



Resilient Ready

Tampa Bay

December 2, 2022
FSA Winter Conference





Resilient Florida Grant Program

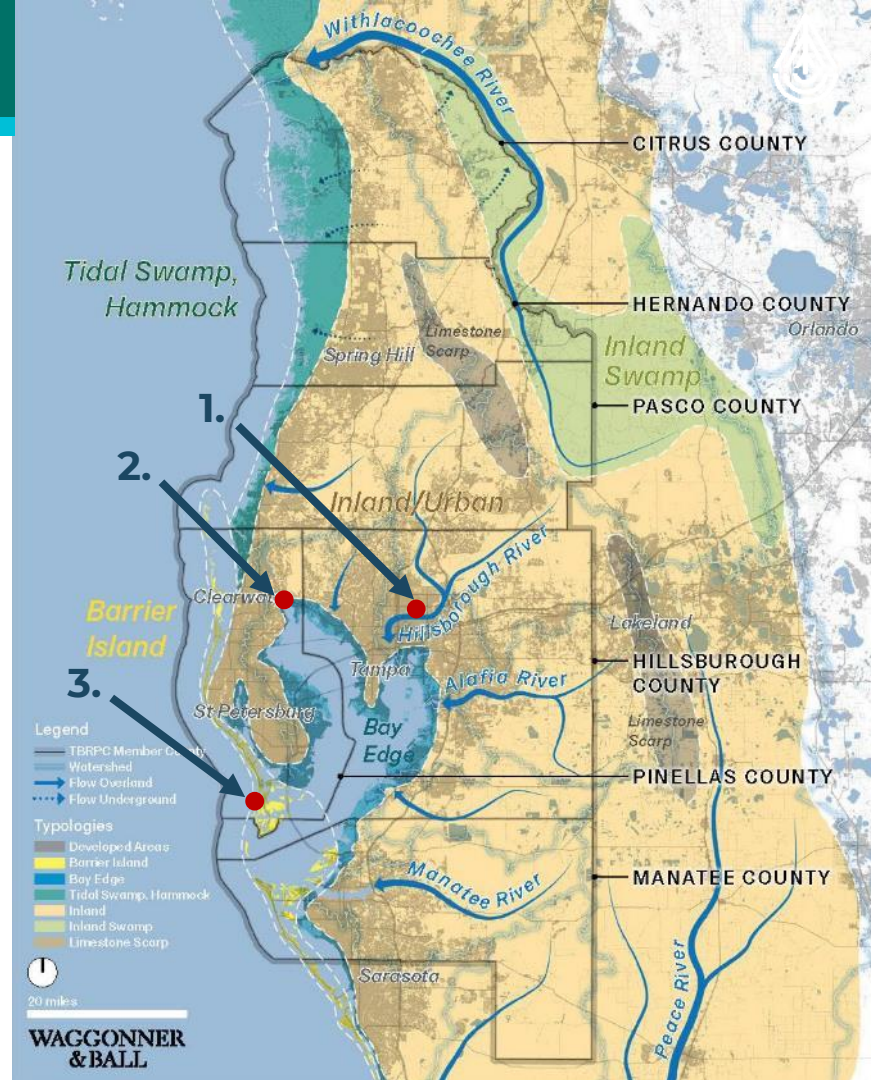
To effectively address the **impacts of flooding and sea level rise** that the state faces, eligible Resilient Florida grant applicants may receive funding assistance to analyze and plan for vulnerabilities, as well as **implement projects for adaptation and mitigation.**

In partnership with the City of Tampa, TBRPC was selected to implement the **Resilient Ready Tampa Bay** project.



Landscape Types and Study Areas

- 1. Inland Areas (Basins, Rivers, Lakes)**
North Tampa Closed Basin, City of Tampa
- 2. Estuary / Bayfront Edge**
R.E. Olds Park, City of Oldsmar
- 3. Barrier Islands**
Pass-A-Grille, City of St. Pete Beach





ROBERT DE KONING
LANDSCAPE ARCHITECT BNT



Coordinated by the **Tampa Bay Regional Planning Council**

Funded by the **Florida Department of Environmental Protection's Resilient Florida Grant Program, FY 2021-2022**



Resilient Ready

Tampa
Bay

Project Overview





Resilience

“The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation.”

IPCC 2018, pg. 557



Increasing Flood Risks

Increased flooding from “extreme” rain events

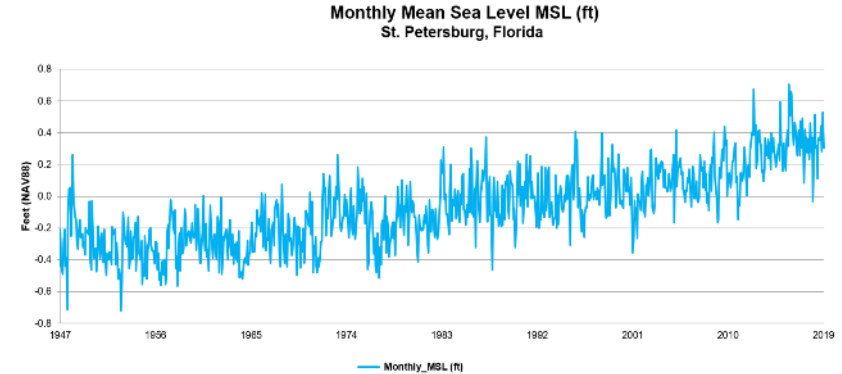
- High volume in short periods
- Slow moving tropical storms

Storm surge

- Wave energy, more frequent over topping
- Erosion to beaches, natural shorelines and sea walls

Increased frequency and duration of “King Tide” high tide flooding events

Increasing sea level



1946 to 2019 = 7.8 inches





Integrating Nature-Based & Green Infrastructure into Capital Improvement Planning



Hybrid Living Shoreline



Floodable Parks



Permeable Pavements



Rain Gardens & Bioswales



Riparian Buffers

Modern resilient flood reduction strategies require a range of engineered techniques and materials.

GREEN - SOFTER TECHNIQUES
Small Waves | Small Fetch | Gentle Slope | Sheltered Coast

**HOW GREEN OR GRAY
SHOULD YOUR SHORELINE SOLUTION BE?**

GRAY - HARDER TECHNIQUES
Large Waves | Large Fetch | Steep Slope | Open Coast

LIVING SHORELINE

VEGETATION ONLY

EDGING

SILLS

BEACH NOURISHMENT ONLY

BEACH NOURISHMENT & VEGETATION ON DUNE

COASTAL STRUCTURE

BREAKWATER

GROIN

REVETMENT

BULKHEAD

SEAWALL

FEMA, USACE, HUD, NOAA, FDEP are requiring and funding more innovative infrastructure improvement projects which use nature-based features and encourage equity for low income residents.



Design Charrettes: Fast, Coordinated, Integrated

1. Stakeholder Engagement - Define Resilience Challenges
2. Understand Systems & Ongoing Projects
3. Define Values, Priorities & Opportunities
4. Develop Design Concepts & Order-of-Magnitude Costs
5. Pursue Funding Application or Allocation
6. Stakeholder Engagement - Develop & Coordinate Detailed Designs
7. Permitting, Construction & Implementation
8. Ongoing Operation & Maintenance



**Resilient
Ready** Tampa
Bay

Regional Analysis



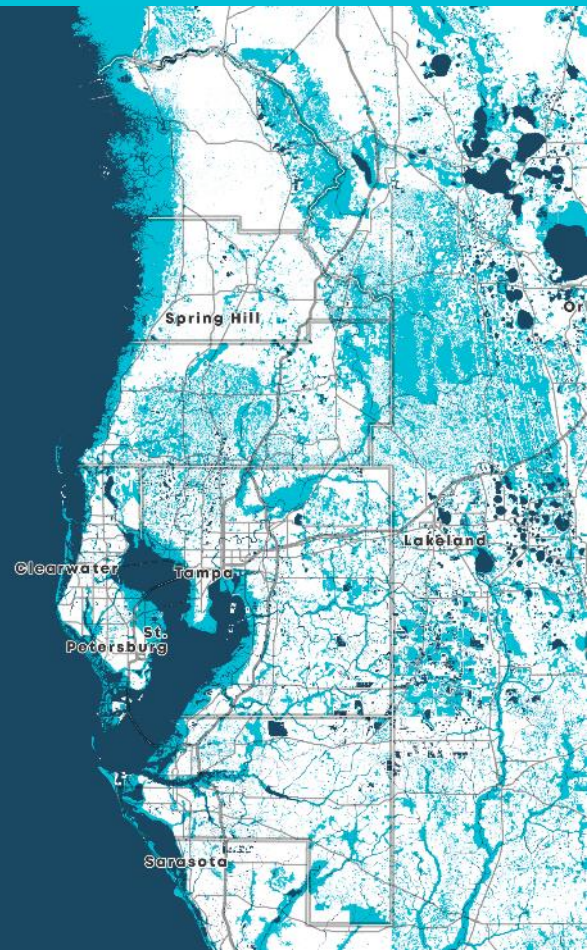
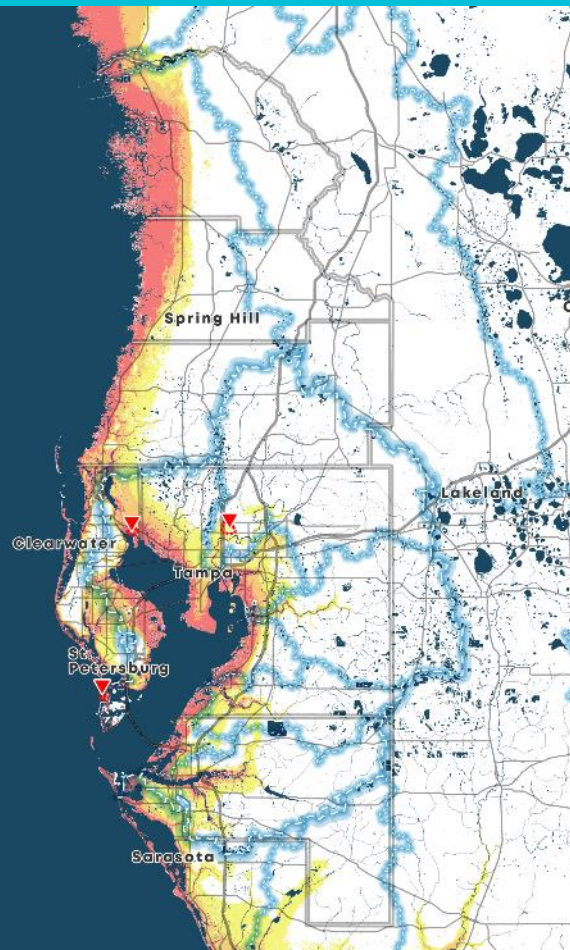
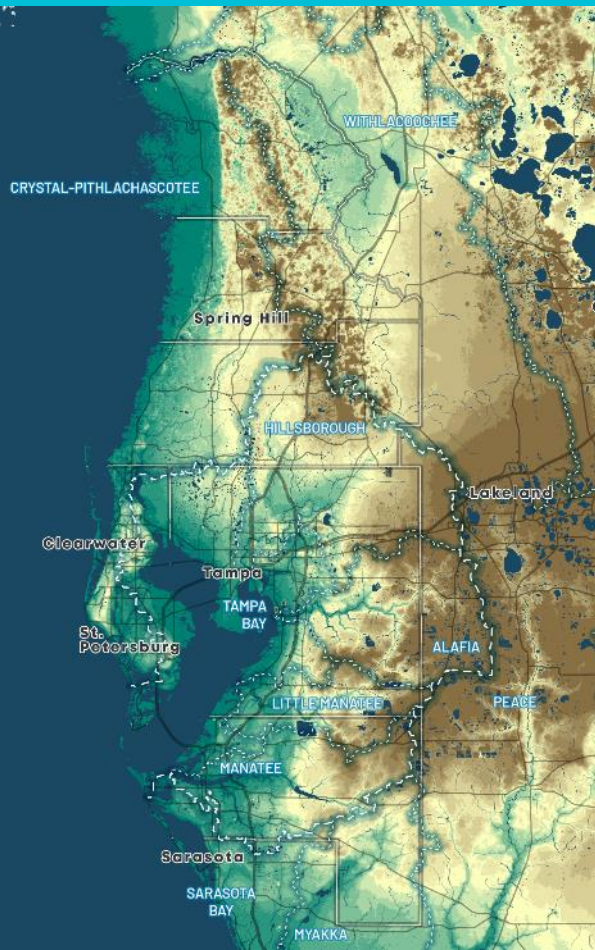
INLAND
BASIN



ESTUARY/
BAYFRONT



BARRIER
ISLAND

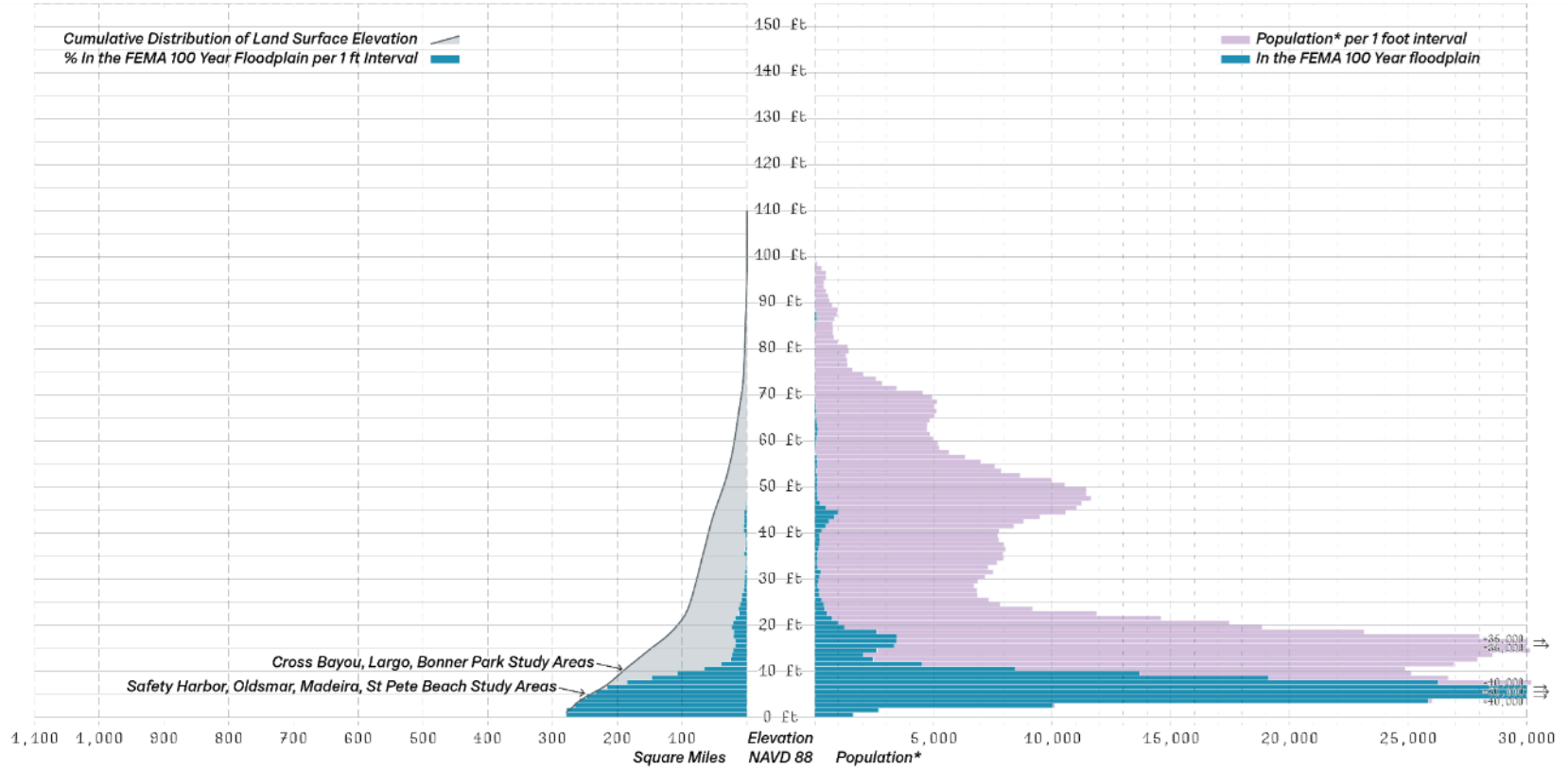




PINELLAS COUNTY

Land Area Relative to Elevation and Floodplains

Population Relative to Elevation and Floodplains





Schedule of Activities

- Day 1** — Walking Tours / Site Visits
- Day 2** — Introduction, Listening & Iteration
- Day 3** — Integration & Open House



Design Charrette Goals

1. Demonstrate new forms of **collaboration** through the charrette process
2. Iterate and advance **existing project ideas**
3. Develop **design concepts** ready for funding application/allocation
4. Discuss the **future of inhabitation** in high flood-risk areas
5. Identify **replicability** opportunities for areas of similar landscape types



North Tampa Closed Basin



Pass-a-Grille in St. Pete Beach



R.E. Olds Park in Oldsmar





ADAPT STRATEGIES

Wetland Shelves	\$
Bioswales & Rain Gardens	\$
Home Raising	\$
Detention Ponds	\$\$
Stormwater Storage Streets	\$\$
Living Shorelines	\$\$
Stormwater Park	\$\$\$
Dune Restoration	\$\$\$
Beach Nourishment	\$\$\$

Order-of-Magnitude Construction Cost*

\$ <\$1
MILLION

\$\$ \$1-5
MILLION

DEFEND STRATEGIES

Tide Gates & Baffle Boxes	\$
Small Berm	\$\$\$
Small Pumps Station (<20 cfs)	\$\$\$
Medium Pump Station (20-200 cfs)	\$\$\$\$

\$\$\$ \$5-10
MILLION

\$\$\$\$ >\$10
MILLION

STUDY AREA VISIONS (AGGREGATE)

North Tampa Closed Basin	\$\$\$
Pass-a-Grille	\$\$\$\$
Oldsmar	\$\$\$

R.E. Olds Park in Oldsmar



ESTUARY/
BAYFRONT

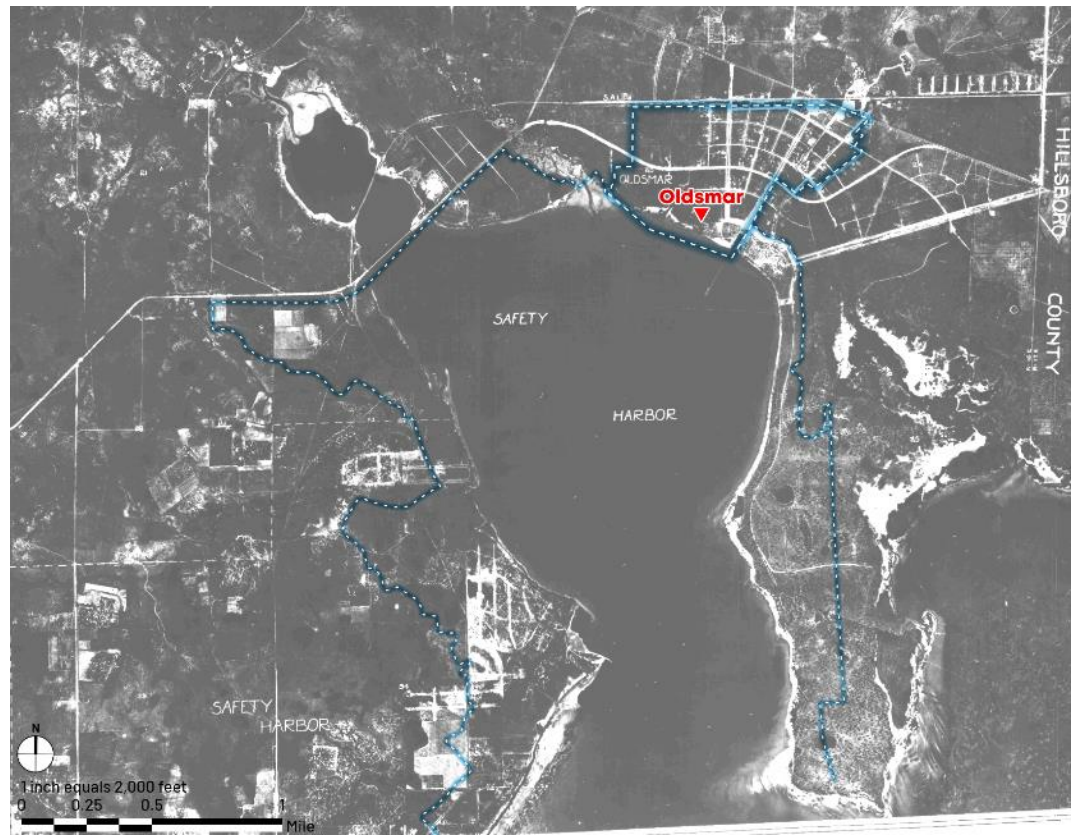
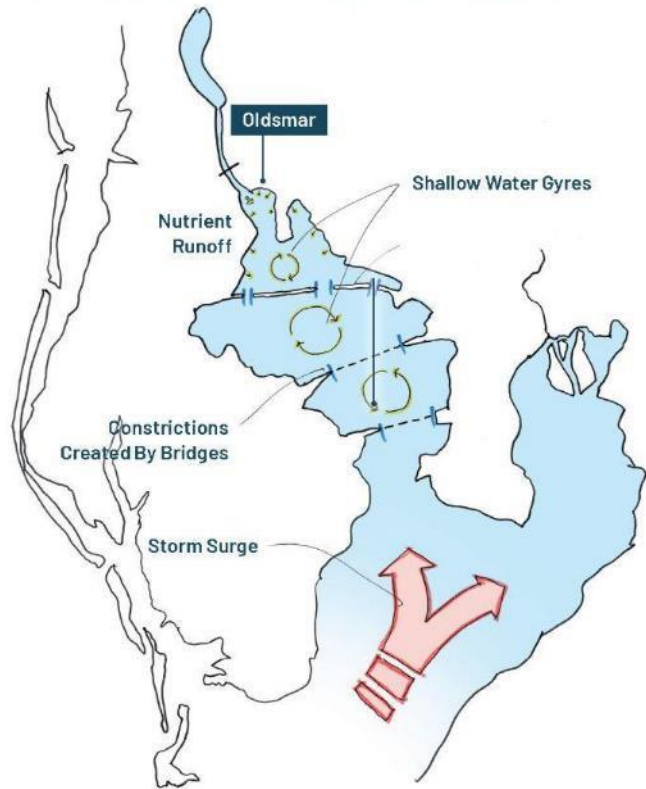


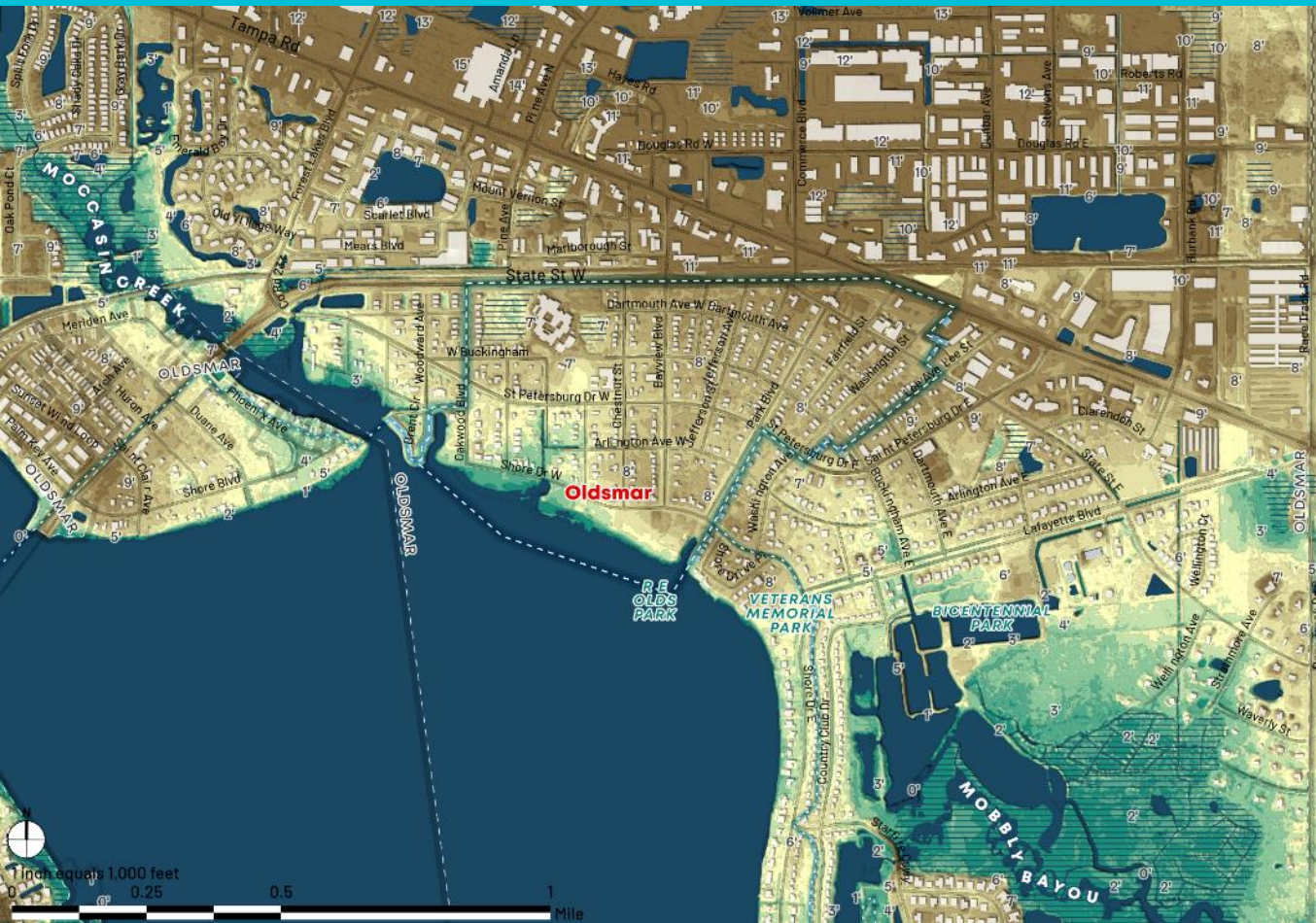




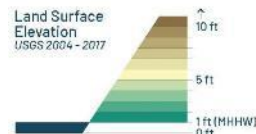


BAY SCALE WATER FLOWS & QUALITY





Oldsmar is built on gently sloping land where tide and runoff meet.





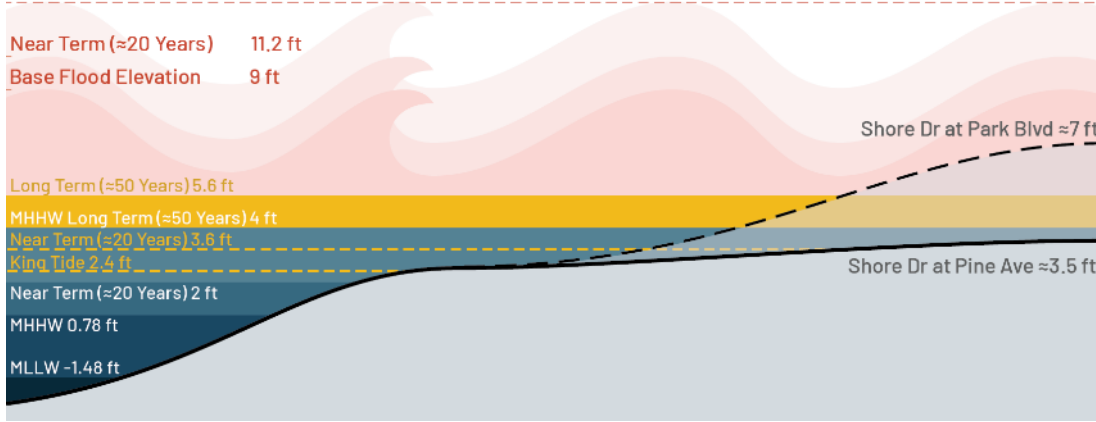
Catastrophic Storms (Once per 100 Years)
 King Tides (1 or 2 per Year)
 Mean Higher High Water (Daily)

Long Term (≈50 Years) 13.2 ft
 Near Term (≈20 Years) 11.2 ft
 Base Flood Elevation 9 ft

Long Term (≈50 Years) 5.6 ft
 MHHW Long Term (≈50 Years) 4 ft
 Near Term (≈20 Years) 3.6 ft
 King Tide 2.4 ft
 Near Term (≈20 Years) 2 ft
 MHHW 0.78 ft
 MLLW -1.48 ft

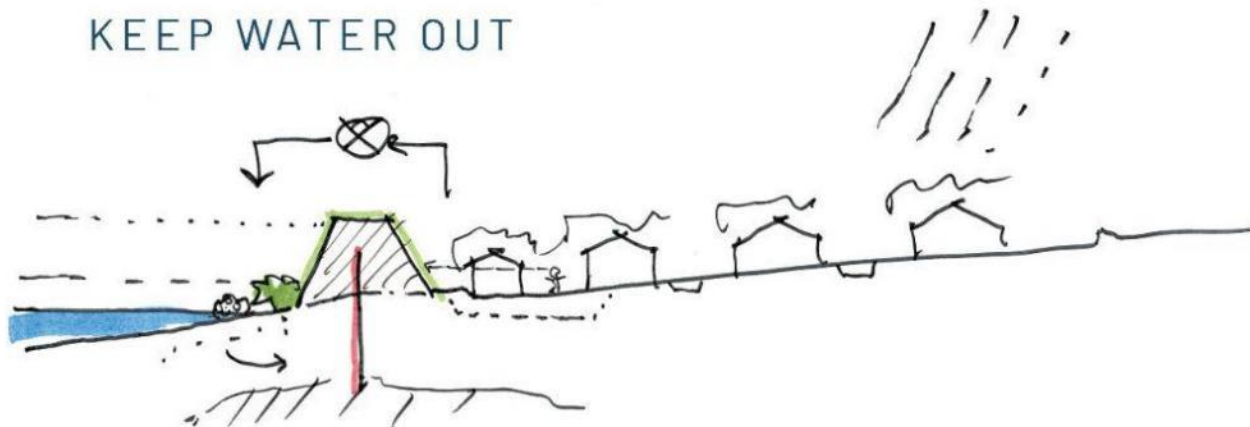
Shore Dr at Park Blvd ≈7 ft

Shore Dr at Pine Ave ≈3.5 ft





KEEP WATER OUT



LET WATER IN





GROW

ADAPT

PROTECT

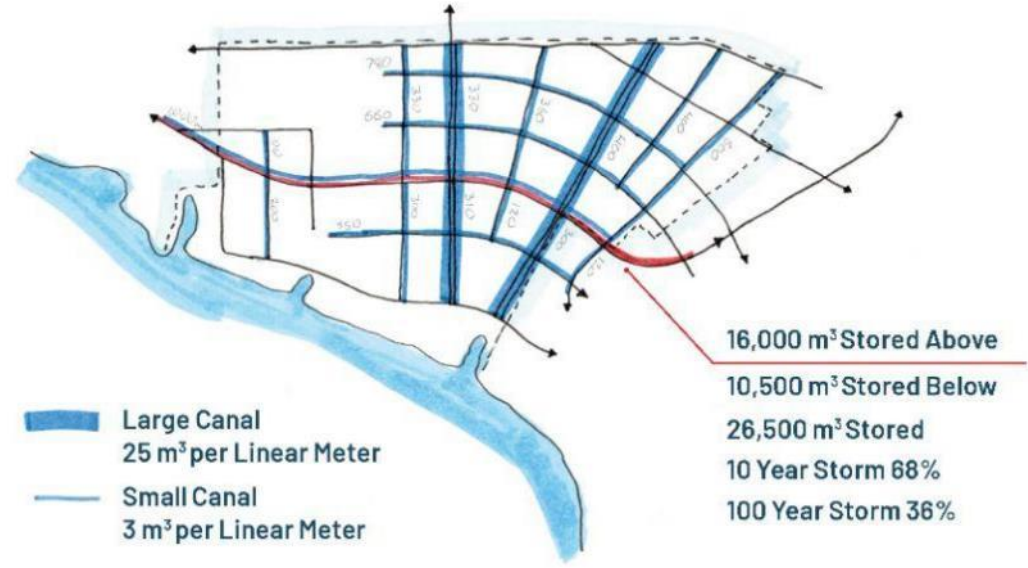
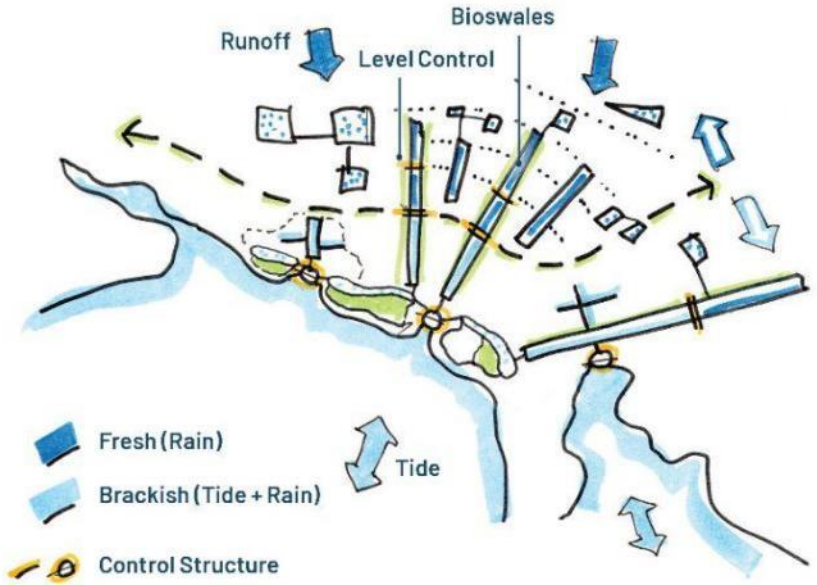


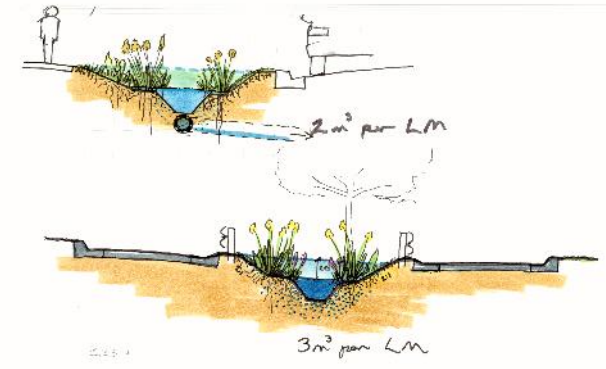
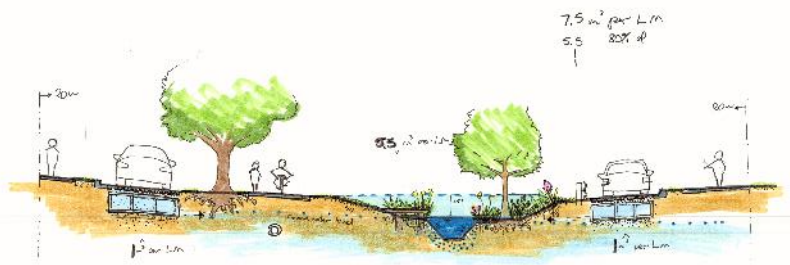
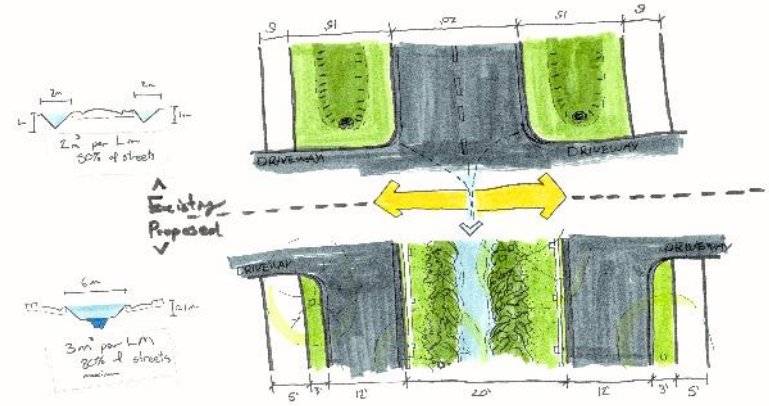
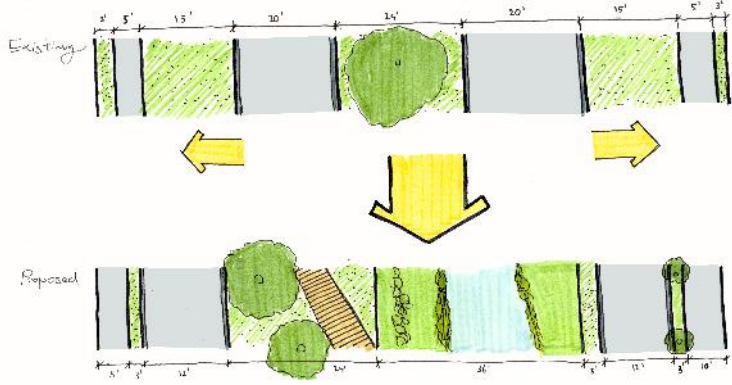
PROTECT

ADAPT

GROW



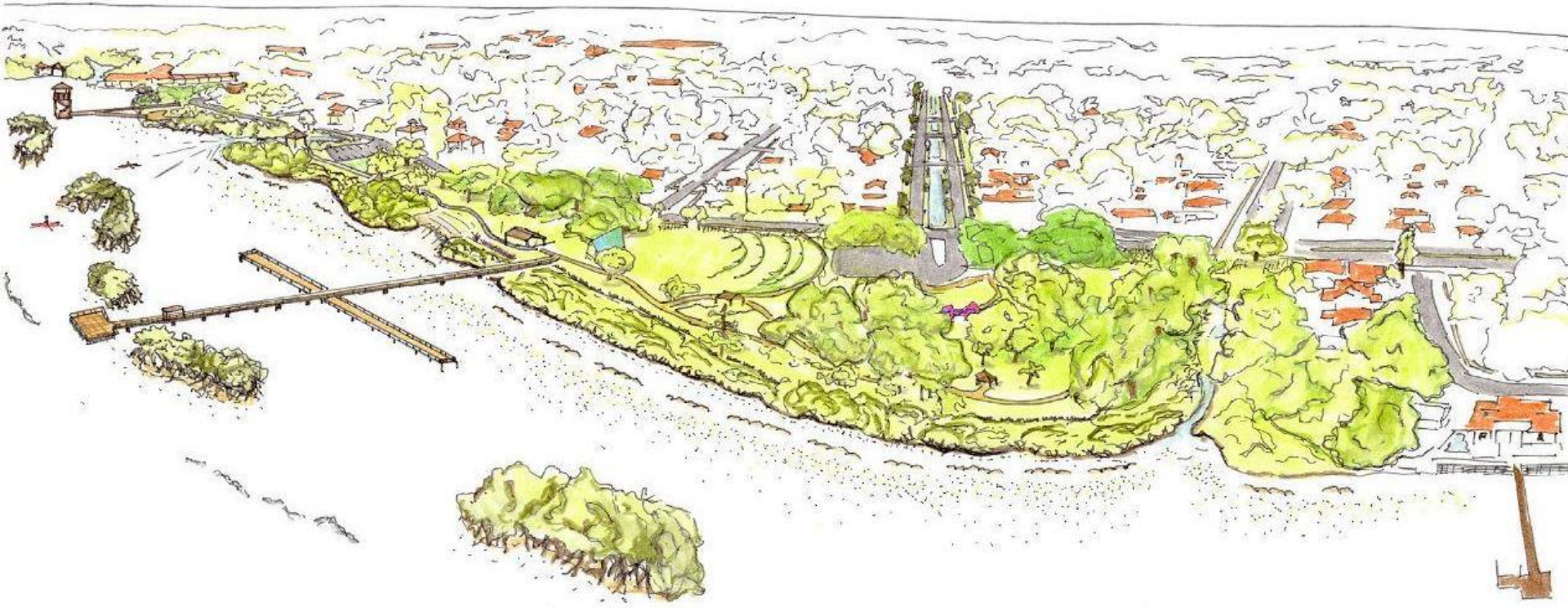






R.E. OLDS PARK CONCEPT









Conceptual Cost Estimates

PARK ADAPTATION

\$5.5 MILLION

LIVING SHORELINE

\$1.4 MILLION

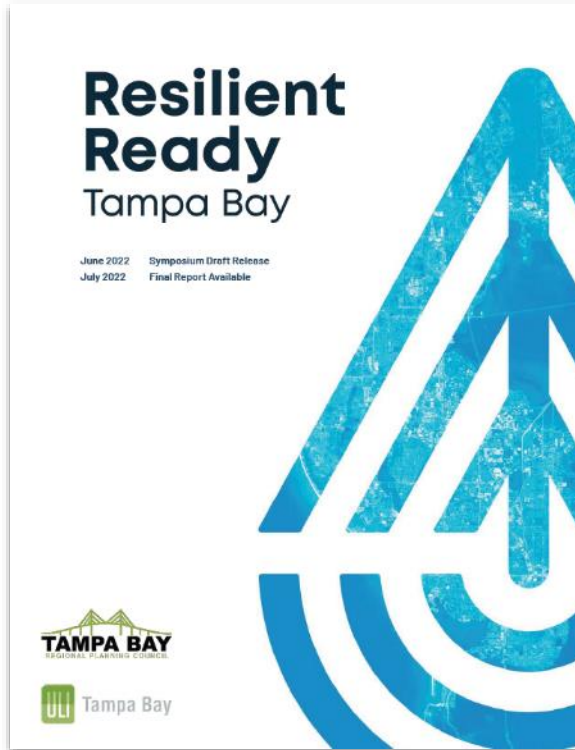
STREET ADAPTATIONS (PER BLOCK)

\$1.1 MILLION



Oldsmar Next Steps

1. Create **Stormwater Master Plan** that incorporates green infrastructure
2. Conduct **feasibility study and design** based on project concepts
3. Identify and apply for **funding support**
4. Identify **replicability** opportunities for other city properties



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Thank you!

Questions?

Contact Info:

Ashlee Painter

apainter@myoldsmar.com