

Welcome!

We will begin shortly...

| Virtual Meeting Schedule | |
|---------------------------------|---------------------------------|
| 6:00 – 6:10 | Welcome |
| 6:10 – 6:55 | Presentation |
| 6:55 – 7:15 | Presentation Q & A (General) |
| 7:15 – 7:30 | Wrap-Up |



Starkweather Creek/Olbrich Gardens Watershed Study Public Information Meeting No. 1

by City of Madison Engineering Division
September 16, 2021

Please Note: This meeting is being recorded. It is a public record subject to disclosure. By continuing to be in the meeting, you are consenting to being recorded and consenting to this record being released to public record requestors.

- ✓ This meeting will be **recorded** and posted to the City's project page.
- ✓ All attendees should stay be **muted** to keep background noise to a minimum.
- ✓ You may use the **“raise hand”** option at the bottom if you have something that required immediate clarification.
- ✓ Use **“chat”** option if you are having technical issues and a staff person can try to assist.
- ✓ Please use the **“Q&A”** option at the bottom of the screen to type your question. Questions will be answered at the end of the presentation. Inappropriate questions may be dismissed.
- ✓ If you cannot ask via typing your question, use the “raise hand” option and you will be unmuted when it is your turn.



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How to Participate

The screenshot displays a Zoom meeting interface. At the top, a green banner reads "You are viewing City of Madison's screen" with a "View Options" dropdown. Below this is a shared Excel spreadsheet with a ribbon and data. A "City of Madison" window is visible on the right. In the center, a "Phone Call" window is open, and a "Computer Audio" window is also present. A blue button labeled "Join Audio by Computer" is highlighted with a red arrow. At the bottom left, a "Join Audio" button is also highlighted with a red arrow. The bottom right corner features a "Leave Webinar" button. The bottom navigation bar includes icons for "Join Audio", "Q&A", "Chat", and "Raise Hand".

Make sure to join audio

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Raise your hand to be unmuted
For comments or ask additional questions.

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Use chat if you have technical issues or a question for the panelists

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Use Q/A if you have questions.
We will answer after the presentation

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Recording

You are viewing City of Madison's screen View Options

City of Madison

Phone Call

Computer Audio

Join Audio by Computer

Join Audio

Q&A

Chat

Raise Hand

Leave Webinar

To leave the meeting click here



Evening Overview

- ▶ Welcome (Hannah Mohelnitzky, City of Madison)
- ▶ Presentation (Aaron Volkening, Stantec)
- ▶ Q&A (facilitated by Hannah Mohelnitzky, City of Madison)
 - Submit questions through Zoom Q&A
 - *To find the Zoom Q&A Box, hover over the edge of your screen. A toolbar will appear and you can click on “Q&A”*
 - Questions answered at the end of the Presentation
- ▶ Wrap Up (Hannah Mohelnitzky, City of Madison)

Poll Questions



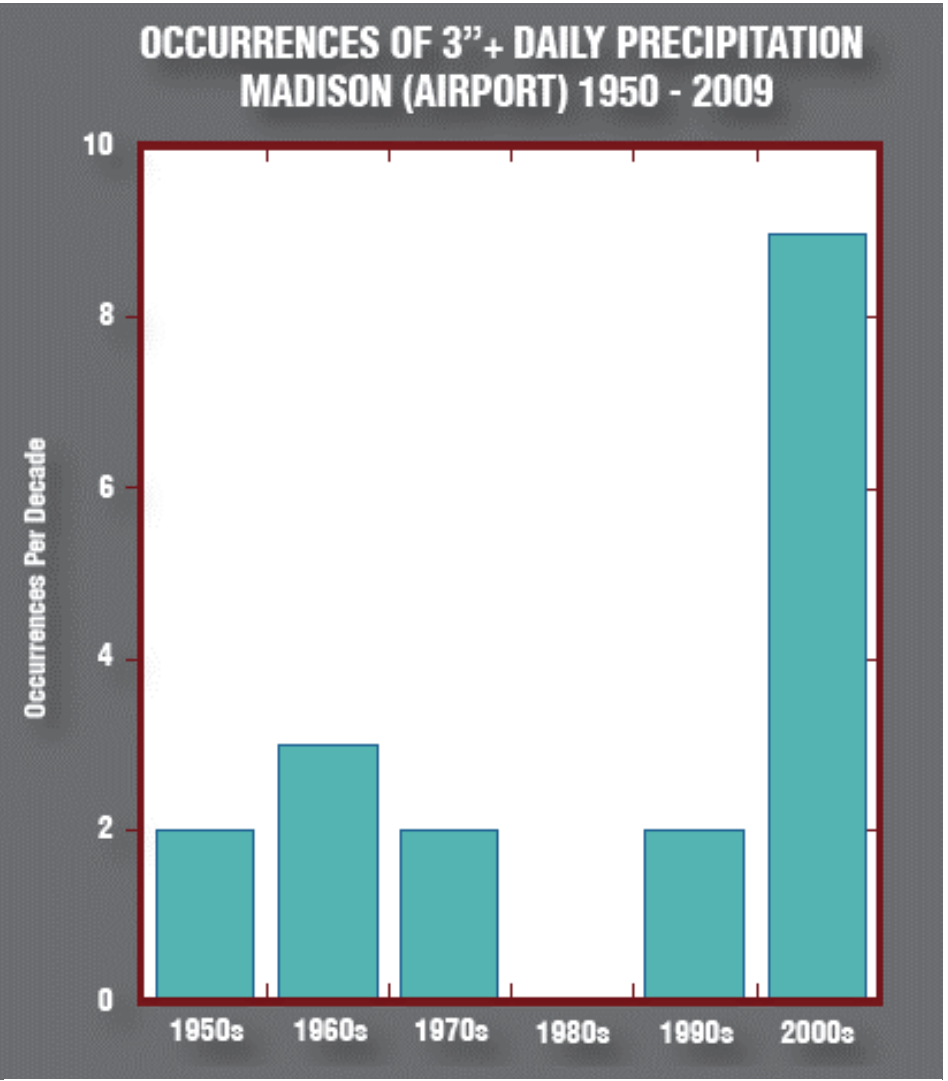
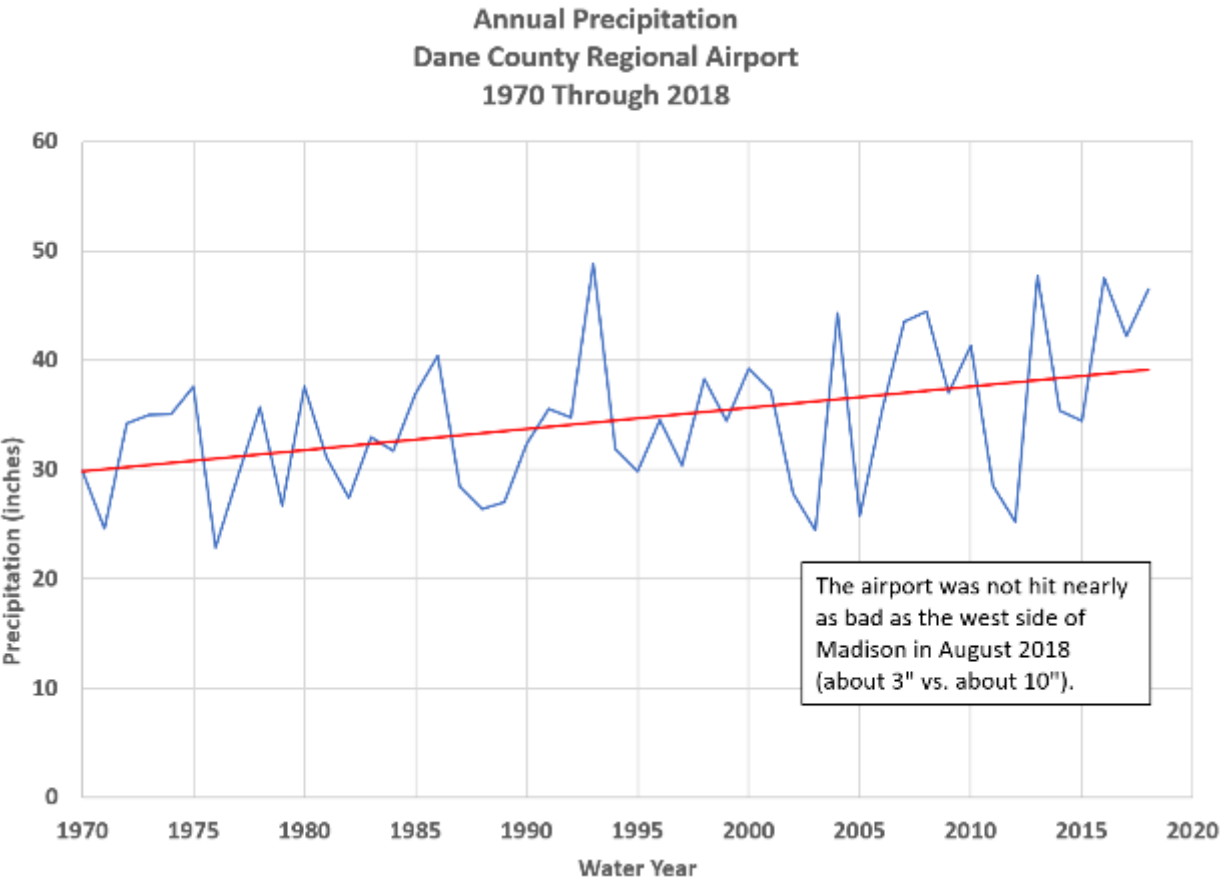
Presentation Overview

1. Why We Are Here
2. Where the Water Goes
3. Reasons for Flooding Issues
4. Watershed Study Goals
5. Next Steps
6. Property Owner Responsibilities
7. How to Stay Involved



Why We Are Here: Historic Events

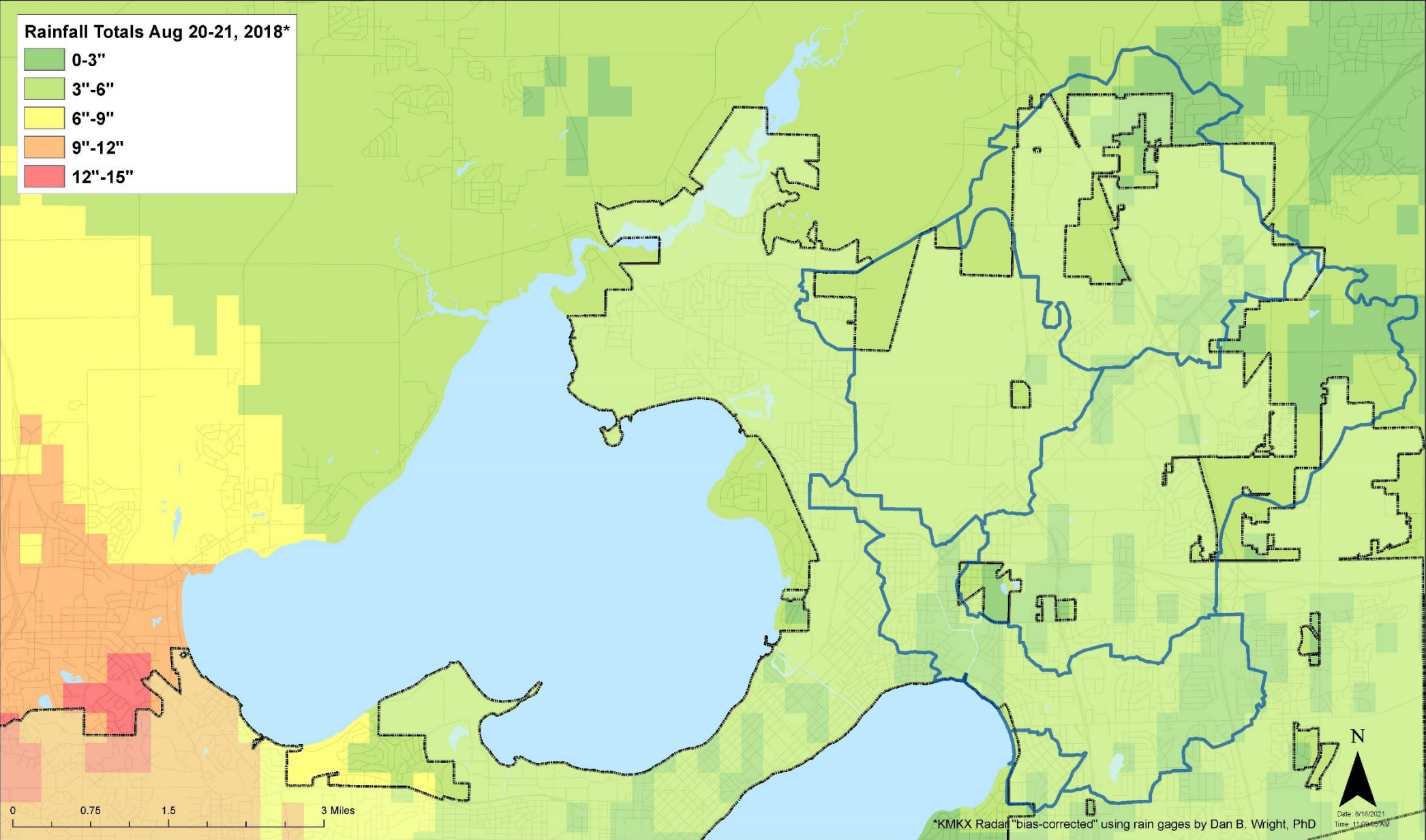
- ▶ More rain
- ▶ More rain events greater than 3"



Wisconsin's Changing Climate: Impacts and Adaptation. 2011. Wisconsin Initiative on Climate Change Impacts. Nelson Institute for Environmental Studies, University of Wisconsin-Madison and the Wisconsin Department of Natural Resources, Madison, Wisconsin.

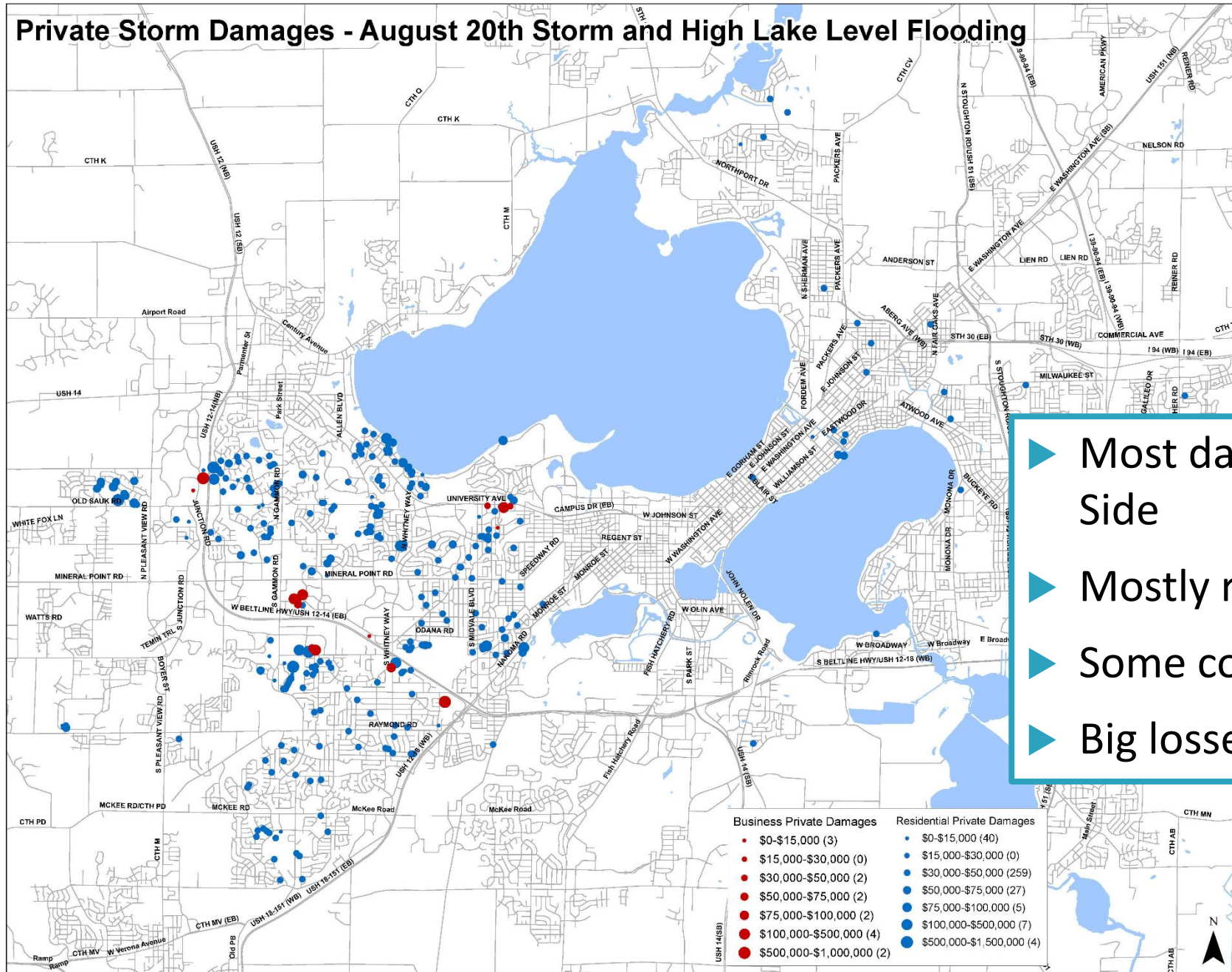


August 20-21, 2018 Event



KMKX Radar that was "bias corrected" using rain gauges by UW Professor Dan Wright

Private Storm Damages - August 20th Storm and High Lake Level Flooding



- ▶ Most damage on the West Side
- ▶ Mostly residential damage
- ▶ Some commercial damages
- ▶ Big losses!

0 0.75 1.5 3 Miles

Date: 11/12/18 Time: 2:00 PM

MADISON



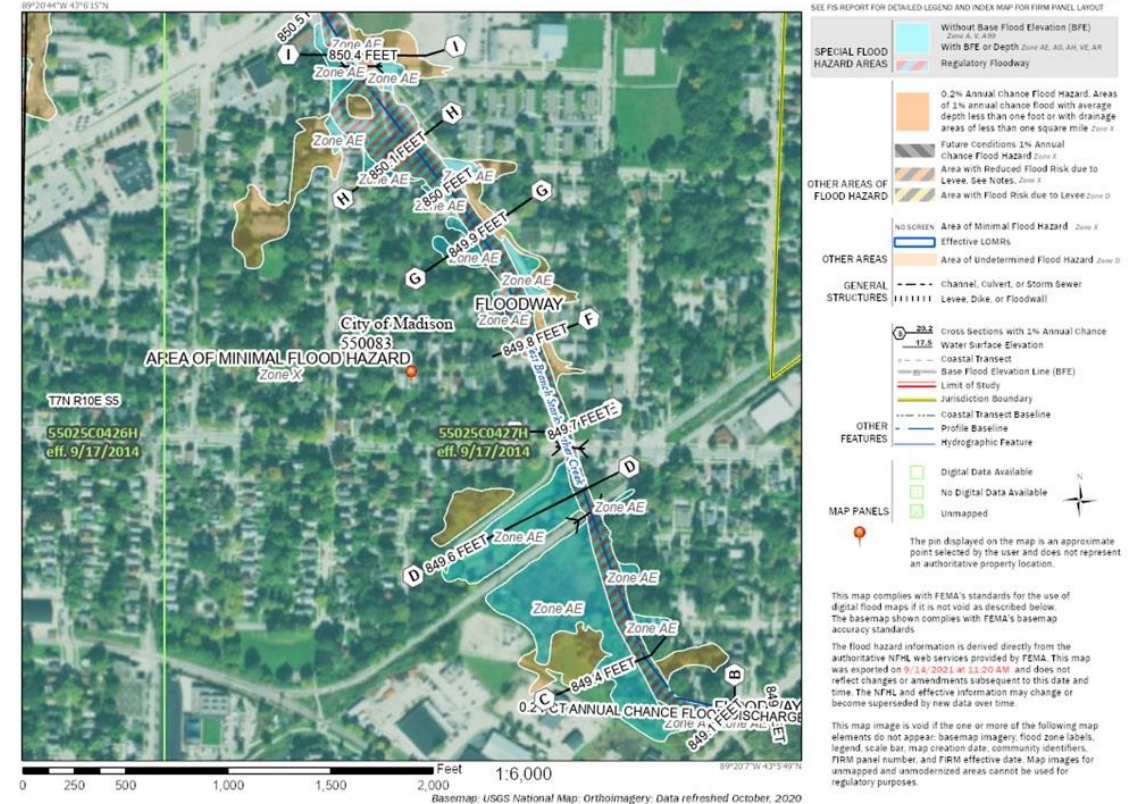
2018 Flooding: Distribution and Impacts, Insights for Future

- ▶ West side experienced more flooding and damage, because of rainfall patterns
- ▶ One of primary purposes of project is to predict where and how much flooding will occur if east side, including Starkweather watershed, has a similar storm
- ▶ Opportunity to be proactive rather than reactive
- ▶ We welcome your historical observations from Starkweather and Olbrich Gardens watersheds, in case there are flooding problems which have been underreported

Floodplains mapped by state (DNR) and federal (FEMA) government

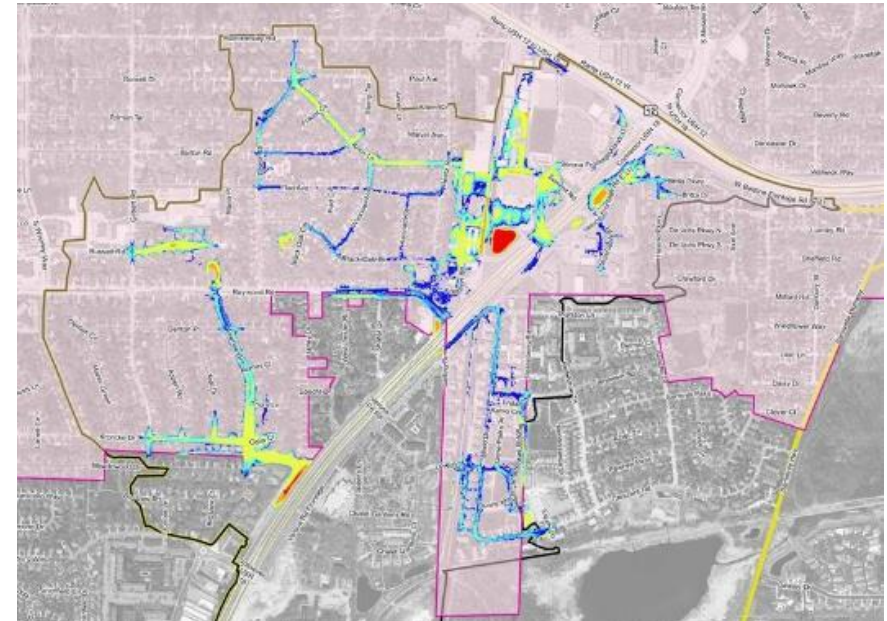
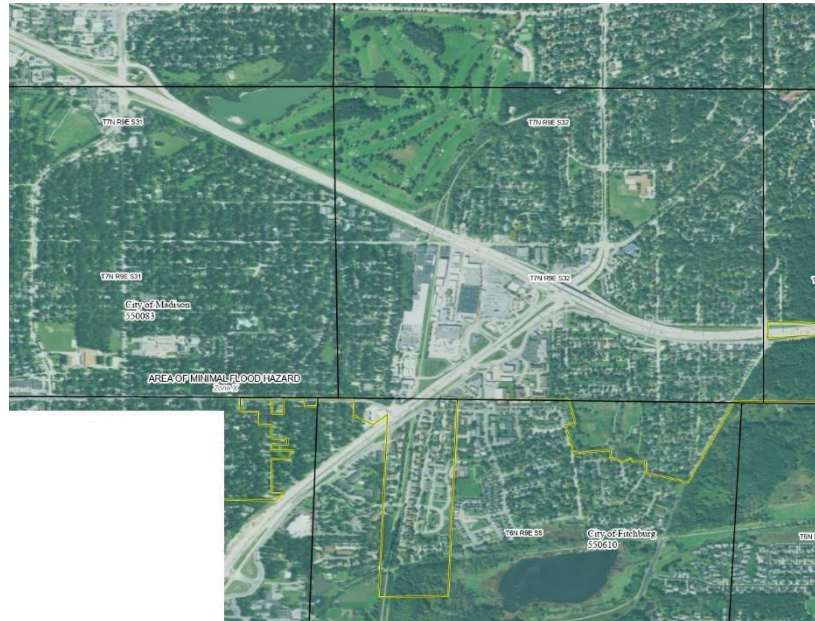
- ▶ Historically, floodplains have been mapped for flood risks associated with midsize and large rivers, lakes and creeks
- ▶ Flooding in 2018 and other recent years showed there are areas of high flood risk outside of officially mapped floodplains

National Flood Hazard Layer FIRMette



Flooding occurs outside of mapped floodplains

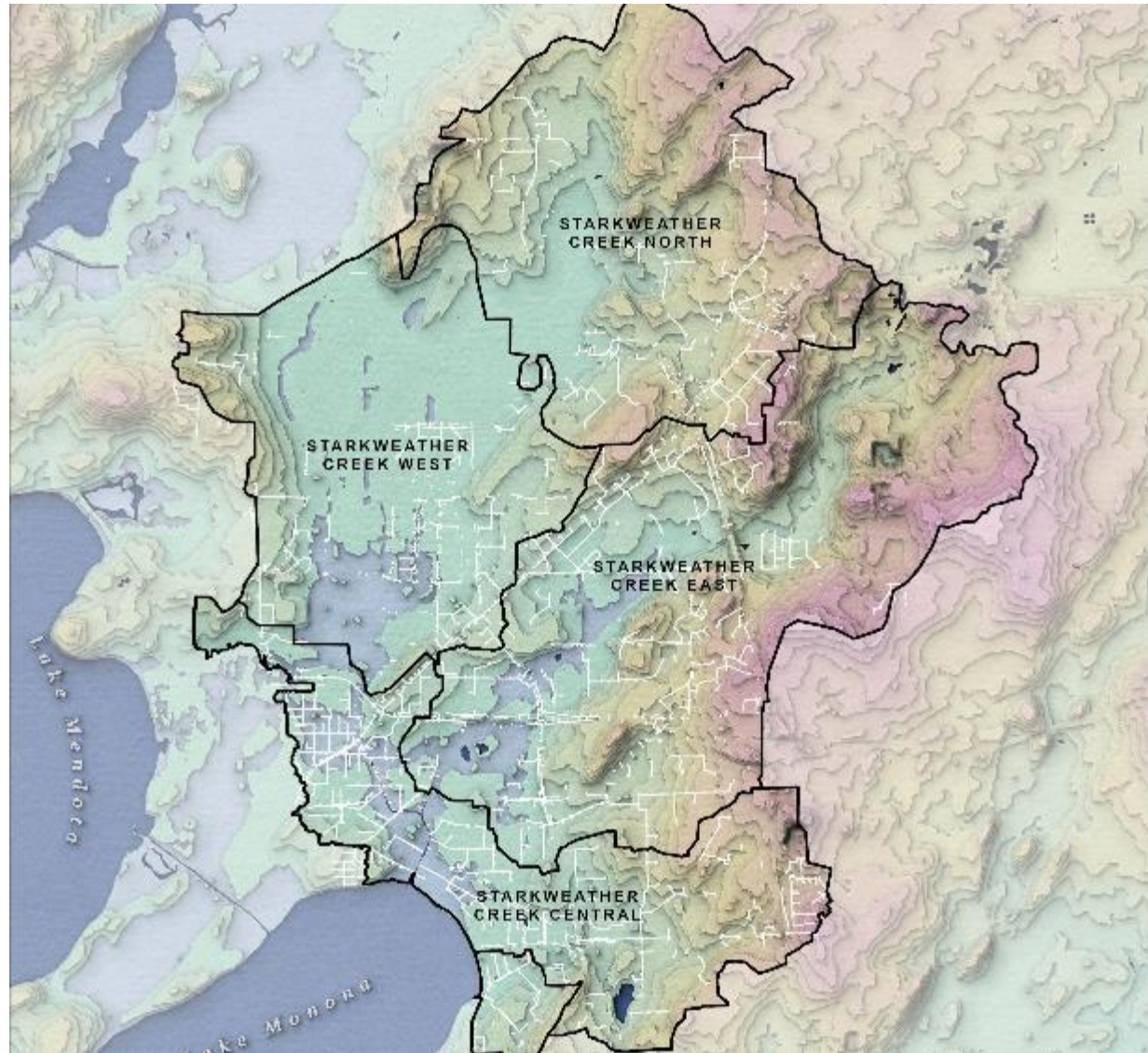
- ▶ Recent flooding and analysis shows there are areas of high flood risk outside of officially mapped floodplains
- ▶ Flood risk because of undersized stormwater drainage systems is typically not mapped by FEMA



Where the Water Goes

What's a watershed?

- ▶ A watershed is the area of land that drains precipitation (rain, snow, etc.) to a common low point, such as an inlet, stream, or lake.
- ▶ Determined by surface terrain and underground pipe system.



Where the Water Goes: Sewer Systems

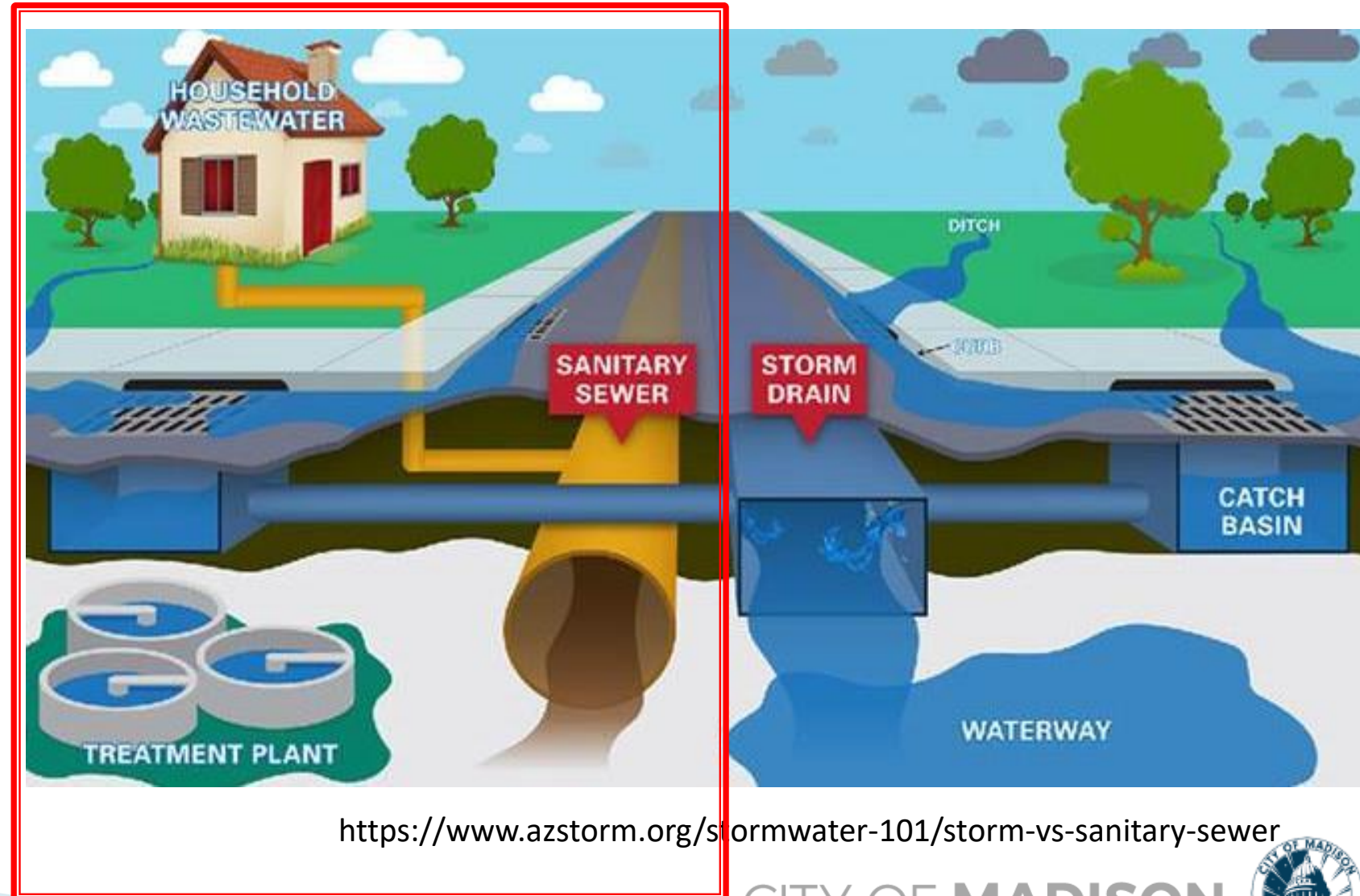
- ▶ Madison has separate storm and sanitary sewers
- ▶ Storm sewer system is NOT the same as the sanitary sewer system



<https://www.azstorm.org/stormwater-101/storm-vs-sanitary-sewer>

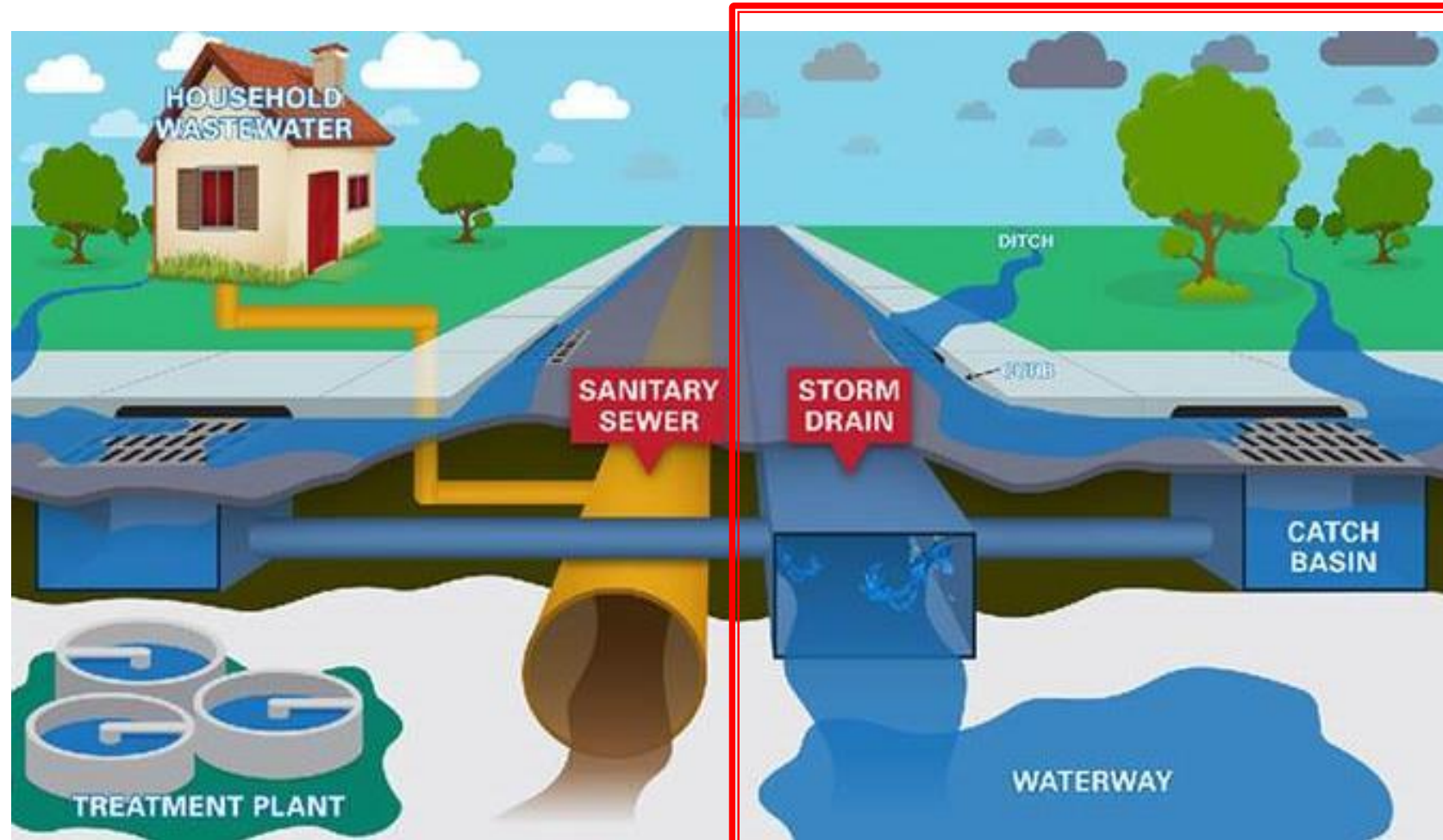
Where the Water Goes: Sanitary Sewer

- ▶ Sanitary sewer drains residential (toilets, showers, kitchen sinks, etc.), commercial and industrial wastewater streams
- ▶ Sanitary sewer transports wastewater to Madison Metropolitan Sewerage District (MMSD) treatment plant
- ▶ Sanitary infrastructure includes:
 - ▶ Manholes
 - ▶ Household lateral pipes
 - ▶ Main collector pipes



Where the Water Goes: Storm System

- ▶ Our stormwater drains to local surface waters
- ▶ We try to treat for nutrients and sediment
- ▶ Storm infrastructure includes:
 - ▶ Curbs and gutters
 - ▶ Inlets
 - ▶ Pipes
 - ▶ Channels (greenways)
 - ▶ Ponds



<https://www.azstorm.org/stormwater-101/storm-vs-sanitary-sewer>

Where the Water Goes: Storm System in Madison



Greenway at Owen Conservation Park



Above: 96" pipe on University Ave (2013)
Below: storm sewer inlet on W Doty St



Reasons for Flooding Issues

- ▶ In many watersheds, flooding is not driven by lake levels
- ▶ This study will include an assessment of how Lake Monona levels affect flooding in Starkweather Creek watershed
- ▶ Yahara Lakes function as a system
 - Solution to problems is increased conveyance through lake chain
- ▶ Website:
<https://lwrdd.countyofdane.com/Yahara-Chain-of-Lakes-Lake-Levels-Task-Force>



<https://www.wiscontext.org/yahara-watershed>

Reasons for Flooding Issues

- ▶ Flash flooding: when storm sewer system cannot handle high amounts of rain
- ▶ Comparative example: a traffic jam
 - Too many cars of the Beltline during rush hour → backups happen
- ▶ During a storm, more water tries to move through the storm sewer system → backups happen



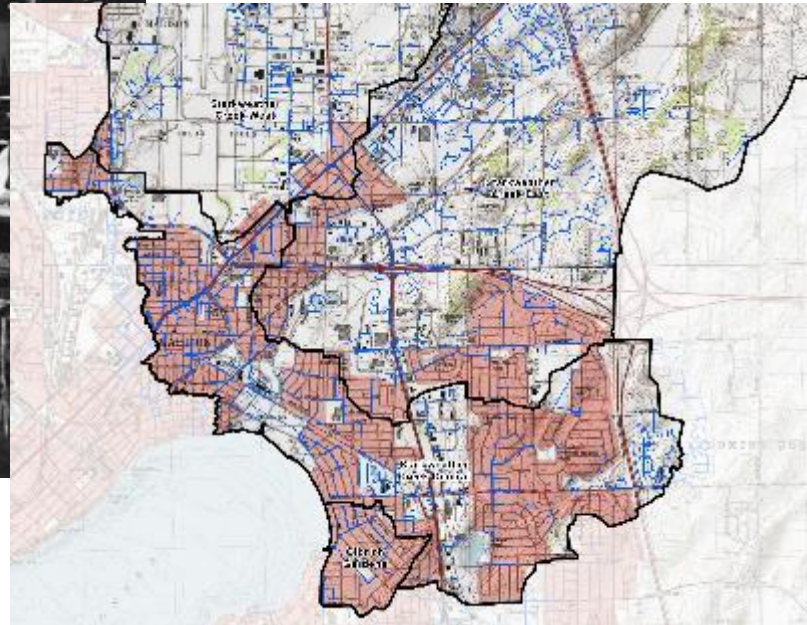
Beltline, looking west from Park Street, WisDOT

Reasons for Flooding Issues

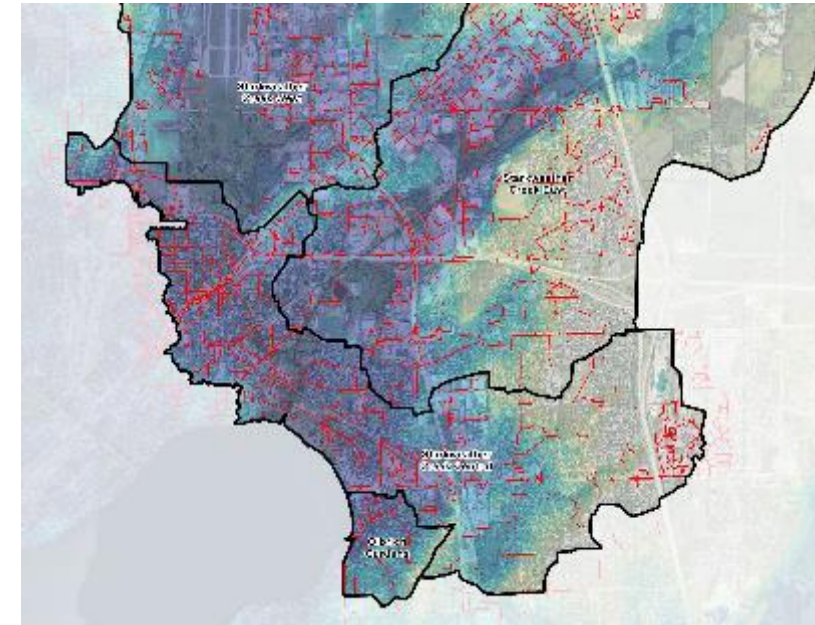
- ▶ Tools have changed in the last five decades.
- ▶ Old tools made data gathering and stormwater modeling difficult.



Photo above:
<https://www.vintag.es/2018/08/life-before-autocad.html>



VS.



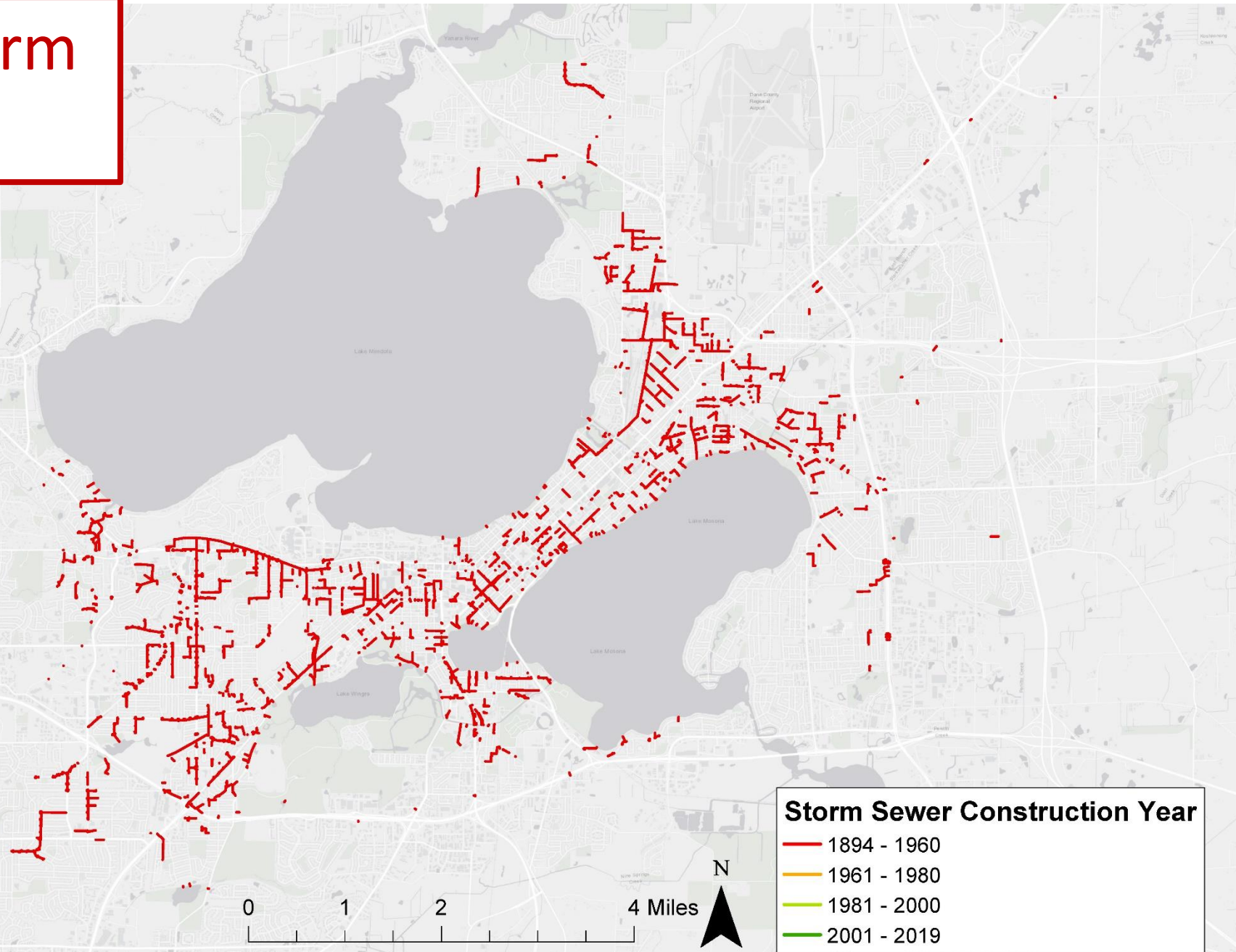
Reasons for Flooding Issues: Changing Design Standards

- ▶ Changing public design standards and past limited private design standards have led to flash flooding.
- ▶ Lax historical building requirements created hard-to-solve flooding problems on private property which cannot be easily corrected.



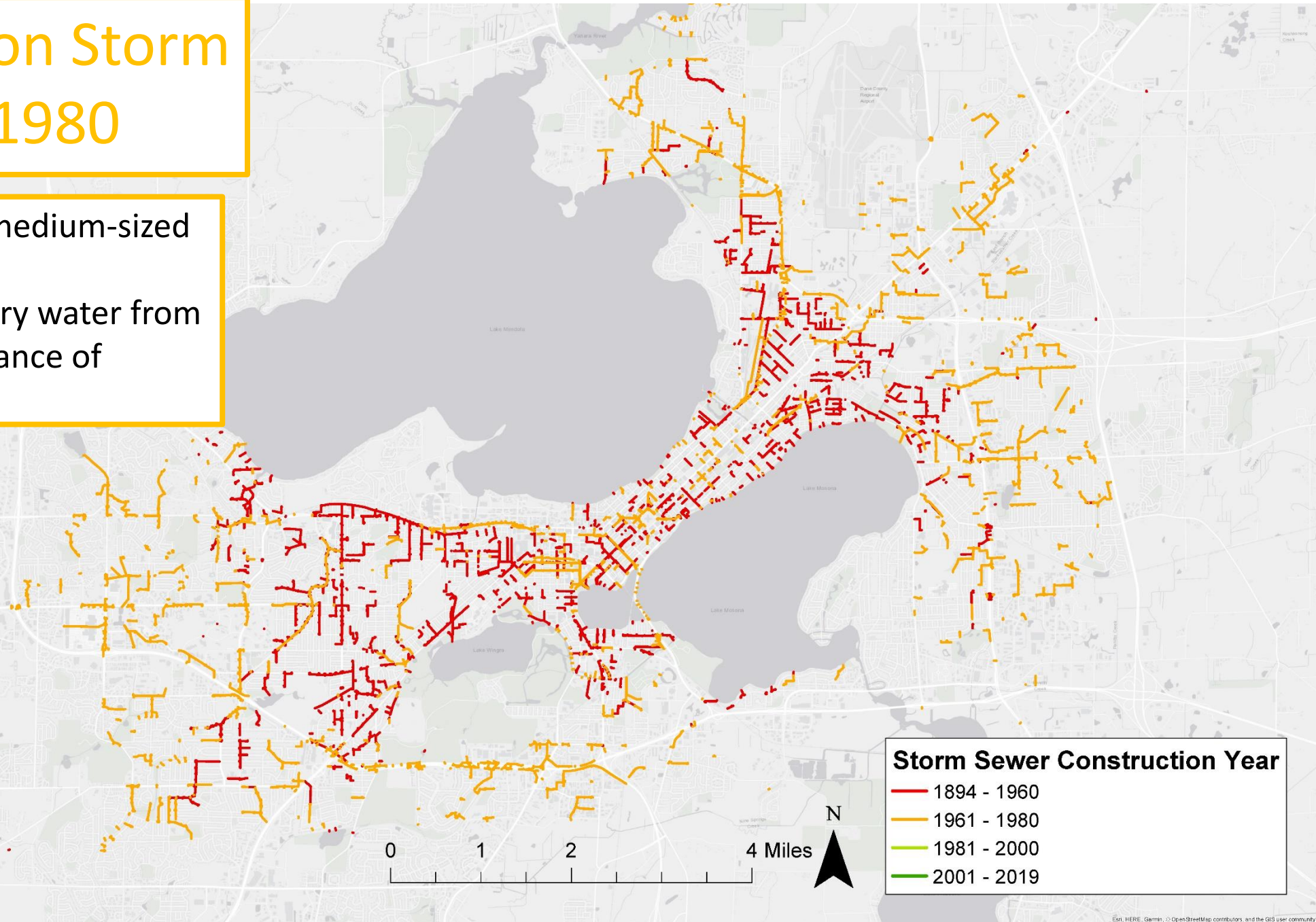
City of Madison Storm Sewer: 1894-1960

- Rule of thumb design
- No flood control



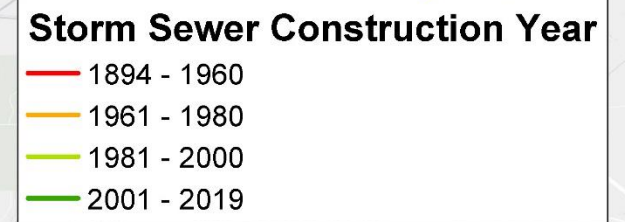
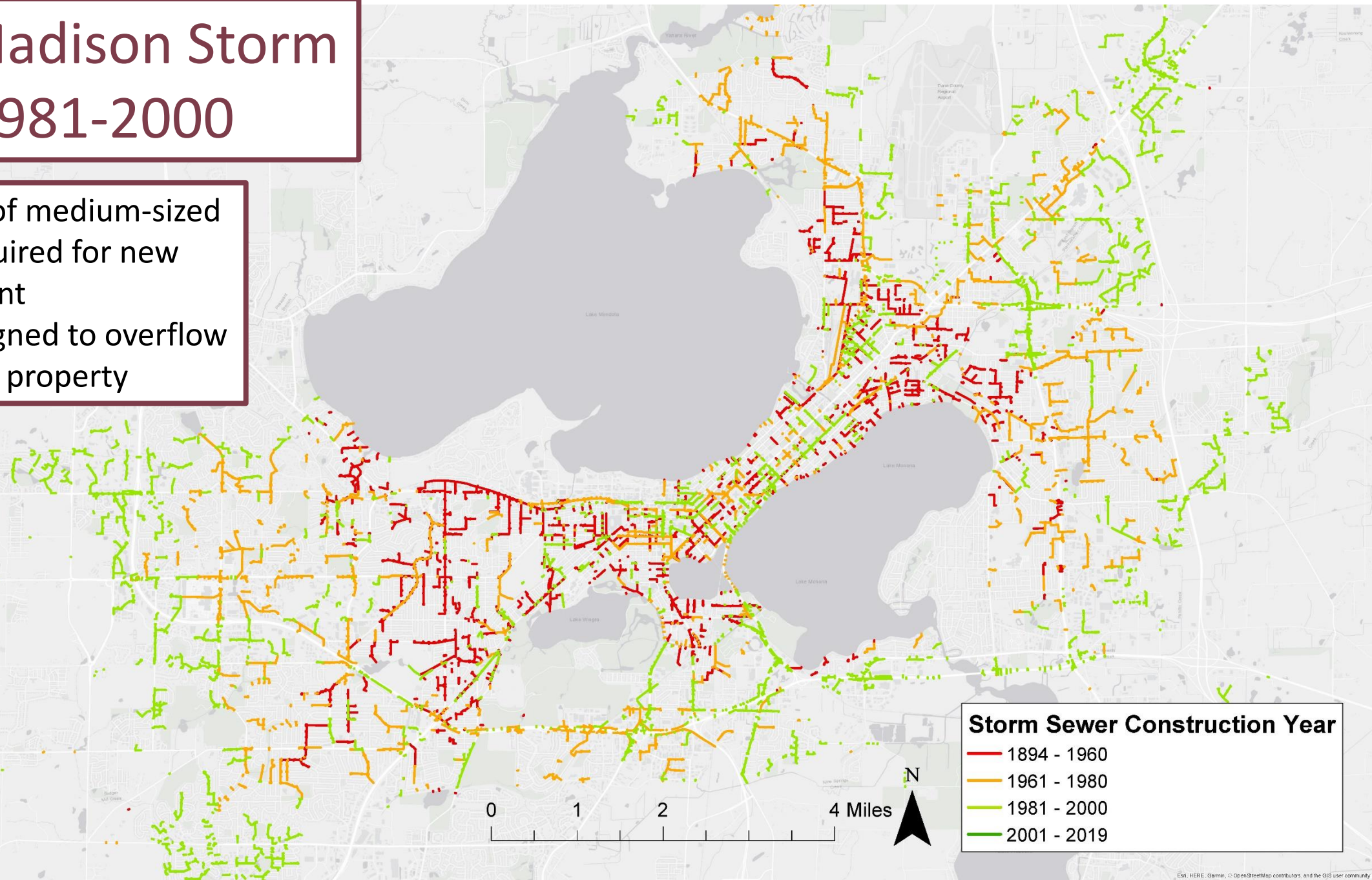
City of Madison Storm Sewer: 1961-1980

- Pipes designed for medium-sized storms
- Culverts sized to carry water from storms with 10% chance of occurring each year



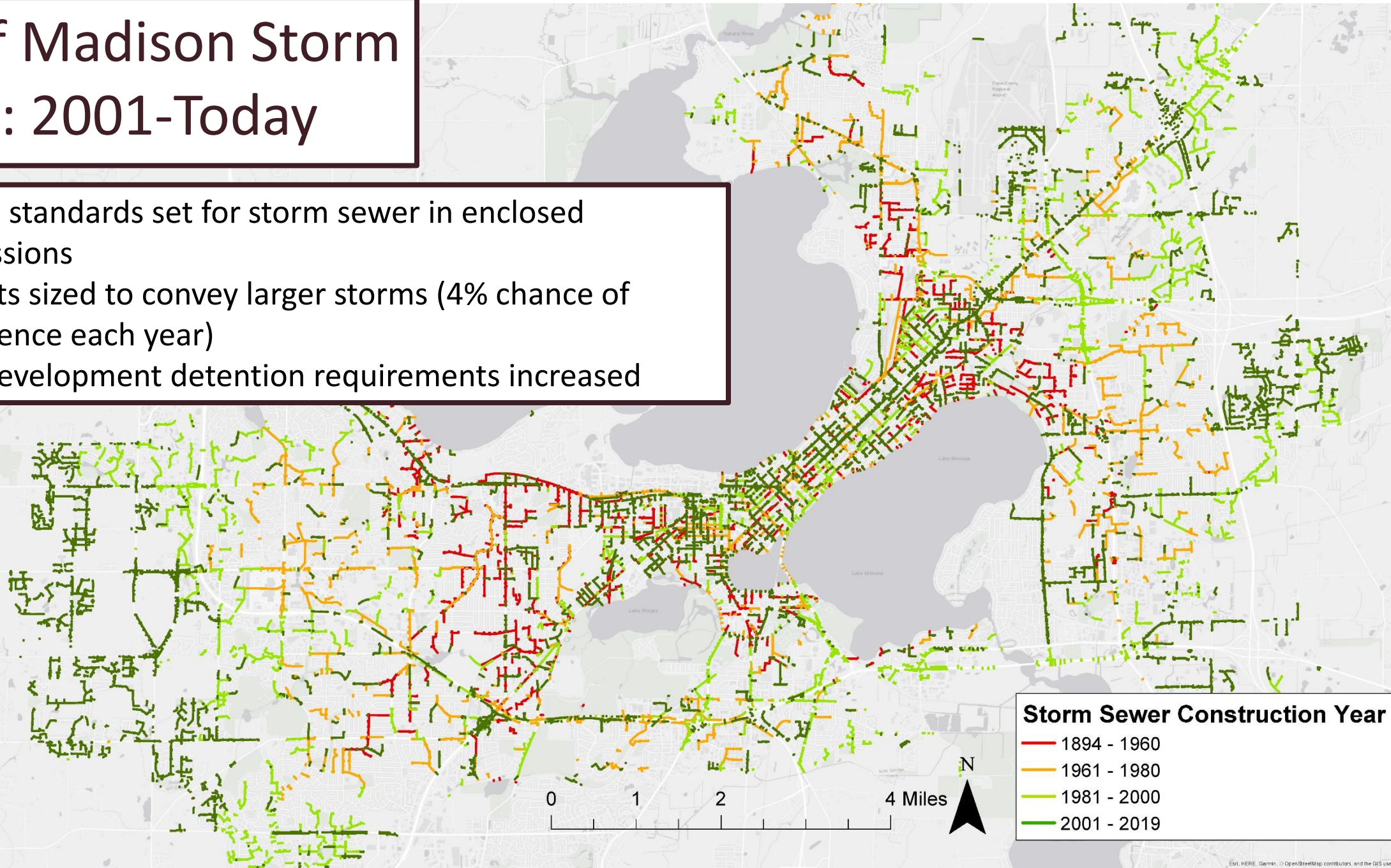
City of Madison Storm Sewer: 1981-2000

- Detention of medium-sized storms required for new development
- Ponds designed to overflow onto public property



City of Madison Storm Sewer: 2001-Today

- Design standards set for storm sewer in enclosed depressions
- Culverts sized to convey larger storms (4% chance of occurrence each year)
- New development detention requirements increased



Why Replacement Takes Time

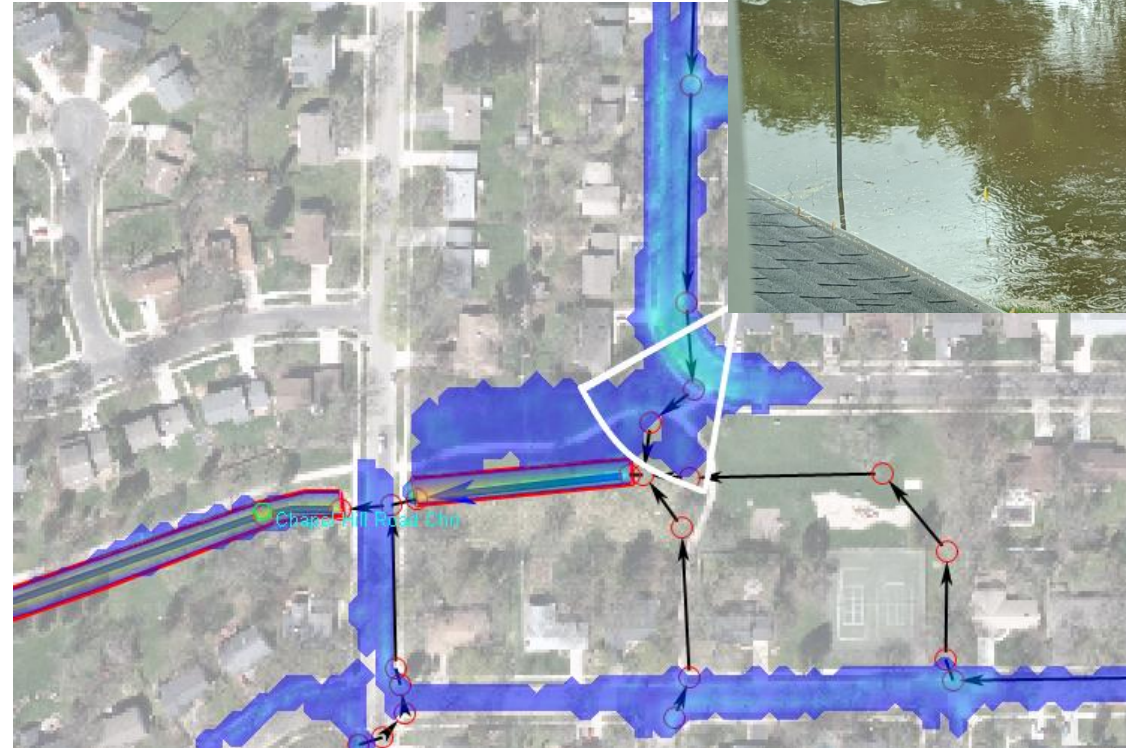
- ▶ Road reconstruction, storm sewer is expensive but long-lasting
 - Road reconstruction cost = approximately \$500-\$2,000/ft
 - 2% City infrastructure is upgraded annually
 - Average life:
 - Street=30-50 years
 - Pipes=50-100 years
- ▶ Storm Water Utility bill
 - 2018 increased 2.3% (avg. residential increase of \$2.15/year)
 - 2019 increased 10.1% (avg. residential increase of \$9.60/year)



96" pipe tunneling on University Ave, Madison, WI
(2013)

Watershed Study Targets

- ▶ Find out why flooding happens in certain locations



Above – Photograph of Actual Flooding Witnessed (June 9, 2020)

Left – Example Watershed Model Output Map (June 9, 2020)

Watershed Study Targets

- ▶ Find out why flooding happens in certain locations
- ▶ System goals
 - Eliminate flooding from storm sewer during storms with a 10% chance of occurring each year (4" of rain in a day)



N. High Point Road at Old Sauk Road, Madison, WI

Watershed Study Targets

- ▶ Find out why flooding happens in certain locations
- ▶ System goals
 - Eliminate flooding from storm sewer during storms with a 10% chance of occurring each year (4" of rain in a day)
 - Cars can pass down the middle (highest) part of the street during a storm with a 4% chance of occurring each year (~5" of rain in a day)



Winding Way, Madison, WI

Watershed Study Targets

- ▶ Find out why flooding happens in certain locations
- ▶ System goals
 - Eliminate flooding from storm sewer during storms with a 10% chance of occurring each year (4" of rain in a day)
 - Cars can pass down the middle (highest) part of the street during a storm with a 4% chance of occurring each year (~5" of rain in a day)
 - Structure and major roadway damage is eliminated for storms with a 1% chance of occurring each year (6.5" of rain in a day)
 - Flooding extents known during storms with



Regent St at Kenosha Ave, Madison, WI

Watershed Study Targets

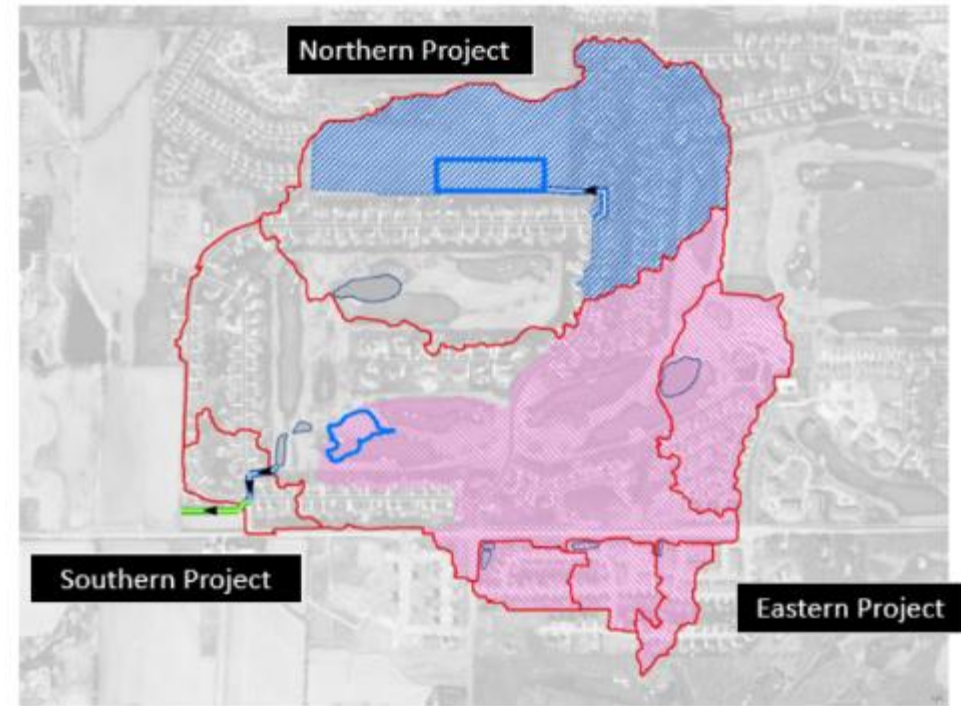
- ▶ Find out why flooding happens in certain locations
- ▶ System goals
 - Eliminate flooding from storm sewer during storms with a 10% chance of occurring each year (4" of rain in a day)
 - Cars can pass down the middle (highest) part of the street during a storm with a 4% chance of occurring each year (~5" of rain in a day)
 - Structure and major roadway damage is eliminated for storms with a 1% chance of occurring each year (6.5" of rain in a day)
 - Flooding extents known during storms with a 0.2% chance of occurring each year (8.96" of rain in a day)



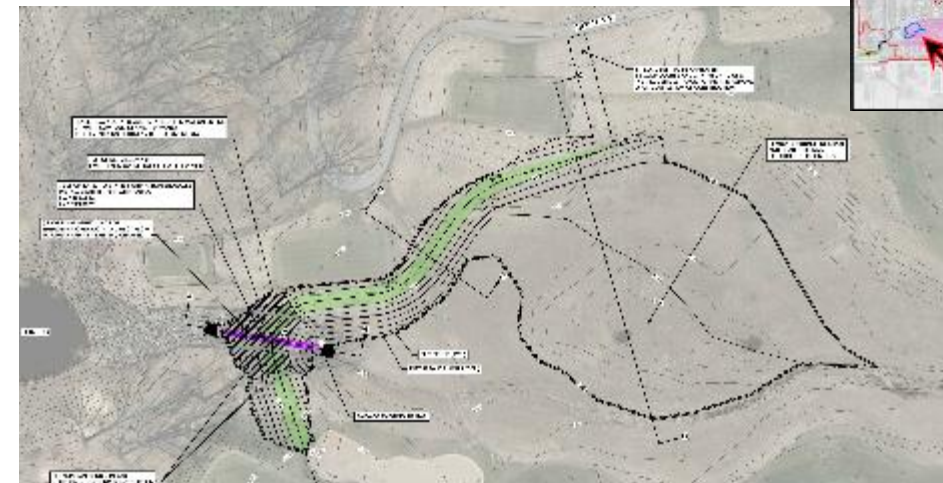
Tenney Park, Madison, WI

Watershed Study Targets

- ▶ Find out why flooding happens in certain locations
- ▶ System goals
- ▶ Test Solutions
 - ▶ Lots more detail gets added in final design
 - ▶ Will help prioritize and budget future projects



Above: Model-Level Solution Evaluation
Below: Design Level Detail



Watershed Study Limitations

- ▶ Retrofitting infrastructure takes time and money
- ▶ Repairs are not always easy, popular, or cheap
- ▶ Not always a good solution
- ▶ Property owners will need to create solutions too
- ▶ Solutions will need broad community cooperation
- ▶ Groundwater problems not easily addressed by watershed modeling and surface infrastructure
- ▶ Not a water quality study

Starkweather Creek Water Quality Concerns

- High suspended sediment
 - This is dirt smaller than a grain a sand
- High phosphorus
 - This is food for plants and also for algae in lakes
- PFOS/PFAS
 - Chemicals used in firefighting foams that are not good for humans even at very low levels
 - Fish advisories for Starkweather Creek and Lake Monona
- High Chloride levels
 - This is from road and parking lot salt (NaCl)
 - Too much is hard on fish and bugs in the water
 - Please take this survey:
 - <https://www.capitalarearpc.org/starkweather-creek-chloride-survey/>



High TSS is bad for streams



Blue Green Algae Bloom on Yahara River June 16th, 2017



Madison Fire Department Switches to PFAS Free Foam



Winter Maintenance has an impact on creek

Water Quality Improvement Efforts

- ▶ Starkweather Creek has water quality goals
 - Goal to Reduce Suspended Sediment by 73% and Total Phosphorus by 61%
 - In Starkweather Creek
 - City is at 27% TSS reduction and 19% TP reduction
 - We have a way to go.
 - City of Madison Fire switch to a PFAS free foam
 - WI Saltwise promotes safe roads and reduced salt with certification program
 - Capital Area Regional Planning Commission created Salt reduction plan

<https://www.capitalarearpc.org/being-salt-wise-for-starkweather-creek/>

- Friends of Starkweather Creek volunteer to improve the watershed, creek habitat and increase the recreational opportunities on the creek.

<https://starkweatherfriends.org/>



For more information on Starkweather Creek Water Quality Improvement Programs, reach out to Phil Gaebler: pgaebler@cityofmadison.com

Next Steps

Model Existing Conditions & Predict Future Flood Risk

Analyze Solutions on Watershed Scale, Rank & Budget

**Create
Drainage
Model**

**Identify
Flooding
Impacts**

**Develop
Engineering
Solutions**

**Prioritize
& Budget**

Next Steps

**Create
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**Identify
Flooding
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**Develop
Engineering
Solutions**

**Prioritize
& Budget**

- ▶ Gather model input data
- ▶ Install equipment and measure rainfall and channel flow
- ▶ Build computer models to represent rainfall-runoff-routing
- ▶ Compare model to data
- ▶ Determine extent of past flooding

Next Steps

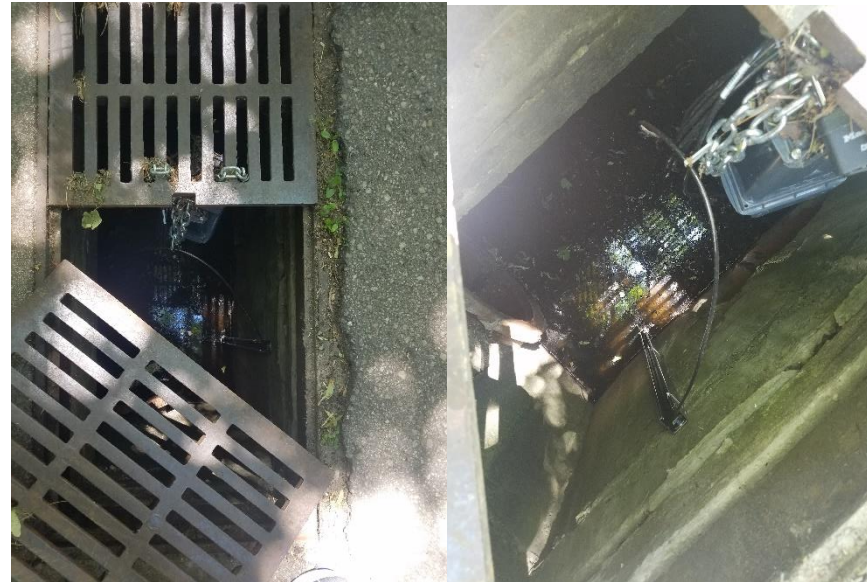
Create Drainage Model

- ▶ What does modeling the Starkweather Creek and Olbrich Gardens watersheds involve?
 - ▶ Watershed area: 15,740 acres (about 25 square miles)
 - ▶ 117 miles of City-owned storm sewer
 - ▶ 10 miles of City-owned major drainage-ways (open channels)
 - ▶ About 15,700 parcels, primarily residential, with over 1,000 commercial
 - ▶ ~6,340 inlets

Next Steps

Create Drainage Model

- ▶ What you might see in the watershed



Above: Storm Sewer Flow Meter
Left: Rain Gauge



Above: surveyor in the field.
Photo courtesy of Amber Lefers (AE2S).

Next Steps

Create
Drainage
Model

Identify
Flooding
Impacts

Develop
Engineering
Solutions

Prioritize
& Budget

- ▶ See how well existing storm sewer system meets goals



Commerce Drive near
Plaza Drive, Madison, WI

Next Steps

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Flooding
Impacts

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Engineering
Solutions

Prioritize
& Budget

- ▶ Must be holistic
- ▶ Not “move the problem elsewhere”
- ▶ Account for climate change
 - ▶ Look at **trending increases** in storm frequency and intensity
- ▶ Consider long term maintenance needs
- ▶ Provide benefits relative to cost

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What are some general options?

- ▶ Improve pipe and/or inlet capacity
- ▶ Safe overflow paths
- ▶ Reroute flow
- ▶ Increase storage / detention
- ▶ Flood-proof buildings
- ▶ Local landscaping / grading
- ▶ Solutions on private property to structures or land



CITY C



Next Steps

Create
Drainage
Model

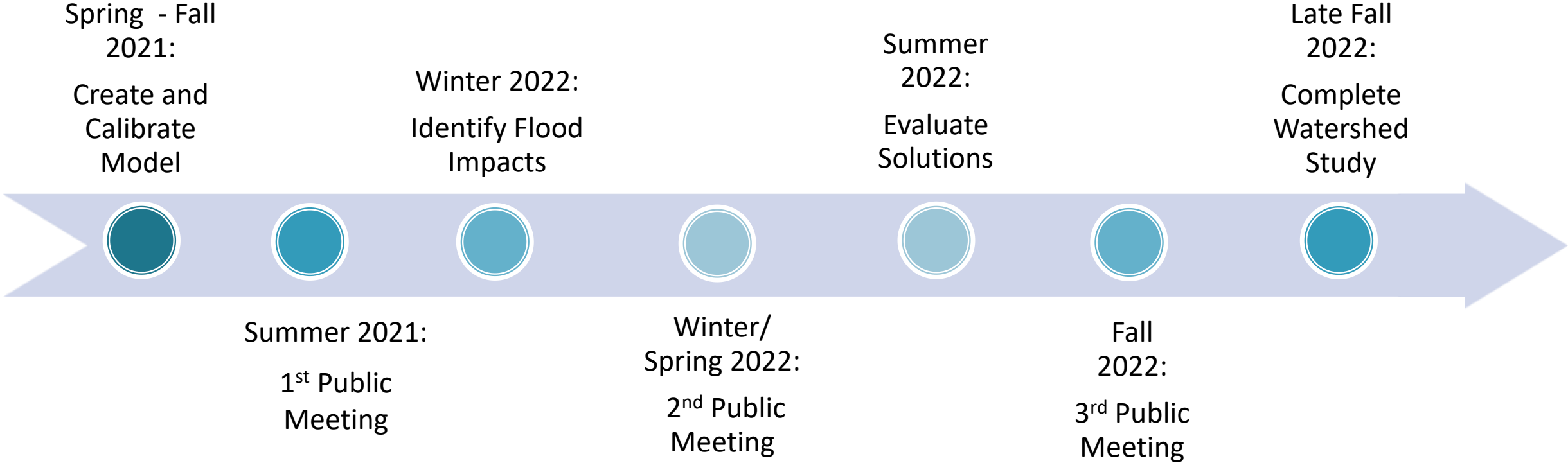
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Prioritize
& Budget

- ▶ Improvements require time and money
 - ▶ Some solutions are long-term, sustained community efforts (green infrastructure)
 - ▶ Some solutions are discrete, high capital-cost projects (box culverts, pond, etc.)
- ▶ Solutions prioritized based on:
 - ▶ Frequency, severity and damage (cost-benefit)
 - ▶ Emergency response routes
 - ▶ Areas with other projects scheduled (road repair, etc.)
 - ▶ Within a Neighborhood Resource Team area

Next Steps



Property Owner Responsibilities

- Self-report Online Survey: document and share data during rain events
 - www.cityofmadison.com/flooding
WE NEED YOU TO REPORT ON-LINE TO INFORM OUR STUDY!
- Understand local drainage and how to protect your property
- Install backflow preventers and sump pumps
- Consider supplemental insurance
- Focus group/stakeholder meeting participation

Report Flooding & Damage

Please use this form to report **Non-Emergency** issues only.

- **Emergencies:** If you or someone else is at risk or needs help, or if the maintenance item is an emergency condition, please call **911**.
- **Stormwater Emergencies:** If clogged grates or blocked waterways are causing an imminent threat to your property, please call (608) 266-4430

Please use this form to report flooding and damage to private property or public lands, including City parks. This form is for reporting flooding in the **City of Madison** only.

We will use this information to prioritize repairs and to plan for upgrades to our City stormwater infrastructure to reduce flooding damage in the future. Thank you for your time.

Flooding Type

Flooding Type * *required*

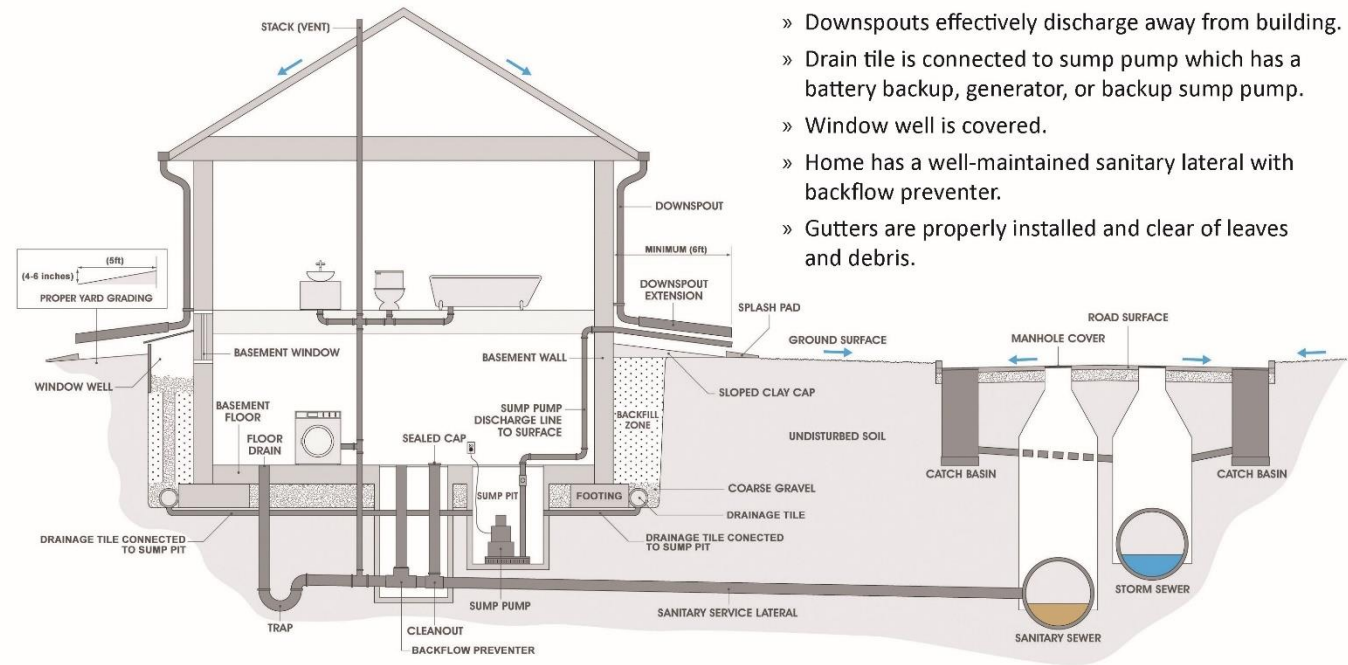
- Home or Building (Private Property)
- Street Flooding
- Park, Bike Path, Pond or Greenway, or Other

NEXT

Property Owner Responsibilities

- Self-report Online Survey
- Understand local drainage and how to protect your property
www.cityofmadison.com/floodprotection
- Install backflow preventers and sump pumps
- Consider supplemental insurance
- Focus group/stakeholder meeting participation

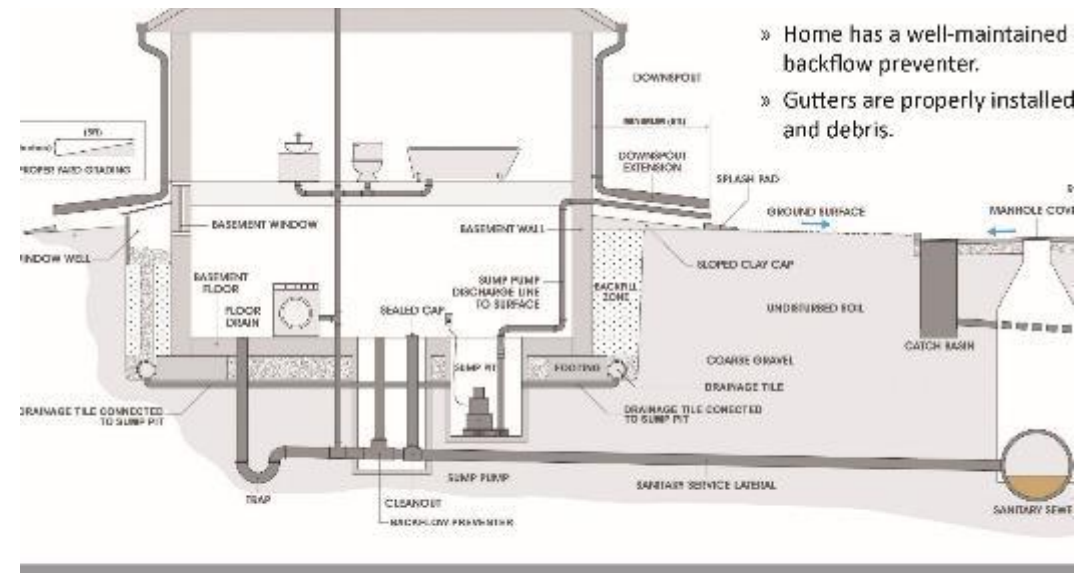
Good Flood Prevention



- » Foundation, wall, and sewer are in good condition.
- » Ground sloped away from the building.
- » Downspouts effectively discharge away from building.
- » Drain tile is connected to sump pump which has a battery backup, generator, or backup sump pump.
- » Window well is covered.
- » Home has a well-maintained sanitary lateral with backflow preventer.
- » Gutters are properly installed and clear of leaves and debris.

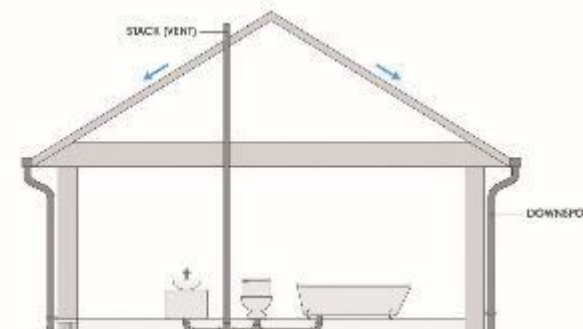
Property Owner Responsibilities

- Self-report Online Survey
- Understand local drainage and how to protect your property
- **Install backflow preventers and sump pumps**
- Consider supplemental insurance
- Focus group/stakeholder meeting participation



- » Home has a well-maintained backflow preventer.
- » Gutters are properly installed and debris-free.

Basement Flood Prevention



- » Foundation, wall, and sewer lateral are cracked.
- » Ground is sloped towards the basement.
- » Downspouts discharge near the foundation.
- » Drain tile is illegally connected to the exterior.
- » Window well is not covered and has debris.
- » No sump pump.
- » No backflow prevention installed on sanitary sewer lateral.
- » Gutters are cracked/loose/sagging and full with debris.

Property Owner Responsibilities

- Self-report Online Survey
- Understand local drainage and how to protect your property
- Install backflow preventers and sump pumps
- Consider supplemental insurance – **contact your private insurance agent for more information**
- Focus group/stakeholder meeting participation



Property Owner Responsibilities

- Self-report Online Survey
- Understand local drainage and how to protect your property
- Install backflow preventers and sump pumps
- Consider supplemental insurance
- Focus group/stakeholder meeting participation: for regional issues that affect more than one person

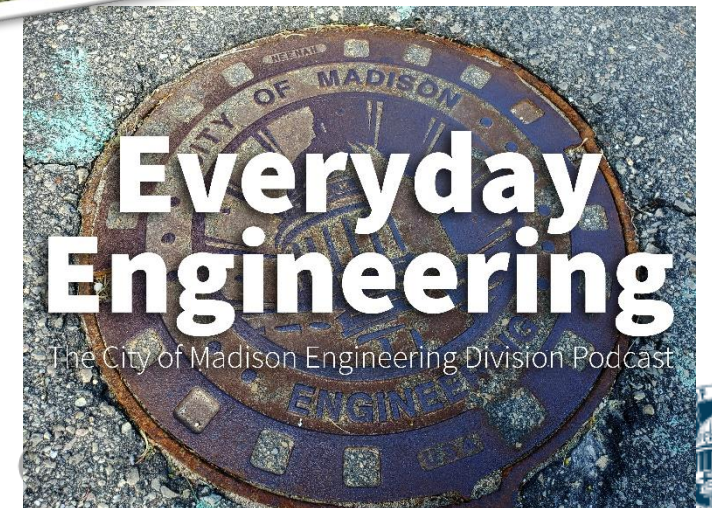
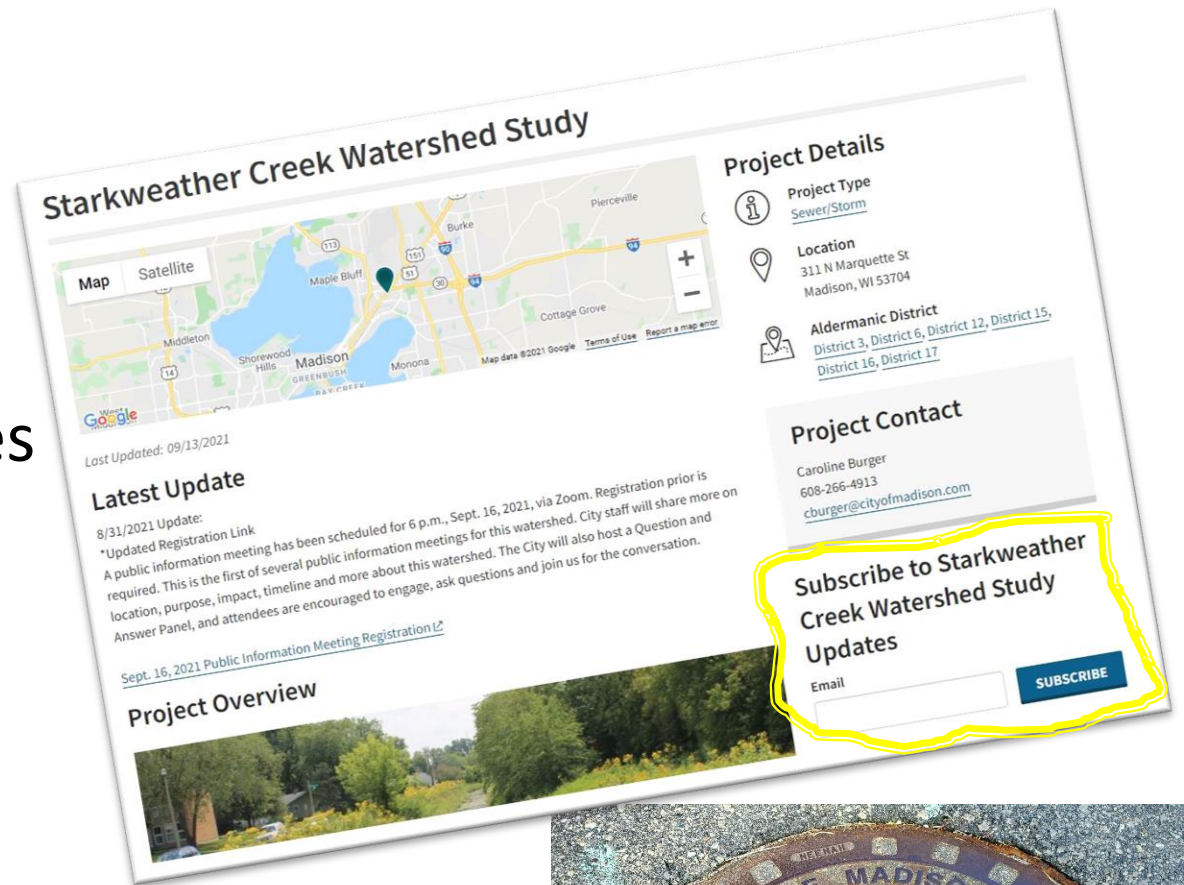


Property Owner Responsibilities

- **Be a good neighbor!** Understand how your water could have negative impacts on your neighbor's property.
- Install rain gardens and/or rain barrels etc.
- **Have a plan** to protect yourself during a flash flood warning.
- Become a better steward of your watershed.
 - Adopt an Inlet
 - Remove leaves from the street
 - <http://www.ripple-effects.com/>

How to Stay Involved

- ▶ www.cityofmadison.com/flooding
 - Report Flooding Survey
- ▶ Individual Watershed Studies Pages
 - Sign up for updates!
- ▶ How you can prevent flooding at your home
- ▶ Everyday Engineering Podcast
 - Historic Flooding and Basement Drainage episodes
- ▶ Focus Group/Stakeholder Meetings



How to Stay Involved

- ▶ Attend the Public Information Meetings
- ▶ Focus Group/Stakeholder Meetings
 - Complete the survey to let us know how you'd like to engage
 - Posted on the Project Webpage
www.cityofmadison.com/StarkweatherCreekWatershed

Take Our Survey!

We'd love to hear from you on how you would like the City and project team to engage with you on the Starkweather Creek and Olbrich Gardens Watershed Study.

[Public Engagement Survey](#) ↗

Next Public Information Meeting

- ▶ Winter / Spring 2022
 - Present stormwater and flood model findings
 - Specific to the watershed
 - Refine data and model
 - Use as a 'fact check' with residents



Contact Information & Resources

- Project Manager: Caroline Burger, cburger@cityofmadison.com
- Public Information Officer: Hannah Mohelnitzky, hmoelnitzky@cityofmadison.com
- Project Webpage: www.cityofmadison.com/StarkweatherCreekWatershed
 - Engagement Survey
 - Sign-up for project email updates on the website
 - Report flooding, past or current on the Report Flooding form
 - Learn ways to protect your property from flooding with on-site fixes
- New Flooding Website: www.cityofmadison.com/flooding
- Everyday Engineering Podcast
- Facebook – City of Madison Engineering
- Twitter – @MadisonEngr



Question and Answer Session

