Long-Term Management of CDFs

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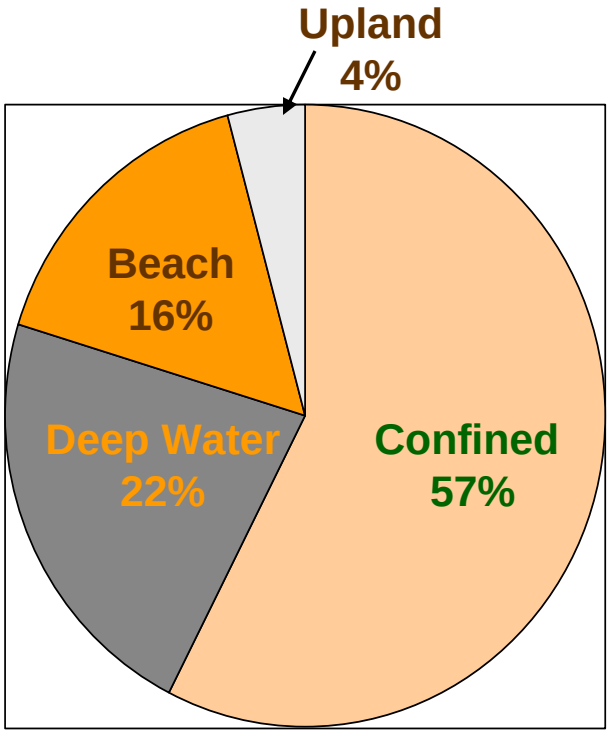
Dredged Material Assessment and Management Seminar
15-17 September 2009, Detroit, MI

Strategic Plan for Dredged Material Management Great Lakes Commercial Harbors

- Harbors with greatest risk in the next 5 years
- Long-term solutions for sustainable navigation

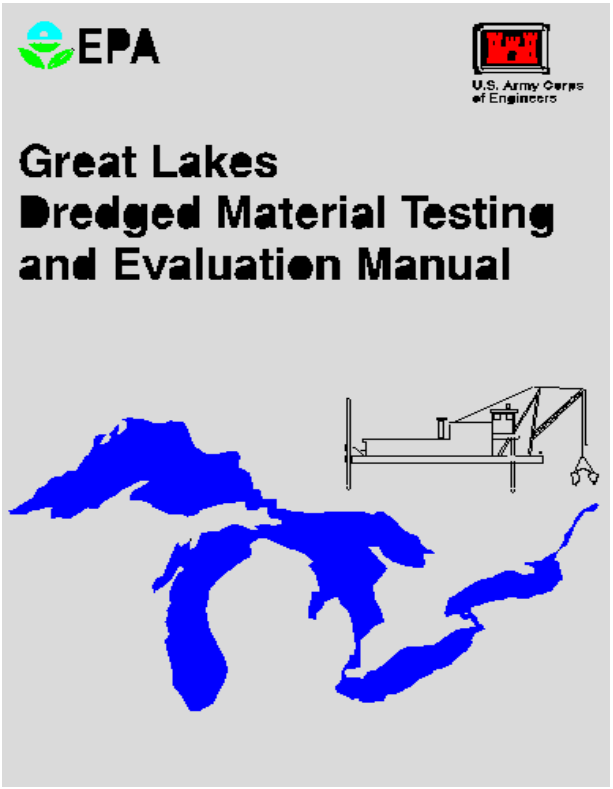
Dredged Material Management Options



Average Annual Disposal by Volume

Deep Water Placement of Dredged Material

- USEPA-Corps Testing Protocol
- “Federal Standard” prevails
- Determines Base Plan
- Incremental costs are non-Federal



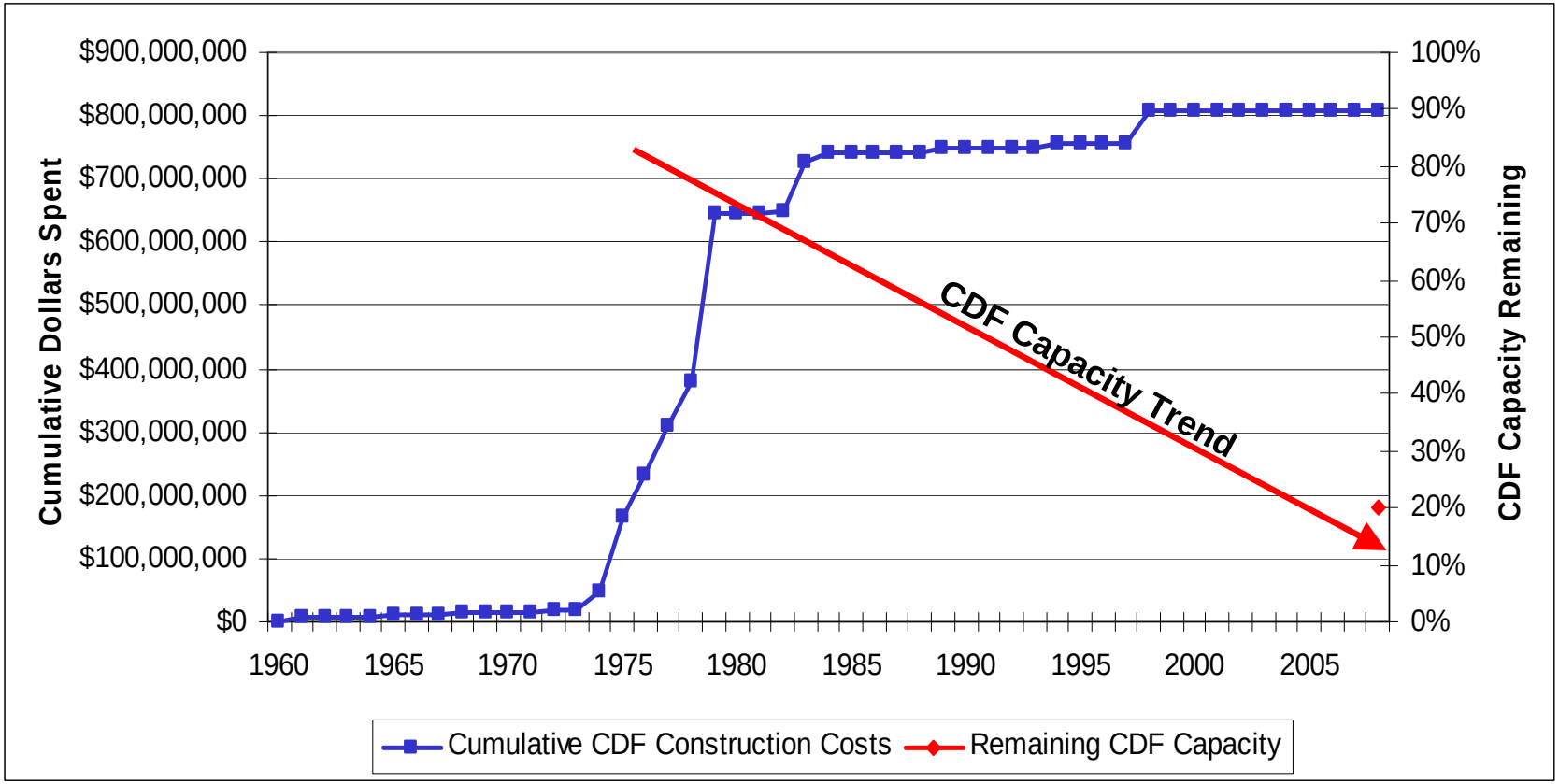
State Positions on Open-Water Disposal

Allowed in six states

and for beneficial use in the other two states.

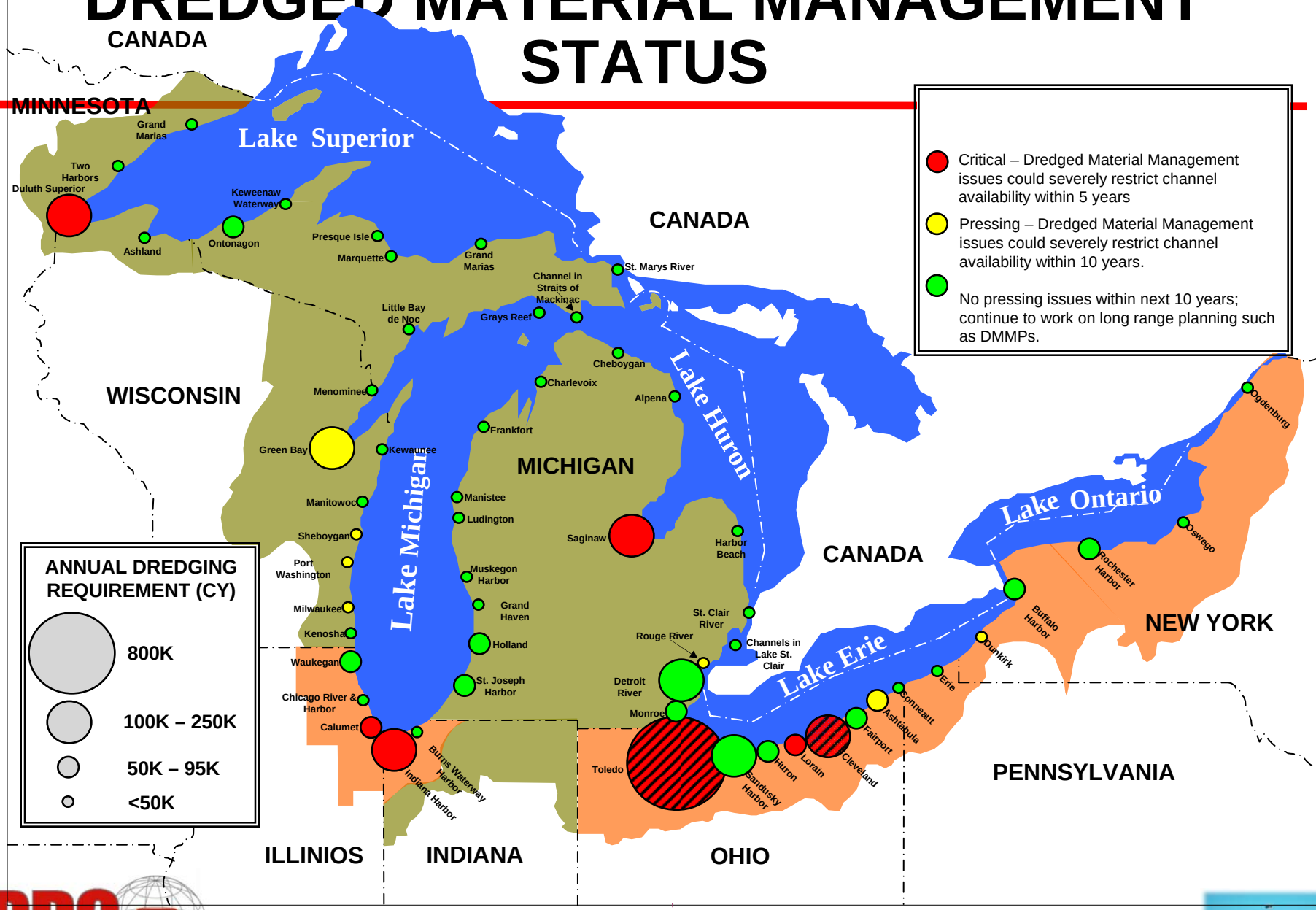
- **IL and IN do not object. Not an issue for NY.**
- **MN and WI: state laws prohibit open water disposal--with exceptions for beneficial use.**
- **MI: Executive Directive prohibits open water disposal of contaminated sediments (USACE cannot do this anyway).**
- **OH: no promulgated regulation or laws, but OEPA has withheld Sec. 401 WQ Certifications for disposal in shallow west basin of Lake Erie. Objections focused on Toledo.**

Cumulative CDF Construction Costs vs. CDF Remaining Capacity



Deep-water disposal prior to 1970's

DREDGED MATERIAL MANAGEMENT STATUS



Critical – Dredged Material Management issues could severely restrict channel availability within 5 years

Pressing – Dredged Material Management issues could severely restrict channel availability within 10 years.

No pressing issues within next 10 years; continue to work on long range planning such as DMMPs.

ANNUAL DREDGING REQUIREMENT (CY)

- 800K
- 100K – 250K
- 50K – 95K
- <50K

ERDC Engineer Research and Development Center

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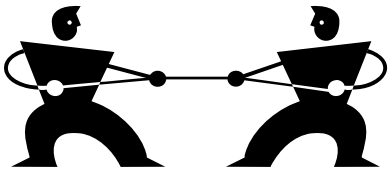
Long-Term Strategy
Great Lakes Dredged Material Management

- **Extend life of existing CDFs, defer need for new facilities.**
  - ***Fill Management (raise perimeter dikes for 1-2 dredging cycles, excavate old dredged material).***
  - ***Beneficial use of newly dredged material***
  - ***Scientific basis for proscribing open water placement*.**
- **Leverage other programs (e.g., GLLA, GLRI)**
- **Embrace Regional Sediment Management--reduce future sedimentation in harbors**
- **Engage stakeholders**

Document in Progress:
Strategic Plan for Dredged Material Management
A Comprehensive Approach

- **History and Current Practices; State agency positions on open-lake disposal, Federal Standard issues**
- **The Strategy**
  - ➢**Beneficial Uses (upland and near-shore)**
  - ➢**CDF Fill Management—<2 cycles capacity**
    - **Dike raisings**
    - **Excavation when economically feasible**
  - ➢**Open-Lake placement where appropriate**
  - ➢**New CDF construction**
  - ➢**Initiatives to reduce the amount of material entering harbors (Regional Sediment Management)**
- **New or Changed Authorities**
- **Stakeholder Engagement**

The Beneficial Use Rationale



- **Horizontal limits for new CDF construction**
  - **Waterfront space is valuable**
- **There are also vertical limits to raising CDF dikes**
  - **Raising dikes has limits**

- **Beneficial use policy must be driven by science-based decisions to provide effective and sustainable management of sediment resources**
  - **More science support for why we can**

Erosion and Contaminant Effects

- USACE is not in the business of agricultural, industrial and urban discharges of soil and contaminants.
- Erosion remains largely unabated
- Although contaminant discharge is reduced
- Concern over lower levels of contaminants has increased
- More pressure for CDF disposal than beneficial aquatic uses

Viable solutions require partnerships

CDF – Define the Purpose

- **Confined Disposal Facility – A constructed site designed to contain sediment wastes from dredging operations**
  - **Disposal implies waste**
  - **If there is no return flow then states can regulate as solid waste**

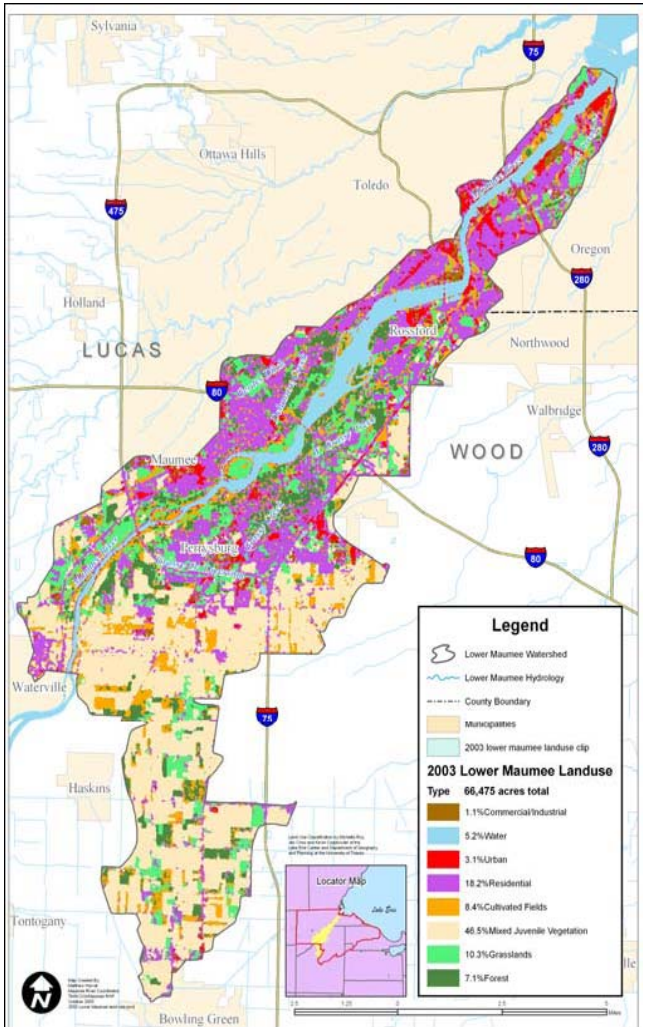
- **Dredged Material Placement Site**
- **Sediment Processing Facility**
- **Controlled Dewatering Facility**
  - **Intent should be reuse of dewatered material**

Paths for Sustainable CDF Mgt

- **Beneficial use is part of the dredging and placement process**
  - **Regional Sediment Management**
  - **No sediment that is suitable for aquatic placement should be placed in an upland CDF**
  - **If State desires less aquatic placement of sediment then focus should be in the watershed**
- **Beneficial use is part of the CDF operations and management process**
  - **Mining CDFs to maintain capacity**
  - **Many CDFs contain dredged material suitable for many upland uses**

Toledo – The Ugly Truth

- **Impacts to Dredging in Toledo**
  - The Maumee watershed is the source of the problem
    - Excessive erosion
    - Discharge of contaminants
    - Poor watershed management
  - Reduce impacts to dredging/mgt
    - Reduce watershed erosion
    - Control contaminant inputs
    - Increase in-water beneficial use
    - Increase upland beneficial use
  - Simple disposal not an option
    - Watershed-based risk
    - Accepting the spoils of labor



Maumee Watershed Impairments

http://www.epa.gov/glnpo/aoc/maumee/MaumeeAOC-BUISummaryTable.pdf

Beneficial Use Impairments In 2005
for the Lower Maumee River (Waterville to mouth)
(last updated 11/5/05)

Beneficial Use Impairments	Maumee River	Grassy Creek	Duck Creek	Reasons/Data Source
BUI 1: Restriction on fish and wildlife consumption	Impaired	Not Impaired	Impaired	**Duck**: If health dept. LE-wide notices apply to creeks—no creek specific advisory **Maumee River**: Mouth to Waterville – Do not eat channel catfish (2005 fishing season advisory[18]). Statewide – No more than one fish per week due to mercury[19]. 2005 Ohio Snapping Turtle Consumption Advisory (mercury[20]). **Grassy Creek**: Ohio EPA DSW website does not list any impairments for the creek.
BUI 2: Tainting of fish & wildlife flavor	Unknown	Not Impaired	Unknown	**Maumee River & Duck and Grassy Creeks**: No known reports of tainting of fish and wildlife flavor; no known sources of phenols and related compounds.
BUI 3: Degradation on fish and wildlife populations	Impaired	Impaired	Impaired	**Maumee River**: In most cases, for ICI, Miwb, and IBI the Maumee River scores below the designated criteria. (See data table in Volume 1) **Grassy Creek**: 1993 data for RMs 2.9 (6.919 & 7.462) and 4.9 (5.548) fall below criteria. No ICI scores. 1993 data for RMs 2.9 is conflicting (38 & 26) and 4.9 (20) is below criteria. No data or determination of degradation of wildlife populations; Unknown **Duck**: OEPA 305b reports; data from Dennis Minshke
BUI 4: Fish tumors or other deformities	Impaired	Impaired	Impaired	**Duck**: OEPA DELT data- fish sampling in 1986, 1993, 1997 **Maumee River**: Data from 1986, 1993, 1996, 1997, and 1998 indicate that there are DELTS from RM 0.6 to RM 19.8. **Grassy Creek**: Data from 1993 are for RMs 2.9 and 4.9. Eroded fins and lesions recorded at RM 2.9.
BUI 5: Bird or animal deformities or reproductive problems	Unknown	Not impaired	Not Impaired	This BUI was not indicated for the Maumee AOC for its RAP designation.
BUI 6: Degradation of benthos	Impaired	Impaired	Impaired	**Maumee** : Average 1986 ICI score for RMs 0.8 - 15: 0. Average 1997 ICI score for RMs 17.9 to 18.3: 26. Average 1998 ICI score for RMs 1.6 & 2.6: 0. **Grassy**: No data available. BPJ assumes impaired **Duck**: OEPA 305b report data

Maumee Watershed Impairments

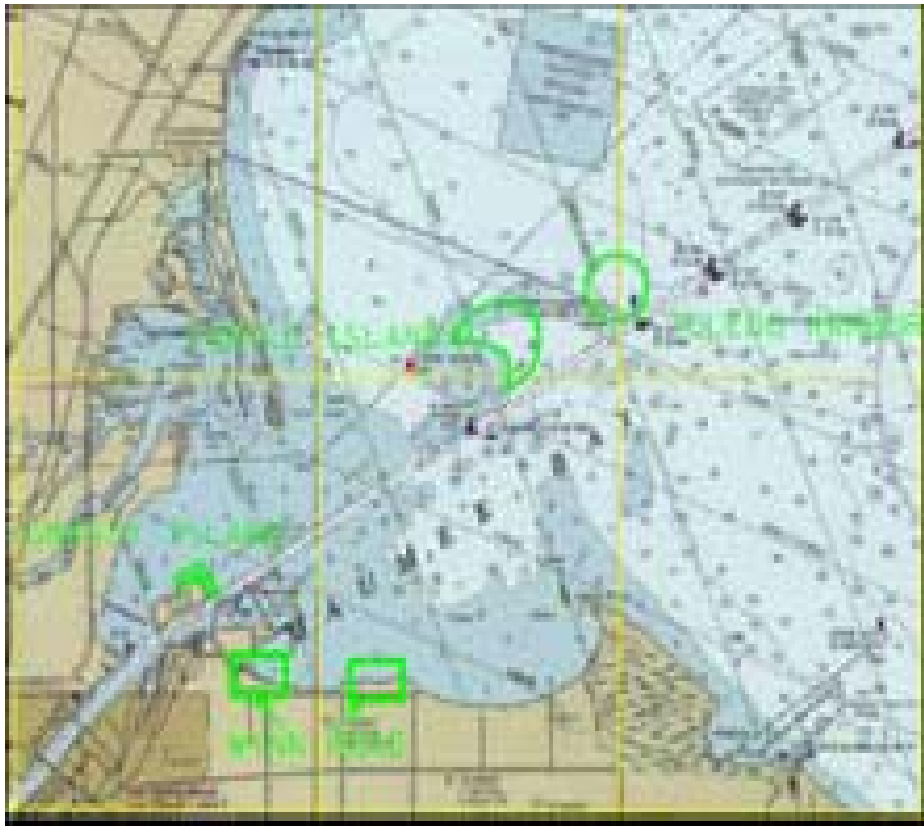
Beneficial Use Impairments	Maumee River	Grassy Creek	Duck Creek	Reasons/Data Source
BUI 7: Restriction on dredging activities	Impaired	Not applicable	Not applicable	**Maumee River:** commercially navigable waterbody with dredging activities is the Maumee River. **Grassy & Duck Creek:** No navigational dredging occurs on Grassy Creek.
BUI 8: Eutrophication or undesirable algae	Unknown	Unknown	Unknown	**Maumee & Grassy:** Status of this BUI is unknown. No data available on dissolved oxygen or nuisance growths of algae. **Duck:** Occasionally; not toxic algae
BUI 9: Restrictions on drinking water consumption, or taste and odor	Not applicable	Not applicable	Not applicable	**Grassy & Duck:** Does not apply- no known drinking water supplies
BUI 10: Beach closings	Impaired	Impaired	Not Impaired	**Maumee River:** Local fishing spots along the river. Because work is scheduled on CSOs, BPJ would be to indicate impairment. ODH only has information on Lake Erie.[21] **Grassy Creek:** No information available on use of this creek. **Duck:** Review e.coli data; work w/Health Dept
BUI 11: Degradation of aesthetics	Impaired	Impaired	Impaired	**Maumee & Grassy:** Public health nuisances associated with raw or poorly treated sewage can be a problem in these streams due to number, density of units (homes), age, poor maintenance, and no monitoring of septic systems. **Duck:** Clean Your Streams day events, surveys of watershed during WIRP project and tours; past reports of sheens to OEPA and Coast Guard
BUI 12: Added cost to agriculture and industry	Unknown	Unknown	Not impaired	**Duck:** No known ag or industrial users present
BUI 13: Degradation of phytoplankton & zooplankton populations	Not applicable	Not applicable	Not applicable	Ohio EPA has determined that this BUI does not apply to these waters.
BUI 14: Loss of fish and wildlife habitat	Impaired	Impaired	Impaired	Ohio EPA QHEI scoring in 1986, 1993, 1997 & 1998 indicate that Maumee is impaired. Ohio EPA 1993 QHEI scoring indicate that Grassy Creek is slightly below the desired score.

Possible answers – Impaired, Not Impaired, Unknown, Not Applicable

Toledo - Existing CDF Structures

Toledo - Long-Term Mgt Strategy

- **Maximize aquatic beneficial use**
  - Up to 1,000,000 yd^3/year of material – passes ITM
  - Purpose is habitat, not to maximize CDF space by building mountains
  - Sites:
    - 300+ acres
    - 1’, 8’ and 20’ deep
    - Mostly shallow water habitat for fish spawning
    - Some upland resting areas for Atlantic flyover avian species



Toledo - Long-Term Mgt Strategy

- **Maximize Recycling from CDF**
  - Value of Cell 2 dredged material subject of previous researched at ERDC
  - Potential uses after comparison of contaminant concentrations to current reuse standards set by Ohio EPA or site specific exposure testing
    - Landscaping
    - Athletic fields, parks
    - Brownfield restoration
    - Landfill cover

US Army Corps of Engineers – Detroit

Grand Haven Harbor

Holland Harbor

Benton Harbor

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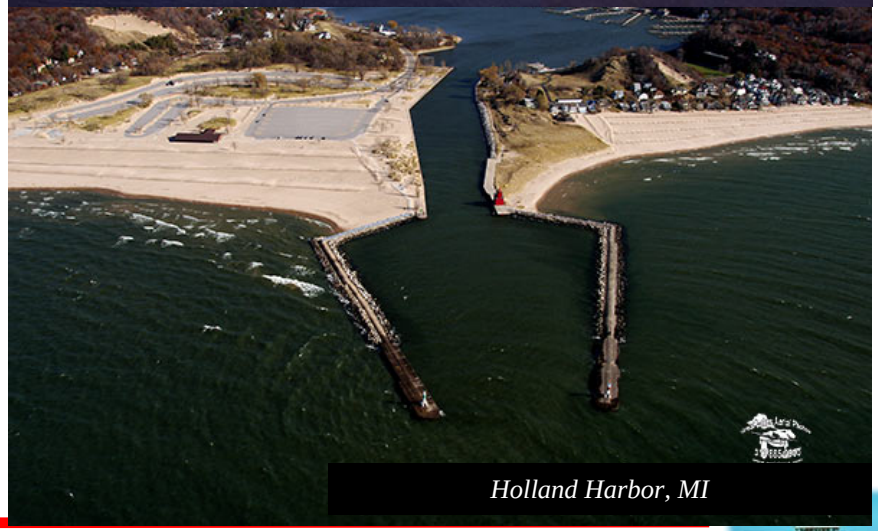
Maintenance Dredging

Outer harbor:

- Clean sand
- Accomplished annually
- Used for beach nourishment (Section 111)

Inner harbor:

- Intended to be accomplished tri-annually
- Material is not suitable for beach nourishment
- Existing dredged material has been classified by MDEQ as "inert"
- Large backlog quantities remain



Grand Haven Harbor

Sustainable Solution

Goal

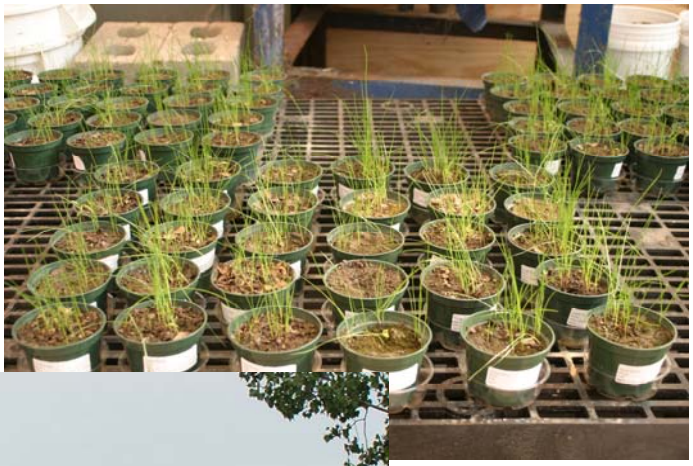
Recycle 40K yd^3 of dredged material between every 3-yr dredging cycle

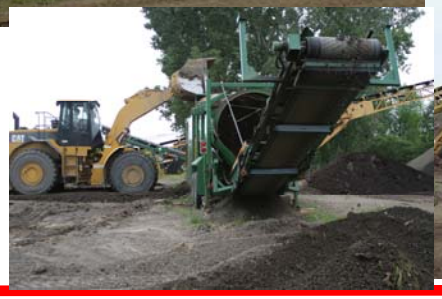
Verplank Dock & Facility
Grand Haven, Michigan

Photo taken approximately 1999

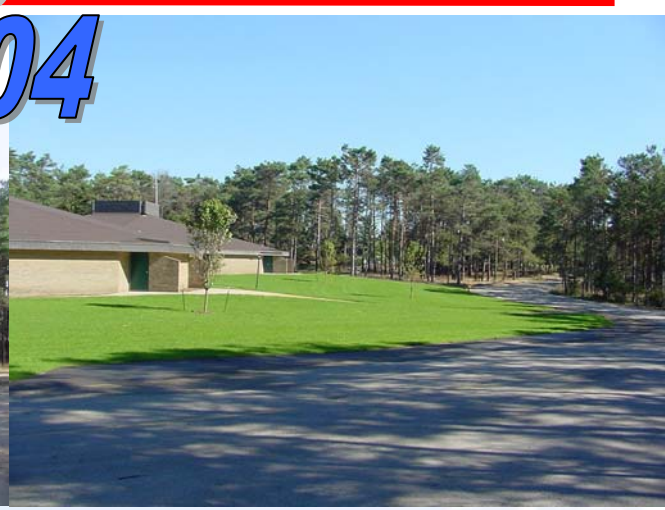
USACE/DOER Program Funded Demonstration Project

- **Greenhouse study conducted 2003-2004**
  - **90% dredged material + 10% leaf litter compost**
- **On-site pilot test conducted Summer 2004 with Verplank Dock Co (9K yd^3)**





Pilot Demonstration: Lake Hills Elementary School



Aug/Sep 2004

Sep 2005

Result – A Marketable Product

Participants

- Tri-City Chamber of Commerce
- Mayors of Ferrysburg, Spring Lake and Grand Haven
- US Congressional Representative
- Michigan DEQ
- Grand Haven School District
- Board of Power and Light
- USACE – Detroit
- USACE – ERDC Vicksburg
- Local Press
- Other interested individuals

Creating an Environmentally Sustainable Harbor

The Problem: Sediment from upstream filling the Grand River harbor in Grand Haven.

The Solution: Recycle the soil by removing it, dewatering it, and mixing it with leaf compost.

The Outcome: Combining riverbed soil and leaf compost creates a competitively priced, desirable landscaping soil.

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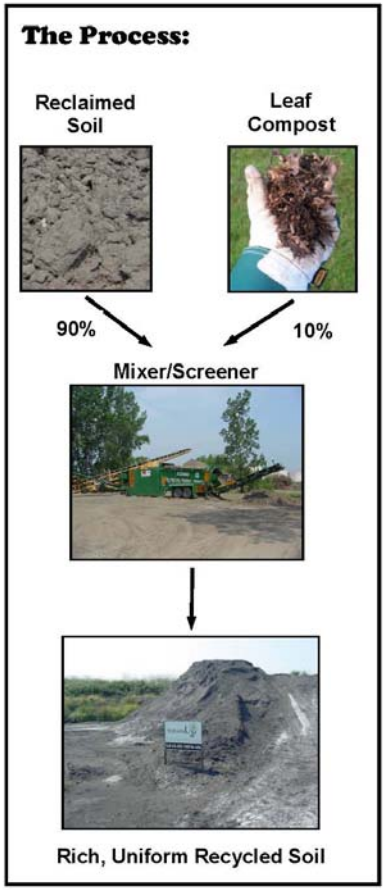
For more information, or to order bottomsUp topsoil, call Verplank Dock Company at 616-842-1448.

bottomsUp topsoil

All Dredged Up and Nowhere to Go!



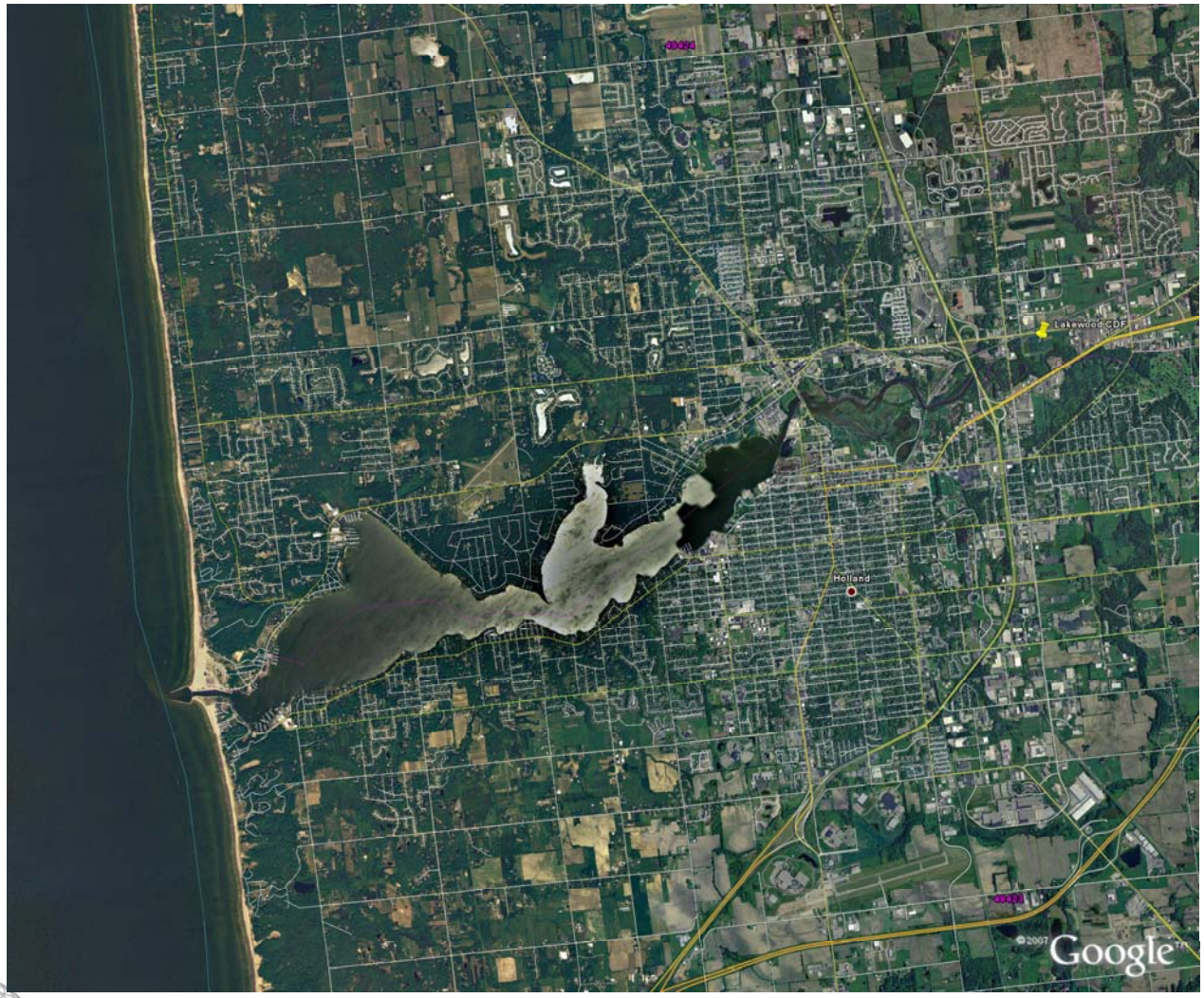
Holland Harbor

Problem: Find a site or don't dredge

Solution: Mobilize the community

- Locals purchased land for placement
- 2-1/2 miles upstream of Harbor
- Designed for placement, dewatering and reuse
- Berms can be raised as needed
- City keeps "title" to the material; either sells or uses for fill/cover/other reuse

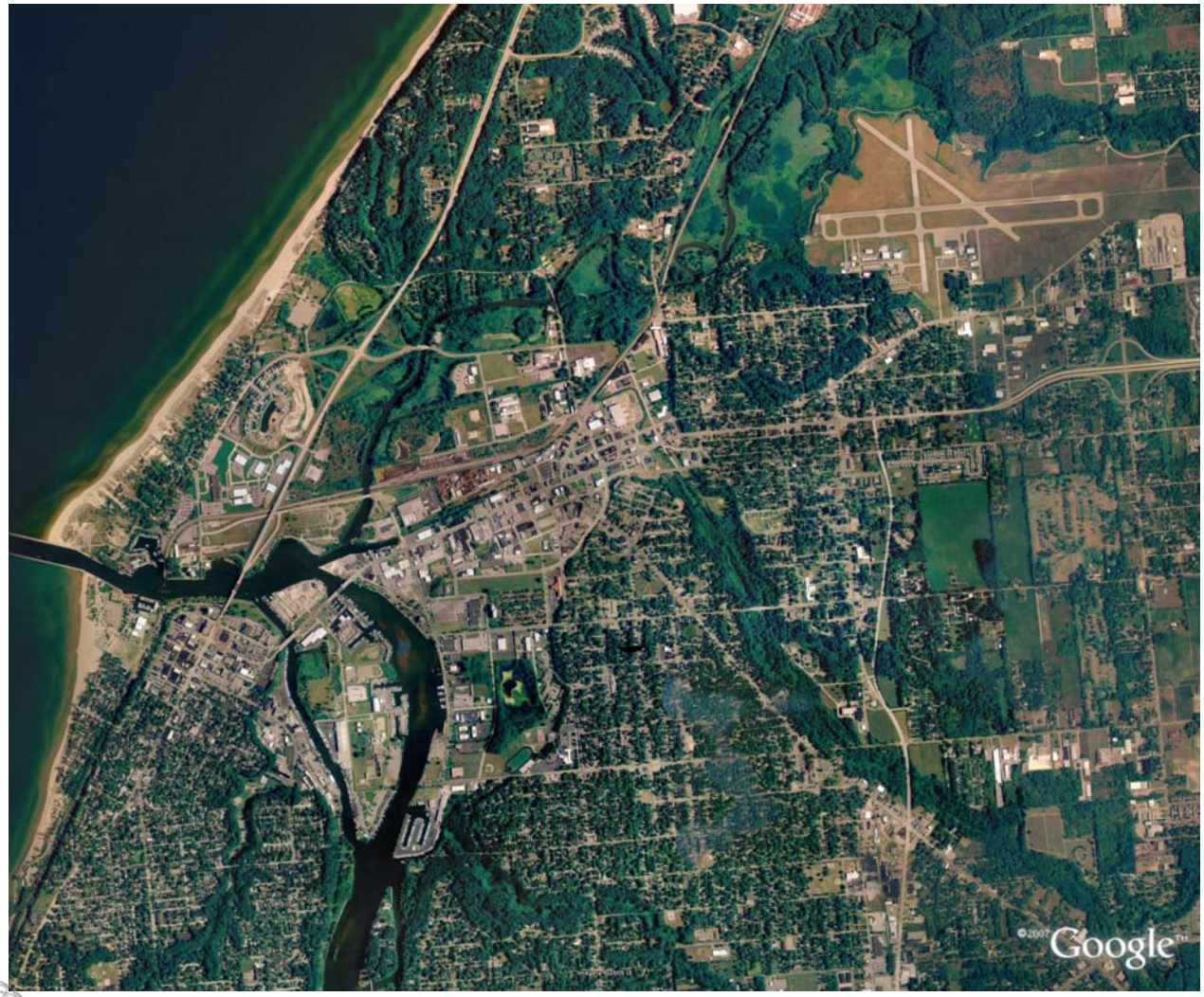
Holland Harbor



Lakewood DMPS

Fully sustainable solution- can be used indefinitely

Benton Harbor, St. Joseph, MI



Benton Harbor - St. Joseph, MI

Direct placement on SW MI Regional Airport

- Meets MI “inert” classification
- No CDF required for dewatering
- Reduces CDF input and rehandling cost
- Increases safety buffer for airport

Beneficial Reuse Regulated by State

- **What is "suitable" in Michigan?**
  - **SOLID WASTE MANAGEMENT ACT PART 115**
  - **R 299.4115 Criteria for designating inert materials appropriate for general reuse – 1 met:**
    - **(a) Hazardous substance below background.**
    - **(b) Hazardous substance below method detection limit**
    - **(c) Type B criteria for soil specified in R 299.5711. Non-respirable**
  - **R 299.4116 Criteria for designating inert materials appropriate for reuse at a specific location:**
    - **(a) The material does not pose a threat to groundwater as specified in subrule (3) of this rule.**
    - **(b) The material will not otherwise result in an unacceptable risk**
  - **R 299.4117 Criteria for designating inert materials appropriate for specific reuse instead of virgin material:**
    - **(a) The material meets the criteria of R 299.4115.**
    - **(b) The material does not pose a threat to groundwater, as specified in R 299.4116, and the conditions of reuse will prohibit exposures that result in unacceptable risks as defined in R 299.5711.**
    - **(c) The material does not pose a greater hazard to human health and the environment during reuse than the virgin material that it replaces**

Impacts of Vegetation?

- Increases dewatering
- Attracts-Repels wildlife
- Improve water quality
- Improve soil quality
- Decrease volume
- Noxious/invasive plants

Questions


Beneficial Use:
Landscape Soil
Dredge Material: Contained Disposal Facility
Saginaw, MI
ERDC