 5,619.90

AMOUNT BUDGETED:

APPROPRIATION REQUIRED: \$ 5,619.90

TREASURER'S CERTIFICATE: NA

COMPLIANCE WITH ORDINANCE 51: Section 51.26 (b) of Chapter 51, Ashland City Ordinances, permit the Mayor and/or Clerk to schedule items directly for Council action when a timely decision is needed by the City. The City Clerk has chosen to direct this item directly to Council pursuant to the authority granted to her in Chapter 51, Ashland City Ordinances.

STATEMENT OF CONFORMANCE WITH COMPREHENSIVE PLAN OF RECORD: Strengthening the Housing Market through diversification is one of the key priorities expressed in the City of Ashland's Comprehensive Plan of record, *Authentic Ashland*.

SUMMARY STATEMENT:

A group consisting of many Chequamegon Bay Area leaders from Bayfield and Ashland Counties has been meeting for several months discussing the need for housing of all types in our region. It is anecdotally recognized that every community faces a shortage of housing of one type or another. This includes such housing as low income housing, workforce housing, high end housing plus apartments, townhouses, and all

types of houses. The group has worked with WHEDA & Northwest Regional Planning to get input of what can be done. State Senator Janet Bewley and State Representative Beth Meyers have also been involved in discussions. All have been very helpful.

The group has reached a consensus that more information is needed so that we might have a precise idea of what is needed and desired in each community. To accomplish this, the group wants to undertake a regional study on housing to be done by Northwest Regional Planning. This study would seek to be as comprehensive as possible. It would include all the statistics about the region as a base for what we have. It would include a survey of citizens to determine what they may want. Many have opinions about all of this, but the study hopes to quantify with data what the needs of the region are.

It is hoped that with a completed study, developers will see the big demand in our region for housing and will undertake a scattered site project here that would allow them to reach a profit margin that would incentivize their investment and make a major affordable housing project in each community more attractive.

The City of Ashland completed a housing study performed by the Center for Rural Development in 2017. It is believed that the proposed study would build on that report to provide a more comprehensive regional snapshot that would qualify for WHEDA tax credit projects.

It is hoped a CDBG Planning Grant could be obtained to cover most of the costs of a regional study, but each locality within the area is being asked to provide funds on a per capita basis to make up the required match. The City of Ashland's share would be \$ 5,619.90. Information about the proposed study, its scope and timeline are contained in the enclosed documents.

Council is being asked to appropriate \$5,619.90 in the 2020 budget towards the estimated required match for the regional housing study, contingent upon the grant being awarded through CDBG.



**UW-Madison Extension
Bayfield County**
117 E. 5th Street
Courthouse, PO Box 218
Washburn, WI 54891

Phone: 715-373-6104
Dial 711 for Wisconsin Relay
<https://bayfield.extension.wisc.edu/>

August 29, 2019

Dear Elected Official,

Municipalities across the Chequamegon Bay region have identified housing as a high priority issue in their comprehensive plans, yet few have had success in effectively addressing the issue. In response to this pervasive housing needs across the region, the UW-Madison Extension Community Development program along with the Northwest Regional Planning Commission (NWRPC) have been convening conversations with local elected officials to find collaborative solutions to address the region's growing housing challenges.

These regional conversations have identified the following:

- **There is a pressing need** across the region for additional workforce housing, housing for seniors, quality rental housing, and redevelopment of blighted properties.
- **There is little data available to help define the issue.** While there is agreement that the regional housing need is great, it is unclear what kind of housing our region needs, and how many units would satisfy our current and future needs.
- **New workforce housing has proven difficult to develop across Bayfield and Ashland counties.** This is negatively affecting our regional economy. Workforce and affordable housing is most often built by developers applying for highly competitive federal tax credits that offset the cost of development. It is difficult for developers to do projects in rural communities because the size of the projects are often not large enough to compete for tax credits. This makes development of workforce housing in rural areas nearly impossible. One strategy to combat this is to work together across municipalities to identify common needs in order to create larger projects that can be more competitive in the tax credit market (i.e. scattered-site development).
- **Housing challenges will likely get worse in coming years,** exacerbated by a rapidly aging population, aging housing stock, rising construction costs, and increases in second home purchases.
- **Housing is a regional challenge** that needs to be addressed by a region willing to work together in order to make the best use of limited resources.

Given these challenges, several municipalities have decided to band together to conduct a regional housing study. *The primary purpose of the study is to gather better data about regional housing needs in order to make more informed decisions.* By clearly identifying regional needs, the region can better make use of the resources and programs available. This study will also gather data needed to proactively work with developers to ensure *that the kind of development that the region gets is the kind of development the region wants and needs.* The study will include a macro county-level view and community-level studies of participating municipalities. These community-level studies will include

stakeholder interviews and comprehensive community surveys. The NWRPC will be conducting the study. *(The Bayfield & Ashland County Regional Housing Study- Project Overview is attached.)*

In order to offset the cost of the study, the group is recommending the communities work together to apply for a Community Development Blocks Grant (CDBG) Planning Grant. This grant is administered by the WI Department of Administration. The NWRPC has agreed to write the grant on behalf of the participating units of government at no cost. The City of Bayfield has agreed to be the lead applicant on the grant, as they best meet the necessary requirements for CDBG grant funding. The grant provides a 2 to 1 match, which will greatly reduce the cost of the regional study to all participating municipalities. Additionally, by working together, all communities will benefit from the economy of scale. (Please note: Due to restrictions on CDBG grant funds, tribal entities are not able to participate.)

Qualifying municipal units of government in Ashland and Bayfield County are invited to contribute and participate. Based on size, location and amenities, your municipality would likely benefit from participating in the study. Should you wish to participate, your municipality will be asked to contribute the amount as calculated in the attached chart. This number is based on the estimated cost of conducting a comprehensive housing survey in your greater community.

In order to participate in this opportunity, your local unit of government will need to submit a Letter of Financial Commitment by Friday, October 25, 2019. Participating counties & municipalities will not need to provide the estimated matching funds until April 2020.

An informational meeting will be held:

September 16, 2019 from 6:00pm -7:30pm in the Bayfield County Board Room

The Board Room is located on the 2nd Floor of the Bayfield County Courthouse, 117 E 5th Street, Washburn. Elected officials are invited to attend in order to gather information and ask questions. If you have additional questions or would like a project representative to be present at your next council or board meeting, please let us know.

Sheldon Johnson, NWRPC sjohnson@nwrpc.com 715-635-2197 or

Kellie Pederson UW-Extension kellie.pederson@wisc.edu 715.373.3290

Sincerely,



Kellie Pederson
Community Development, Bayfield County
UW-Madison, Division of Extension

Bayfield & Ashland County Regional Housing Study

Project Overview

Aug 29, 2019

Study Overview and Timeline:

Community leaders in Ashland and Bayfield County have identified the need for a regional housing study as an important step in addressing regional housing challenges. In partnership with the Chequamegon Bay Regional Housing Group, the Northwest Regional Planning Commission (NWRPC) is preparing a Community Development Blocks Grant (CDBG) Planning grant application for submittal in the fall of 2019 (subject to the approval timeline of local participating municipalities and counties). The grant will offset the cost of the regional housing study. The City of Bayfield has agreed to serve as the lead grant applicant. Participating counties and municipalities will be asked to provide City of Bayfield with a letter of commitment demonstrating their intent to participate in the project prior to submittal of the grant application. Housing studies will be prepared for each participating county as well as for participating municipalities.

If funded, the project will span 6-9 months with some of the following key activities:

County and municipal level housing data collection	January-March
Kick-off meetings with each county and participating municipality	January-March
Survey development, distribution, analysis	February-April
Community and stakeholder interviews	March-May
Prepare participating municipality housing studies and toolbox	May-September
Finalize housing studies and recommendations	August-September

Study Outline

1. Introduction
2. What is Low and Moderate Income (LMI) Housing? (required to make project CDBG eligible)
3. Housing Supply
 - a. Community housing stock
 - b. Owner-occupied housing
 - c. Rental, multi-family and group housing
 - d. LMI, workforce and senior housing supply
4. Land Availability and Cost
 - a. Analysis on infrastructure availability
 - b. Zoning review of critical areas
5. Housing Demand
 - a. Demographic trends and projections
 - b. Housing sales and finance
 - c. LMI, workforce and senior housing demand
 - d. Brief discussion on quality of life influence on housing demand
6. Housing Gap Analysis
 - a. Owner and renter gap analysis
 - b. LMI, workforce and senior housing gap analysis
7. Key Tools and Recommendations
 - a. Strategies to address regional housing needs
 - b. Strategies to address community housing needs
 - c. Underutilized resources and funding

Appendix: County Housing Data

Appendix: Community Housing Data
Appendix: Survey Results
Appendix: Housing Toolbox

About County Housing Studies:

The County-level reports will provide an overview of housing needs, demands and gaps, while allowing some comparison between areas and communities of each county. This information will be pulled from survey data and other primary housing data in the housing data appendix as well as from interviews of housing partners, realtors, developers and stakeholders. Study will include a long-range forecast on regional housing and address the regional economic impacts of workforce housing development. The County level study will include some broad level housing analysis for municipalities and towns not identified as a “financially contributing” participants. A residential housing survey will be developed and distributed county-wide.

Due to limitations on time and resources, the county-level studies will not include:

- The analysis of specific properties, including the potential rehabilitation and re-use;
- In depth analysis of the individual components of housing costs (e.g. trends in construction trades, housing material costs, specific reasons for foreclosures, costs of maintaining a home)

About Municipal Studies:

Individual studies conducted on behalf of participating municipalities will reflect the different concerns and priorities of each municipality as expressed in initial interviews and input received. Detailed housing supply, land availability/cost, demand and gap analysis information at the municipal level will be included. A comprehensive residential housing survey will be developed and distributed in participating municipalities. Additional local input will be received through interviews with local realtors, developers, and housing partners.

About the Appendices:

The appendices will be stand-alone county-level documents with primary data, tools, and partners applicable to most or all communities, such as the Census and workforce survey results, State and Federal grant programs, and county or regional partners. Primary source data will be provided to all levels of government.

Cost Estimate and Local Match:

The CDBG Planning Grant program provides funds on a 2:1 basis with the grant program funds capped at a maximum contribution of \$50,000. Estimated cost of participation for specific units of government are included in the following chart. These estimates were derived based on the estimated cost of conducting a residential housing survey in each county or municipality. Participating counties and municipalities will be asked to provide NWRPC with a letter of financial commitment demonstrating their intent to participate in the project prior to submittal of the grant application. Participating counties and municipalities will not need to provide funds until 2020. A final project budget will be developed after it is determined which counties and municipalities will participate.

Municipality	Surrounding Areas	Apportioned Costs	Cost to Municipality
These municipalities would most likely benefit from an individualized community study.	These municipalities would not likely benefit from an individualized community study but should likely be included in the study of neighboring municipality.	These are apportioned costs estimates that could be used to share the financial burden of studies that span multiple jurisdictions	These are estimated costs. Final budget will be based on number of participating communities.
Ashland County			\$6,873.75
Bayfield County			\$6,900.00
City of Bayfield *		\$831.60	\$3,587.10
	City of Bayfield: Surrounding Area: Town of Russell	\$1,643.40	
	City of Bayfield: Surrounding Area: Town of Bayfield	\$1,112.10	
City of Washburn **		\$3,082.20	\$5,454.90
	City of Washburn: Surrounding Area: Town of Washburn	\$699.60	
	City of Washburn: Surrounding Area: Town of Bayview	\$636.90	
	City of Washburn: Surrounding Area: Town of Barksdale	\$1,036.20	
Town of Iron River			\$1,765.50
City of Ashland			\$5,619.90
Town of Cable			\$1,432.50
Town of Drummond			\$742.50
Town of Port Wing			\$750.00
Town of Grand View			\$885.00
Town of Bell (Cornucopia)			\$656.25
City of Mellen			\$2,823.75
Town of Jacobs (Glidden)			\$1,173.00
Town of LaPointe			\$500.00
Village of Butternut			\$738.75
TOTAL matching funds ***			\$39,902.90

***City of Bayfield:** In order to get the most comprehensive data from the community survey, it is recommended that the City of Bayfield include the surrounding towns of Russel and Bayfield in its survey area. The City of Bayfield may choose to ask surrounding towns to provide additional financial support to offset the cost associated with a more comprehensive survey.

****City of Washburn:** In order to get the most comprehensive data from the community survey, it is recommended that the City of Washburn include the outlying Towns of Washburn, Bayview and Barksdale in its survey area. The City of Washburn may choose to ask surrounding towns to provide additional financial support to offset the cost associated with a more comprehensive survey.

***** Please note:** The TOTAL matching funds in the estimate above currently exceeds the estimated match needed (\$25,000) to complete the project. A final project budget and cost to participate will be assessed based on the final number of participating municipalities. Final assessments are not to exceed the numbers above.

**LETTER OF FINANCIAL COMMITMENT
FOR ASHLAND/BAYFIELD COUNTY REGIONAL HOUSING STUDY
CDBG PLANNING GRANT**

(please use letterhead of county/municipality)

Date:

To: Mayor Ringberg
City of Bayfield
125 South First Street
PO Box 1170
Bayfield WI 54814

RE: Support for CDBG-Planning Grant Application

Dear Mayor Ringberg:

I am writing to provide documentation of the *(insert name of county/municipality)*'s understanding of the Community Development Block Grant Planning (CDBG-PL) application submittal and study development process is as follows:

1. The City of Bayfield will act as the CDBG-PL application sponsor on behalf of the participating municipalities and counties.
2. The application will request funding for the participating municipalities and the participating counties to complete housing studies in 2020.
3. The *(insert name of county/municipality)* will provide matching funds for the completion of its portion of the project in the amount of \$_____ as estimated in the project overview.
4. The NWRPC will provide assistance in the preparation of the studies.
5. Each municipality will be responsible for sending representatives to the housing study kick-off meeting and providing relevant information and input for the studies as requested by NWRPC

The *(insert name of county/municipality)* is committed to participating in this project and providing the required funding match. Please contact me should you have questions or need additional information.

Sincerely,

Chief Elected Official

(insert name of county/municipality)

SUBJECT: Approve to Waive Bid Requirements and Purchase Badger Books Electronic Voting Equipment from Wisconsin Elections Commission (WEC) (Clerk) Roll

RECOMMENDATION: Approval

DEPARTMENT OF ORIGIN: City Clerk

CLEARANCES: Clerk

EXHIBITS:

1. Badger Book Purchasing Communication, August 30, 2019
2. Election Security in Wisconsin, WEC

EXPENDITURES REQUIRED:

Badger Books	12 @ 1,904.00 ea	22,848.00
Polling place pkg	3 @ 193.00 ea	579.00
UPS unit	3 @ 184.00 ea	552.00
Total required		23,979.00

AMOUNT BUDGETED: \$25,000 Capital Fund

**APPROPRIATION
REQUIRED:** \$0

**TREASURER'S
CERTIFICATE:**

COMPLIANCE WITH ORDINANCE 51:

STATEMENT OF CONFORMANCE WITH COMPREHENSIVE PLAN OF RECORD:

SUMMARY STATEMENT:

In 2017, Wisconsin Elections Commission (WEC) staff developed an electronic poll book system to be used in polling places in Wisconsin on Election Day. The "Badger Book" is electronic poll book software that is specific to Wisconsin elections practices and statutes. The Badger Book is the only electronic poll book software created with direct WisVote integration. Badger Books do not use an internet connection.

The Badger Book is primarily used to check in voters, process absentee ballots, and register voters on Election Day. The Badger Book maintains the voter number and count independent of poll worker input. Each process was chosen and designed based on feedback provided by clerks and poll workers from across the state. After Election Day, a data file generated from the Badger Book is used to upload election participation and Election Day Registration information into WisVote.

The Badger Book is currently supported on the HP ElitePOS 141 Point of Sale retail terminal. One Badger Book station includes the main terminal computer with a touch screen for electronic signature capture, a wireless mouse, a wireless keyboard, a barcode scanner, a case of thermal printer paper, and a printer that can either be integrated into the terminal base column or as a stand-alone printer. Additionally, a router and an encrypted, password protected USB memory stick must be purchased for each polling place. The router facilitates communication locally between the Badger Book machines. The USB stick is used to transfer data from an internet-connected computer to the Badger Book server machine.

The City took advantage of the Wisconsin Elections Commission's borrowing program during the April 2019. This allowed for the opportunity to trial the system for both the Clerk's office to conduct the election, and the poll workers to use the system live during an election day. The response was overwhelmingly positive from the majority of both the workers and the voters due to the simplicity and user friendly program. The Clerk's office also benefited through less preparation paperwork, printing, and Election Day registration input during the week following the election. Information was easily and securely downloaded from WisVote (formerly Statewide Voter Registration System or SVRS) and onto the server unit through an encrypted flash drive. This flash drive is kept at the Clerk's office during Election Day for further security, and information is updated and downloaded to a separate encrypted flash drive throughout Election Day. At the end of the day, reports can be easily downloaded through the Administrator of the Badger Book for reporting and future researching.

As security is an ongoing concern during today's elections, it is on constant radar for the WEC. Wisconsin has one of the most progressive security programs in the United States, creating standards for other states to replicate. In February, the WEC received an award from the US Election Assistance commission for outstanding innovations in Elections for its cybersecurity training program series intended to better secure the statewide election system. On the City's side, security updates are required periodically throughout the year as the City's IT staff ensured firewall, spyware and antivirus software is in place and current. More background of Election Security in Wisconsin can be found within Exhibit 2.

In 2018, a number of cities throughout Wisconsin volunteered to trial the Badger Book for their November elections. Due to the positivity in experience and voter and worker response, the Clerk's office budgeted for purchase of twelve Badger Books to be used at the three different voting locations for Ashland. Although the City does not hold four elections at all three locations each year, voter turnout is difficult to estimate in advance and preparedness is key to good results.

The Clerk's office is requesting Council waive the bidding requirements as stated in chapter 194, Ashland City Ordinances, for this purchase, as the WEC and Paragon development Service (PDS) are the only group to manufacture the Badger Book, due to the level of security necessary. We are also asking for Council approval to purchase twelve (12) Badger Books as budgeted for in the Capital Improvement Fund, for \$22,848.00, three (3) polling place packages for \$579.00, and three (3) APC Uninterrupted Power Supply units for \$552.00, for a total purchase amount of \$23,979.00.



Wisconsin Elections Commission

212 East Washington Avenue | Third Floor | P.O. Box 7984 | Madison, WI 53707-7984
(608) 266-8005 | elections@wi.gov | elections.wi.gov

DATE: August 30, 2019

TO: Wisconsin Municipal Clerks
Wisconsin County Clerks
City of Milwaukee Election Commission
Milwaukee County Election Commission

FROM: Michelle R. Hawley, Training Officer
Michael Sabaka, Elections Security Trainer

SUBJECT: Badger Book Purchasing and Borrowing Processes – 2020 Elections

The Wisconsin Elections Commission (WEC) is making Badger Books available to purchase for the 2020 elections. Two configuration options are available for purchase, and both packages include HP's Elite POS G1 8GB retail unit as the main piece of hardware. The data sheet for this device is attached to this Clerk Communication.

It is important to be informed and to ensure Badger Books will be a good fit for your municipality. As a result, WEC staff compiled a list of items municipalities should know prior to considering the implementation of electronic poll books. While this is not an exhaustive list, it highlights major areas identified since the Spring 2018 roll out. Attached please find a copy of the "Badger Book Purchasing Considerations" document.

Due to the anticipated high voter turnout during the 2020 Elections, the WEC will lend additional Badger Books to purchasing municipalities, if needed.

Purchasing

The window to place a Badger Book order will be from September 16th – October 18th. Municipalities that purchase will do so directly to Paragon Development Service (PDS), the provider of the Badger Book hardware. For your information, listed below are the current costs associated with purchasing as provided by PDS. Direct quotes will be provided to each interested municipality by PDS. Per PDS, this quote may increase (between 3%-8%) as a result of potential tariffs.

Package 1 – Badger Book with Integrated Column Printer (approx. \$2,108 total)

- \$1,880.00 per Badger Book Station
- \$228.00 per Polling Place (router, thermal receipt paper, and USB Device)

Package 2 – Badger Book with Stand-Alone Printer (approx. \$2,097 total)

- \$1,904.00 per Badger Book Station
- \$193.00 per Polling Place (router, thermal receipt paper, and USB Device)

Wisconsin Elections Commissioners

Dean Knudson, chair | Marge Bostelmann | Julie M. Glancey | Ann S. Jacobs | Jodi Jensen | Mark L. Thomsen

Administrator
Meagan Wolfe

Please use the following steps to place your order of Badger Books through PDS.

Step 1: Set up an account with PDS (May be done immediately)

- Complete and send the “Client Registration” form and tax-exempt information to Dana Berner at TeamGovEdu@pdsit.net. The “Client Registration” form is attached to this Clerk Communication.

Step 2: Indicate your purchasing plans (May be done between 9/16/2019 – 10/18/2019)

- E mail the number and type of machine(s) that will be purchased to Dana Berner at TeamGovEdu@pdsit.net.

Device Information

Each Badger Book package contains a 2-D barcode scanner, thermal receipt printing functionality, Windows 10 Pro, a wireless keyboard and mouse, and PDS configuration services. A per polling place package includes a wireless router, a secure USB, thermal receipt paper, and configuration services.

Badger Books with an integrated column printer are about two inches taller and will require more frequent printer paper replacement, however they do not need to be manually connected to the Elite POS unit (Badger Book Tower) with a cord, unlike the Badger Book stand-alone unit.

The WEC will be exploring additional hardware options for Badger Book implementation AFTER the 2020 Elections. All current Badger Book models will continue to be supported into the future, regardless of whether or not the WEC decides on a new Badger Book model.

Should municipalities choose to purchase Badger Books for use in 2020 elections, WEC staff will be in contact regarding implementation, training, etc., to ensure they have the support necessary for a successful implementation.

Borrowing

Due to the anticipated turnout for the 2020 elections, the WEC will lend out their supply of Badger Books to municipalities who may need extra devices. It is important to note that there are a limited number of Badger Books to lend per election.

If you have additional questions about the Badger Book Borrowing or Purchasing Programs, please contact the WEC Help Desk at (608) 261-2028 or elections@wi.gov. If you have technical hardware questions, please contact Dana Berner at (262) 569-5366 or TeamGovEdu@pdsit.net.

Badger Book Purchasing Considerations



When deciding on whether Badger Books are the right fit for your municipality, it is important to consider the following items:

- **Electronic Poll Book Capabilities**

- The main three functions of the electronic poll book include checking in voters, processing Election Day Registrations, and recording absentee ballots. All of these functions will be completed electronically (no paper EDRs or pre-numbering absentee ballots).
- Some processes will continue to be completed on paper:
 - creating and tracking provisional ballots
 - creating and tracking challenged ballots
 - checking a voter against the Ineligible Voter List
- Municipalities who have separate central count locations may choose to incorporate Badger Books in that process and separate server machines will be required.

- **IT Support**

- As Badger Books are electronic poll books, it is important that you have strong IT staff that will be involved during the whole process. Invite IT staff to Badger Book training and encourage them to be a part of your team to help ensure you have technical support leading up to and on Election Day.
- Clerk familiarity with computers and WisVote is also important. There are tasks that must be completed in WisVote (e.g. preparing the poll book and transferring it, using a USB device, to the Badger Book server).

- **Storing Badger Books**

- Each stand-alone Badger Book device will be delivered in a box that is 26 in x 20 in x 12 in. Each integrated Badger Book device will be delivered in a box that is 17.5 in x 20 in x 12 in. In addition, there will be some smaller boxes delivered with accessories.
- You must have a plan on where and how to securely store each Badger Book device, including during non-election times. WEC staff may provide recommendations for storage solutions, and currently there is currently no uniform storage option.
- A plan on how to get your Badger Books to and from each polling place for Election Day will need to be created.

- **Super User for Each Polling Place**

- WEC staff recommends that each polling place have a dedicated "Super User" who will be the "go-to" staff for any Badger Book questions that come up on Election Day (consider election inspectors other than/in addition to the Chief Inspector, who will have other responsibilities on Election Day).
- A Super User should be a person with strong technology/computer skills.

- **Computer Skills of Election Inspectors**

- WEC staff developed the Badger Book application to be user friendly; however, staff also recommends that election inspectors possess basic computer skills. Consider assigning inspectors that have enhanced skills, especially typing skills, to focus on Election Day Registrations.

- **Phased Implementation Plan**

- For municipalities with more than one polling place, a gradual implementation may be beneficial.

- **Training Time for Election Inspectors**

- You will need to promote Badger Book to gain the acceptance of election inspectors.
- Plan multiple opportunities to train election inspectors on the Badger Books.
- Hands on time with the Badger Books ahead of Election Day is the most effective training strategy to ensure your election inspectors are familiar, confident, and comfortable on Election Day.

- **Public Outreach**

- Residents may be nervous or resistant to this change. Make plans how to notify and educate the voters in your municipality about the Badger Books.
 - Invite the public to see a Badger Book demonstration ahead of an election.
 - Educate your election inspectors on how to take questions from the public.

- **The Number Election Day Registrations (EDRs) Completed at Each Polling Place**

- As a certain amount of data entry is required to process each EDR, this process may take longer than having voters go through the traditional paper process (the paper process will not be an option if using Badger Books).
- A greater number of Badger Books will likely be necessary at polling places on/near college campuses compared to your other polling places (generally, WEC staff recommends 1 Badger Book per 800 voters, plus 1 per polling place).

- **Physical Layout of Polling Places**

- Each Badger Book needs to be plugged in to a power source.
- Each polling place needs to plug in a router in the voting area, out of reach of voters, and close enough to the devices to ensure maximum performance.
- Consider changing the flow of the polling place based on the need for electricity and ensuring that cords do not get unplugged or create a tripping hazard.

- **Contingency Plans**

- Printed paper poll books are mandatory (the same number as would be required to run your polling place without the devices), in case of an emergency where the power goes out and/or the devices become inoperative. In its current state, Badger Books do not have a battery back-up. You may separately purchase your own battery back-up system.

- **Wisconsin Elections Commission & Paragon Development Services**

- There will be parts of this process where you will be working with staff at the Wisconsin Elections Commission, and other parts where you will be working strictly with employees of the hardware supplier, Paragon Development Services (PDS).
 - WEC staff develops and maintains the software. Staff will help train on how to use the Badger Books and how to run an election using the Badger Books, including the pre and post-election data transfer processes.
 - PDS will sell and deliver the actual Badger Book devices.

HP Engage One All-in-One System



Transform your retail space with a versatile point of sale system that elevates the customer experience and supports your critical business operations. With security, durability, and flexibility built into its gorgeous design, the HP Engage One system marks a new era in retail.

HP recommends Windows 10 Pro.



Sleek. Modern. Adaptable.

Build the ideal checkout, interactive signage or self-service solution for your retail or hospitality environment with the streamlined, versatile HP Engage One system and its accessory ecosystem¹, all available in a choice of colors.

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Today's business calls for next-level security. The HP Engage One answers with a self-healing PC BIOS and firmware that shields the BIOS against attacks to help keep your data, devices, and customers safe and secure.

Durable. Powerful. Built for the day ahead.

Power through your peaks with 7th generation Intel® processors and a durable system that has a 5-year lifecycle and up to a 3-year standard limited warranty.² Get up to 5 years peace of mind with optional HP Care Pack.³

Additional Features

- Enjoy Windows management and security features that support seamless integration with your existing Windows apps and infrastructure.
- Set a new bar for sophistication with components and accessories that complement the HP Engage One aesthetic, including stands, magnetic stripe reader, barcode scanner, customer-facing displays, and an in-column or standalone receipt printer.
- Engage customers and enable associates with a modern, polished 14" diagonal touchscreen display that's intuitive and responsive for fast interaction and has an anti-glare coating to minimize light interference.
- Entrust a device that's not only beautiful but retail-hardened. It's designed to pass MIL-STD 801G with a sturdy, anodized aluminum chassis that resists spills by channeling liquids away from the screen.
- Get extra protection with automatic updates and security checks from HP BIOSphere Gen3. Control application and system access with Device Guard, Credential Guard, and an optional fingerprint reader.
- The HP Engage One is ready for duty with 7th generation Intel® processors, efficient M.2 storage, fast DDR4 memory, and optional wireless LAN with Bluetooth®. An integrated SD card reader supports easy backup, deployment, and servicing.
- HP Device as a Service delivers the HP Engage One as a complete solution of hardware, insightful analytics, and services for every phase of the device lifecycle—with one, easy, predictable price per device.

HP Engage One All-in-One System Specifications Table



Available Operating System	Windows 10 Pro 64-bit ¹ Windows 10 IoT Enterprise 2016 LTSB 64-bit ¹ FreeDOS SUSE Linux Enterprise Desktop 12 (certification only)
Processor Family³	7th Generation Intel® Core™ i5 processor 7th Generation Intel® Core™ i3 processor Intel® Celeron® processor
Available Processors^{2,3,7}	Intel® Celeron® 3965U with Intel® HD Graphics 610 (2.2 GHz, 2 MB cache, 2 cores); Intel® Core™ i3-7100U with Intel® HD Graphics 620 (2.4 GHz, 3 MB cache, 2 cores); Intel® Core™ i5-7300U with Intel® HD Graphics 620 (2.6 GHz base frequency, up to 3.5 GHz with Intel® Turbo Boost Technology 2.0, 3 MB cache, 2 cores)
Chipset	Multi-chip package
Maximum Memory	32 GB DDR4-2400 SDRAM ⁴ (Transfer rates up to 2400 MT/s.)
Memory Slots	2 SODIMM
Internal Storage	128 GB up to 512 GB SATA SSD (M.2) ⁵ 128 GB up to 1 TB PCIe® NVMe™ SSD ⁵
Display	14" diagonal FHD anti-glare touch screen (1920 x 1080) 35.56 cm (14") diagonal FHD anti-glare touch screen (1920 x 1080)
Available Graphics	Integrated: Intel® HD Graphics 610; Intel® HD Graphics 620
Audio	Integrated HD audio with Realtek ALC3228 codec with standards internal speakers and stereo headphone jack
Communications	LAN: Broadcom BCM943228Z 802.11n wireless M.2 with Bluetooth®; Realtek RTL8153 ¹⁴ WLAN: Intel® 3165 802.11ac wireless M.2 with Bluetooth®; Intel® 8265ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, non-vPro™; Intel® 8265ac (2x2) Wi-Fi® and Bluetooth® 4.2 Combo, vPro™; Realtek 802.11b/g/n (1x1) Wi-Fi® and Bluetooth® 4.0 Combo
Expansion Slots	1 M.2 2230; SD card reader ⁶
Ports and Connectors	Back: 1 cash drawer connector; 1 power connector; 1 RJ-45; 1 USB Type-C™ (charging); 2 serial; 4 USB 3.0; 1 Powered 24 Volt USB; 2 Powered 12 Volt USB ¹³ Side: 1 headset connector ¹⁴
Internal Drive Bays	One M.2
Available Software	HP business PCs are shipped with a variety of software titles including: HP BIOSphere with Sure Start Generation 3.0, HP Support Assistant, HP Device Guard, HP Credential Guard. Please refer to this product's quick spec document for a full list of preinstalled software. ⁹
Security Management	Power-on password (via BIOS); Setup password (via BIOS); VESA mounting; HP ElitePOS Keyed Cable Lock; HP FingerPrint Sensor (optional); HP BIOSphere with SureStart Gen 3; Device guard; Credential guard and password protection; Trusted Platform Module TPM 2.0 Embedded Security Chip; USB enable/disable (via BIOS) ^{9,12}
Power	120 W, 88% efficiency, active PFC (basic base); 180 W, 89% efficiency, active PFC (advanced base); 65 W, 89% efficiency at 20 V, active PFC (display head unit)
Dimensions (W x D x H)	13.23 x 8.51 x 0.69 in (head unit); 3.77 x 3.77 x 10.2 in (stand with column printer); 11.23 x 6.37 x 1.14 in (connectivity base) 33.62 X 21.64 X 1.76 cm (head unit); 9.6 x 9.6 x 26 cm (stand with column printer); 28.4 x 16.2 x 2.92 cm (connectivity base)
Weight	2.92 lb (rotate stand); 2.39 lb (fixed stand); 3.03 lb (head unit); 1.23 lb (connectivity base); 4.26 lb (printer) 1.33 kg (rotate stand); 1.09 kg (fixed stand); 1.38 kg (head unit); 0.56 kg (connectivity base); 1.94 kg (printer)
Environmental	Low halogen ¹¹
Energy Efficiency Compliance	ENERGY STAR® certified and EPEAT® registered configurations available ¹⁰

HP Engage One All-in-One System

Accessories and services (not included)

HP ElitePOS W Top Mount 2x20 CFD

Frame easily readable price, product, and order information for customers on the HP ElitePOS Top Mount 2 x 20 CFD, HP's smallest and thinnest CFD, designed to complement your HP ElitePOS. It has cleanable¹ edge-to-edge glass and customizable colors and fonts so you can personalize your content.

Product number: 3GS18AA

HP ElitePOS W 2D Barcode Scanner

Deliver an efficient customer experience with the breathtaking HP ElitePOS 2D Barcode Scanner, HP's smallest, slimmest barcode scanner, designed to complement the HP ElitePOS. It reads mobile wallets, digital coupons, and printed barcodes and can be used by hand or in presentation mode.

Product number: 3GS20AA

HP ElitePOS W 10.1-inch Touch Display

Share dynamic content with customers and enable them to input their data for a personalized experience with the HP ElitePOS 10.1 in Touch Display for the HP ElitePOS. It has a durable, cleanable¹, edge-to-edge touchscreen, adjustable stand for optimal placement, and simple USB-C™ connectivity.

Product number: 3FH67AA

HP ElitePOS W 10.1-inch Display

Share dynamic videos and content with customers on a display that gets attention in any room with the HP ElitePOS 10.1 in Non-Touch Display for the HP ElitePOS. It has durable, cleanable¹, edge-to-edge glass, an adjustable stand for optimal counter placement, and simple USB-C™ connectivity.

Product number: 3FH66AA

HP ElitePOS W Fingerprint Reader

Enable secure, accurate employee log in protocols and help reduce opportunities for theft with the minimalist HP ElitePOS Biometric Fingerprint Reader. It's designed for your HP ElitePoS, can be configured next to the stand or as a standalone, and intuitively confirms successful reads.

Product number: 3GS21AA

Messaging Footnotes

¹ Optional features sold separately or as add-on features.

² 1- or 3-year limited warranty, depending on country.

³ HP Care Pack Services are optional. Service levels and response times for HP Care Pack Services may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit <http://www.hp.com/go/cpc>. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

⁴ Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

⁵ MIL-STD testing is pending and is not intended to demonstrate fitness for U.S. Department of Defense contract requirements or for military use. Test results are not a guarantee of future performance under these test conditions. Accidental damage requires an optional HP Accidental Damage Protection Care Pack.

⁶ HP BIOSphere Gen3 requires Intel® or AMD® 7th generation processors.

⁷ Microsoft Device Guard and Credential Guard are available with Windows 10 IoT Enterprise 2016 LTSB delivered from HP or to customers with a volume license to use Windows 10 Enterprise. Microsoft Device Guard and Credential Guard are not available with Windows 10 Pro. The installation of Windows 10 Enterprise and Microsoft Device Guard and Credential Guard are available through HP Configuration & Deployment Services.

⁸ Wireless access point and Internet access required.

⁹ Please contact your HP representative or authorized HP reseller for details. Device support may vary by country. Features vary among Standard, Enhanced, and Premium HP Device as a Service plans. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

Technical Specifications Footnotes

¹ Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com/>.

² Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering is not a measurement of higher performance.

³ Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on products configured with Intel and AMD 7th generation and forward processors or provide any Windows 8 or Windows 7 drivers on <http://www.support.hp.com>.

⁴ Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed.

⁵ For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10) is reserved for system recovery software.

⁶ Wireless cards are optional or add-on features and requires separately purchased wireless access point and internet service. Availability of public wireless access points limited. The specifications for the 802.11ac WLAN are draft specifications and are not final. If the final specifications differ from the draft specifications, it may affect the ability of the notebook to communicate with other 802.11ac WLAN devices.

⁷ Intel® HD Graphics 610: integrated on Celeron™ G3965U; Intel® HD Graphics 620: integrated on 7th gen Core™ i7/i5/i3 processors.

⁸ Optional MSR is integrated directly into display head unit.

⁹ HP BIOSphere with Sure Start available only on business PCs with HP BIOS. HP BIOSphere Gen 3 requires Intel® 7th generation processors.

¹⁰ EPEAT® registered where applicable. EPEAT registration varies by country. See www.epeat.net for registration status by country. Search keyword generator on HP's 3rd party option store for solar generator accessories at www.hp.com/go/options.

¹¹ External power supplies, power cords, cables and peripherals are not low halogen. Service parts obtained after purchase may not be low halogen. Standard configurations meet the low halogen specifications however, some custom feature components may not meet the same Low Halogen standard. A standard configuration includes display head, rotate / tilt or fixed position stand, stability plate and I/O Connectivity Base.

¹² Device Guard is only available with Windows 10 IoT 64 Enterprise LTSB for Retail. Device Guard is not available with Windows 10 Pro.

¹³ Optional HP Engage Go Advanced I/O Connectivity Base specs shown. Optional HP Engage Go Basic I/O Hub and HP USB-C Hub also available. Refer to system quick specs for full I/O specification <http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=c05573243s>.

¹⁴ LAN - in Retail I/O Connectivity Base.

¹⁵ For further details please refer to Quick Specs document.

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4AA7-2170ENUC, 12/12/2018





WISCONSIN ELECTIONS COMMISSION

Administering Wisconsin's Election Laws

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Election Security in Wisconsin

Wisconsin's election systems are secure thanks to the Wisconsin Elections Commission's strong partnerships with federal and state agencies and local election officials. This page briefly summarizes the WEC's election security efforts and provides links to more information.

Election security has always been a concern, but those concerns became heightened in 2016 with news of hacking attempts of state voter registration systems around the country. According to the U.S. Department of Homeland Security, the state of Wisconsin's online defenses were scanned twice in July of 2016 by "Russian government cyber actors" who did not breach the system. To put that in context, state's computer systems are scanned approximately 9 million times a year. **The Commission has found no evidence that Wisconsin's election systems have ever been compromised.** [You can learn more about the scanning attempts here.](#)

In October 2016 the WEC published its first manual for clerks regarding contingency planning and election security. Since then, the WEC has been developing extensive plans for Election Security Preparation and Incident Prevention, Election Security Incident Response, and Election Security Communications.

In May 2018, the WEC launched an ambitious election security training program for county and municipal election officials, based on training our staff received earlier in the year at Harvard University's [Belfer Center for Science and International Affairs](#).

Wisconsin has two main elections systems: voter registration and vote counting. The voter registration system is very centralized and mostly online. The vote counting system is very decentralized and mostly offline.

Voter Registration

Since 2006, Wisconsin has had a statewide voter registration system, now known as WisVote. That system is hosted on servers owned by the state and protected by our partners at the Department of Administration's Division of Enterprise Technology (DET).

WisVote was developed by our staff in 2015 using Microsoft Dynamics CRM, an enterprise-class platform which ensures constant security updates. We launched WisVote in 2016.

WisVote has approximately 3,000 users, primarily the clerks in Wisconsin's 1,852 municipalities and 72 counties and their employees. Users of the system receive extensive online training, including security training. Users have access only to voter records in their jurisdiction, limiting the potential for damage in the event an authorized user's credentials were stolen or of unauthorized actions by an authorized user.

WisVote gives clerks the tools they need to maintain their local voter registration lists securely, but it is also a complete election management system.

Since launching WisVote, the WEC has made several upgrades to enhance the system's security:

- The data in WisVote is encrypted on our servers and between the servers and users, so in the unlikely event of a breach, any data stolen would be unusable.
- A new WisVote access policy, effective July 23, 2018, requires all users to complete a series of electronic learning modules focused on computer security best hygiene practices. New users must complete security training before gaining access to the system and existing users were required to complete the training prior to the November 2018 election.
- Multi-Factor Authentication (MFA) was implemented before the November 2018 General Election, requiring clerks to use a third identification factor in addition to their username and password to gain access to the system.
- WEC is upgrading its existing monitoring tools to alert staff of any suspicious activity within the WisVote system.
- In 2018, WEC completed a risk and vulnerability assessment conducted in conjunction with U.S. Department Homeland Security and the Wisconsin Department of Administration – Division of Enterprise Technology (DET). The assessment found no evidence of any unauthorized access to Wisconsin's elections systems.
- In addition to the risk and vulnerability assessment, WEC has been receiving regular Cyber Hygiene Scans from DHS since 2016.

Electronic poll books (EPB) are being introduced gradually in Wisconsin by clerks who are adopting the [Badger Book EPB system](#) developed by the WEC. Badger Books became available to municipal clerks for the first time in 2018. Wisconsin EPBs are not connected to the Internet and must have a paper back-up.

Vote Counting

Every ballot in Wisconsin is either cast on paper or has a paper back-up:

- 85 percent are cast on optical-scan paper ballots
- 5 percent are cast on hand-count paper ballots
- 10 percent are cast on touch-screen voting equipment that has a voter-verifiable paper audit trail. In the event of a recount or audit, the paper record is used.

Municipalities, often in consultation with counties, decide what kind of electronic voting equipment to use for tabulating ballots. They may only purchase voting equipment that has been tested and approved by both the U.S. Election Assistance Commission and the Wisconsin Elections Commission. Systems from three vendors (ES&S, Dominion and Clear Ballot) have been approved for use in Wisconsin.

Voting equipment in Wisconsin may not be connected to the Internet and the computers used to program them must be hardened systems, which means they must be single-purpose computers with no unnecessary software, and unable to connect to the Internet. Most larger counties program their own voting equipment while smaller counties tend to rely on voting equipment vendors for programming.

State law requires municipal clerks to publicly test voting equipment for logic and accuracy before each election. Voting equipment memory devices are secured in the machines with tamper-evident seals.

Most ballots are counted at the polling place, including absentee ballots which are processed throughout Election Day and fed into polling-place scanners. A few large municipalities, including Milwaukee, count absentee ballots at a central location and those absentee ballots are also fed into scanners that record and tabulate votes. Members of the public can observe the counting of ballots at both polling places and central absentee locations.

After the polls close at 8 p.m. on Election Day, voting equipment is switched into reporting mode to print an official results tape. Members of the public can be present to hear the results read aloud and to view the tapes.

On Election Night, official results in the form of paper tapes and electronic memory devices are transported to the municipal clerk's office. Depending on the technology available, some polling places may transmit unofficial results to the county electronically via a hard-wired dial-up modem or a cellular wireless modem, but most use hand delivery or phone in the unofficial results to the county clerk's office.

County clerks compile unofficial results from reporting units within the county. Some use computer programs supplied by their voting equipment vendors while others use spreadsheets. Some use a reporting function within the WEC's Canvass Reporting System, which provides them with reports they can post on their websites. County clerks are required to post unofficial election results to their websites within two hours of receiving results from the municipalities.

State law does not require the Wisconsin Elections Commission to have a centralized system for collecting and reporting unofficial Election Night results. Traditionally, that role has been fulfilled by the Associated Press and other news organizations, which gather unofficial results from county clerks in person, by telephone or electronically.

Official results are certified by county boards of canvassers, comprised of the county clerk and two members of the public from opposite political parties. They must meet by the Tuesday after the election to open and publicly examine the returns. County canvassers have 10 days after the election to certify and deliver a statement of canvass to the state using the Canvass Reporting System.

Recounts in Wisconsin are not automatic. After completion of the canvass, a losing candidate whose total votes were within 1 percent of the winner's vote total may petition for a recount. [There are different deadlines and thresholds depending on the office.](#)

After the deadline for requesting a recount passes (or there is a recount), the Wisconsin Elections Commission reviews and certifies the results.

Post-Election Audits

After each November election, state law requires the WEC to direct an audit of every type of voting equipment used in the state. [You can read the audit results here and learn more about the audit process.](#)

At its September 25, 2018 meeting, the WEC enhanced election security by [approving a significant expansion of post-election audits to ensure the integrity of voting systems.](#)

WEC staff randomly selected 185 wards across the state to conduct audits. Municipal clerks for the selected wards were notified and received instructions on how to conduct the audits. Wisconsin has 12 different makes and models of voting equipment in use, and each type was audited at least five times. At

least one ward in each of the 72 counties was selected, but no municipality was selected for more than two audits. Audits were required to be completed by November 28, several days before the deadline for the WEC certified results on Monday, December 3.

The purpose of the audit is to ensure that voting equipment used in Wisconsin is accurately counting ballots according to federal standards, which is 1 error in 500,000 ballots. These audits are usually completed after certification of the results.

The Commission has also [approved procedures for voluntary post-election audits](#) that counties may conduct as part of the county board of canvassers process before they certify results in November. Current state law does not permit the WEC to order counties to conduct post-election audits.

Post-election audits may help the public to have the same level of confidence in local election officials and boards of canvass that the WEC has with respect to election results. Post-election audits help showcase the accuracy with which votes are counted in Wisconsin. In the unlikely event that the post-election audit reveals a discrepancy or error, mistakes in the tabulation/counting votes process can be identified and corrected prior to the certification of election results.

Wisconsin Elections Commission | 212 East Washington Avenue, Third Floor P.O. Box 7984 | Madison,
Wisconsin 53707-7984

tele (608) 266-8005 | *fax* (608) 267-0500 | *tty* 1-800-947-3529 | *e-mail* elections@wi.gov

Toll-Free Voter Help Line: 1-866-VOTE-WIS

SUBJECT: Approve to Waive Permit the Building Permit Fee for Roof Replacement at 618 Beaser Avenue. Applicant: CESA-12 (*Planning*) Voice

RECOMMENDATION: Denial

DEPARTMENT OF ORIGIN: Planning & Development

CLEARANCES: Planning & Development Department

EXHIBITS:

EXPENDITURES REQUIRED: NA

AMOUNT BUDGETED: NA

APPROPRIATION REQUIRED: NA

TREASURER'S CERTIFICATE:

COMPLIANCE WITH ORDINANCE 51:

STATEMENT OF CONFORMANCE WITH COMPREHENSIVE PLAN OF RECORD: NA

SUMMARY STATEMENT:

CESA 12 and the School District of Ashland are requesting that the Building Permit fee be waived for a roof replacement project taking place at 618 Beaser Avenue, the CESA 12 building. The total project cost for replacement of shingles and removal of 2 chimney structures is \$130,000 with a Building Permit fee of \$50. Staff appreciates the need and value of this project but has recommended denial of this request based on the recent denial of fee waiver requests from Ashland County in August, 2018 (amount: \$572.50) and from EverGrow Learning Center (amount: \$1,500) and Partners in Recovery (amount: \$75) in February, 2019. Additionally, since inspection by a commercial building inspector is still required for projects completed by non-profit entities, the Building Permit fee helps the City to recover a portion of the cost of these inspections.