

Climate Change Resilience Planning Study

Public Outreach Meeting
Oct 26, 2022

Background

This study focuses on the “other” flood event: *localized flooding due to heavy rainfall*

— Potential impacts

- Street flooding
- Sanitary sewer overload & back-up
- Property damage

We have experienced these types of events in the past

- July 15-16, 1993: 5.1 inches
- June 19-20, 2000: 6.8 inches

A comprehensive model of the City’s storm sewer system has been developed & will be used to evaluate the impacts of increasing rainfall intensity associated with climate change













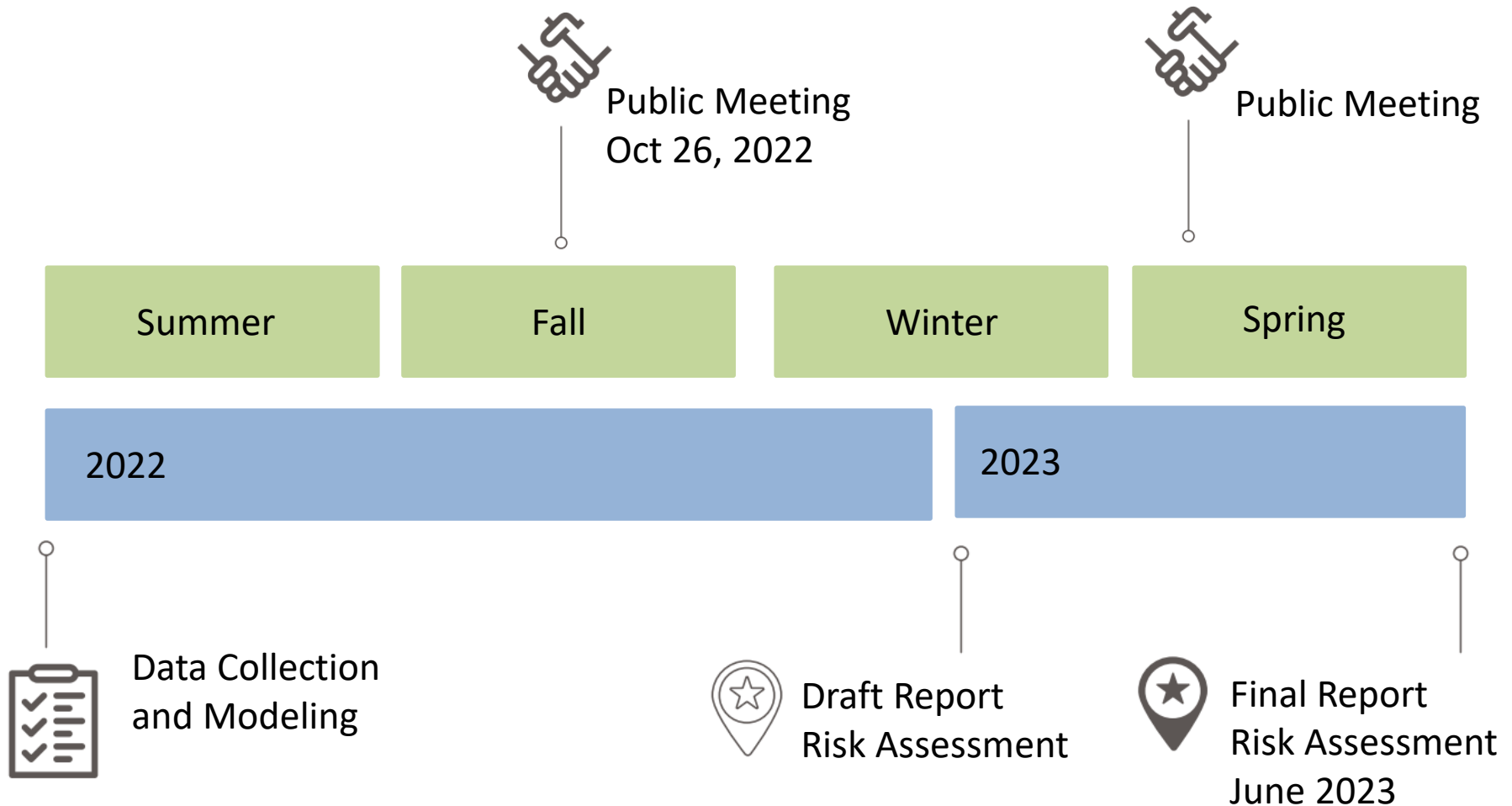


State Grant Program

- For the purpose of this grant, our study area will focus on the more vintage infrastructure
 - Increase resilience to stormwater & reduce localized flood risk
 - Improve resilience of wastewater systems
 - Reduce human health effects & adapt community services, ordinances & public spaces

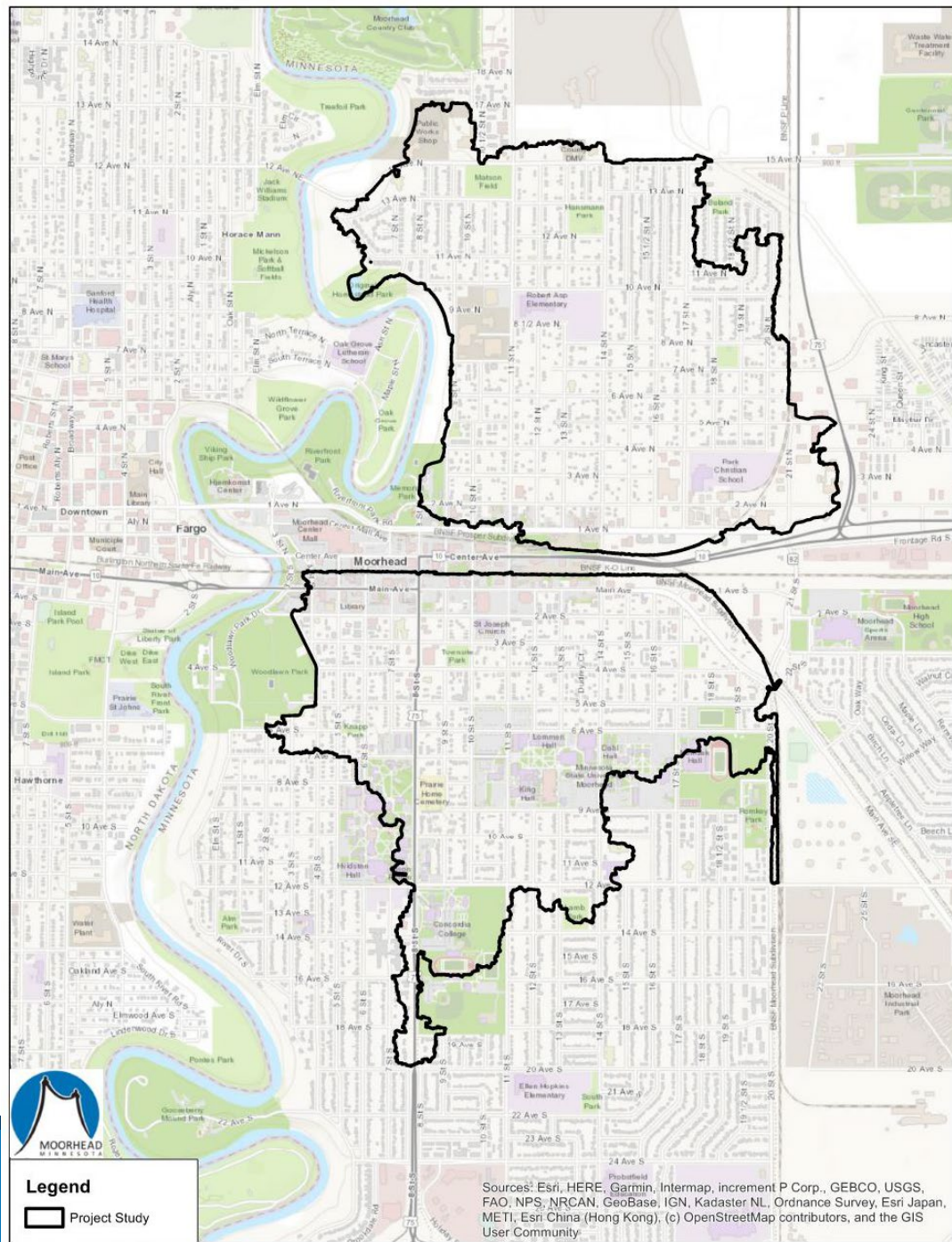
Source	State	City
Cost-share	\$74,929.50	\$24,976.50
Total	\$99,906.00	

Work Task Timeline



Study Area

Core Areas of Town That Are
Most Susceptible to Flooding



Design Storm Events

Annual exceedance probability	50%	20%	10%	2%	1%
Typical storm sewer design for:	Local streets	Minor arterial & collector streets		Underpass	Ponds
Original Design Event (1960s - 1990s)	2.3 in	3.1 in	3.6 in	4.6 in	5.3 in
Current Design Event	2.5 in	3.1 in	3.8 in	5.6 in	6.5 in
Projected Design Event	2.9 in	3.6 in	4.4 in	6.4 in	7.5 in

Design Storm Events

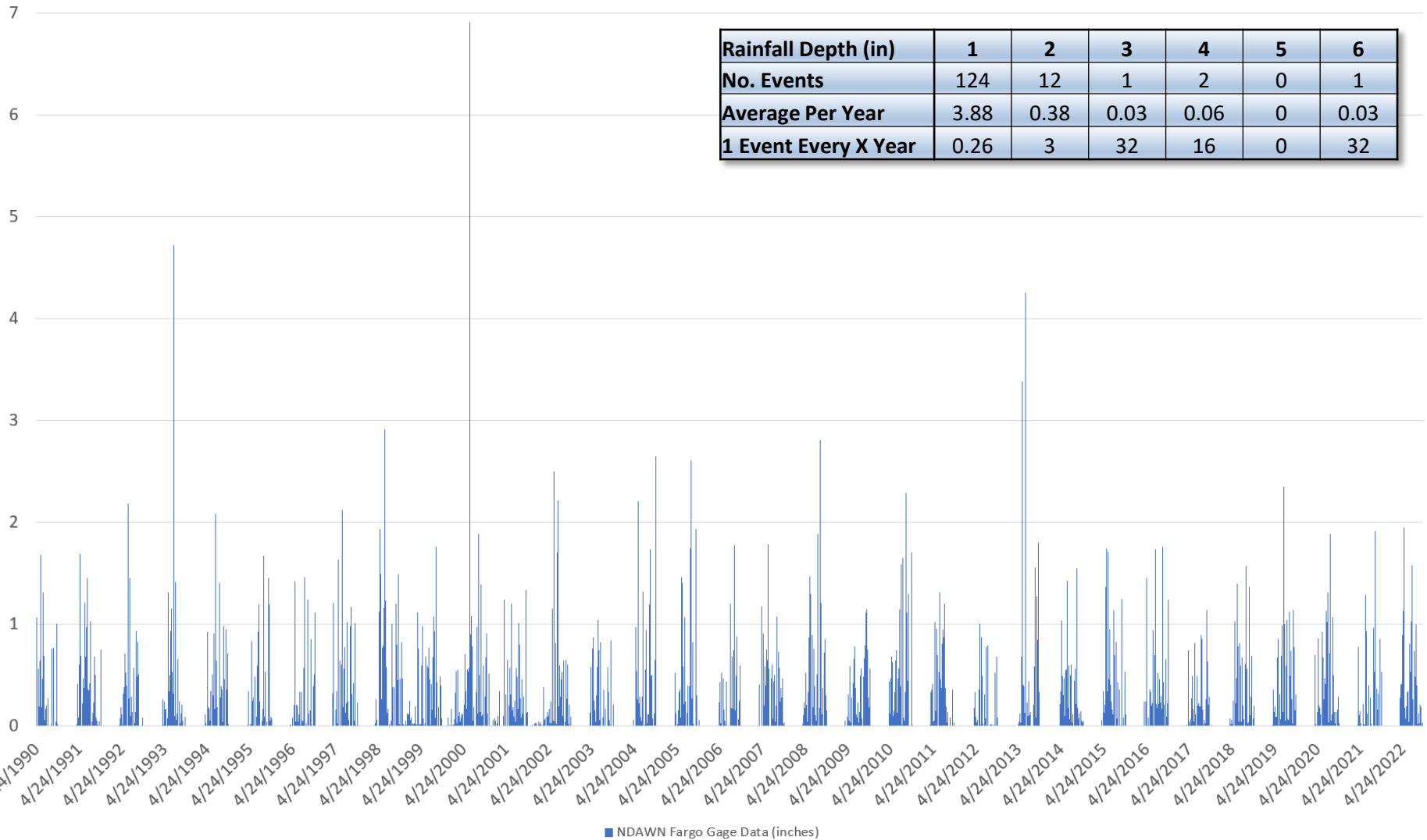
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Historic 24 Hour Storms Events

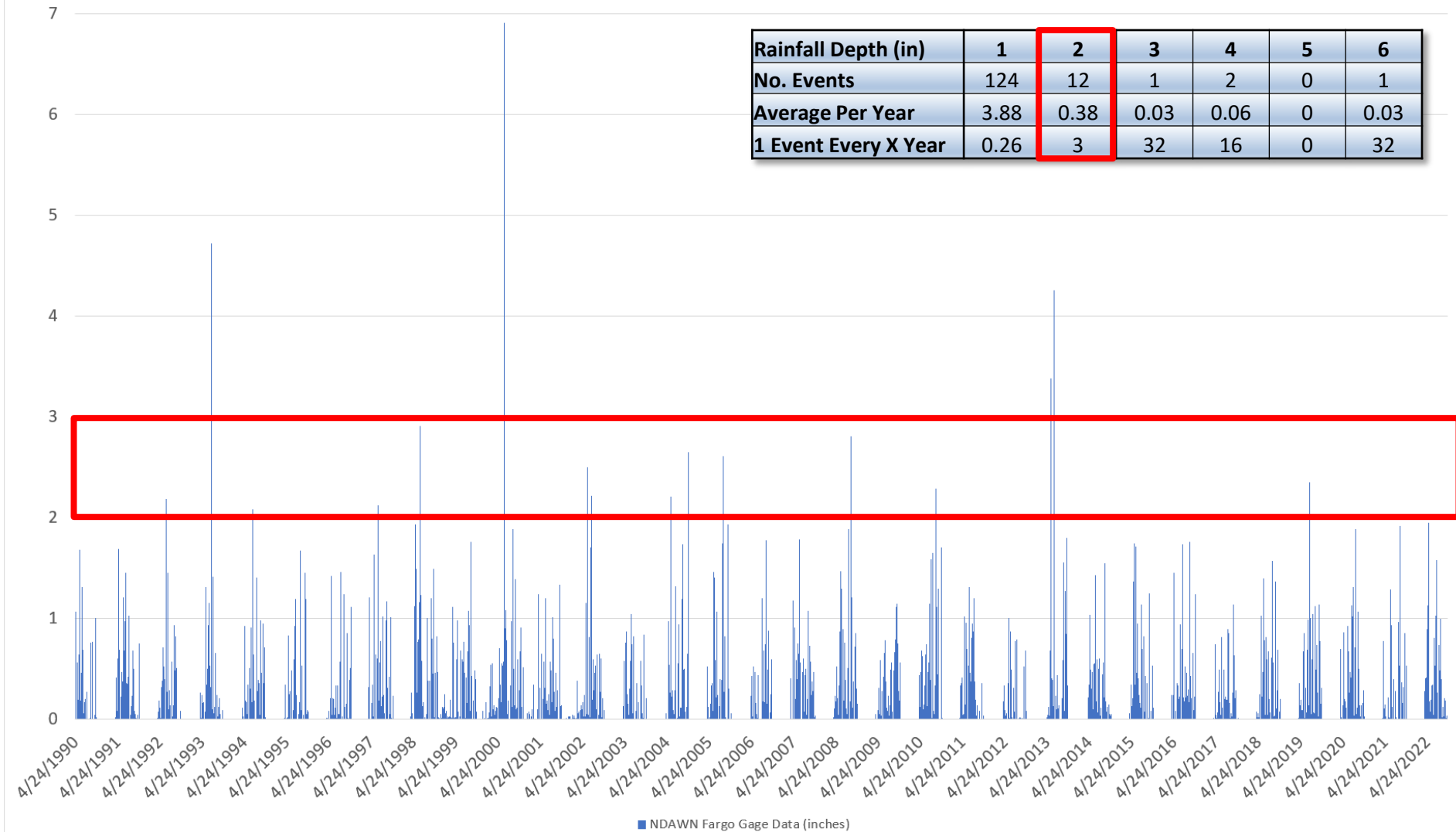
1990 - 2022 Historic Rain Events

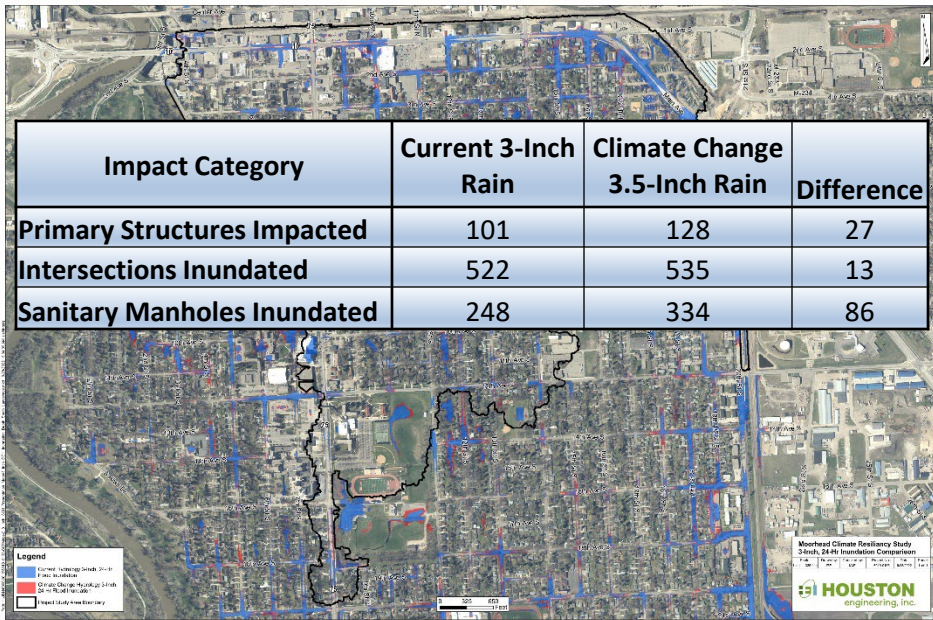
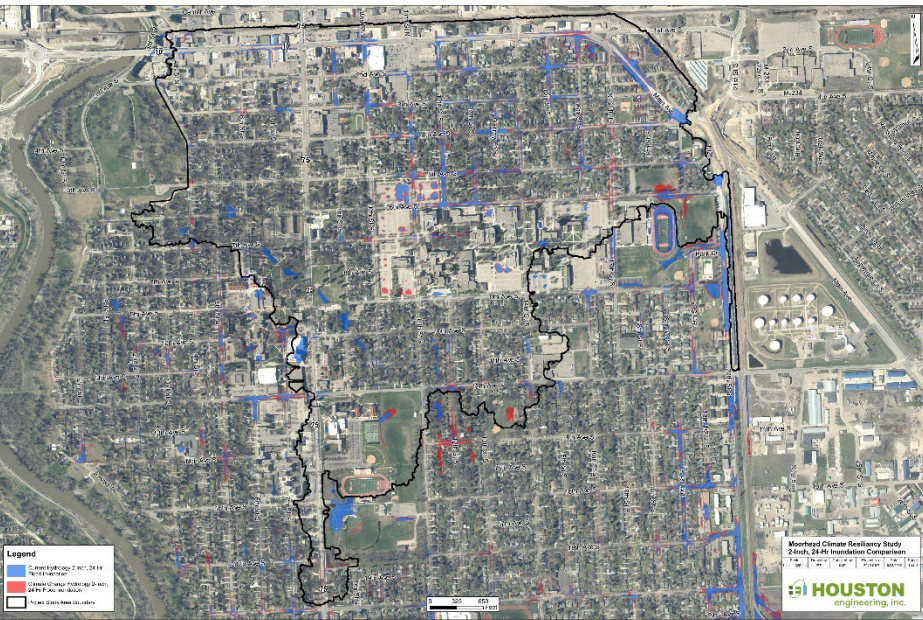
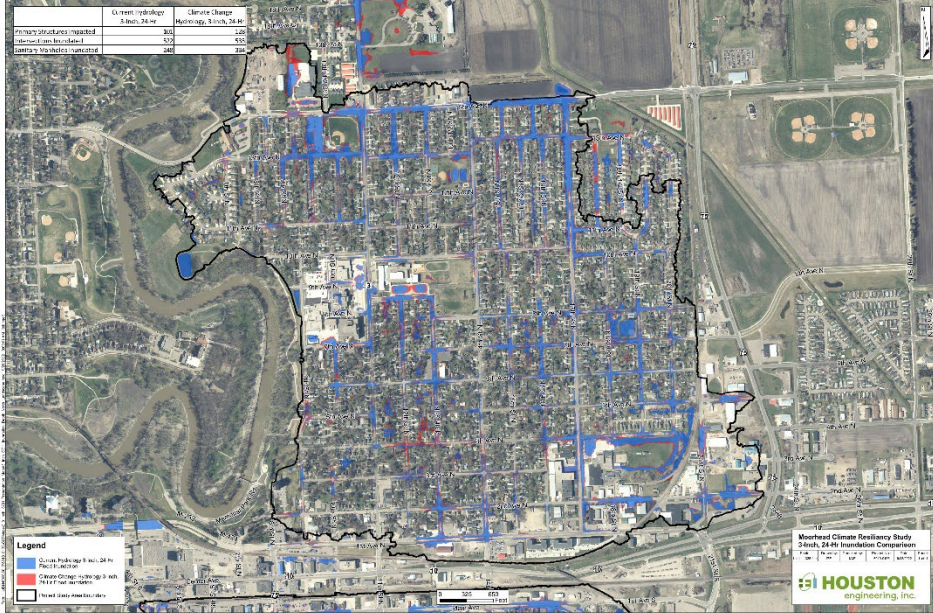
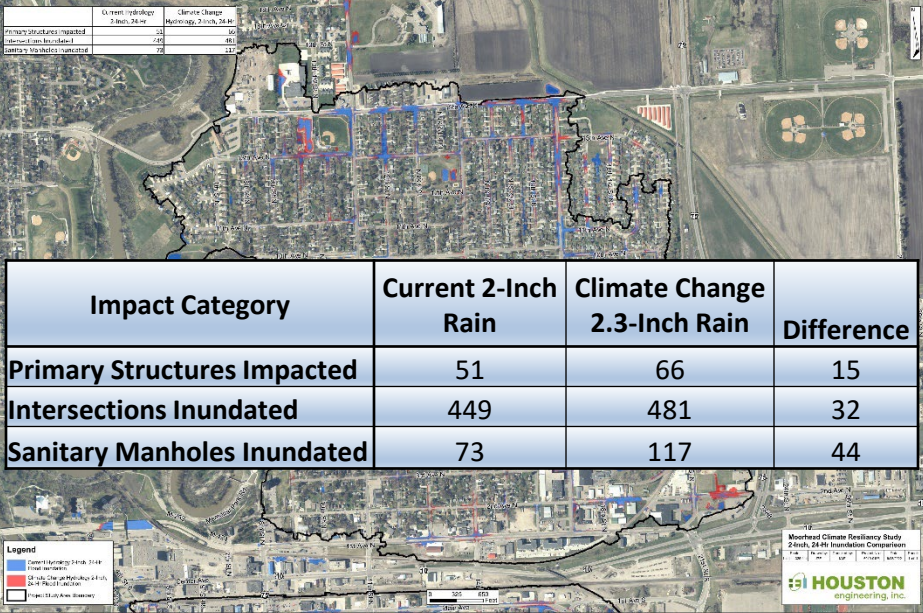


Historic 24 Hour Storms Events

1990 - 2022 Historic Rain Events

Rainfall Depth (in)	1	2	3	4	5	6
No. Events	124	12	1	2	0	1
Average Per Year	3.88	0.38	0.03	0.06	0	0.03
1 Event Every X Year	0.26	3	32	16	0	32





Preliminary Modeling Results

Some possible mitigation strategies may include:

Replace and increase the size of the drainage system

- Challenge: \$\$\$

Construction of ponds or other types of detention

- Challenge: Limited space available to construct ponds

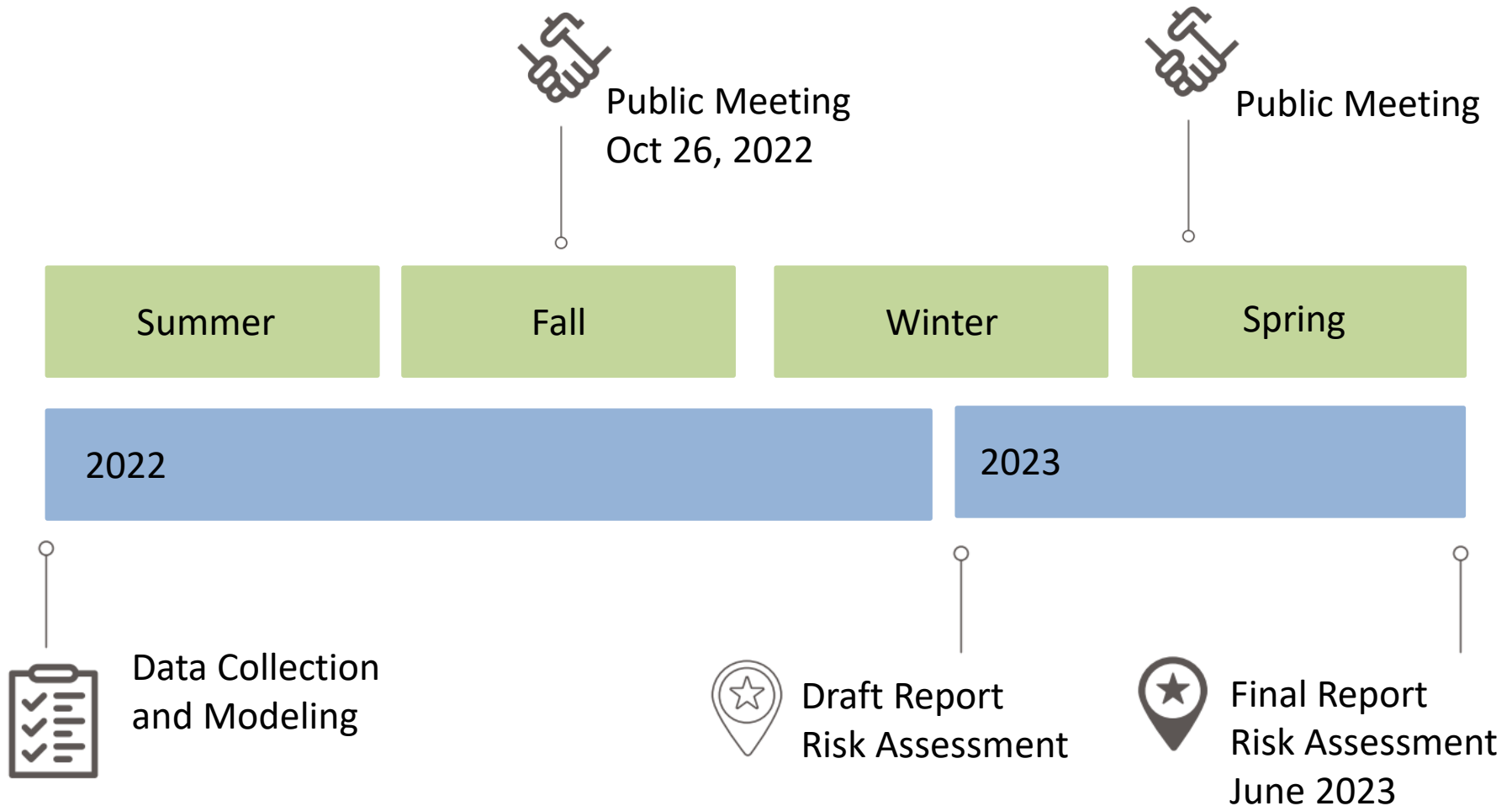
Use of green infrastructure.

- Challenges: local soil conditions and space limitations.

Minimize the potential street flooding from entering our sanitary sewer manholes

- Challenges: \$\$\$ and effectiveness

Work Task Timeline



www.cityofmoorhead.com

The screenshot displays the City of Moorhead website. At the top, there is a navigation bar with links for News, Calendar, City Code, Maps, e-Notification, Contact Us, and Translate, along with a search bar. Below this is a large banner with the text "CITY OF MOORHEAD Your Hometown minnesota". A horizontal menu contains links for HOME, ABOUT THE CITY, HOW DO I..., RESIDENTS, BUSINESS, DEPARTMENTS (highlighted), and GOVERNMENT. On the left side, a vertical sidebar lists various departments, with "Engineering" expanded to show sub-items like "Current & Future Projects", "Street & Traffic Control Signs", "Forms & Resources", "Special Assessments", "Floodplain Information", "Geographic Information Systems", "Stormwater Management", "Stormwater Permits", "Stormwater Public Education", "Moorhead Climate Change Resilience Study", "Contact Stormwater Staff", and "Wastewater". The main content area features the title "CLIMATE CHANGE RESILIENCE STUDY" with a breadcrumb trail "Departments » Engineering » Stormwater Management". Below the title are social media sharing options and a "Print" button. The text describes a grant from the Minnesota Pollution Control Agency (MPCA) for studying stormwater, wastewater, and community climate resilience. It includes sections for a "Public Meeting" on October 26, 2022, and an "Online Survey" where residents can report flooding locations. A list of links for the GIS Mapping Tool, QR Code, and Map of Study Area (PDF) is provided. A "Questions?" section offers an email contact for stormwater staff. The footer contains the city logo, contact information for Moorhead City Hall, and a copyright notice for 2022. It also credits "Vision Internet - Innovators of Online Government".

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CLIMATE CHANGE RESILIENCE STUDY

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Climate Change Resilience Study

The City of Moorhead received a State of Minnesota grant from the Minnesota Pollution Control Agency (MPCA) to study stormwater, wastewater, and community climate resilience to localized flooding during and after heavy rain events. The City will use this grant to develop climate-resilient strategies to reduce risk to vulnerable community assets resulting from increased rainfall intensities caused by climate change.

Public Meeting

On October 26, 2022 City staff will hold a Public Meeting at the Hjemkomst Center at 6 pm.

Online Survey

The City of Moorhead would like your help in identifying areas in the project study area that flood during rain events. Place a point on the map where flooding has been observed and provide as much detail as possible. If you have more than one location or more than one occurrence at the same location please submit the form and you will be provided with a link back to the form where you can submit additional locations.

The Study area was chosen because it is more susceptible to change in precipitation due to the vintage of the infrastructure.

- GIS Mapping Tool
- QR Code
- Map of Study Area (PDF)

Questions?

Email Stormwater staff or call 218.299.5386

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Public Observation

- City staff would like to hear feed back of what you are seeing in your neighborhood.
- On-line survey <https://arcg.is/000ne0>

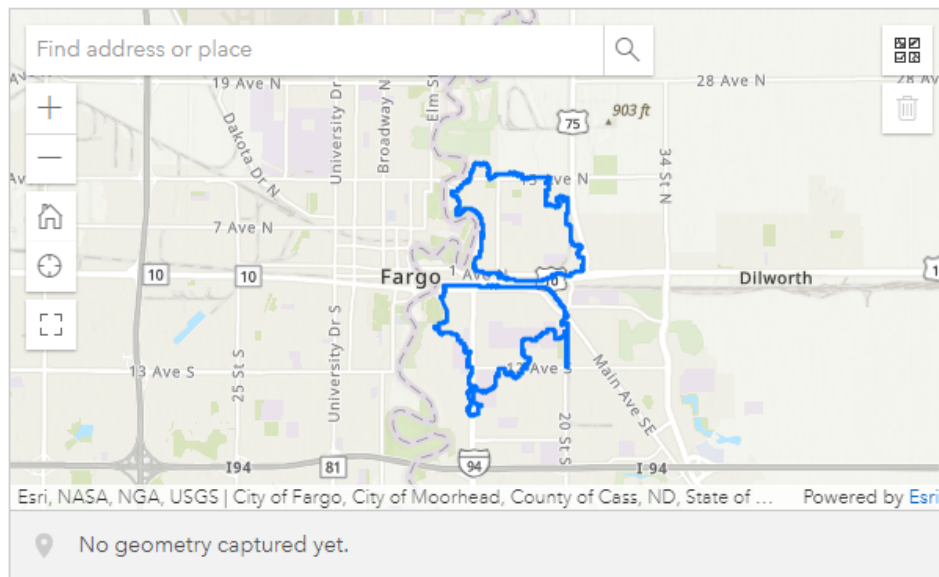


Moorhead Climate Change Resilience Study

The City of Moorhead would like your help in identifying areas in the project study area that flood during rain events. The map below displays the current study areas with a blue outline. Place a point on the map below where you have observed flooding in the past and provide as much of the requested data as you can. If you have more than one location you would like to mark, please submit the form and you will be provided with a link back to this form where you can submit additional locations. If you have questions, you may contact Stormwater Management at 218.299.536 or email gis@cityofmoorhead.com. Thank you for assistance.

Map Flood Event*

Drop pin in map where flooding occurred or use current location using the "target" button alongside of the map. Although the intent of this study is to specifically examine the highlighted study areas, you may select locations outside of the study areas where you have observed flooding following a heavy rainfall event.



Your address

Not required

Date flooding was observed

If known

Approximate depth of floodwater

In feet

Did flooding reach buildings

<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Unknown
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Were any inlets plugged

<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Unknown
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Other Comments

Ex. How many buildings flooded, is it a recurring issue, how long did it remain flooded, description of damage, etc.

1000

Photos for upload if available

Drop image here or select image



Submit