Emmet County Hazard Mitigation Plan Update

January 4, 2023

Networks Northwest

Talent / Business / Community

nwm.org/SeasonalPopulation

SEASONAL POPULATION STUDY FOR NORTHWEST LOWER MICHIGAN

Published October, 2022

Networks Northwest

Talent / Business / Community

Regional Study

Counties

- Antrim
- Benzie
- Charlevoix
- Emmet
- Grand Traverse
- Kalkaska
- Leelanau
- Manistee
- Missaukee
- Wexford

Data Includes

1. Estimate of Permanent Residents
2. Estimate of Part-time Residents (second home owners)
3. Estimate of Overnight Visitors in Accommodations
4. **Estimate of Overnight Visitors in Short Term Rentals**
5. **Estimate of Seasonal Workforce**

Methodology

1. Estimate of Permanent Residents
   - 2020 Decennial Census Data
2. Estimate of Part-time Residents (second home owners)
   - 2020 ACS Estimate Data multiplied by 3.3 occupancy
3. Estimate of Overnight Visitors in Accommodations
   - Online and phone survey; questions include how many rooms, total occupancy, and occupancy rates per month to calculate the number of people staying each month, multiplied by days per month, divided by average length of stay
4. **Estimate of Overnight Visitors in Short Term Rentals**
   - AlltheRooms Data; max number of listings, average listings, available nights, available room nights, nights booked, room nights booked, and occupancy rate for a 12-month period , multiplied by 2 to calculate occupancy, divided by 3.81 room nights (the average length of STR stay in Michigan)
5. **Estimate of Seasonal Workforce**
   - Bureau of Labor and Statistics and Census dataset X-13 ARIMA-SEATS to calculate seasonally adjusted data

Emmet County

Emmet County is the second-most seasonal county in the region, largely driven by an influx of overnight visitors in the months of May – October. In the summer, the permanent population of 34,112 individuals accounts for less than 40% of the total population compared to over 70% in the off-season. Over 17% of the regional accommodation visitors in the month of July stay in Emmet County. The seasonal workforce heavily mirrors the substantial monthly fluctuations in population. In the off-season, the seasonal workforce represents less than 4% of the total labor force, and in the on-season, seasonal workers are upwards of 15% of the total labor force. In the month of July, there are an estimated 2,789 seasonal workers in Emmet County, 18% of the region's seasonal workforce.

Figure 9. Regional Share, Emmet County

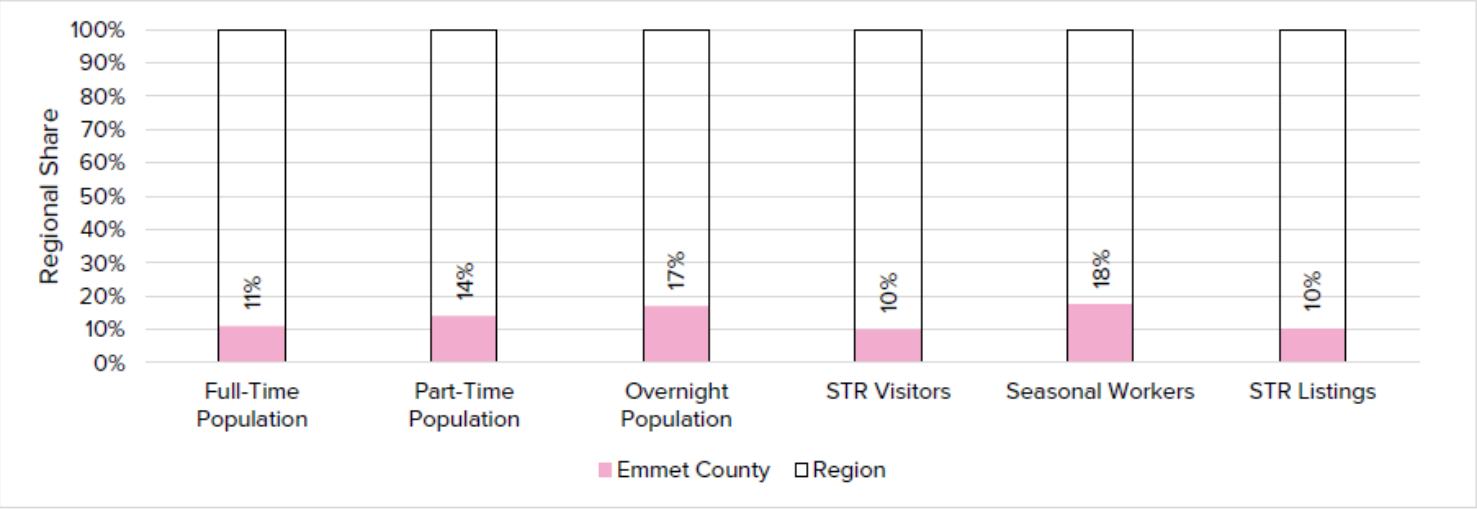

Table D-1. Seasonal Population - Emmet County

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Full-Time Population	34,112	34,112	34,112	34,112	34,112	34,112	34,112	34,112	34,112	34,112	34,112	34,112	34,112
Part-Time Population	1,688	1,688	2,532	2,532	2,532	13,504	13,504	13,504	3,798	3,798	3,798	3,798	5,556
Overnight Population	8,386	7,866	7,786	7,472	38,367	40,136	42,011	41,898	34,779	34,794	6,725	7,715	23,162
Accommodations	5,087	4,608	5,222	5,586	34,538	35,205	36,962	36,785	30,386	30,419	4,467	5,168	19,536
Short-term Rentals	3,299	3,258	2,564	1,887	3,829	4,931	5,049	5,113	4,393	4,376	2,259	2,548	3,625
Total	44,186	43,666	44,430	44,116	75,011	87,752	89,628	89,514	72,690	72,705	44,635	45,625	62,830

Figure 10. Population Breakdown, Emmet County

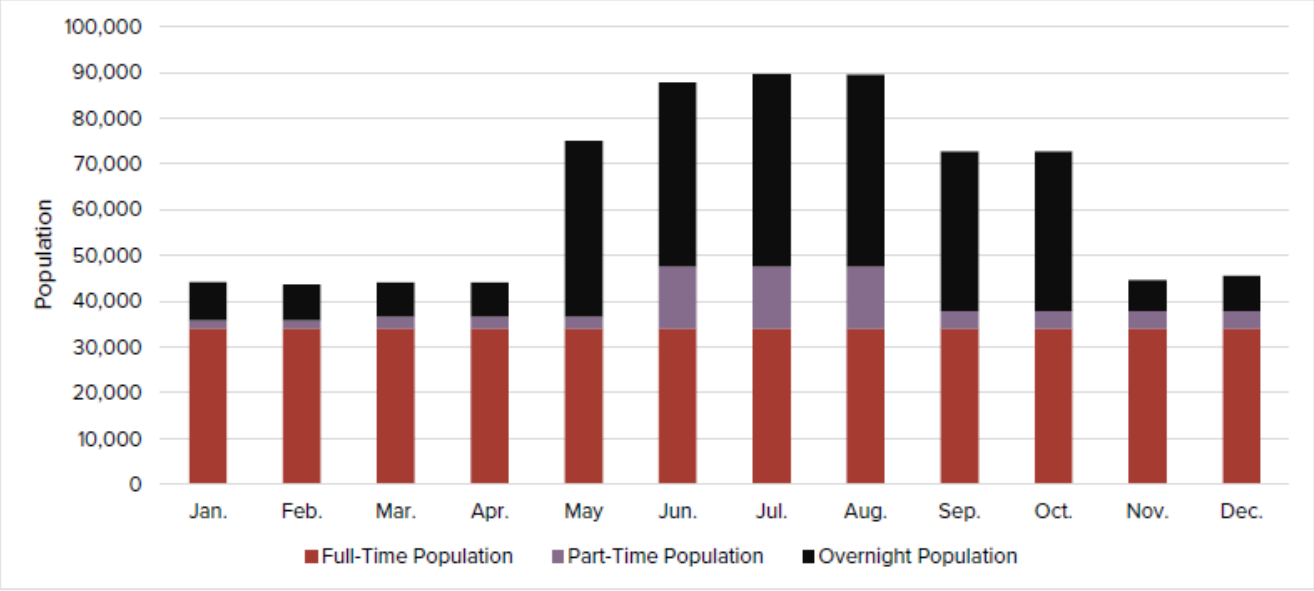

Table D-2. Short-term Rental Details - Emmet County

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Max Listings	438	439	451	467	411	417	435	437	445	445	439	437	438
Average Listings	436	435	444	458	400	411	427	432	440	442	431	423	432
Available Nights	10,981	9,502	10,938	11,363	9,685	9,016	8,586	8,837	9,964	11,102	10,918	10,185	10,090
Available Room Nights	27,187	23,634	28,082	29,519	24,189	21,518	20,245	20,957	24,104	27,466	27,609	25,336	24,987
Nights Booked	2,569	2,532	1,938	1,635	3,167	4,280	4,802	4,699	3,935	3,940	1,897	2,141	3,128
Room Nights Booked	6,285	6,206	4,885	3,594	7,295	9,393	9,619	9,740	8,369	8,336	4,303	4,853	6,907
Occupancy Rate	23.4%	26.6%	17.7%	14.4%	32.7%	47.5%	55.9%	53.2%	39.5%	35.5%	17.4%	21.0%	32.1%

Table D-3. Seasonal Workforce - Emmet County

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Labor Force	15,565	15,728	15,760	15,746	17,164	17,487	17,802	17,466	16,441	15,959	15,604	15,654	16,365
Employed	14,361	14,483	14,729	14,739	16,310	16,430	16,787	16,650	15,748	15,323	14,882	14,741	15,432
Non-Seasonal	14,283	14,384	14,722	14,702	14,971	14,067	13,998	14,008	14,104	14,099	14,282	14,310	14,327
Seasonal	78	99	7	37	1,339	2,363	2,789	2,642	1,644	1,224	600	431	1,104
Percent of Labor Force Seasonal	0.5%	0.6%	0.0%	0.2%	7.8%	13.5%	15.7%	15.1%	10.0%	7.7%	3.8%	2.8%	6.5%

Welcome

- Thank you for joining us!
- We will be discussing the following:
  - Purpose
  - Historic Hazard Events
  - Hazard Identification Resources

Purpose

Hazard Mitigation Planning

“The effort to reduce loss of life and property by lessening the impact of disasters”

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Billion-Dollar Disasters Shattered U.S. Record in 2020

The 22 events that each caused at least $1 billion in damage show the increasing costs of climate change

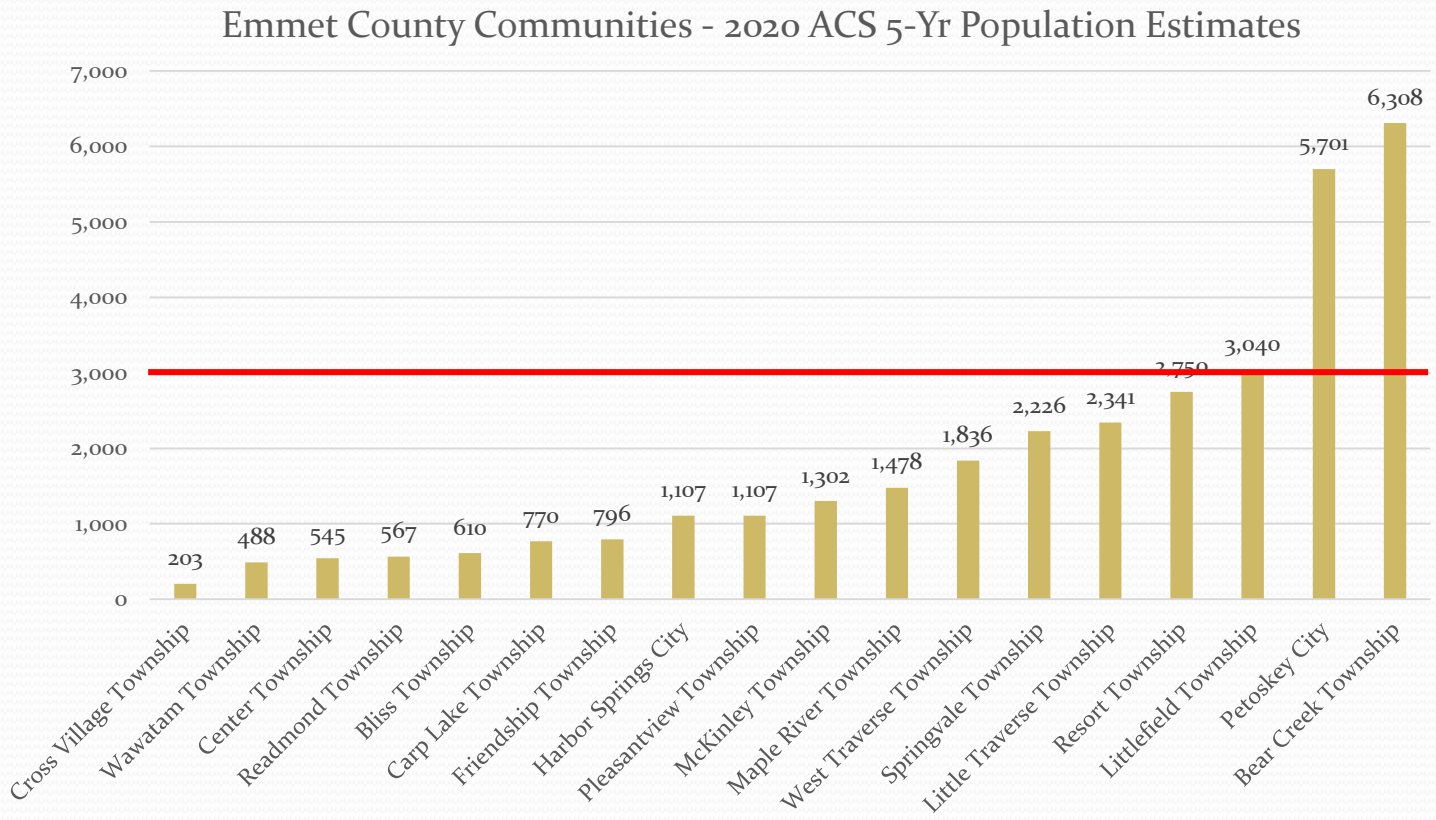
By Thomas Frank, E&E News on January 11, 2021

An aerial view of flood waters from Hurricane Delta surrounding structures destroyed by Hurricane Laura on October 10, 2020 in Creole, Louisiana. Credit: Mario Tama *Getty Images*

2020 FEMA Grant Awards

Building Resilient Infrastructure & Communities (BRIC) Funding Program

- $600 million available for each state for FY 2020
- Awards for "economically disadvantaged rural communities" with 3,000 or fewer individuals with a per capita income < 80% of the national per capita income



2020 FEMA Grant Awards

Building Resilient Infrastructure & Communities (BRIC) Funding Program

- Income not to exceed 80% of the national per capita income
- In 2020, US per capita income was $35,384.
  80% = $28,307.2
- Emmet County communities meeting this criteria:
  - Townships of McKinley, Maple River, Bliss, Wawatam and Center
- 77% of small impoverished applications were awarded nationally

2020 FEMA Grant Awards

Building Resilient Infrastructure and Communities (BRIC) Funding Program

- Awards for Capability and Capacity Building
  - Building code activities to support efforts in increasing community resiliency
  - 12 of 22 competitive projects were flood control project
  - 18 of 22 included nature-based solutions into the mitigation project

Potential *Natural* Hazard Events

- Extreme Winter Weather (*ice, frost/freeze, heavy snowfall, lake effect snow, blizzard, winter storm)*
- Severe thunderstorms *(lightning, hail, wind intense rainfall)*
- High Winds/Straight-line winds
- Tornado/Waterspout
- Dense Fog
- Flooding (*Riverine and Urban*)
- Shoreline Hazards (*flooding, erosion, rip current, seiche*)
- Extreme temperatures *(heat/cold)*
- Drought
- Wildfire
- Invasive species & plant/animal diseases *(can cause damage to forests, crops, native species, water quality, recreation resources etc.)*
- Subsidence *(i.e., sinkholes)*
- Earthquakes
- Space Weather *(solar-geomagnetic storm, solar flare)*
- Meteorites and other Impacting Objects from Space

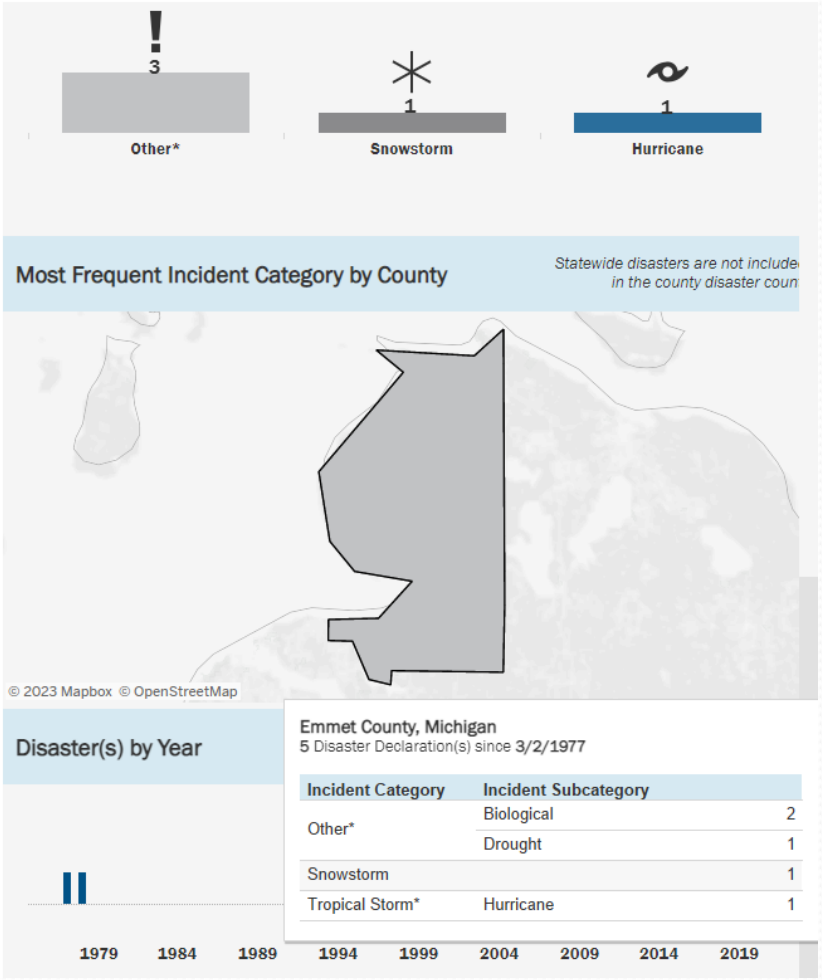
Potential *Technological* Hazards

- Energy Failure *(electric, natural gas, petroleum)*
- Communications Failure
- Road/Bridge Failure
- Sanitary Storm Sewer Failure
- Dam Failure
- Structural Fire
- Scrap Tire Fire
- Transportation Accidents
  - Hazardous materials release
  - Air, land or marine vehicle crash
- Oil and Gas Well or Pipeline accident
- Hazardous Materials Release from a fixed site/business

Potential *Human-Related* Hazards

- Public Health Emergency *(epidemic, water contamination)*
- Terrorism & Similar Criminal Incidents *(biological/nuclear/chemical weapons, active shooter)*
- Civil Disturbance *(protests, riots, insurrection)*
- Cyber-Security Attack

Historic Federal and Governor Declared Emergencies/Disasters



FEMA's Records of Disaster Declarations for States and Counties: https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

Presidential and Governor Declared Emergencies/Disasters

Date of Incident	Type of Incident	Affected Area	Type of Declaration/Federal ID #	Notes
March 2020	COVID-19; COVID-19 Pandemic	Statewide & National	State of Emergency, National Emergency (3455), and Governor and Presidential Declared Major Disaster (4494)	
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.
2/3/2014	Deep Frost	Emmet County and Cheboygan, Chippewa, Delta, Charlevoix, Gogebic, Luce, Mackinac & Marquette Counties.	Governor Declared Emergency	
12/29/2001	Heavy Snow	Emmet County	Governor Declared Emergency	
1/26-27/1978	Blizzard, Snowstorm	Statewide	Presidential Declared Emergency (3057); Governor Declared Disaster	
3/2/1977	Drought	44 Counties, including Emmet.	Presidential Declared Emergency (3035)	

Historic Events

- 209 days with an event were reported between 01/01/1950 and 09/30/2022 (26,571 days), according to NOAA's National Centers for Environmental Information database.

* Presidential and/or Governor Declared Emergencies/Disasters

** Great Lakes Current Incident Database https://www.michiganseagrant.org/dcd/dcdsearch.php

Type of Event	# of Events	Event Location	Year Event Recorded
Wildfire	377	MDNR Lands	1981-2018
Extreme Winter Weather	124	Statewide; Region	1978*, 1996-2022, 2001*, 2014*
Thunderstorm/Wind; High/Strong Wind	73	County and Region	1967-2021; 1 injury in 2001
Hail	18	Countywide	1983-2019
Extreme Temperatures (Heat / Cold)	6	Region; Statewide	2001, 2007, 2015 (2), 2018, 2019*
Shoreline Hazards	6	Lake MI Coast - County/Region	1999 (waterspouts on LTB); 2005 & 2010 (rip current rescues at Petoskey State Beach**); 2012 (1 rip current death at Good Hart); 2020 (2 lakeshore floods; LTW washout due to coastal erosion)
Tornadoes	5	Countywide; F0 to F1	1953, 1955, 1957, 1987, 1996
Drought	3	Countywide and Region	1977*, 2007(2)
Flash Flood	2	Countywide and Region; Good Hart & Oden	2011, 2020
Lightning	1	Petoskey	2011
Public Health Emergency	1	Statewide/National	2020* (COVID-19 Pandemic)

124 Extreme Winter Weather Events

* Presidential and Governor Declared Emergencies/Disasters

Event Type	Total Events	Property Damage	Crop Damage	Event Years
Winter Weather	1	-	-	2006
Winter Storm	49	$4,000 (March 2007)	-	1996-2022
Heavy Snow	50	$200,000 (March 2012)	-	1996-2018, 2001*
Ice Storm	4	-	-	1997, 2001, 2005, 2008
Lake-Effect Snow	12	-	-	2007-2016
Blizzard	6	-	-	1978*, 1997, 1998, 1999, 2002, 2019
Frost/Freeze	2	-	$5,000,000	April 2012, Feb 2014*
TOTAL	**124**	**$204,000**	**$5,000,000**	-

Extreme Winter Weather Events

- **March 1, 2007 Winter Storm Event Narrative**

A strong low pressure system approached the region from the southwest. Associated precipitation spread northward into the region on the 1st. Eastern Upper Michigan stayed all snow, mixed with sleet and freezing rain at times in far Northern Lower Michigan, and turned over to all freezing rain further south. Precipitation was turning showery during this transition time, so significant accumulations of ice were localized. Strong easterly winds were enhanced by showery precipitation, with some gusts in excess of 50 mph. Downed power lines were also common, thanks to the winds and the heavy, wet snow which clung to lines. Substantial blowing and drifting snow occurred where precipitation stayed all snow. A number of school districts closed early on the 1st, and stayed closed through the 2nd. ***$4,000 in property damage was reported to NOAA for Emmet County.***

- **March 2-3, 2012 Heavy Snow Event Narrative**

Low pressure tracked from Missouri, to southern Lower Michigan, and on to eastern Canada, while rapidly strengthening. Precipitation surged northward into the region on the evening of the 2nd. This was primarily snow, except in parts of east central Lower Michigan (especially near Lake Huron), where temperatures were mild enough for rain. Snow wound down on the morning of the 3rd, and though somewhat blustery winds occurred behind the system on the 3rd, blowing snow was limited because the snowfall was so wet. Snow totals ranged from 6 to 14 inches across most of Northern Michigan. Higher amounts fell near and west of Grand Traverse Bay, with a maximum amount of 20 inches near Lake Ann. With relatively warm temperatures, the snow was very wet; Traverse City saw around a foot of snow during the night, with a low temperature of 33 degrees. The snow stuck to everything, with the weight of the snow downing many, many trees and power lines. Power outages were widespread, with an outright majority of Northern Michigan residents losing power at some time during or after the storm. In Benzie County, 95 percent of residents lost power. Outages lasted up to a week in some spots. Great Lakes Energy described it as the worst snowstorm (in regards to power outages) in 30 years. A number of counties and communities opened shelters to aid those without power or heat. ***$200,000 in property damages were reported to NOAA for Emmet County.***

- **April 27, 2012 Frost/Freeze Event Narrative**

A killing freeze caused extreme damage to agriculture, particularly in the fruit belt of Northwest Lower Michigan. Traverse City saw low temperatures of 25 degrees on the 27th, 31 degrees on the 28th, and 26 degrees on the 29th. These values were not exceptionally colder than normal lows, which are in the middle 30s. Ultimately, the main culprit was a stretch of unprecedented warmth in mid-March, which included five consecutive 80-degree days (17th-21st). This caused fruit trees to bud out far, far ahead of schedule, and left them vulnerable to even relatively normal weather as the spring progressed. The tart cherry crop was a total loss, while other orchard fruits such as sweet cherries, apples, pears, and peaches saw losses in excess of 90% of the expected crop. Total losses were estimated at $132.8 million, with ***Emmet County accounting for $5 million of that loss.***

- **Thunderstorm Wind/High Wind Events (73)**

Event Type	Number of Events	Property Damage	Crop Damage	Event Year(s)
Thunderstorm Wind	57	$ 379,000	$ -	1967-2021
High Wind/Strong Wind	16	$ 244,000	$ -	1998-2021
TOTAL	**73**	**$623,000**	**$ -**	

- **Lightning Events** (1) 2011 – Lightning struck a home, in Petoskey igniting a small roof fire that was brought under control within an hour. $4,000 in property damage. No reported deaths or injuries.

- **Tornado events (5)** 1953, 1955, 1957, 1987, 1996 - No deaths or injuries; $52,500 in property damages.

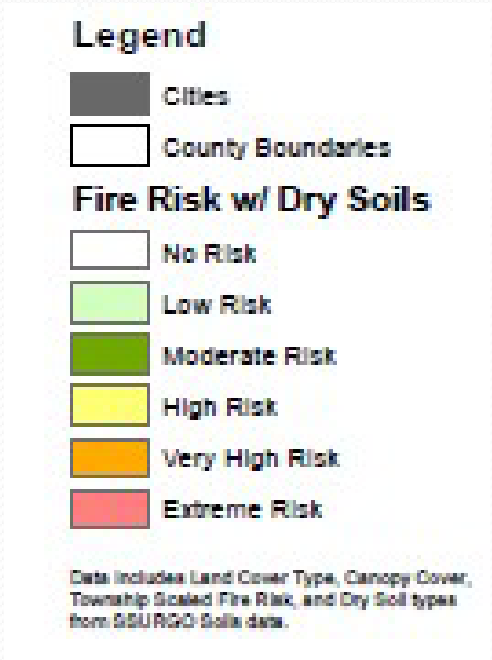
- **18 Hail events** (1983-2019), no deaths or injuries
- $100,000 in property damages during 6/24/1998 event in Petoskey, with the largest hail diameter on record at 2.5”

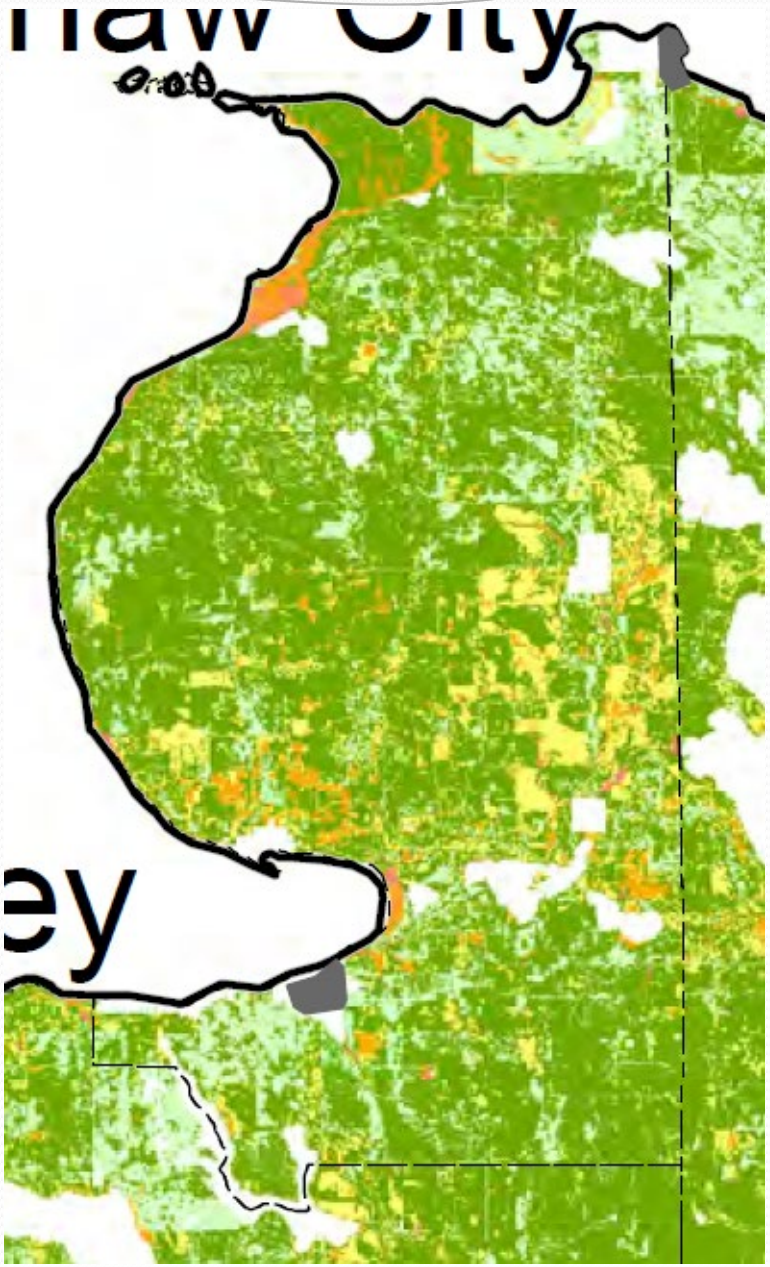
Appearance	Approximate Size in Inches
Pea	0.25-0.5 inch
Penny	0.75 inch
Nickel	0.88 inch
Quarter	1.00 inch
Walnut/Ping Pong	1.50 inch
Golf Ball	1.75 inch
Hen Egg	2.00 inch
Tennis Ball	2.50 inch
Baseball	2.75 inch
Tea Cup	3.00 inch
Grapefruit	4.00 inch
Softball	4.50 inch

BEGIN_LOCATION	BEGIN_DATE	MAGNITUDE
	7/31/1983	1
	7/31/1983	1
PELLSTON	8/14/1996	0.75
BAYSHORE	6/24/1998	1.5
PETOSKEY	6/24/1998	2.5
PETOSKEY	6/24/1998	1.25
PETOSKEY	8/23/1998	1
PELLSTON	7/13/2000	0.75
PETOSKEY	4/18/2002	0.75
PETOSKEY	6/27/2005	0.75
CONWAY	6/27/2005	0.88
CROSS VLG	10/14/2005	1
ALANSON	7/30/2006	0.75
BRUTUS	6/22/2008	0.75
BAY VIEW	6/9/2010	0.75
BAY VIEW	6/8/2011	0.75
(PLN)EMMET CO APT PE	9/21/2012	0.88
LEVERING	9/30/2019	1

Wildfire

- **377 fires on MDNR land**, 649.6 acres burned (1981-2018)
- Equates to an average of **9.9 wildfires and 17.1 acres burned on MDNR land per year**
- High fire risk corresponds with certain vegetation types (pine, dune grass, etc.)

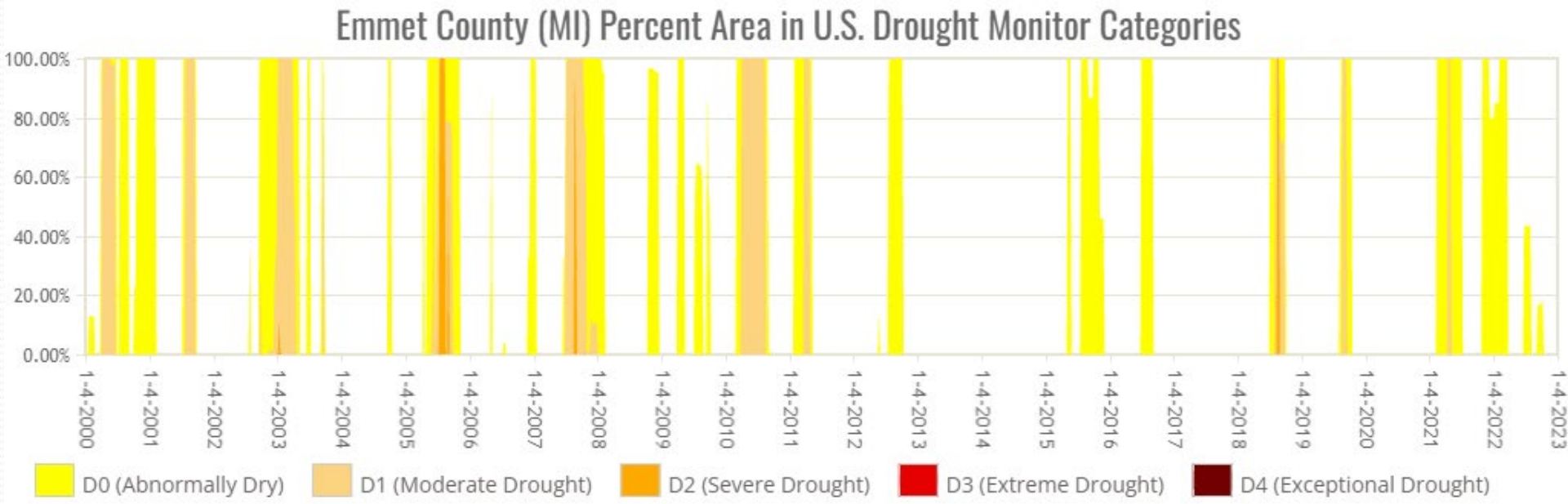




Drought

- **1977 (Presidential Emergency)** The 1976-77 drought in the Great Plains, Upper Midwest, and West of the United States also severely impacted Northern Michigan. At a statewide level, the drought lasted for 11 consecutive months, from September 1976 to July 1977, and reached a low point in January 1977, with a Palmer Index value of -5.29 (within the D4 exceptional drought classification).
- **08/28/2007** Drought conditions (severe, D2) expanded into the tip of Northern Michigan by the end of August. The was the result of a dry summer in the region. The dryness dated as far back as May, when only 1.09 inches of rain fell in Pellston. June rainfall was 1.92 inches. July rainfall was near normal and brought some respite, but August saw just 1.21 inches of rain at Pellston. A ban on burning was issued for most of the state in mid-August, the first such ban since 1998. Golf courses and farmers complained of very high utility bills, due to the need for near-constant irrigation. Corn and bean crops were severely impacted. Rains in September would partially alleviate drought conditions for a spell.
- **9/1/2007** Drought conditions (severe, or D2) carried over from August in Eastern Upper Michigan and far Northern Lower Michigan. Several rain events eased the drought by mid-month. The area received half an inch to an inch of rain on September 3-4, again on the 7th, and again on the 11th.

Drought Risk



Michigan

Category	Historically observed impacts
D0	Grass fires increase
	Lawns are brown; landscape and gardens are watered more frequently
D1	Most crops and vegetation are stressed; farmed Christmas trees are stressed
	Well levels decline
D2	Corn and soybean yields are low
	Mature trees are stressed
	Streamflow is extremely low, potentially too low to irrigate

Source: U.S. Drought Monitor https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx

Extreme Temperatures

- **2 Extreme Heat Events**

  - **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.

Extreme Temperatures

- **4 Extreme Cold Events**
  - **2/4/2007** Exceptionally cold air surged into Northern Michigan. High temperatures on the 4th (Super Bowl Sunday) were around zero, with low temperatures that night from five to ten below zero. Gusty northwest winds produced hazardous wind chills of 20 to 30 below zero, along with blowing and drifting snow. Many area schools closed on the 5th, due to the extreme cold and poor road conditions.
  - **2/14/2015** A clipper system passing just north and east of Michigan would bring a multitude of weather hazards. Widespread light snow occurred ahead of the system's cold front, but that snow was enhanced by Lake Michigan into northwest lower Michigan. Snowfall totals of 6 to 8 inches were seen, especially west and southwest of Traverse City, with the highest amounts near Wellston. The coldest air of the winter so far surged in behind the cold front, along with gusty northwest winds and lake effect snow. Considerable snowfall, blowing and drifting snow, and low wind chills were realized in northwest lower Michigan. Across the rest of northern Michigan, away from the temperature-mitigating effects of Lake Michigan, wind chills reached warning criteria. Wind chills reached 30 to 40 below zero in northern lower Michigan, and 40 to 50 below zero in eastern upper, bottoming out at -49 in Dafter early in the morning of the 15th.
  - **2/19/2015** The second blast of extremely cold air into northern Michigan in about a week. This event featured colder air (including the coldest high temperature ever recorded in Gaylord), but not quite as much wind, as the event a week previous. As a result, wind chills were not quite as drastically cold. Still, wind chills reached 30 to 40 below zero across part of northern Michigan, bottoming out at -43 near Cadillac early in the morning on the 19th.
  - **1/28/2019** Governor Whitmer issued a statewide Declaration of Emergency due to a winter storm impacting much of the Lower Peninsula and statewide temperatures forecast to hover around 0 degrees with wind chills at 50 below or colder in some areas over several days.

- 2 Flash Flood events

Date	Location	Property Damage	Episode Narrative	Event Narrative
6/21/2011	GOOD HART	$18,000	A culvert was washed out along Levering Road (C-66) a few miles east of Cross Village. Substantial soil erosion occurred in the yards of some homes. The co-operative observer, one mile east of Cross Village, measured 4.79 inches of rain in 12 hours, most of which fell in a four hour period either side of midnight.	Bands of training thunderstorms affected parts of Northwest and North Central Lower Michigan. Locally very heavy rain occurred in a few spots, including between Manistee and Cadillac. The only flooding occurred in the Cross Village area of Emmet County.
7/18/2020	MENONAQUA BEACH (Start); ALANSON (End)	$98,000	Thunderstorms moved repeatedly over the same area on the afternoon of the 18th. Rainfall amounts of 2 to 4 inches were estimated to fall from just northeast of Petoskey, on toward Indian River. Measured rainfall amounts by the next morning were as high as 5.25 inches near Afton, though this occurred over multiple rounds of thunderstorms, not just this late afternoon batch. Flash flooding was reported in the community of Oden in Emmet County, where knee-high water flooded homes along Pingree Avenue, on the east side of town.	Thunderstorm activity earlier in the day laid down an outflow boundary across far northern lower Michigan. Severe thunderstorms reignited along that boundary by mid afternoon. Damaging winds and excessive rainfall were the primary hazards.

Emmet County Dams (7)

Listed on the National Inventory of Dams

7 Dam(s) Found

Windward Dam
Hazard Potential Classification: Significant
Emergency Action Plan: Not Required
Owner Name: Windward Development Company
Primary Purpose: Recreation

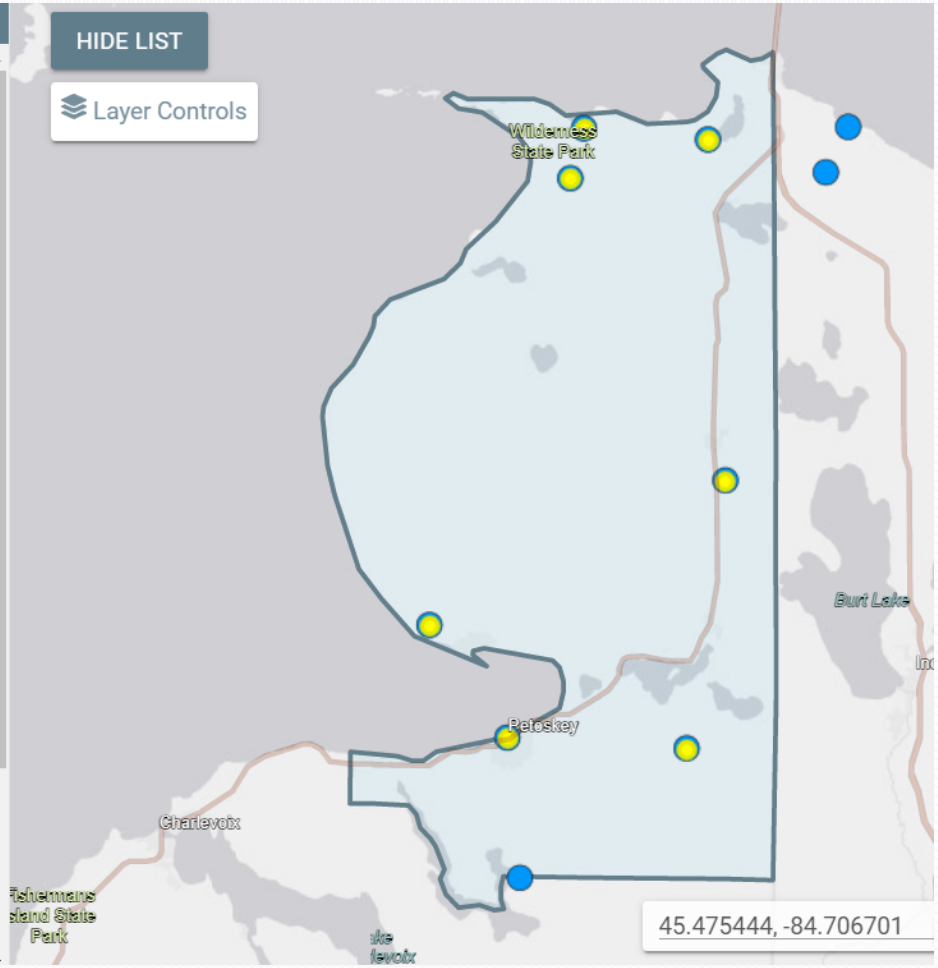
Starks Mill Dam
Hazard Potential Classification: Low
Emergency Action Plan: Not Required
Owner Name: George Stark
Primary Purpose: Other

Maple River Dam
Hazard Potential Classification: Low
Emergency Action Plan: Yes
Owner Name: Blue Maple Real Estate Company
Primary Purpose: Recreation

Lake Street Dam and Flume
Hazard Potential Classification: Low
Emergency Action Plan: Not Required
Owner Name: City of Petoskey
Primary Purpose: Recreation

O'Neal Lake Dam
Hazard Potential Classification: Low
Emergency Action Plan: Not Required
Owner Name: MDNR Parks & Recreation
Primary Purpose: Recreation

French Farm Lake Dam
Hazard Potential Classification: Low



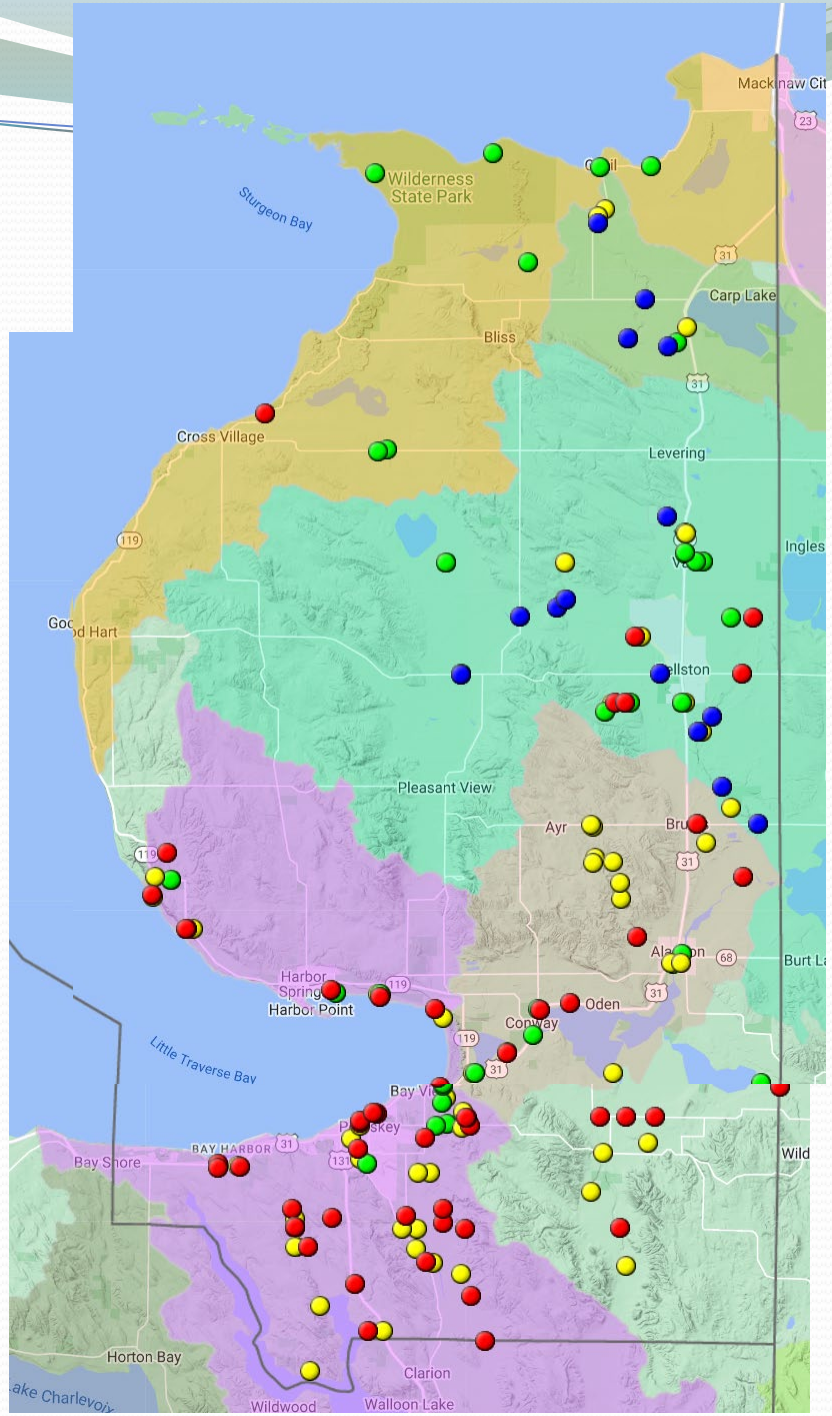
Three (3) State-Regulated Dams in Emmet County

Dam Name	Owner Names	City	River or Stream Name	Primary Purpose	Dam Types	Year Completed	Data Last Updated	Last Inspection Date	Inspection Frequency	Hazard Potential Class	Condition Assessment	Condition Assessment Date	EAP Prepared
French Farm Lake Dam	MDNR Wildlife	Carp Lake	French Farm Creek	Recreation	Earth	1949	4/7/2021	10/19/2016	5	**Low**	**Satisfactory**	**10/19/2016**	**Not Required**
Maple River Dam	Blue Maple Real Estate Company	Indian River	Maple River	Recreation	Earth; Gravity	1966	4/7/2021	12/3/2014	5	**Low**	**Poor**	**12/3/2014**	**Yes**
O'Neal Lake Dam	MDNR Parks & Recreation	Carp Lake	Big Sucker Creek	Recreation	Earth; Gravity	1954	4/7/2021	10/12/2011	5	**Low**	**Unsatisfactory**	**10/12/2011**	**Not Required**

"Low Hazard Potential" = no expected loss of human life; economic losses and environmental damages are low and generally limited to the dam owner; no lifeline interests are impacted.

Road-Stream Crossing Conditions

Five Watersheds - Frontal Lake Michigan, Carp River, Maple River, Crooked River, Little Traverse Bay.

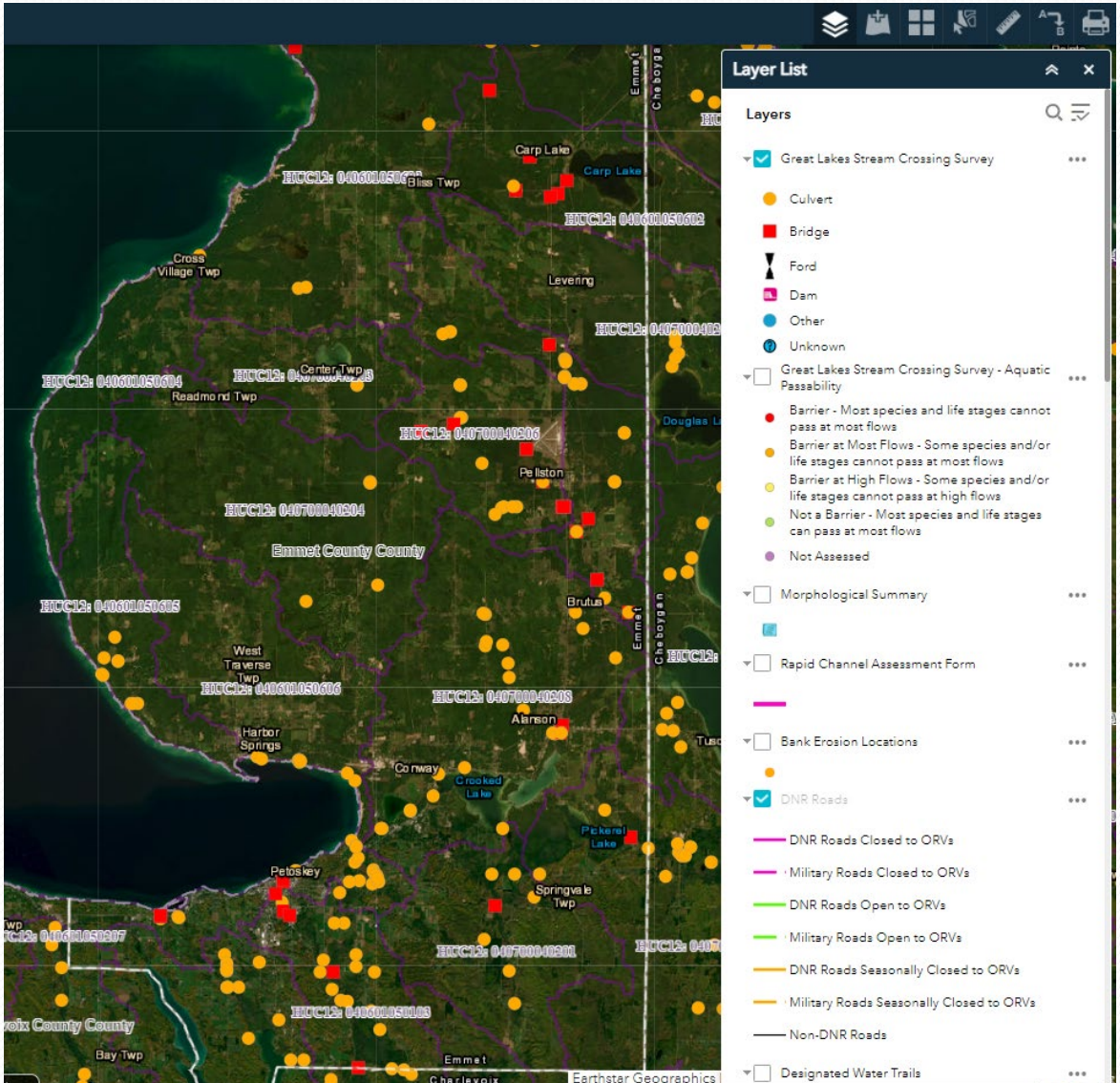


http://www.northernmichiganstreams.org/emmetcorsx.asp

Road Stream Crossings

MDNR's Great Lakes Stream Crossing Inventory

https://great-lakes-stream-crossing-inventory-michigan.hub.arcgis.com/



County Wetlands

https://www.mcgi.state.mi.us/wetlands/mcgiMap.html#

Map Legend

Change what items you see on the map by using the checkboxes

Wetland Data

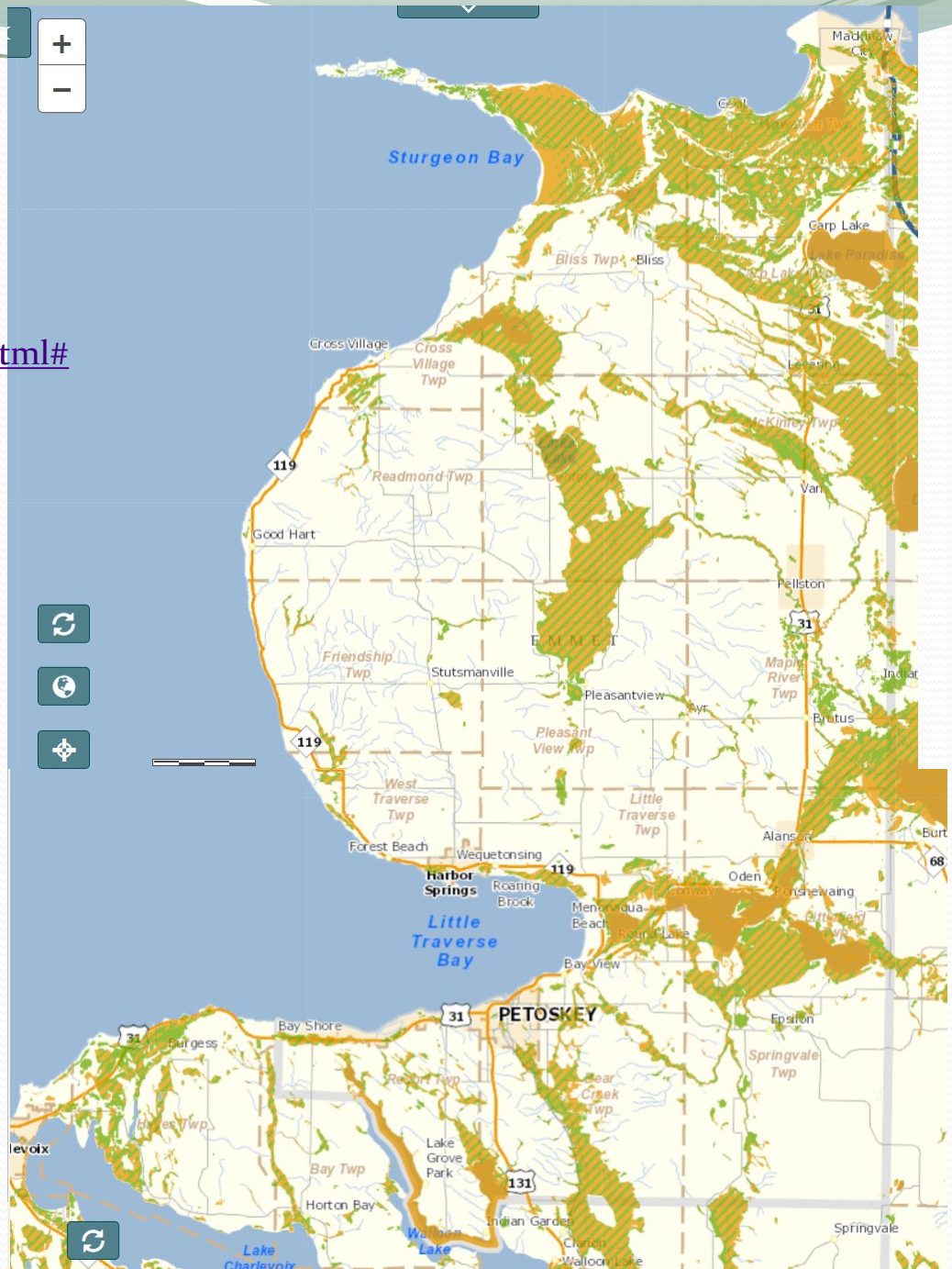
- Wetland (Hydric) Soils ☐
- National Wetlands Inventory 2005 ☐

Potential Wetland Restoration ☐

- Highest Potential - Hydric and Presettlement Wetland Overlay
- High Potential - Hydric Soils Only
- Moderate Potential - Presettlement Wetlands Only

Part 303 Final Wetlands Inventory ☑

- Wetlands as identified on NWI and MIRIS maps
- Soil areas which include wetland soils
- Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils



NFIP & CRS Participating Communities

- FEMA's National Flood Insurance Program (NFIP) provides flood insurance to property owners, renters and businesses, and having this coverage helps them recover faster when floodwaters recede. The NFIP works with communities required to adopt and enforce floodplain management regulations that help mitigate flooding effects.

- 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. 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 NFIP
  - Foster comprehensive floodplain management

- There are a handful of communities in MI that participate in the CRS program, but none are in northern MI.

NFIP Participating Communities

All communities in the County with Lake MI coastline

NFIP Participating Community	Community ID #	FIRM Map Effective Date
Bear Creek Twp.	261574A	6/1/2022
Bliss Twp.	261566A	6/1/2022
City of Harbor Springs	260272A	6/1/2022
City of Petoskey	260072A	6/1/2022
Cross Village Twp.	260745A	6/1/2022
Friendship Twp.	261573A	6/1/2022
Little Traverse Twp.	260748A	6/1/2022
Readmond Twp.	260755A	6/1/2022
Resort Twp.	261575A	6/1/2022
Village of Mackinaw City	260675A	7/19/2022
Wawatam Twp.	261572A	6/1/2022
West Traverse Twp.	260721A	6/1/2022
**Springvale Twp - No Significant Flood Hazard Areas Identified; non-participating NFIP*	*261017A*	*3/3/2000*

Coastal Hazard events

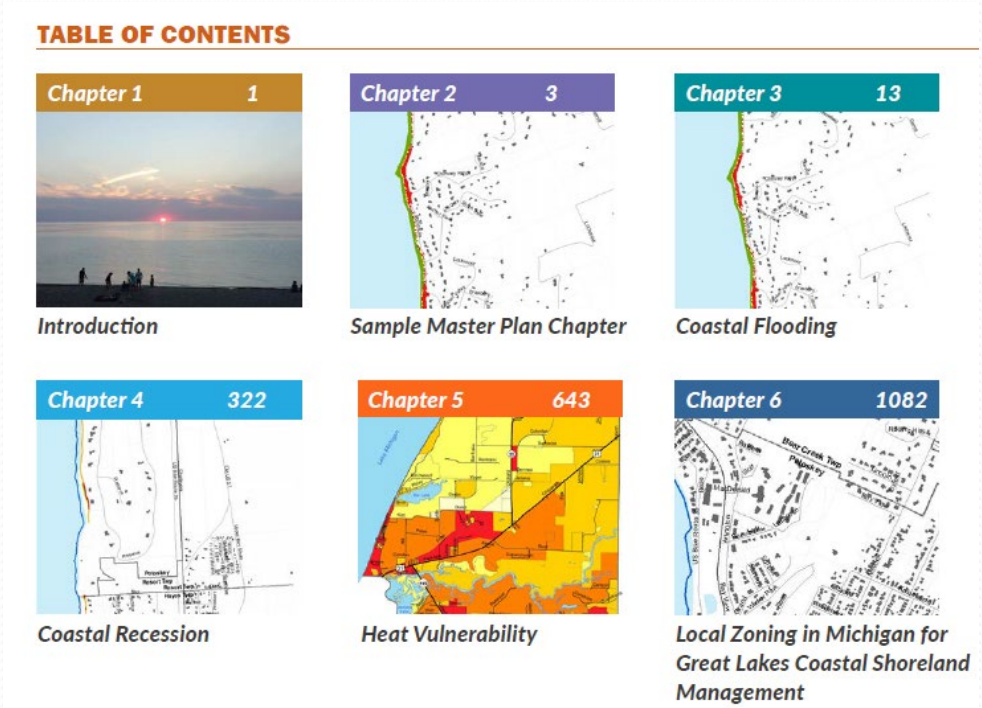
Event Type	Date	Location	Episode Narrative	Event Narrative
Lakeshore Flood	4/13/2020	Lake MI coastal communities		Strong low pressure passed just north of eastern upper Michigan on the morning of the 13th. Gusty west to northwest winds developed during the day, in the wake of the low. Gusts of 40 to 50 mph were common across northern Michigan, especially during the afternoon. Some localized power outages resulted. Lakeshore flooding also occurred along portions of the Lake Michigan coastline of northwest lower Michigan. Severe coastal erosion destroyed a portion of the Little Traverse Wheelway between Petoskey and Charlevoix. $150,000 in property damage was reported to NOAA for Emmet County.
Lakeshore Flood	10/23/2020	Lake MI Coastal Communities; Wawatam Twp.	Wilderness Park Drive was closed between Headlands Rd and Straits View Dr for five hours due to lakeshore flooding.	Low pressure lifted across northern lower Michigan early in the morning of the 23rd. Very heavy rain fell just in advance of this low, late on the 22nd and early on the 23rd. 24 hour rainfall totals were 5.00 in Suttons Bay, 4.98 in Lake Ann, and 4.73 in Gaylord. Following a period of relatively dry weather, most flooding issues were minor. However, more significant road flooding occurred in and near Traverse City. In addition, gusty northwest winds in the wake of the low contributed to lakeshore flooding along the Lake Michigan coast on the 23rd. $5,000 in property damage was reported to NOAA for Emmet County.

Coastal Hazard events, continued

Event Type	Date	Location	Episode Narrative	Event Narrative
Waterspout	8/4/1999	Little Traverse Bay	Unseasonably cold air over the warmer waters of Lake Michigan triggered numerous cold air funnel clouds over Little Traverse Bay; three of which developed into waterspouts.	-
Rip Current	7/18/2005	Petoskey State Park Beach	16 people were rescued; classic rip current.	SW wind 10-20 mph; 3-4 ft. waves
Rip Current	8/17/2010	Petoskey State Park Beach	Two people were rescued; classic rip current	W wind 15-25 mph ; 5-6 ft. waves.
Rip Current	7/11/2012	Good Hart	A teenaged male from Portage, Michigan, drowned off of Cross Village Beach. Dive teams were called in, and found the body about 40 feet from shore.	West winds gusting to 20 mph produced considerable wave action on Northern Lake Michigan, and provided a favorable environment for rip currents.

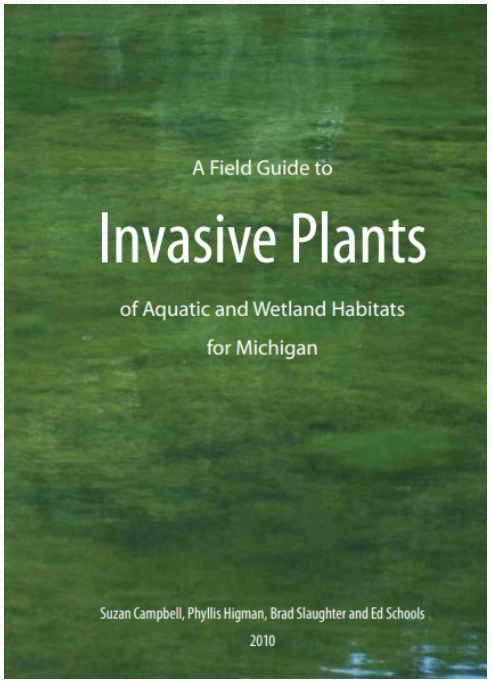
Northwest Lower Michigan Coastal Resilience Atlas

- Data provided by Land Information Access Association
- http://www.resilientmichigan.org/nw_atlas.asp
- Ten-county region
- Covers coastal hazards:
  - **Flooding**
  - **Coastal Recession / Erosion**
  - **Heat Vulnerability Analysis**
  - Zoning processes and provisions coastal shoreland management
- Also account for State-designated Critical Dunes & High Risk Erosion Areas



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.



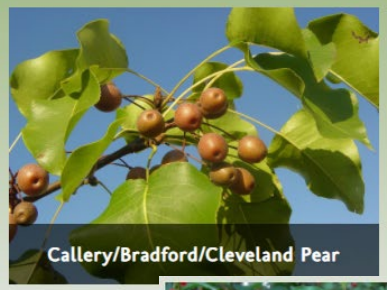
Invasive Species

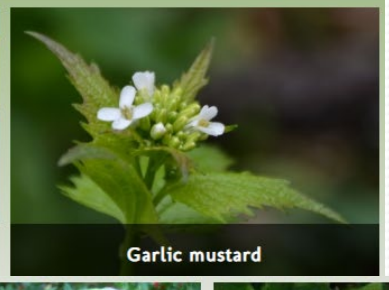

Baby's breath


Japanese and common barberry


Blue lyme grass


Glossy and common buckthorn


Callery/Bradford/Cleveland Pear


Garlic mustard


Invasive honeysuckles


*Knotweeds

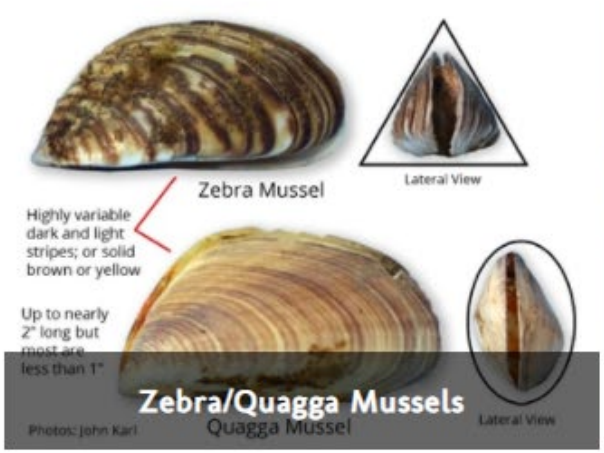

Invasive bittersweet


*Invasive Phragmites


*Purple loosestrife


Tree-of-Heaven

Invasive Species



Zebra/Quagga Mussels


Round goby


Rusty crayfish


Eurasian Ruffe


Sea Lamprey

Asian Carp

Public Health Emergency – Pandemic

- Data provided by Michigan.gov
- https://www.michigan.gov/coronavirus/stats
- Covid-19 Cases by County
- As of January 23, 2023
- 7,505 Cases, 107 Deaths (confirmed and probable) since March 1, 2020
- 40 of the 89 confirmed deaths were of persons aged 80+

- Other challenges that occurred because of the pandemic? Opportunities to improve?

Community Survey

- Opened/distributed 11/7/22
- **As of January 1, 2023, we have 79 responses** with representation from **all communities.**
- Local government/non-profit representatives and some residents.

Next Steps

- Close survey and summarize results
- Obtain available historical data on the other technological and human-induced hazard events
- Hazard mapping
- Review 2016 prioritized hazards
- Prepare hazard analysis
- Next group meeting