



# Floodplain Resilience Action Plan

*May 14, 2026 Regular Board Meeting*

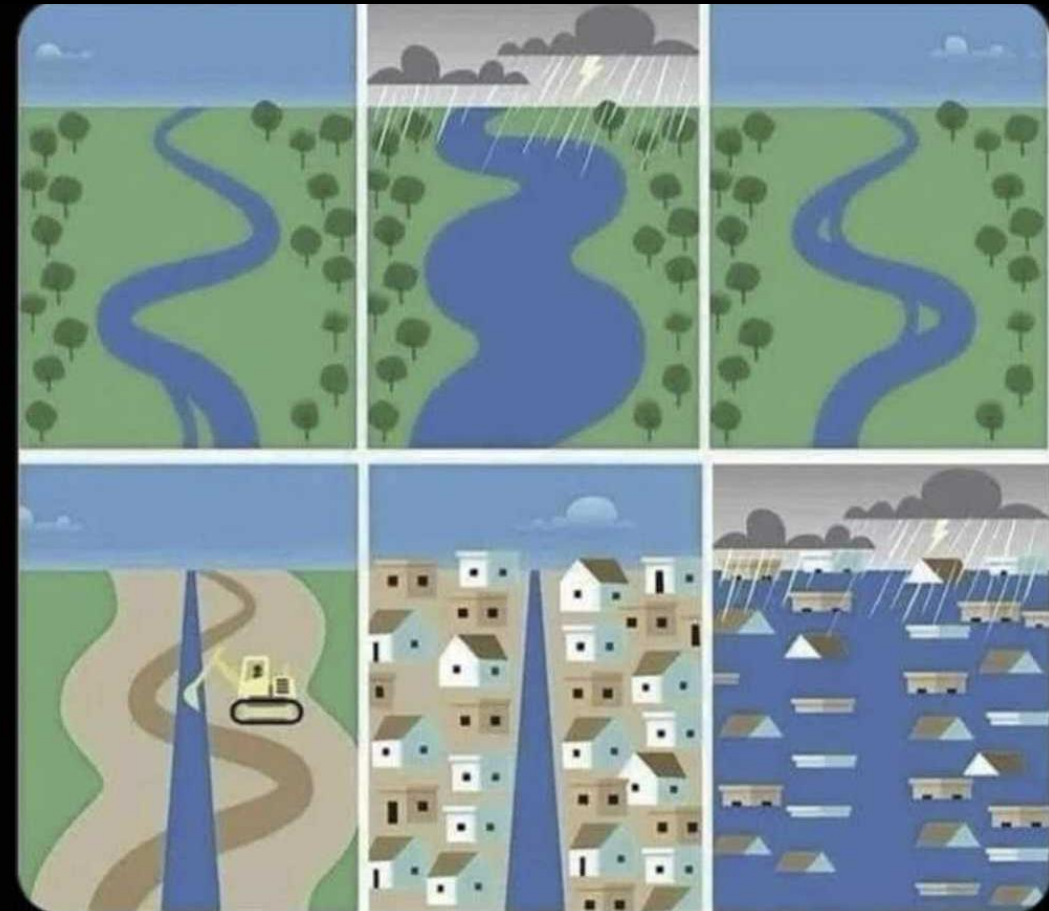


Sunrise River Flowing Through Shallow Pond Wetland Complex

## Presentation Outline

- Setting the Stage: CLFLWD conditions, goals, priorities.
- Planning Process Overview: How do we do resiliency planning?
- Planning Process Steps: Recap of what we accomplished.
- Next Steps: Where do we go from here?

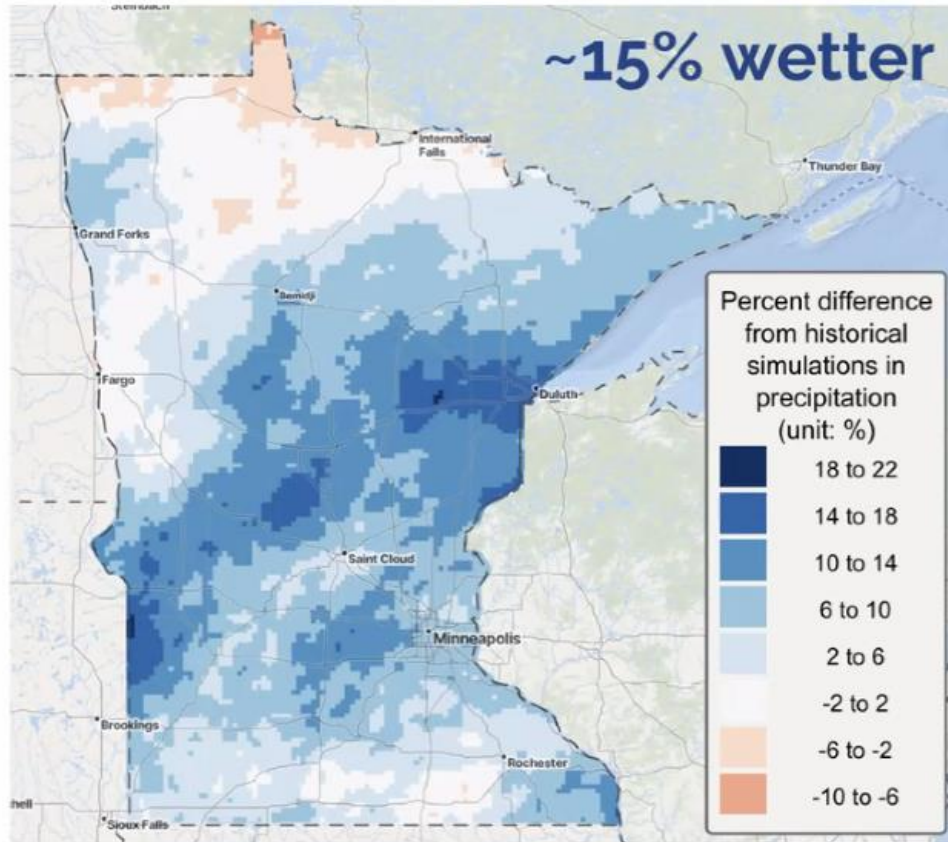
## Undeveloped Area Flood Response VS Developed Area Flood Response



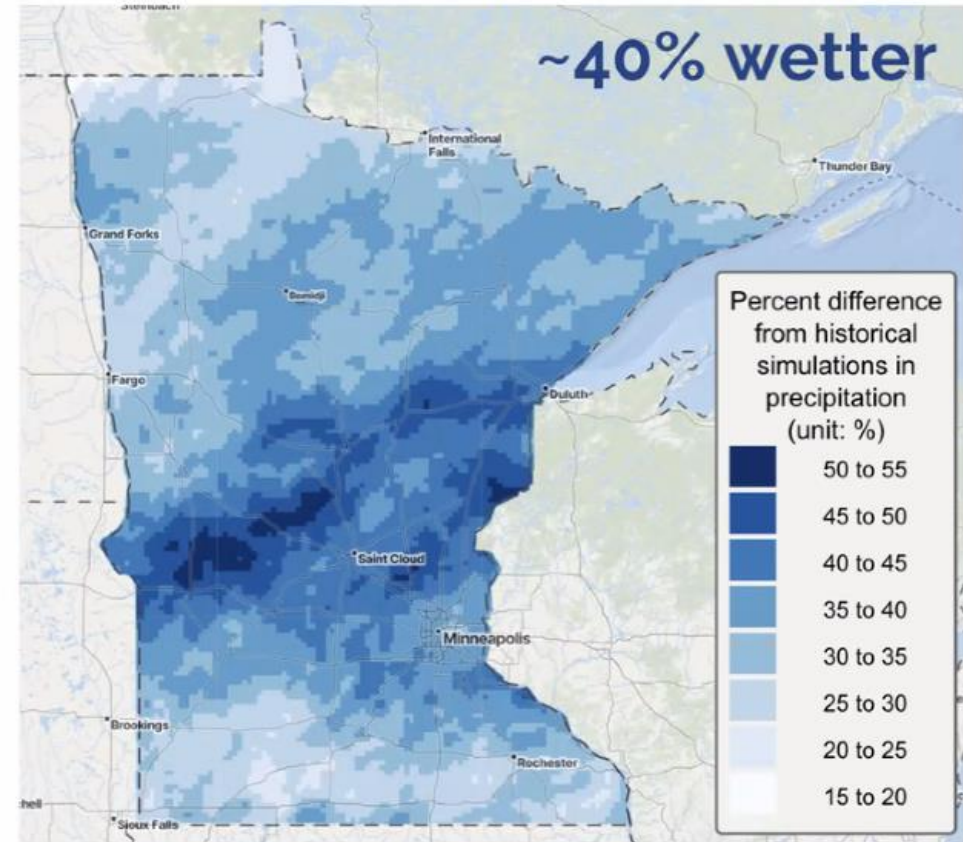
# Climate change = wetter spring season

## Average percent change in spring precipitation

Mid-century (2040-2059)



End-of-century (2080-2099)



very high emissions (SSP585); relative to 1995-2014

Data: UMN Climate Adaptation Partnership, 2024



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# Minnesotans are concerned & want to see action

60%

of  
Minnesotans

would like to see an **increase in the use of wind, solar, and other renewable energy** to power homes and businesses.

64%

of  
Minnesotans

think we **should prepare for climate change** by preserving & conserving our state's **grasslands, forests, and wetlands**.

83%

of  
Minnesotans

think **local, state and municipal governments are responsible** for addressing climate change in the state.

Source: UMN MCAP, CFANS, Caravan Climate Opinion Poll, Sept. 2022

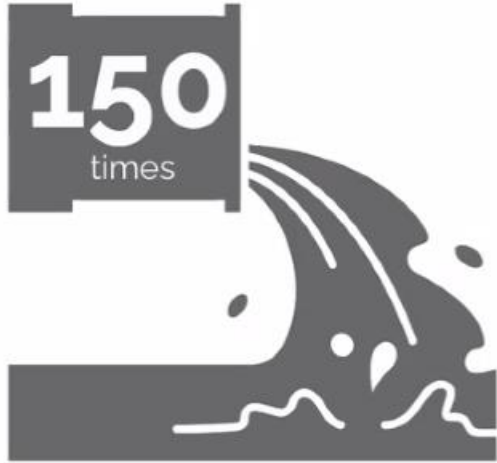


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# Today's Extremes Bring Risks & Costs to Minnesotans

Wastewater overflows into Minnesota lakes & streams



on average per year due to wet weather

Current flood risks threaten



across Minnesota.

Extreme weather events have caused insurance premiums to increase



across Minnesota since 1998

Insurance Federation of Minnesota, MPCA, 2024, NCA5, 2023



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# Adaptation Is Essential. Many Actions Bring Co-Benefits.





For every dollar invested in natural climate solutions practices, Minnesota would receive

**\$8.55**  
in public benefits  
by 2050

## NEWS:

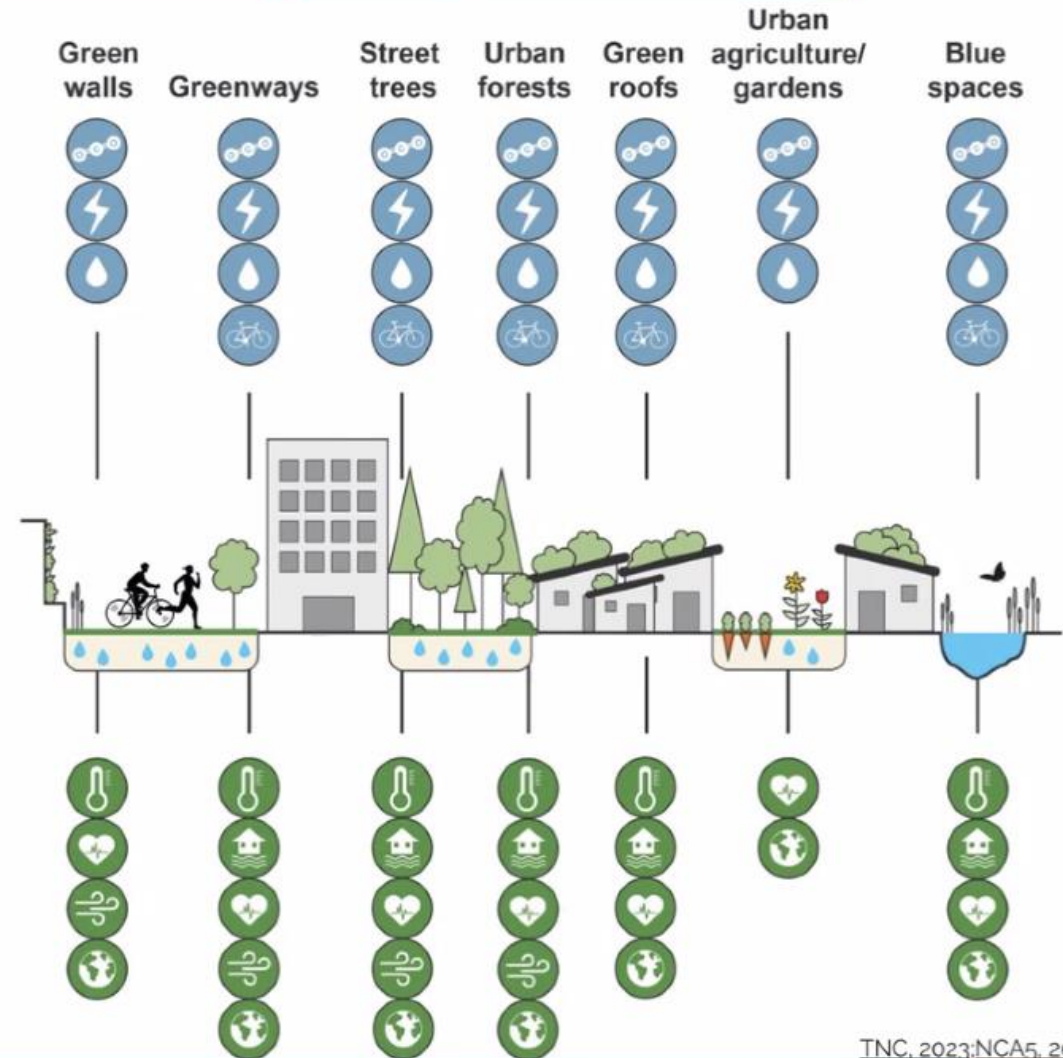
March 2026 MPCA study estimates that a reactive approach is 8-15x more costly than a proactive approach to climate adaptation

### Mitigation benefits

-  Sequester and store carbon
-  Reduce building energy use
-  Reduce municipal water use
-  Facilitate active mobility

### Adaptation co-benefits

-  Reduce heat stress
-  Reduce flooding
-  Improve health
-  Improve air quality
-  Promote biodiversity

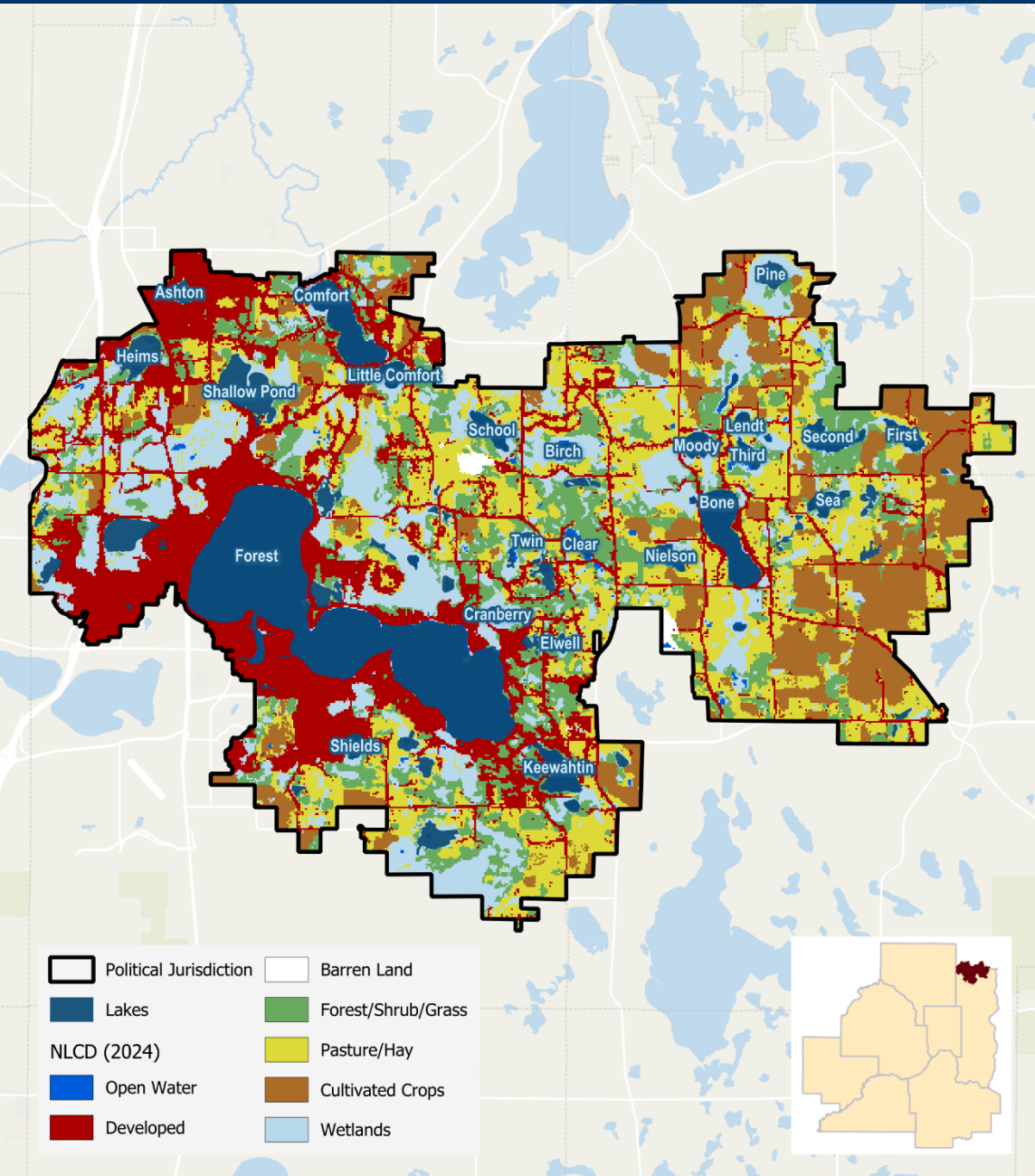


TNC, 2023; NCA5, 2023



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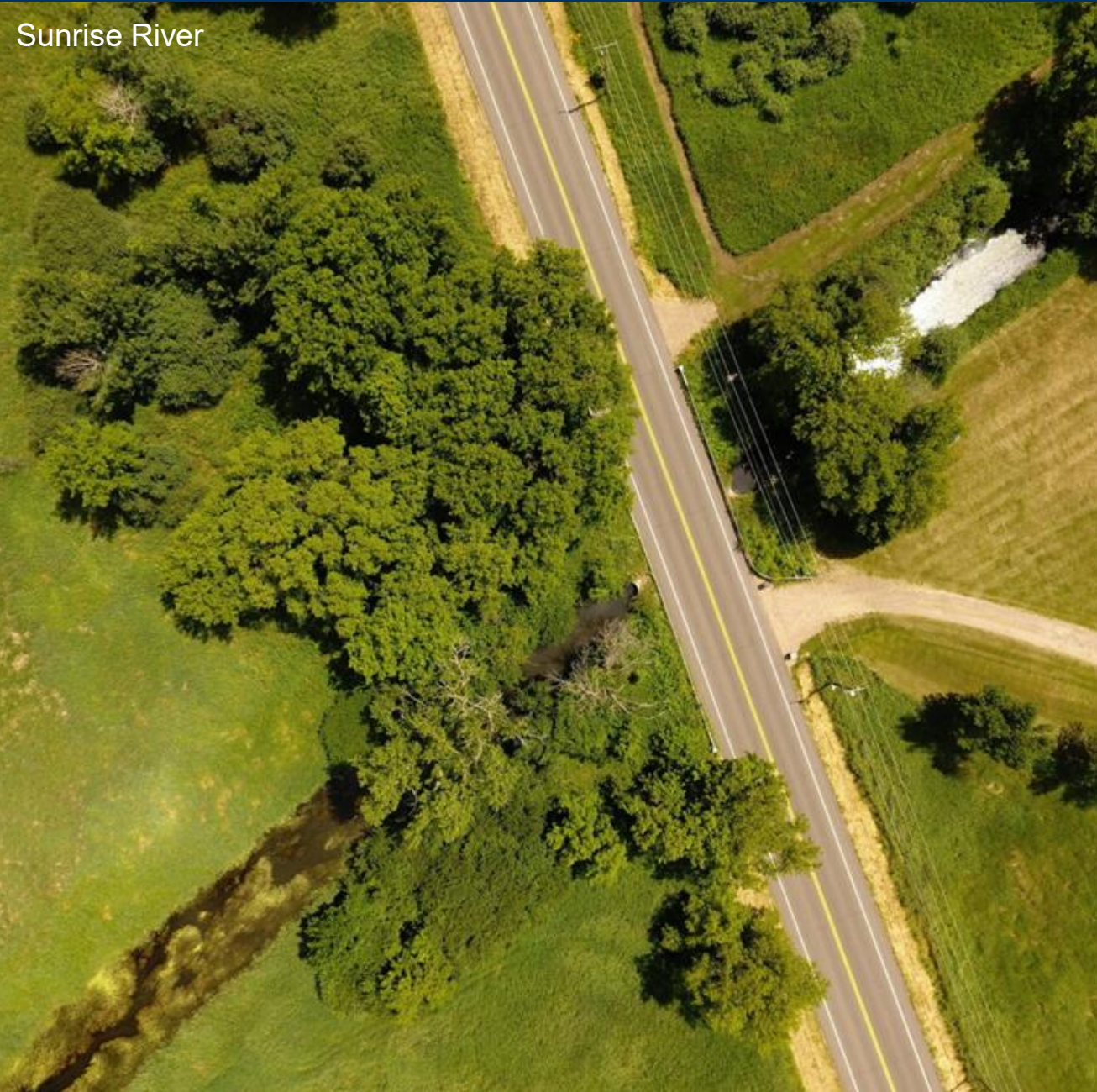
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## CLFLWD Snapshot – Setting the Stage

- Northeast edge of Twin Cities Metro Area
- Part Metro (Washington County), part Greater Minnesota (Chisago County)
- Cities of Forest Lake, Wyoming, Scandia, Chisago City, Chisago Lake Township, small portion of Franconia Township
- Urban, suburban, agricultural land uses
- Large portion of 49 square mile Watershed District is **open water, wetlands, and ditched wetlands**

Sunrise River



## CLFLWD Mission:

- Protect and enhance local ecosystems and natural water resources.

## Priorities:

- Primary Issues – Lake water quality, stream water quality, and floodplain management
- Secondary Issues – Wetlands, upland habitat, and groundwater

## Floodplain Goals:

- Add 99 acre-feet of storage
- Improve community preparedness and emergency response capacity to flooding by sharing modeling and mapping with communities

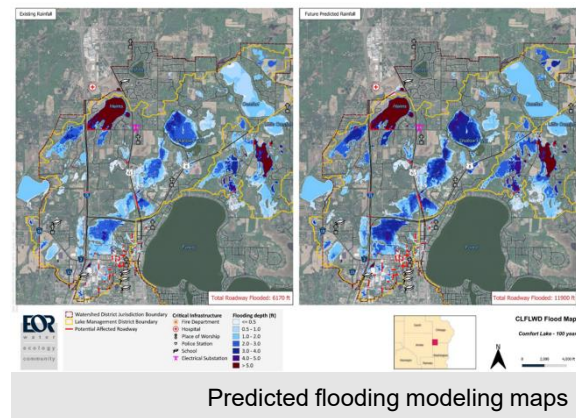
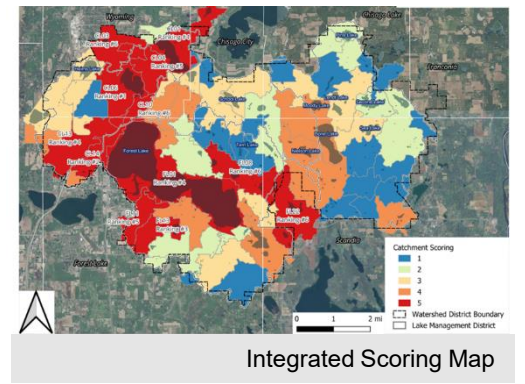
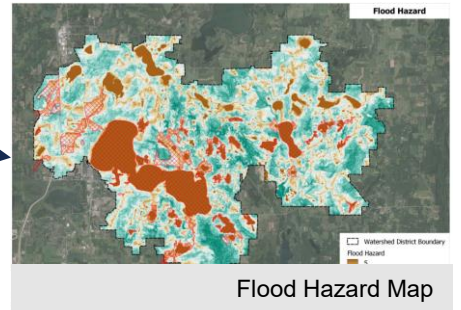
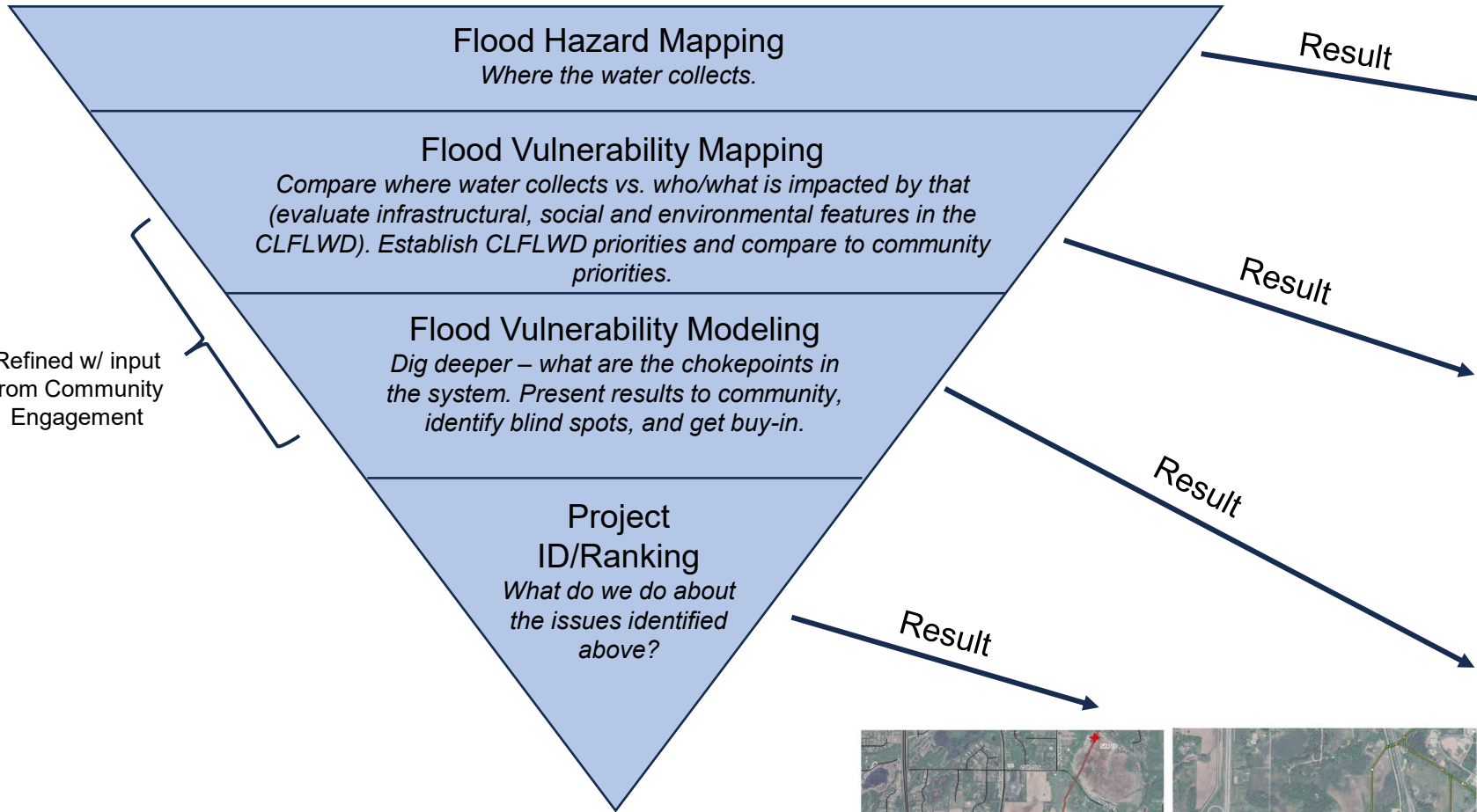
Sunrise River/Highway 61 Wetland Restoration Project  
26 ac-ft of floodplain storage toward 99 ac-ft goal



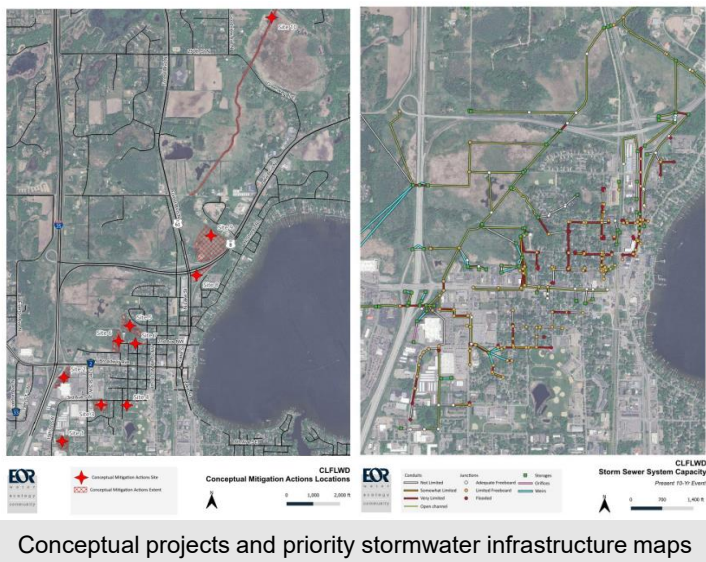
## Assessment Purpose

- Help target **WHERE** to add the needed 99 acre-feet and implement other mitigation strategies
- Help identify **WHO/HOW** to build community preparedness
- Inclusive process to build trust in the community and strengthen partnerships; CLFLWD is the local technical expert/resource
- As of now we've achieved 40 ac-ft out of the 99 ac-ft goal by implementing projects with multiple benefits
  - Primarily water quality improvement
  - Also created flood storage, wildlife habitat, groundwater conservation, etc.

Course  
Level of Detail  
Fine



# Resiliency Planning Process




## Establish Design Storm

*Intergovernmental meetings to discuss consistency across climate modeling scenarios*

- Atlas 15 not yet available
- Mean value of Atlas 14 is not reflective of anticipated increased rainfall in this region of Minnesota:
  - 100-year storm event, 9.2" in 24hrs
  - 60-days of "unseasonably wet" weather
- Atlas 14, 90% confidence is used as a stand-in for future rainfall estimates
- 24-hr period estimated rainfall for the following storm probabilities/frequencies
  - 1-year, 2-year, 10-year, 100-year

Storm Frequency	Existing Conditions (Atlas 14 Mean Value)	Future Conditions (Atlas 14 90% Confidence)
1-year	2.42 inches	2.97 inches
2-year	2.80 inches	3.43 inches
10-year	4.14 inches	5.11 inches
100-year	6.95 inches	9.22 inches



What does this look like for our area?

View the rainfall simulators embedded in this presentation on the April 23<sup>rd</sup> board packet at [www.clflwd.org](http://www.clflwd.org), or by going directly to the National Weather Service's website at <https://www.weather.gov/lox/rainrate>.



0.33 inches per hour  
(similar to 100-yr future event if rate remained constant for 24-hr period)



1.5 inches per hour (w/ hail)  
(what peak intensities may look like)

## What does this mean?

- Flooding in our area is likely not as flashy and deadly as riverine flooding seen elsewhere in the country
- Some roads, sidewalks, parking lots may see up to 2.6 feet water depths for extended periods of time, making navigation difficult
- Some homes and commercial buildings may experience water damage (e.g., wet basements)
- Lots of wet backyards, especially for homes that encroach upon wetlands (built under outdated regulations)
- Insurance rates are rising in MN due to intense storms, with MN rates 38% higher than the national average

## ENVIRONMENTAL

- Pollution Sensitivity of Near Surface Materials
- Impaired Waters
- Native Plant Communities Connected with Groundwater
- Soil Erosion Risk
- MN Biological Survey Sites of Biodiversity Significance

## INFRASTRUCTURAL

- Critical Infrastructure
- Emergency Routes
- Roadways



## SOCIAL

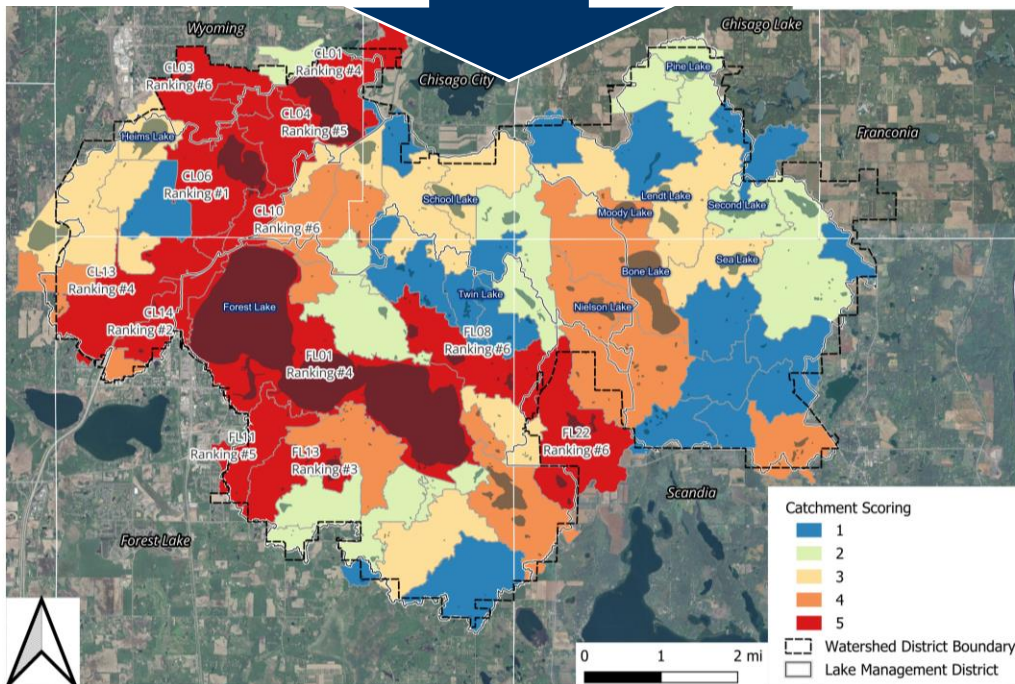
- Parks/Trails
- Buildings
- Social Vulnerability Layer (based on census data)

## FLOOD HAZARD

- Slope
- Imperviousness
- Distance to Streams
- Height Above Nearest Drainage

## GIS Prioritization

- Used flood hazard mapping - a coarse screening tool to prioritize subwatersheds for further investigation
- Prioritization consisted of intersecting the flood hazard map with environmental, social, and infrastructural data layers



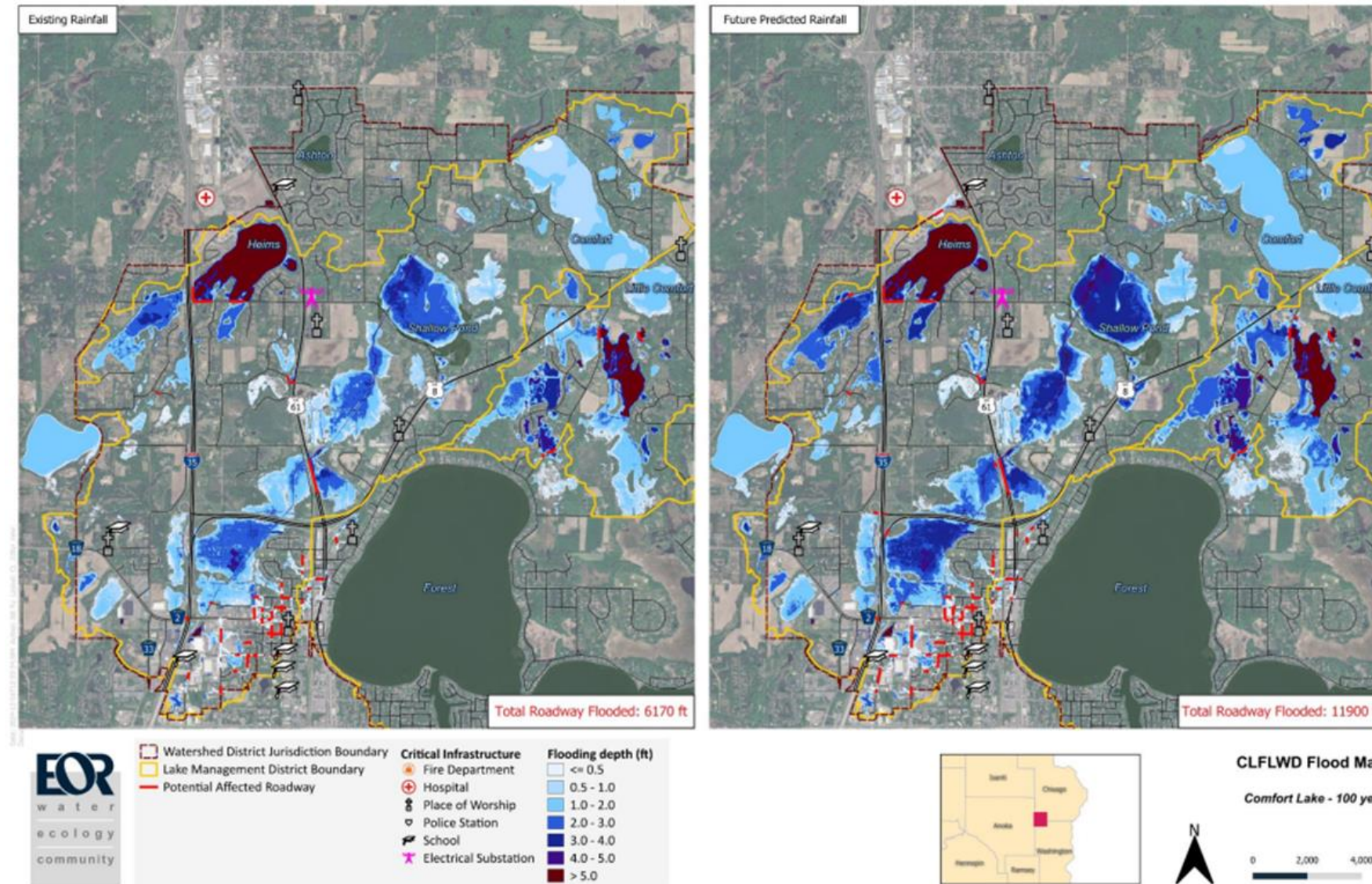
Blue = lowest risk



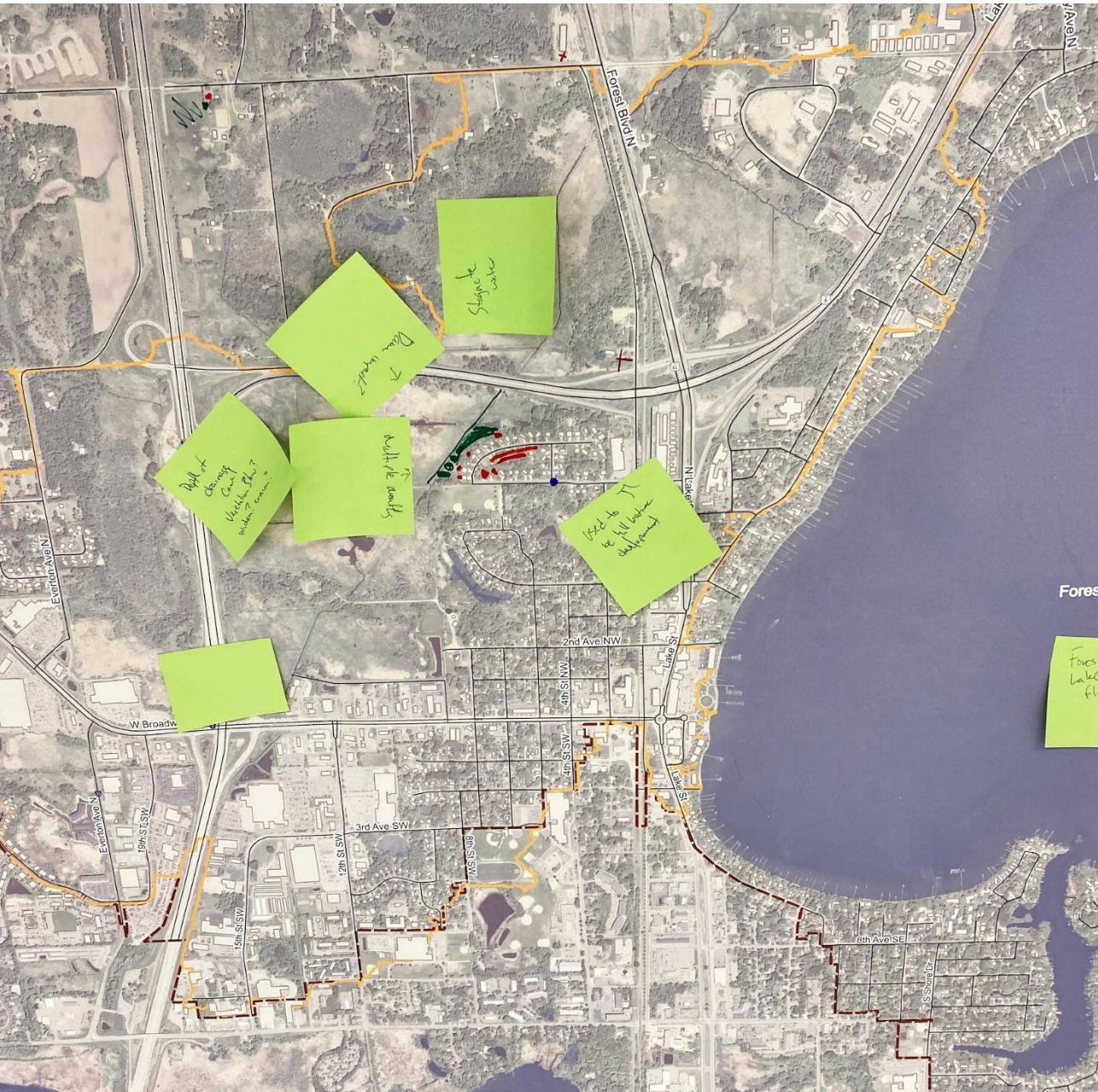
Red = highest risk

## Modeling In Highest Vulnerability Areas

- 1-D CLFLWD model
- 2-D model using City of Forest Lake model
- Worked with City of Forest Lake to leverage additional modeling resources
- More refined model results
- Quantified roadways and buildings potentially affected



100-Year Storm



## Community Engagement

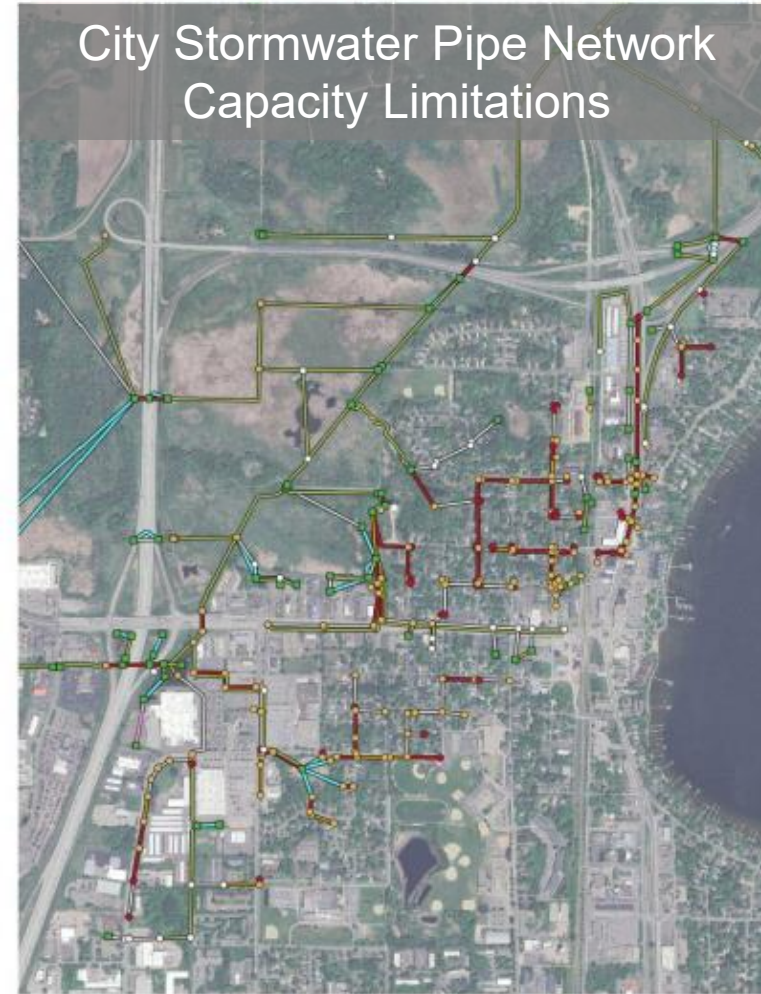
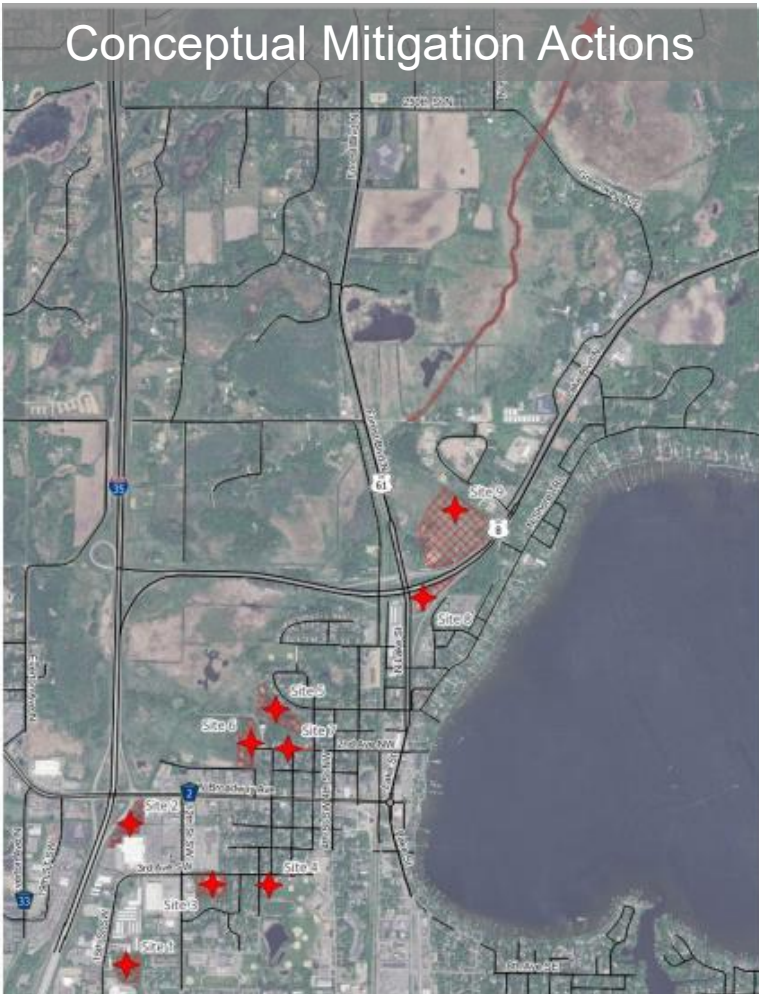
- Outreach to residents in high vulnerability areas
- Coordination with local municipalities, state agencies, and other local partner organizations

## Conceptual Mitigation Actions

## City Stormwater Pipe Network Capacity Limitations

## Draft Floodplain Resilience Action Plan Framework and Potential Mitigation Actions

- Storage expansion projects
- Green infrastructure
- Prioritized city stormwater infrastructure maintenance/upgrades
- Public outreach campaign and small-scale residential project incentives
- City of Forest Lake provided detailed commentary on proposed mitigation actions





## Next Steps

- **City of Forest Lake currently reviewing redlined action plan framework**
- **Board discuss revised action plan framework after City has reviewed**
- **Project modeling and concept design funded by grant, board approve scope of work at future board meeting**
- **Continue partner coordination**