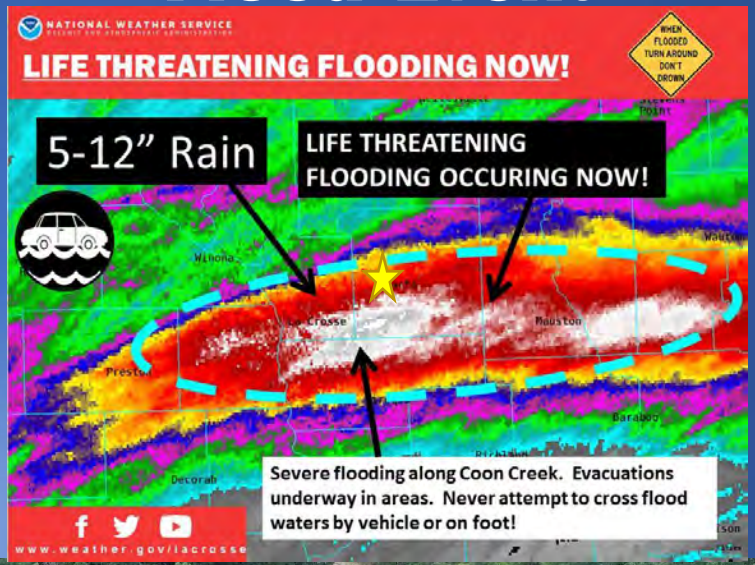
August 28, 2018 Flood Event

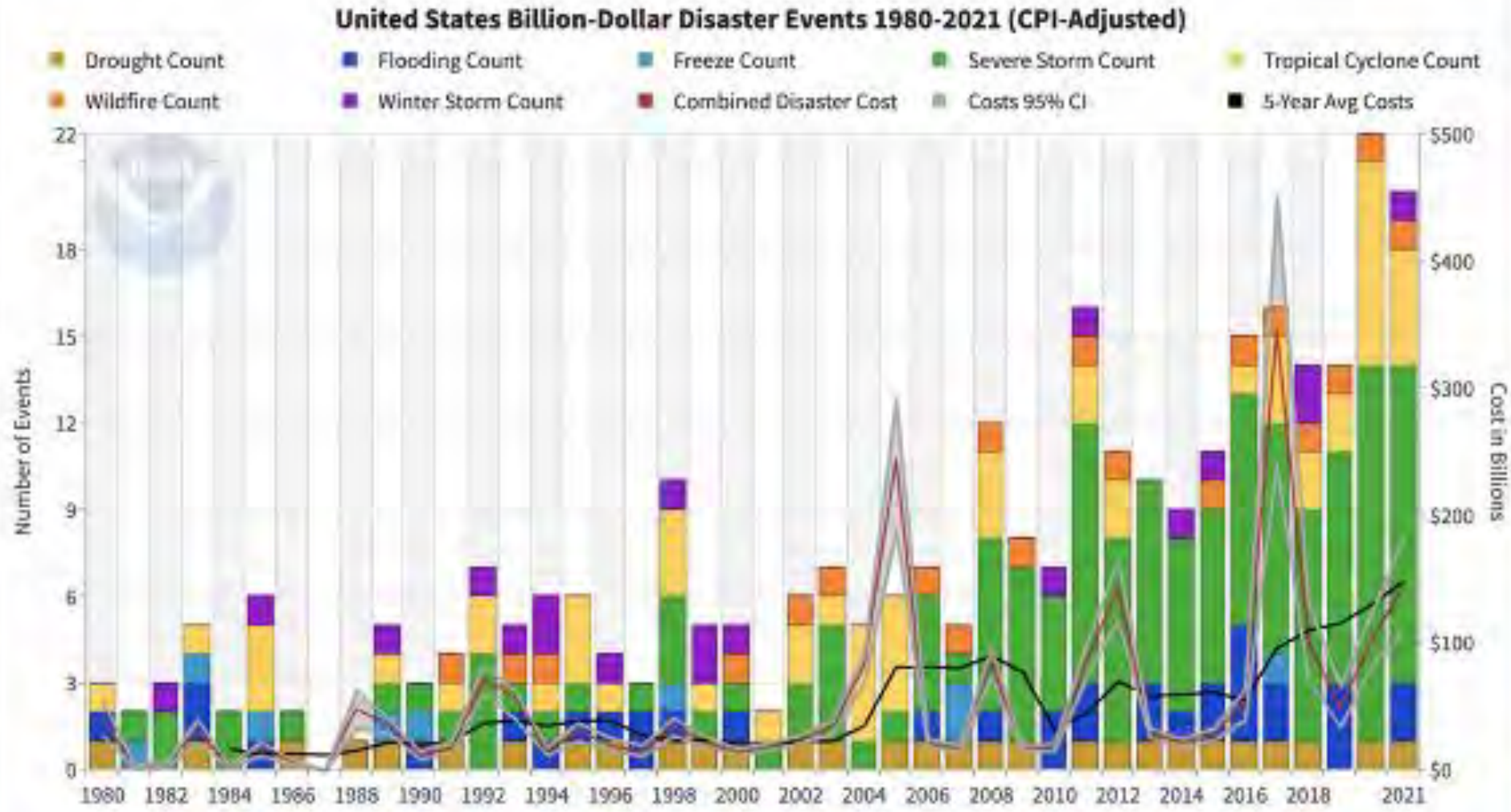


★ **PL566 Flood Control Dams**
(Coon Creek Watershed)

- **6 of 7 Overtopped**
- **3 Breached**

Flood damage per decade in Monroe County (EM)

Billion-dollar Weather Disasters in U.S. since 1980



More and more costly weather disasters. Most ever in 2020 and 2021.

Conservation Practice Failure

Grass Waterway

Streambank Stabilization

Grade Stabilization Structure

CCTF Born on Date

July 1st – Concrete Stream Crossing

5” rain in 90 minutes – **July 3, 2019**

CLIMATE CHANGE IN MONROE COUNTY

WHEREAS, climate change poses a serious threat to Monroe County's natural resources, agriculture, public health, communities, tourism, and economy; and

WHEREAS, increasing instances of extreme weather events since 2007 and more recently August of 2018 and July of 2019 are devastating Monroe County and surrounding communities; and

WHEREAS, the safety of our citizens is of the utmost importance and adequate monitoring of severe weather occurrences will help protect individuals, businesses and communities; and

WHEREAS, adequate floodplain management can help alleviate future property damage; and

WHEREAS, updating and or creating the county's floodplain map through an impact study will more accurately reflect current weather events; and

WHEREAS, identifying current landuse trends and challenges will allow the county to improve enforcement of standard zoning policies and practices to create sustainable land use decisions; and

WHEREAS, Monroe County citizens, businesses, and municipalities have incurred significant financial damage in the millions of dollars due to climate change and extreme weather events. These damages are impacting the municipalities budgets and adding substantial financial strain; and

WHEREAS, the Climate Change Task Force (CCTF) will seek federal, state, and local technical and financial assistance to implement Task Force recommendations and goals; and

WHEREAS, the CCTF will provide educational materials and inform the citizens of Monroe County about climate change and it's effects on the County; and

WHEREAS, establishing mitigation programs throughout Monroe County that will benefit all citizens; and

WHEREAS, promotion of sustainable land use policies and practices with the state and federal government is vital for future change; and

WHEREAS, our county has a responsibility to current and future generations of Monroe County residents to act to prevent continuing damage to our resources and infrastructure and to invest in solutions that help to mitigate the changes that have already occurred.

NOW, THEREFORE, BE IT RESOLVED that the Monroe County Board recognizes that climate change is occurring in Monroe County and supports the efforts of

Monroe County Board
September 28th, 2019

Resolution - Vote: 15-0

Re-Active / Pro-Active

CCTF - 16 Members: (August 28, 2019)

1. County Administrator
2. LCD – Director
3. Land Use Planner
4. UWEX – Agent
5. Emergency Mgt. Coordinator
6. Hwy Commissioner
7. Sanitation & Zoning Administrator
8. County Board Supervisor
9. County Board Supervisor
10. County Board Supervisor
11. County Board Supervisor
12. Town Board Supervisor
13. Town Board Supervisor/Farm Bureau President
14. DNR Program & Policy Agent
15. Fort McCoy – Public Affairs Officer
16. Fort McCoy – Fisheries Biologist

Monroe County

Climate Change - Task Force

***Define:* goals/plan/action – 12/11/19**

(Sequence based on importance and development time)

1. *Implement monitoring devices (weather stations) and warning systems in real time by coordinating with emergency management and the national weather service. (warning signage/Nixel/messaging)*
2. *Floodplain Management – Remove structures/roads/crossings within floodway that have a history of being flooded & or under immediate threat. Define standards for building within the floodplain.*
3. *Complete flood impact study to identify 100 year floodway boundary based on recent rainfall data and current land use. Focus on areas with development pressure & or chronic flooding issues.*
4. *Zone to promote sustainable land use decisions. Improve existing enforcement of shore land zoning ordinance.*
5. *Enforcement of land use decisions.*
6. *Flood Mitigation Projects – (watershed management) implement/develop water infiltration, retention practices that address rainfall and runoff.*
7. *Promote sustainable land use policies or practices that influence state and federal legislation.*
8. *Climate Change Mitigation:*
   - *ID contributions/sources*
   - *Establish standards for sustainability*
   - Implement climate change mitigation and adaptation planning into municipal (county, town, village, city, etc.) comprehensive plans and promote planning integration throughout other municipal plans (transportation, hazard mitigation, watershed, etc.).
   - *Implement mitigation programs (ex. Tree planting, mass transit, Runoff Curve Number (RCN) & Temperature balancing, Agriculture – Carbon Sequestering practices, etc.*
   - *Individual Empowerment*
9. *Provide information & education*
10. *Seek funding sources to implement Task Force recommendations/goals.*

https://www.bing.com/videos/search?q=you+tube+marty+severson&docid=608029440769924716&mid=57BCDCFF1B7A08B9555257BCDCFF1B7A08B95552&view=detail&FORM=VIRE

Objective #2 - Floodplain Management – Remove structures, roads, crossings within the floodway that have a history being flooded and or under immediate threat.

Floodplain Infrastructure Vulnerability

Photo is from Village of Lafarge, Kickapoo River at STH 82, Vernon County, 8 July 2008

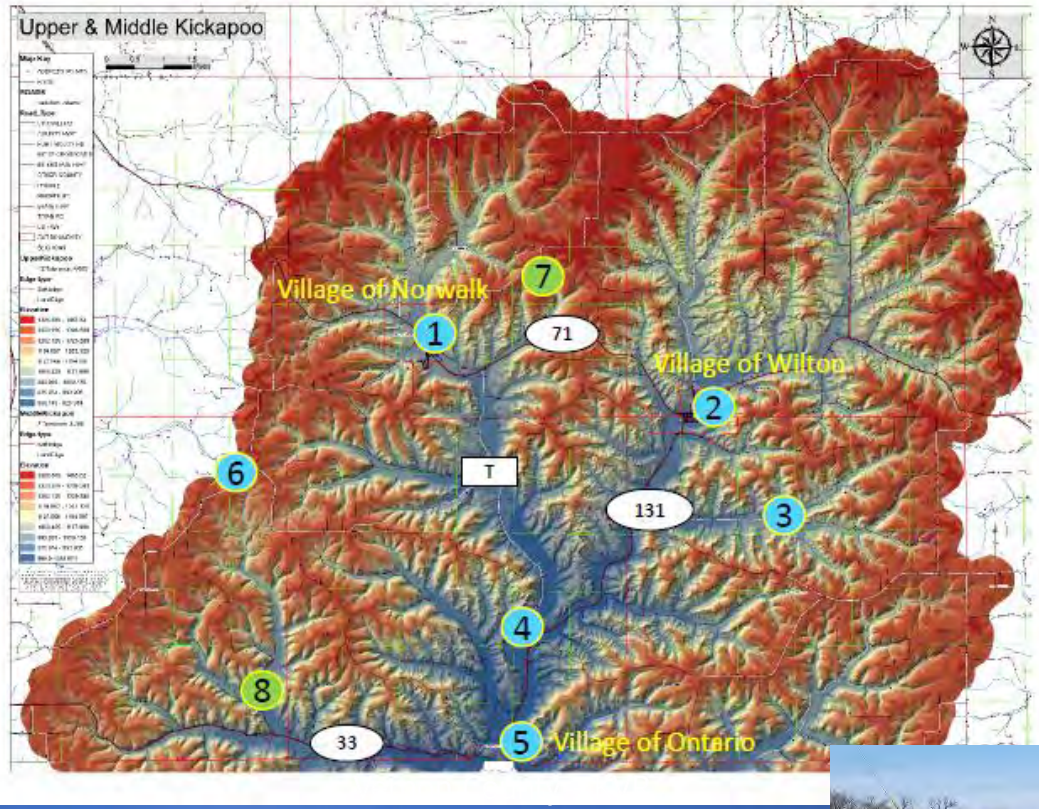
Many existing structures in Monroe County are in **flood-risk zones.** Based on preliminary building footprint data, and current FEMA maps, over 200 structures occur in a floodway, over 500 in a flood fringe zone, and over 600 in an unstudied floodplain.

[FEMA Voluntary Buyout Project - Monroe County , WI (arcgis.com)]

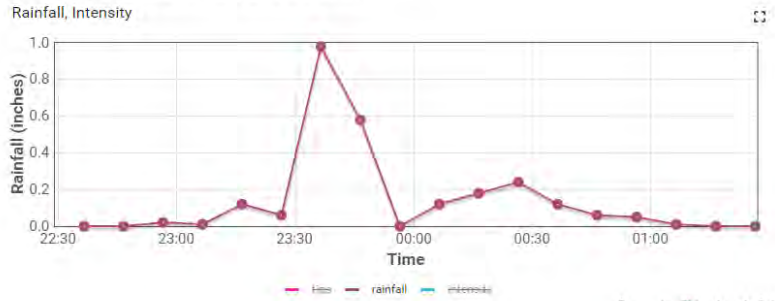
Objective #1 *Implement monitoring devices (weather stations) and warning systems in real time by coordinating with emergency management and the national weather service.*

Kickapoo River Watershed – Monitoring Station Planning

Site 3



St. Mary's Ridge (Klinkner Farm) –
Rainfall event duration from 11pm to 1am = 2hrs
Total rainfall accumulation = 2.55 inches
Highest Intensity from 11:30pm to 12am, rainfall of 1.56 inches

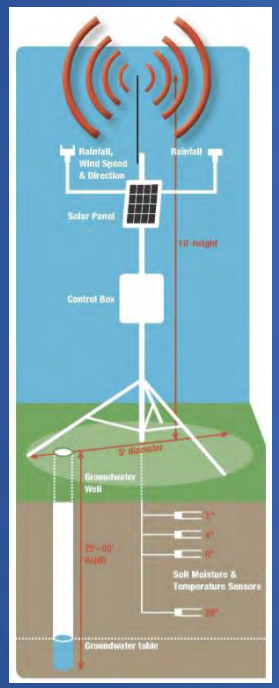


Site 6

intellisense SYSTEMS

Data Platform and Information System Management

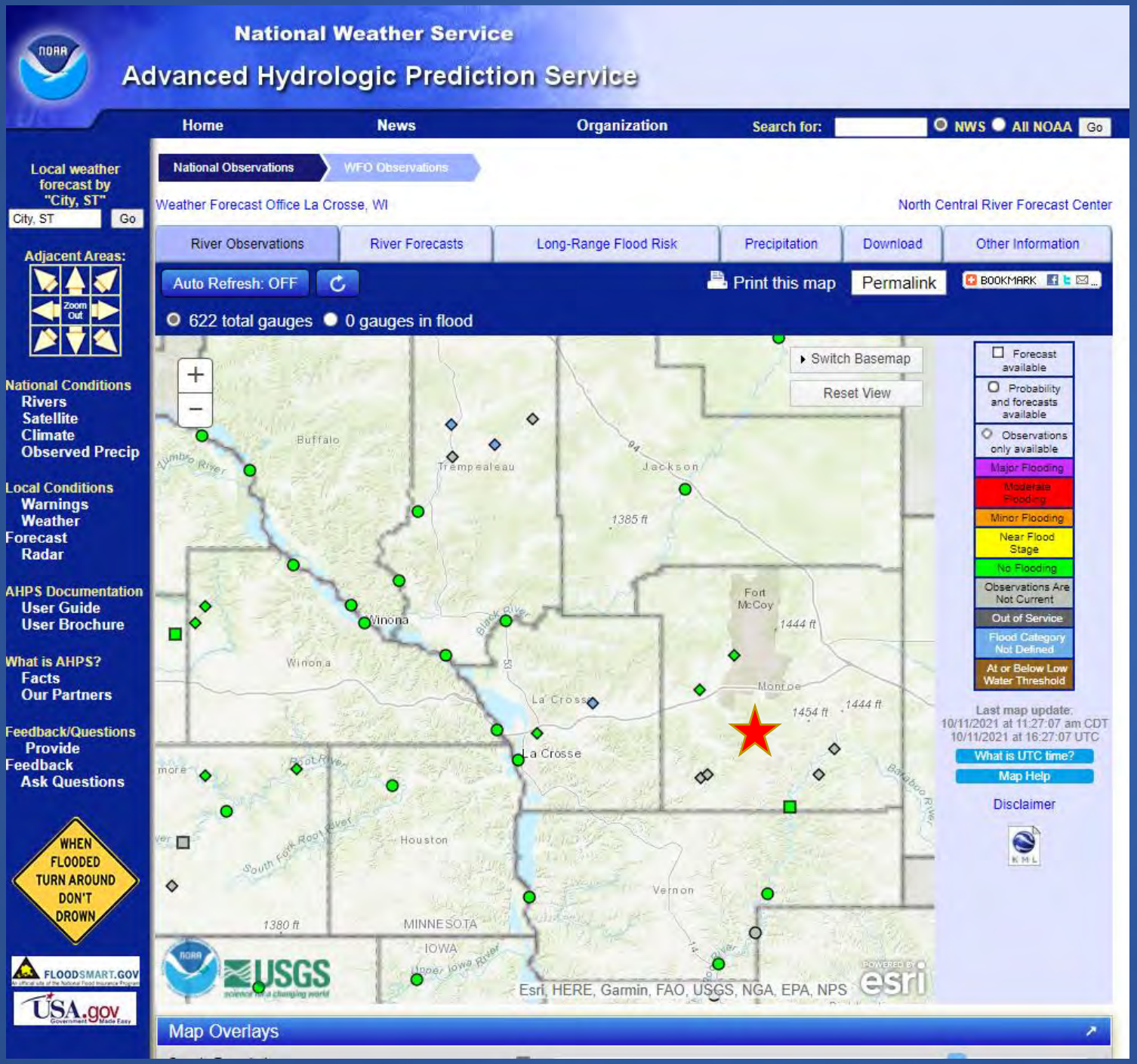
Stations / Sensors
Cellular or Wi-Fi
Transmission



Data Storage and
Processing

Cloud Server
OR
Local In-House Servers

User Interface
Internet Web or Mobile
Applications



National Weather Service

(Notification)

County

Nixle Radio

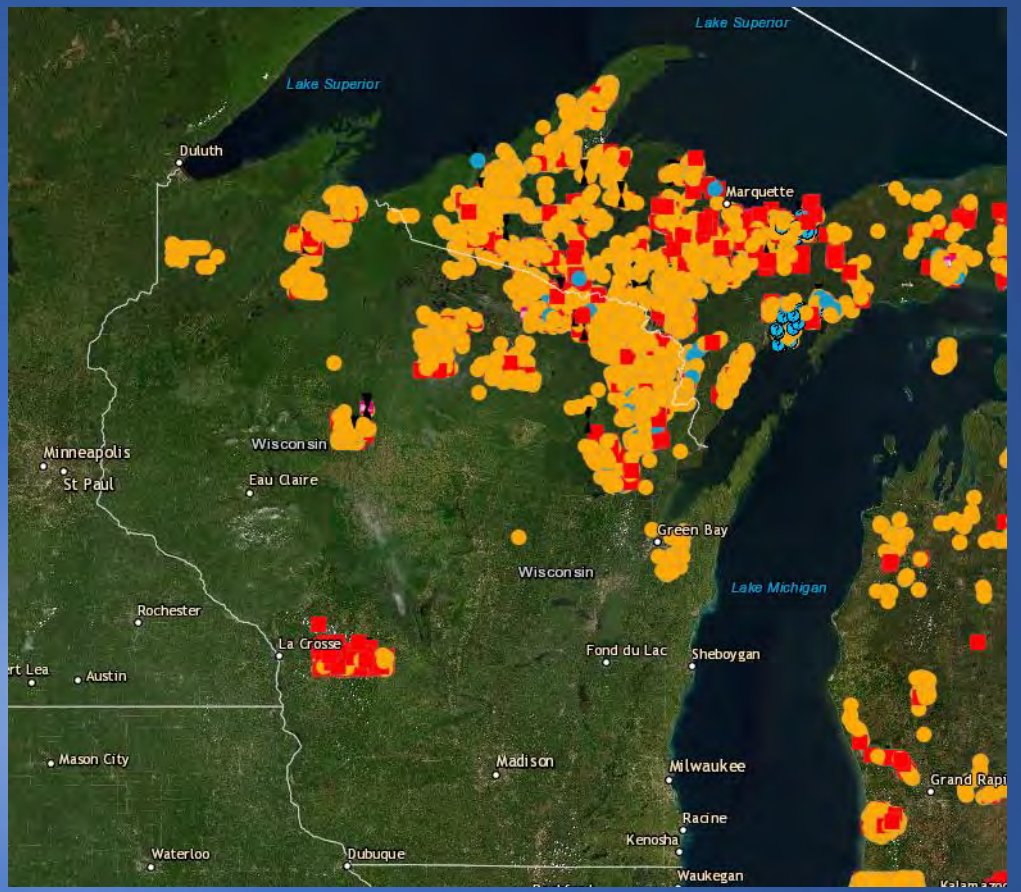
Public

Town Road Crossing

Why are so Many Structures Failing?

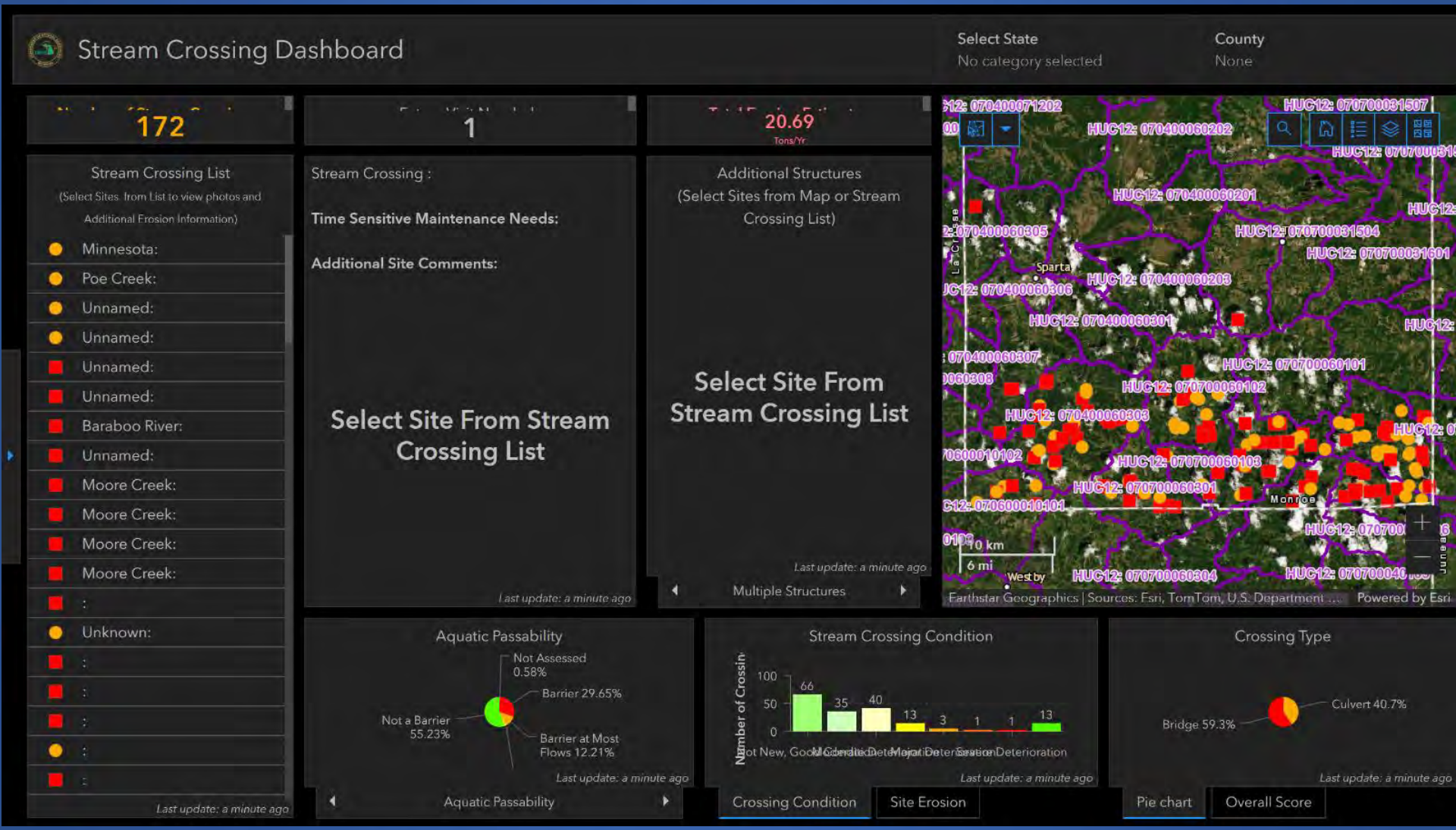
- Poor or No Design
- Traditional Hydraulic Design is No Longer Adequate
- Climate Change—warmer air holds more moisture
- Population and Development Increasing—marginal sites being developed
- Regular Maintenance Neglected
- Regular Inspections and Inventories of Culverts Needed
- Lean Budgets
- Perceived Cost of Ecological Design Culverts
- More Media Coverage

2021 Crossing Inventory/Assessment



- County evaluate (2021) the cumulative effects (flooding, conductivity, fish passage, watershed management, etc.).
- Provide training to the Town & County officials to address infrastructure (Culvert/Bridge)
- Long term plan – improve stream crossing resiliency for climate change

Great Lakes Survey123 - Data Dashboard



- Using ArcGIS software, conduct assessments of all stream crossings (1,700+) by starting at the southern border and working north (highest rate of damage from 2018 and 2019 flood events)

Township Map

General Findings

- 29.65% of structures surveyed are barriers
- 20.70 tons of erosion per year
- 39.93% of structures are undersized according to the sizing standards
  - Minimum size: 1.2 times bankfull width
  - Ideal size: 1.2 times bankfull width plus 2 ft.
    - Bankfull width calculated at representative reach