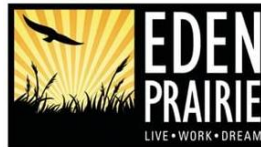




TO35: Eden Prairie Stormwater Model Update and Flood-Risk Area Identification & Prioritization for Eden Prairie Portion of Riley & Purgatory Creeks

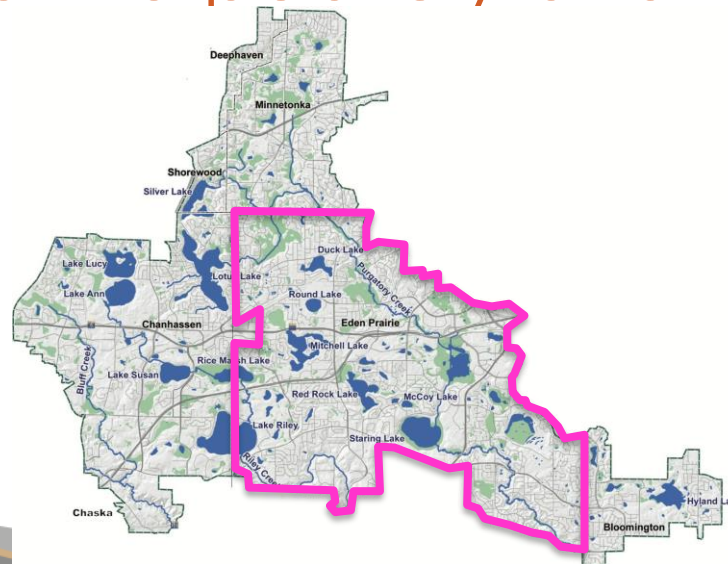
Board Workshop

April 20, 2023



Agenda

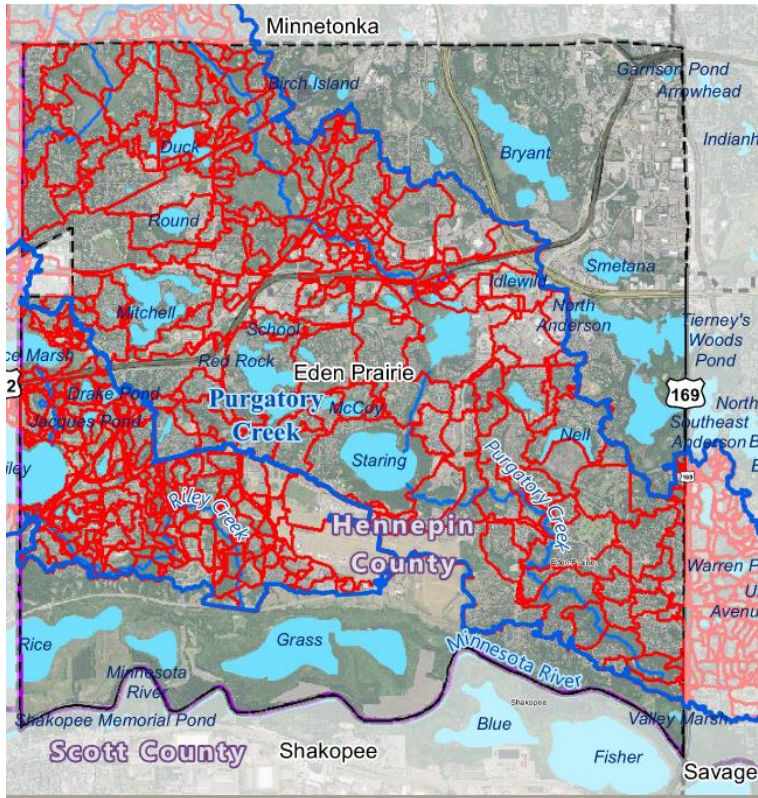
- Stormwater model updates & validation
- Identification of flood-prone areas
- Prioritization of flood-prone areas
- Comparison to publicly available data



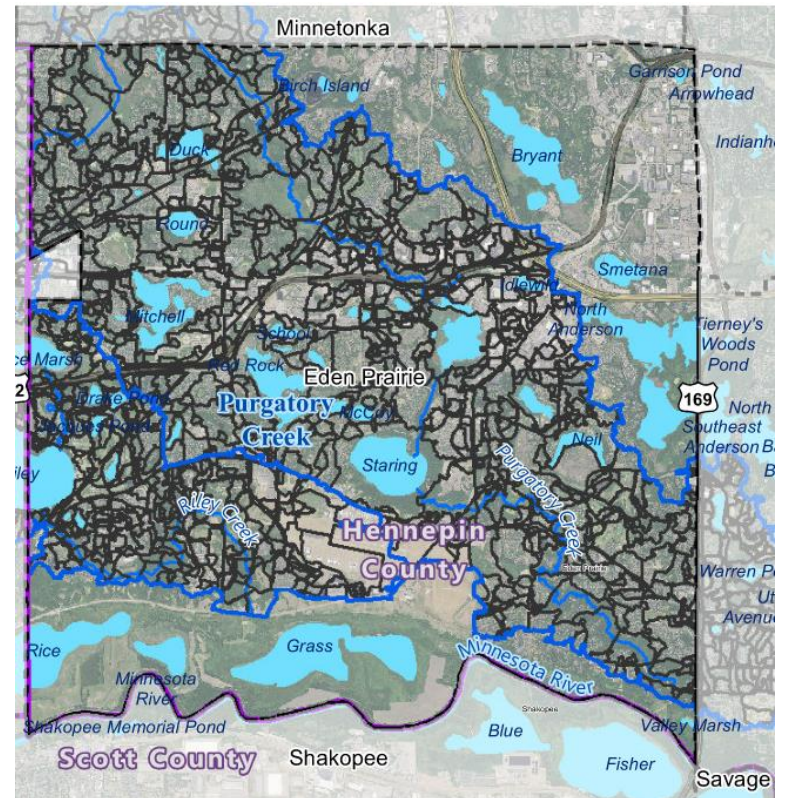
Abbreviated History of RPBCWD Stormwater Model Updates

- **2015** - Development of PCSWMM models and simulation of Atlas 14 rainfall (TO2)
- **2016** - 100-year floodplain vulnerability Evaluation (Climate Adaptation) (TO15)
- **2021** - Stormwater model update and flood-risk area prioritization identification for the Bloomington (TO26)
- **2023** – Eden Prairie update (TO35)

Model Updates



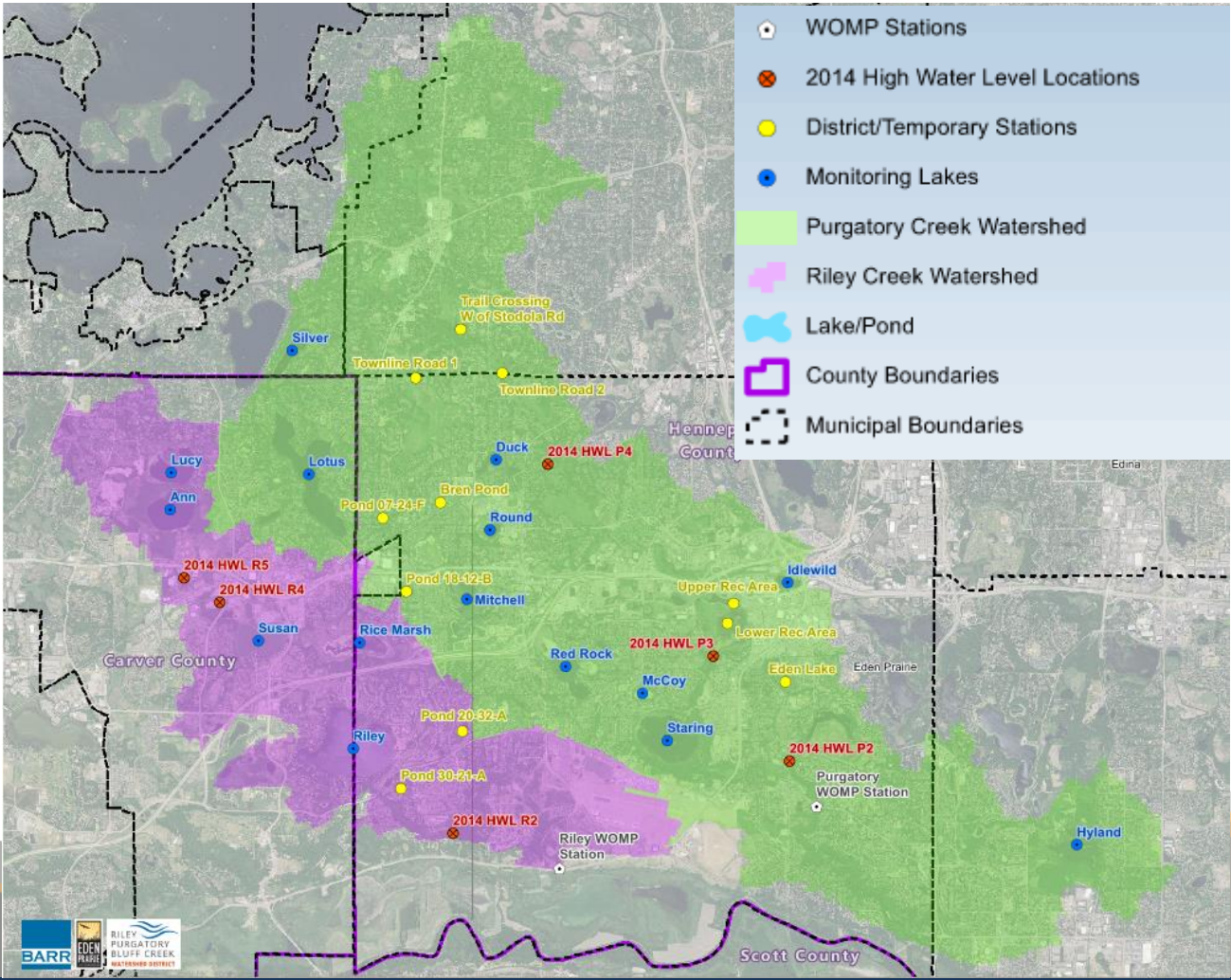
Starting Model



Updated Model

	Starting Model	Updated Model
Watersheds in Eden Prairie	501	1,120

Model Validation



**FIGURE A-15:
PURGATORY CREEK CALIBRATION RESULTS
POND 18-12-B**

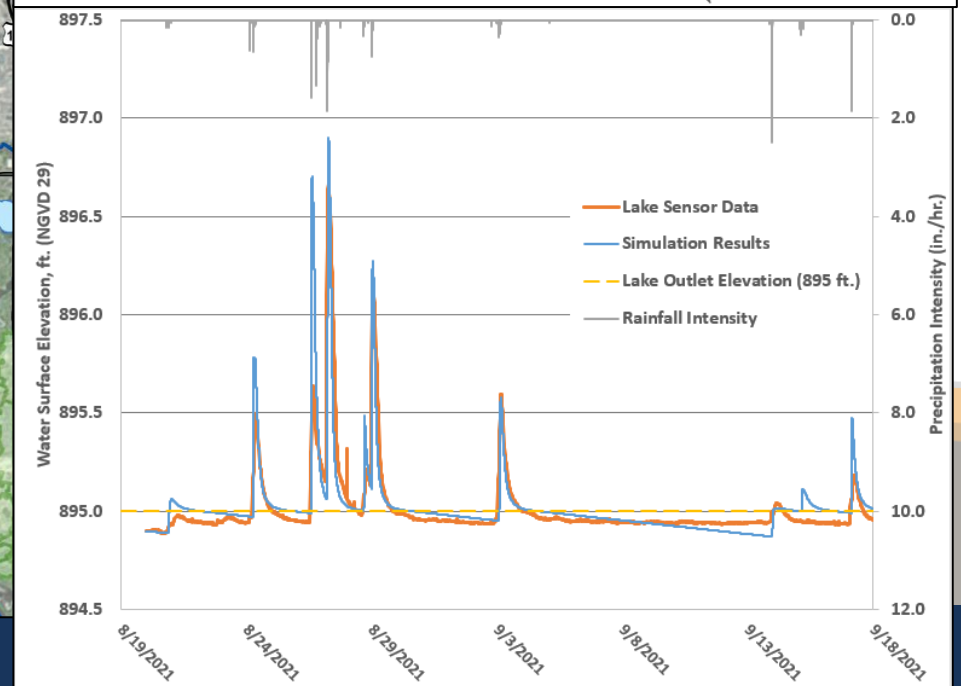
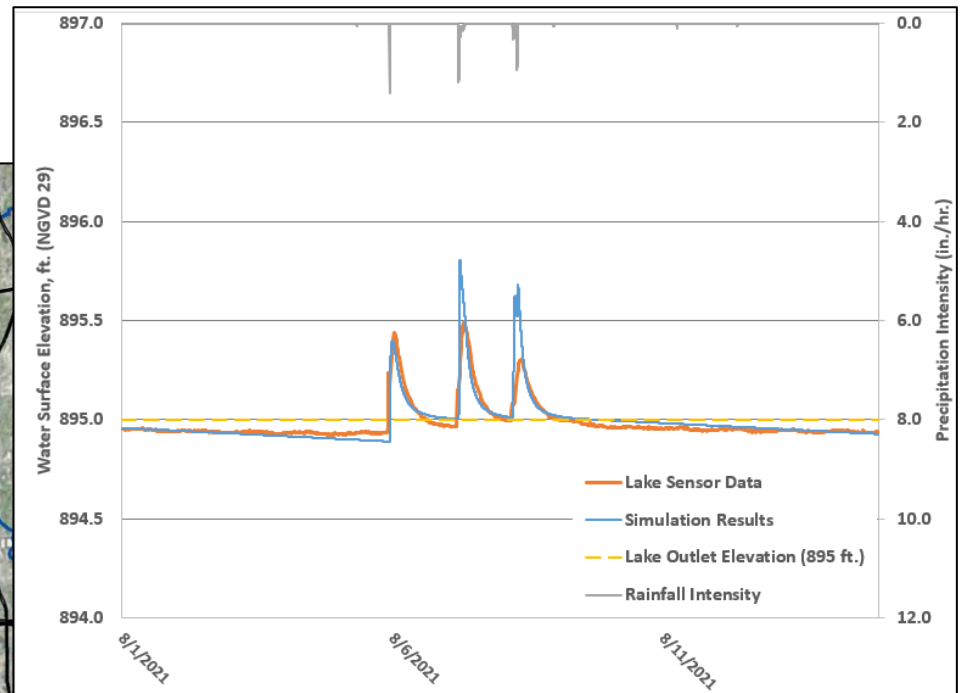
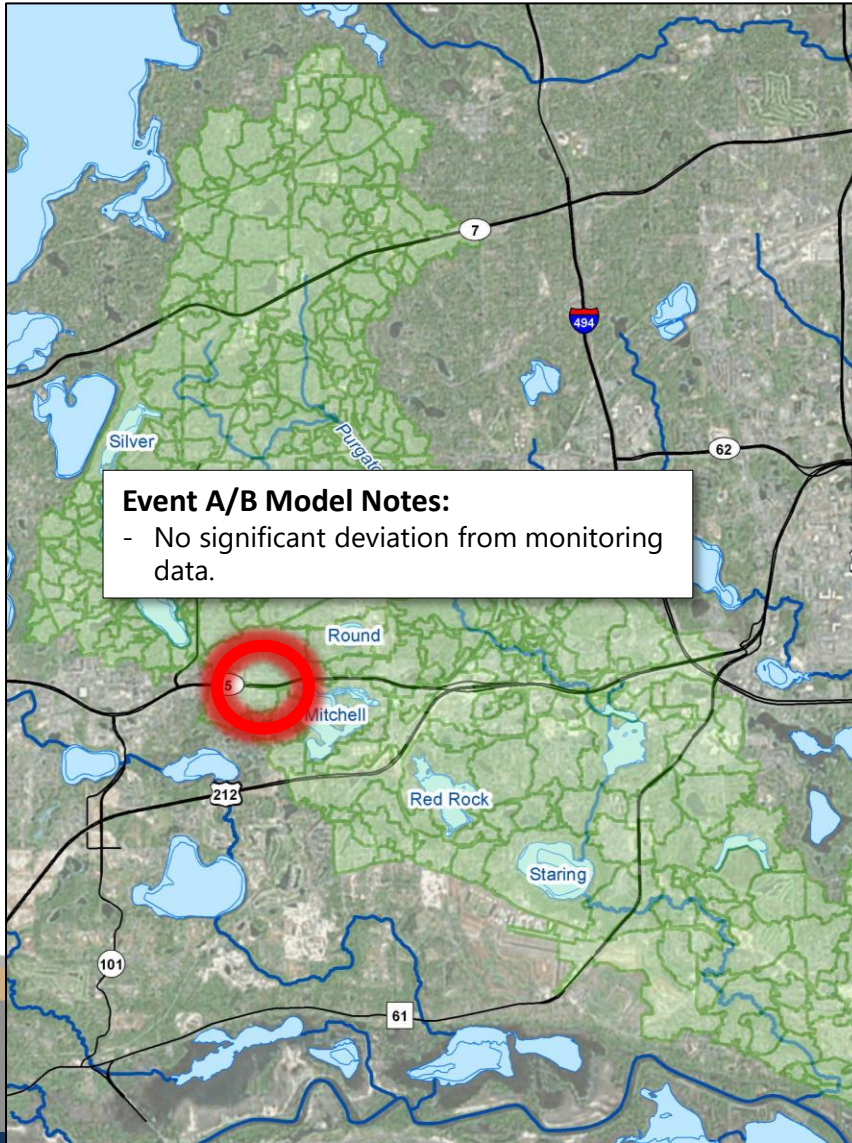
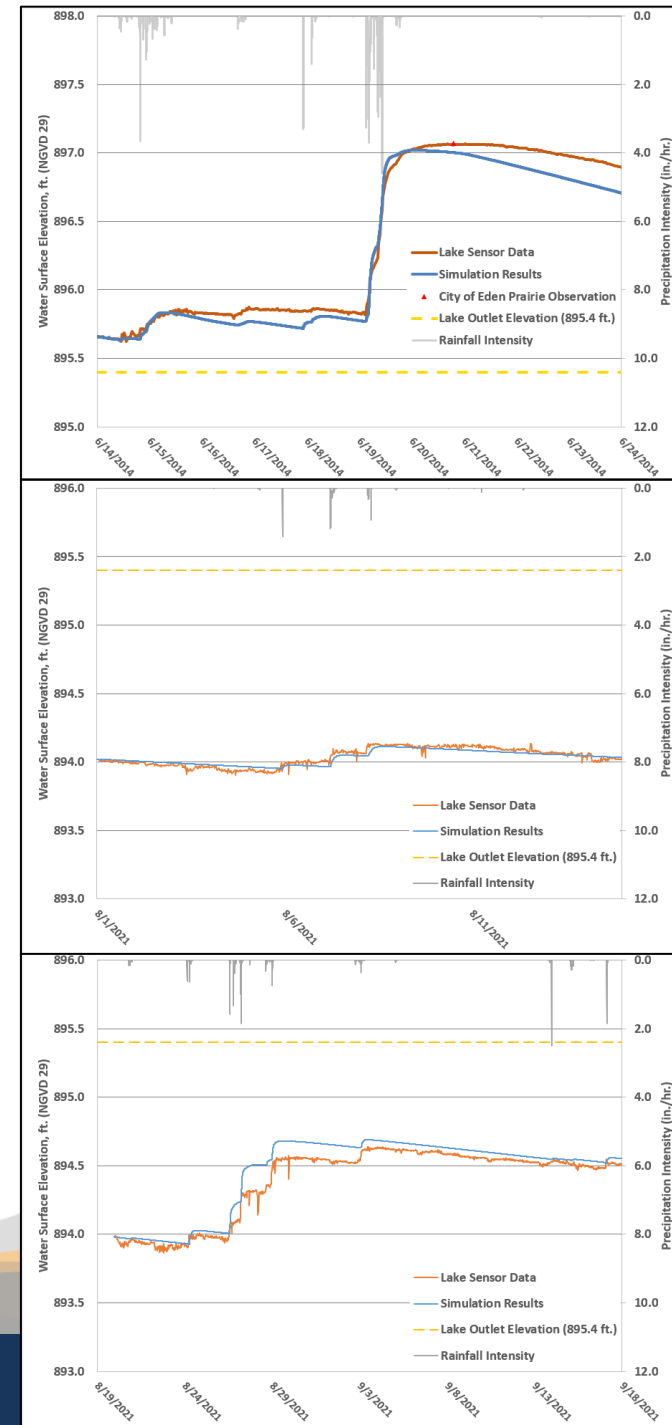
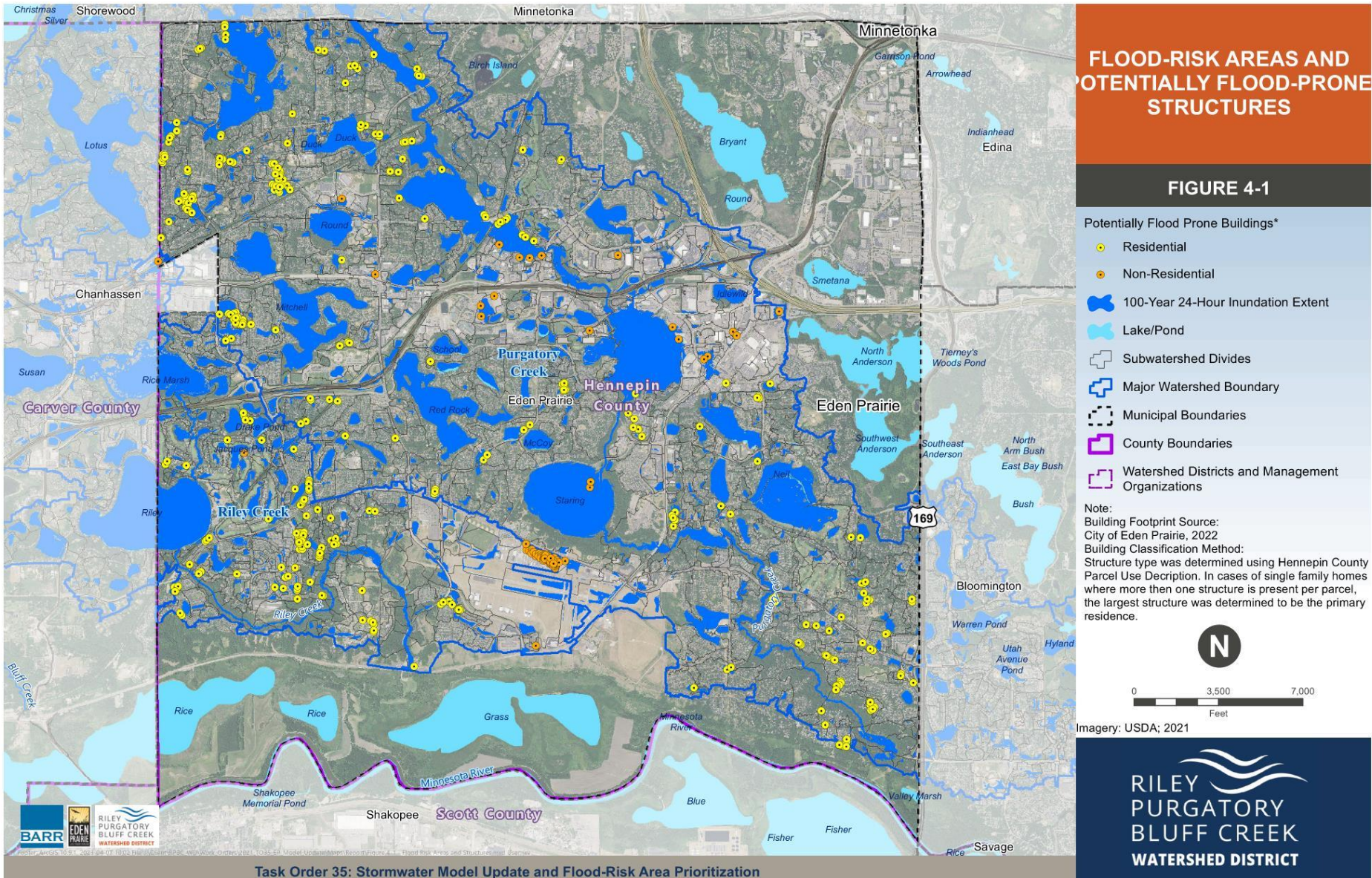


FIGURE A-2: PURGATORY CREEK CALIBRATION RESULTS LOTUS LAKE



Identification of Flood-Prone Areas



Prioritization Categories

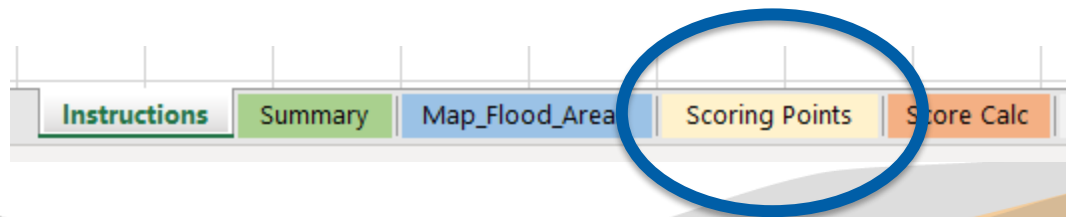
- number of flood-prone structures
- frequency of flooding
- social vulnerability
- project efficiency
- multiple benefits
- critical infrastructure



Prioritization Framework

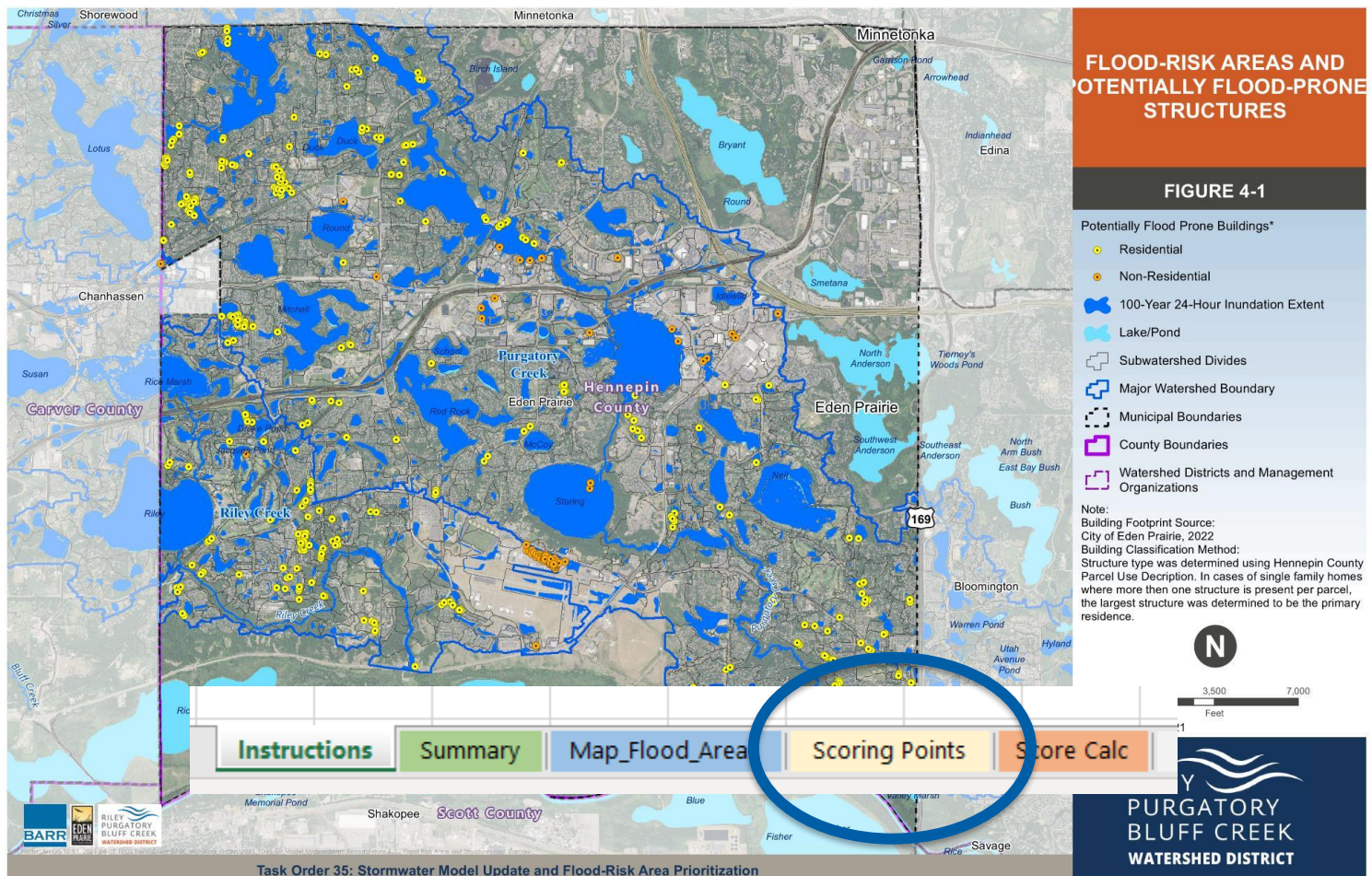
- number of potentially flood-prone structures

	Category		Scoring Points	Scoring Ranges			
				Low End of Range - Commerical	High End of Range - Commerical	Low End of Range - Residential	High End of Range - Residential
Criteria 1	Number of Structures Impacted	No impacted structures	0				
		Impacts 1-5 commerical structures	1	1	5		
		Impacts 1-5 residential structures OR >5 commerical structures	3		5	1	5
		Impacts 6-10 residential structures	5	0		6	10
		Impacts >10 residential structures	10				10



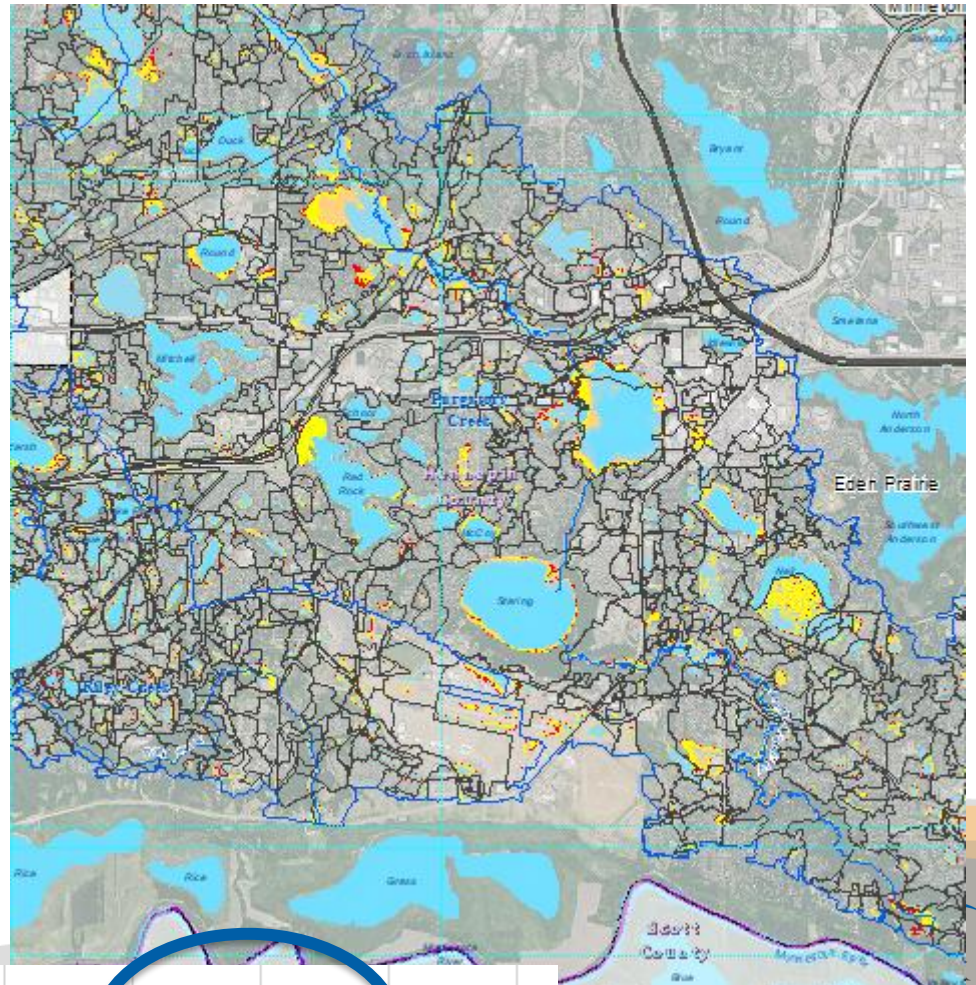
Prioritization Framework

- number of potentially flood-prone structures



Prioritization Framework

- Frequency of flooding
 - 2-year
 - 10-year
 - 50-year
 - 100-year

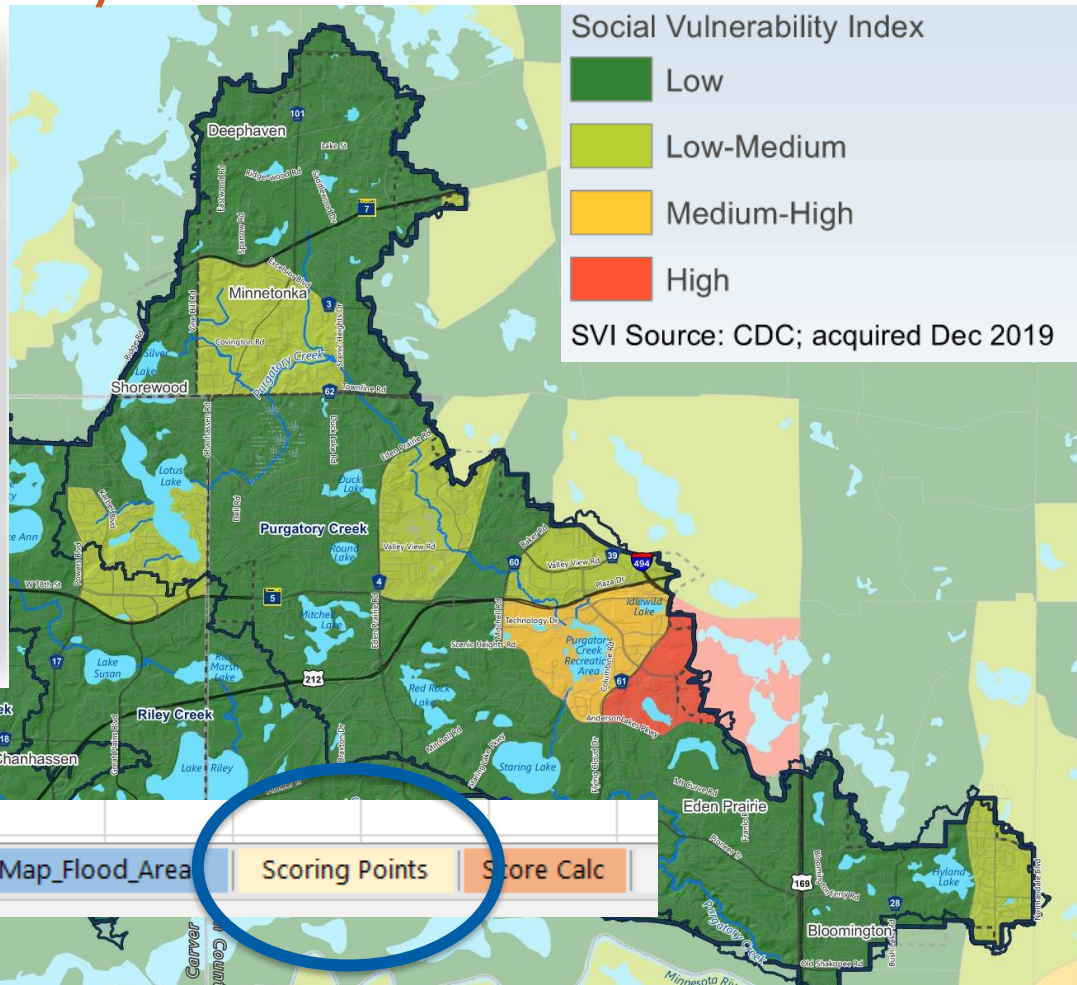


Instructions	Summary	Map_Flood_Area	Scoring Points	Score Calc
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Prioritization Framework

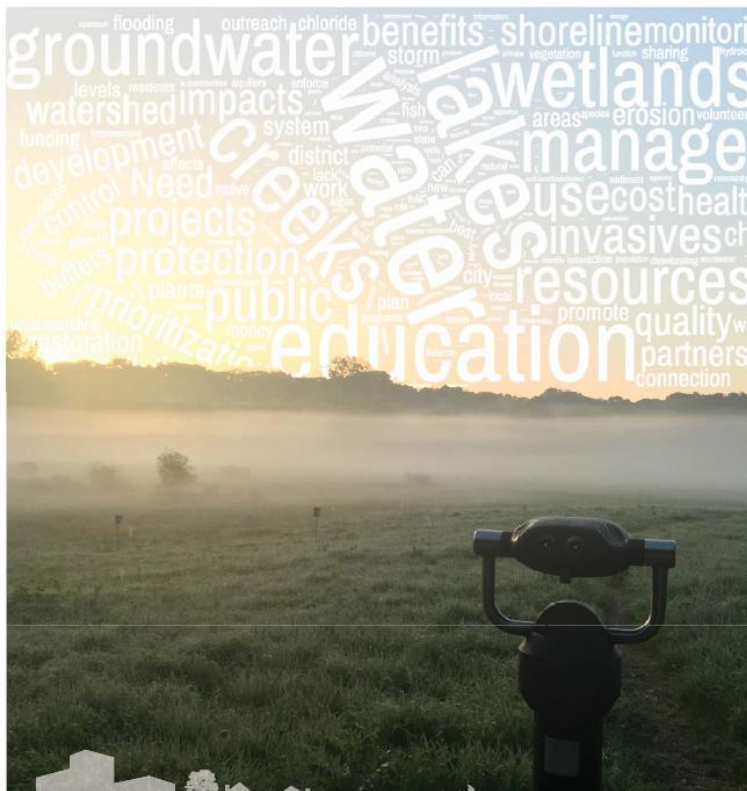
- social vulnerability

Overall Vulnerability	Socioeconomic Status	Below Poverty
		Unemployed
		Income
		No High School Diploma
	Household Composition & Disability	Aged 65 or Older
		Aged 17 or Younger
		Civilian with a Disability
		Single-Parent Households
	Minority Status & Language	Minority
		Speak English "Less than Well"
	Housing & Transportation	Multi-Unit Structures
		Mobile Homes
		Crowding
		No Vehicle
		Group Quarters



Prioritization Framework

- project efficiency



WENCK

CITY OF EDEN PRAIRIE, MINNESOTA

December 2020

Local Water Management Plan Update

EDEN PRAIRIE

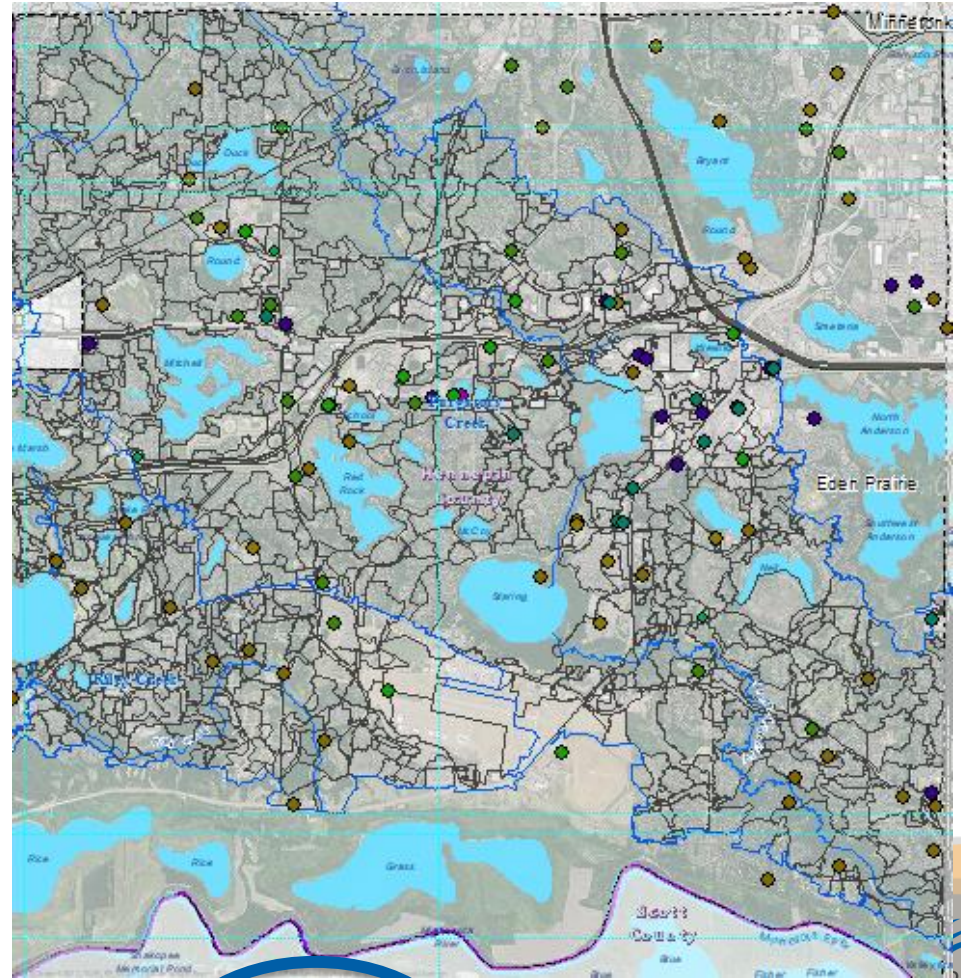
PREPARED FOR:
City of Eden Prairie
8080 Mitchell Road
Eden Prairie, MN 55344

PREPARED BY:
Wenck
7500 Olson Memorial Highway
Suite 300
Golden Valley, MN 55427
Phone: 763-252-6880
www.wenck.com

Instructions Summary Map_Flood_Area **Scoring Points** Store Calc

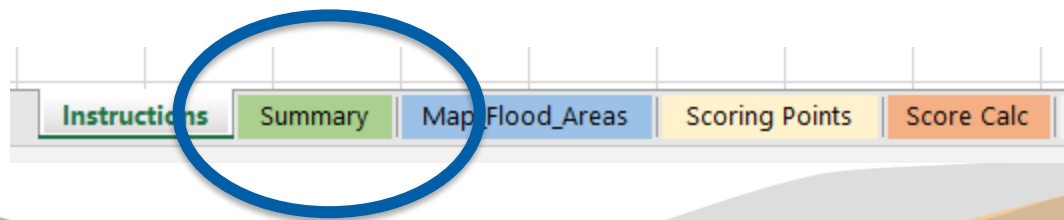
Prioritization Framework

- critical infrastructure
 - Critical transportation routes
 - Emergency services
 - Emergency support services
 - Critical City services

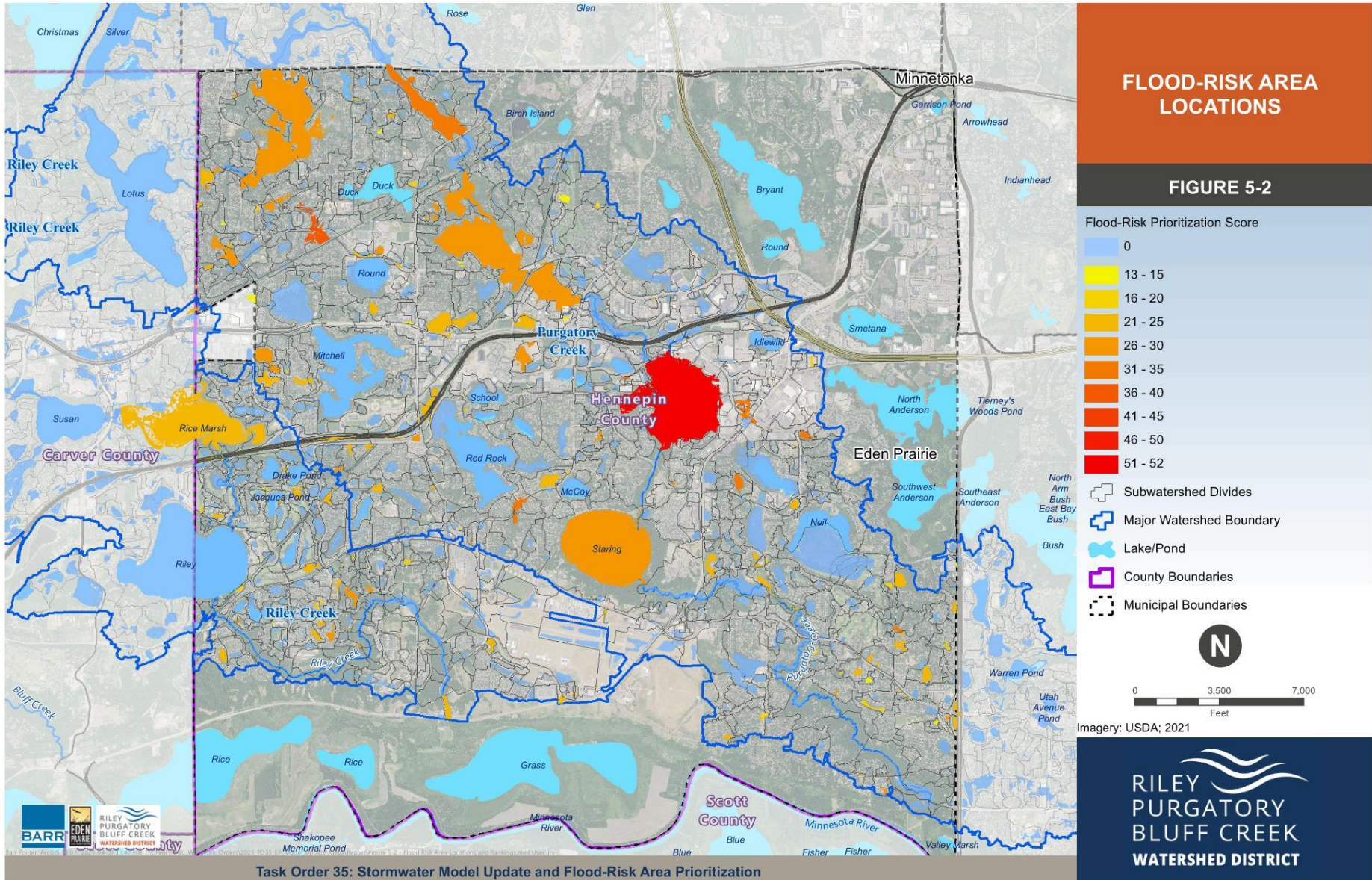


Prioritization Framework

Flood Area	Total Score	Criteria 1		Criteria 2	Criteria 3	Criteria 4		Criteria 5		Criteria 6	Total Score <i>without filter for no flood-prone structures or critical infrastructure</i>	User Defined Score Note
		Structures Impacted - up to 100 YR Storm		Minimum Return Period Flood Occurance	Maximum Social Vulnerability Index	Project Efficiency		Additional Service Benefits		Number of Critical Infrastructure Impacted		
		Residential - Total	Non-residential - Total			Goals Met in District/City Management Plans	Potential Partners - Total	Ecological - Total	Recreational - Total			
PURG36	52	1	2	2-year	Med-High	6	1	4	0	4	52	
PURG7	39	29	0	10-year	Low	6	1	1	0	1	39	
SL16B	34	3	0	2-year	Med-High	5	0	1	0	0	34	
PC29D	32	3	0	10-year	Low	6	1	1	0	1	32	
PURG34	32	2	0	100-year	Low	6	1	1	0	2	32	
SL06E	32	0	1	2-year	Med-High	6	0	2	0	0	32	
PURG38	31	1	0	100-year	High	6	0	1	0	0	31	
PURG37	31	0	2	50-year	High	6	0	1	0	0	31	



Initial Prioritization

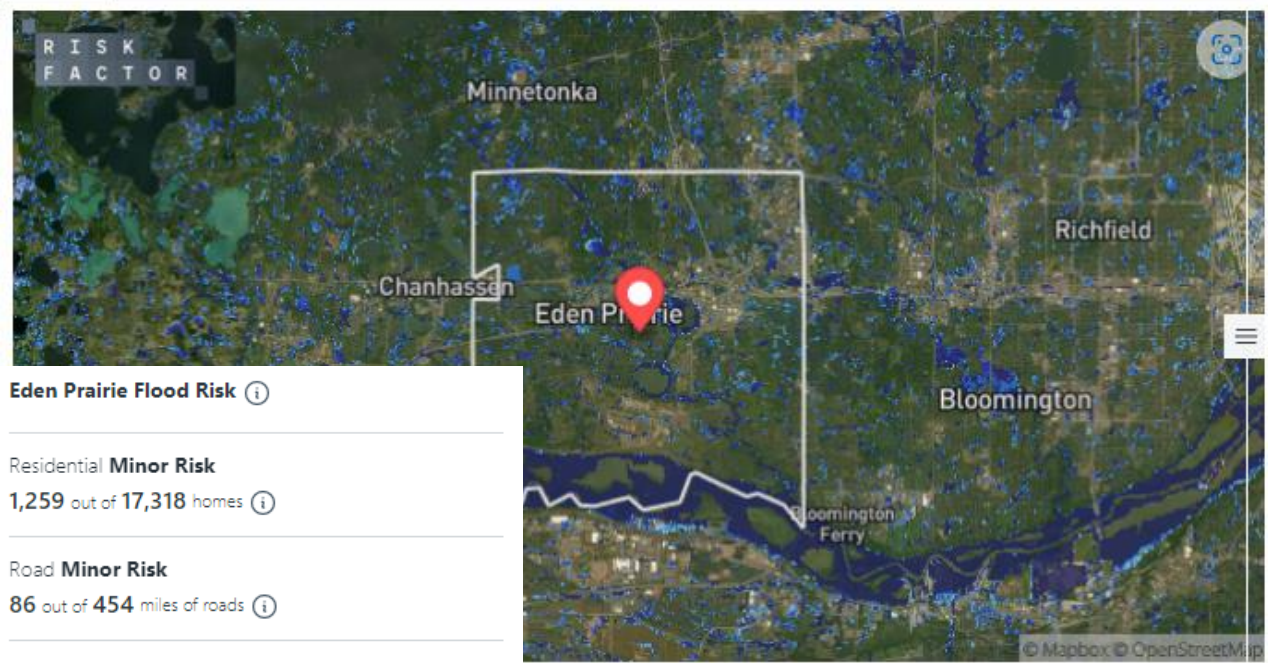


Flood Factor

Minor



This year ← → In 30 years



Properties at risk

1,088
Today ⓘ

1,115
In 30 years ⓘ



Depth of flooding (ft.)

Eden Prairie Flood Risk ⓘ

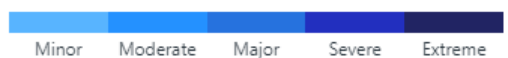
Residential **Minor Risk**
1,259 out of 17,318 homes ⓘ

Road **Minor Risk**
86 out of 454 miles of roads ⓘ

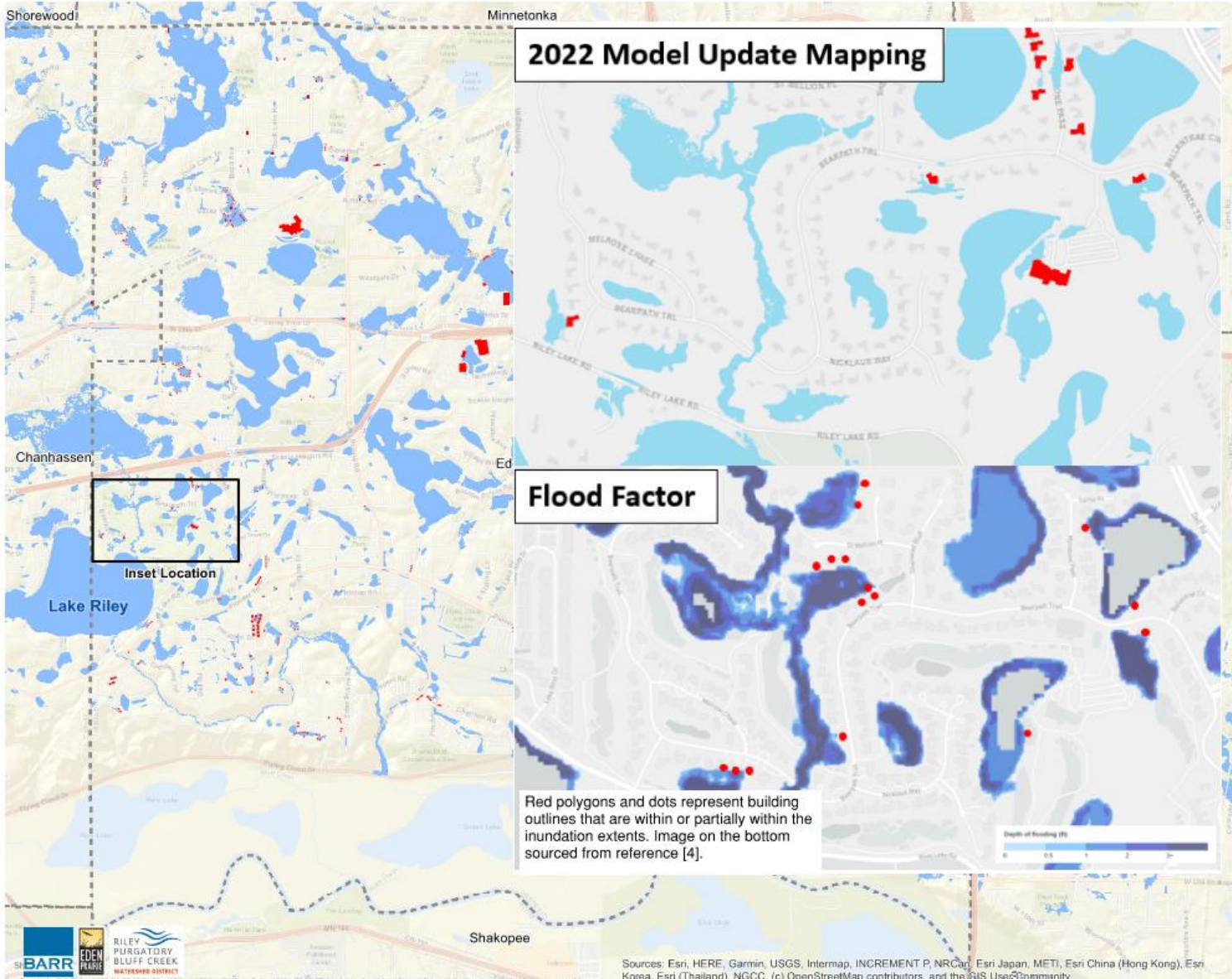
Commercial **Minor Risk**
84 out of 589 commercial properties ⓘ

Critical Infrastructure **Minimal Risk**
0 out of 6 infrastructure facilities ⓘ

Social Facilities **Moderate Risk**
3 out of 40 social facilities ⓘ



Flood Factor Comparison



COMPARISON OF 100-YEAR IMPACTED STRUCTURES NEAR LAKE RILEY

FIGURE 6-2

- 2022 Model Update Mapping
- 100-Year 24-Hour Inundation Extent
 - Potentially Flood-Prone Building
- Flood Factor
- 100-year Depth of Flooding
- Depth of flooding (ft)
- 0 0.5 1 2 3+
- Potentially Flood Prone Building

Note:
 Building Footprint Source:
 City of Eden Prairie, 2022
 Building Classification Method:
 Structure type was determined using Hennepin County Parcel Use Description. In cases of single family homes where more than one structure is present per parcel, the largest structure was determined to be the primary residence.



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Next Steps...

- finalize project deliverables
- collaboration with other cities
- feasibility studies for flood-risk mitigation and field verification
- identification of funding sources and project partners
- implementation of flood-risk reduction projects