

# Waterfront Redevelopment for Stillwater, MN

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## Research

### Matrix

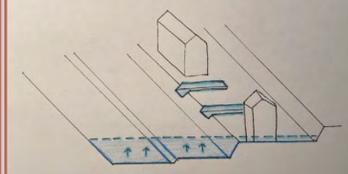
Information	Type/Theme	Design	Details
<ul style="list-style-type: none"> <li>- San Antonio Riverwalk</li> <li>- Located in San Antonio, Texas</li> <li>- 15 Miles long</li> <li>- Designed by Robert H. Hugman</li> </ul>	<ul style="list-style-type: none"> <li>- River Flood Prevention</li> <li>- Defend (keep rising waters away from cities and people)</li> </ul>	<ul style="list-style-type: none"> <li>- Includes 41 dams built along the river</li> <li>- Includes bypass channel for water</li> <li>- River ranges from 2 - 24 feet deep</li> <li>- Many bridges connect both sides of the river</li> </ul>	<ul style="list-style-type: none"> <li>- Concrete, stone, and brick were used to create the riverwalk</li> <li>- A variety of plants are used along the riverwalk</li> </ul> 
<ul style="list-style-type: none"> <li>- Bonnet Carre Spillway</li> <li>- Located in St. Charles Parish, Louisiana</li> <li>- 5.7 Miles long</li> <li>- Created by the U.S. Army Corps of Engineers</li> </ul>	<ul style="list-style-type: none"> <li>- River Flood Prevention</li> <li>- Defend (keep rising waters away from cities and people)</li> </ul>	<ul style="list-style-type: none"> <li>- Made up of two main components 1) a control structure along the Mississippi river 2) a floodway that transfers diverted flood waters to Lake Pontchartrain.</li> </ul>	<ul style="list-style-type: none"> <li>- High strength concrete was used to create the spillway</li> <li>- Large wooden planks are used to stop the water flow</li> <li>- To open large planks are removed one by one</li> </ul> 
<ul style="list-style-type: none"> <li>- Governors Island park</li> <li>- Located in New York Harbor NYC</li> <li>- 87 Acres</li> <li>- Designed by West 8 Urban Design and landscape Architecture and Mathews Nielsen Landscape Architects</li> </ul>	<ul style="list-style-type: none"> <li>- Coastal Flood Prevention</li> <li>- Retreat (to move away from rising waters)</li> </ul>	<ul style="list-style-type: none"> <li>- Majority of the island had to be lifted out of the flood zone</li> <li>- A seat edge was designed along the western side of the island to protect the site from waves</li> <li>- There is a lawn around the perimeter of the park that can withstand the flood waters</li> </ul>	<ul style="list-style-type: none"> <li>- Flood tolerant amenities</li> <li>- Concrete seat edge</li> <li>- Less flood tolerant plants are located at the center of the island</li> <li>- New soil was brought in to lift the island out of the flood zone</li> </ul> 
<ul style="list-style-type: none"> <li>- Water Square</li> <li>- Located in Rotterdam, Netherlands</li> <li>- Designed by Hugh Maaskant</li> </ul>	<ul style="list-style-type: none"> <li>- Urban Flood Prevention</li> <li>- Adapt (to allow rising waters to enter the space and acclimate to the presence of water)</li> </ul>	<ul style="list-style-type: none"> <li>- Water Square is made up of three pools that fill up when it rains</li> <li>- The three pools collect water and transports it through large stainless-steel gutters</li> <li>- Most of the year these pools remain dry and are used for recreation.</li> <li>- Includes a rain wall and a water wall</li> </ul>	<ul style="list-style-type: none"> <li>- Stainless steel is used for gutters</li> <li>- All three basins are made up of concrete</li> <li>- All that can flood is painted in shades of blue and all that transports water is shiny stainless steel</li> </ul> 

### Project Statement

Lowell Park in Stillwater, MN, is along the St. Croix River and consists of park space, picnic tables, sidewalks, restrooms, the Stillwater Lift Bridge historical site, a bike path, restaurants and a boardwalk with boat ties available to dock. This area typically floods annually in the Spring, with the boardwalk being most affected. The goal for this project is to create a functional use of this space in correlation to the St. Croix River's seasonal flooding. I will be analyzing three flood prevention methods (Adapt, Defend, Retreat) to develop and design a solution for this site. Currently, a large portion of the site consists of multi levels of concrete, as well as park space. This project will also explore other materials for this design.

### Flood Prevention

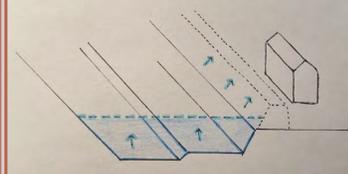
#### Adapt:



To allow rising water levels to enter the spaces of cities and communities prompting buildings, landscapes and people to transform in an effort to acclimate to the presence of water.

(Image and description from Water Index, page 84)

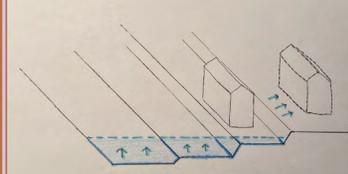
#### Defend:



To construct a mechanism to keep rising water levels away from people, buildings and cities.

(Image and description from Water Index, page 72)

#### Retreat:



To move people, buildings and cities away from rising water levels.

(Image and description from Water Index, page 52)

## Site Analysis

### The Site

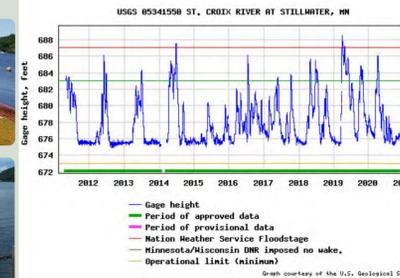


- Street Access
- Parking Lots
- Restaurant Locations
- Restroom Building
- River Access Points

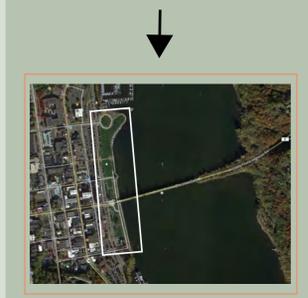
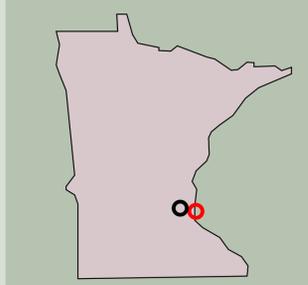
### The Problem

Due to the city's close proximity to the river, it is often impacted by seasonal flooding. The conditions of the St. Croix River depend heavily on seasonal weather, precipitation and location.

### Flood Levels 2012-2021



### Site Location



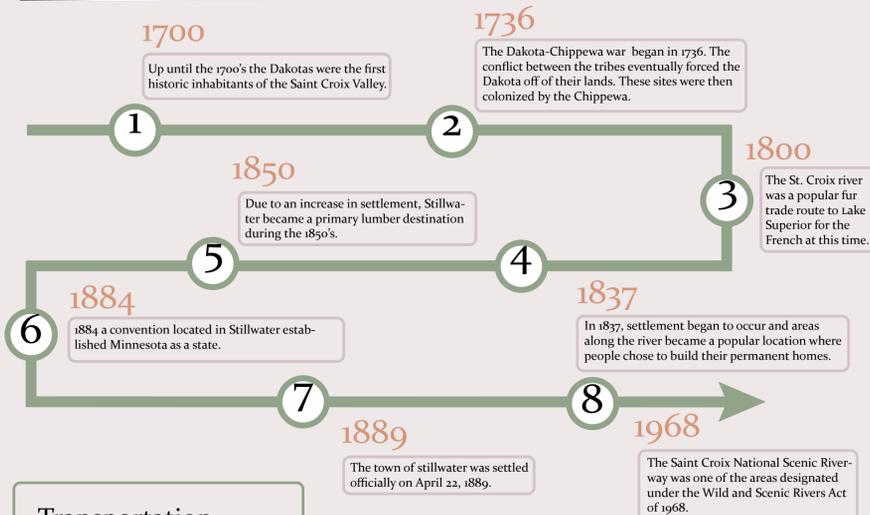
- Address: 425 Nelson St E, Stillwater, MN 55082
- Site Typology: Urban Riverfront
- Planting Zone: 4b
- Current Population: 19,404

### Historic Crests

- Historic Crests
- 94.10 ft on 04/18/1965
  - 92.30 ft on 04/27/2001
  - 92.20 ft on 04/16/1969
  - 91.10 ft on 04/16/2001
  - 90.45 ft on 04/12/1997
  - 89.70 ft on 04/14/1952
  - 88.48 ft on 03/31/2019 (P)
  - 87.90 ft on 06/28/1993
  - 87.63 ft on 06/27/2014
  - 87.50 ft on 04/06/1986
  - 87.30 ft on 04/30/1975
  - 87.28 ft on 04/12/2011
  - 85.99 ft on 06/01/2012
  - 85.93 ft on 03/25/2010
  - 85.80 ft on 07/16/2016
  - 85.65 ft on 04/30/2018 (P)
  - 85.53 ft on 06/22/2018 (P)
  - 84.19 ft on 07/01/2013
  - 83.82 ft on 10/10/2017
  - 83.46 ft on 05/25/2017
  - 81.75 ft on 05/27/2013
  - 80.48 ft on 06/15/2013
- (P): Preliminary values subject to further review.

## The Saint Croix River Over Time

### General History



### Transportation

The Palmyra was the first steamboat to travel the St. Croix in 1838. Between 1860-1890, hundreds of steamboats traveled annually on the river. Before the railroads were built in the St. Croix Valley, the steamboats were one of the only connections river towns had.



### First People

Native people lived along the St. Croix River long before Europeans immigrated to the area. Several tribes of the Dakota and Ojibwe still live along the river today. Evidence of people living along the river goes as far back as 5,000 years. Many historical artifacts are still being found today.



### Logging History



The logging era in this location lasted from 1839-1914. During this time all aspects of the logging industry could be found along the St. Croix



The St. Croix "Boom" was built in 1856 and located above Stillwater. "The Boom" was a checkpoint location where all of the logs were collected. The Boom operated for 58 years before closing in 1914. It was the most important industry for this location at the time.



Stillwater had the largest number of saw mills. This image shows the Issac Staples sawmill in Stillwater. The chimney is still there today.

## Design Framework

### Functions:

- Flood Remediation:** Stopping further environmental Flood damage to the site and the surrounding city
- Recreation:** Allow for recreational activities and opportunities such as biking, fishing, and boating.
- Community Connection:** Creating community connections through recreational opportunities and education about the city of Stillwater and its history.

### Programming Elements:

- Seating areas
- Stormwater Drainage
- River Access: Access to the St. Croix River for fishing and kayaks
- Art
- Park signs
- Restaurants
- Boat Docks: Space for docking boats along the St. Croix River
- Biking/Walking Paths: Path ways for pedestrian circulation
- Pedestrian Bridge
- Food truck
- Public parking
- Walkway along the river
- Bike Rack

### Existing Conditions:



Master Plan



- 1 Waterwalk Steps
- 2 Restaurant
- 3 Patio Space
- 4 Pollinator Garden
- 5 Grass Garden



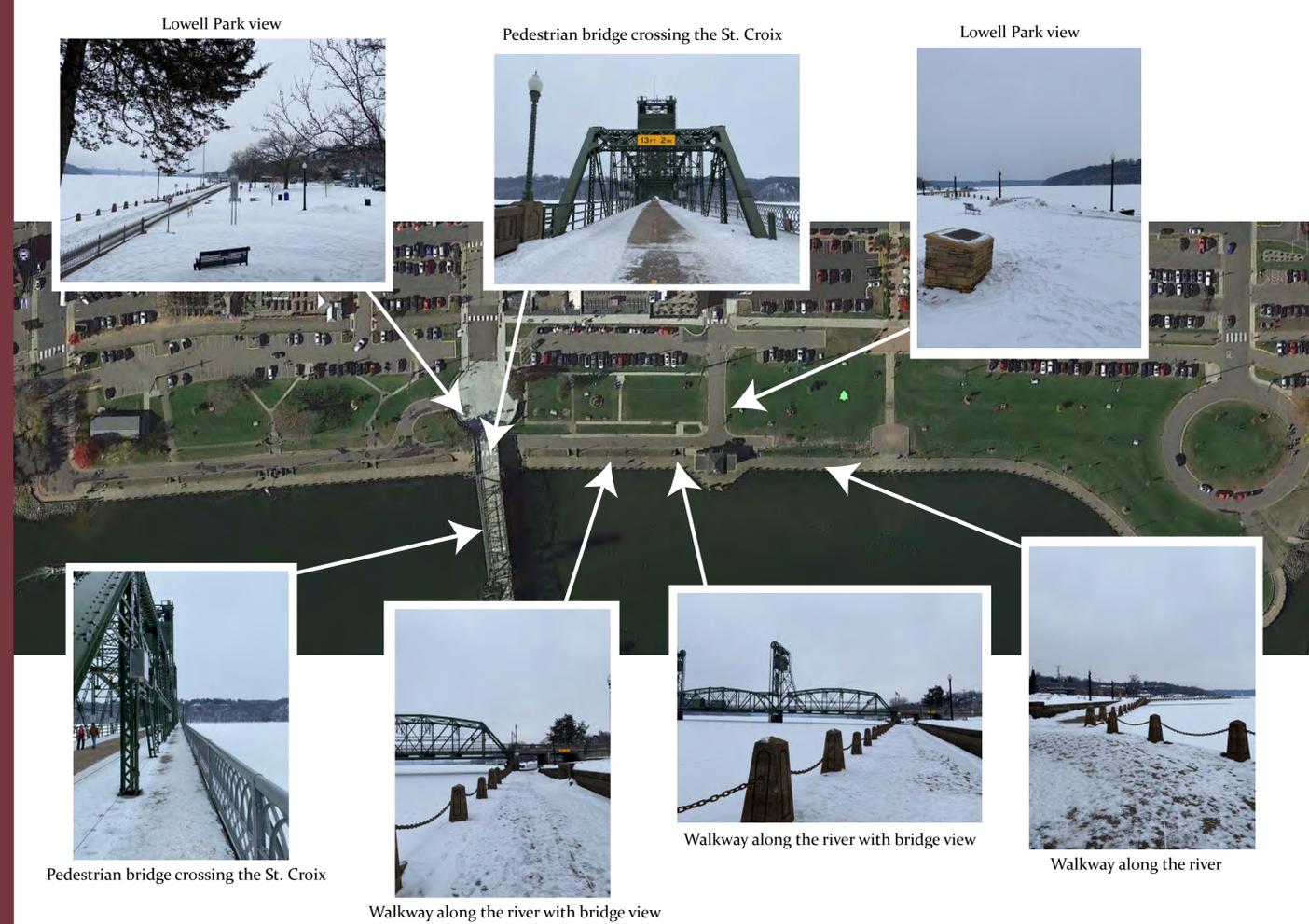
Project Narrative

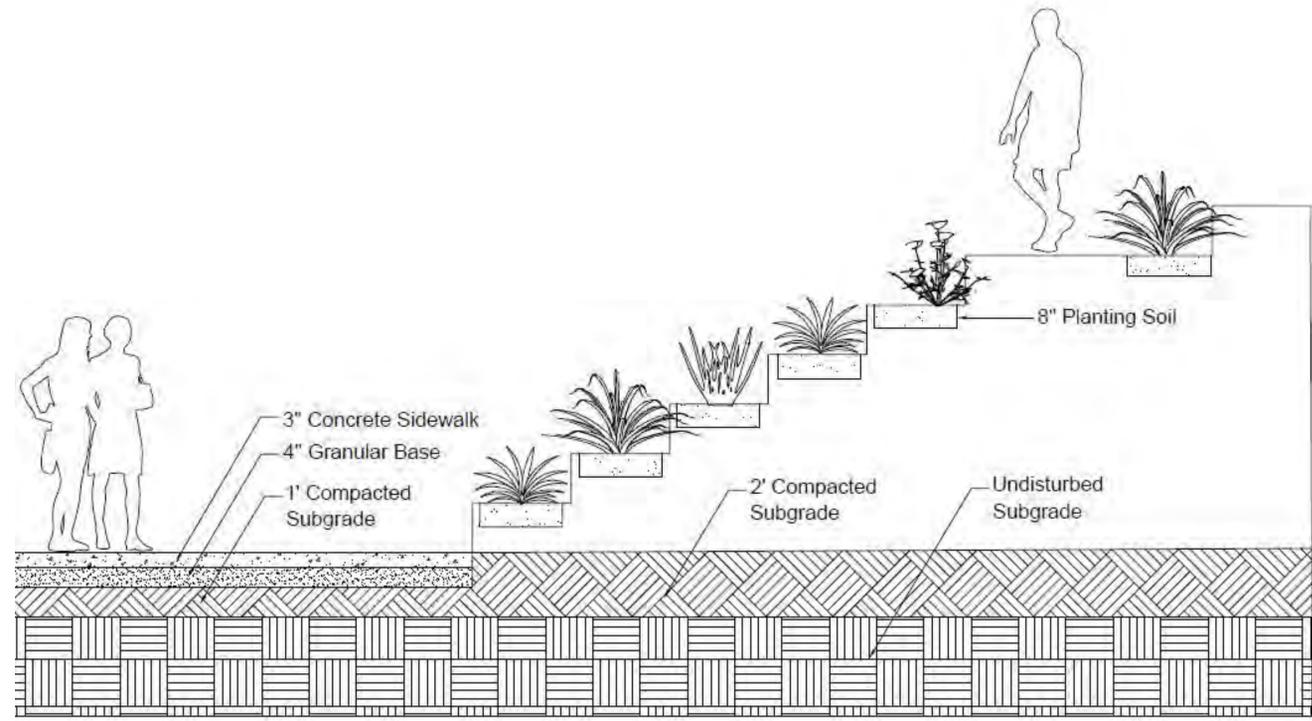
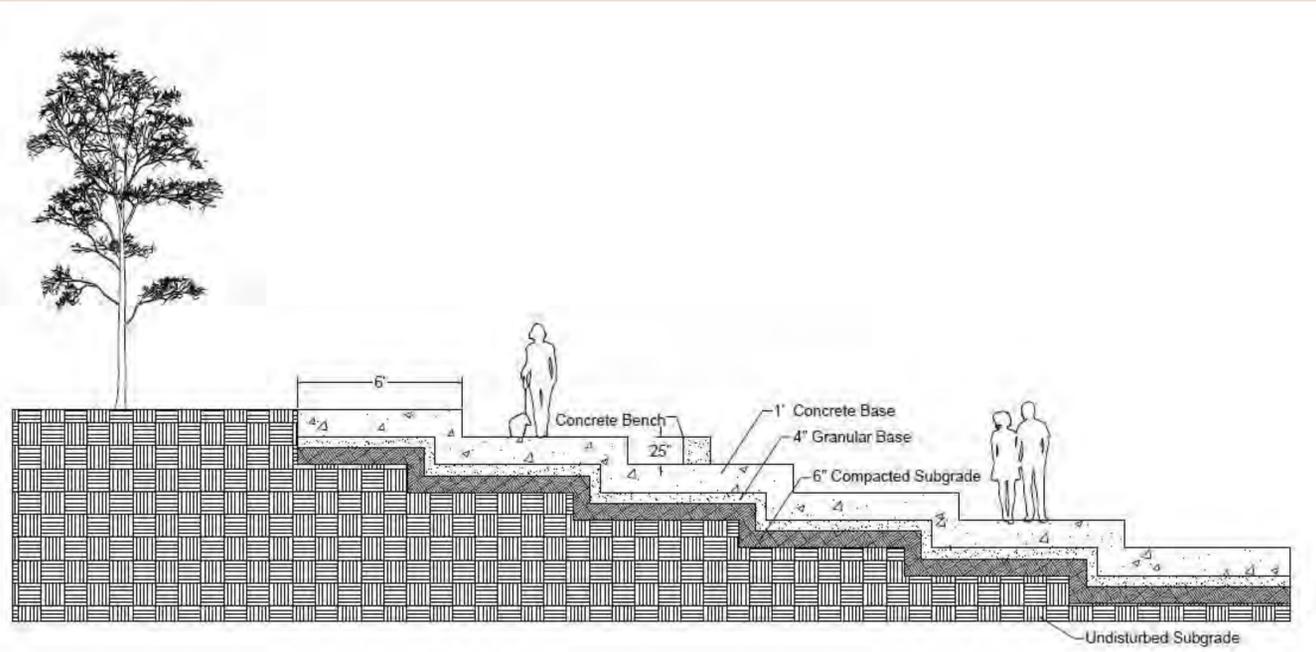
This updated design of Lowell Park, in Stillwater, MN, will provide a walkway along the St. Croix River for individuals to enjoy throughout all seasons. The existing pathways located around the park provide connections to public parking, local shopping and restaurants. The paths also provide recreational opportunities for walking and biking, as well as lead to other trails in the surrounding area. Groupings of plantings and green space will be incorporated into the design to enhance the area with flowers, plants and natural vegetation. There will be added seating to be used for social interactions and to provide space and opportunities to sit and enjoy a peaceful view of the passing boats along the St. Croix River in the warmer months, or the lights decorating the city and river-front area in the winter months. This design is intended to provide access to Lowell Park and the surrounding throughout all seasons, and plans for the seasonal flooding that occurs on an annual basis.

Case Studies:

Method:

Bonnet Carre Spillway		→		<p>This design uses the Defend Method for flood protection. It works by creating concrete steps between the river and walkway, thus blocking the river water when it rises. This idea was used from the removable wall designed for the Bonnet Carre Spillway, located in St. Charles Parish, Louisiana. The Spillway is used to defend the city of St. Charles Parish.</p>
Governors Island Park		→		<p>This design uses the Retreat Method for flood protection. It creates planting designs located far from the rising waters of the river. The Retreat Method was also used when creating Governors Island Park in NYC.</p>
Water Square		→		<p>This design uses the Adapt Method for flood protection. This method uses the concrete steps to allow the waters to rise naturally on the site. The Adapt Method was also used at Water Square where water was stored and drained into different locations. Water Square is located in Rotterdam, Netherlands.</p>





Top View of Site



Park Perspective



Park Perspective/Planting



Park Perspective/Planting



Red Spruce  
*Picea rubens*



Norway Spruce  
*Picea abies*



Karl Foerster  
*Calamagrostis x acutiflora*



Blue Fescue  
*Festuca glauca*



Black Mondo  
*Ophiopogon planiscapus*



Birds Eye Primrose  
*Primula farinosa*



English lavender  
*Lavandula*



Alpine Aster  
*Aster alpinus*



Red Daisy  
*Bellis perennis*



Linden  
*Tilia*