

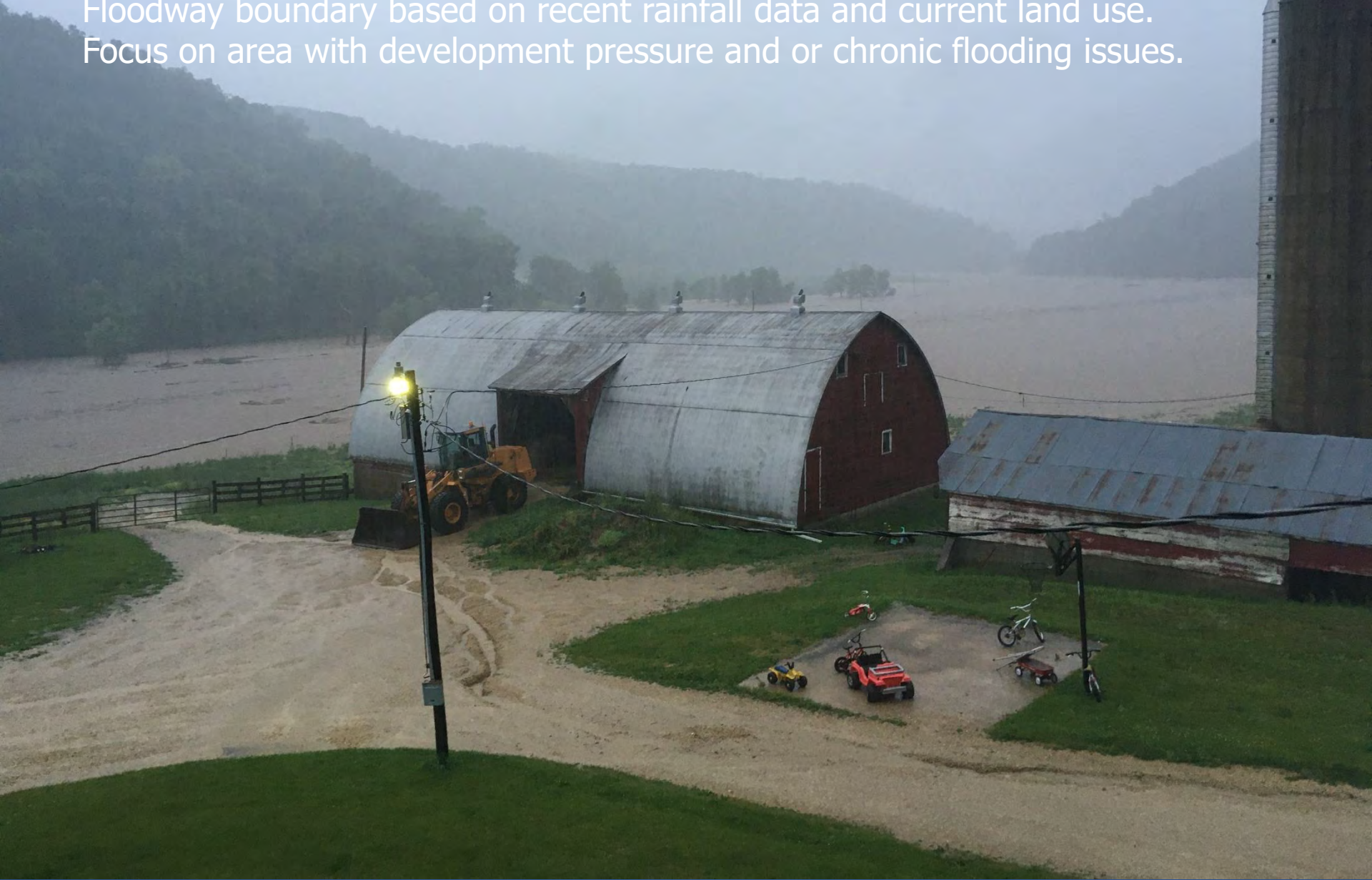
Permitting Private Crossings



LCD/Zoning Dept.

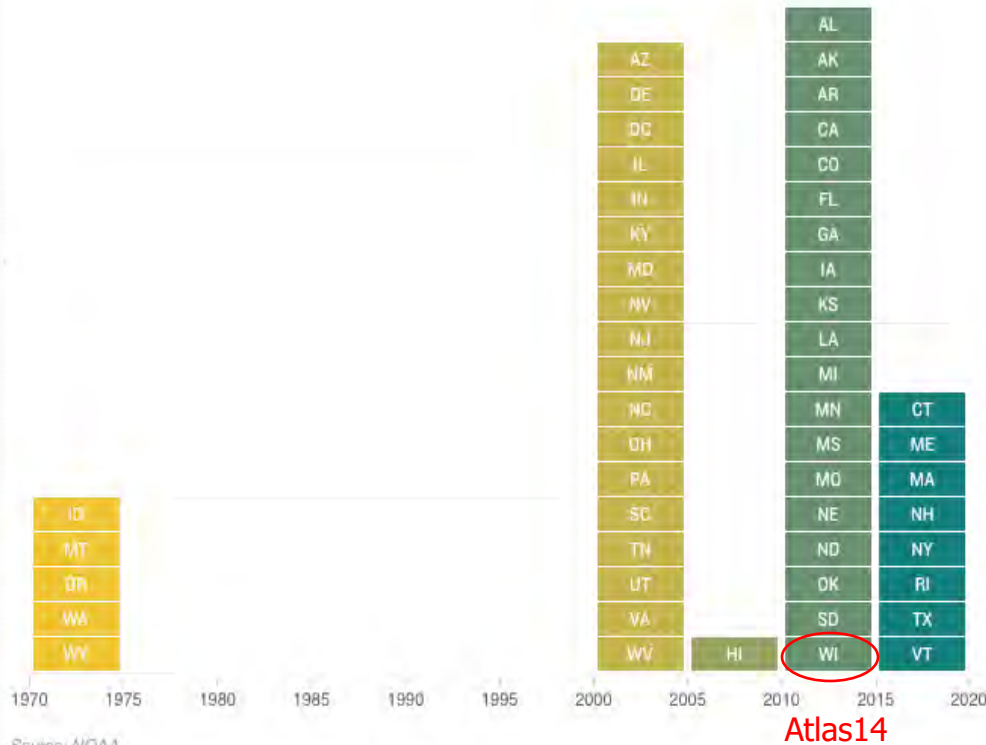
- Watershed Evaluation
- Siting

Objective #3 – Complete Flood Impact study to identify 100 year Floodway boundary based on recent rainfall data and current land use. Focus on area with development pressure and or chronic flooding issues.

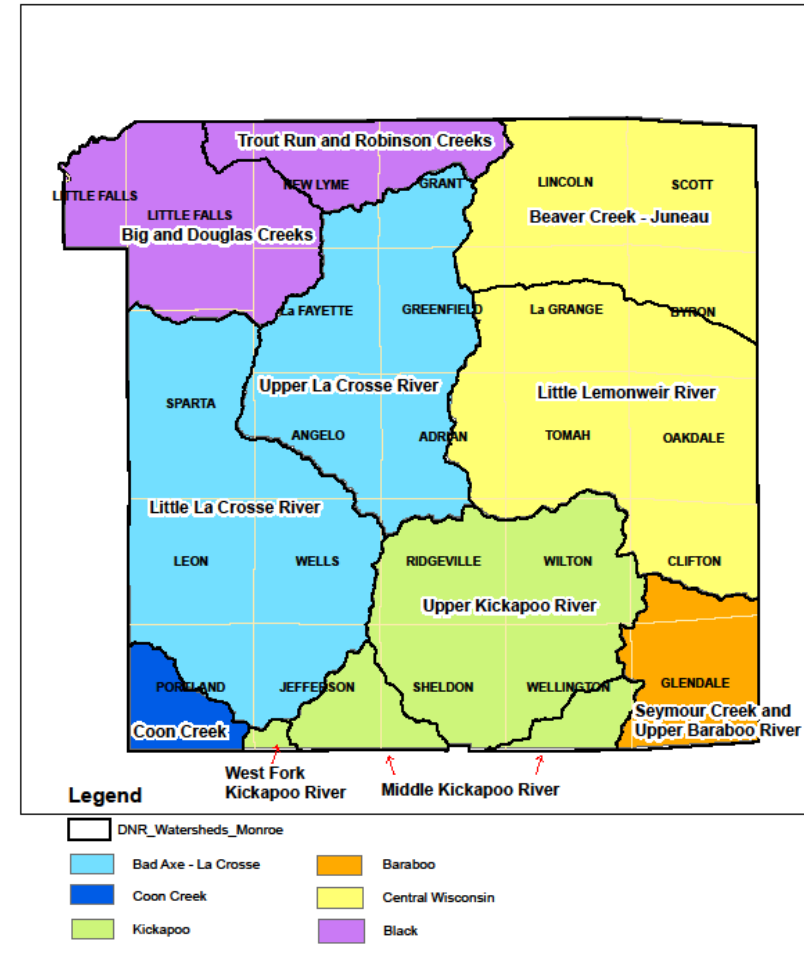


Many states use decades-old rainfall data for infrastructure planning

The National Oceanic and Atmospheric Administration only updates historical rainfall records, known as Atlas 14, when a state requests and pays for it. The chart below shows the last update for each state. As a result, many cities are designing infrastructure with outdated data that doesn't reflect how storms are becoming more intense.



Monroe County Watersheds



Update Flood Mapping

- 2022 – Kickapoo River Watershed
- 2028 – Remaining Watersheds

Objective #9 - Information & Education



-Media-



Wisconsin Land+Water Conservation Association

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Weekly News. Wisconsin Conservation.

February 21, 2020

TOP STORIES



Clean water bills flow smoothly through Assembly



Lt. Gov. Barnes speaks on climate change impact in WI

Climate Change Task Force



WRP Radio Interview

Climate Change Task Force – Members

CCTF Objectives Amended

Iowa Prescription Power Point

Wisconsin Climate Fast Forward Conference Report

CCTF Feb 12 Presentation – Project Cost Scenarios Updated

- ▶ February 12th, 2020 Minutes & Attendees
- ▶ February 12th, 2020 Agenda
- ▶ January 8th, 2020 Meeting Minutes, Attendees List, & DNR Stream Crossing Info
- ▶ DNR PowerPoint Presentation
- ▶ January 8 2020 Agenda
- ▶ December 11th 2019 Meeting Minutes w/ Attendees
- ▶ December 11 2019 Agenda
- ▶ October 4 2019 Agenda
- ▶ October 4 2019 Meeting Minutes
- ▶ September 5 2019 Agenda
- ▶ November 13 2019 Agenda
- ▶ November 13 2019 Meeting Minutes – Final

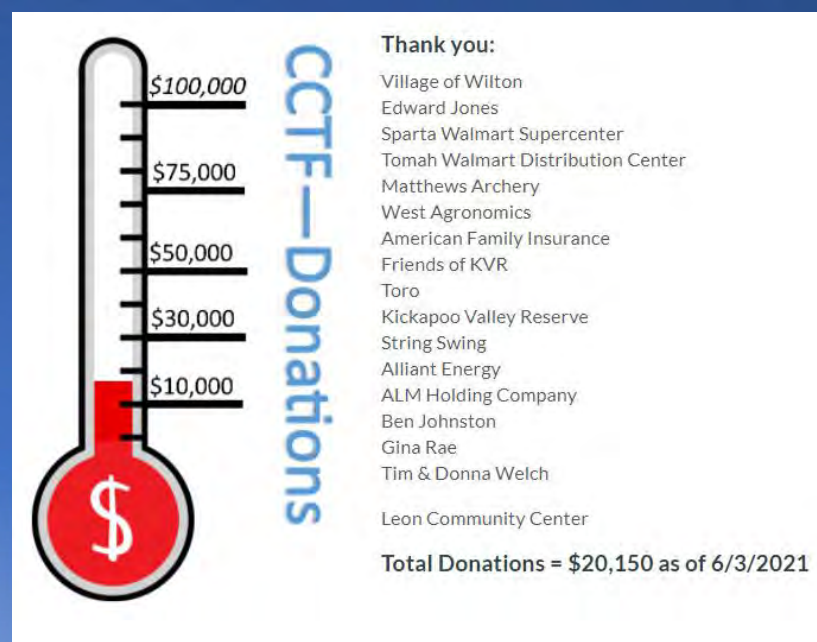


2020 Climate Change Task Force Tour and Meeting
by WI Land+Water

Messaging through participation:

- WI Climate Change Task Force, WICCI
- Wisconsin Land & Water
- DNR, NRCS, USGS, UWEX, LCD, National Weather Service
- 5 Surrounding Counties
- Wisconsin Green Fire
- Village, City, County, State & Federal Elected Officials
- Media
- County & Regional Planners

Objective #10 - Seek funding to implement objectives



Fishers and Farmers Partnership Grant
US Fish and Wildlife Service: \$36,086

American Rescue Plan Funds (ARPA)
Monroe County: \$130,000

Hazard Mitigation Grant Program – Planning Grant: FEMA and WEM: \$80,976

DNR-Municipal Flood Control Grant - Buyouts
\$222,886

Hazard Mitigation Grant Program - Buyouts
FEMA and WEM: \$1,175,028

Environmental Health Capacity Grant: WI DHS and CDC: \$64,400

Grants = \$1,749,376

Building Resilient Infrastructure and Communities
FEMA: \$40,000

Partners

(Beyond Monroe County)

WI Green Fire

University of Wisconsin Extension

Wisconsin Initiative on Climate Change Impacts

WI Department of Natural Resources

WI Department of Trade Consumer Protections

Natural Resource Conservation Service

National Weather Service

Organic Valley

Farm Bureau

Fort McCoy

Wisconsin Land & Water

US Fish & Wildlife Service

Savanna Institute

Thriving Earth

Monroe County Objectives:

Address the Symptoms:

- Keep people & structures out of the flood-way
- *Mitigate intense rain events on the landscape (Objective #6)
- *Manage runoff events



*Conservationist



- Address the Cause

Investigating Paths to Increased Flood Resilience in the Coon Creek Watershed



Lead Advisor:

Eric Booth

Associate Scientist



Students:

Rajpreet Grewal, Cathryn Herlihey, Jackson Parr,
Robert Rosner, Rachael Sodeman, Kayla Wandsnider



Advisory Committee:

Caroline Gottschalk-Druschke,
Adena Rissman,
Stephen Ventura

Rainfall Analysis Team: Daniel Wright, Zhe Li



Enhancing Infiltration *Through Land Use & Land Management*

- Literature Review
 - Cropland management: contour strips, buffer strips, prairie strips, and no-till can all increase infiltration
 - Land use: forest, prairie, well-managed pasture (perennials) can all increase infiltration relative to cropland
- Trend analysis
 - Land management: aerial photo analysis revealed a 28% decrease in area devoted to contour strips in Rullands Coulee watershed (2004-2018)
 - Land use: agricultural census data shows shift from dairy rotations to corn-soy (less opportunity for contour strips)





Maintain & Improve Land Use



Soil Health: the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.

Soil Health Principles:

- Minimize soil disturbance
- Soil armor - keep the soil covered
- Maximize diversity of plants in the rotation – 4 crop types
- Maintain living roots in the soil - cover crops
- Integrate livestock

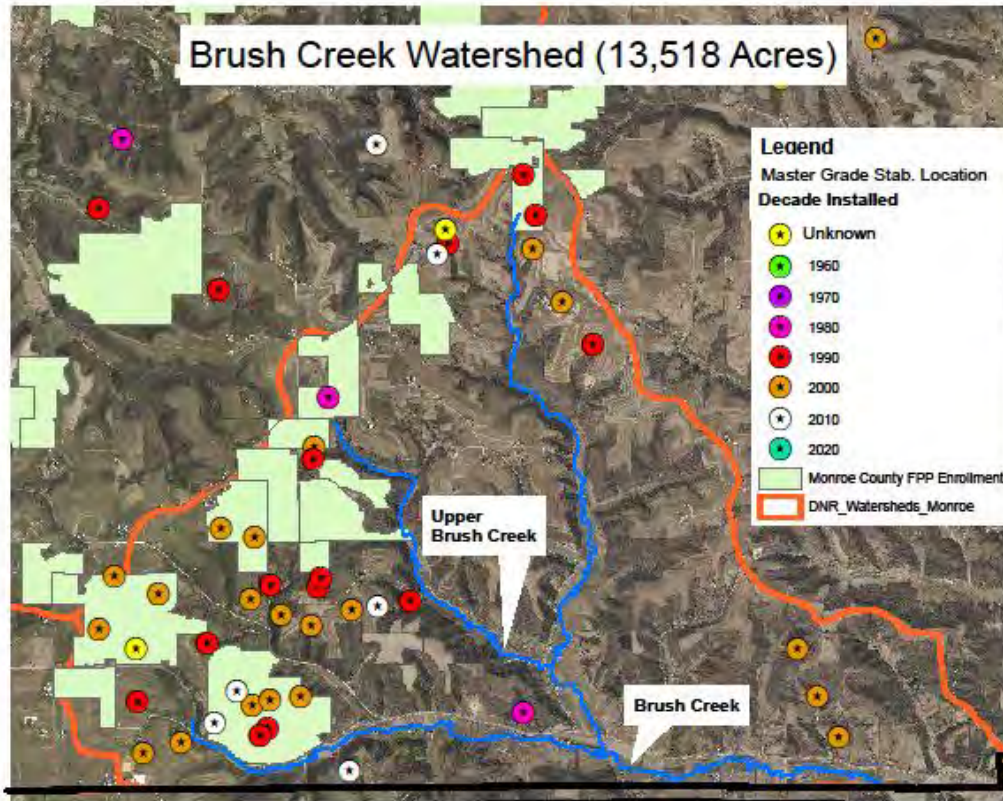


Grade Stabilization Structures - Dams



Monroe County

Grade Stabilization Structures



Field Office: SPARTA SERVICE CENTER
Agency: MONROE COUNTY LCD
Assisted By: BEN ANDERSON

Notes:

- 41 Dams Total (designed and built by either NRCS or LCD)
- A mix of hood and pipe drop inlets, and PVC and CMP
- Average CFS Reduction in % (for 10 yr storm): **53%**

Conservation Impact:

- Sediment Reduction
- Stream Classification
- Watershed Resiliency

Stream Corridor



Stream Restoration



Shaping & Seeding





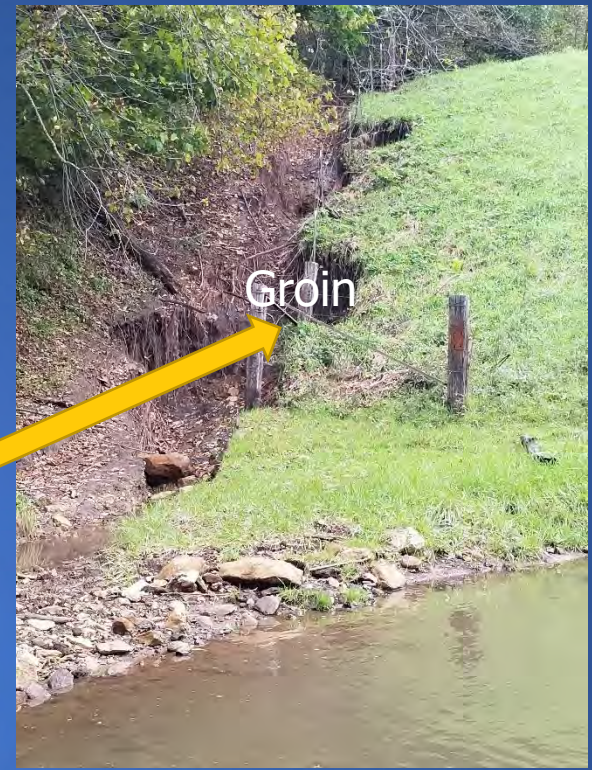
Critical Sites (580) – Headwaters/Crossing

Evaluating – Slope, keyway vs excavated riprap toe.



Lessons Learned





Conservation Practice Adaptation:

- Level Top
- Shape Groin
- Consider 25 (4.8") year vs 10 (4.2") year design storm

Monroe County Climate Readiness and Rural Economic Opportunity Assessment



Objective #8 – Climate Change Mitigation

4 Sub-Teams:

- 1.) Climate and Hydrology
- 2.) Infrastructure
- 3.) Agriculture
- 4.) Forestry

Monroe County CLIMATE READINESS AND RURAL ECONOMIC OPPORTUNITY ASSESSMENT

Hydrologic Sensitivity Analysis Results TIMBER CREEK WATERSHED

Our Climate and Hydrology Sub-team includes representatives from the Wisconsin Initiative for Climate Change Impacts, the University of Wisconsin Madison, the Natural Resources Conservation Service, and the National Weather Service.

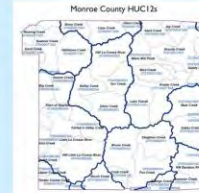
Hydrologic Sensitivity Analysis

This GIS based analysis of runoff depth/volume from storm depth using distributed soils and landcover (NCLD2019) data and newly-developed plug-in. Our analysis graphically displays "runoff source areas".

This analysis shows some of the impact of differing land uses in a watershed and how those land uses influence runoff. This analysis is not a design tool and does make specific land use recommendations.

Our initial hydrologic sensitivity tests focus on runoff depth (water volume) generation - not peak discharge or flooding depth - for 4 conditions:

- a. Existing Land Use Conditions
- b. All agricultural land is in pasture or perennial cover
- c. All agricultural land is in row crops
- d. Forest area is increased by 20%



Hydrologic Sensitivity Analysis Approach

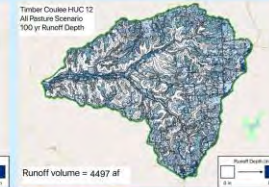
- Timber Creek (Rulands Coulee) (drains to Coon Creek)
 - Moore Creek (Kickapoo)
 - Headwater Little La Crosse River (La Crosse)
 - Rathbone Creek (Black R)
 - Bear Creek (Lemonweir River) the drought index
- Evaluate Runoff response to extreme rainfall and changes in agricultural use and forest cover

Timber Coulee HUC 12 Existing Conditions 100 yr Runoff Depth



Runoff volume = 5046 af

Timber Coulee HUC 12 All Pasture Scenario 100 yr Runoff Depth



Runoff volume = 4497 af

- High runoff areas are filled lands (and some impervious areas) in both upland and lowland positions
- Wooded hillsides produce little runoff

- Less runoff from pasture

Observations from Hydrological Sensitivity Analysis on Timber Creek Watershed

- When agriculture is the dominant land use most of the watershed runoff is generated from row-cropping.
- Pasture or perennial cover on agricultural lands substantially reduces runoff volume, especially in smaller storm events.
- For typical small storms - smaller than 2 inches, runoff reductions exceed 25% when agricultural land is dominated by pasture. This could produce substantial water quality and stream health benefits.
- Runoff from large rainfalls - over 7 inches - would only be reduced by ~10%.
- Increasing forest cover also reduces runoff, depending on the extent of reforestation.
- If all agricultural lands are in row crops, runoff will increase substantially.

Results of Preliminary Runoff Modeling for Timber Creek Watershed

Storm Depth, inches (Rainfall)	2 in	5 in	10 in
Annual Exceedance Frequency	0.5	0.5	0.05
Rainfall Depth, inches (Rainfall)	2.85	4.56	7.93
Runoff, inches			
Existing Conditions	0.53	1.34	2.68
All Ag Land converted to Pasture	0.40	0.95	2.39
All Ag Land converted to Row Crop	0.60	1.37	3.02
Forest Area expanded by 20%	0.45	1.03	2.43



Agriculture and Climate

Monroe County CLIMATE READINESS AND RURAL ECONOMIC OPPORTUNITY ASSESSMENT

Farm families are disproportionately affected by the impacts of climate change. Intense rain events are carving gullies through fields, warming winters are increasing pests and invasive species that threaten crops, and erratic weather are shifting growing seasons and causing plant stress. With agriculture managing over half of the Monroe County landscape, the Agriculture Sub-team is working to find solutions to limit these impacts and support the community effort to build a more resilient landscape across the county.

Agriculture sub-team members consist of representatives from County farmer, County land conservation department, Extension, NRCS, American Farmland Trust, Northern Institute for Applied Climate Science, WI Land+Water.

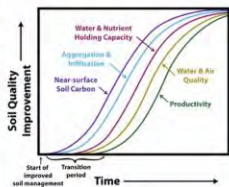
How will climate impact farmland?

- Heavy rain events, flooding
- Changes in summer soil moisture, increased length of dry spells
- Day to day variation/erratic weather
- More extremely hot days
- Warmer air temperatures, longer growing season
- Changes in invasive species, pest/pathogens and diseases
- Increased humidity
- Fewer extremely cold days, shorter winters

What tools do we have to respond to these impacts?

What's next?

- The Agriculture Sub-team is using carbon accounting tools to assess storage potential on Monroe County soils and developing case studies to better understand management changes of the farm scale.
- Monroe County Land Conservation Department is looking for farmers interested in finding climate-smart practices that fit unique farm management systems and create a more resilient community.







Create resilient landscapes carbon farming

1. keep fields covered
2. incorporate trees
3. diversify crops



Monroe County Climate Assessment - Recommended Strategies

						Public Safety	Resiliency	Soil, Air, Water	Carbon
Sector	18 Strategy	80 Action	Responsible or Lead Party	Secondary Party	Notes				
1. Invest in Enhanced Floodplain Risk Assessments	1.1 Review additional floodplain risk assessments to supplement FEMA maps and incorporate into future land use planning and project reviews.	Counties, Cities, and Villages			For example, First Street Foundation's Flood Factor Tool, https://firststreet.org/flood-factor/ ; WI DHS Flood Resiliency Scorecard. This data may be qualitative and may not affect insurance eligibility, but it can be valuable in identifying risk areas especially outside FEMA mapped floodplains.	+	+		
	1.2 Complete a geospatial data set for buildings > 600 sq. ft. and their associated flood risk zone(s)	Counties, Cities, and Villages			This project identified the FEMA flood hazard zones of structures larger than 600 sq. ft based on the County's building data and current FEMA maps. Add the attributes for tax parcel number, elevation, and any parcel zoning records for use by Planning and Zoning program administrators.	+	+		
	1.3 Use the improved topography developed from the County's digital elevation model (DEM) to contribute to floodplain hydraulic modeling.	WI DNR	Monroe County		WDNR's studies to update FEMA maps will improve the risk assessment of structures in flood hazard zones.	+	+		
	1.4 Review stormwater management standards across jurisdictions	Counties, Cities, and Villages	WI DNR		Ensure construction and post-construction measures go beyond minimum standards in NR-151 wherever possible, e.g. use WI Rainfall Project statistics. Encourage and remove unnecessary barriers to implementing green infrastructure, such as infiltration basins, permeable pavement, and bioswales.	+	+		
	1.5 Inspect and evaluate stream corridors in flood risk areas	Monroe County	Farmers and Forest Owners		Assess wooded corridors for deadfalls from dead and dying trees (such as ash) and other debris sources that may reduce peak flow capacity. Plan for tree debris removal in high-risk flood zones where debris loading is high.	+	+	+	
	1.6 Use rainfall runoff analyses using transposition of the August 2018 storm to explore flooding vulnerability in selected watersheds	Monroe County	Non-government Entities		This technique could be very valuable in answering the question "what if the big storm happened here" in areas of potentially high flood damage or public safety risk. Likely approach would be for a contractor or NGO working with Monroe County in collaboration with DNR.	+	+		
	1.7 Evaluate the extent of cleanup and remaining toxicity of Superfunds and Brownfields sites in or near floodplains throughout the county, especially in urban	Local Units of Government	Monroe County		Contaminated sites are vulnerable to release of contaminants during flood events. Following inventory of identified sites determine whether unremediated or exposed contaminants could be discharged to surface waters via river flooding or storm water runoff. Superfund and Brownfield sites listed in WDNR's	+	+	+	
7. Maintain and Improve Watershed Resiliency	7.1 Make the business and economic development case for watershed conservation and compatible uses.	Monroe County	Non-government Entities		Monroe County has some of the best conditions in southern Wisconsin to become a trout fishing destination, even as the climate warms. Showcase the large number of associated benefits from watershed restoration, including flood risk reduction, reduced soil loss, improved water quality, and tourism and recreation, and associated economic benefits.	+	+	+	
	7.2 For the highest risk watersheds, adopt tailored strategies to enhance resiliency.	Monroe County	Farmers and Forest Owners		Practices may include targeted efforts to increase agricultural lands in continuous cover, increase forest cover or forest improvement, restore degraded wetlands and streamside habitats.	+	+	+	+
	7.3 Ground truth and assess feasibility of potential restoration and improvement projects	Monroe County	Farmers and Forest Owners		Potential restoration or improvement identified here is based on remotely sensed data without regard to parcel boundaries. Understanding current conditions and landowner considerations are essential next steps to assess project feasibility before further planning.	+	+	+	

Questions

