SEMINOLE GLEN WATERSHED STUDY

AE2S

Fitchburg
WISCONSIN

Why Are We Here?

- Update Stormwater Plan from 2000 for Seminole Glen

1987

2000

2022

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  - Significant flooding of kettles east of park

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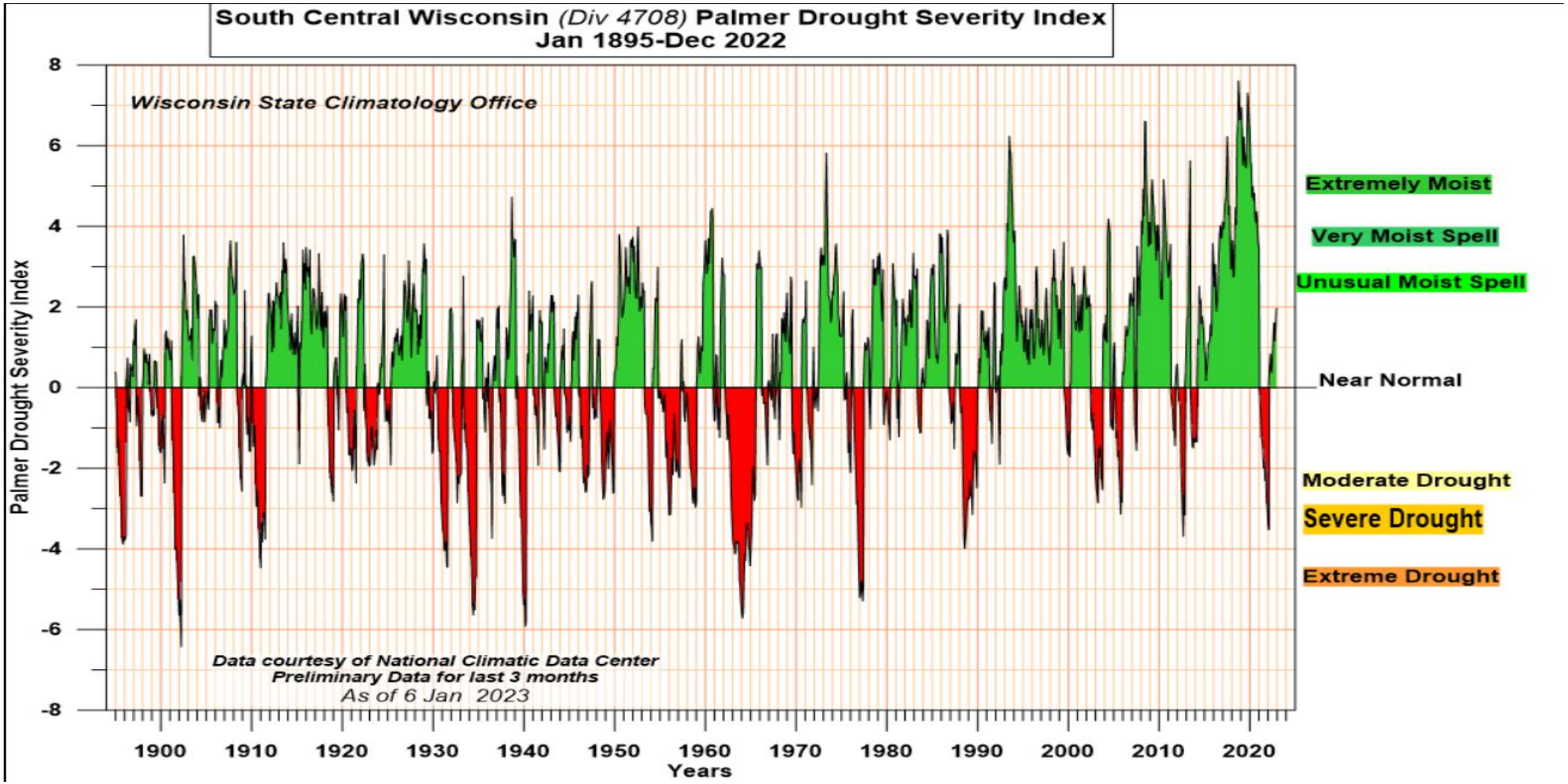
Why Are We Here?

- Update Stormwater Plan from 2000 for Seminole Glen
  - Significant flooding of kettles east of park
  - Flooding causing erosion/washouts/tree die-off
  - Concerns about water quality impacts to kettles

Why Are We Here?

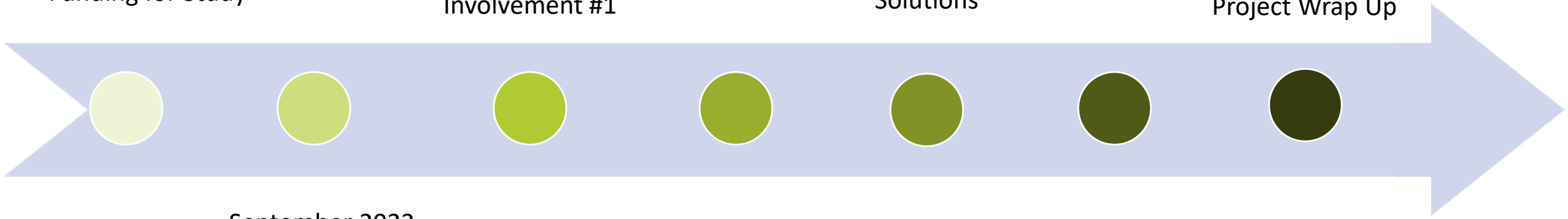


Why Are We Here

October 2021

City issued a request for proposals to complete a feasibility study and design concepts to mitigate flooding in the Seminole Glen kettles and evaluate water quality impacts.

What you can expect throughout the process

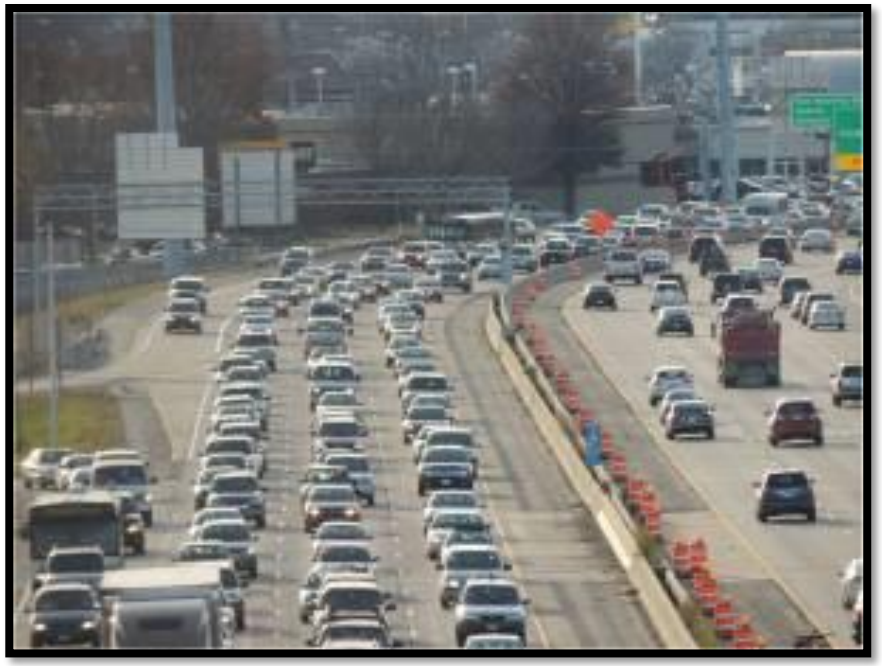


What you can expect throughout the process

- Your input is valuable to a successful plan
  - Email Ryan Stenjem at City Engineering at:
    - ryan.stenjem@fitchburgwi.gov
    - 608-270-4278
  - Additional project information provided on the City's website:
    - https://www.fitchburgwi.gov/234/Projects

Why Does Flooding Occur?

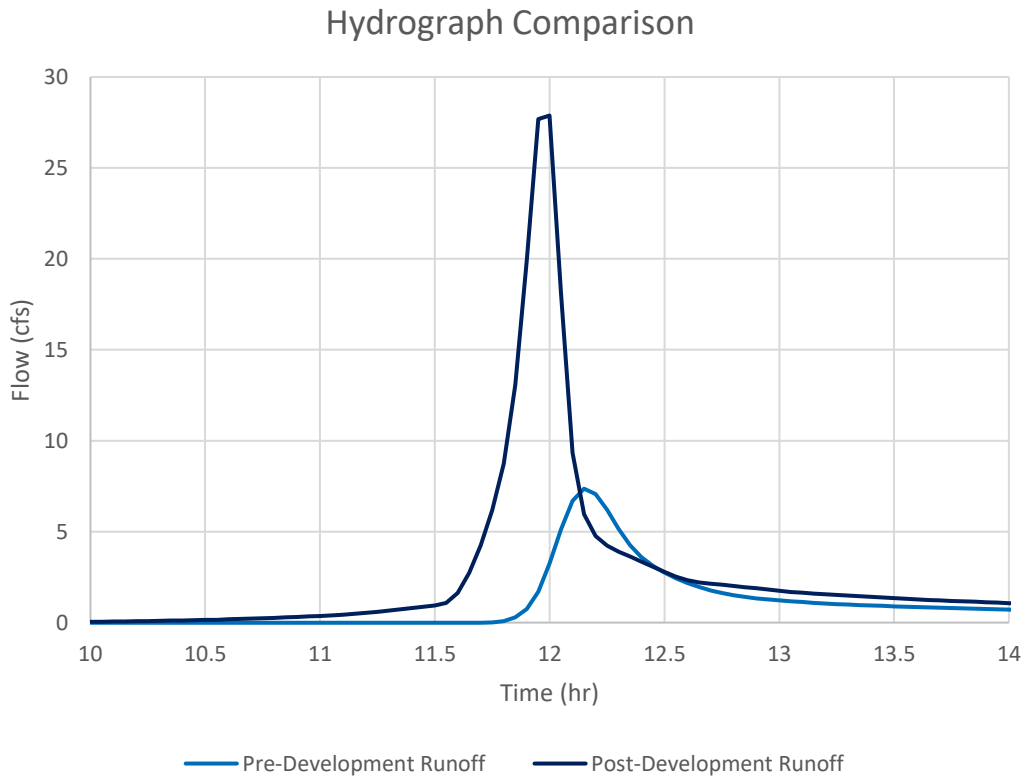
- Flooding at Seminole Glen is driven by runoff volume
- Ponding occurs before overflow to Schumann Drive
- Pipes are like underground freeways
  - 5:00 pm beltline traffic causes slow downs – too many cars
  - Large rain events result in too much runoff. Pipes are full and backups occur.



Why Does Flooding Occur?

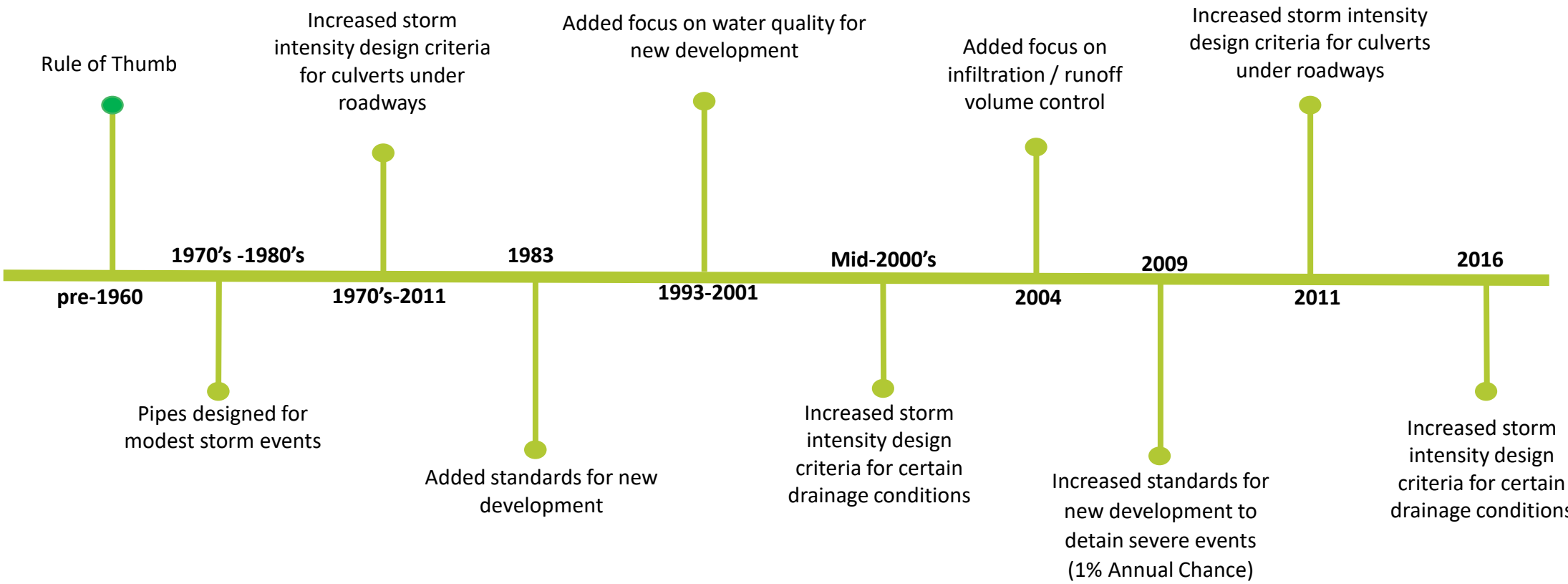
Entire neighborhood developed after 1980s

- Some stormwater requirements, but not yet robust
- Even when **peak flow rates** (how much water and how quickly) are controlled, new development generally results in more **volume** (total amount of water) prior to current County/City volume control standards.



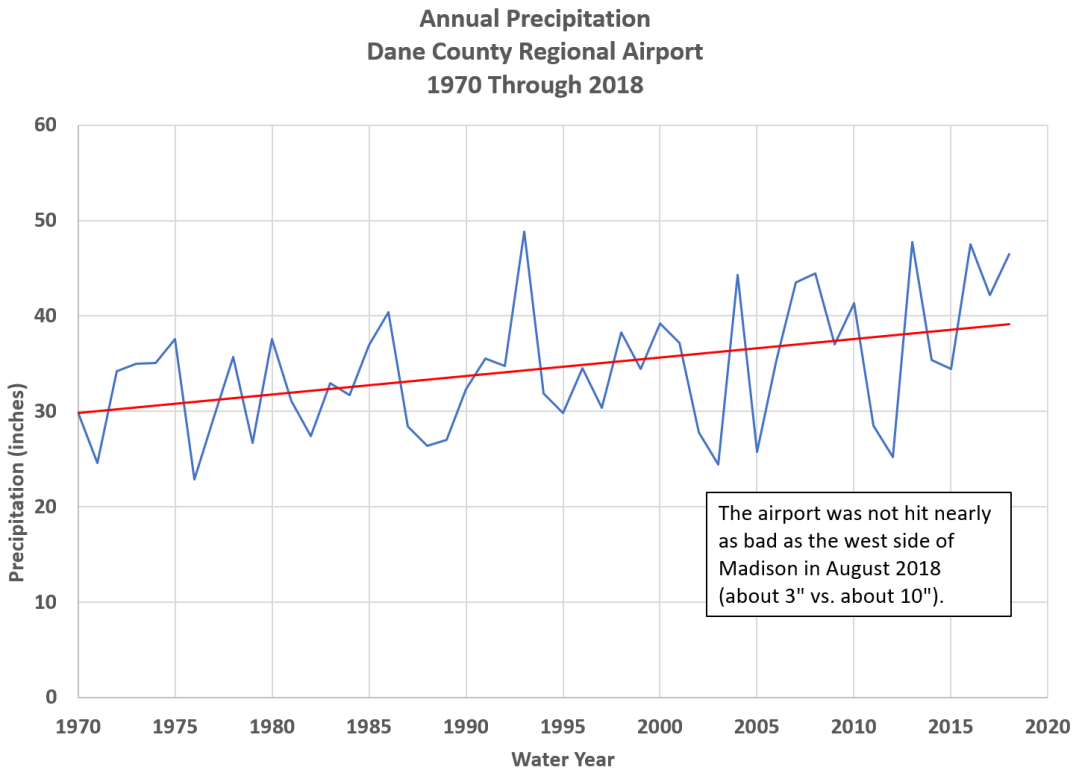
Why Does Flooding Occur?

Design standards when most of the system was built were less robust



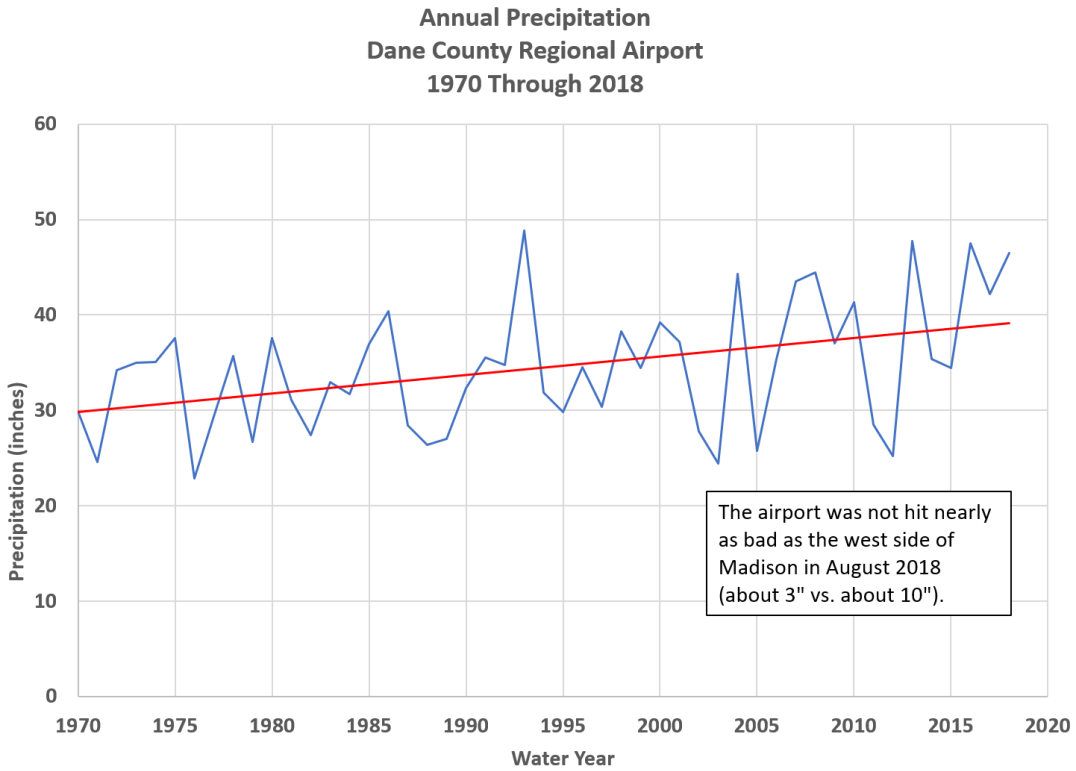
Why Does Flooding Occur?

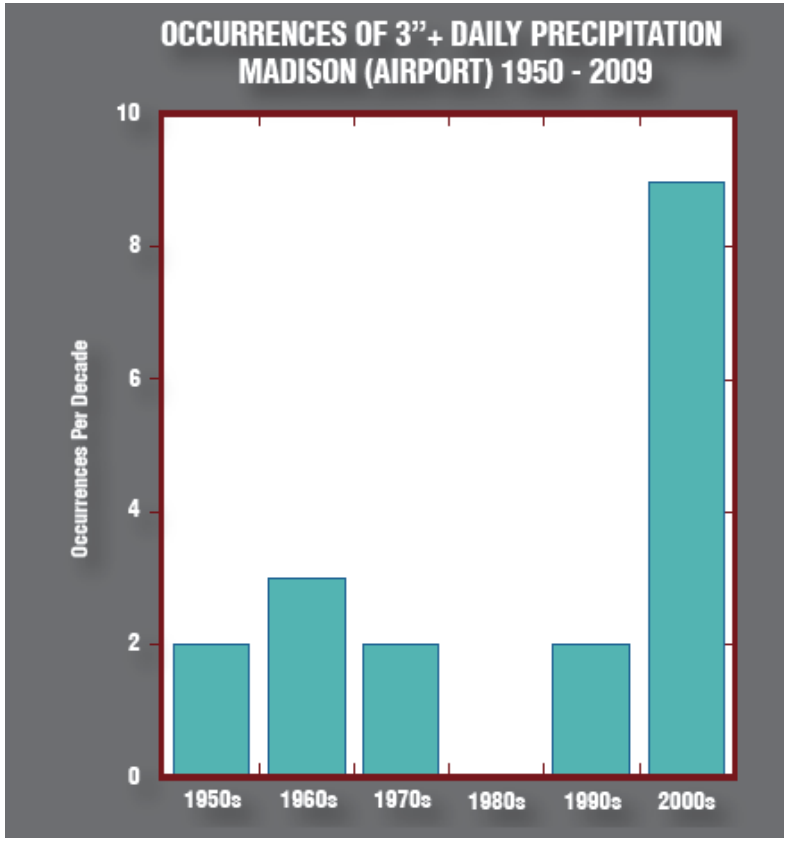
- More total rain



Why Does Flooding Occur?

- More total rain
- More severe rain events





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.

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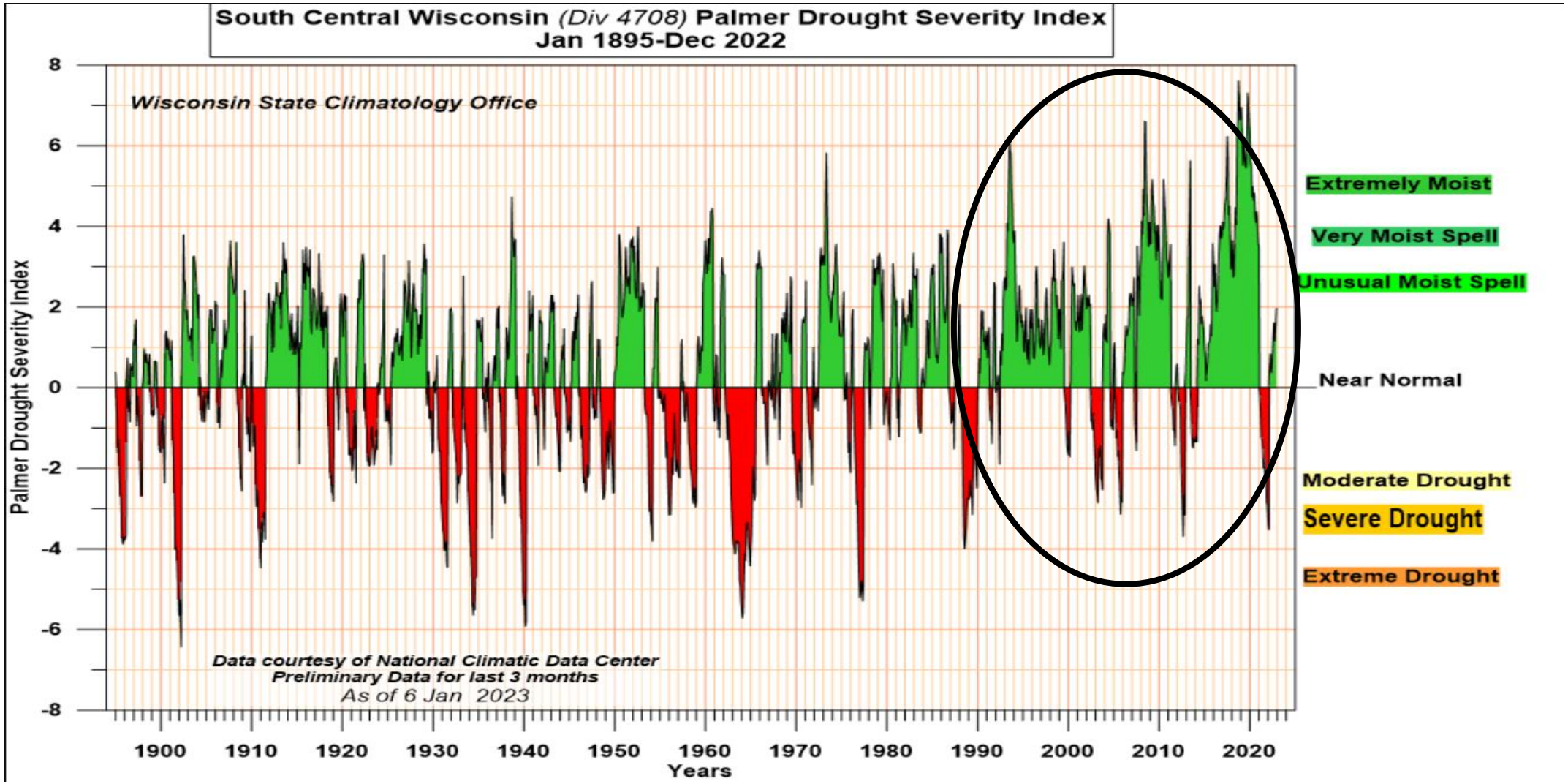
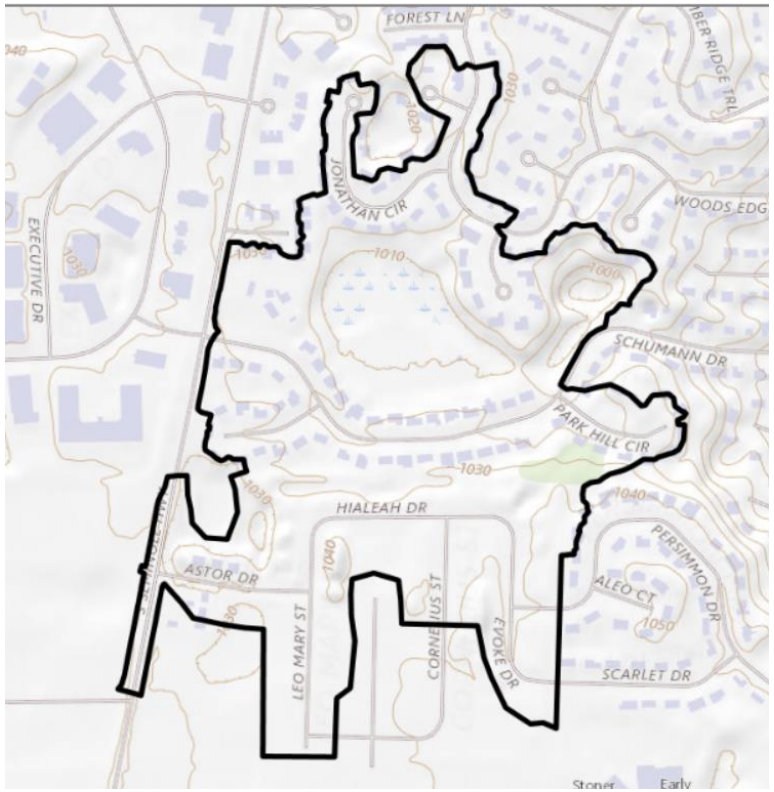
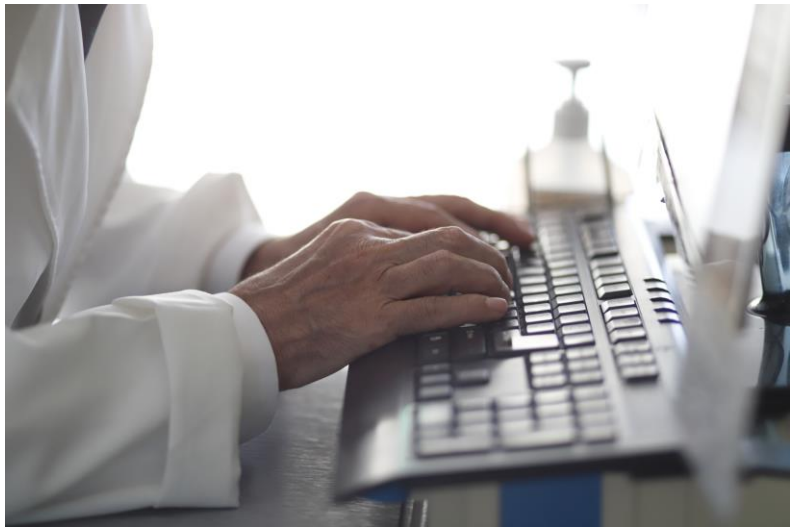
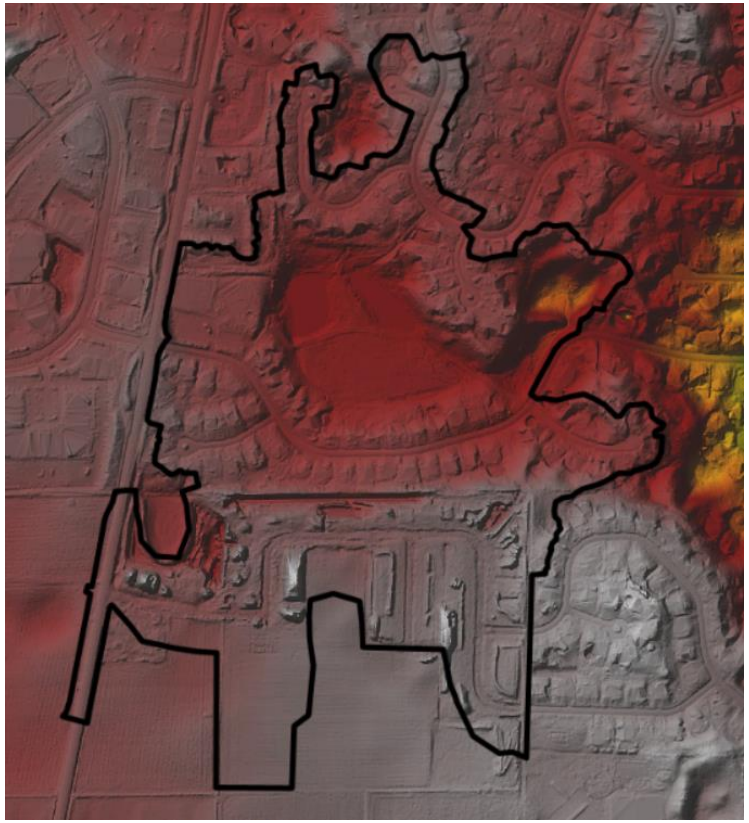


Why Does Flooding Occur?

- Better tools and information than we had before





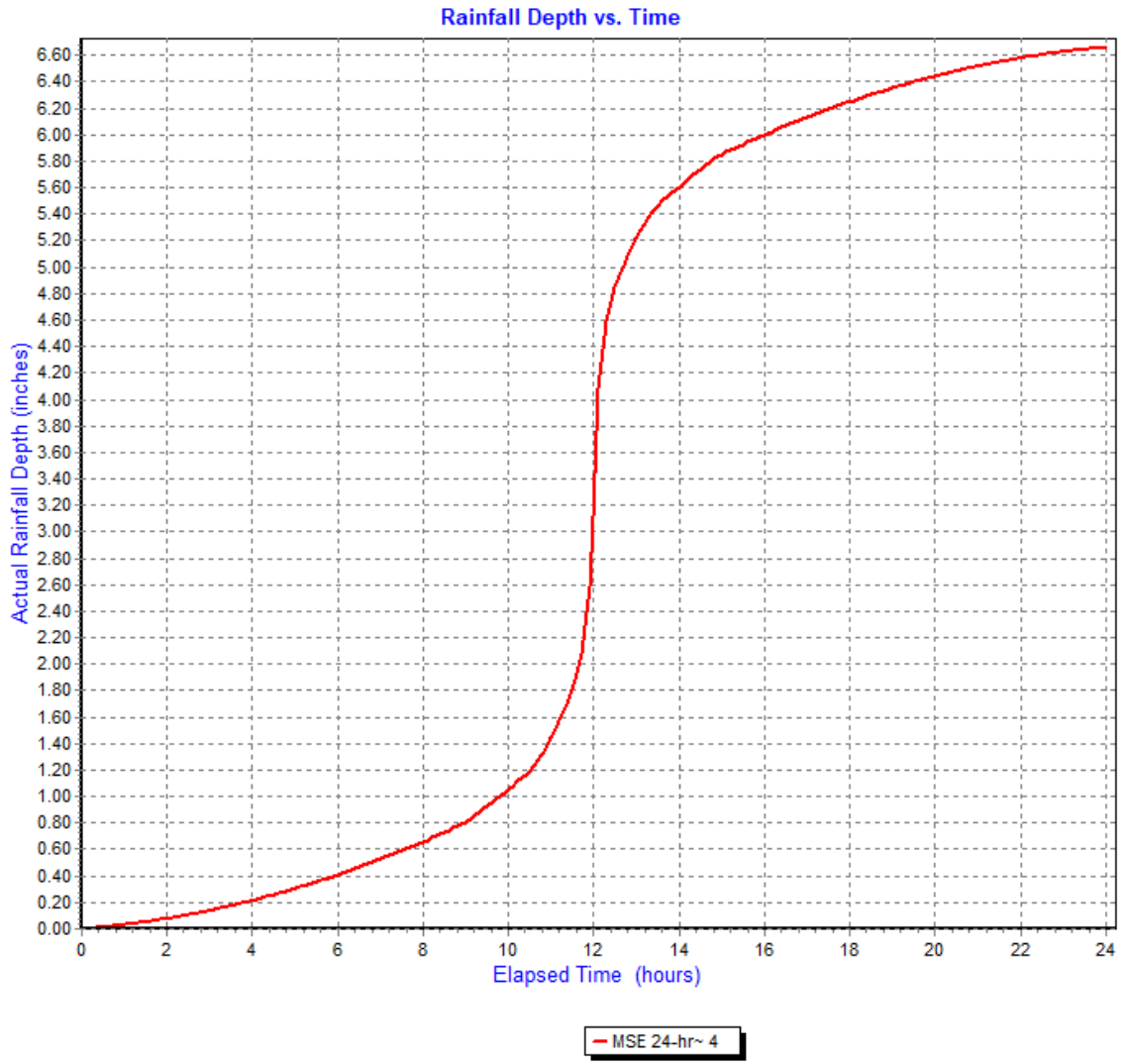


Why Does Flooding Occur?

- Depth and duration matters!

Why Does Flooding Occur?

- Design standard
  - 100 Year 24-hour Storm
  - Depth=6.66 inches



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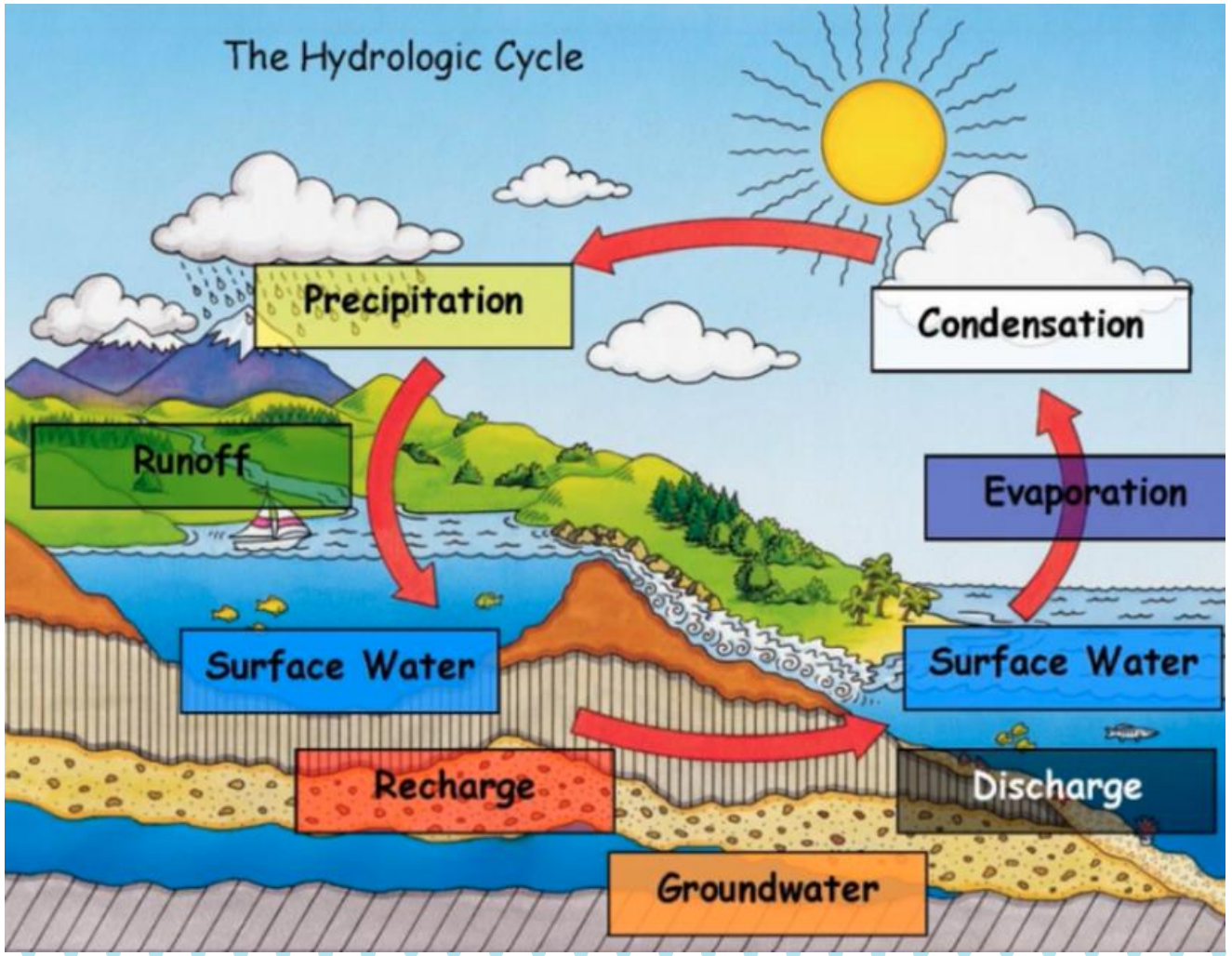
- Seminole Glen flooding is caused by flooding **volume**

- Runoff volume is a function of rainfall depth, land cover, soil properties, and steepness of watershed.



Why Does Flooding Occur?

- 100-year storm: What does it mean?
- Depth=6.66 inches
- Risk **accumulates over time**—the more times you roll the dice, the more likely you are to roll the “unlucky” extreme event.

What is the Purpose of the Study?

- Determine specific reasons why flooding occurs in Seminole Glen Kettles

What will this study do?

- Determine specific reasons why flooding occurs along Crescent Street
- Evaluate solutions based on current design standards

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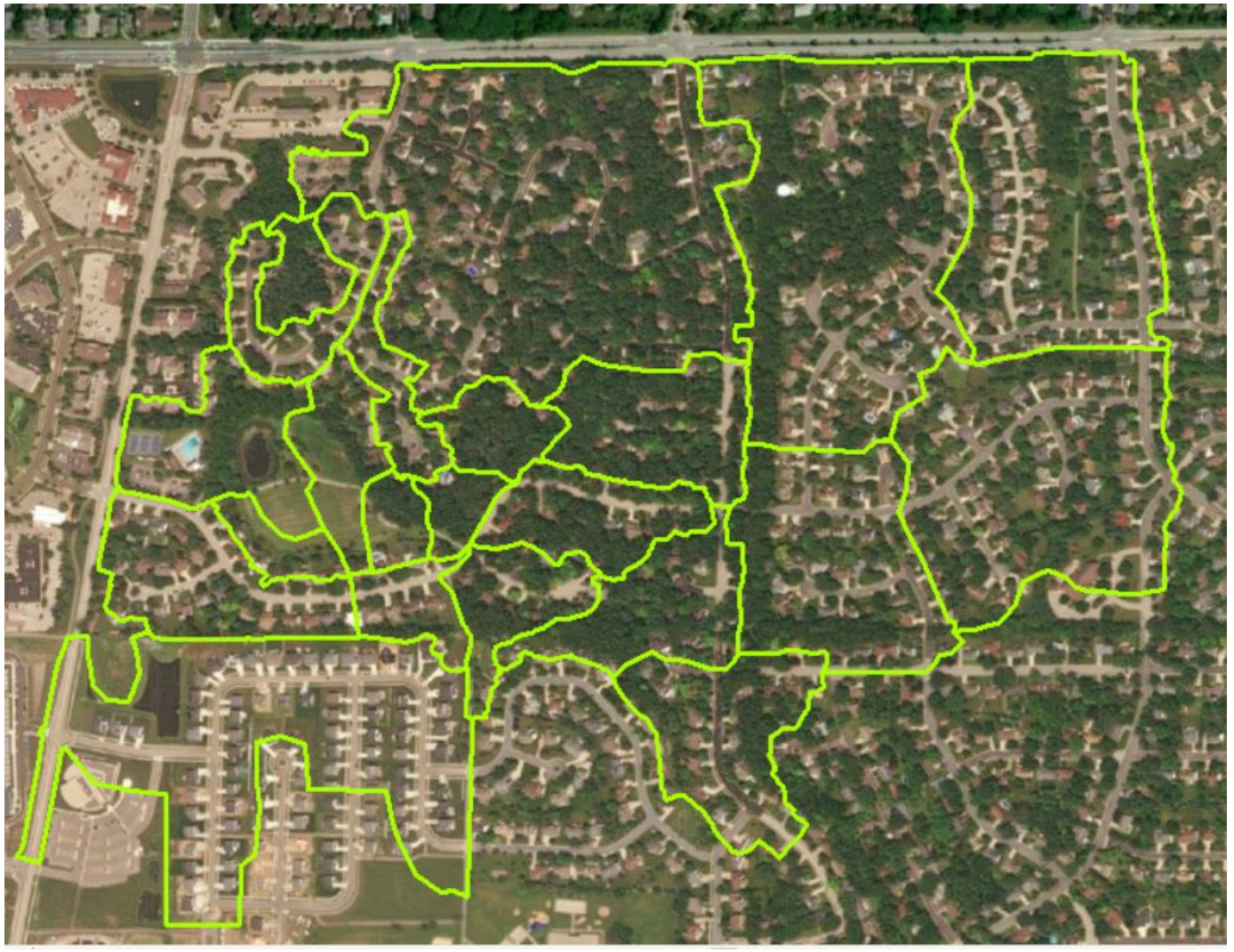
- Determine specific reasons why flooding occurs along Crescent Street
- Evaluate solutions based on current design standards
- Model water quality impacts of potential design alternatives

Existing Conditions Model Construction

- Model Inputs
  - Subcatchments



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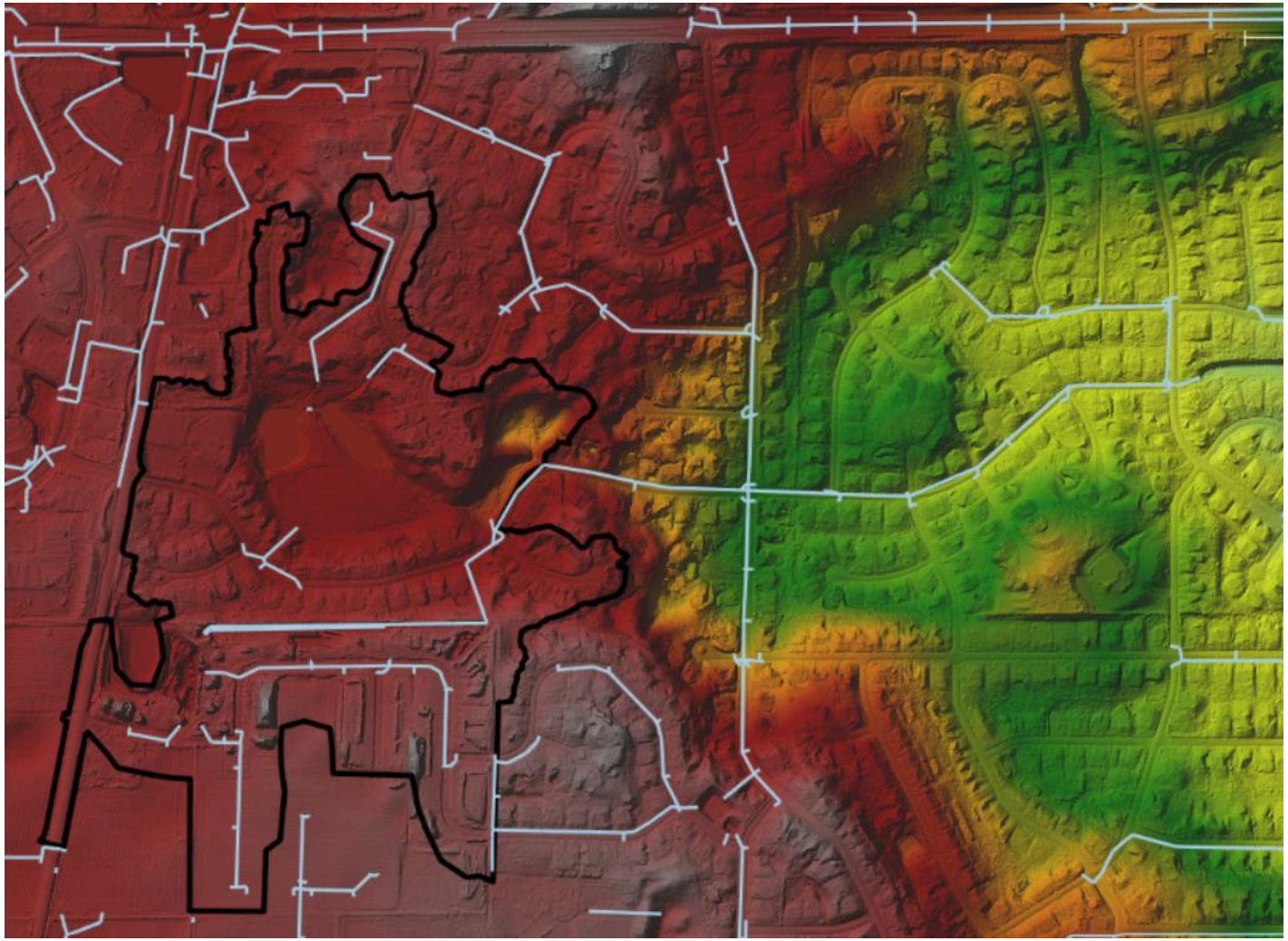

Existing Conditions Model Construction

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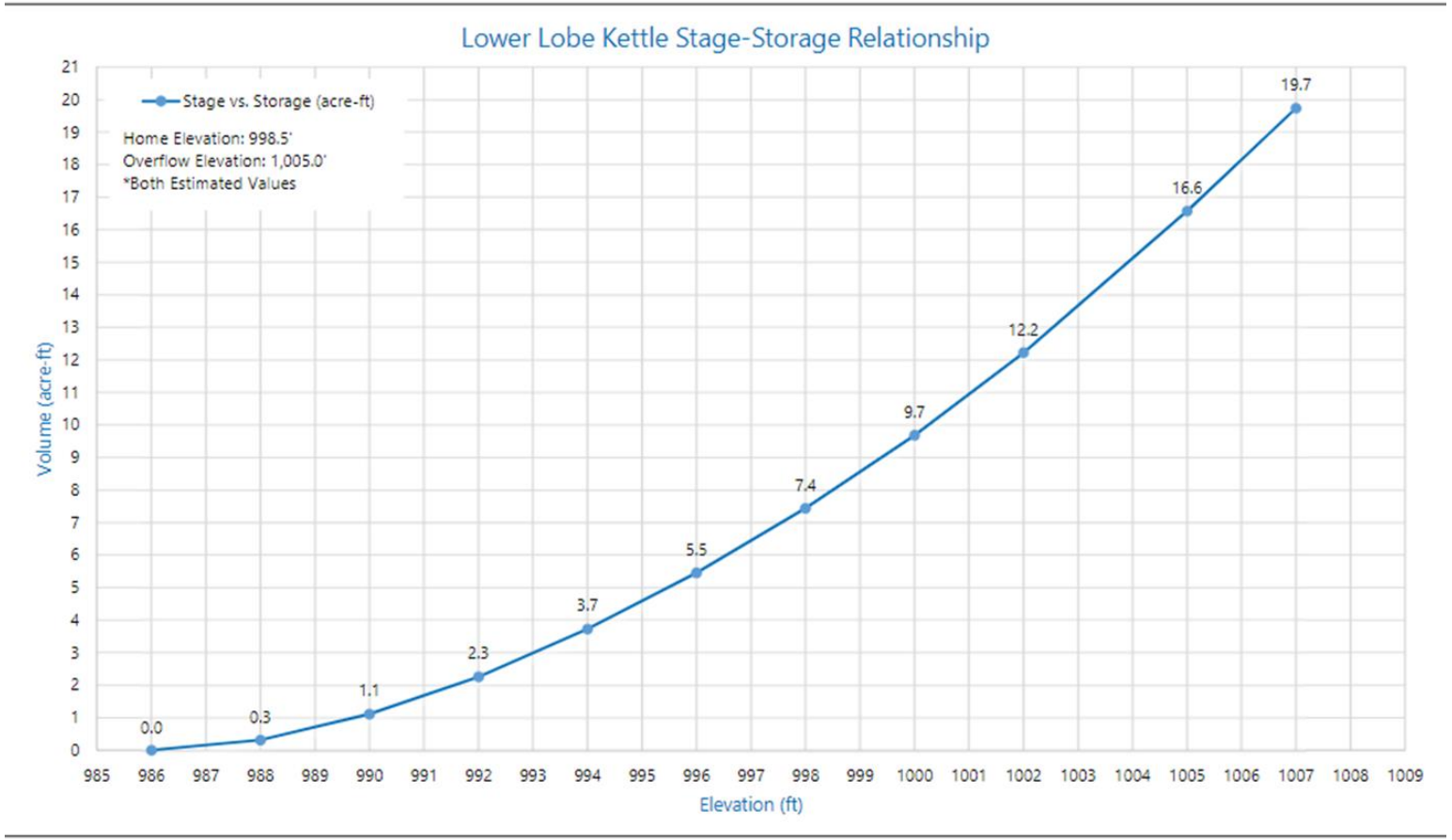
  - Storage in park ponds and kettles



Existing Conditions Model Construction

- Model Inputs
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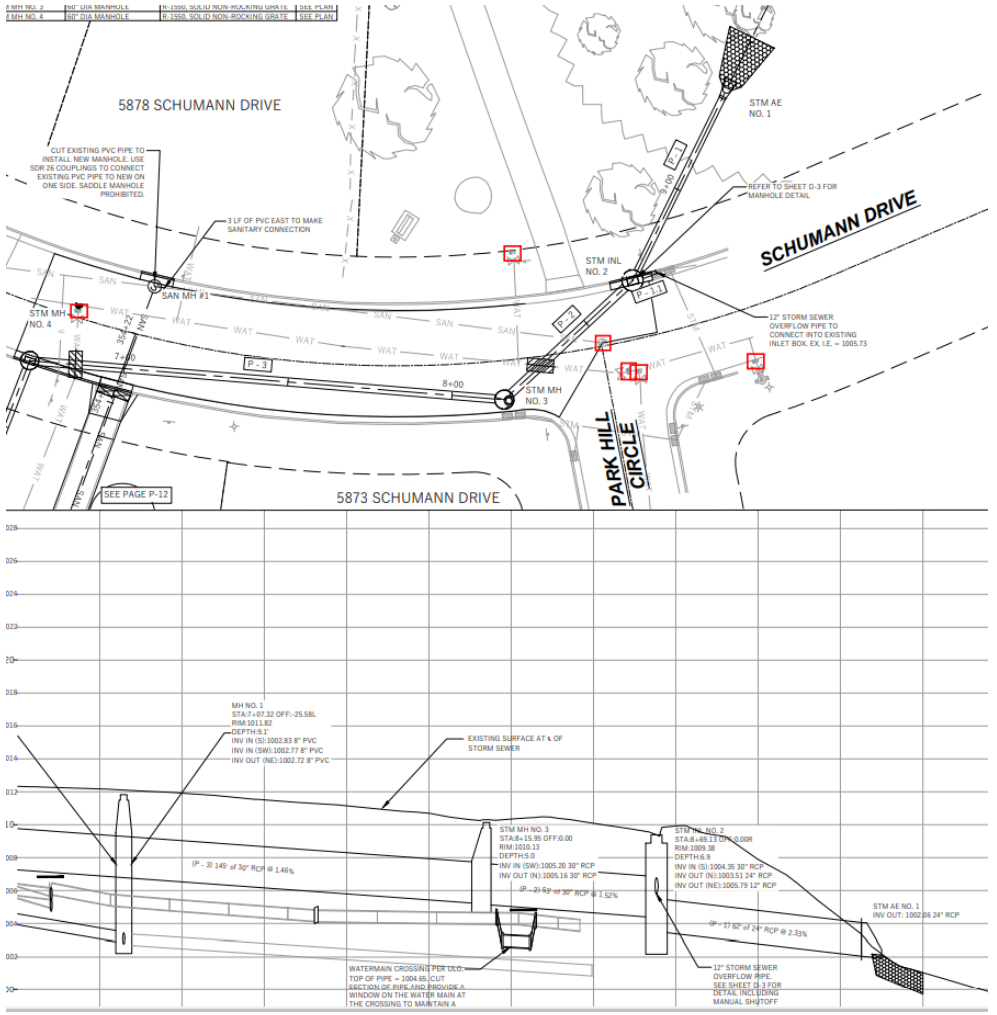
  - Gate structure between North Stoner Prairie and Schuman Drive



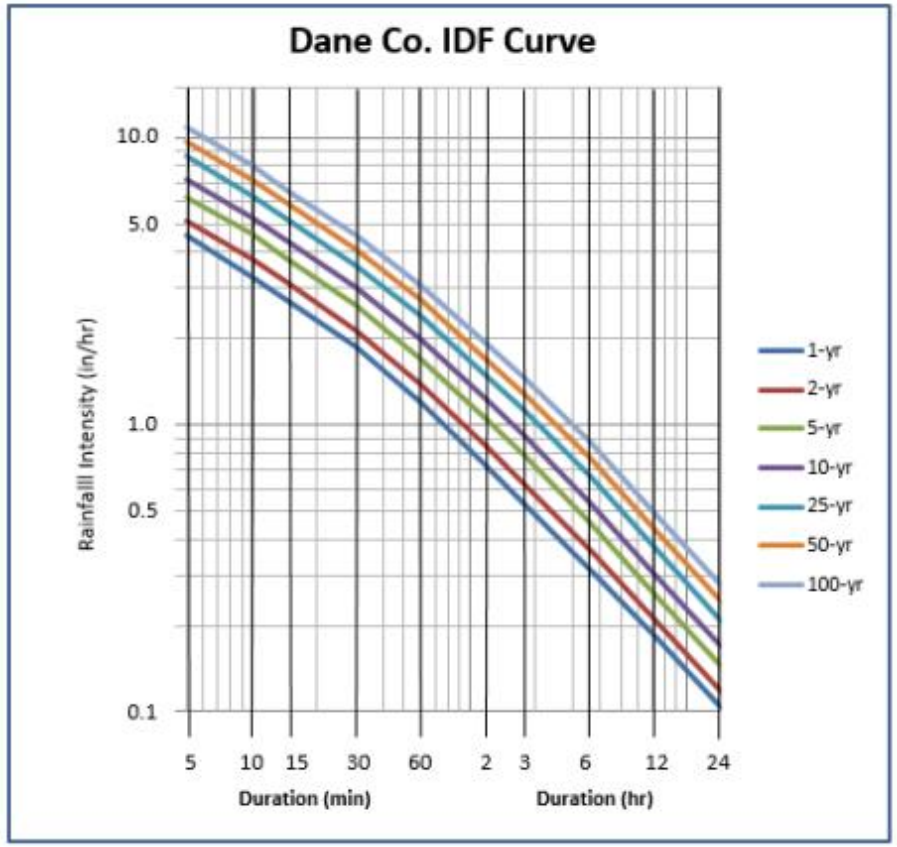
North Stoner Prairie Drainage Pre-Development

North Stoner Prairie Drainage Post-Development

Existing Conditions Model Construction

- Model Inputs
  - Subcatchments
  - Storm sewer
  - Storage in park ponds and kettles
  - Gate structure between North Stoner Prairie and Schuman Drive
  - Rainfall Information

Name	Distribution	Rainfall Depth					
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Adams	MSE3	2.69	3.26	3.82	4.71	5.50	6.38
Ashland	MSE4	2.75	3.46	4.15	5.27	6.27	7.37
Barron	MSE3	2.88	3.57	4.17	5.03	5.72	6.44
Bayfield	MSE4	2.73	3.45	4.14	5.23	6.18	7.24
Brown	MSE4	2.37	2.94	3.45	4.22	4.87	5.56
Buffalo	MSE3	2.90	3.63	4.32	5.39	6.32	7.33
Burnett	MSE4	2.84	3.52	4.12	5.02	5.76	6.54
Calumet	MSE4	2.47	3.06	3.60	4.45	5.17	5.96
Chippewa	MSE3	2.76	3.41	4.00	4.87	5.60	6.38
Clark	MSE3	2.77	3.37	3.91	4.74	5.44	6.19
Columbia	MSE4	2.76	3.38	3.96	4.88	5.66	6.52
Crawford	MSE4	2.94	3.64	4.35	5.50	6.53	7.68
Dane	MSE4	2.84	3.49	4.09	5.01	5.80	6.66



Existing Conditions Model Findings

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Approximately 7 ac-ft of incremental volume between risk to Schumann Drive home and overflow to Schumann Drive.

Existing Seminole Glen wetland ponds have a combined surface area of approximately 2 acres.

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  - Safe overflow routes
  - City plan for managing gate valve at North Stoner Prairie

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- Future design depending on study outcomes

Questions?