

**David Waggoner**

Waggoner & Ball

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**TERMS OF INVESTMENT**

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**KEEPING HISTORY ABOVE WATER**

# Climate change and water challenges

Threats coming from 4 directions



precipitation

River discharges

Groundwater

Sea level rise



## SLR threats NL

59% of land is at or below sea level

70% GDP produced in flood-prone areas

IPCC mid-level projections:

--20 cm by 2050

--85 cm by 2100

### Flood-prone area

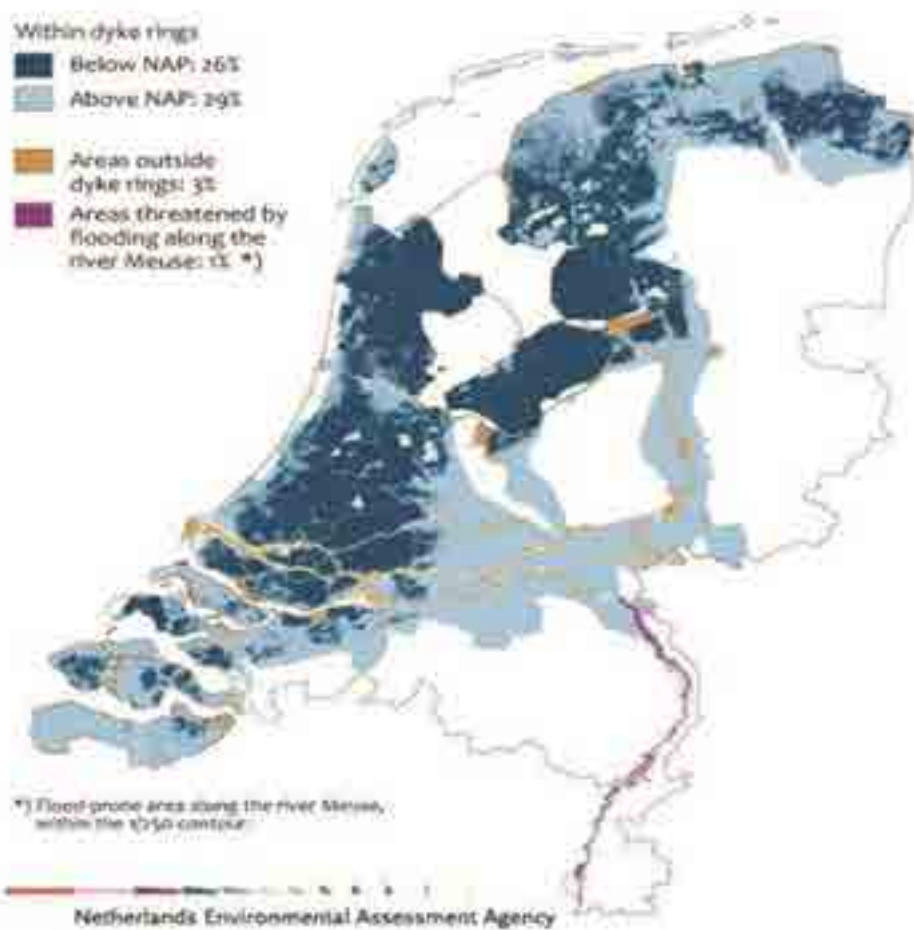
Within dyke rings

Below NAP: 26%

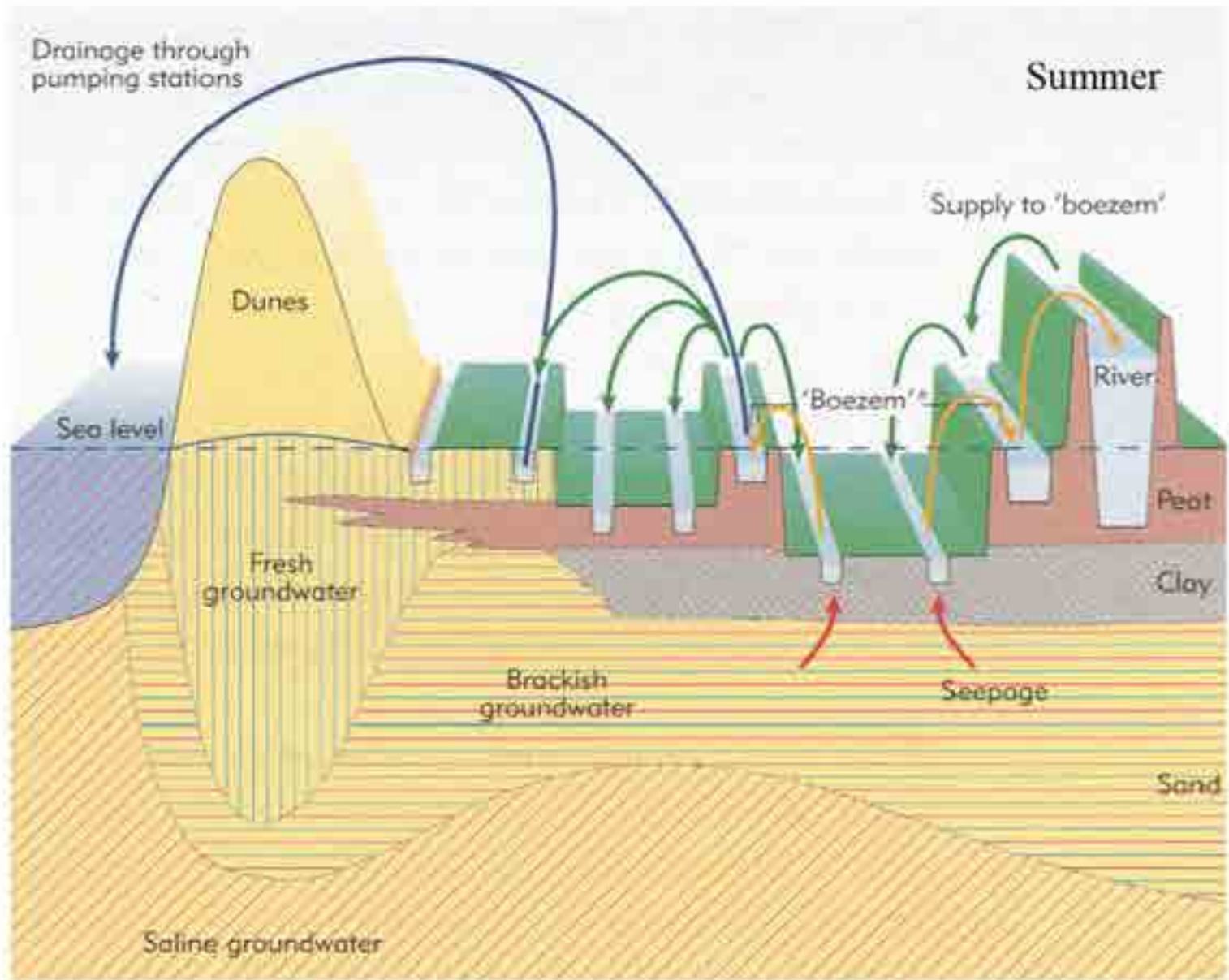
Above NAP: 29%

Area outside dyke rings: 3%

Area threatened by flooding along the river Meuse: 1% \*)



# THE NETHERLANDS FORCES OF WATER



MULTIPLE LINES OF DEFENSE  
**WESTERSINGEL**



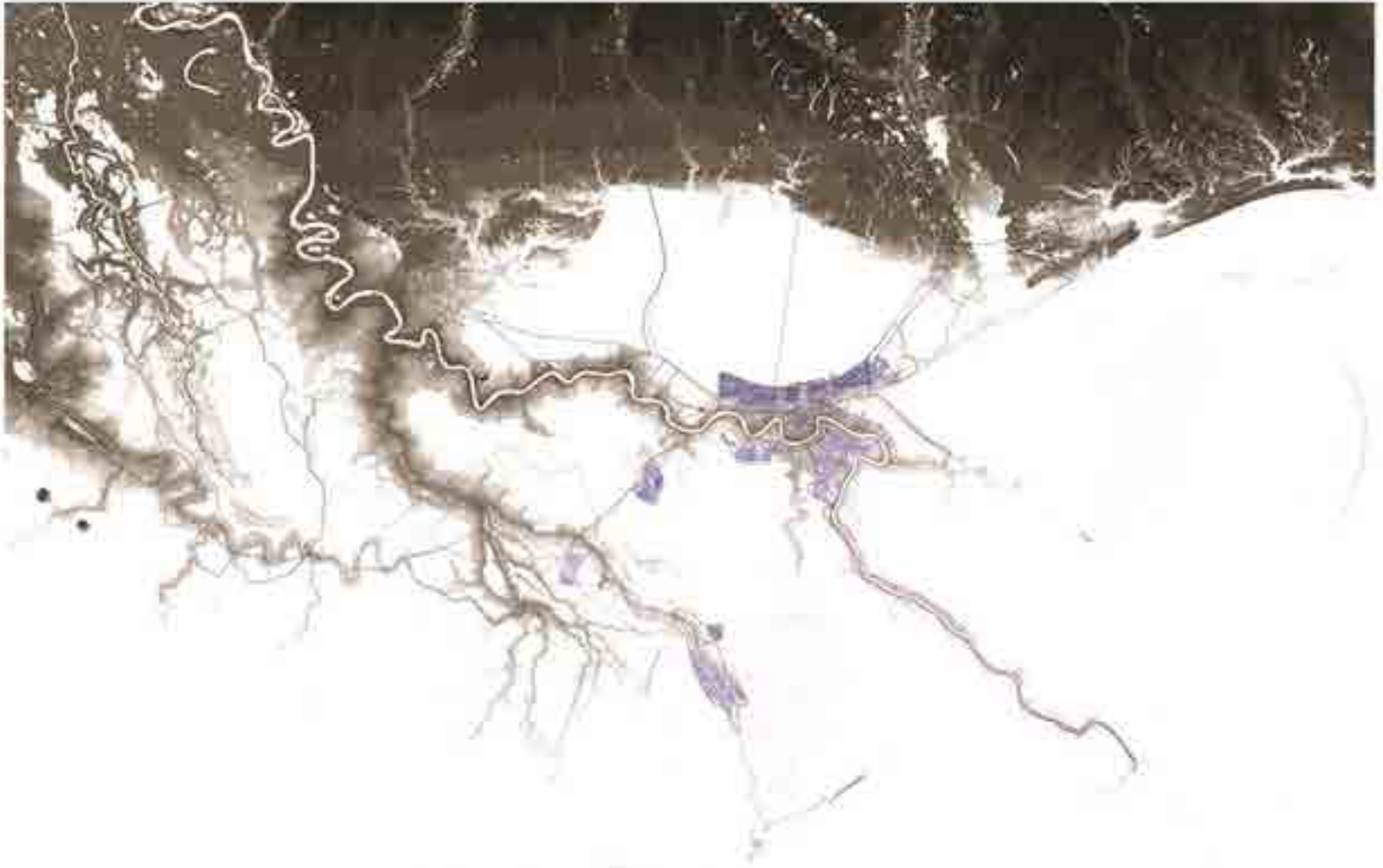
MISSISSIPPI RIVER - FISK MAP  
**FORCES OF WATER**



LOUISIANA  
COASTAL CONDITION



LOUISIANA  
HIGH + LOW LANDSCAPE







NEW ORLEANS  
**LINES OF DEFENSE**

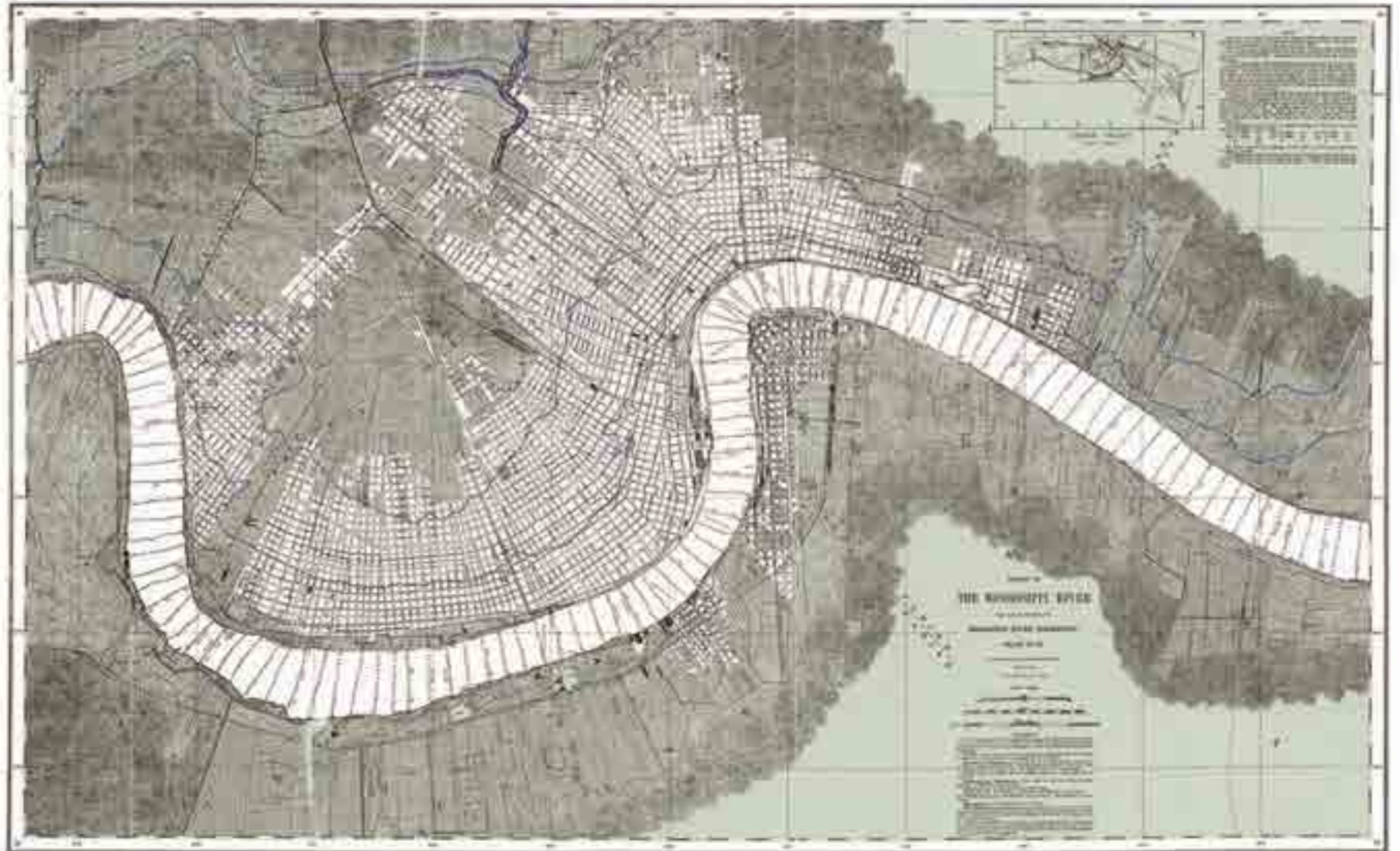




NEW ORLEANS  
FLOODED CITY



NEW ORLEANS  
HISTORIC CITY



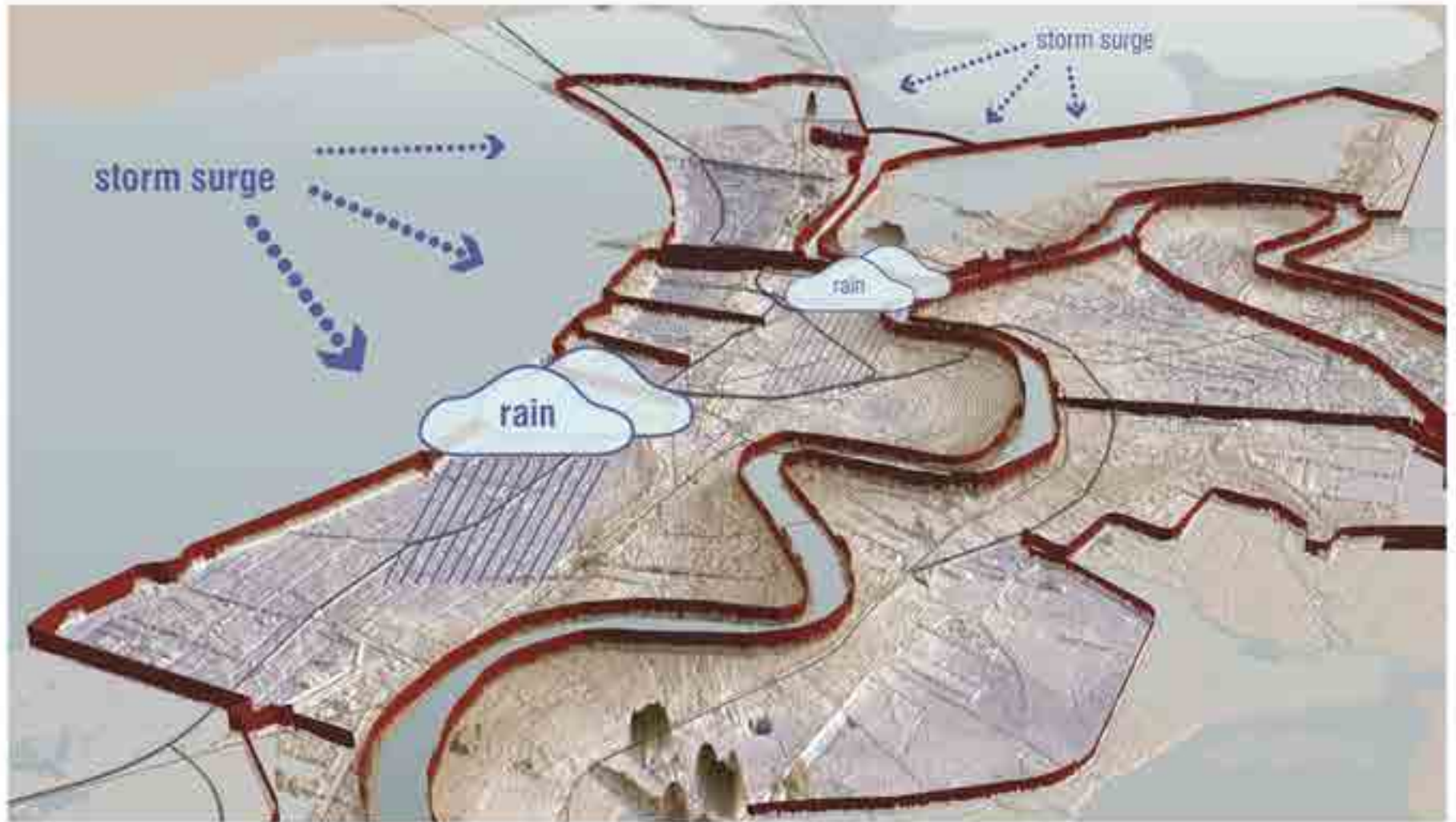
NEW ORLEANS  
**LINES OF DEFENSE**



NEW ORLEANS  
**LINES OF DEFENSE**



NEW ORLEANS  
LIVING IN A BASIN: WALLED CITY





NEW ORLEANS  
LINES OF DEFENSE



NEW ORLEANS  
LINES OF DEFENSE



NEW ORLEANS  
**DRAINING THE SWAMPS**

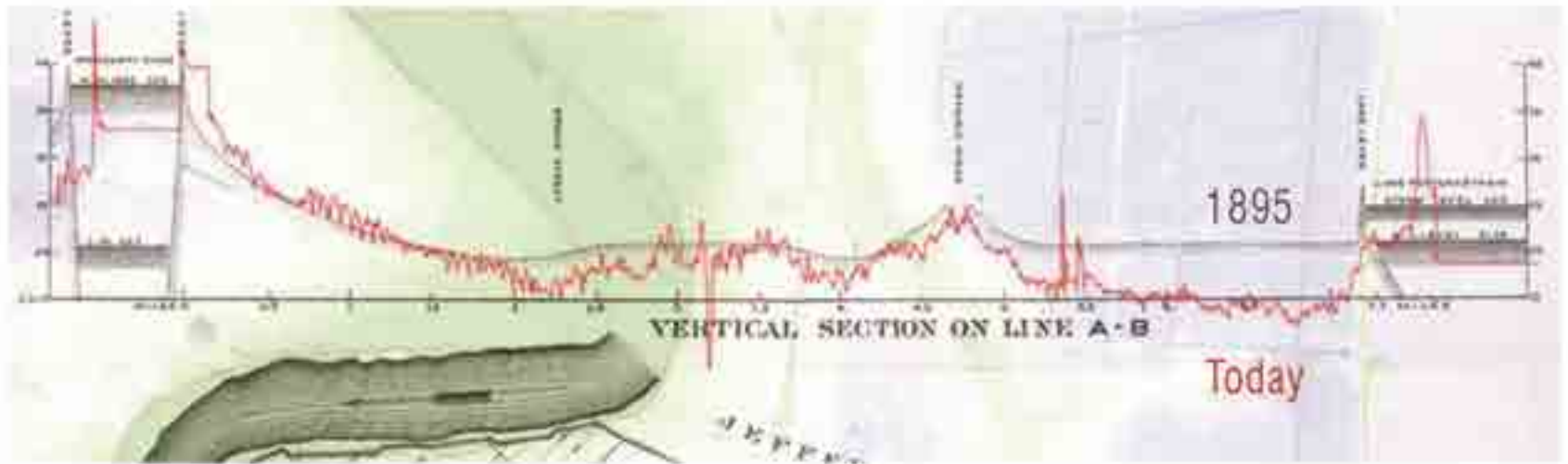


# NEW ORLEANS SUBSIDENCE

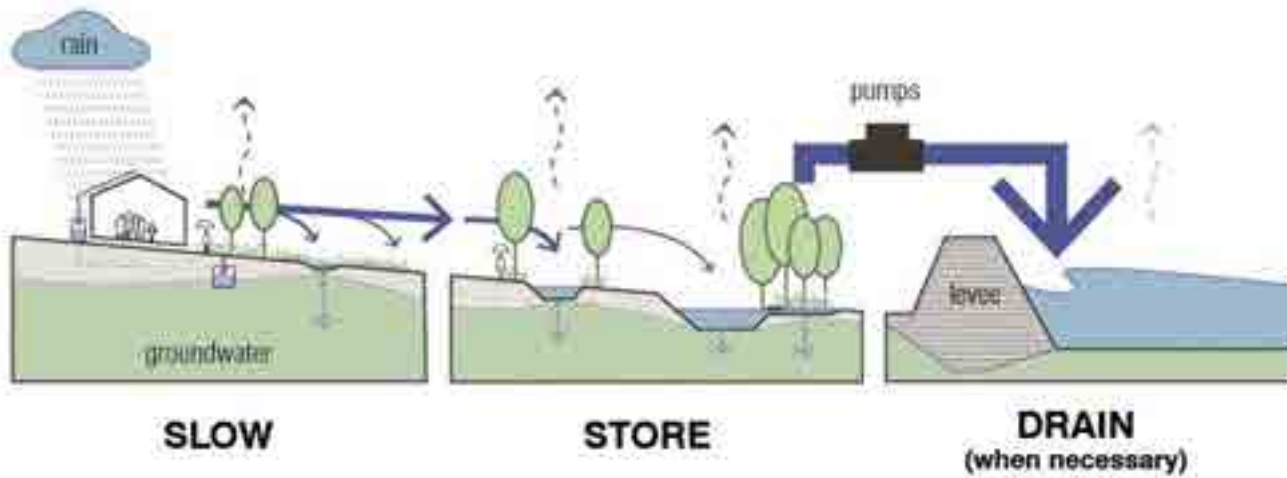
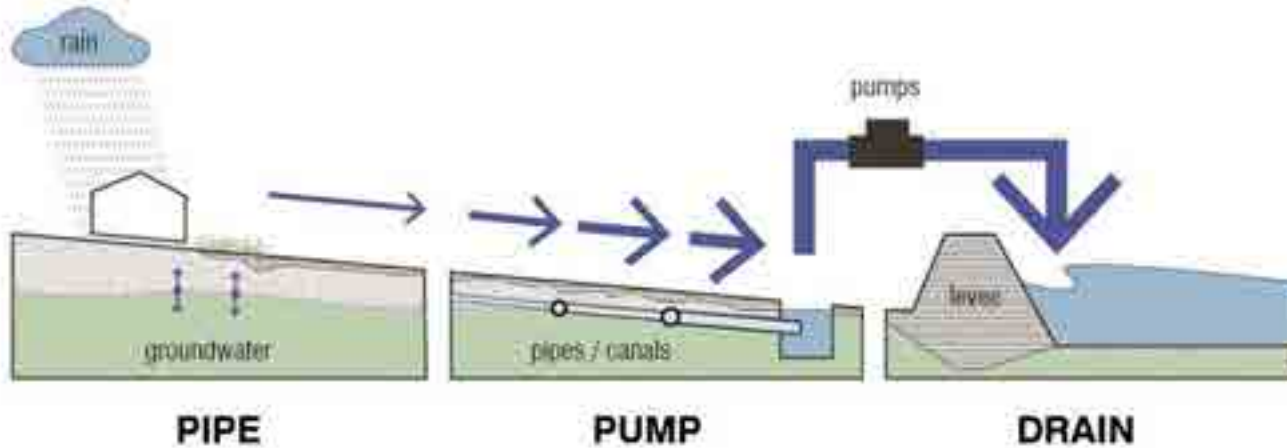
Circa 1718 Founding on the riverbank



Circa 2000 City Between River and Lake



# NEW ORLEANS WATER MANAGEMENT PARADIGM SHIFT



NEW ORLEANS  
BAYOU ST. JOHN



# NEW ORLEANS LAFITTE BLUEWAY: HISTORIC CONNECTIONS



NEW ORLEANS  
LAFITTE BLUEWAY: BASIN STREET

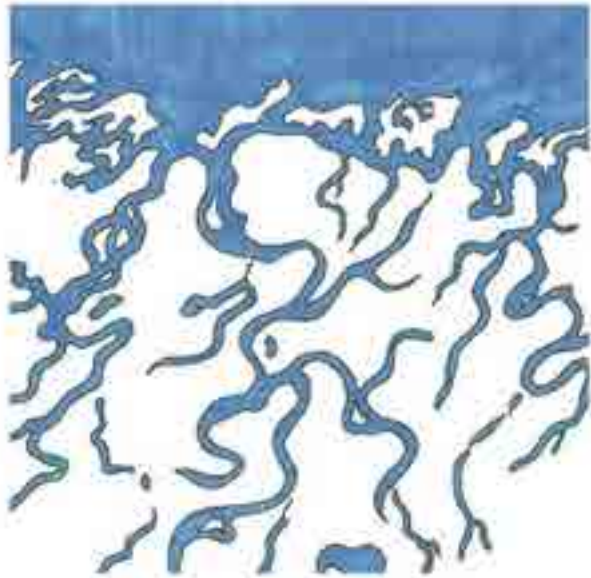




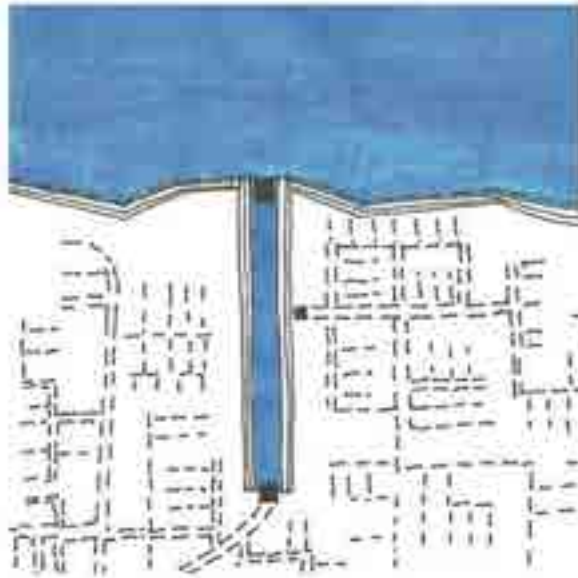
# NDRC: NEW ORLEANS PROJECTS



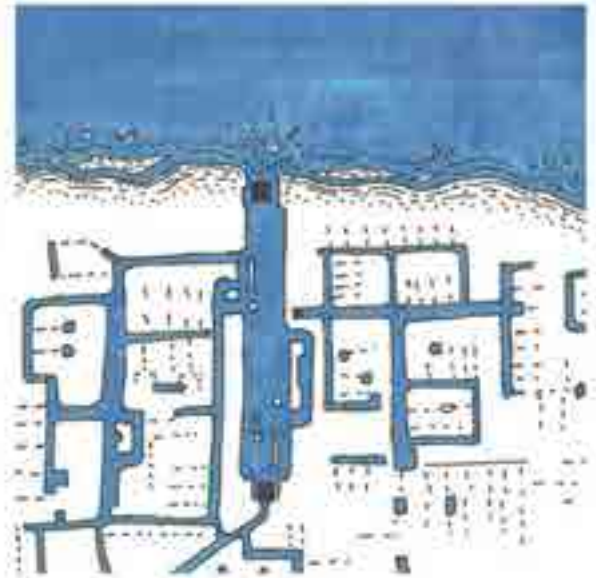
**NDRC: NEW ORLEANS  
DELTA ADAPTATION**



**PAST**



**CURRENT**

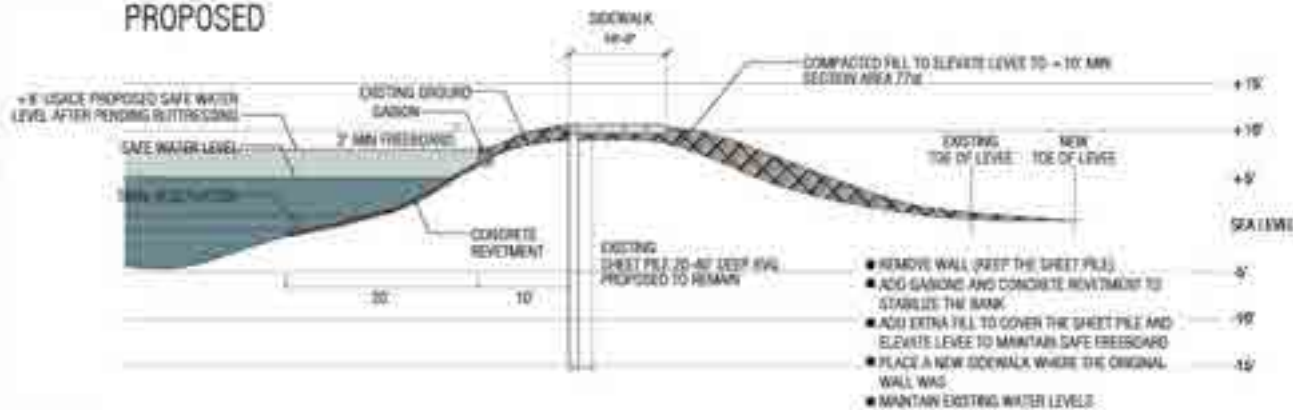


**FUTURE**

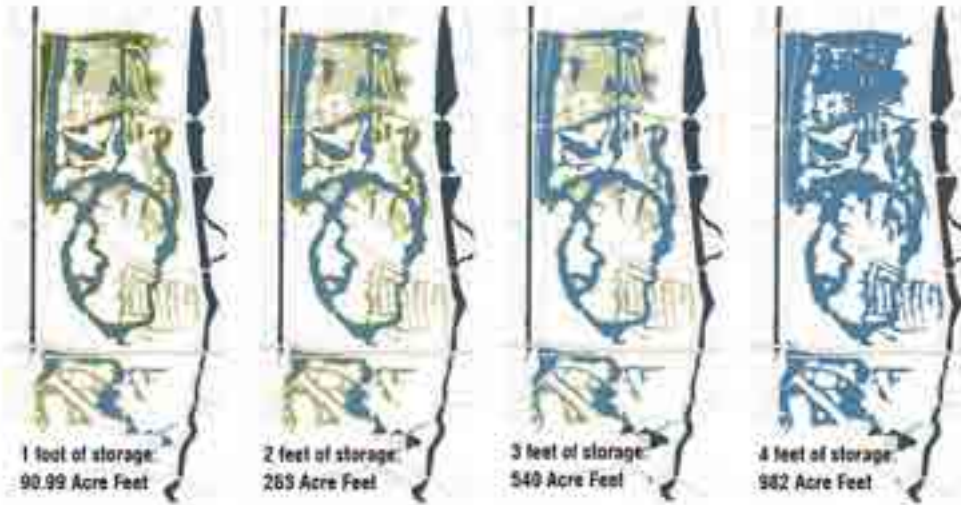
# NDRF: NEW ORLEANS OUTFALL CANALS



## PROPOSED



# NDRC: NEW ORLEANS CITY PARK



# NDRC: NEW ORLEANS DILLARD WETLAND



**NDRC: NEW ORLEANS  
MIRABEAU WATER GARDENS**



NDRC: NEW ORLEANS  
**GENTILLY STREET RETROFIT**



NDRC: NEW ORLEANS  
**BLUE-GREEN NETWORK**

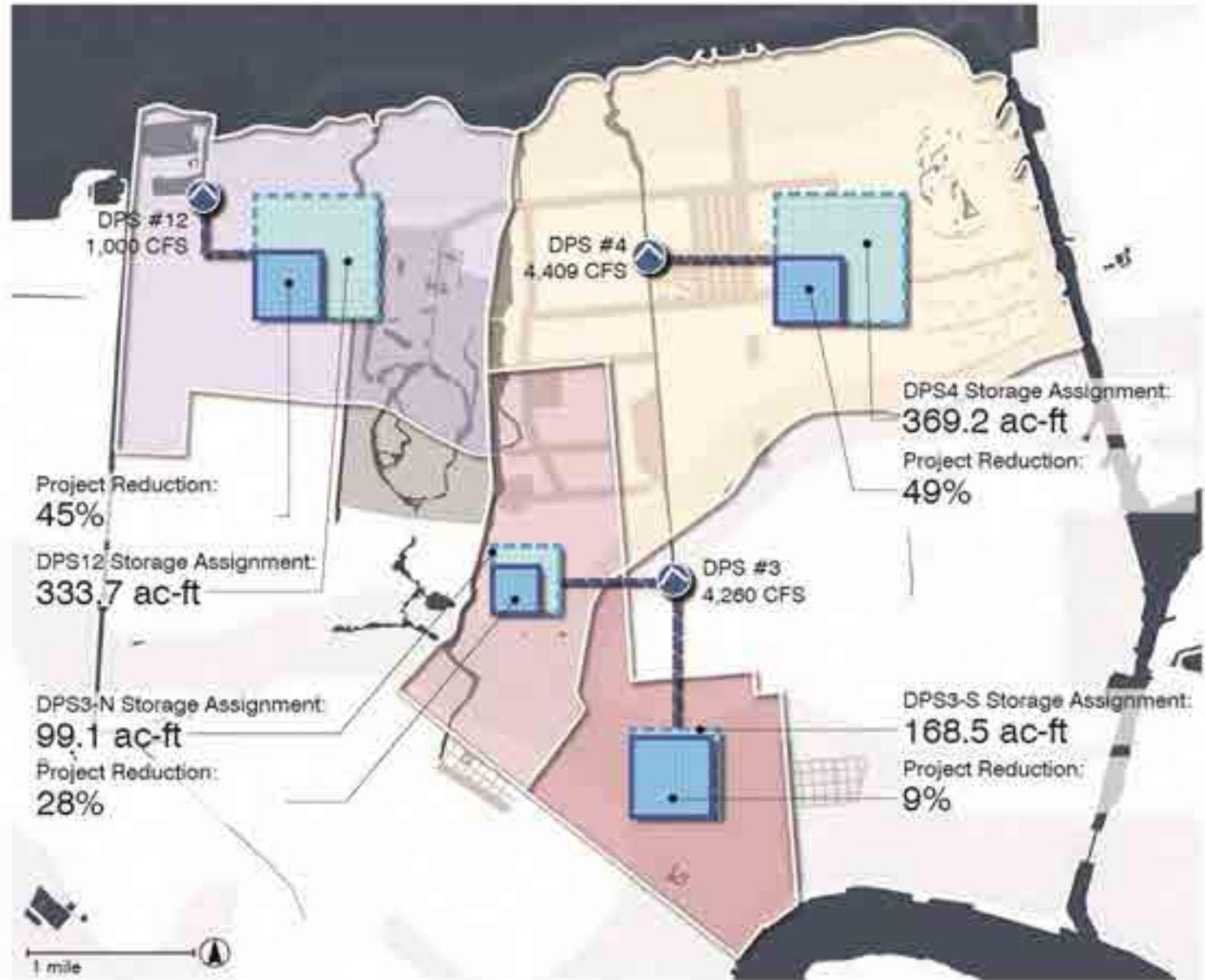




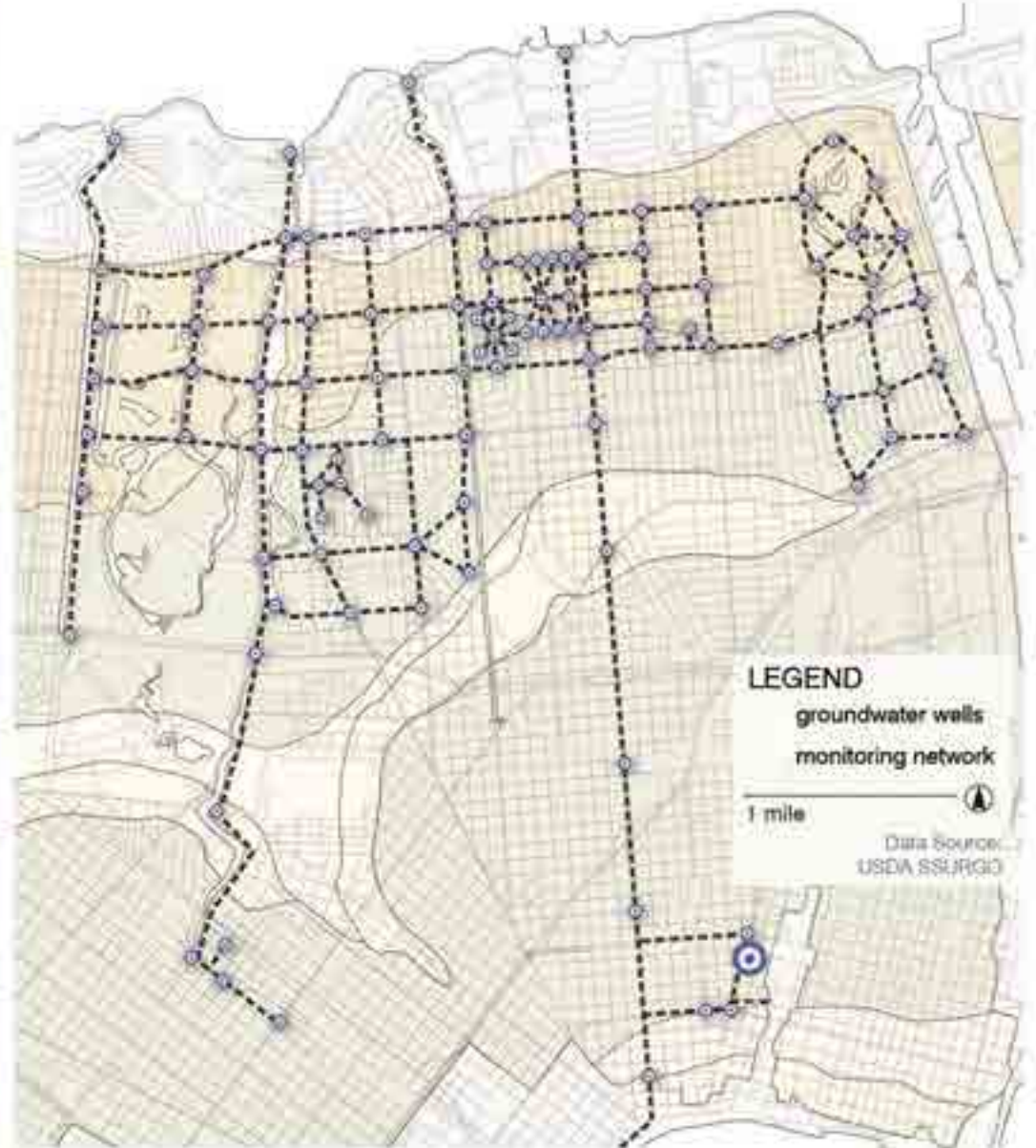
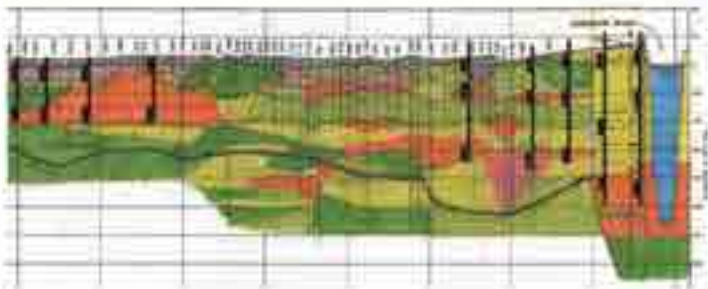
NDRC: NEW ORLEANS  
**BLUE-GREEN NETWORK**



# NEW ORLEANS NDRC IMPACT ON WATER ASSIGNMENT

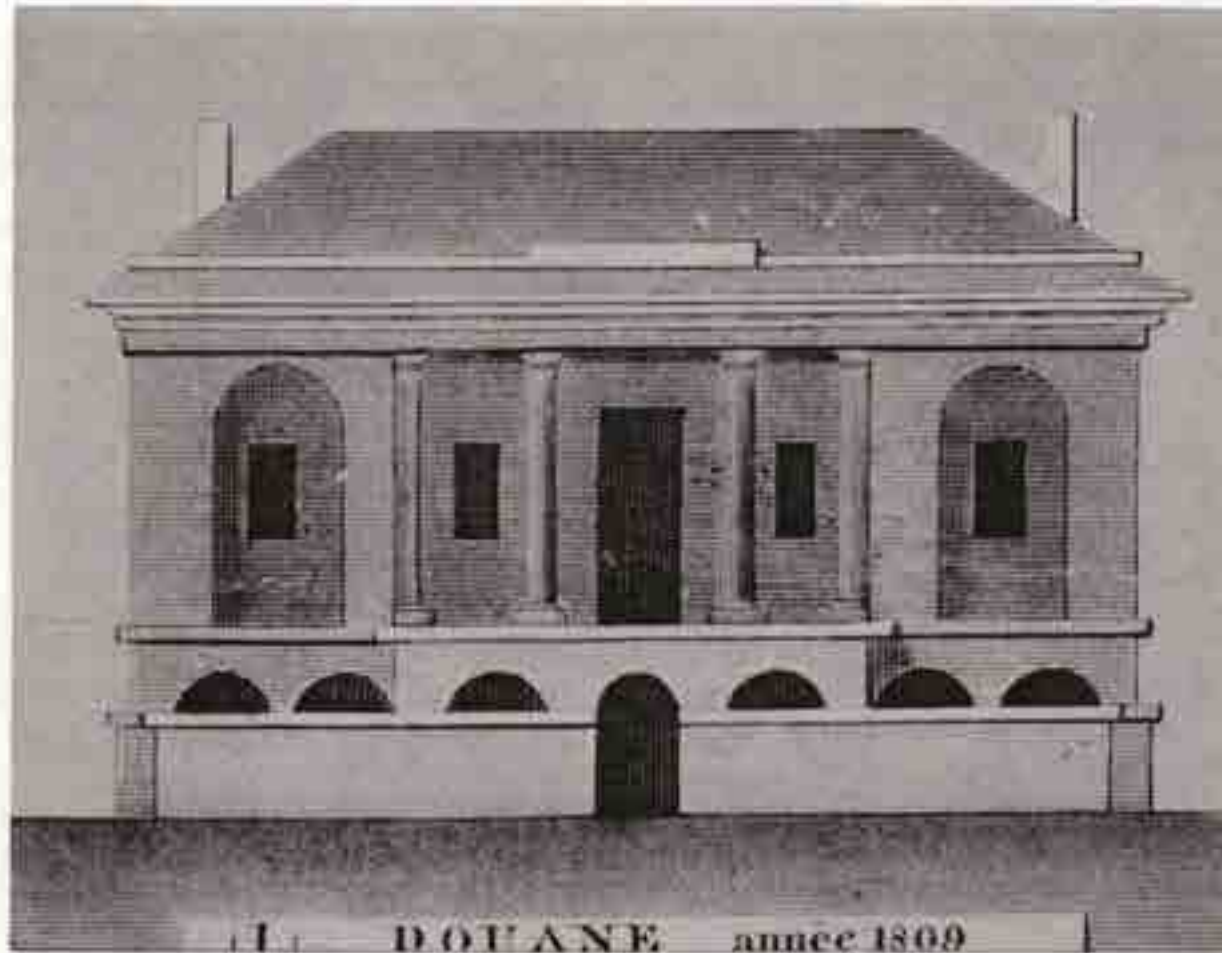


# NEW ORLEANS NDRC GROUNDWATER MONITORING NETWORK



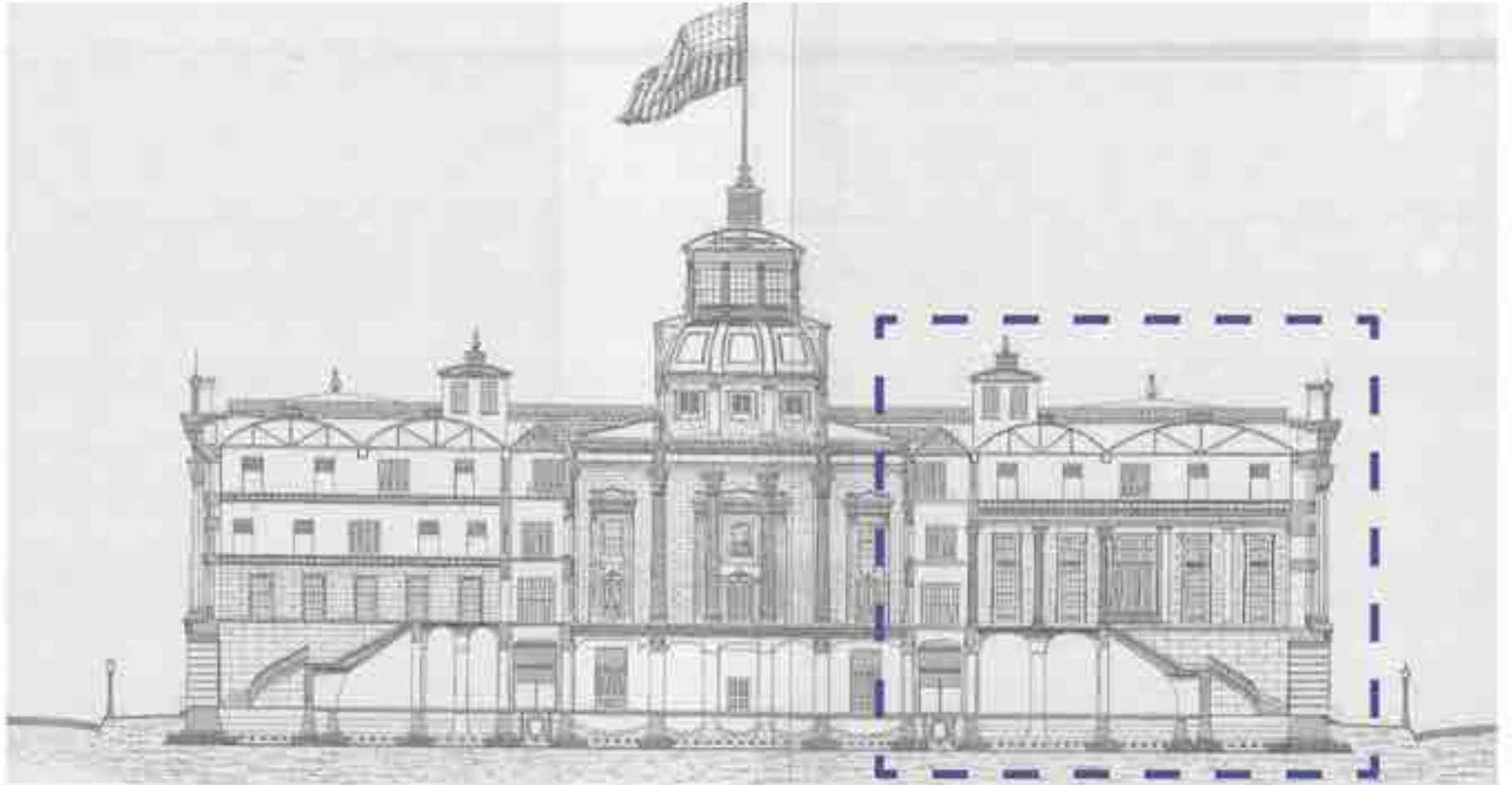
NEW ORLEANS

U.S. CUSTOM HOUSE, VERSION 1

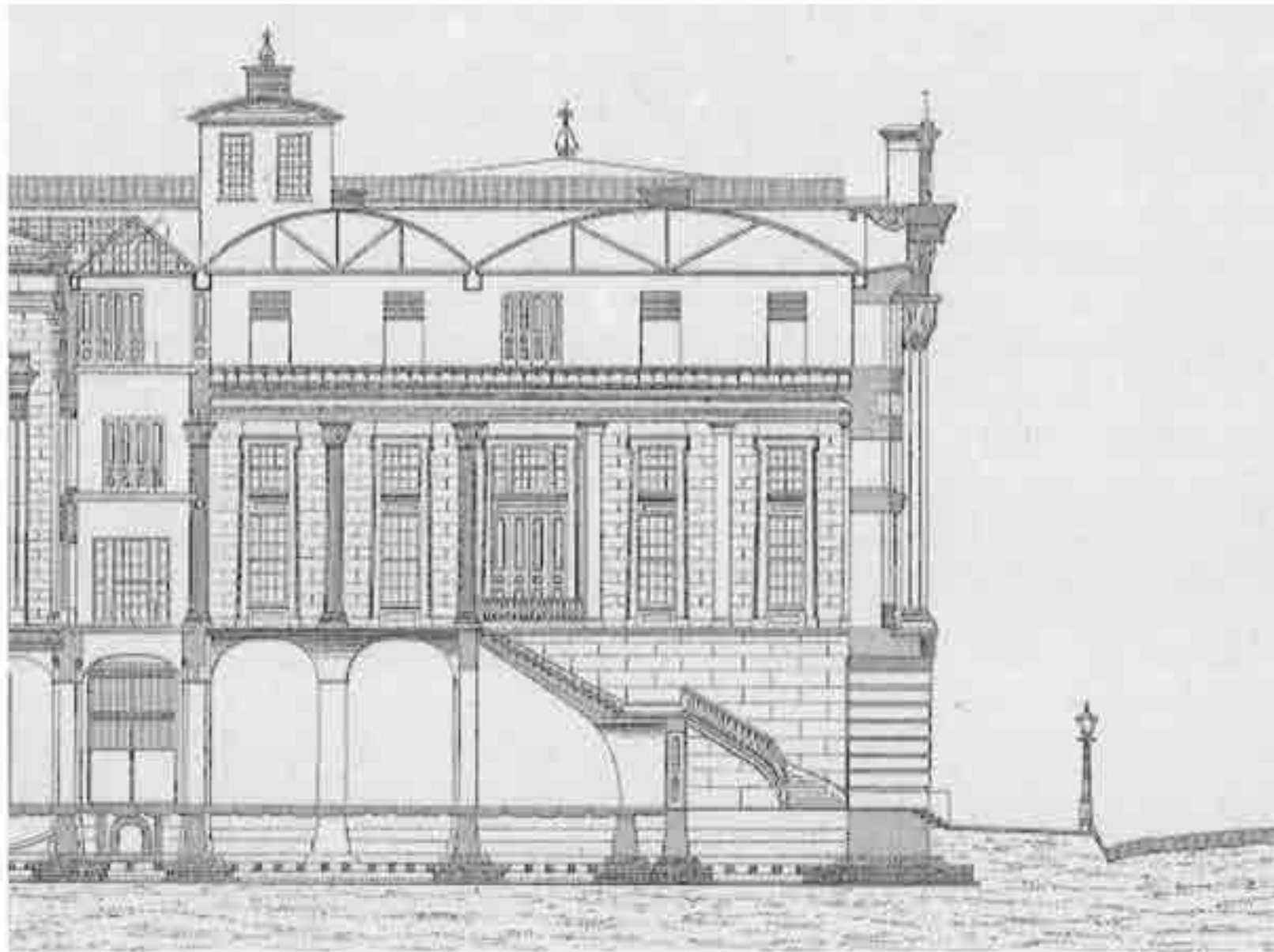


*Customhouse, 1807-1810, Benjamin H. Latrobe, architect; Robert Alexander, Builder. This first U.S. Customhouse built in New Orleans stood on the site of the present building facing the river. Latrobe was also designer of the Federal Capital in Washington, D.C. (Courtesy of The Historic New Orleans Collection, 533 Royal Street)*

NEW ORLEANS  
U.S. CUSTOM HOUSE, VERSION 3



NEW ORLEANS  
U.S. CUSTOM HOUSE, VERSION 3



NEW ORLEANS  
U.S. CUSTOM HOUSE, VERSION 3



NEW ORLEANS  
U.S. CUSTOM HOUSE, MARBLE HALL





NEW ORLEANS  
HISTORIC NEW ORLEANS COLLECTION



# NEW ORLEANS PETROLEUM INDUSTRY INFRASTRUCTURE

- 
- The map displays the New Orleans region with a complex network of red lines representing pipelines. Various symbols are scattered across the landmass, including squares, circles, and dots, corresponding to the legend. The legend is located in the top right corner and includes the following items:
- refinery
  - storage station / terminal
  - extraction operation
  - oil / gas well (active)
  - oil / gas well (dry)
  - offshore platform
  - Louisiana Offshore Oil Port
  - pipeline

NEW ORLEANS  
VIEUX CARRE



NEW ORLEANS  
MADAME JOHN'S LEGACY

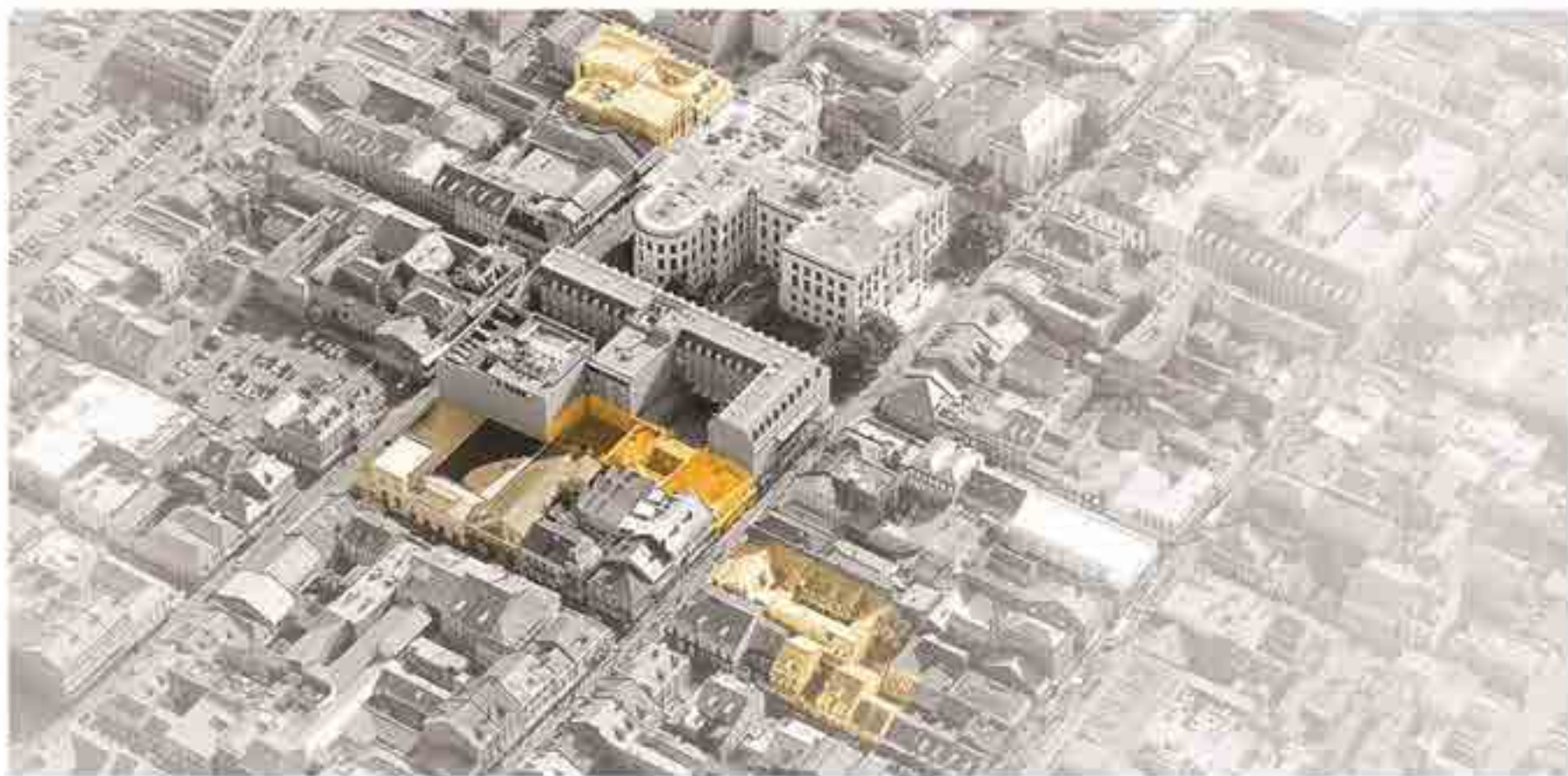


NEW ORLEANS

## MADAME JOHN'S LEGACY



NEW ORLEANS  
HISTORIC NEW ORLEANS COLLECTION



NEW ORLEANS  
HISTORIC NEW ORLEANS COLLECTION



NEW ORLEANS  
HISTORIC NEW ORLEANS COLLECTION





NEW ORLEANS  
HISTORIC NEW ORLEANS COLLECTION



NEW ORLEANS  
HISTORIC NEW ORLEANS COLLECTION



NEW ORLEANS  
HISTORIC NEW ORLEANS COLLECTION







SOUTH END SEASIDE PARK  
**FREDERICK LAW OLMSTED**



PEQUONNOCK  
UPSTREAM BEARDSLEY PARK



# MODEL FOR THE SOUND FORCES OF WATER



## RIPARIAN

RIVER/WATERSHED RESTORATION

STREAM DAYLIGHTING

STREAM CAPACITY ENHANCEMENT

PARK-TO-RIPARIAN CORRIDOR  
CONNECTIONS

## URBAN

GREEN DRAINAGE

CSO SEPARATION

FLOOD-PROOF/ELEVATED BUILDINGS

CROSS-CITY CONNECTIONS/  
NETWORKS

## COASTAL

SHORELINE STABILIZATION AND  
ENHANCEMENT

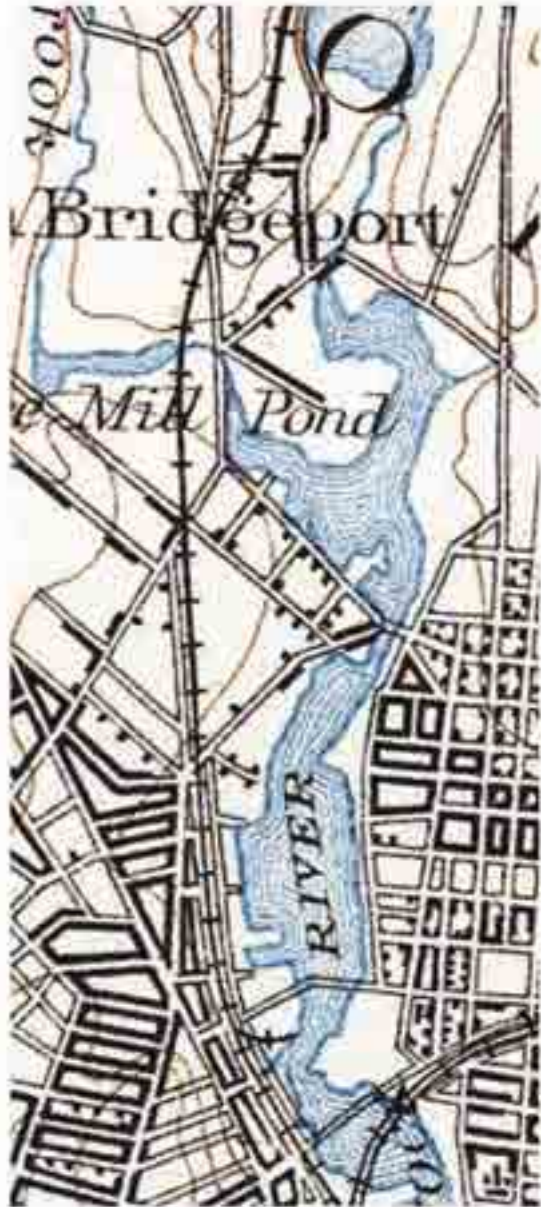
BERMS AND STORM SURGE  
BARRIERS

CRITICAL FACILITIES PROTECTION

RELOCATION OF FLOOD PLAIN  
DEVELOPMENT



# NEW ORLEANS REVALUING THE FLOODPLAIN



PEQUONNOCK  
COVERED RIVER AT SHOPPER'S PLAZA



PEQUONNOCK  
COVERED RIVER AT SHOPPER'S PLAZA



**BRIDGEPORT**  
**UNCOVERING THE PEQUONNOCK**



BRIDGEPORT  
MAIN STREET



**DOWNTOWN  
CONNECTING THE CENTER**



# BRIDGEPORT HISTORIC OVERLAYS



## Legend

- 2012 National Hydrography Dataset Water
- 1700's-1893 Water Overlay
- 2012 National Hydrography Dataset Wetlands
- 1848-1893 Wetlands Overlay
- 1893 USGS Quadrangle Map
- Bridgeport Historic Districts
- Historically Designated Parcels
- 1700's Roads

BRIDGEPORT  
1840'S RAILROAD







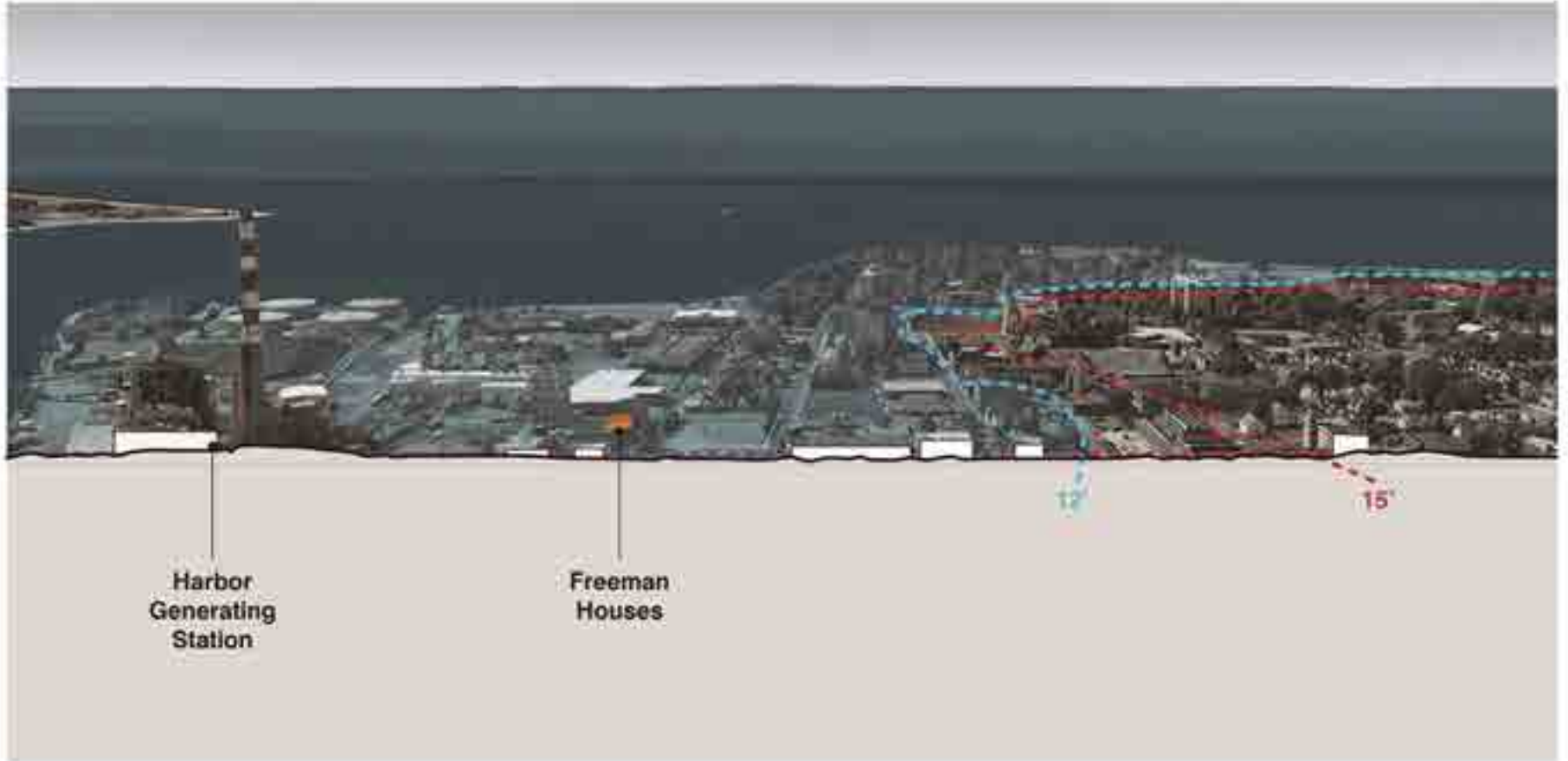




**SOUTH END  
PROTECTING THE COMMUNITY**



**SOUTH END**  
**PROTECTING THE COMMUNITY**



BRIDGEPORT  
FREEMAN HOUSES



Little Liberia  
**OLDEST SURVIVING  
HOMES IN CONNECTICUT  
BUILT BY AFRICAN-AMERICANS**

Original 1848 Houses Being Restored by  
ABCD - Action for Bridgeport Community Development, Inc.  
The Bridgeport Community Historical Society  
Historical Collections, Bridgeport Public Library  
The Walters Memorial AME Zion Church  
City of Bridgeport

**ON THE CONNECTICUT FREEDOM TRAIL**

SIGN DONATED BY MURPHY INC., OUTDOOR ADVERTISING

BRIDGEPORT  
SEASIDE VILLAGE





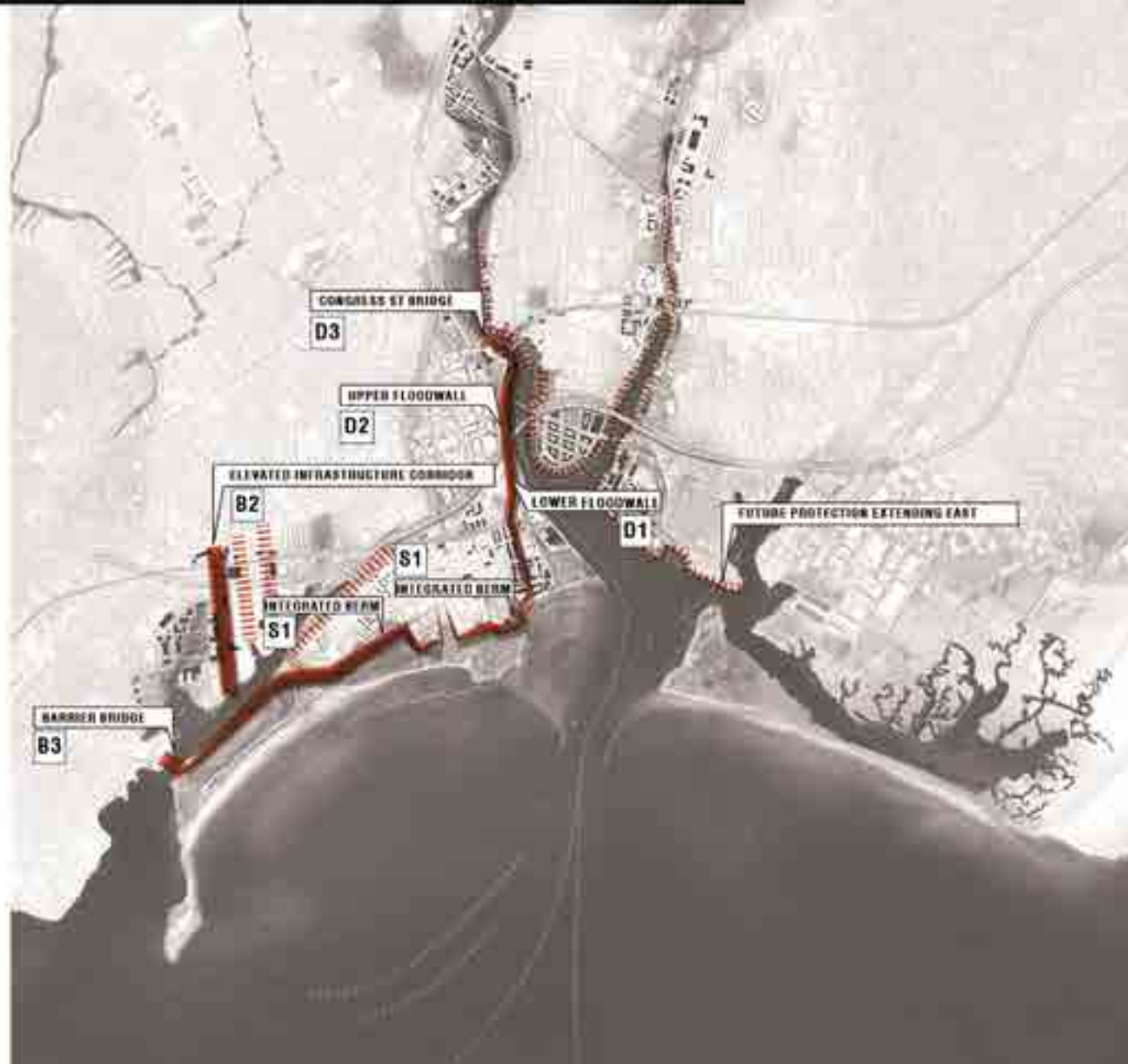
BRIDGEPORT  
RAIN GARDEN



BRIDGEPORT  
FEMA REPETITIVE LOSS



INTEGRATED LINES OF RESILIENCE  
**STRONG LINES**



# INTEGRATED LINES OF RESILIENCE GREEN EDGES



# BRIDGEPORT HISTORIC MAP

## BLACK ROCK AND BRIDGEPORT

Founded upon a trigonometrical survey  
under the direction of T. H. HANBLE, Superintendent of the  
**SURVEY OF THE COAST OF THE UNITED STATES**

Trigonometrical by J. FERDINAND Assistant

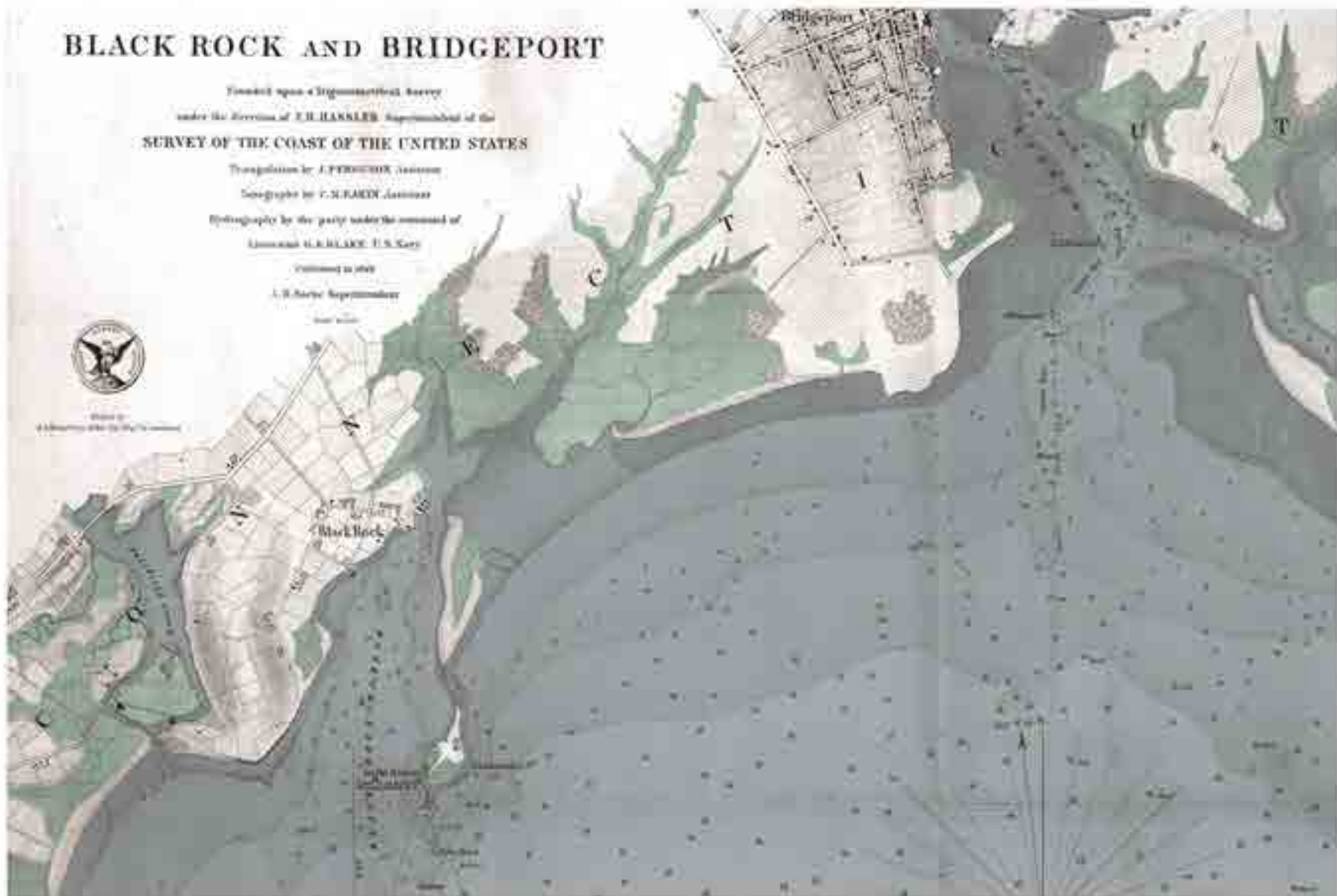
Topographer by C. M. RAE Assistant

Hydrography by the party under the command of  
Lieutenant G. B. BLAKE, U. S. Navy

Published in 1871  
U. S. Navy Superintendent



Scale of  
1:62,500 (1 inch = 1 mile)



**NDRC: CONNECTICUT  
BRIDGEPORT**



Rebuild by Design Illustrative plan of South End showing catalytic development potential and NDRC Projects

NDRC: CONNECTICUT  
**BRIDGEPORT**



# BRIDGEPORT FRAMEWORK





BRIDGEPORT  
7 MIDDLE



JAPAN  
MINAMI-SNARIKU



**“The costs come before the benefits.”**  
Inscription at the Amsterdam Stock Exchange



**NDRC: NEW ORLEANS**  
**BENEFIT COST ANALYSIS**

Environmental + Social Value:

**\$5.2 Million**

Reduced Damage from 5 Year Flood:

**\$20.1 Million**

Road Maintenance Cost Reduction  
Associated with Subsidence:

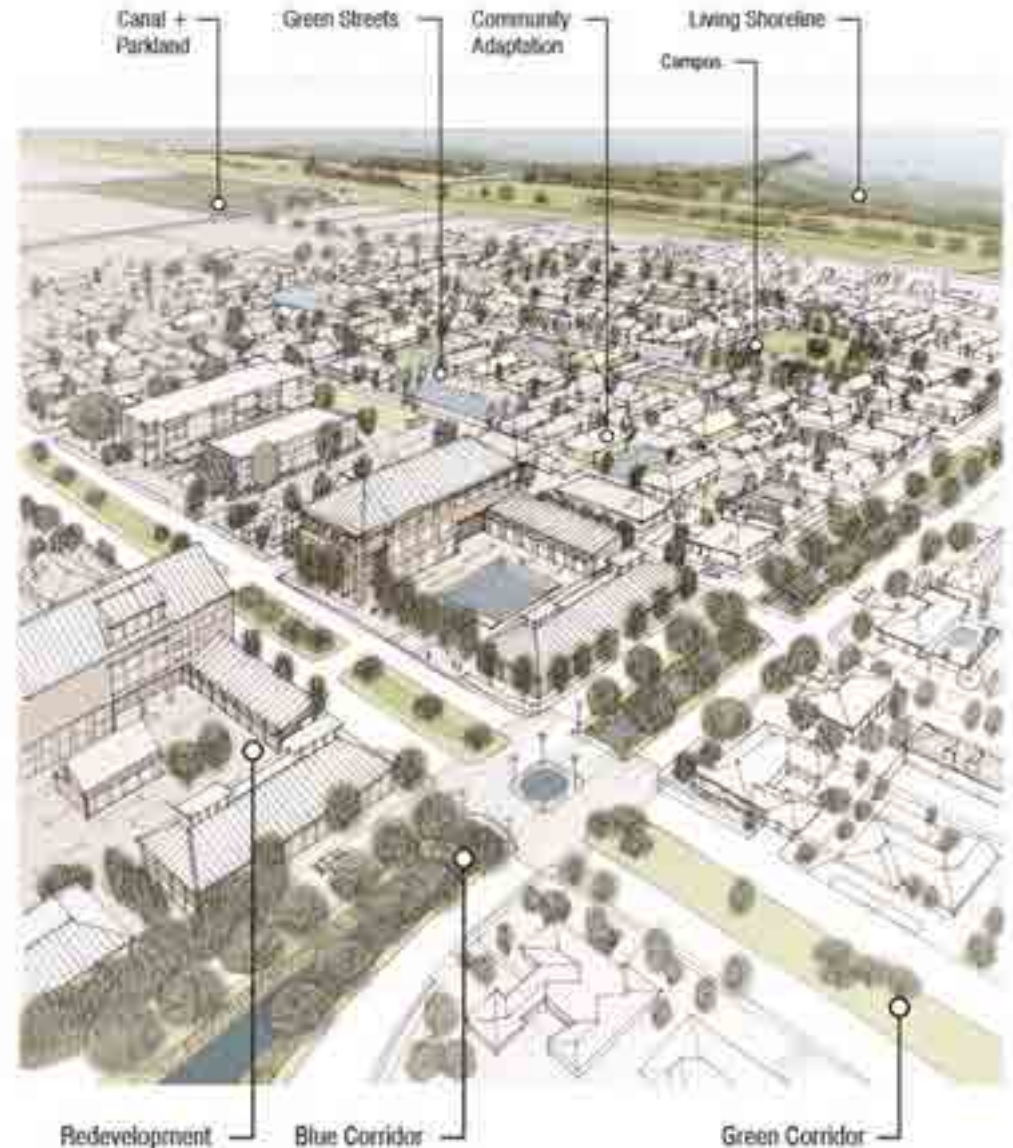
**\$123.8 Million**

Increased Property Values:

**\$392.5 Million**

Benefit Cost Ratio:

**3.6 to 1**





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