



CHEERS!

Cleveland Harbor Eastern Embayment Resilience Strategy

Lessons from the Great Lake's most
Ambitious Multi-Phase Resiliency Plan



01

BENEFICIAL USE OF DREDGED MATERIAL (BUDM)



Fort Pierce Marina, Bird Island

BUDM PROGRAM VISION



Fort Pierce Marina

“USACE historically uses 30-40% of the sediments derived from the Navigation mission for beneficial purposes.

I have established a goal for USACE to advance the practice of BUDM to 70% by the year 2030 (70/30 Goal).”

**LTG Scott A. Spellman, Chief of
Engineers & Commanding
General, USACE
January 25, 2023**

BUDM PROGRAM VISION (CONT.)

Partner collaboration is key to our success:

- *Innovative pursuit*, both internally & externally, with *partners & stakeholders*, will:
 - Maximize *available solutions, strategies, & tools*
 - Develop & apply *new approaches & technologies*



Fort Pierce Marina, Breakwater

02

DIKE 14



Federal Breakwall

Lake Erie

Edgewater Park

Dike 14

I-90

Gordon Park

FirstEnergy Power Plant



Dike 14: From **Blue** to Brown to Green

- Private Estate turned Public Park in 1892
- Cleveland's premier turn-of-the-century destination
- Famous for fishing, boating, bathing, & picnicking
- Noted migratory bird corridor:
 - Doan Brooks
 - Shaker Lakes



Dike 14: From Blue to **Brown** to Green

- An 8-acre solid waste landfill - “Cleveland Lakefront Dump”
- Operated by the City from about 1930 to 1970
- In 1962, two ships from the U.S. Steel Fleet sunk to create a reef
- Landfill operations continued around & over the boats between 1962-1970

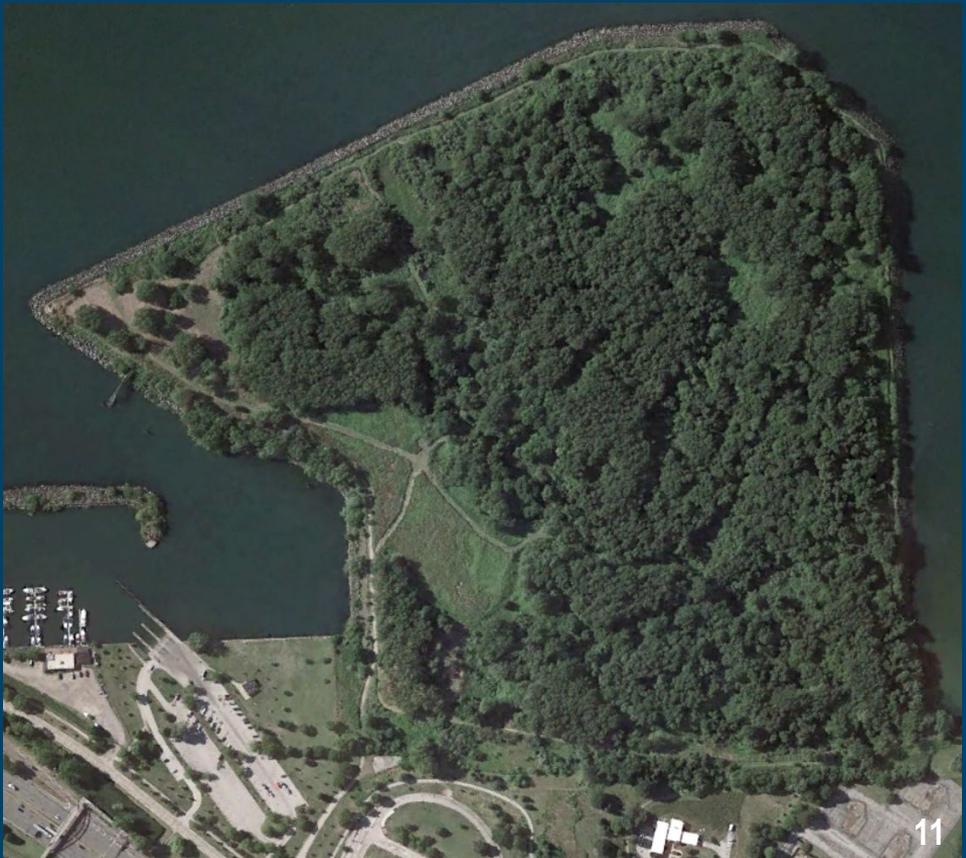


Dike 14: From Blue to **Brown** to Green

- Creation of Dike 14 DMMA
- In 1979, the USACE began dredged material placement at Dike 14
- Sediments from both the Cuyahoga River & Cleveland Harbor shipping channel
- In 1999, the USACE placed the final load of dredged material

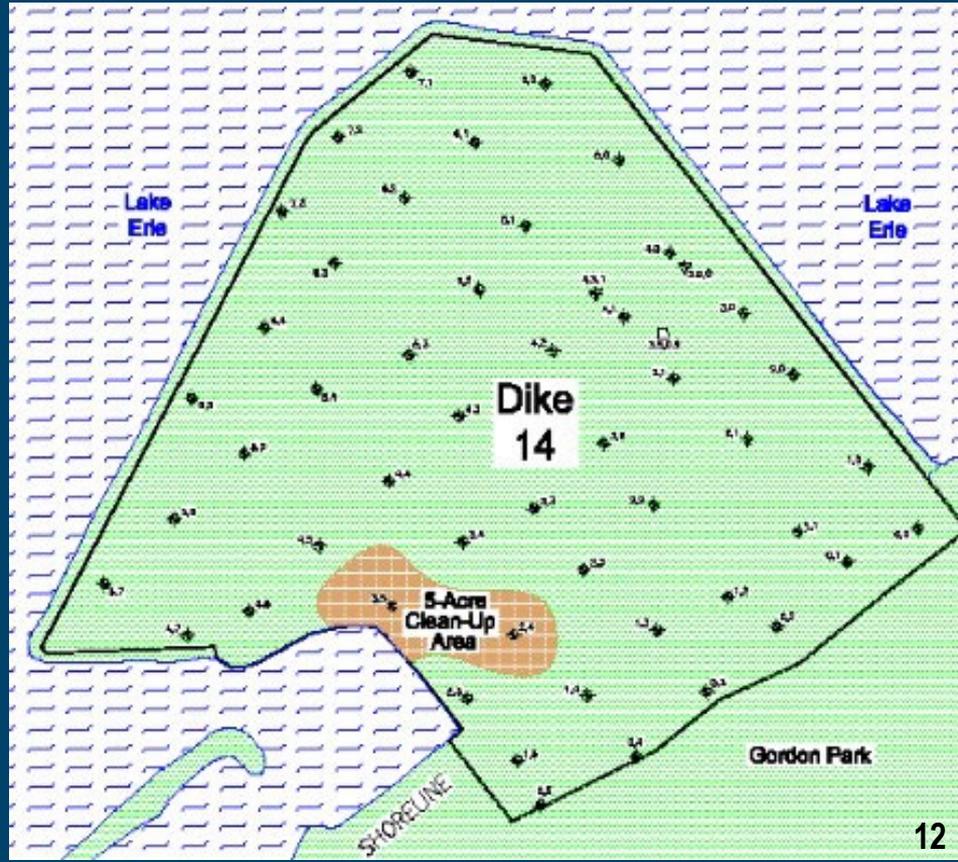


Dike 14: From Blue to **Brown** to **Green**



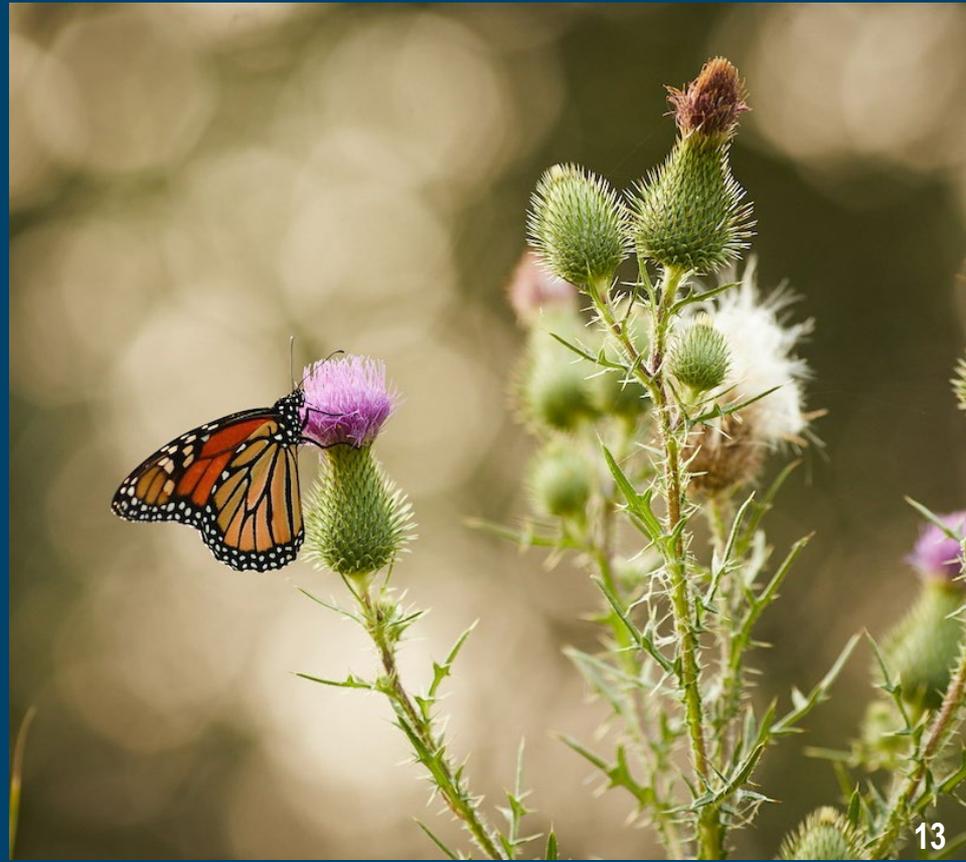
Dike 14: From Blue to Brown to Green

- Left undisturbed for ~15 years, most of the 88-acre site didn't require cleanup
- Mitigated ~5-acre area associated with the former landfill
 - Low levels of PCBs, PAHs, & lead
 - Ongoing seasonal monitoring



Dike 14: From Blue to Brown to Green

- Only significant natural area along the Cleveland Lakefront
- Only accessible natural area between Huron to the west & Mentor Marsh to the east
- Important bird migration stopover site before crossing Lake Erie
- 280+ species of birds
- 29+ species of butterflies
- 26 native plant species
- 16 mammals
- 2 reptiles
- 9 native trees & shrubs



03

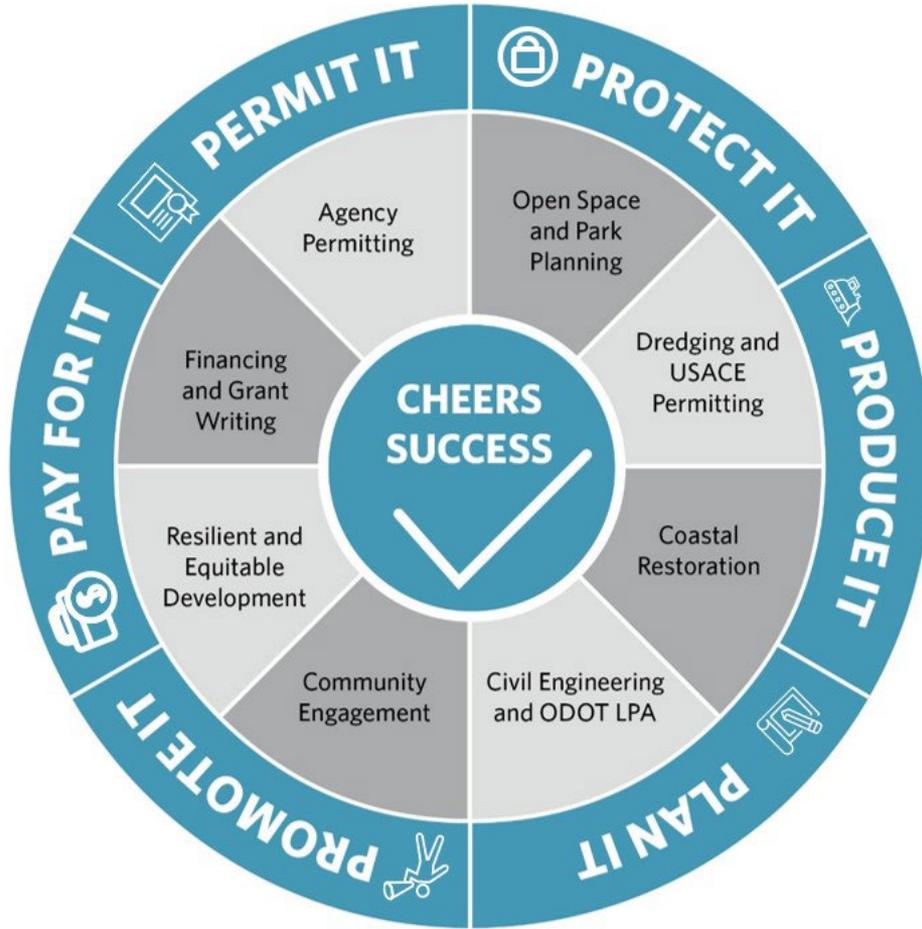
CHEERS!



CLEVELAND'S COMEBACK



CHEERS DESIGN



Federal Breakwall

Lake Erie

Cleveland Metroparks

Dike 14

I-90

Gordon Park

FirstEnergy Power Plant



Federal Breakwall

PHASE B: The Isle
36 acres

Lake Erie

Edgewater Park

The Cove

The Isle

The Lakeshore

PHASE A: The Lakeshore
64 acres (43 new acres)



04

LESSONS LEARNED - CLEVELAND



LESSONS LEARNED



Plan It



Promote It



Pay for It



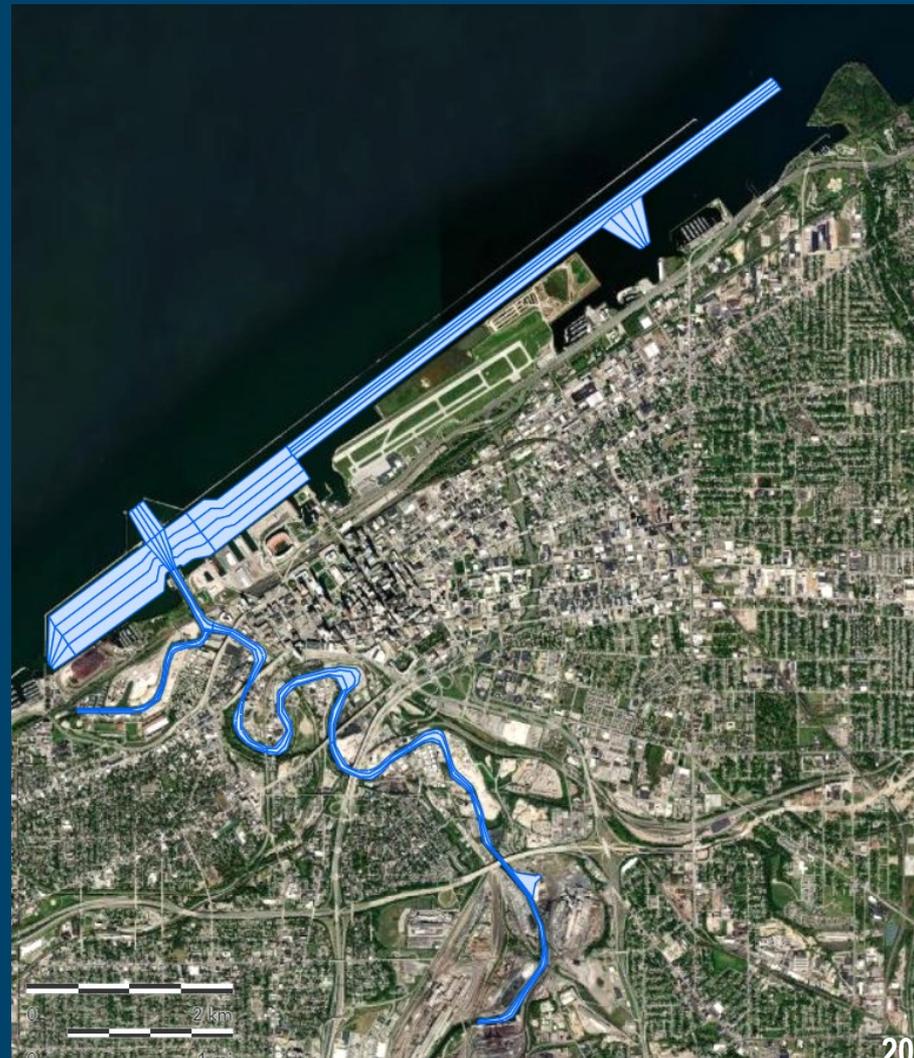
Permit It



Protect It



Produce It



05 LESSONS LEARNED - PTB



LESSONS LEARNED



Plan It



Promote It



Pay for It



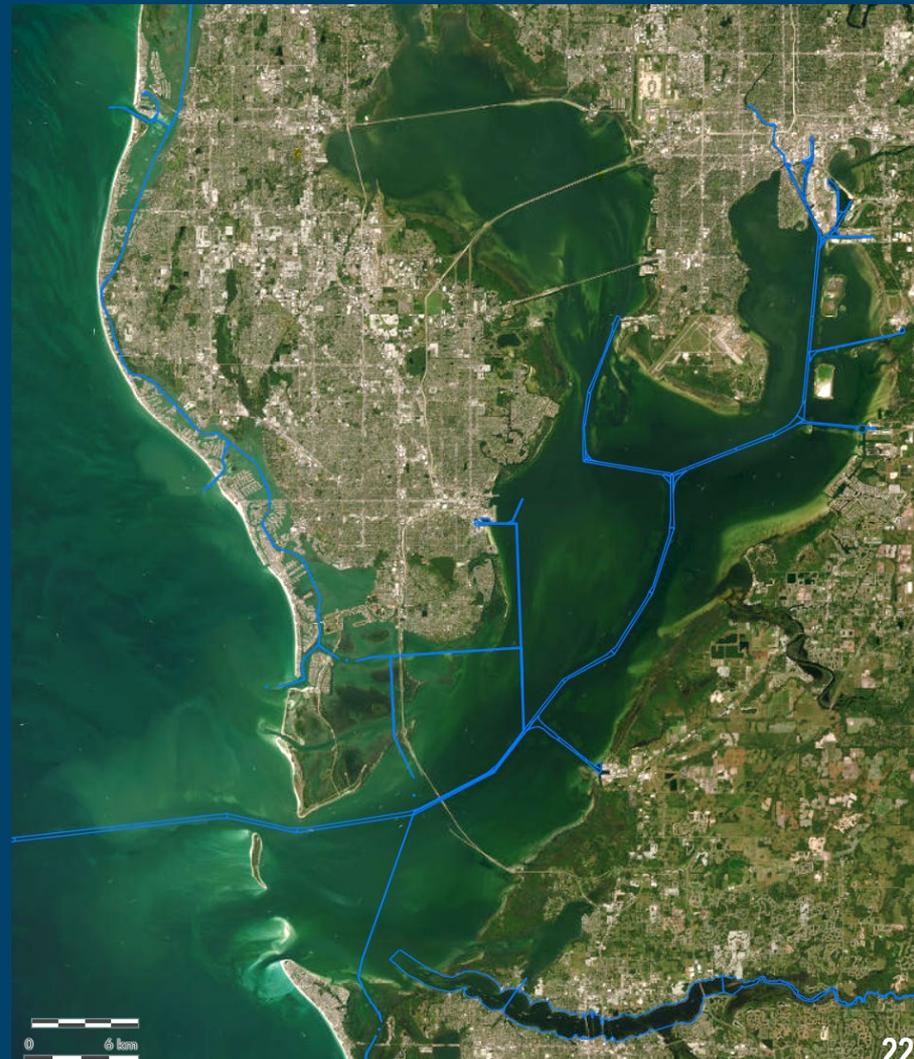
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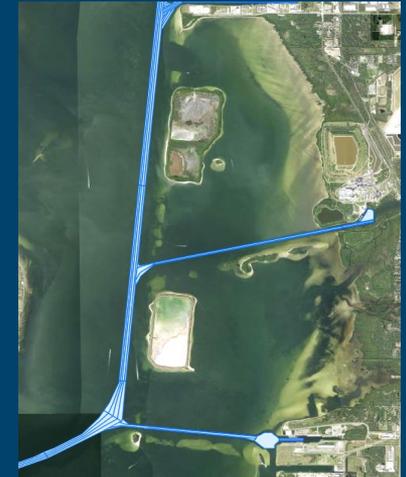
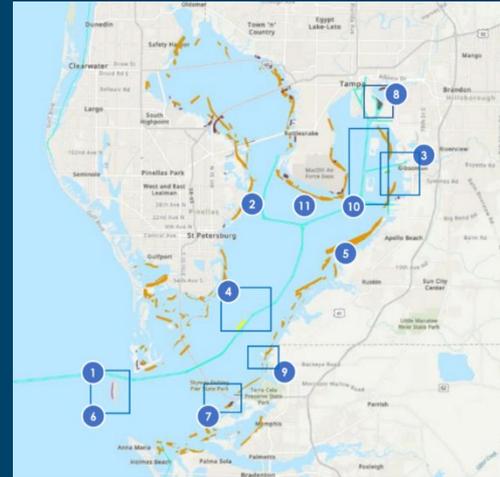


Plan It

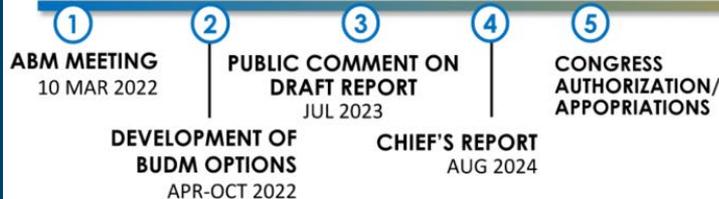
LESSONS LEARNED

LEGEND	
	Tampa Harbor Channels
<i>Beneficial Use Opportunities</i>	
	1 Egmont Key Beach Placement (1 MCY)
	2 Dredged Holes (1.5 MCY) (not all suitable for restoration)
	3 Alafia Bank Sanctuary Islands (~500 KCY) (Island Creation/Restoration)
	4 Hardbottom Creation Site (1.7 MCY) (previously permitted)
	5 Nearshore Breakwaters (~100 KCY) (potential restoration sites)
	6 Egmont Key Island Restoration (5 MCY)
	7 Manatee County Boat Ramp (1-2 MCY)
	8 East Bay Port Expansion (3-4 MCY)
	9 Manbirdree Key Island Restoration
	10 Shoreline Restoration at DMMAs
	11 Reddish Egret Habitat (bay-wide, location TBD)

- Emphasize Existing Resources
- Determine Desired Outcomes
- Project Conditions Data



FEASIBILITY STUDY (2021-2024)



PRECONSTRUCTION ENGINEERING DESIGN (2025-2026)

- Design Data Collection
- Detailed Design

CONSTRUCTION PHASE (2026+)

- Real Estate Acquisition
- Relocations (if needed)
- Plans & Specifications
- Construction



Pay for It

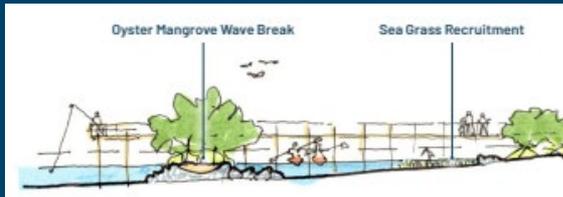
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LEGEND

— Tampa Harbor Channels

Beneficial Use Opportunities

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location TBD)



- Planning & construction cannot be implemented without funding
- Can the project itself generate funds
 - Federal funds, grants, tolls, usage fees?
 - Public-private partnerships?
 - Mitigation credits, etc.?
- Unique climate for long-term funding





Permit It

LESSONS LEARNED



Why we need to improve environmental resilience on the eastern lakefront:

- + Impact of Climate Change
- + More Frequent and Intense Storm and Weather Events
- + Impact of Waves, Ice, and Erosion on the Shoreline and Critical Infrastructure
- + Flooding and High Lake Levels
- + Limited Nearshore Habitat
- + Degraded Water Quality and Aquatic Habitat
- + Lack of Natural Shoreline Protection
- + Large Availability of Dredge Material that Needs to be Beneficially Used or Stored
- + Increase in Average Temperatures

- Connecting regulatory reviewers to its potential environmental renewal
- Connecting the public to its possible ecological splendor
- Connecting Port Tampa Bay, FDEP, USACE, counties, & municipalities to its long-term adaptive planning benefits



- + Lack of Equity in Availability and Access to Open Spaces and Recreational Amenities
- + Safety and Security Concerns
- + Vulnerable Communities with Limited Ability to Respond to Environmental or Economic Shocks
- + Need for Intergenerational and Community Gathering Spaces



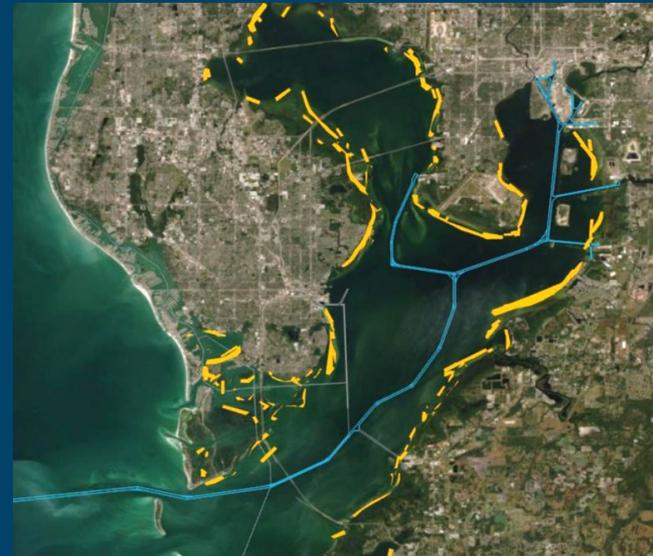
Protect It

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- Nearshore breakwaters (also known as longshore bars) were historically significant features in Tampa Bay
- Over time they have disappeared

- When land reclamation fails
 - Generally, because of the extremely energetic environmental conditions
 - Adaptive management, fail & rebuild, & other strategies should be reviewed
 - Plan & budget for inevitable impacts



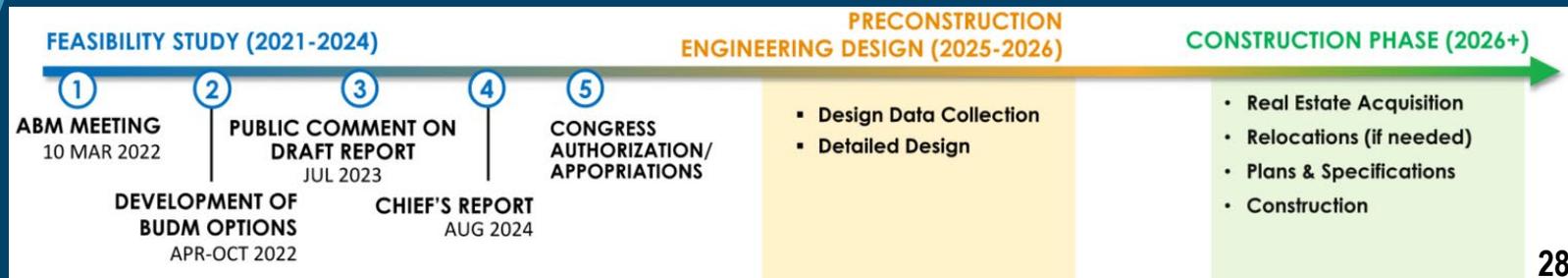


Produce It

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- Actively managing deliverable quality is essential to minimizing cost & eliminating schedule overruns
- Advance schedule & reduce cost while maintaining quality
- Set industry benchmarks for excellence
- With CHEERS! – focused on providing environmental equity elements first
- With PTB – focus on economics?



06

LESSONS LEARNED - LOUISVILLE



LESSONS LEARNED



Plan It



Promote It



Pay for It



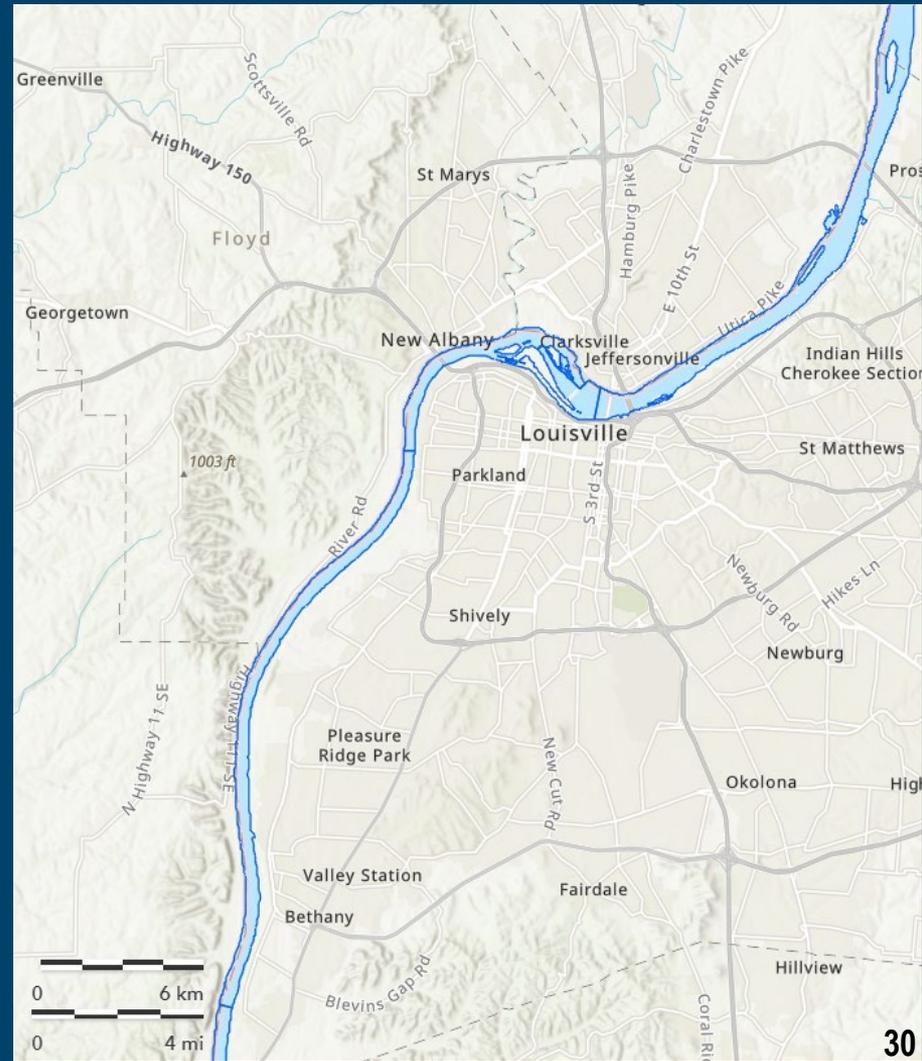
Permit It



Protect It



Produce It



07

LESSONS LEARNED - BUFFALO



LESSONS LEARNED



Plan It



Promote It



Pay for It



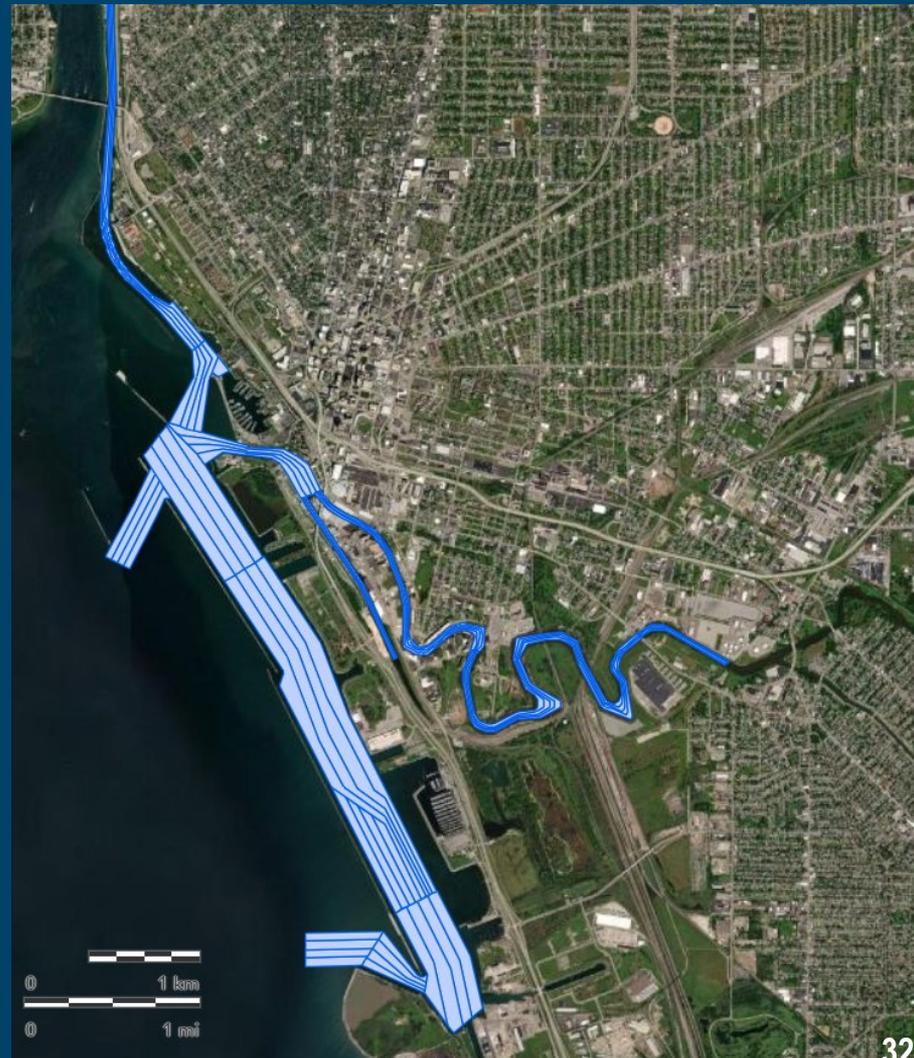
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Protect It

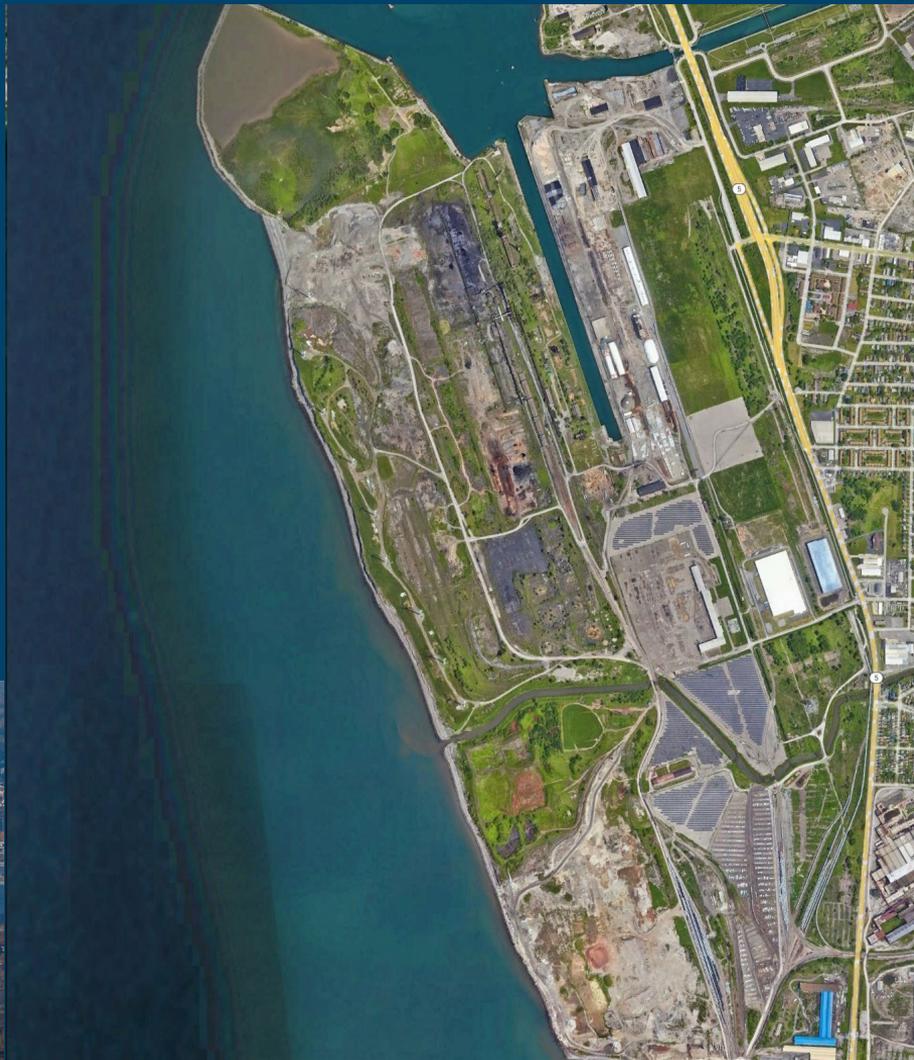


Produce It



LESSONS LEARNED

- Former Bethlehem Steel site
- Terraform Wind Farms
- Protect for Calving Icesheets
- No Wind Interference



09

SUGGESTIONS & QUESTIONS?



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