

Sustainable, Innovative Upland Dredge Material Beneficial Use in Ohio



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Ohio's Dredge Material Program

Ohio's Federal commercial Lake Erie harbors facilitate:

- 35 million tons of commodities
- \$25 billion in business revenue
- 130,000 jobs

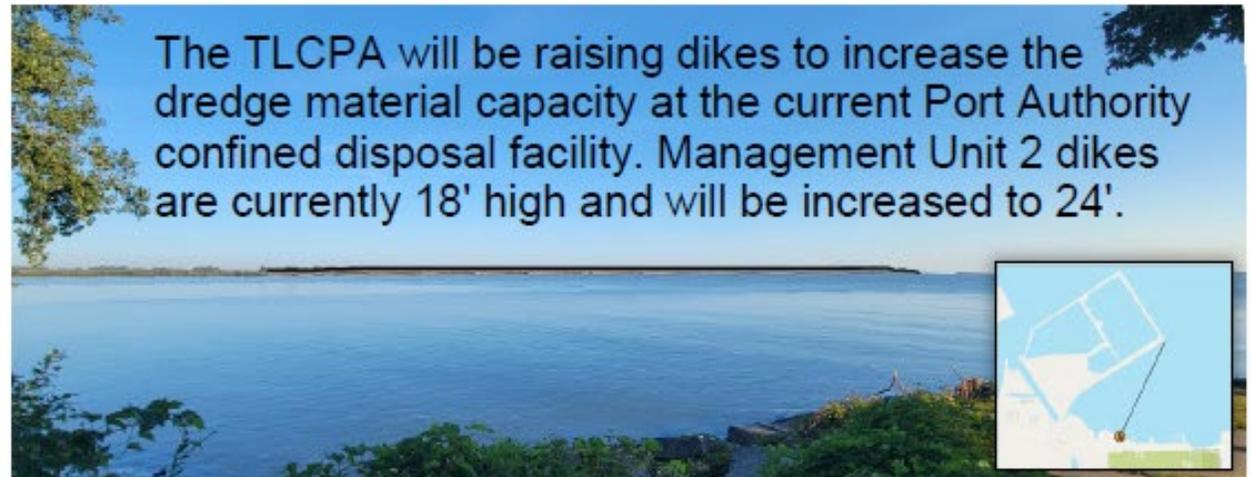
USACE dredges nearly 1.5 million cubic yards of sediment from Ohio's harbors annually. USACE Chief of Engineers has set a goal to beneficially use 70% of all sediment dredged from federal navigation channels by 2030.

Ohio is working closely with local public and private partners and USACE on the development and implementation of sustainable, innovative beneficial uses of dredge material. What started as sediment choreography back in 2014 with leadership from the Port of Cleveland has transformed into a decade long sustainable reuse solution for dredge sediment management. Today our team of partners are turning sediment into a true commodity that recognizes sediment as a valuable resource for marketable soils, agriculture, wetlands and habitat creation, manufacturing, and other innovative uses.

In 2022, Ohio EPA awarded grants, using federal American Rescue Plan Act funds, to four Ohio communities (Conneaut, Fairport, Lorain, and Toledo) to design and construct dredge material recycling facilities and further establish a platform for upland sediment reuse to occur.



Toledo Lucas County Port Authority Toledo Harbor Dredge Facility 3 Improvements



Sediment Processing/Recycling Facilities

Cleveland Harbor



Fairport Harbor



Lorain Harbor



Conneaut Harbor

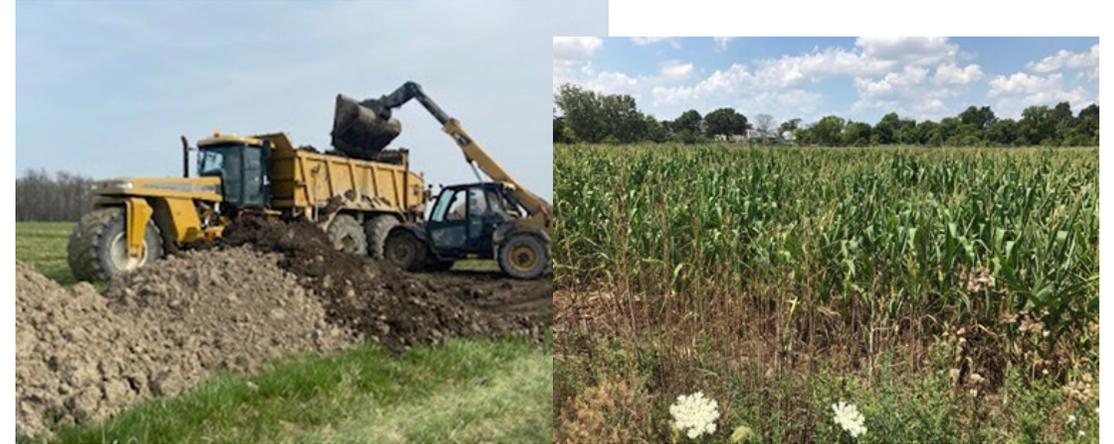


Dredged Sediment Beneficial Use Projects

Glass City Metropark Toledo Harbor Dredge Beneficial Use



Farm Field Dredge Demonstration Projects



Sandusky Bay Initiative Cedar Point Causeway Wetland



Ashtabula Harbor Submerged Aquatic Habitat



A synopsis of the construction of Lake Erie's newest dredge facility in Conneaut, Ohio. A collaboration of city of Conneaut, Ohio EPA, Ohio DNR , and Canadian National Railway.



Conneaut Creek

Dredge Reclamation Facility



**Environmental
Protection
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US Economic Development Administration:
Economic Adjustment Assistance
Assistance to Coal Communities

Collaborative Partnership with Regional Rural Stakeholders:

CONNEAUT OH



**Preserving
Critical
Infrastructure**

Per US Army Corps of Engineers:
\$3.16 BILLION
Annual Revenue
from 3.7 Million Tons Bulk Materials

Port of Conneaut supports:
**16,820 Jobs &
\$850 MILLION**
in Personal Income

Planned Developments: Construction of the Port of Conneaut Dredge Material Facility will enable:



168

High-Paying
Manufacturing Jobs



1,500

Direct Jobs
in Construction



162

Local Indirect Jobs
Multiplier Effect



92

Acres of Industrial
Development



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Proposed Construction Area

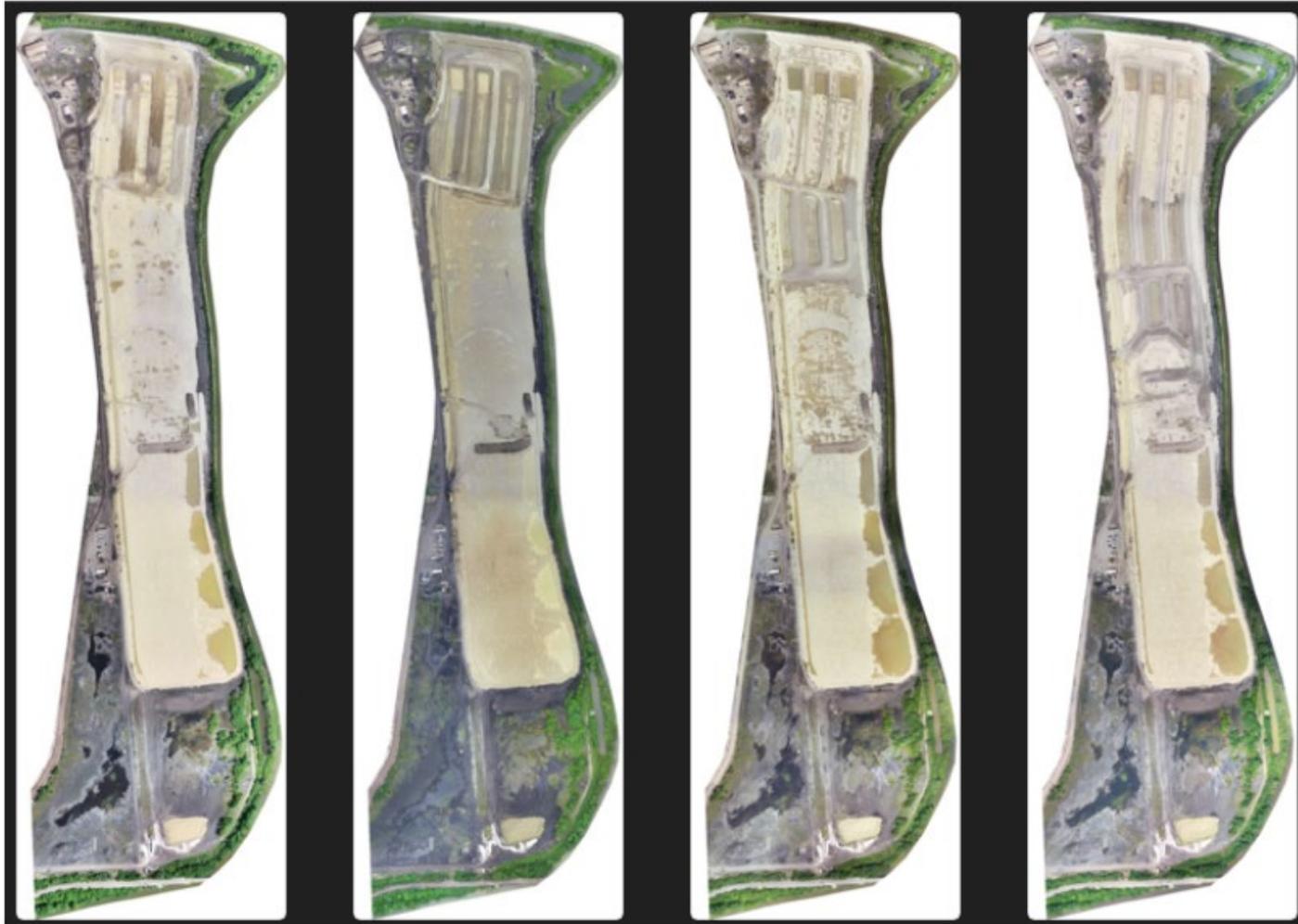




Clay Cap Construction



Bi-weekly Progress Aerials



Bi-weekly Progress Aerials

A Mixed Strategy

Managed - Material Placement



Direct Placement – Living Shoreline

(H) LIVING SHORELINE

The shoreline in front of the Canadian National property will be stabilized using living shoreline techniques. This approach will utilize soft-engineering that relies primarily on soil and vegetation to control erosion. Soil will be imported from off-site with some material coming from dredging activities in the harbor. Native plant communities will be established to create habitat for native plants, fish, and animals.

(I) BEACH REPLENISHMENT EAST OF PORT

Dredge material meeting the requirements for beach replenishment will be placed in the near-shore zone east of the east breakwall (1,500 feet to the east of the east breakwater, between -11 and -8 feet mean low water). A plan for placement of sand will be created that will address the following steps:

- Assessing the Beach: Before any sand is placed, the shoreline will be assessed to determine where it's needed most.
- Sourcing the Sand: Likely sources of the new material will be evaluated including an assessment of material pulled from Conneaut's harbor areas.
- Transporting the Sand: Once the sand has been sourced, it needs to be transported to the beach where it will be placed.
- Placing the Sand: This may involve placement using hydraulic pipes or with heavy equipment like bulldozers or excavators to move the sand into place. The sand is typically placed in a way that mimics the natural shape of the beach, with a gentle slope leading down to the water.



Enlarge of the Canadian National Railroad and Beach Replenishment project areas



Ohio Capacity

- Today in Ohio...Infrastructure in place to sustainably recycle X% of Ohio Federal Navigation Channel Dredging
- Sustainable options for X% of load for next 10-20 years
 - Cleveland – 65%
 - Conneaut – 100%
 - Fairport – 100%
 - Sandusky ...



A Return to Sediment Choreography

Kurtz Bros., Inc. – Largest Upland sediment beneficial reuse company in the Great Lakes.



2016 Sediment Choreography-

- Rely on the natural, physical characteristics of water and sediment
- Treat sediment as a commodity with value to harvest and market usable sediment

Choreography - “The art of designing sequences of movement”

Upland Sediment Reuse Choreography Components:

1. Understanding Current System
2. Removal Process - Dredging
3. Placement Location
4. Processing Needs/Requirements
5. Reuse/Distribution Channels
6. Expansion/Sustainability

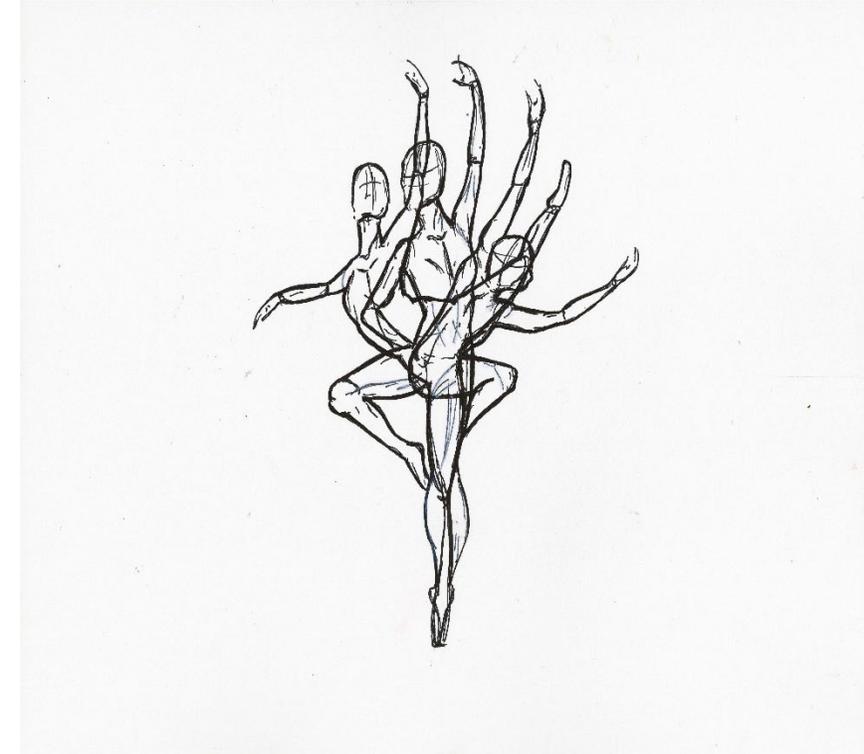


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Designing Sediment Choreography

Preparing Your Sediment Choreography:

- Your Partner- Sediment Type
- The Dance Hall- CDF/Market
- The Music – Timing/Schedule/Load
- Movement/Rhythm- Stakeholders/Economics
- Dance Moves- Local Market Needs, Logistics, Opportunities
- Performance- Implementation/Trial
 - P3/Pilot Projects
- Theater/Plays- Expanding into other reuse opportunities
 - Regional Sediment Management
 - Circular Economy



Conneaut Choreography Example

Choreography

- Dance Partner
- Dance Hall
- Music
- Movement/Rhythm
- Dance Moves
- Performance
- Theater

Conneaut Sediment Management

- Fine grain sediment primarily Silts and Clays with Sand in Harbor – 70k yards per year
- Ashtabula County- Conneaut Creek Sediment Recycling Facility
- Annual Dredging – Summer – ~75K yards
- US ACE, Ohio EPA, City, Private Sector, CN - Economics/Logistics
- Market Sector: Aggregates/Soils/Reclamation/Etc..
- Implementation-July 2024
- Organics Management/RSM/Etc..



Upland Approach to Movement/Moves/Rhythm:

What exists Today, Tomorrow and in the Future?

Approach to Upland Reuse Solutions:

1. Current Market – What exists now
 - Low Hanging Fruit/Other Possibilities
2. Partners – Who can be partners
 - Engagement
 - Communication
3. Logistics – Transportation & Handling
4. Market Capacity Determination
5. Expansion Capacities
 - Regional Sediment Management
6. Innovation – Long term/Future
 - Research and Development/Grants



Current Upland Reuse

- Commodities
- Horticulture
- Land Development
- Brownfield
- Landfill Cap



Future of Upland Beneficial Reuse

- Wetlands Development
- Mine Reclamation
- Agriculture
- Brick and Block



How to Transition from Current to Future Use

- Building Collaboration (Interagency and P3)
- Develop 2nd Stage Material Use through research and development
- Focus on Lowering Operational Costs
- Mixed Strategies for operational resilience