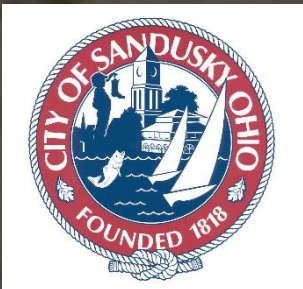


Sandusky Bay Initiative

East Sandusky Bay Nature-Based Shoreline and Coastal Wetland Restoration Project

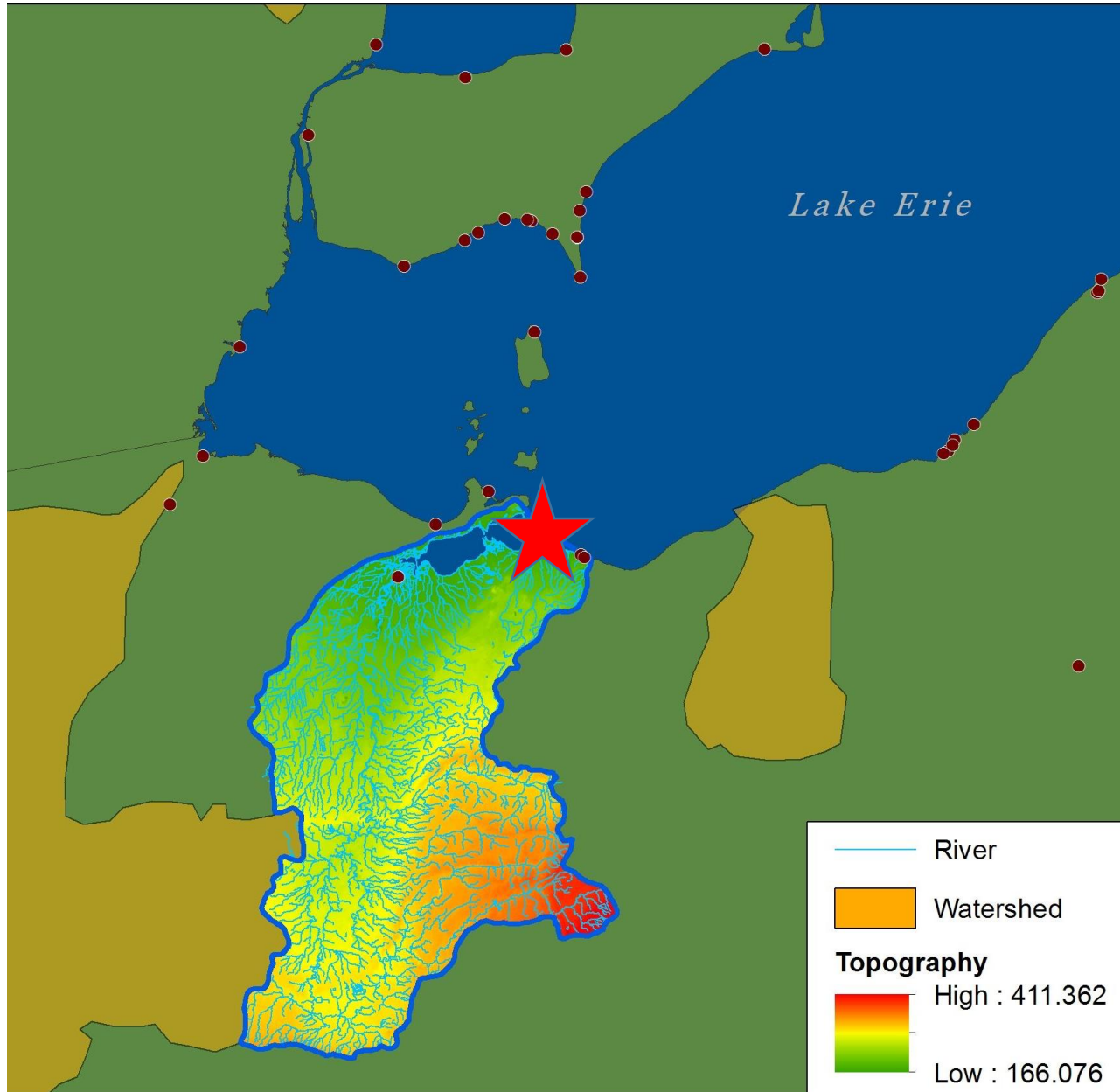


Baird.
Innovation Engineered.



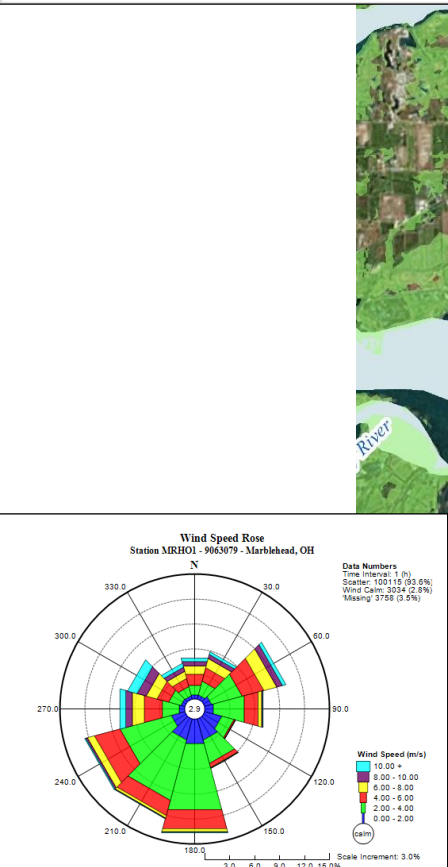
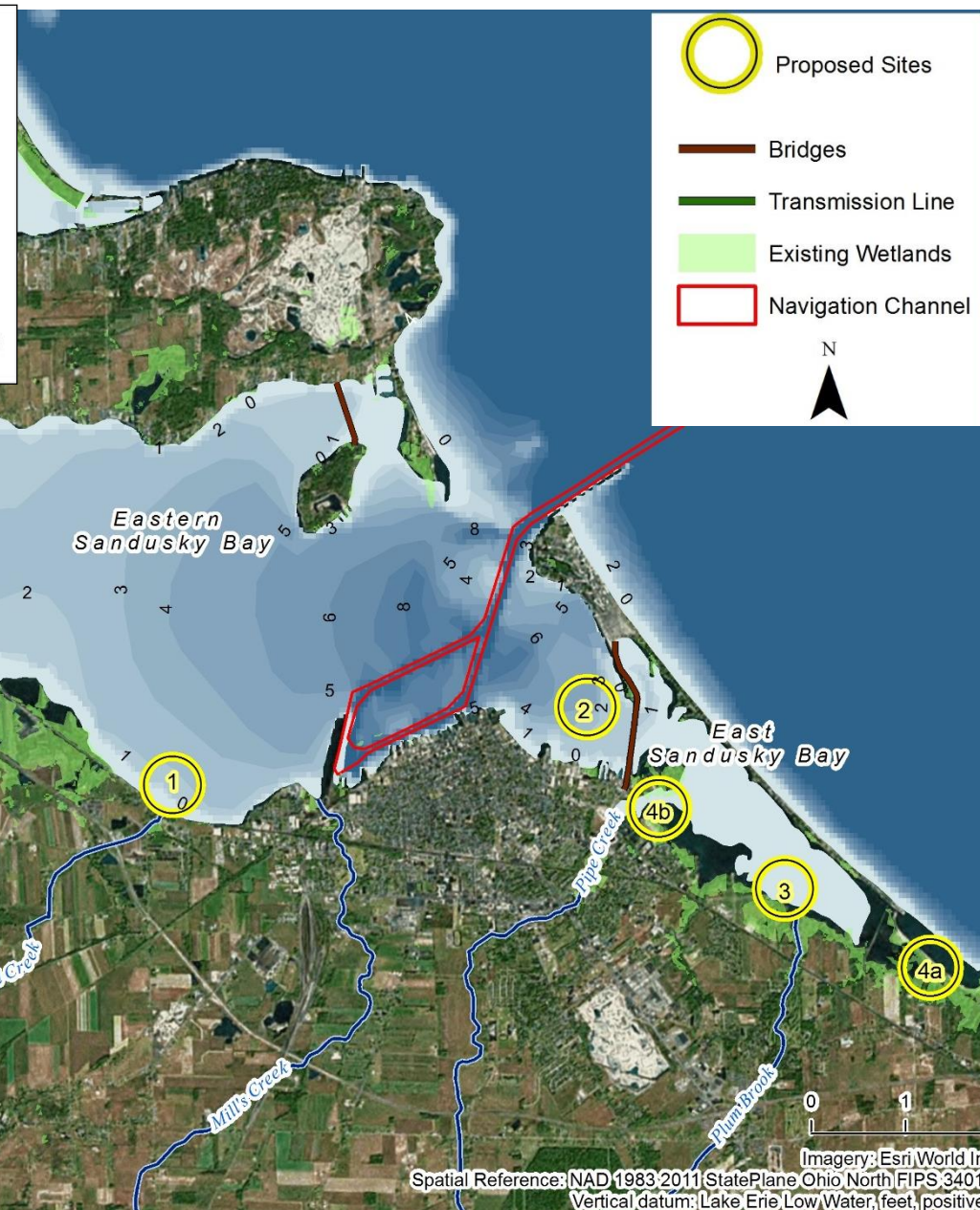
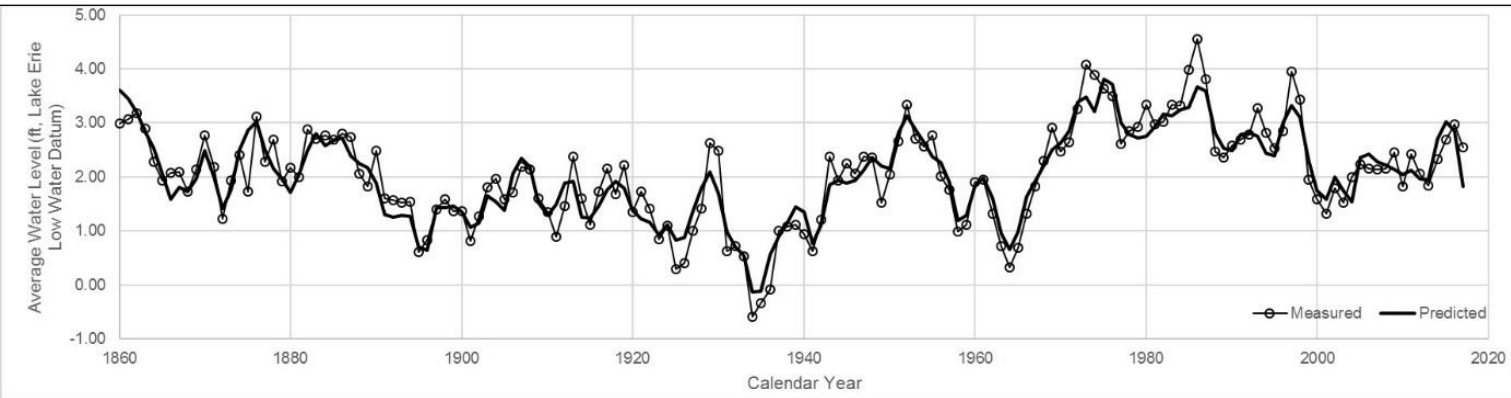
- ☐ Introduce Sandusky Bay Initiative
- ☐ Project Goals
- ☐ East Sandusky Bay Baseline Conditions & Dynamics
- ☐ Project Siting/Location Studies
- ☐ Proposed Designs for Area 3 Pilot Projects
- ☐ Conclusions





- ☐ Sandusky Bay: 65 sq. miles
- ☐ Sandusky River Watershed: 1,828 sq. mi.
- ☐ Primary Land Use: Agriculture
- ☐ Western Sandusky Bay, Eastern Sandusky Bay, East Sandusky Bay (Putnam Marsh Erie Metroparks)
- ☐ Major City: City of Sandusky
- ☐ Recreation, Industry

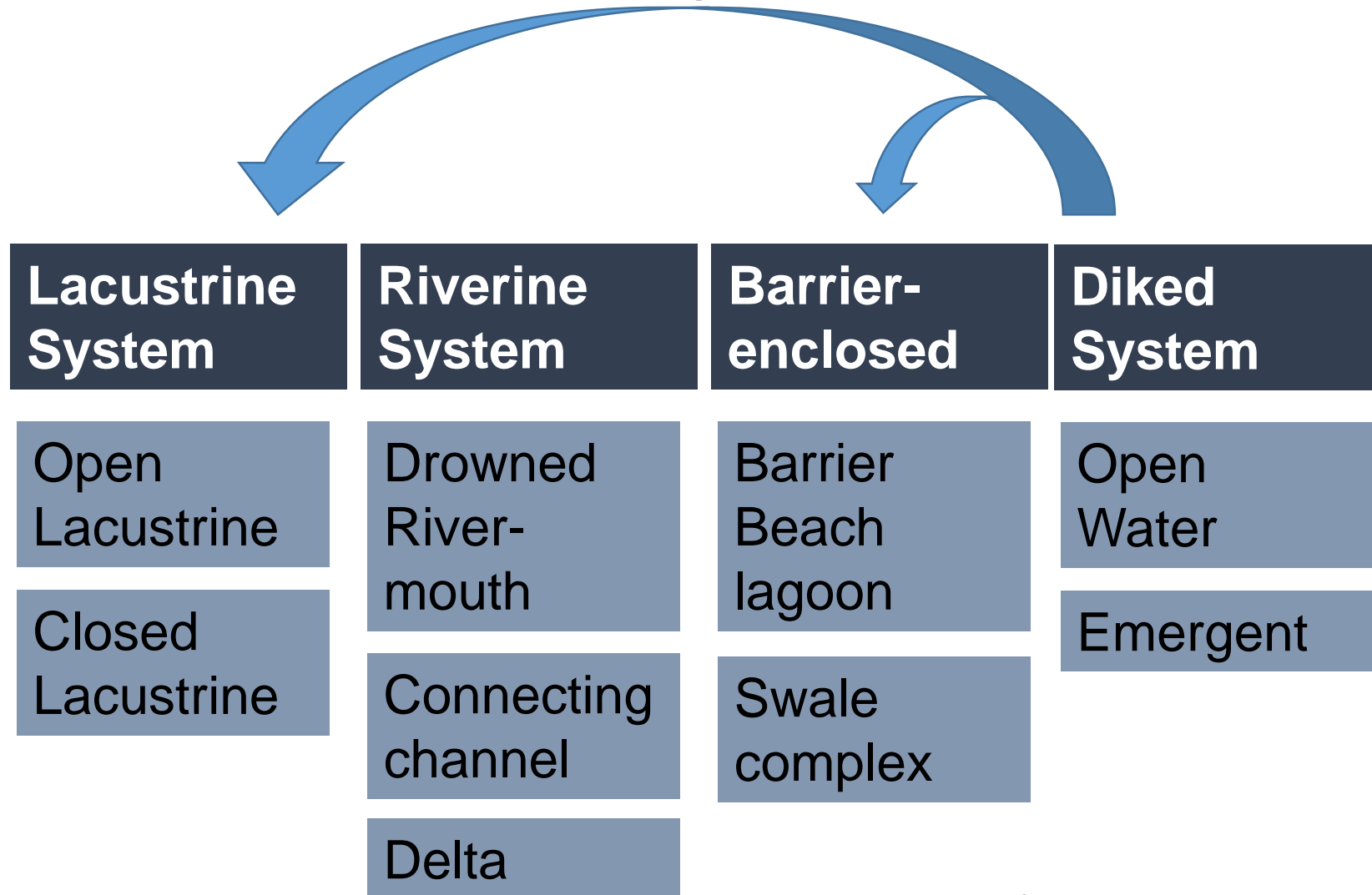
Sandusky Bay Features



- Restore in-water coastal wetland habitats.
- Improve nearshore water quality by reducing nutrient and suspended sediment loads.
- Enhance wildlife, waterfowl, and fisheries habitat in Sandusky Bay.
- Consider beneficial reuse of dredged material to support the 2020 ban on open-lake disposal

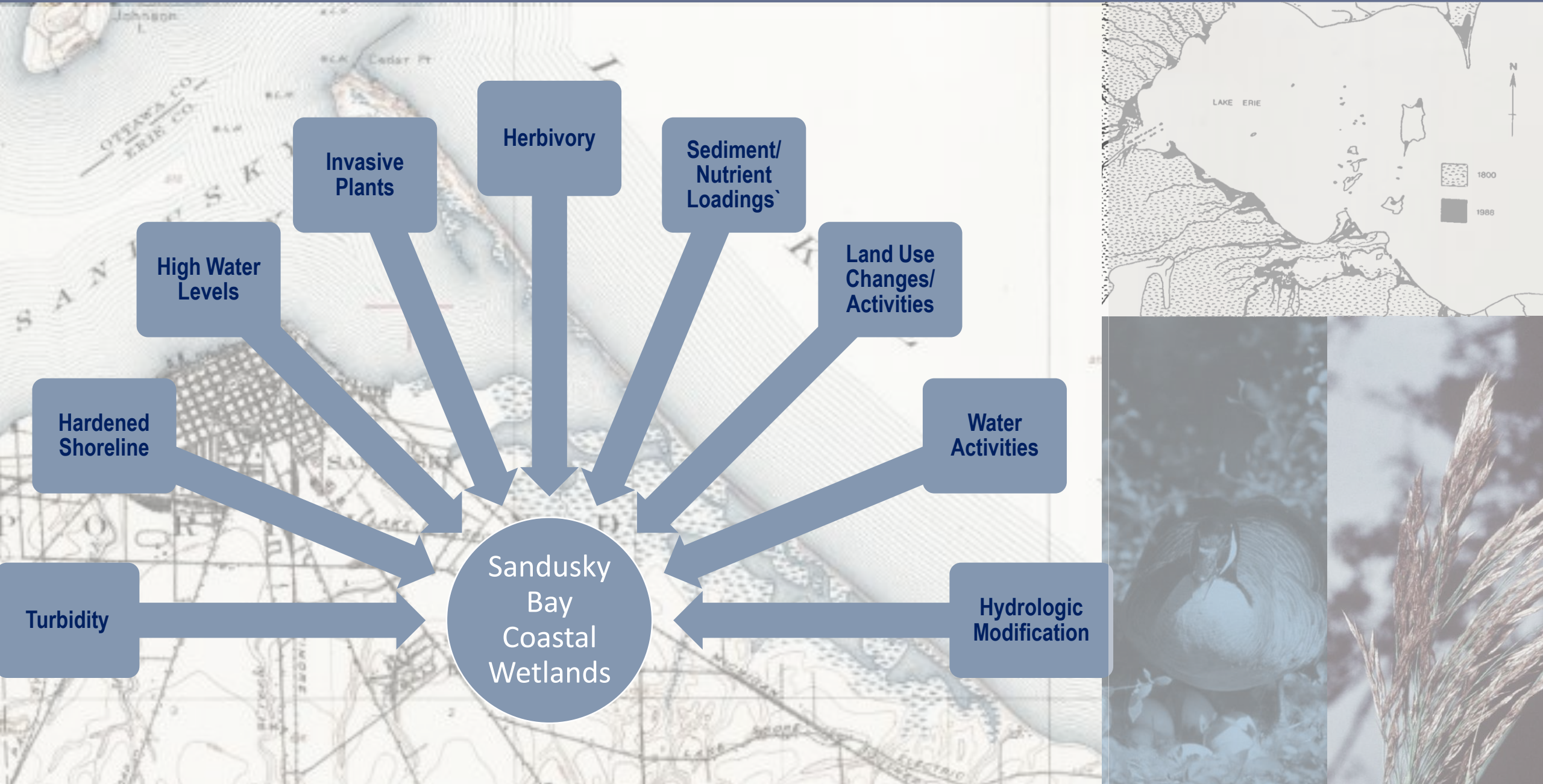


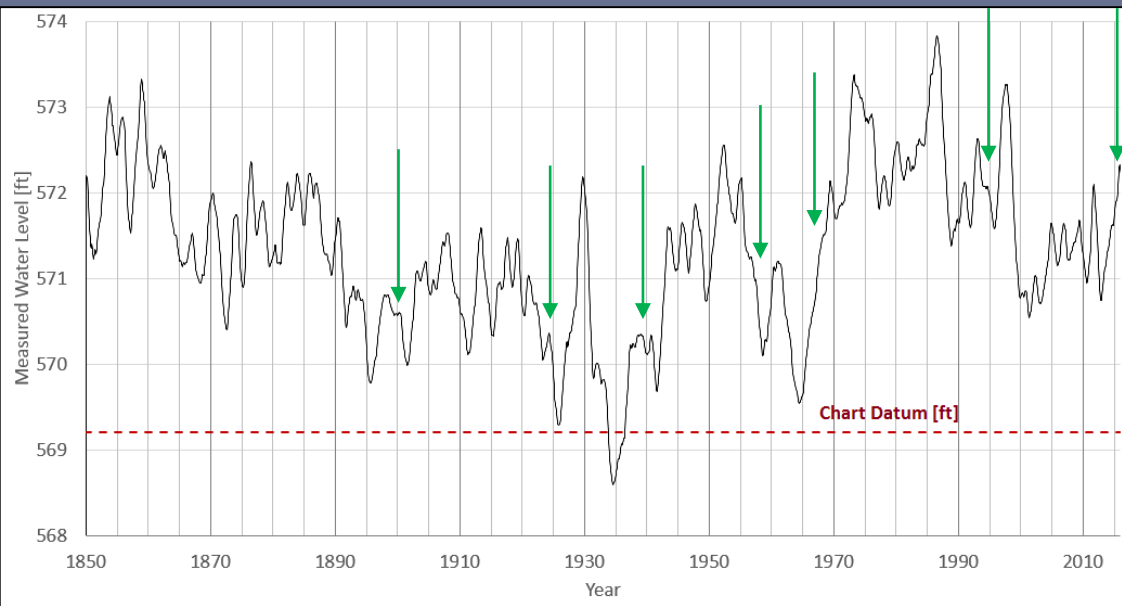
HYDROGEOMORPHIC CLASSIFICATION Great Lakes Coastal Wetland Systems



Adapted from: Albert et al 2005; Herdendorf 1987

Sandusky Bay Threats





- ☐ Pipe Creek
- ☐ Hemminger Ditch
- ☐ Plum Brook
- ☐ Lake Erie Connections

City of Sandusky

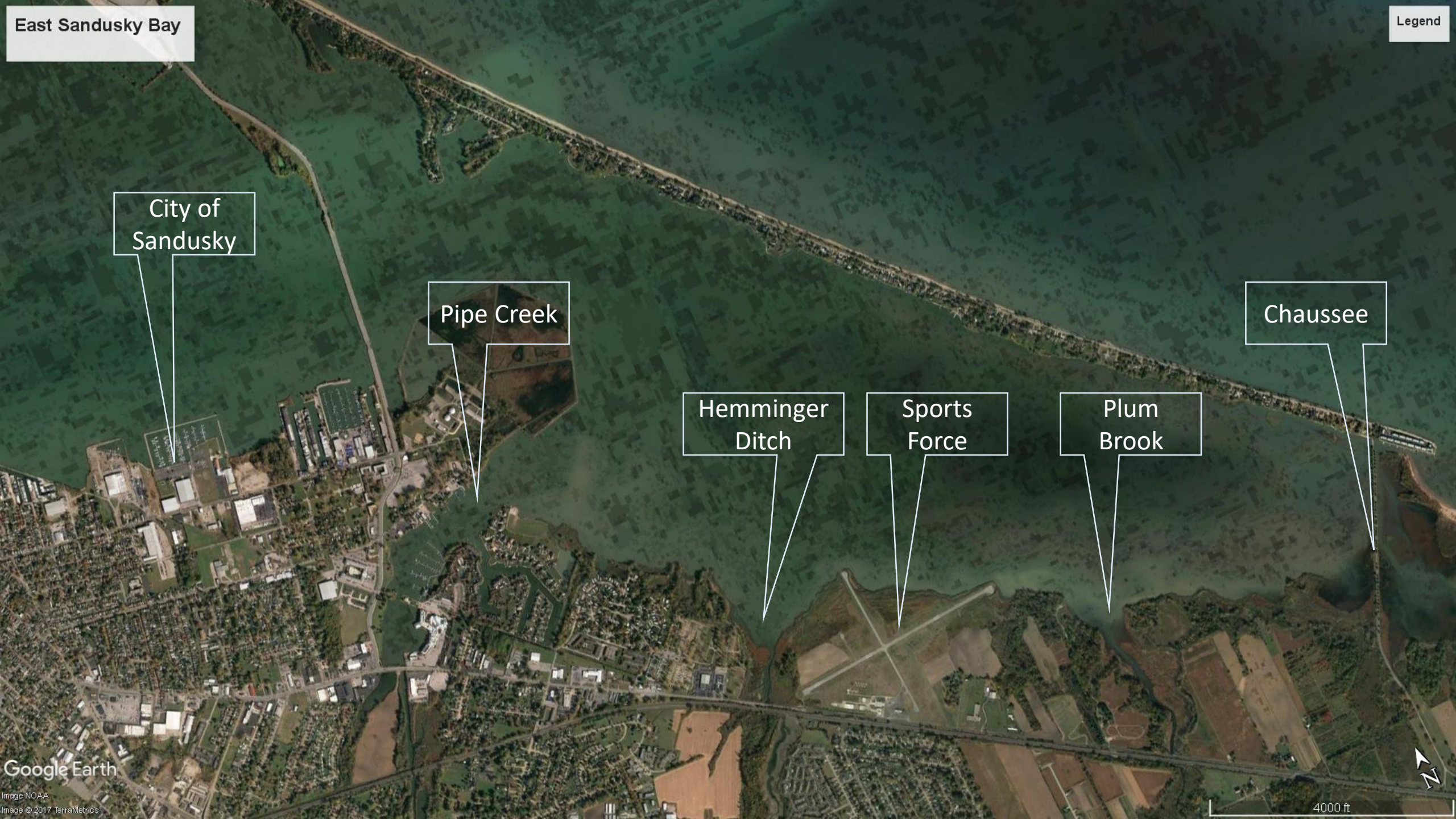
Pipe Creek

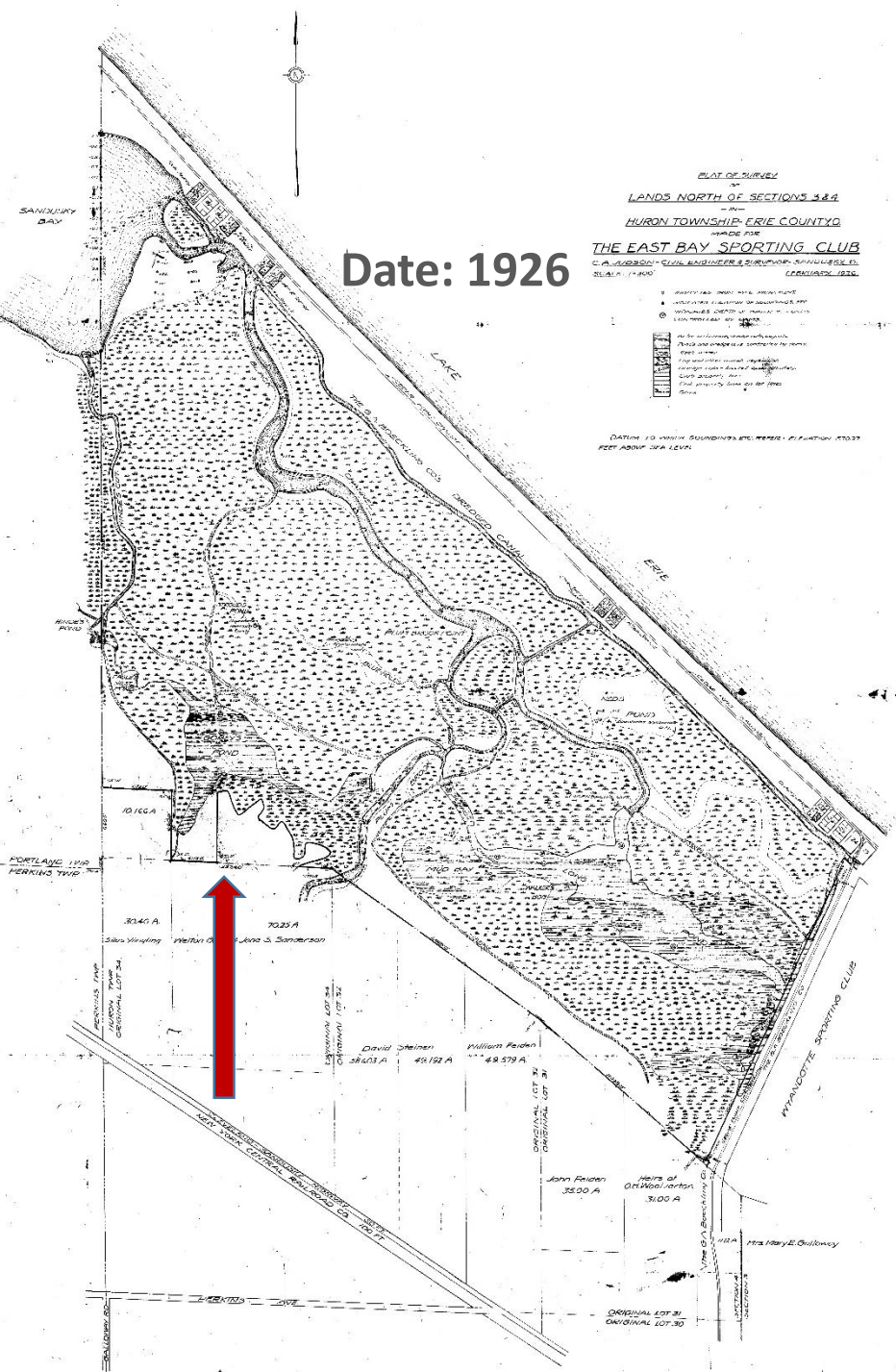
Hemminger Ditch

Sports Force

Plum Brook

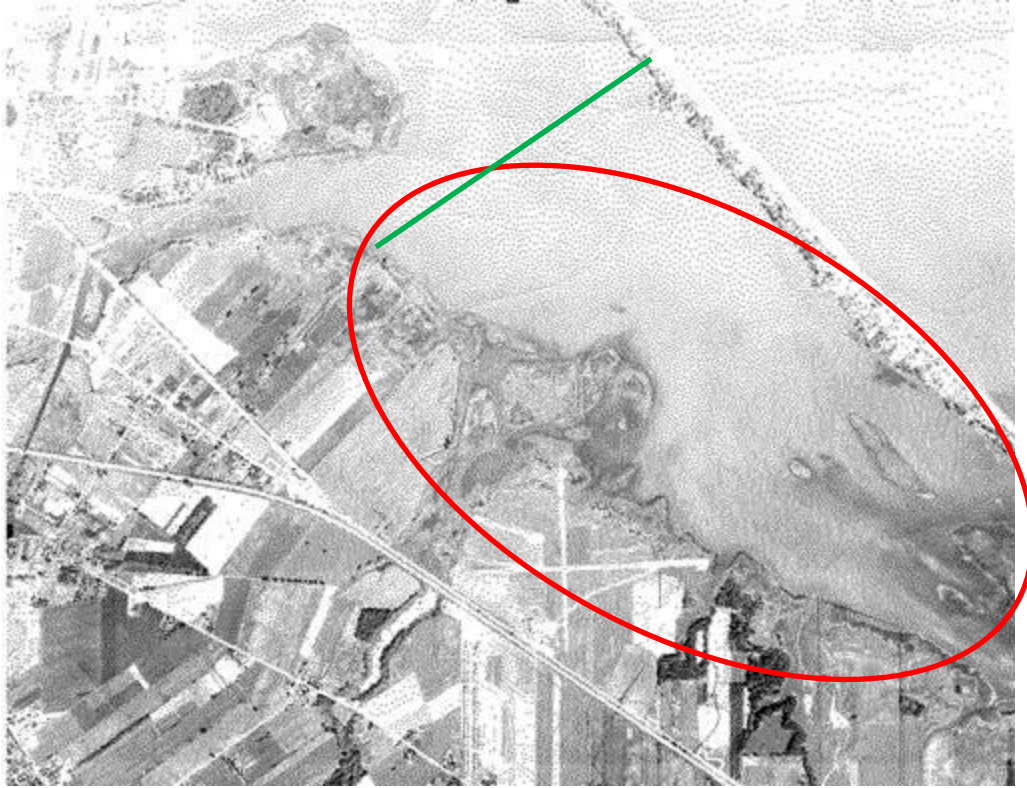
Chaussee





Date: 1937

Changing Water Levels



Date 1957

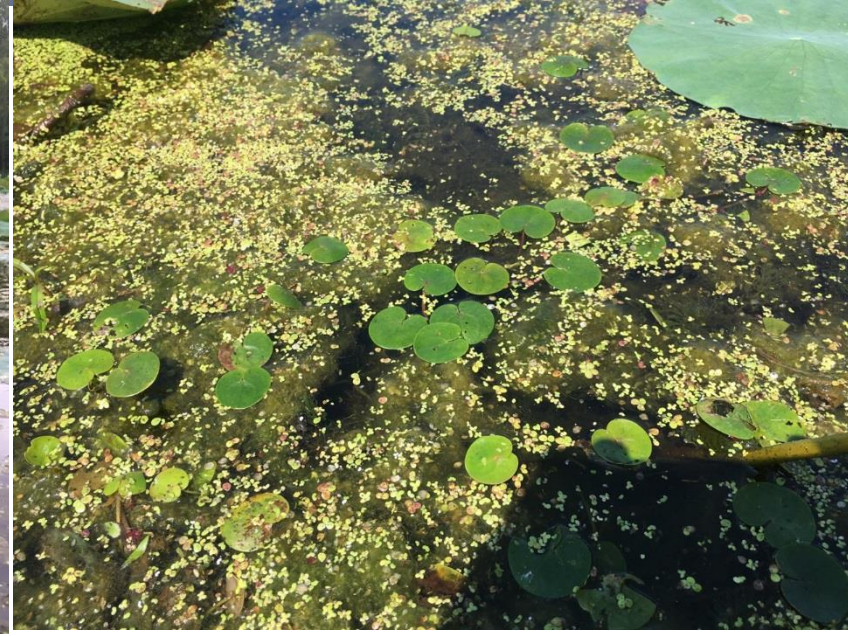
Date: 1968



Determining Ecology & Physical Conditions



East Sandusky Bay — Existing Conditions



Particle Tracking – Sediment Plume



Forcings:

- High Water Level
- Tributary Inflows

Source: W.F. Baird & Associates. Mike 21 Model

Particle Tracking – Sediment Plume



Forcings:

- Low Water Level
- Tributary Inflows

Source: W.F. Baird & Associates. Mike 21 Model



- ☐ Putnam Marsh Management Zone
- ☐ East Sandusky Transition Restoration Zone
- ☐ Former Airport Restoration Zone

What We Learned

- Water level influences marsh community composition and distribution.
 - **Nothing we can do about controlling water level**
- Homogeneity of bathymetry magnifies the effect of water level fluctuation.
 - **We can modify this**
- Connectivity of Sandusky Bay and Site 3 has been reduced to a degree by construction of Cedar Point Drive and improvements along Cedar Point Road
 - **Change may not be necessary**
- Generally low energy system with respect to our project goals.
- Changed watershed conditions result in greater sediment and nutrient loadings.
- Shoreline development and armoring has reduced resiliency of the resource to water level fluctuations

Essential Considerations

Turbidity:

- Reduce sediment resuspension due to wave energy by creating barriers.
- Divert turbidity flows.

Energy:

- Create areas of calm wave and current energy (behind barriers).
- Control boat wakes.

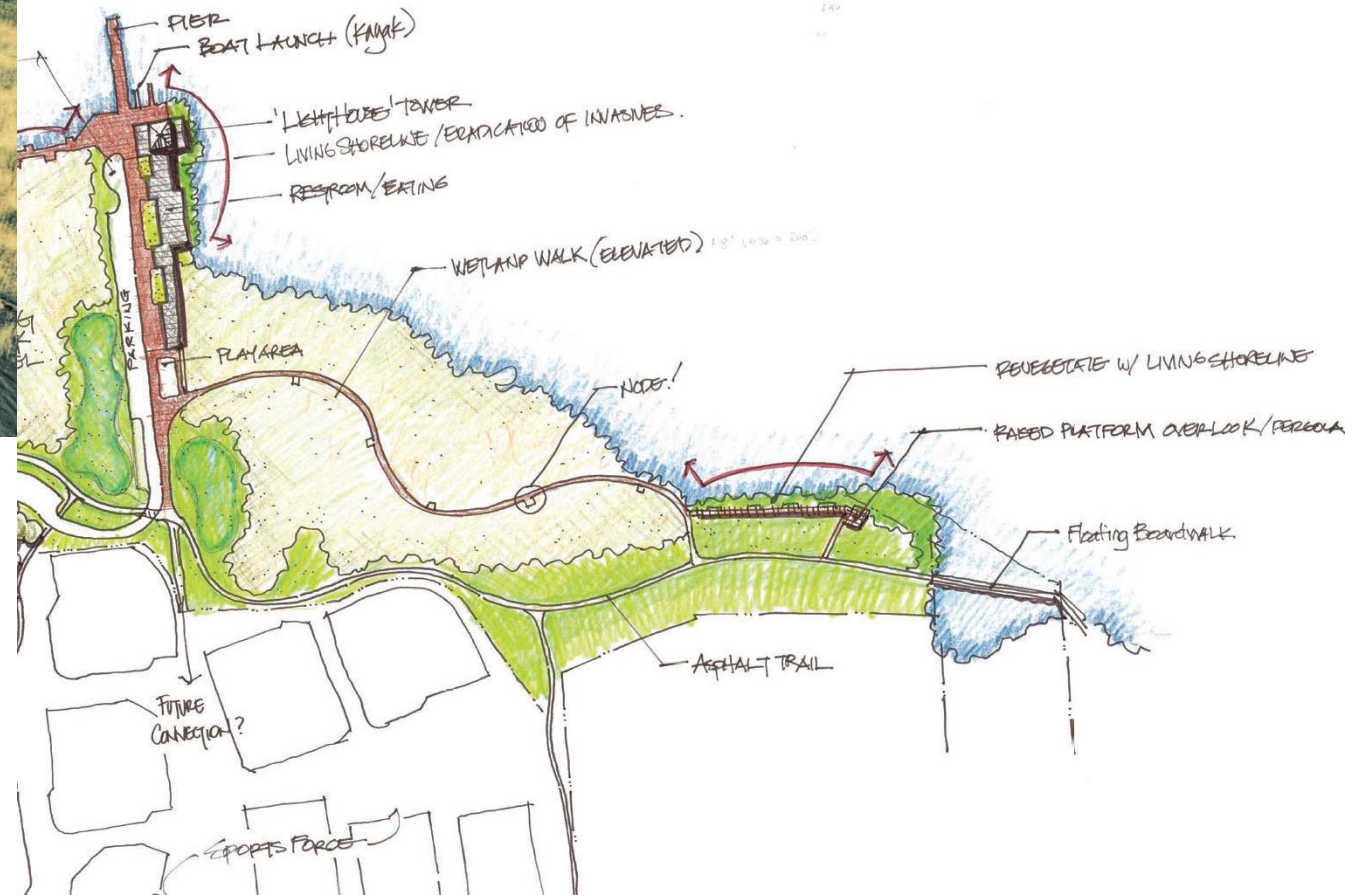
Water Depth:

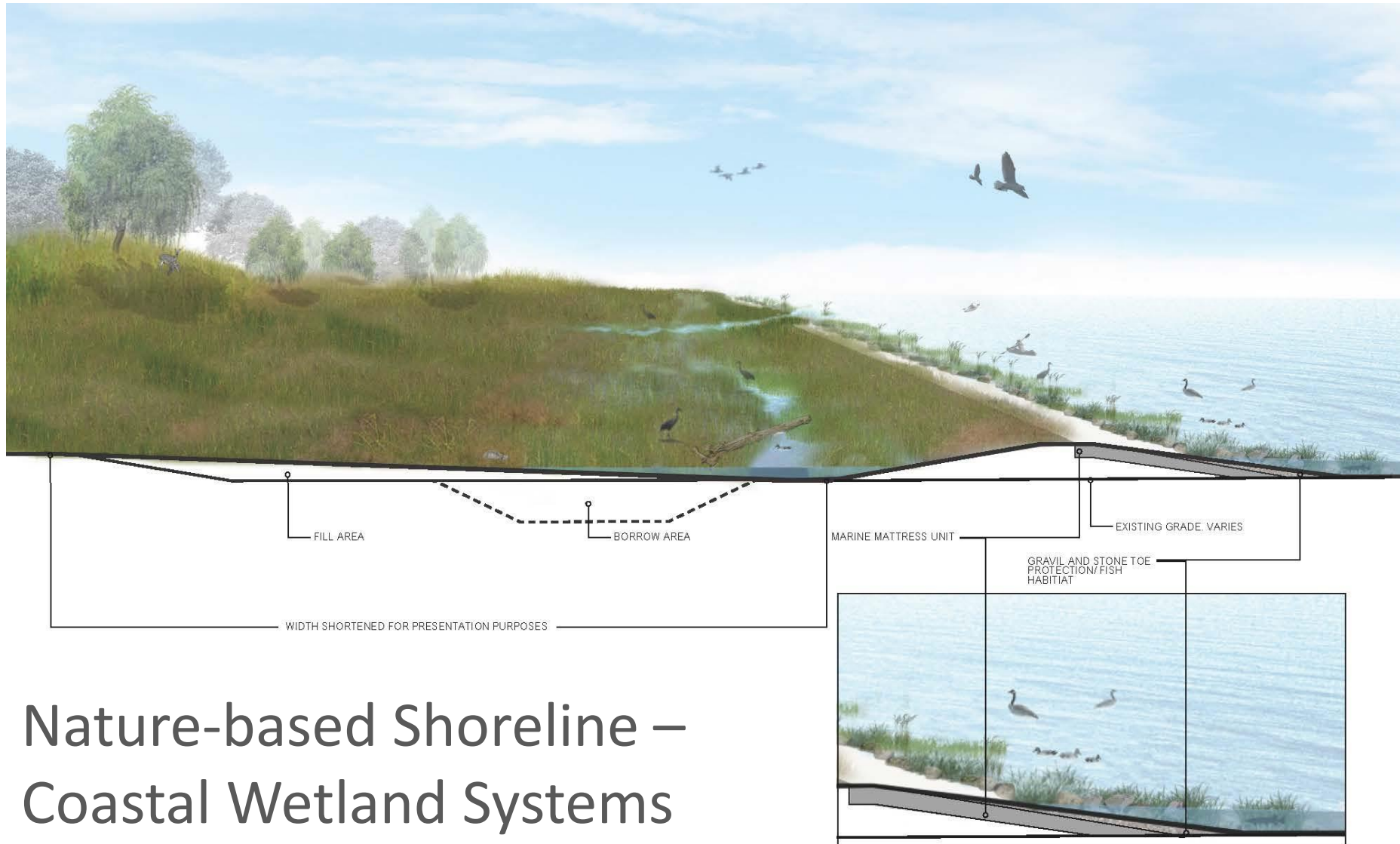
- Create terraced areas to promote recovery of natural habitat.



Landing Park and Sandusky Bay Pathway Master Plan

Source: EDG. 2018. Landing Park and Sandusky Bay Pathway Master Plan. Prepared for City of Sandusky, OH.



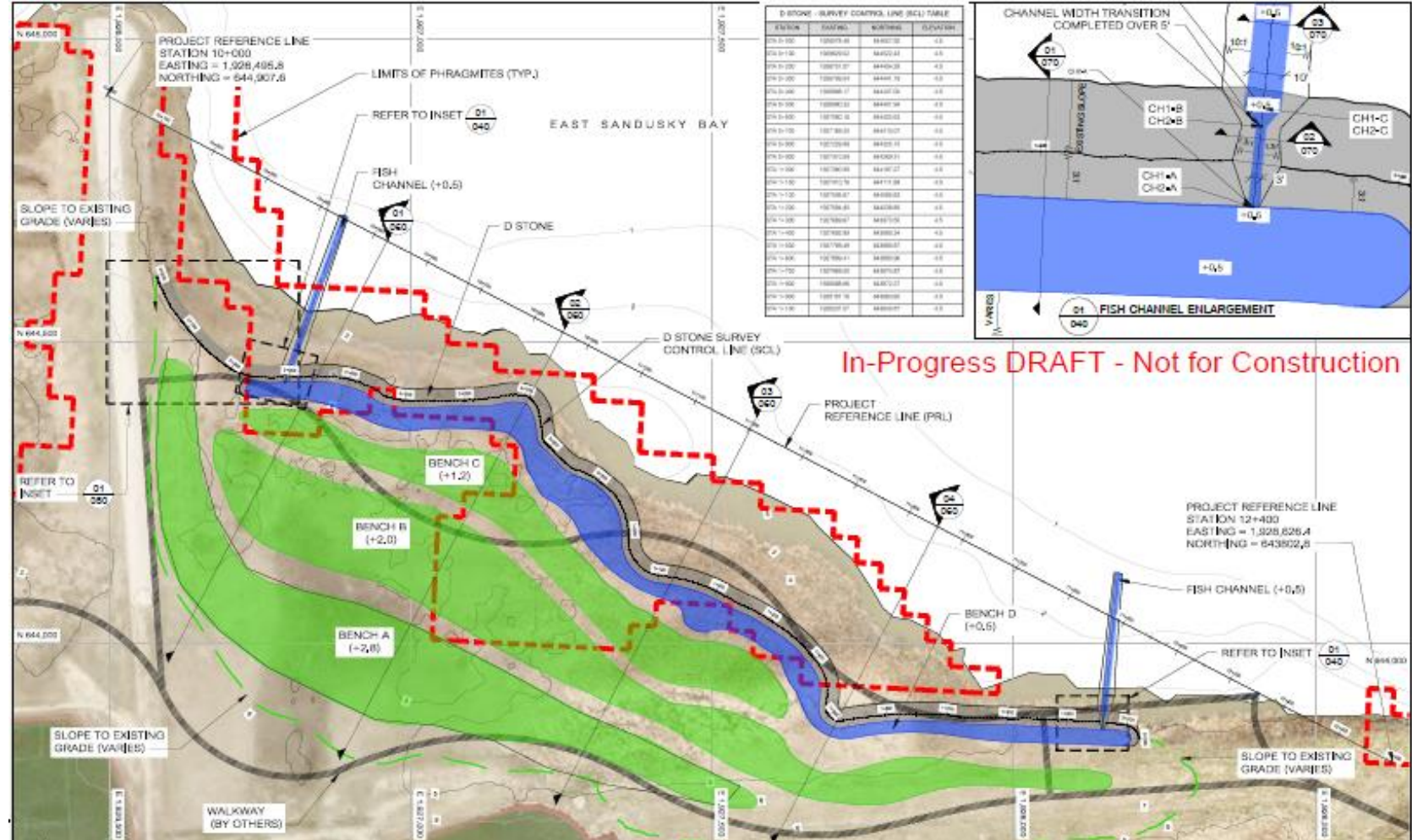
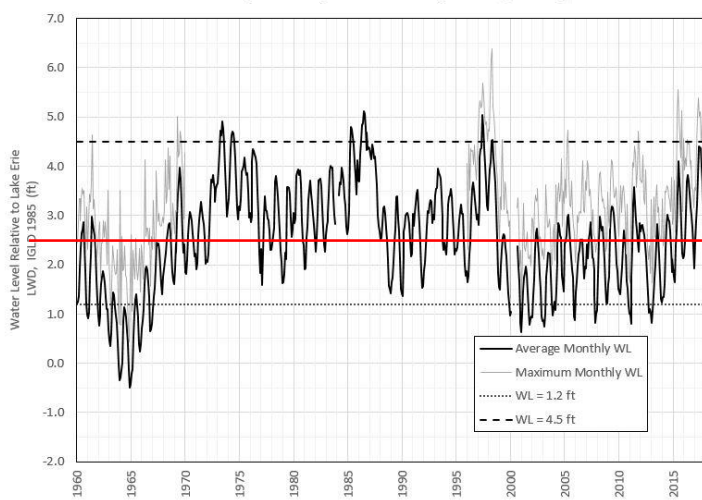
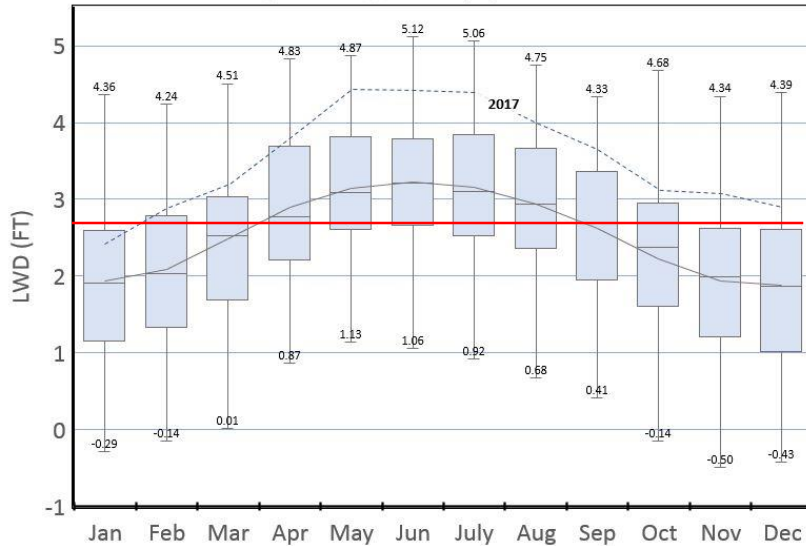


Nature-based Shoreline – Coastal Wetland Systems



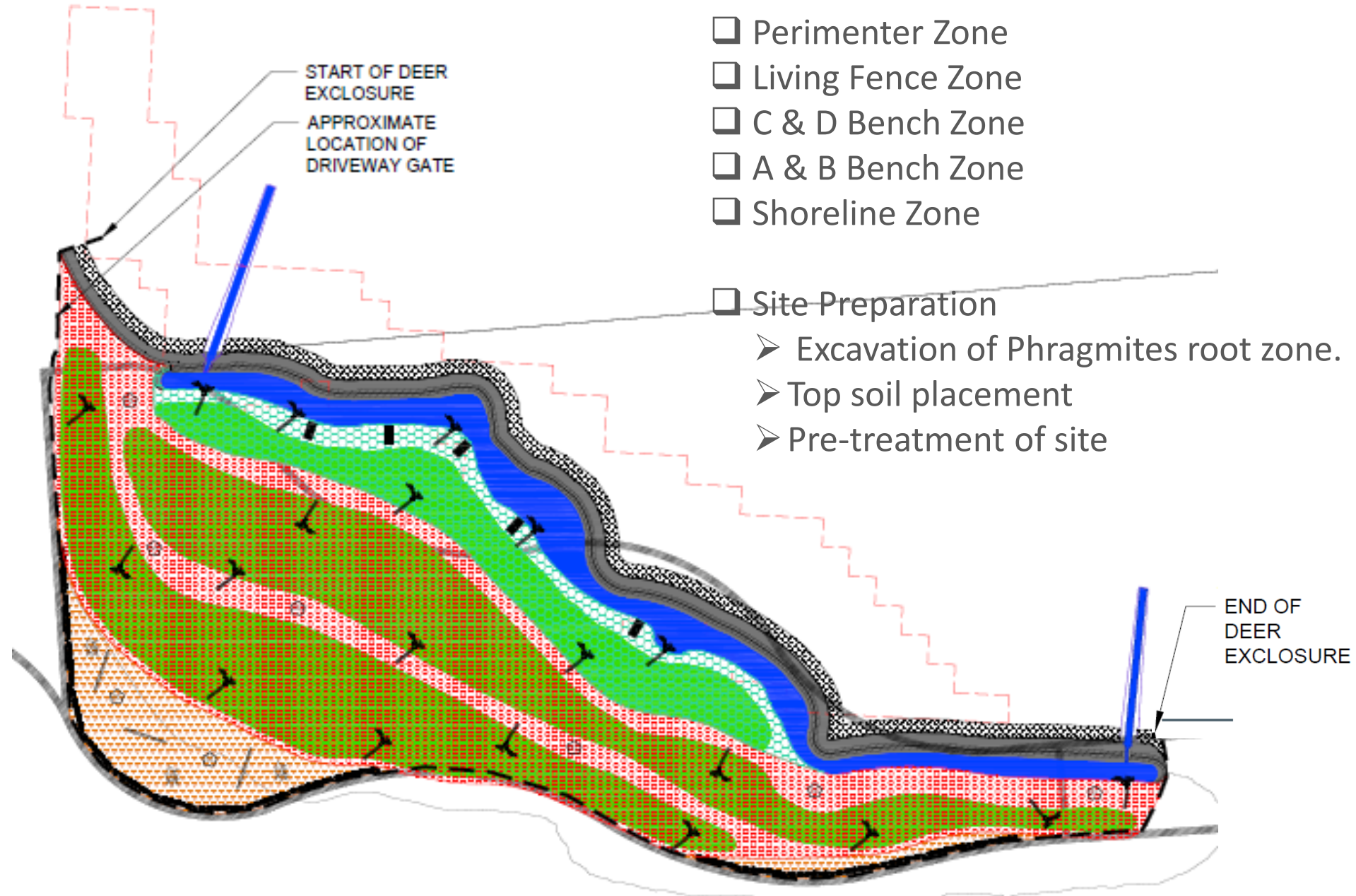
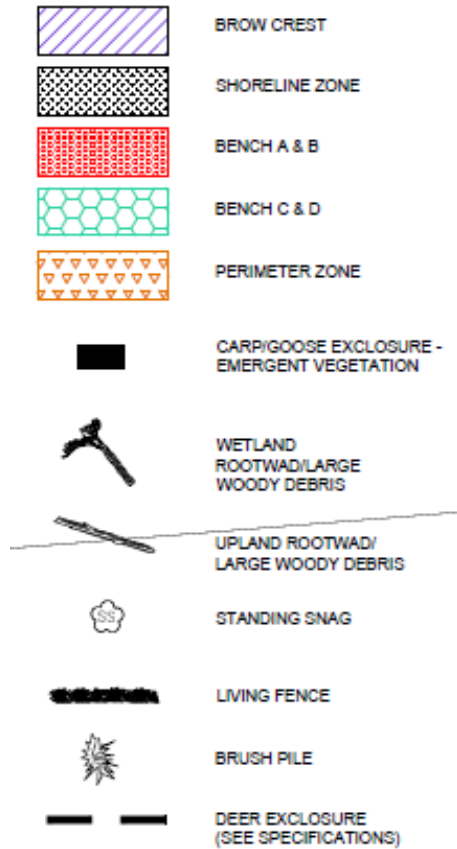
Former Airport Site

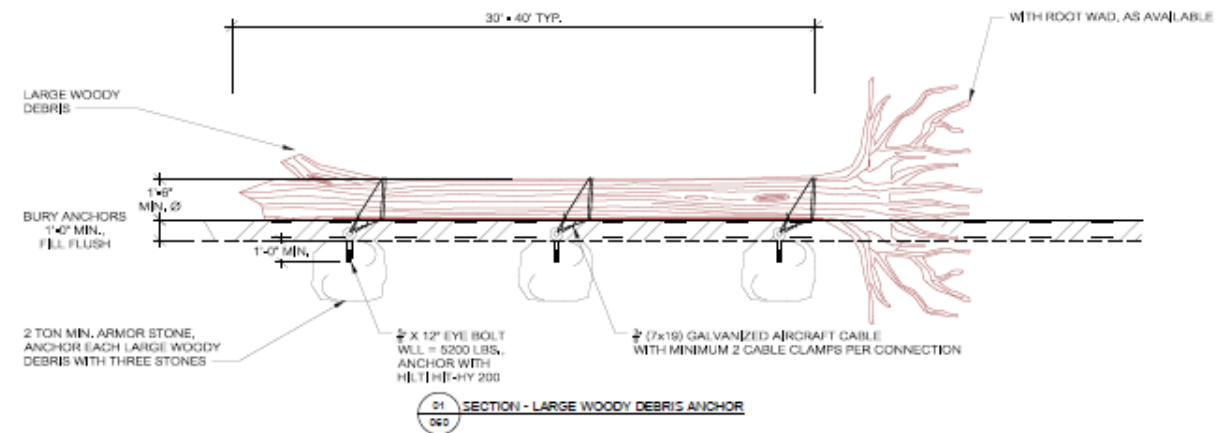
Monthly Average WL (ft) 1960-2018



Airport Site

PLANTING LEGEND





- East Sandusky Bay is highly diverse coastal wetland system but it is under stress.
- On going management activities by Erie Metroparks and others are focused on controlling invasives (Phragmites, Frogbit, etc.).
- Restoring previously degraded shoreline and coastal wetlands will provide nutrient loading reduction benefits and ecosystem services in the Back Bay area.
- As a pilot project, once built, will be important to continue to monitor, apply adaptive management principles, and use the site as a living lab to understand techniques for restoring Sandusky Bay.

Thank you and Questions

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