



Department of
Environmental
Conservation

Niagara River Habitat Improvement Projects:

Managing Erosion and Enhancing Habitat in a High Energy River System

November 5, 2015

Off-Shore Low Profile Berms

- Wind, waves, ice and **boat wakes** necessitate an engineered solution in Niagara
- Design borrowed from coastal system approaches (i.e. Chesapeake Bay)
- First utilized at Environmental Remediation sites
- Later applied to habitat improvement/restoration projects



Photo: Paul Leuchner



Photo: J. Burney



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Reference Sites: Natural Shoreline on Niagara







Design Features to consider:

- **Material: coarseness and roughness**
 - Use of wood vs. rock
- **Height: ability to be overtopped/ protection from waves**
 - Water level fluctuation
- **Vegetated vs. barren**
 - Plant community objectives
- **Breaks along length**
 - Facilitate circulation



Low elevation, High Coarseness,
No Vegetation, Closed design



Moderate Elevation, Medium
Coarseness, Open design



Low coarseness, High profile, Closed design, heavy vegetation









Photo: Paul Leuchner



Photo credit: LDC Construction



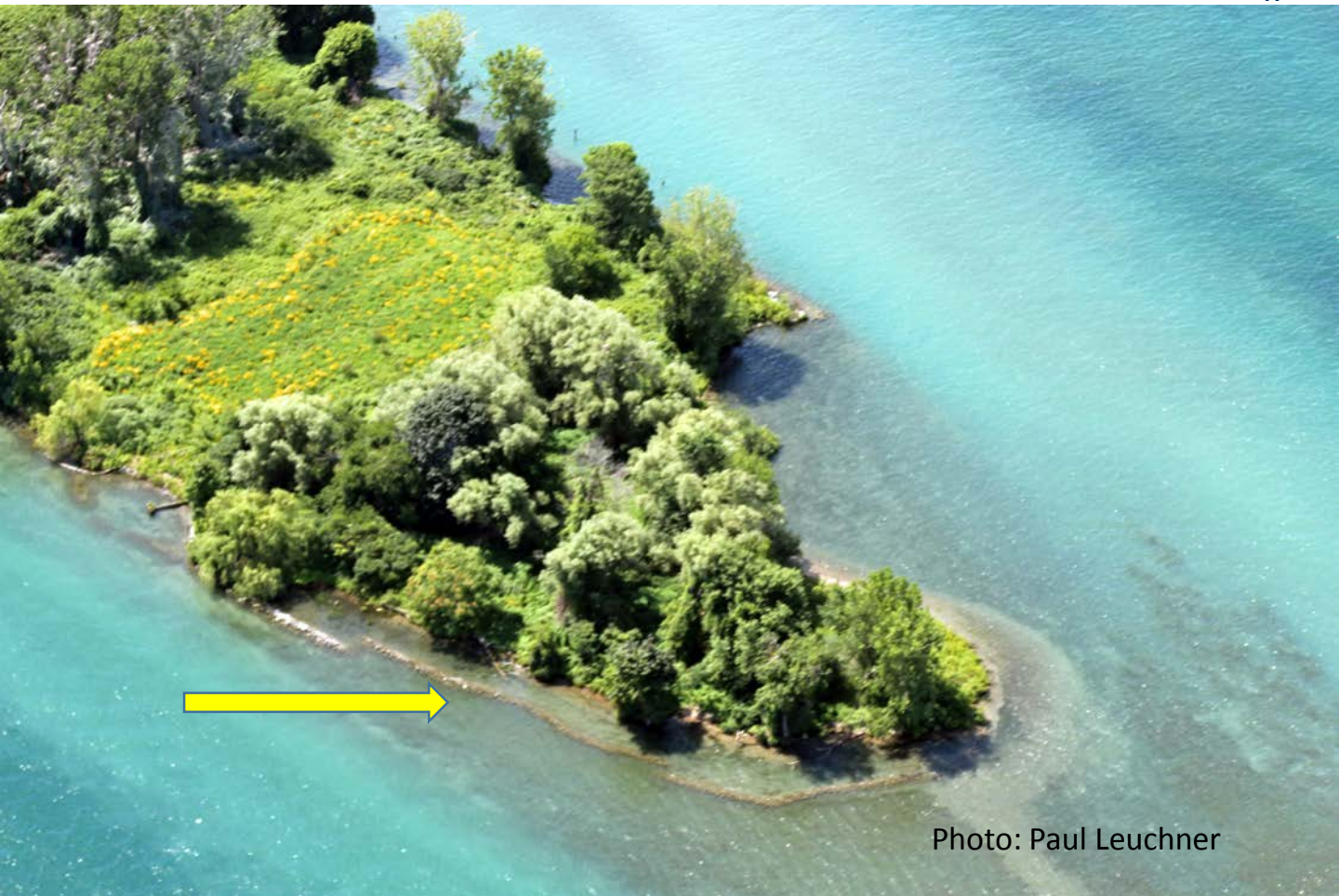


Photo: Paul Leuchner





Large Wood for Shore protection









Other examples of Off shore berms in Habitat Improvement Projects





Photo: Paul Leuchner

Thank You

- Tim DePriest
- Habitat Ecologist
- timothy.depriest@dec.ny.gov
- 716.851.7004

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