Antrim County Hazard Mitigation Plan Update

February 8, 2022

Networks Northwest

Talent / Business / Community

Welcome

- Thank you for joining us!
- We will be discussing the following:
  - Results of the Community Survey
  - Historic Weather Events
  - Hazard Identification

Introductions

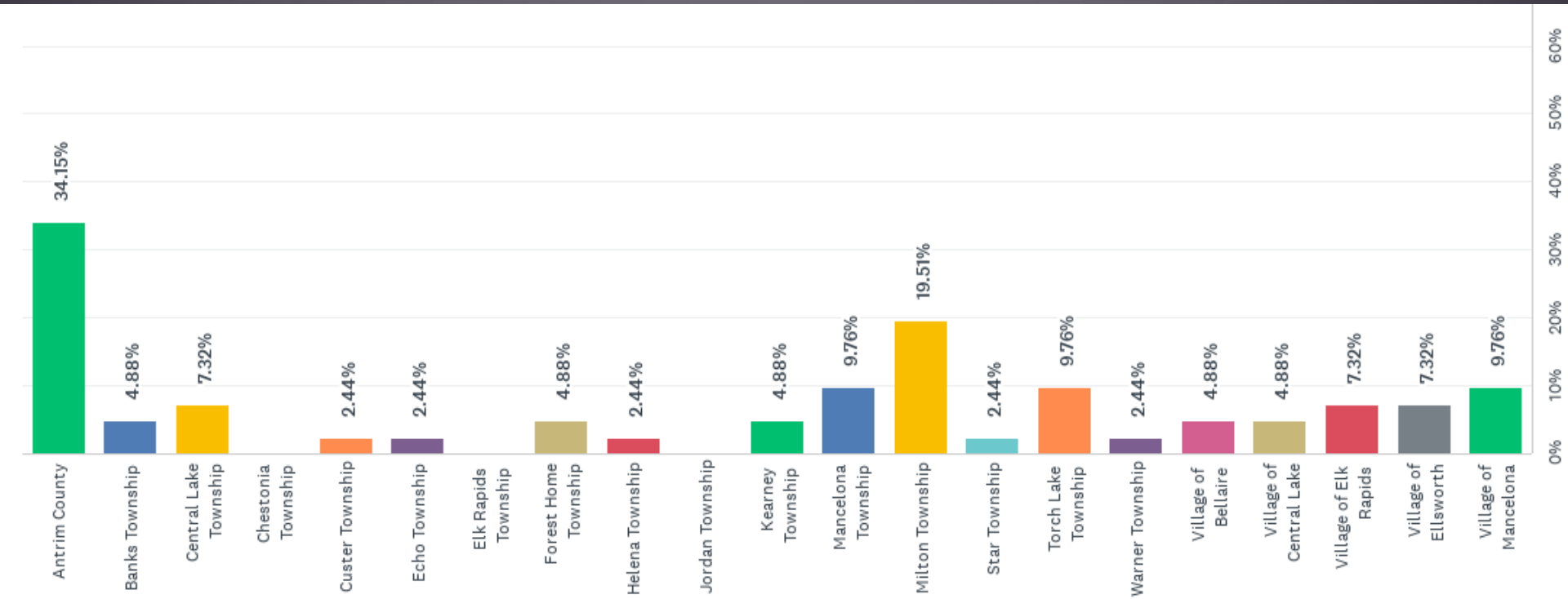
- Networks Northwest Staff
  - Jennifer Neal, AICP
  - Stephanie Loria
- Community Partners

Antrim County Project Meeting Attendance Table

Antrim County Hazard Mitigation Advisory Committee Participation Table						
		Meeting Attended				
Participating Agency or Jurisdiction	**Completed Online Survey (as of 2/2/2022)**	**HM Kick-off Meeting 7/1/2021 (In person and Zoom)**	**LEPC/LPT Meeting 08/10/2021 (via Zoom)**	**LEPC/LPT Meeting 09/01/2021 (via Zoom)**	**LEPC/LPT Meeting 10/18/2021 (via Zoom)**	**LEPC/LPT Meeting 02/08/22 (via Zoom)**
Networks Northwest		X		X	X	
Michigan State Police - Mike Sobocinski		X				
Antrim County EM		X	X	X	X	
Antrim County Sheriff				X		
Antrim County Administrator			X	X	X	
Antrim Conservation District			X	X		
Antrim County Council on Aging			X	X		
Michigan Dept. of Health & Human Services			X	X		
Meadowbrook County Medical Care Facility			X	X		
American Red Cross				X		
Health Dept. of NW MI			X	X		
Allied EMS			X			
East Jordan Family Health Centers				X		
Michigan State Police				X		
MI EGLE			X	X		
Grand Traverse Band of Ottawa and Chippewa Indians		X				
Kalkaska County EM		X				
Antrim County	X					
Banks Township	X					
Central Lake Township	X					
Chestonia Township						
Custer Township	X					
Echo Township	X					
Elk Rapids Township						
Forest Home Township	X					
Helena Township	X					
Jordan Township						
Kearney Township	X					
Mancelona Township	X					
Milton Township	X					
Star Township	X					
Torch Lake Township	X					
Warner Township	X					
Village of Bellaire	X					
Village of Central Lake	X					
Village of Elk Rapids	X					
Village of Ellsworth	X					
Village of Mancelona	X					

Antrim County Hazard Mitigation Community Survey

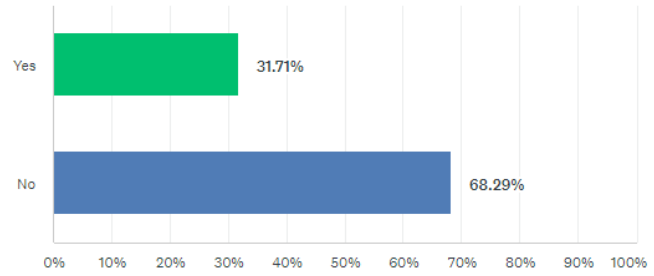
Community Survey Responses from 10/25/21 to 1/28/22
41 Responses



Community Survey Results

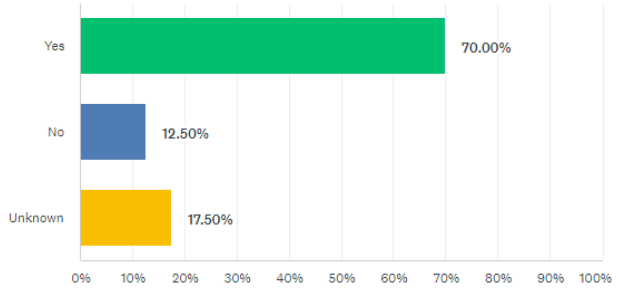
Are you familiar with the county's Natural Hazard Mitigation Plan?

Answered: 41 Skipped: 0



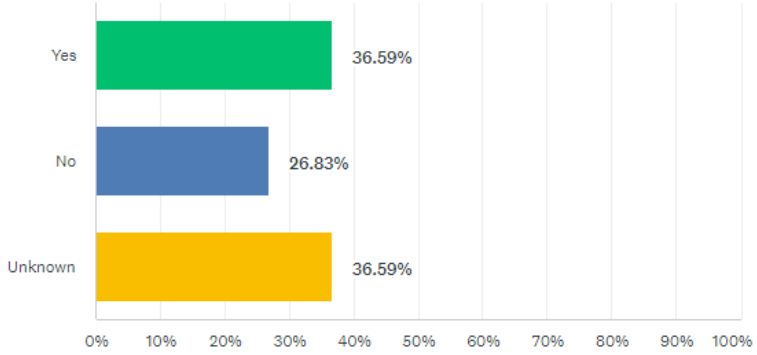
Does the community you represent have an adopted Master Plan?

Answered: 40 Skipped: 1



Does the community you represent have an adopted Capital Improvements Plan?

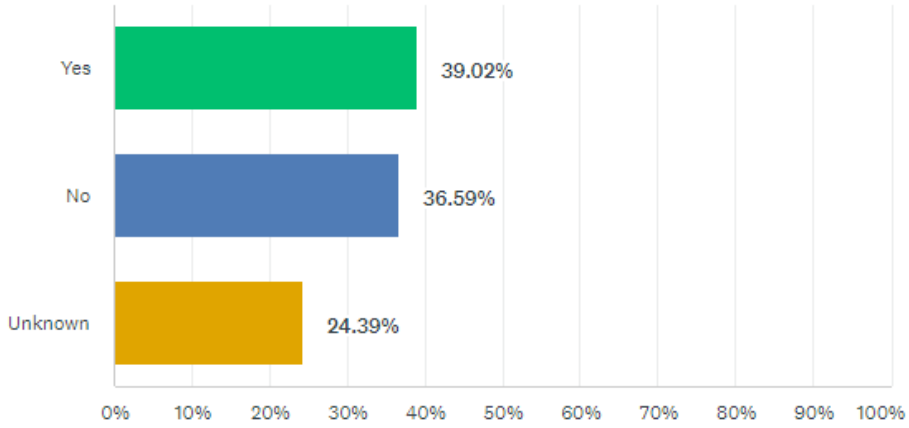
Answered: 41 Skipped: 0



Community Survey Results

Has the community you represent experienced a significant natural hazard event within the last 10 years?

Answered: 41 Skipped: 0

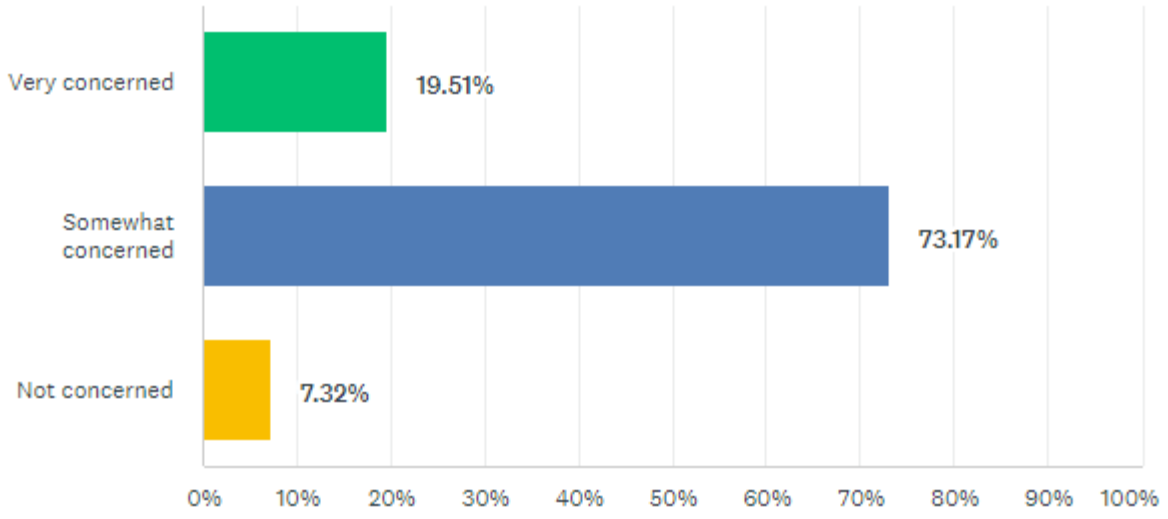


high winds storm road TORNADO damage trees flooding culverts severe wind

Community Survey Results

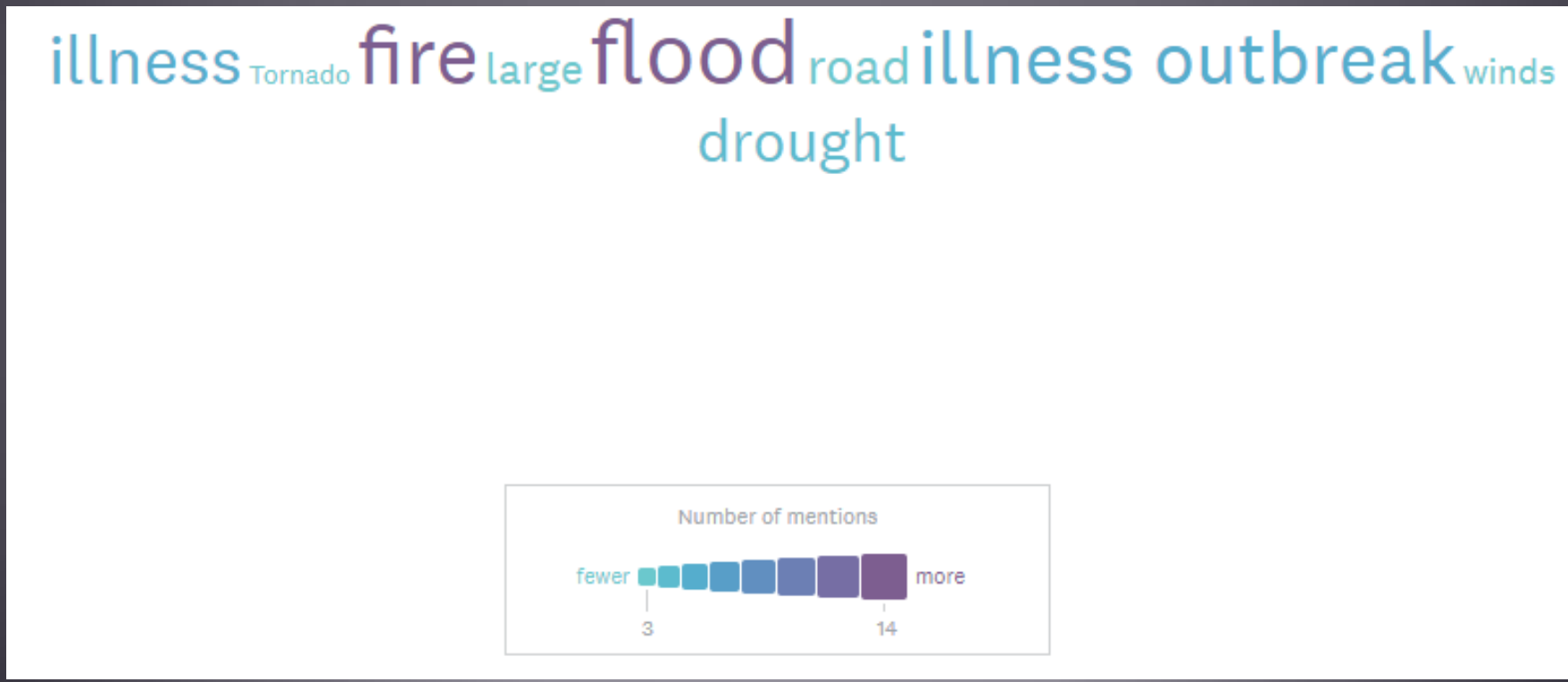
How concerned are you about future natural hazard events impacting your community?

Answered: 41 Skipped: 0



Community Survey Results

Q9 What type of natural hazard events are likely to have the largest impact on your community, for example fire, flood, drought, illness outbreak, etc.?

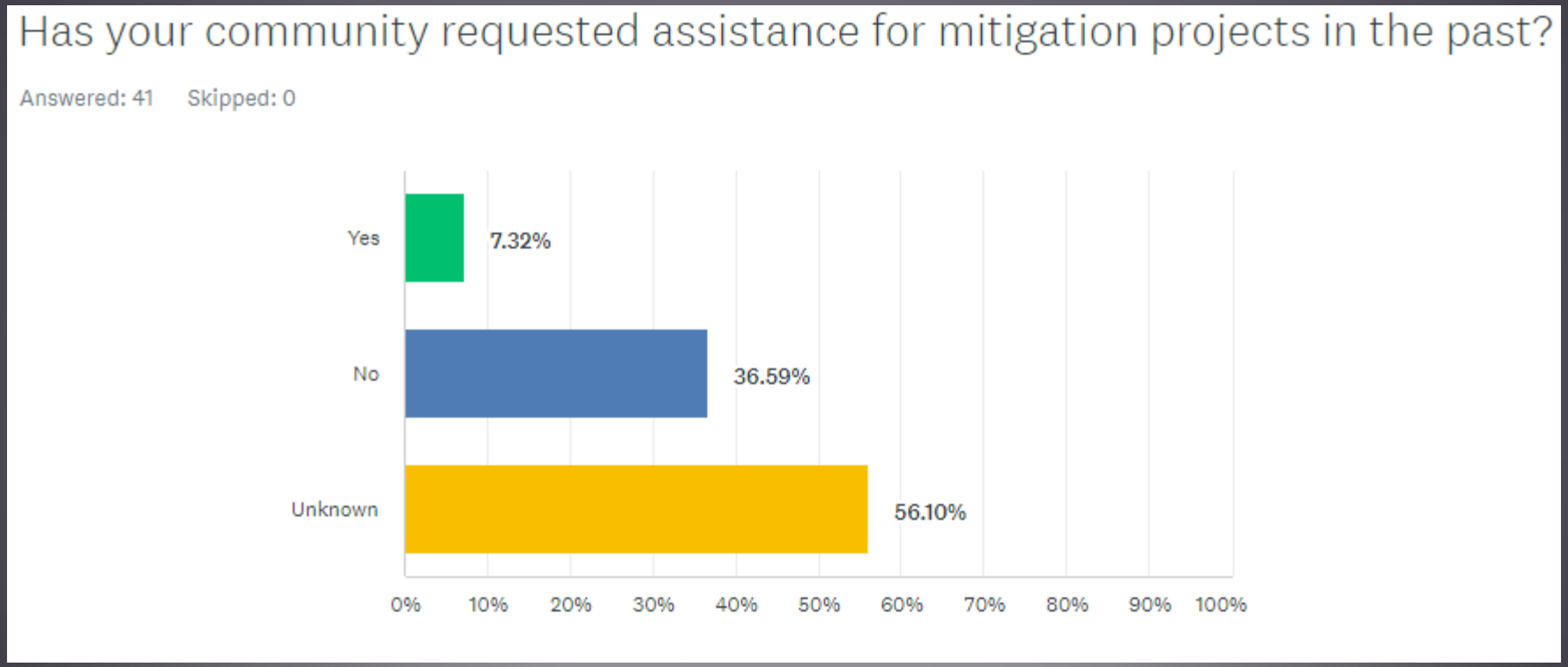


Community Survey Results

Q10 Does your community have concerns about infrastructure (dams, bridges, utilities, etc.) and the potential for a hazardous event in the future? Please describe.

- Bridges – Torch River Bridge, State Street Bridge
  Dams
  Utilities
  Culverts

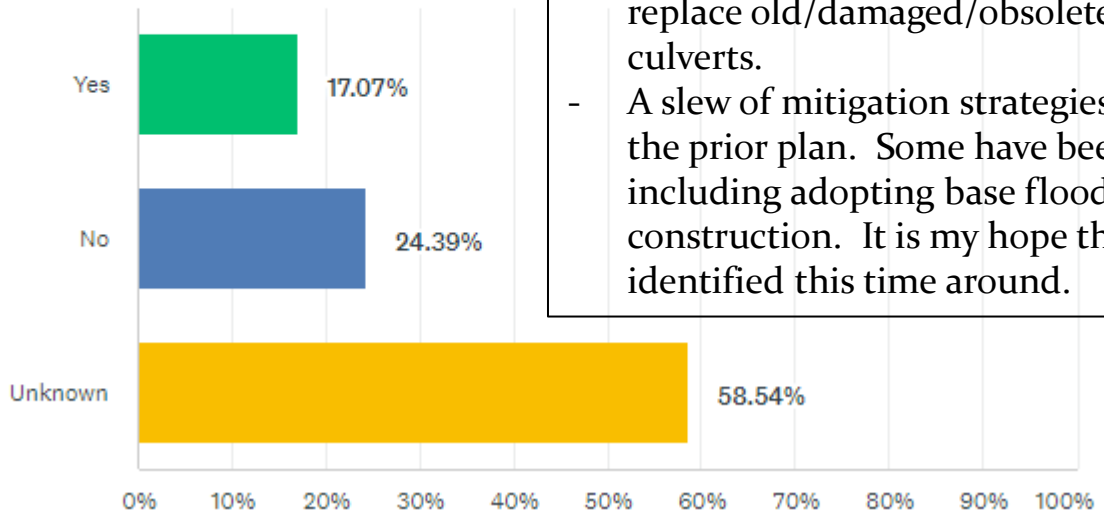
Community Survey Results



Community Survey Results

Has your community considered mitigation strategies for potential or current hazards?

Answered: 41 Skipped: 0



- Funds to replace a culvert under a County road
- Working with partner agencies on grants to replace old/damaged/obsolete/undersized culverts.
- A slew of mitigation strategies were identified in the prior plan. Some have been accomplished – including adopting base flood elevations for new construction. It is my hope that many others will identified this time around.

Community Survey Results

Q15. Is there any additional information you would like us to consider as we update the county's Natural Hazard Mitigation Plan?

- Address two culverts that are failing with Village of Ellsworth officials and ACRC
- Talk to your local firefighters about information, they are your first line of defense, we respond to everything.
- Water quality could be considered. We have a large amount of lakes and a lot of livelihoods and quality of life rely on the continued good quality of the water. A spill, leak, or unattended issues could create water quality issues that could have an affect on the entire chain of lakes (and most of the county).
- Water drainage management
- More information on resources available from the county level to help mitigate a hazardous condition.
- No-never know had one. Will it be on the Antrim County website and alerted via news stores in local papers?
- Forest management.

Presidential and Governor Declared Emergencies/Disasters

- **March 10, 2020: Governor Whitmer declared a State of Emergency** in Michigan to address the COVID-19 pandemic.

- **March 13, 2020:** the **U.S. made a National Emergency Declaration** regarding the COVID-19 virus outbreak. The Federal government began developing a sweeping relief package.

- **March 23, 2020: Governor Whitmer announced an order for all Michigan businesses and operations to temporarily suspend in-person operations** that are not necessary to sustain or protect life, and to stay home unless they are part of the critical infrastructure workforce, engaging in outdoor activities, or performing necessary tasks (e.g. going to the grocery store).

- **March 26, 2020: Governor Whitmer requested a Major Disaster Declaration for the State of Michigan due to the Coronavirus Disease 2019 (COVID-19) pandemic beginning on January 20, 2020, and continuing.** The Governor requested a declaration for Individual Assistance (all programs) statewide; Public Assistance (Categories A-G), including direct Federal assistance, statewide; and Hazard Mitigation statewide. The Governor also requested that the cost-sharing requirement be waived for this disaster.

- **March 27, 2020: President Trump approved Governor Whitmer's request for a Major Disaster Declaration in Michigan**, which allows Michigan to participate in FEMA programming.

Presidential and Governor Declared Emergencies/Disasters

Date of Incident	Type of Incident	Affected Area	Type of Declaration/ Federal ID #	Notes
1/29/2019	Extreme Cold	Statewide	Governor Declared Emergency	
9/4/2005 and 9/7/2005	Hurricane (Katrina) Evacuation	Statewide	Governor Declared Disaster and Presidential Declared Emergency (3225)	Declared due to the emergency conditions in the State of Michigan, resulting from the influx of evacuees from states impacted by Hurricane Katrina beginning on August 29, 2005.
1/26-27/1978	Blizzard, Snowstorm	Statewide	Presidential Declared Emergency (3057); Governor Declared Disaster	
3/2/1977	Drought	44 Counties, including Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Missaukee, Otsego, Roscommon and Wexford.	Presidential Declared Emergency (3035)	

Historic Weather Events (cont'd)

- Extreme Winter Weather Events (events with ice covering, property damage, and/or up to/over 12 in. of snow)

Year	# Severe Winter Storms	Damages
2012	4	$10,000,000 (crop) from a killing frost/freeze in April
2013	2	
2014	4	
2015	2	
2016	3	
2017	0	
2018	2	
2019	6	
2020	1	
2021	0	
Total	**24**	

Historic Weather Events

- Severe Thunderstorms/High Winds (17)

Month	Year	Location	Effect	Damage	Other Event
May	2011	Alden	55 knots/ trees down	$10,000	
May	2011	Mancelona	52 knots/ trees and powerlines down	$18,000	
May	2011	Kewadin	56 knots/ tree limbs down	$500,000	
June	2011	County	50 knots/ trees down	$2,000	
June	2012	County	Lightning destroyed home	$80,000	Lightning
May	2013	Kewadin	55 knots/ trees down	$8,000	
May	2013	Mancelona	50 knots/ trees down	$3,000	
September	2013	Alden to Clam River	52 knots/ trees down/vehicle damage	$21,000	Wind damage and large hail
September	2014	Mancelona	52 knots/trees down	$4,000	Regional T-storms with wind damage
August	2015	Kewadin (considerable wind damage in SW and S. Central parts of Antrim County)	60 knots/hundreds of trees down/damage to vehicles and 40-50 structures/street access difficult/power outages	$600,000	Historic severe weather outbreak. Regional straight-line wind damage; multiple lines of thunderstorms
December	2015	Antrim County	High Wind Event, 50 knots; trees downed, particularly in the eastern portion of the county	$8,000	
September	2016	Chestonia	50 knots/power lines downed; tractor-trailer overturned near M-66 & Bartholomew Rd.	$4,000	Regional strong to severe thunderstorm outbreak
August	2018	Alden to Mancelona	55 knots/trees and power lines downed, particularly in south half of the county.	$28,000	Severe thunderstorm outbreak with wind damage
September	2018	Central Lake to Finkton	52 knots/scattered down trees in northern and western Antrim County.	$18,000	Strong thunderstorm outbreak with wind gusts above 40 mph
July	2019	Alden	52 knots/downed trees	$2,000	Regional strong to severe thunderstorm outbreak
November	2020	Antrim County	50 knots/downed trees/two large trees in Bellaire damaged	$6,000	Regional windstorm, gusts up to 55 mph
April	2021	Kewadin	50 knots/numerous downed trees and power lines	$2,500	Regional strong thunderstorms with shear wind gusts

Historic Weather Events (cont'd)

- Hail (22) *Approximately 60 percent of the cherry crop in northwest lower Michigan was damaged by the very large hail and high winds produced from the severe thunderstorms.

Month	Year	Location	Effect	Damage
July	1979	County	1.00 in.	$0
October	1989	County	0.75 in.	$0
July	1996	Eastport	1.50 in.	$0
June	2000	Mancelona	0.75 in.	$0
May	2001	Kewadin, Eastport	0.75 in.	$0
August	2004	Central Lake	0.88 in.	$0
June	2005	Mancelona	0.88 in.	$0
July	2006	Kewadin	1.0 in.	$30,000 (property/crop)
July	2006	Mancelona	1.25 in.	$0
March	2007	Ellsworth	0.75 in.	$0
October	2007	Mancelona	0.75 in.	$0
October	2007	Alba	1.50 in.	$0
June	2008	Mancelona	0.88 in.	$0
July	2008	Chestonia	0.75 in.	$0
August	2008	County	0.75 in. – 1.50 in.	$0
May	2012	Central Lake	1.0 in.	$0
May	2013	Clam River, Bellaire,Chestonia	0.75 in. – 1.00 in.	$0
September	2013	County	1.0 in.	$0
August	2015	Elk Rapids, Torch Lake	1.0 in.	$0
July	2016	Central Lake	1.0 in. – 3.00 in.	$1,000,000 (crop)* $65,000 (property)
July	2019	Alden	1.0 in.	$0
June	2021	Mancelona Municipal Airport	0.75 in.	$0

Historic Weather Events (cont'd)

- Tornadoes (10)

Month	Year	Location	Effect	Damage
July	1958	County	F1	$3,000
July	1974	County	F3/ 12 miles long, 67yards wide/ 2 injuries	$20,000
July	1977	County	F2	NA
September	1985	County	F1	NA
July	1990	County	F1	NA
August	1995	Elk Rapids	F0	NA
May	1998	Torch Lake	F0	NA
July	2007	Alden	F0/ water spouts/ treesdown/ dock damage	$4,000
August	2017	Kewadin	An EF0 tornado crossed Williams Drive at the south end of Birch Lake, then dissipated over the lake. Maximum wind speed was estimated at 80 mph. Many trees were uprooted, and a few homes were damaged by falling trees. Saturated soils likely contributed to the number of uprooted trees.	$55,000 (property)
August	2018	Alba	An EF0 tornado with estimated maximum winds of 80 mph touched down south of Alba, and followed a discontinuous path to the northeast, lifting just before the Otsego County line. A number of trees were downed.	$80,000 (property)

Historic Weather Events (cont'd)

- Flood/Flash Flood (2)

Month	Year	Location	Effect	Damage	Other Event
July	1999	Elk Rapids	4-6 in. watered covered secondary roads	NA	Flash Flood
August	2021	Alden, Bellaire	Alden highway completely washed out near Comfort Rd. Two vehicles fell into road wash out causing injury to 1 person. Multiple other road sections washed throughout county. Water over M-88 in multiple locations.	$325,000 (property damage in Alden)	Flash Flood

Historic Weather Events (cont'd)

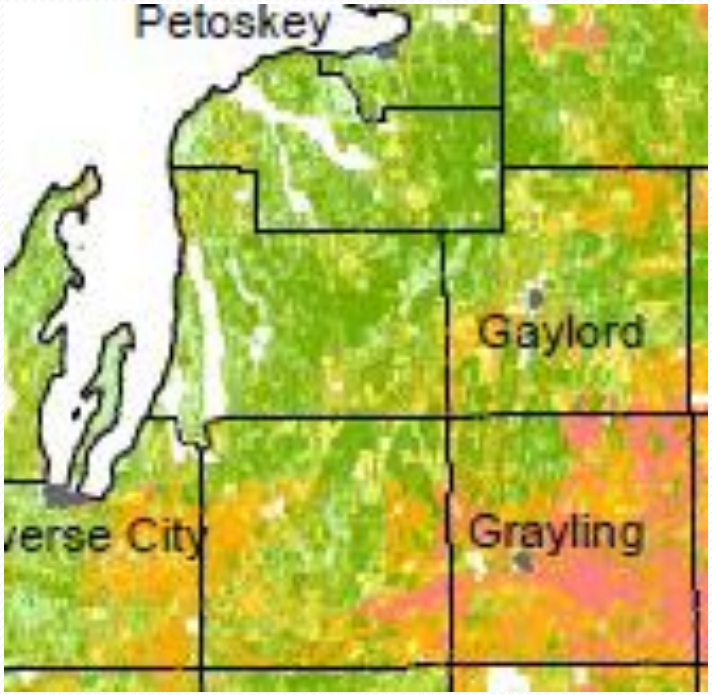
- Extreme Heat (2)
  - **6/30/2018** The month of June closed with one of the hottest days in recent memory. Highs were well into the 90s, including 99 at Alpena, and 98 at Traverse City and Gaylord. The National Weather Service office near Gaylord also hit 98; that was (by several degrees) the warmest reading recorded at that location since observations began there in the late 1990s. Heat indices exceeded 105 degrees across most of northern lower Michigan, and some locations exceed 110. The warmest reported heat index on the day was 114 near Indian River. There were estimated to be between 25 and 30 individuals who visited local hospitals due to heat-related illnesses.
  - **08/01/2001** Excessive Heat was also a problem the first two weeks in August across all of northern Michigan. Temperatures reach the mid to upper 90s, on average, a few days each year; however, for a 5 day (8/5 - 8/9) stretch overnight low temperatures failed to fall below the lower 70s in most areas. This very humid air mass was unusual for northern Michigan, an area which typically sees cool nighttime temperatures and for this reason has very few homes with air conditioners. No heat related deaths or injuries were reported; however, most outdoor events were modified due to the forecasts of hot and humid conditions. County fairs sent animals home, yet still there were livestock losses at fairs in Otsego and Alcona counties. Attendance at county fairs was well below normal and this was attributed to the heat.

Historic Weather Events (cont'd)

- Wildfires
  - 256 wildfires occurred on lands under MDNR jurisdiction within Antrim County from 1981-2018, resulting in about 285 acres burned. (compared to 194 wildfires from 1981-2010)
  - **= average of 7.5 acres burned and 6.7 wildfires per year** on MDNR land in Antrim County.
  - No other wildfires recorded for Antrim County between Jan. 1, 1996 to Apr. 30, 2017

Wildfire Risk

- Higher risk areas:
  - Banks & Torch Lake Twps. (NW)
  - Jordan Twp (N)
  - Mancelona and Star Twps (SE)



Source: Wildfire Risk Map - MDNR Forest Resources Division

Disaster Impacts on Agriculture

Antrim County - Disaster Designation From the US Secretary of Agriculture, Crop Disaster Years 2012-2021		
Event	**# of Incidents 2012-2021**	**Crop Years Affected**
Excessive rain, moisture, humidity	10	2012, 2013 (2), 2014 (2), 2015, 2017, 2018, 2019, 2021
Drought	7	2012- 2016, 2021
Frost, Freeze	7	2012-2016, 2020-2021
Cool/Cold, Below-normal Temperatures	7	2013 (2), 2014 (3), 2015, 2019
Wind, High Winds	5	2012, 2014-2016, 2018
Hail	4	2012, 2015-2016, 2018
Winter Storms, Ice Storms, Snow, Blizzard	3	2012, 2014, 2015
Flood, Flash flooding	2	2012, 2019
Heat, Excessive heat High temp. (incl. low humidity)	2	2012 (2)
Cold, wet weather	2	2013-2014
Lightning	1	2012
Tornadoes	1	2012

Antrim County Dams

Name	Height (ft.)	Storage (acre-feet)	Location	City/Township	Owner	Regulatory Agency	Dam Type	Year Completed	Dam Purpose	Hazard Potential
Bellaire Dam	18	12,180	Intermediate River	Bellaire	Antrim County Board of Public Works	State	Earth, Gravity	1906	Recreation	High
Cedar River Dam	25	475	Cedar River	Bellaire	Village of Bellaire	State	Earth, Gravity	1890	Recreation	High
Elk Rapids Dam	21	75,000	Elk Creek	-	Antrim County	State	Gravity	1916	Hydroelectric	Low

Antrim County Dams –

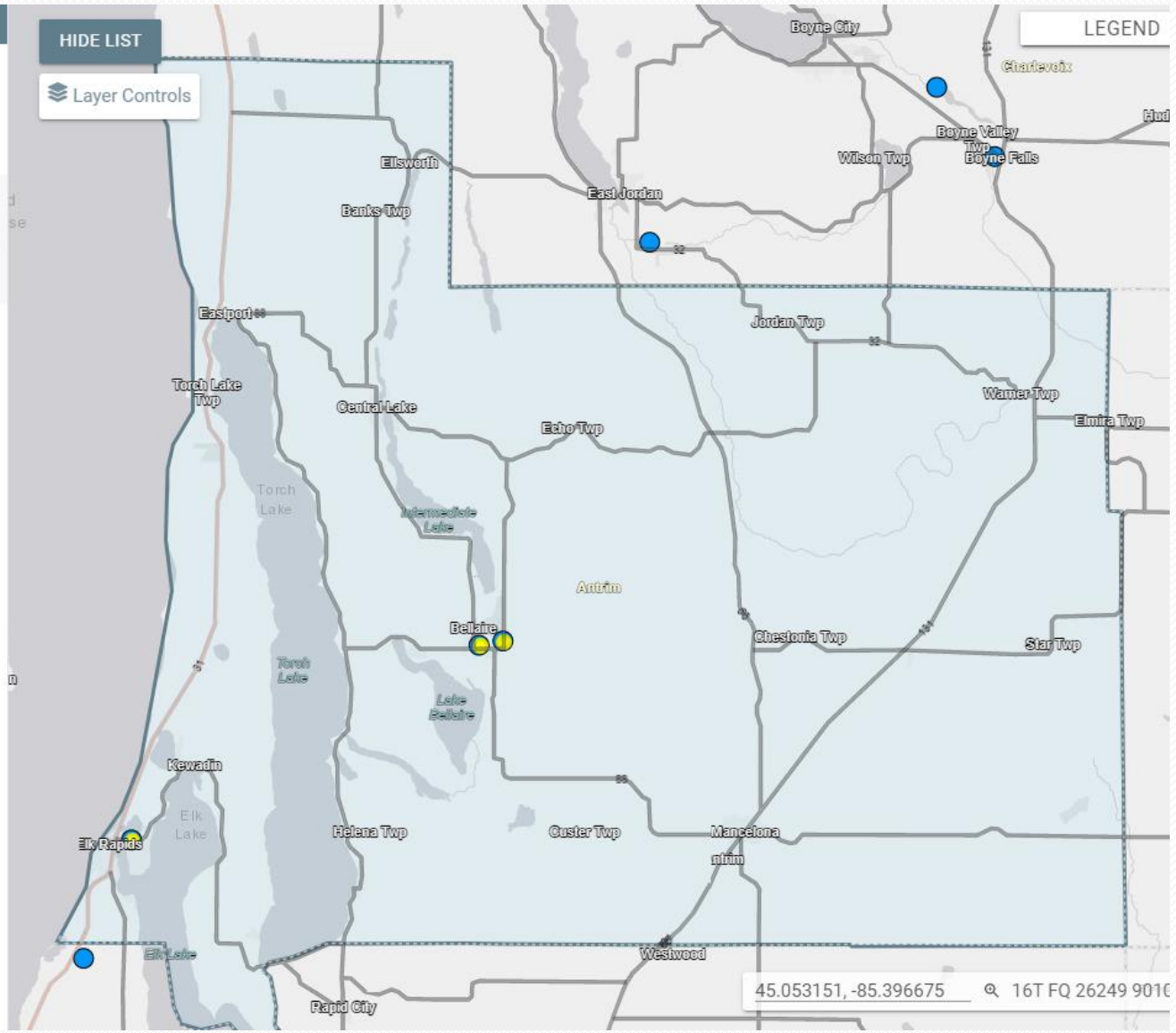
Listed on the National Inventory of Dams

3 Dam(s) Found

Cedar River Dam
Hazard Potential Classification: High
Emergency Action Plan: Yes
Owner Name: Village of Bellaire
Primary Purpose: Recreation

Bellaire Dam
Hazard Potential Classification: High
Emergency Action Plan: Yes
Owner Name: Antrim County Board of Public Works
Primary Purpose: Recreation

Elk Rapids
Hazard Potential Classification: Low
Emergency Action Plan: Not Required
Owner Name: Antrim County
Primary Purpose: Hydroelectric



RIVER RESTORATION
in Northern Michigan

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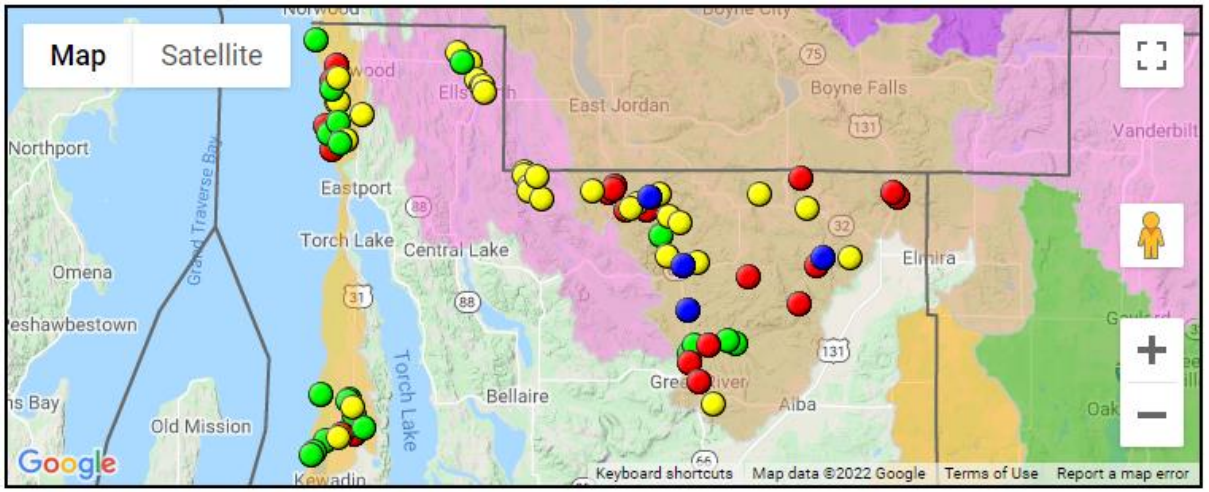
Home>Counties>Antrim>Road Stream Crossings

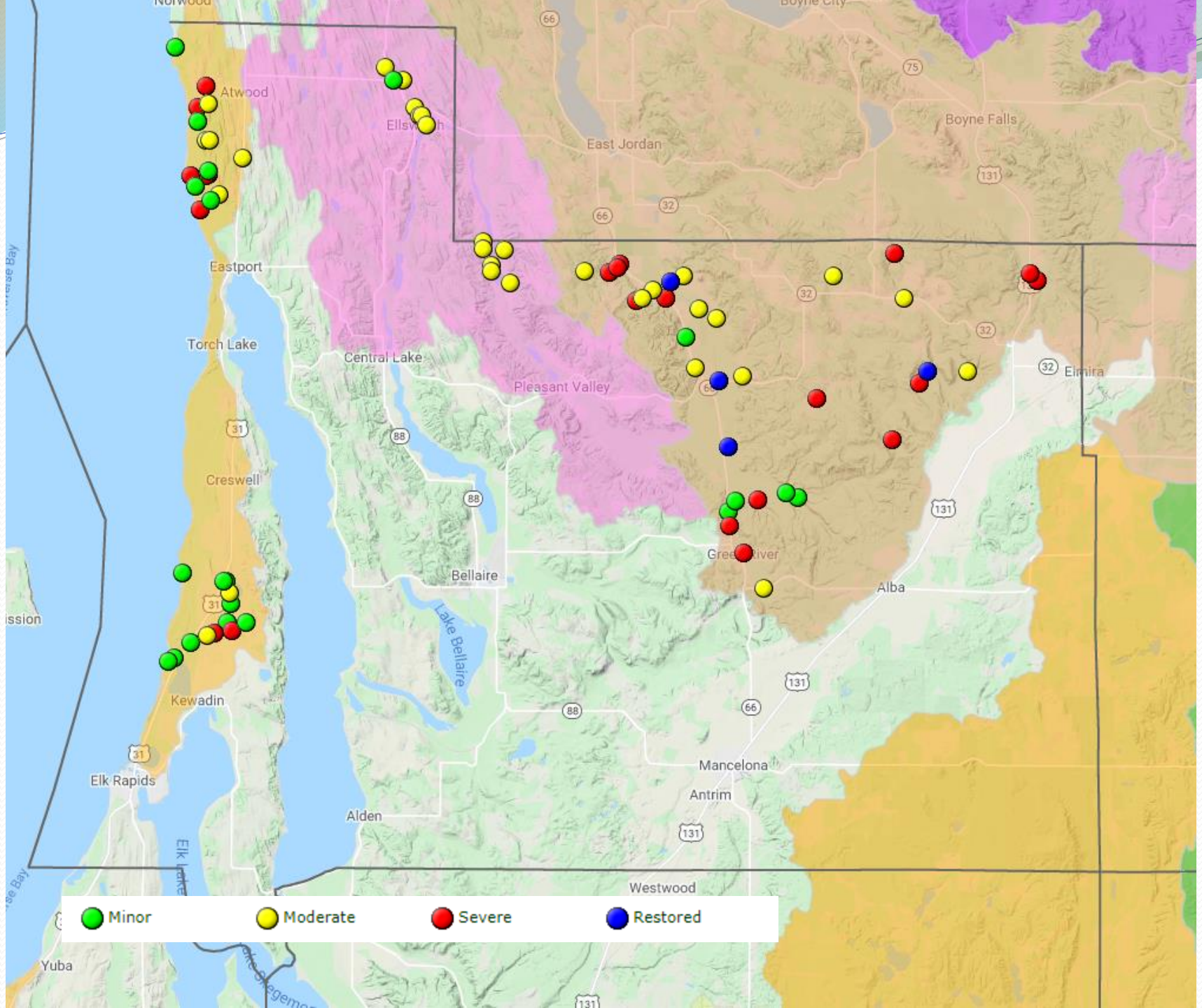
Antrim County Road Stream Crossings

Antrim County
Road Stream Crossings

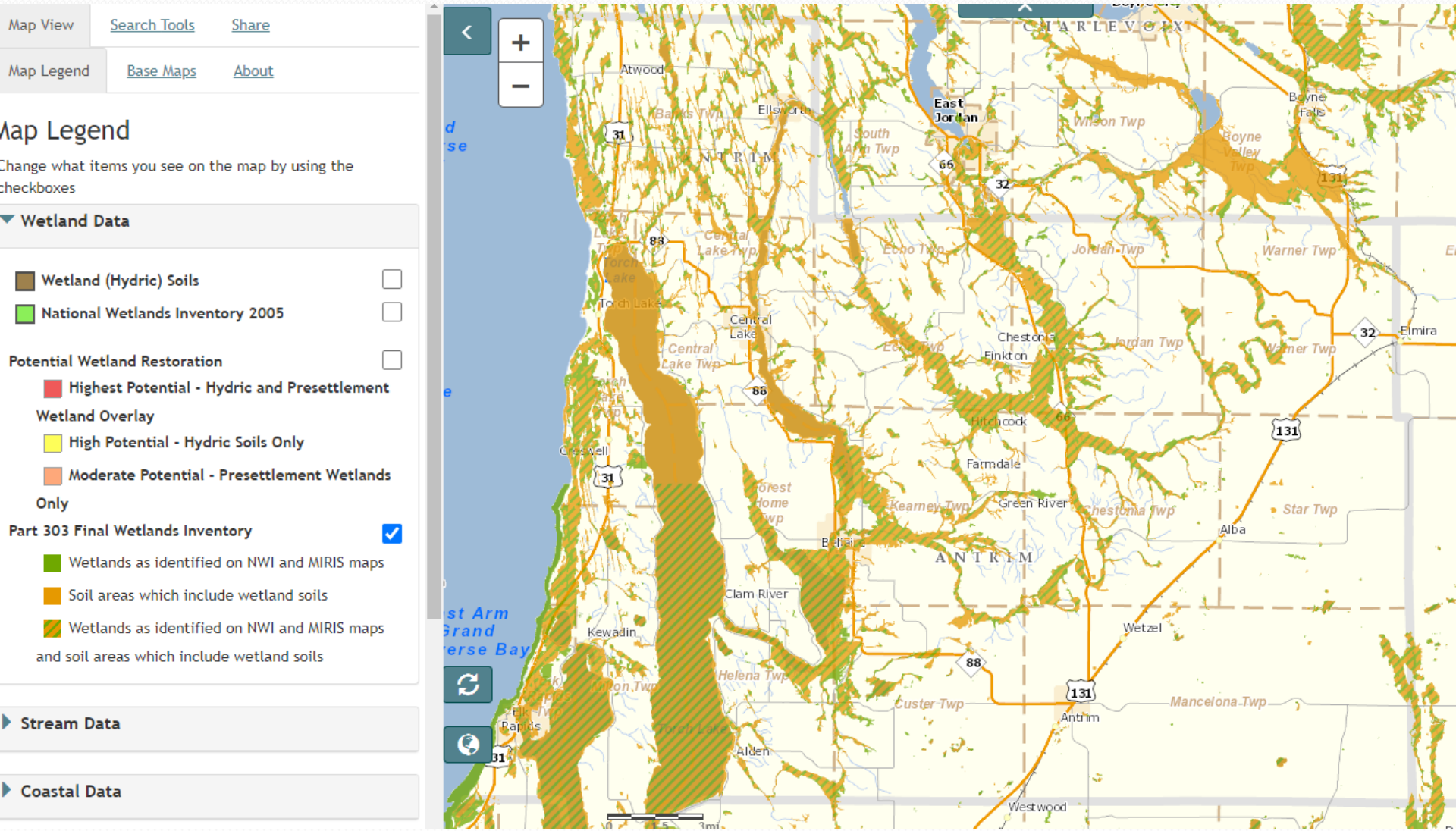


Minor Moderate Severe Restored

- 77 locations listed
- 20 Minor
- 31 Moderate
- 22 Severe
- 4 Restored

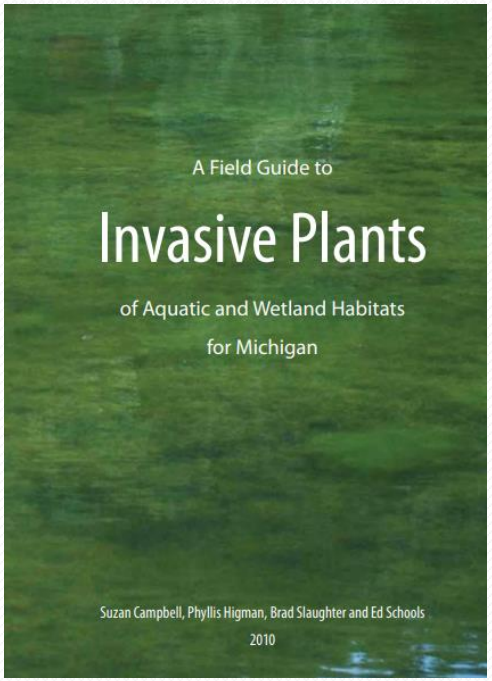

Atwood
Eastport
Torch Lake
Central Lake
Pleasant Valley
Creswell
Bellaire
Lake Bellaire
Kewadin
Elk Rapids
Alden
East Jordan
Boyne Falls
Eimira
Alba
Mancelona
Antrim
Westwood
Yuba
Minor
Moderate
Severe
Restored

County Wetlands



Invasive Species

- Only a small fraction of non-native plants are invasive
- Invasives is a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm
- Lake-moderated climates along Lake Michigan, Lake Erie, Saginaw Bay, Thumb, and Lake St. Clair are milder and have high potential to harbor species typically found to the south.



Invasive Species

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Glossy buckthorn

Frangula alnus Mill. (*Rhamnus frangula* L.)

Description:
Deciduous shrub or multi-stemmed small tree reaching 6 m (20 ft) in height. Shiny, dark green, entire leaves are simple, mostly alternate, oblong, 2.5-6 cm (1-2.4 in) long. Leaf veins curve as they approach leaf margins. Five-petaled, small greenish-white flowers. Abundant pea-sized fruits ripen from red to blackish dark purple. Bark with prominent lenticels.

Habitat:
Fens, open and forested wetlands, woodland edges, roadsides and paths.

Mode of spread:
Widely planted as a hedge; spreads via its bird-dispersed fruits.

Survey:
Recognizable in early spring and late fall as it leafs out before natives; also recognizable in fruit from July through September.

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Purple loosestrife

Lythrum salicaria L.

R

Description:
Herbaceous wetland perennial that grows from 0.5-1.5 m (1.6-5 ft) in height. Lanceolate leaves opposite or in whorls of three, interspersed with leafy bracts. Reddish-purple flowers with five to seven petals are held in dense terminal cluster.

Habitat:
Occurs in moist soils, in wet meadows and prairies, shallow marsh, ditches, waste areas and along lakes, ponds, streams and rivers.

Mode of spread:
Reproduces through prolific seed production; dispersed by water, waterfowl or in soil carried by humans, vehicles.

Survey:
Survey while in bloom from July through September. Native winged loosestrife (*L. alatum*) has single flowers in leaf axils; can be distinguished from other similar natives by its 5-7 petaled flowers.

Invasive Species

MISIN Midwest Invasive Species Information Network

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Zebra mussel (Dreissena polymorpha)

Description: Introduced to the Great Lakes in 1988 through ballast water from a transatlantic freighter. Colonized part of Lake St. Clair and within 10 years spread to all five Great Lakes and the Mississippi, Tennessee, Hudson and Ohio River basins.

Identification: Typically 1 to 2 inches long. Color patterns vary, ranging from striped shells to dark or light shells with no stripes. Flattened underside, making them very stable.

Habitat: Native to the Black and Caspian Seas. Bodies of fresh water, typically attached to an object (pipe, boat, etc.).

ALL ANIMAL PLANT DISEASE

COMMON NAME:	Zebra mussel
SCIENTIFIC NAME:	*Dreissena polymorpha*
FAMILY:	Dreissenidae (Freshwater bivalve)
HABIT:	Mollusks

Local NFIP Status

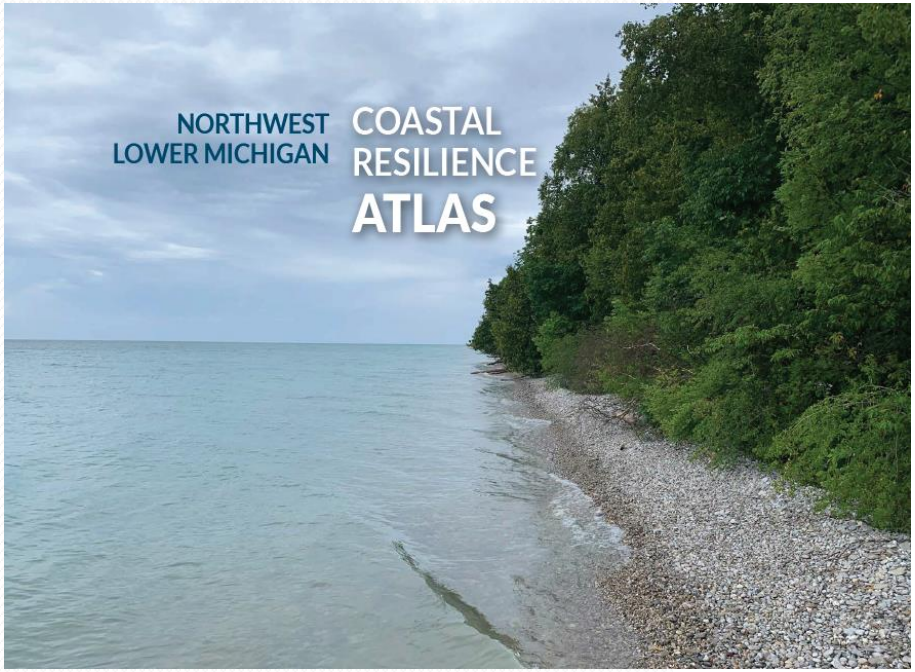
Municipality	NFIP	FIRM	Effective
Banks Township	**Y**	**Y**	**9/1/1988**
Central Lake Township		N	
Chestonia Township		N	
Custer Township		N	
Echo Township		N	
Elk Rapids Township	**Y**	**N**	
Forest Home Township		N	
Helena Township		N	
Jordan Township		N	
Kearney Township		N	
Mancelona Township		N	
Milton Township	**Y**	**Y**	**2/2/1983**
Star Township		N	
Torch Lake Township	**Y**	**Y**	**1/17/1997**
Warner Township		N	
Village of Bellaire		N	
Village of Central Lake		N	
Village of Elk Rapids	**Y**	**Y**	**9/30/1988**
Village of Ellsworth		N	
Village of Mancelona		N	

CRS Participating Communities

- The Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the NFIP
- In CRS communities, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community's efforts that address the three goals of the program:
  - Reduce and avoid flood damage to insurable property
  - Strengthen and support the insurance aspects of the National Flood Insurance Program
  - Foster comprehensive floodplain management

Coastal Flooding / Coastal Recession

- http://www.resilientmichigan.org/nw_atlas.asp



ACKNOWLEDGMENTS

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

NOAA

This Atlas was prepared by the Land Information Access Association (LIAA) in cooperation with the Great Lakes Research Center at Michigan Technological University and the Taubman College of Architecture and Urban Planning at the University of Michigan, July 2019.

LIAA

Michigan Technological University

TAUBMAN COLLEGE architecture + urban planning University of Michigan

Coastal Dynamics

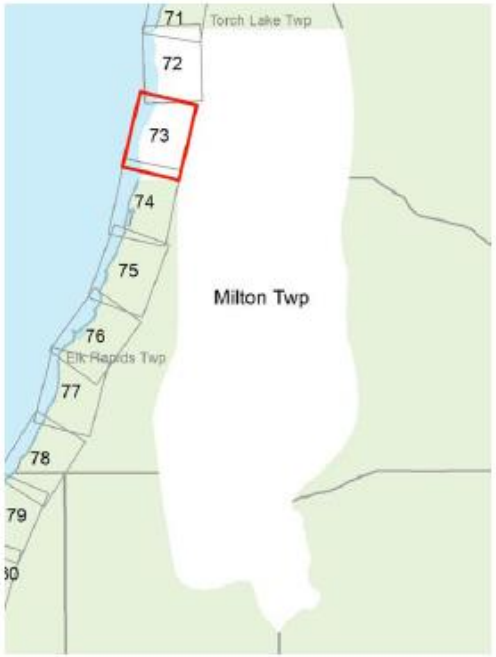
- Changing water levels
- Water Energy and Height
  - Erosion
  - Changing conditions
- Climate change on the Great Lakes
  - Increased precipitation and storminess
  - Variability of lake water levels
  - Water temperature

Coastal Flooding

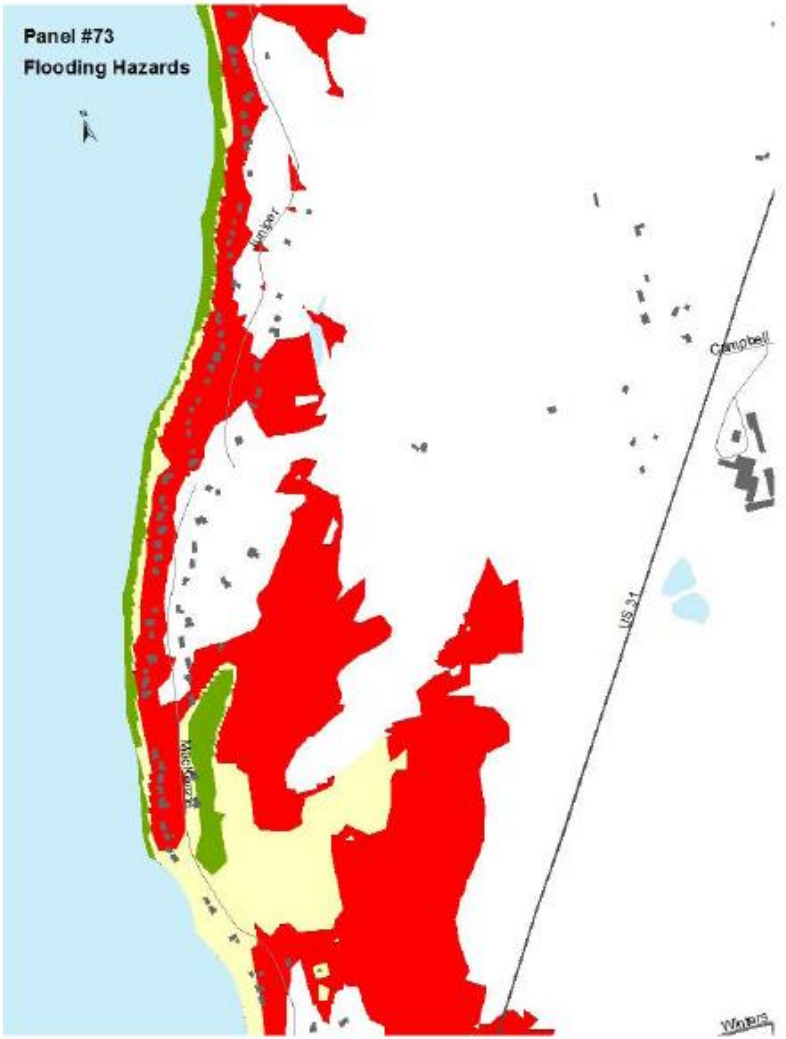
http://www.resilientmichigan.org/nw_atlas.asp

Antrim County

Coastal Flooding



Lucky Flooding Scenario
Expected Flooding Scenario
Perfect Storm Flooding Scenario



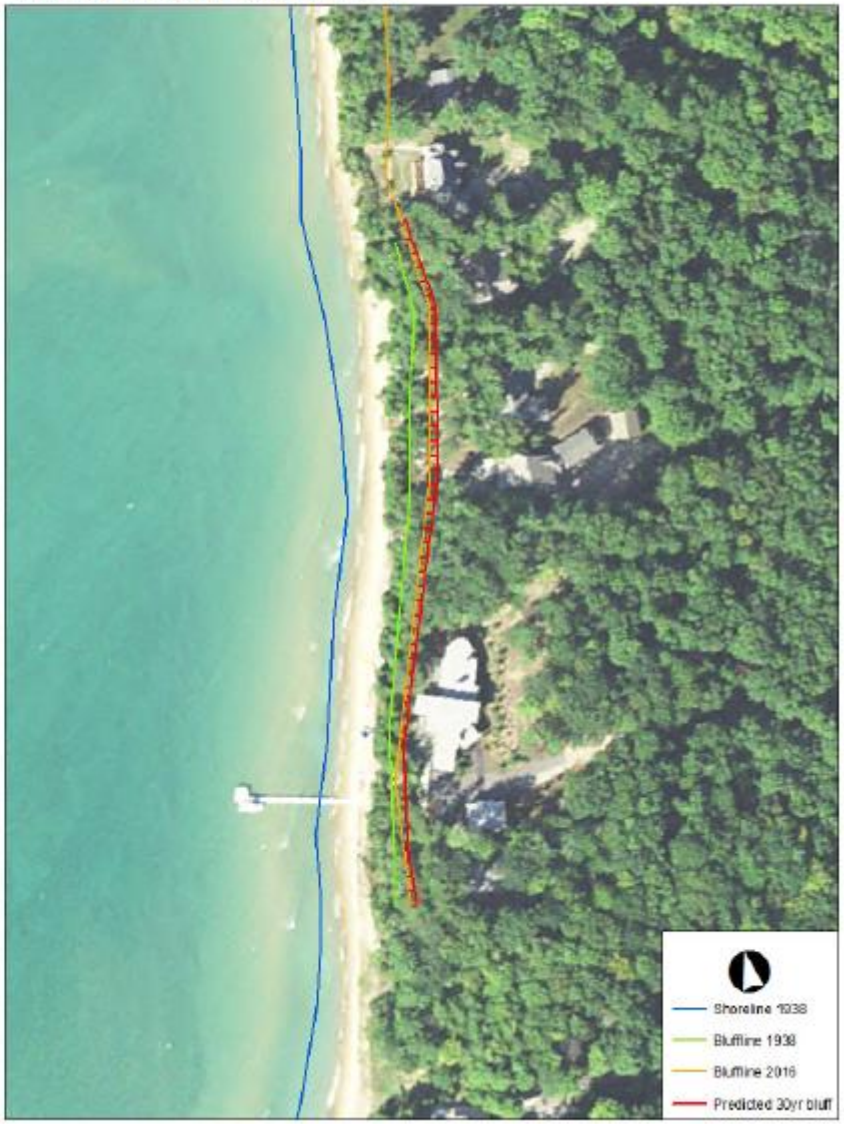
Coastal Recession

http://www.resilientmichigan.org/nw_atlas.asp

BLUFF RECESSION DETAIL

At least one "zoomed in" detail example of historic bluffline recession and future projections is provided at the beginning of each county section of this chapter. Shoreline and bluffline recession data can be viewed in greater detail online at http://geospatialresearch.mtu.edu/czmp.

Bluff Detail, Panel 66, Torch Lake Twp.



Shoreline 1938
Bluffline 1938
Bluffline 2016
Predicted 30 yr bluff

Next Steps

- Hazard mapping
- Review 2016 prioritized hazards
- Prepare hazard analysis
- Next group meeting

Thank you!

- Any questions??