A New Wave of Thinking

Shoreline and Shallows Conference

Lake Conservation Webinar Series

Welcome to the Shoreline and Shallows Conference, "A New Wave of Thinking", co-hosted by the Midwest Glacial Lakes Partnership and the Michigan Natural Shoreline Partnership.

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Social/community acceptance of natural shorelines: Lessons from 20 years of promoting soft shorelines

John Hartig

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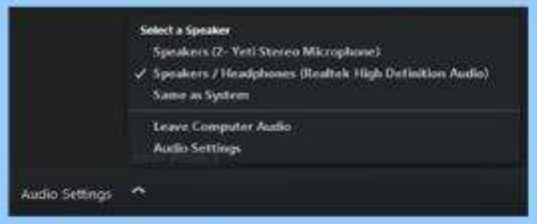

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Social/Community Acceptance of Natural Shorelines: Lessons from 20 Years of Promoting Soft Shorelines

John H. Hartig

Great Lakes Institute for Environmental Research University of Windsor

For over 100 years our Detroit river was perceived as a working river that supported commerce and industry

Working River

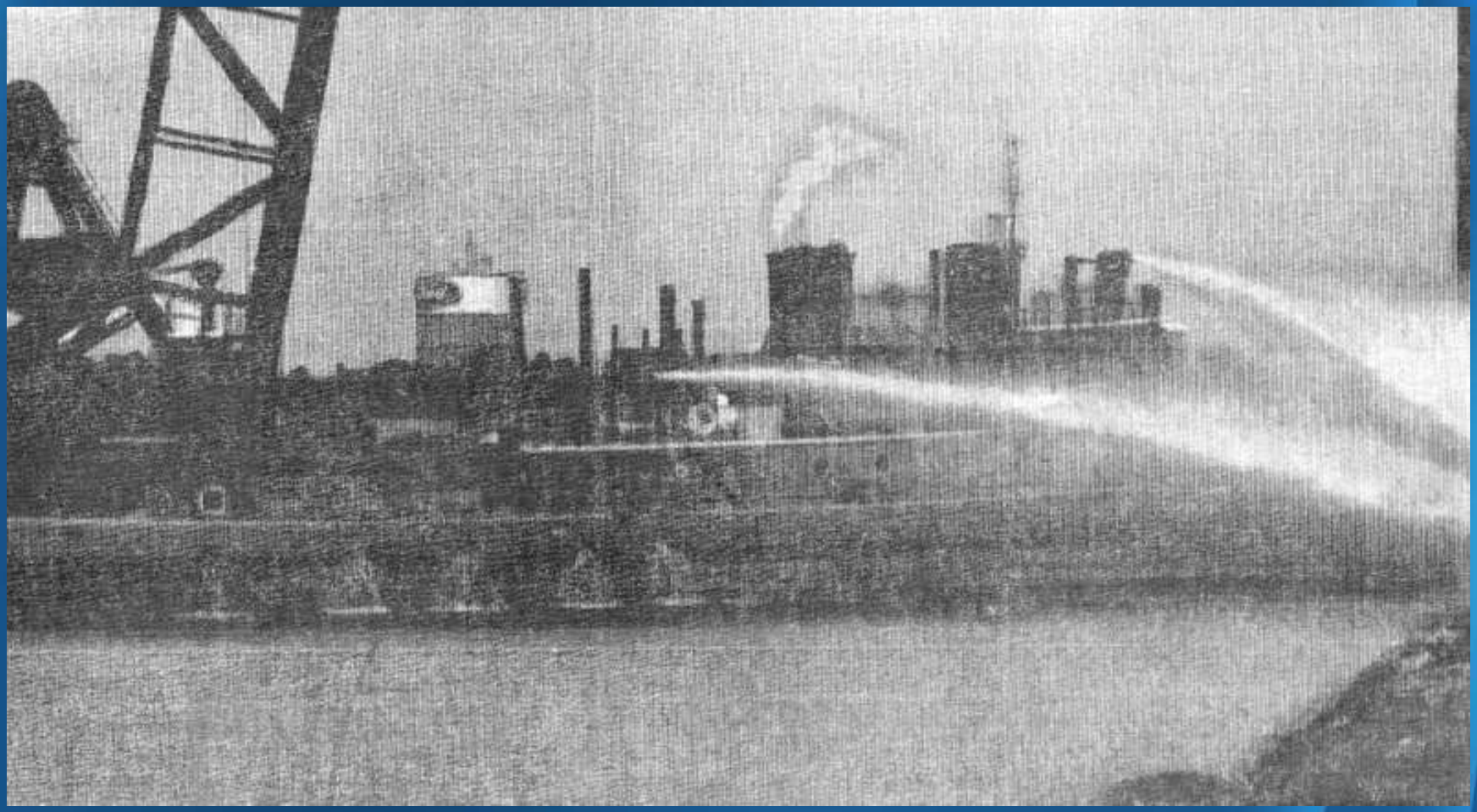
Water pollution was just part of the cost of doing business!

In the 1960s, Federal Water Pollution Control Administration identified the Detroit River as one of the most polluted river in the U.S.

Winter duck kills due to oil pollution

- In 1960, 12,000 ducks and geese died from oil pollution
- In 1967, another 5,400 ducks and geese died from oil pollution

Then on October 9, 1969 the lower Rouge River caught on fire



"When you have a river that burns, for crying out loud, you have troubles. It happened on Cleveland's Cuyahoga, and now it has happened on the Rouge River."

Detroit Free Press

Detroit Free Press Editorial

Oct. 12, 1969

Earth Day 1970
(started by Senator Gaylord Nelson of Wisconsin)

Public outcry over water pollution led to NEPA in 1970, the CWA in 1972, the U.S.-Canada GLWQA in 1972, and the ESA in1973

These laws, in turn, laid the foundation for the cleanup of the Detroit River

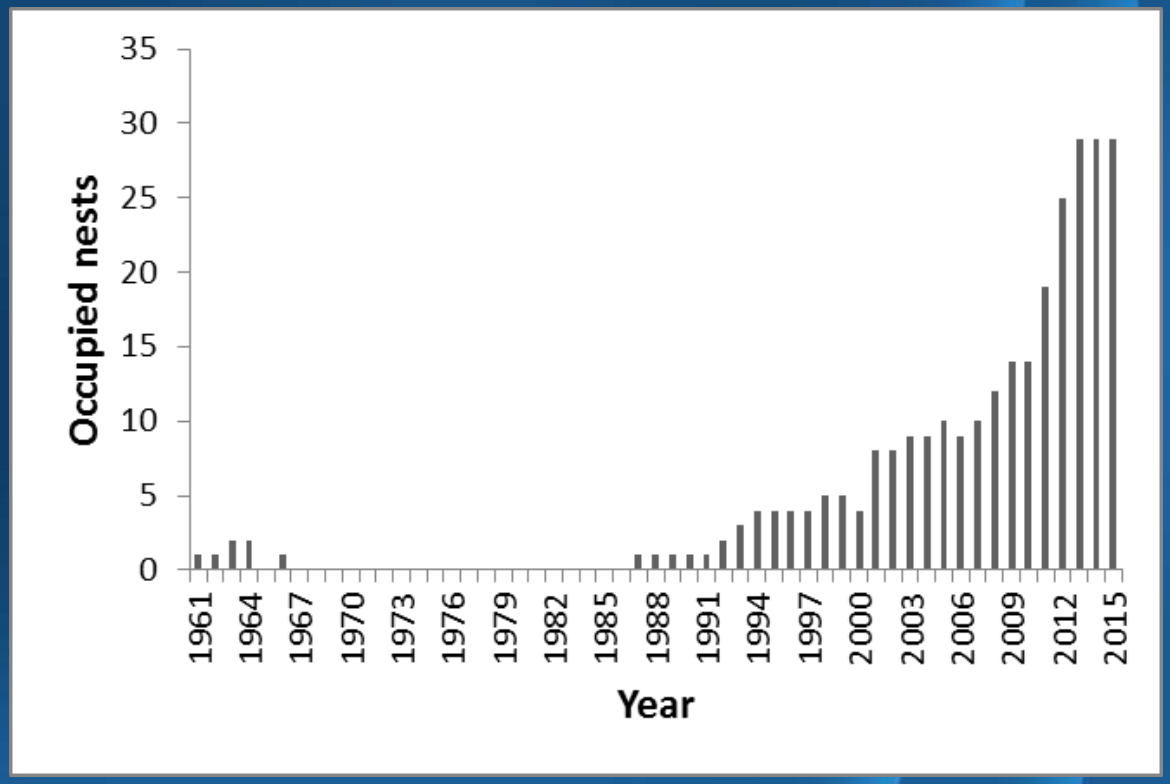
- Substantial reductions in oil discharges and spills have occurred, and winter duck kills due to oil pollution have been eliminated
- Billions of dollars have been spent on municipal wastewater treatment, achieving 2º treatment
- 90% decline in phosphorus concentration and loading from the Detroit WWTP
- Since 1960 there has been an over 90% reduction in untreated CSO volume from communities in SE MI

- Between the 1960s and 1980s there was an over 4,000 tonnes/day decrease in chloride loadings to the river
- 80% decline in mercury and a 90% decline of DDT in fish (yet health advisories remain)
- 88% decline in DDE and 90% decline in PCBs in herring gull eggs
- Approximately one million m^3 of contaminated sediment has been remediated

THESE ENVIRONMENTAL IMPROVEMENTS ARE HEARTENING, BUT THAT IS NOT THE BEST PART OF THE STORY!

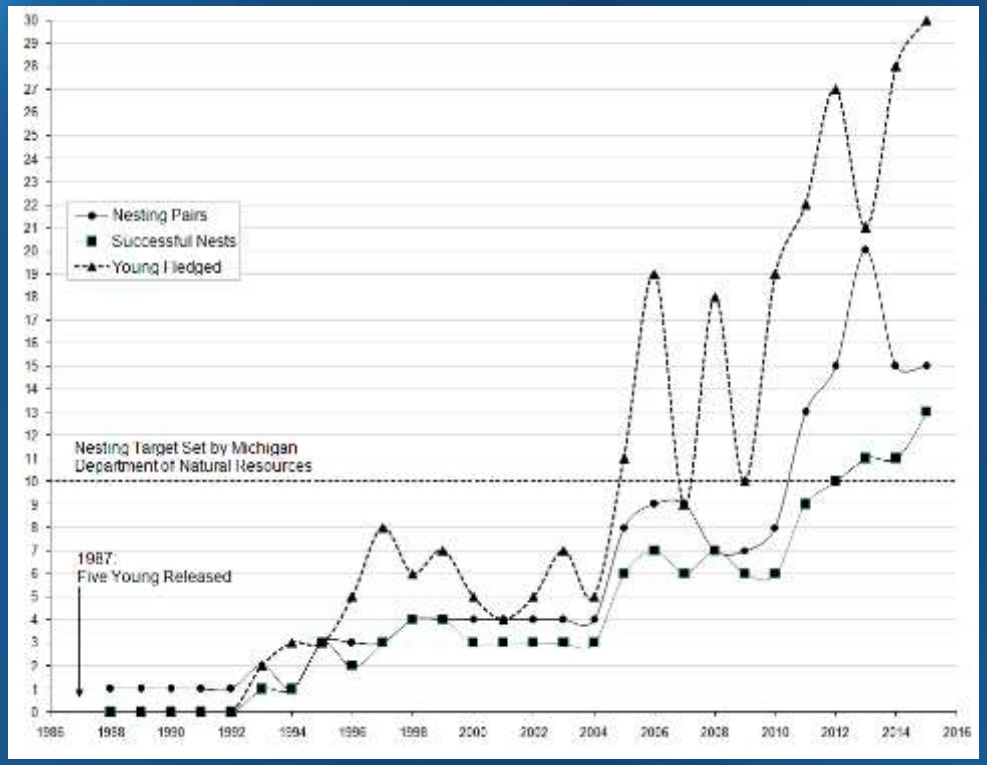
Surprising Ecological Recovery

- The Bald Eagle population has recovered
- There are over 25 active nests in SE MI after a 20-year absence



Peregrine Falcon Recovery

- Peregrines reintroduced in Detroit in 1987
- 20 or more young fledged in SE Michigan, 2011-2015



Return of osprey

- Osprey population rapidly declining in early-1960s
- By 1999 only one active nest in southern Michigan
- Osprey re-introduction starts in late-1990s
- 50 nesting pairs in SE MI in 2016 and 52 in 2017
- Goal: 30 nesting pairs by 2020 in MI's Lower Peninsula

Return of Lake Sturgeon

- Substantial decline in sturgeon population between the late 1800s and early 1900s
- No sturgeon spawning recorded from 1970s to 1999
- Sturgeon reproduction first documented in 2001 (first time in 30 yr)

Return of Lake Whitefish

- Substantial decline in whitefish population between the late-1800s and early-1900s
- In 2006, whitefish spawning in the Detroit River was documented for the first time since 1916

Walleye

- In the 1970s, the walleye population was considered in "crisis"
- Lake Erie and Detroit River considered "Walleye Capital of the World"

Even Beaver Have Returned

- Beaver were hunted to near extinction during the “fur trade era”
- During the height of oil pollution (1940s-1970s), beaver could not have survived
- In 2008, a pair of beaver built a lodge at DTE’s Conner Creek Power Plant
- In 2009, this pair produced at least two pups
- As of 2013, beaver have been reported from six locations in the watershed

One of the Most Remarkable Ecological Recovery Stories in North America!






Environmental and Natural Resource Challenges

- Population growth, transportation expansion, and land use changes
- Habitat and loss and degradation
- Nonpoint source pollution
- Toxic substances contamination
- Introduction of exotic species
- Climate change

* As water quality improved, citizens started re-envisioning their riverfront and calling for improved public access to the Detroit River

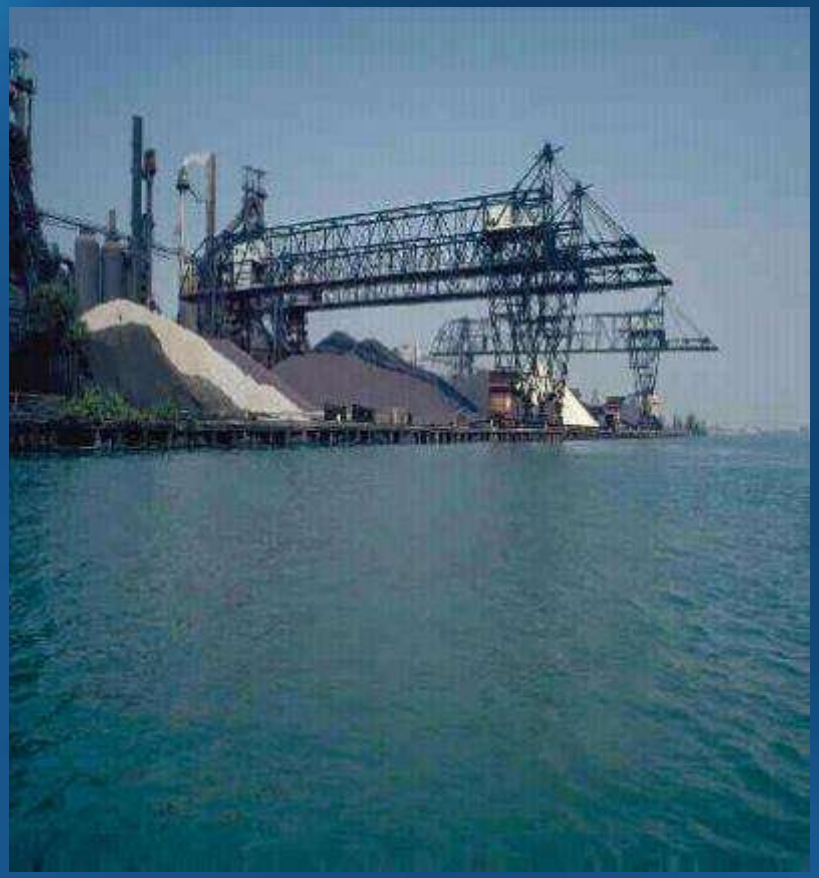
* Detroit River had lost 97% of its coastal wetland habitats and much of the U.S. mainland shoreline was hardened with concrete breakwaters, steel sheet piling, or broken concrete with rebar sticking out

* Scientists and NGOs started calling for habitat rehabilitation and enhancement

Habitat Had No Home!

- There is no “one stop shopping” for habitat
- Responsibility for habitat was shared among many stakeholders
- Think about all the landowners – private landowners, industries, state, federal, and local governments, port authority, Metroparks, land conservancies and other NGOs, and many more

SINGLE PURPOSE SHORELINE DEVELOPMENT



Much of the shoreline had been stabilized and hardened with concrete and steel to protect developments from flooding and erosion, or to accommodate navigation and industry

HARD SHORELINES

- Use of concrete breakwalls or steel sheet piling to reduce erosion off the land into the water, stabilize shorelines for commercial, recreation and other uses, and achieve safety
- There are many places where hard engineering is required for navigation purposes

HARD ENGINEERING OF SHORELINES

- Achieves stability and safety, but has no habitat value
- It can cost $2,000 or more per linear foot

SOFT ENGINEERING OF SHORELINES

- Use of ecological principles and practices to reduce erosion and achieve stability of shorelines and safety, while enhancing habitat, improving aesthetics, and even saving money
- Using rocks, vegetation, and other materials to soften the land-water interface, thereby improving the ecological value without compromising engineering integrity of the shoreline

SOFT ENGINEERING OF SHORELINES *(continued)*

- What could we do to promote soft shorelines?
- How could we ensure greater social and community acceptance of soft shorelines?
- How could we get ourselves to the table where riverfront and shoreline decisions were being made?

Detroit River Canadian Cleanup
Citizen Environment Alliance

City of Detroit

City of Windsor

DTE Energy

Essex Region Conservation
Authority Friends of the Detroit River
Government of Canada

Habitat Advisory Board of GLFC

Rouge RAP Advisory Council
Metropolitan Affairs Coalition

Michigan DNR

Michigan Sea Grant

Smith Group JJR

U.S. Army Corps of Engineers

U.S. Coast Guard

USDA- Natural Res. Cons. Service
U.S. EPA

U.S. Fish and Wildlife Service

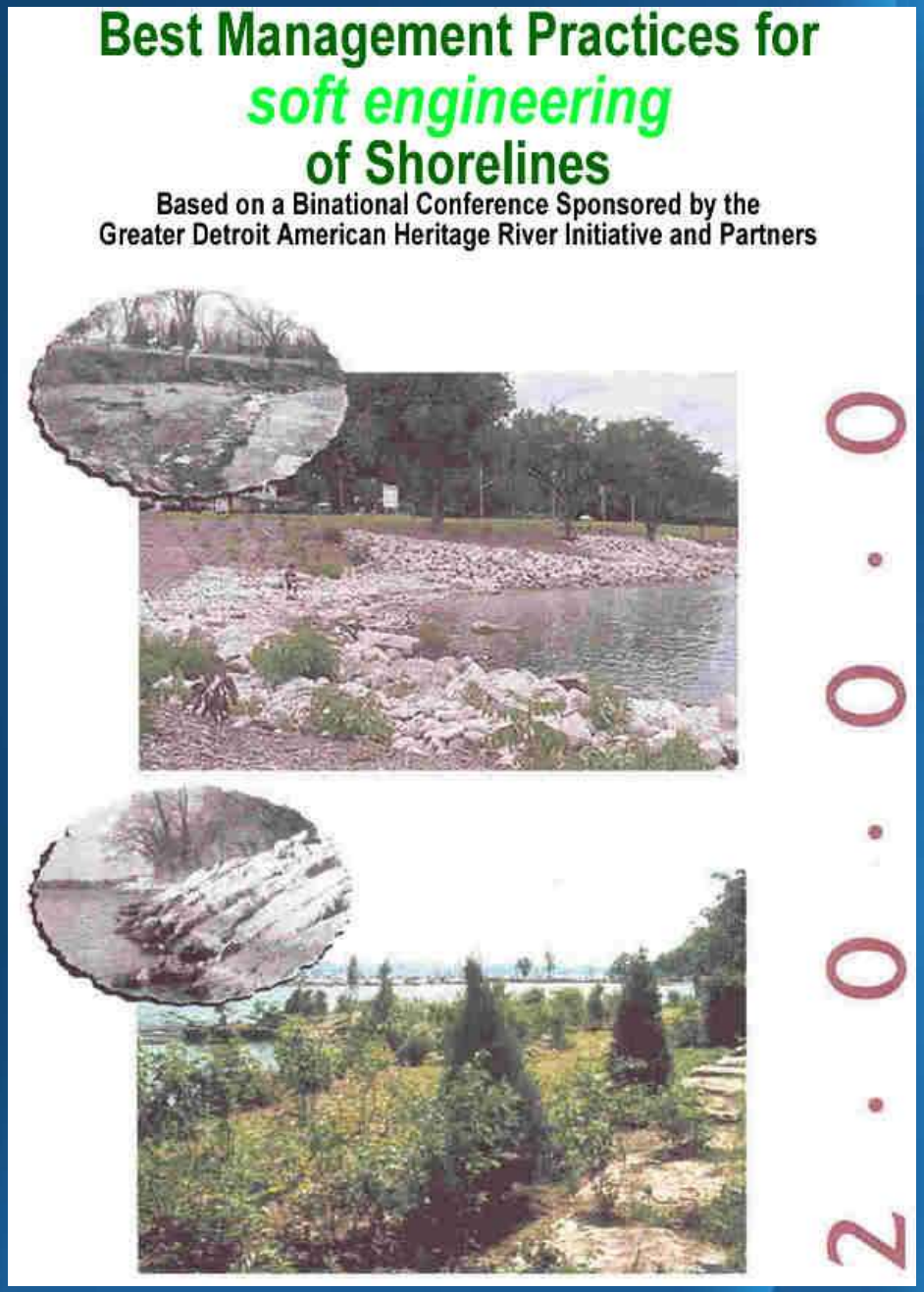
U.S. Geological Survey

University of Michigan

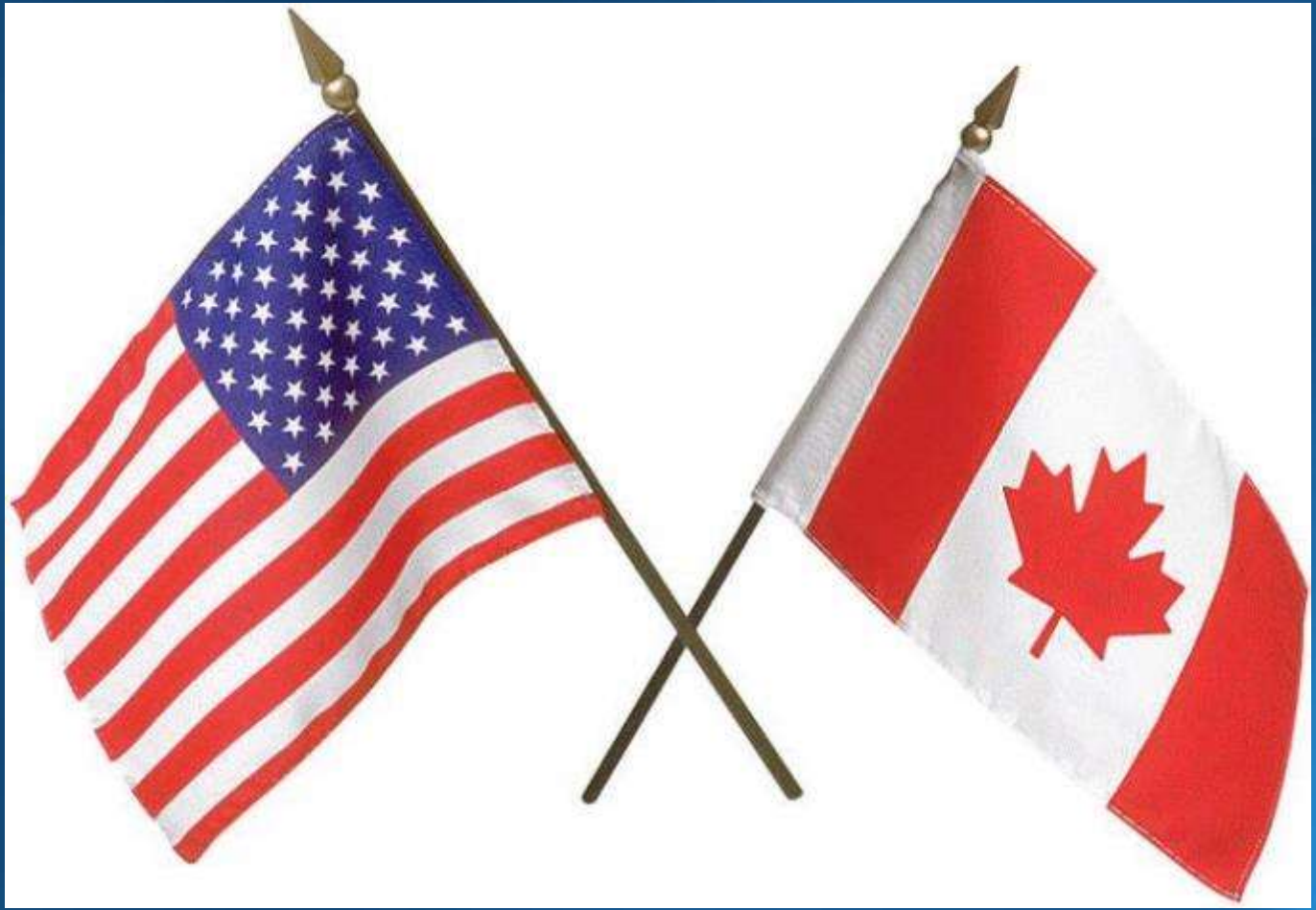
University of Windsor-GLIER

Wayne County

Wayne State University



Over 40 SOFT ENGINEERING PROJECTS IN 20 YEARS



Windsor’s Goose Bay

Before

After

Windsor’s East Waterfront Langlois to Moy Ave.

Before

After

Conner Creek

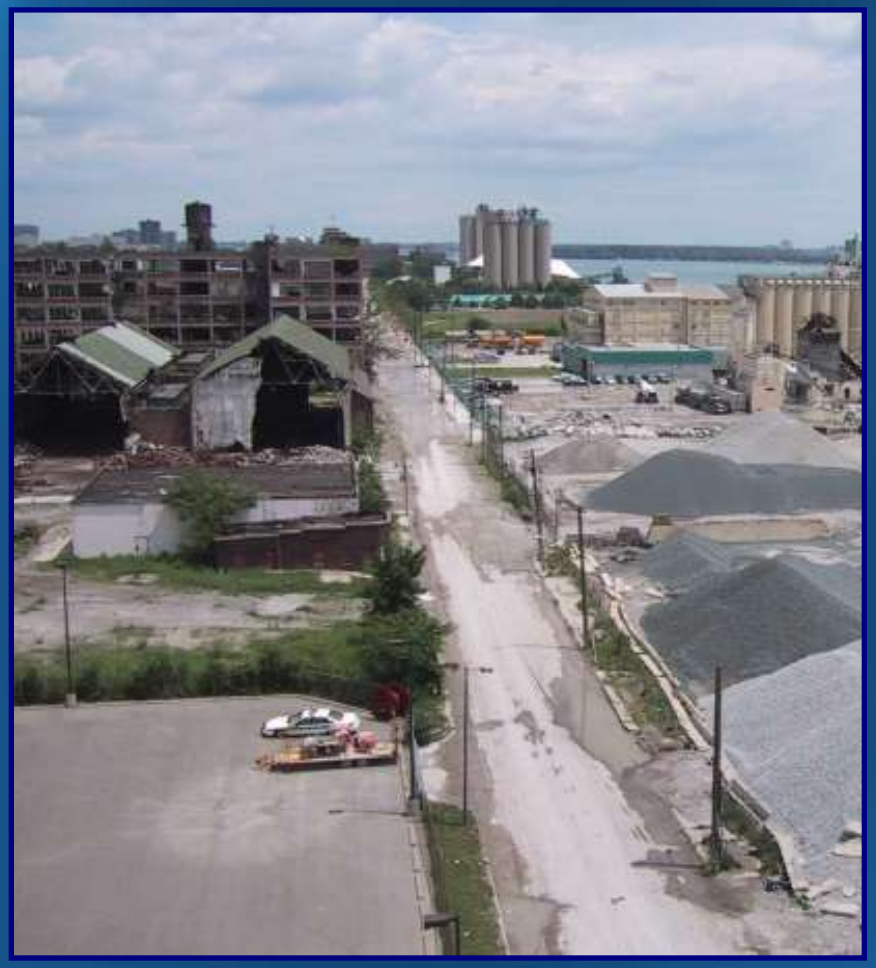
- Contaminated sediment remediation in Conner Creek as a SEP
- First time dredge since 1955
- Addressed long-standing environmental problem (odor problem, contaminated sediment, impacts on Detroit River)
- 146,000 yd^3 of sediment removed
- Over $4 million

Part of a larger project

- $176 million combined sewer overflow control facility (CSO) on Conner Creek
- Sediment remediation through a SEP
- Habitat mitigation at Maheras-Gentry Park (building an oxbow, enhancing habitat, creating greenway connections)

Maheras-Gentry Park (Detroit)

Detroit Riverfront



- For over a century, city planners identified the highest and best use of the waterfront was “industrial”
- Detroit was an industrial town and it had a working riverfront that supported industry and commerce
- And the Detroit River was a working river in the industrial heartland

Detroit Riverfront Conservancy

Established in 2003

- 501 c 3 organization
- Public-private partnership
- 44-member Board of Directors
- Vision: Transform Detroit's international riverfront - the face of the city - into a beautiful, exciting, safe, accessible world-class gathering place for all

Detroit Riverwalk

Milliken State Park

- Nearly 80% complete (3.5 miles completed)
- 3 million annual visitors
- One of the City's most attractive features
- Open every day, free, welcoming to all
- Seven soft shoreline demonstration projects supporting element in Detroit's revival

STROH RIVER PLACE

And It Just Gets Better!

Belle Isle – Blue Heron Lagoon

- Reconnected Blue Heron Lagoon to the Detroit River
- Restored fish access to 15.6 ha of existing wetlands and other habitats, and 3.5 km of canal habitat
- Restored shoreline habitats

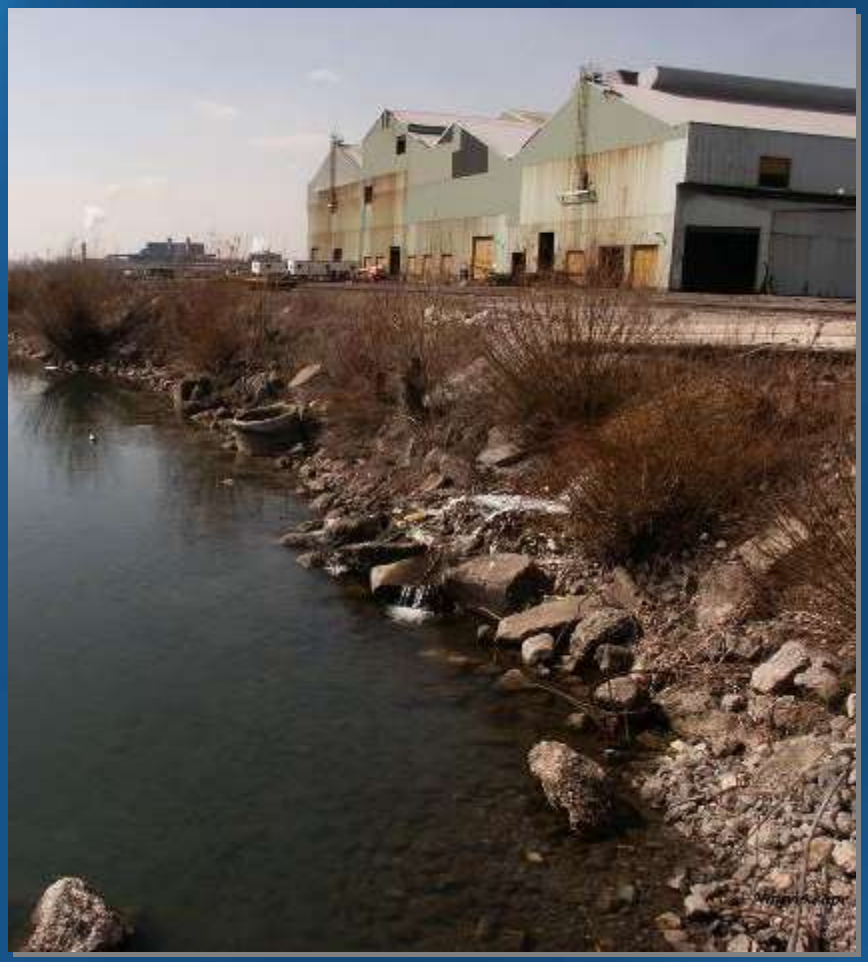
McKee Park, Windsor

ROUGE RIVER OXBOW RESTORATION

- 2,200-foot oxbow
- 3 acres of wetlands
- 10 acres of uplands
- Soft shoreline

DTE’s Rouge Power Plant

US Steel in Ecorse



BLACK LAGOON TO ELLIAS COVE

TRENTON STREET ENDS

Before

After

Wayne County's Elizabeth Park

Before

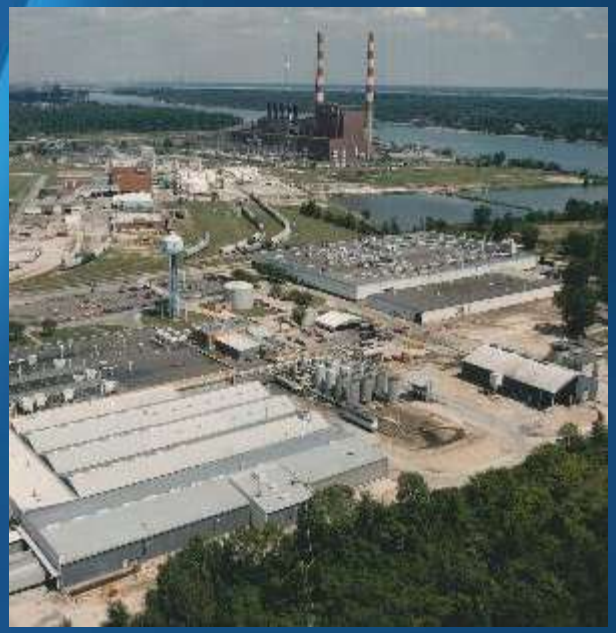
After

Gibraltar Bay Unit of Detroit River International Wildlife Refuge

Before - 2003

After - 2004

FORT MALDEN, AMHERSTBURG, ONTARIO



Refuge Gateway and Humbug Marsh

In 1997, a development company bought Humbug Marsh to build luxury homes, a causeway or bridge to the island, a golf course, marina, and more

Humbug Marsh Unit – Wetland of International Importance

- Over 2,200 Ramsar sites throughout the world
- 41 in U.S.
- One in Michigan

Transformation of an Industrial Brownfield into an Ecological Buffer for Michigan's only Ramsar Wetland of International Importance

Refuge Gateway

- Site cleaned up
- 16 acres of wetlands restored – in an area that has lost 97% of its coastal wetland habitat
- 25 acres of riparian buffer habitat restored
- *Phragmites* controlled on 2.5 mi of shoreline
- Invasive species controlled on 50 acres of upland habitats

Phragmites Control at Humbug Marsh

2008 – Before Treatment

2010 – After Treatment

Monguagon Delta – Humbug Marsh

Many Tools in the Toolbox

- How accomplished: erosion protection, protection of roads, nonpoint source control, SEPs, contaminated sediment remediation, improvement of parks, enhancement of private developments, greening projects by industry, greenway trail projects
- All have been very well received by stakeholders
- All provide teachable moments

KEY LESSONS

- Involve habitat experts up-front in the design phase of waterfront planning
- Establish multiple objectives for soft/natural shorelines
- Ensure sound multidisciplinary technical support throughout the project (e.g., the Natural Resources Conservation Service's Soil Bioengineering Team)
- Start with demonstration projects and attract many partners to leverage resources

KEY LESSONS *(continued)*

- Involve volunteers and researchers in monitoring, and obtain commitments for post-project monitoring of effectiveness up-front in project planning
- Measure benefits, including social and economic, and communicate successes (website)
- Promote education and outreach, including public events that showcase results and communicate benefits
- Incorporate interpretive panels
- Get natural shorelines into the community lexicon

There are millions of difficult challenges and delightful opportunities ahead. I think the only constraint is the willingness to dream, to create and to hope and feel undefended enough to face the tough questions and ideas that must be fiercely engaged at this moment of human history. If design is the signal of human intention then we must continuously ask ourselves – What are our intentions for our children, for the children of all species, for all time! How do we profitably and boldly manifest the best of those intentions.

William McDonough, Renowned Architect and Industrial Designer

Thank you!