



GREAT LAKES DREDGE & DOCK COMPANY, LLC

BENEFICIAL REUSE OF DREDGE MATERIAL

MARCH 2021

Dredging Worldwide Since 1890.



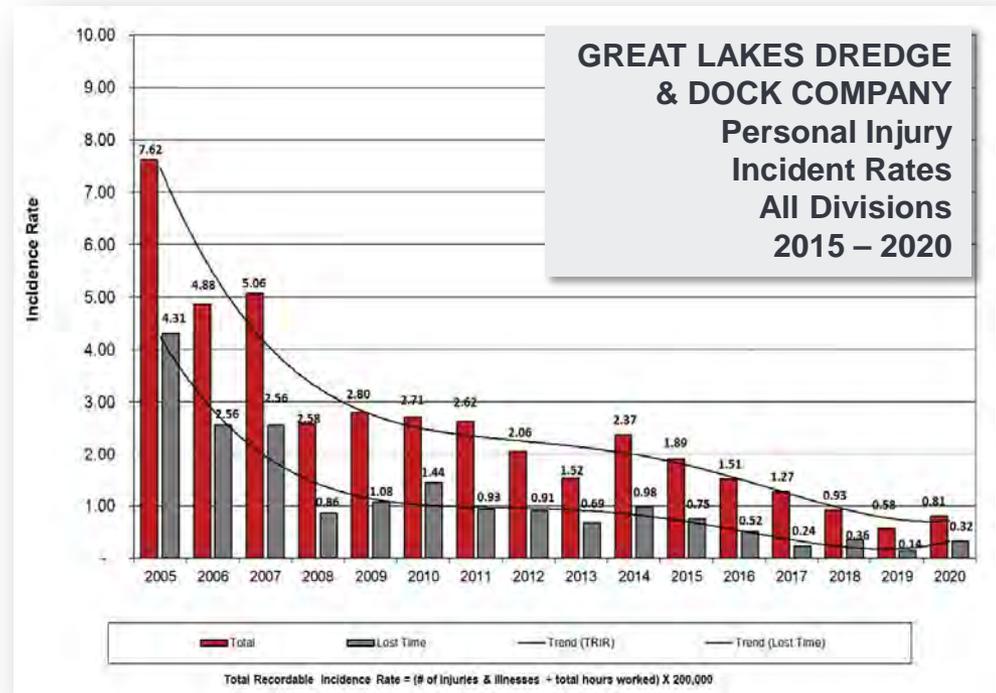
GLDD SAFETY An Uncompromising Commitment

GLDD's commitment to staying safe and focused on the job is a point of pride and strength that runs across our entire industry.

SAFETY WEEK 2021 May 3-7

- ✓ Honor GLDD's safety commitment
- ✓ Bring awareness to the importance of **holistic safety** in the workplace
- ✓ Focus on creating a **physically and mentally safe** environment
- ✓ Make all aspects of everyone's well-being part of our safety culture and programs

JOIN US as we celebrate our promise to each other to be present, focused and safe every day.



GLDD's safety milestones in 2020.

DREDGE OHIO

An incredible 10 years without a lost time incident.



CAPE GIRARDEAU

Yard Crew achieved an amazing accomplishment of 4 years Incident- and Injury-Free.



GLDD Beneficial Reuse of Dredge Material

IT ALL STARTS WITH DREDGING®

- ✓ BENEFICIAL REUSE
- ✓ RESILIENT INFRASTRUCTURE

- Many of us have been involved with such discussions even if we didn't use these terms.
- My first dredging project over 38 years ago involved rebuilding an island using dredged material.



ADVANTAGES

- Beach Restoration / Nourishment
- Storm Surge and Hurricane Buffer
- Flood Damage Reduction
- Erosion / Sediment Loss Reduction
- Water Quality Improvements
- Fish and Wildlife Habitat
- Coastal Community Resiliency
- Increased Land Values
- Water Quality and Security

Natural or “nature-based” infrastructure projects,

“...rely on services produced by ecosystems, often utilizing natural landscapes to minimize flood damages, purify and store water, and reduce urban storm water runoff.”

-Resources for the Future

GLDD Beneficial Reuse of Dredge Material

IT ALL STARTS WITH DREDGING®



MANGROVE FORESTS

- Storm surge and wave buffer
- Shoreline erosion prevention
- Wildlife sanctuaries enhancement



BEACH RESTORATION / NOURISHMENT

- Habitat Creation
- Storm and hurricane buffer
- Recreational use enhancement



NATURAL WETLANDS

- Water supply and flood prevention
- Upstream water filtration
- Sediment reduction
- Wildlife habitat enhancement



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BARRIER ISLANDS & WETLANDS

GLDD → Active supporter of natural infrastructure and beneficial use of dredged material on all projects to create environmental features including,

- ✓ Shallow water habitat
- ✓ Marsh creation and wetlands
- ✓ Beach nourishment (commonly known as turtle and plover habitat creation)

Most GLDD Projects → US ARMY CORPS OF ENGINEERS

- ✓ Focus on collaboration with Corp and Stakeholders
- ✓ Consistent awareness of GLDD capabilities
- ✓ Keep thought processes fresh on on-going and new projects



GLDD Beneficial Reuse of Dredge Material

BEACH NOURISHMENT

GLDD has restored more eroded recreational and commercial waterfronts than any other dredging company, making it the leader in this important field.



GLDD Beneficial Reuse of Dredge Material

RESERVOIRS / LAKES / RIVERS



SAN JACINTO RIVER FLOOD CONTROL PROJECT

- USACE, Galveston District
- 1,920,700 CY
- Portable Electric CSD
- Pump Distance 34,000 lf to 50,000 lf

Dredged material to be reused for resale in the Houston sand market.



JOHN REDMOND RESERVOIR

- Kansas Water Office
- 3,000,000 CY
- Portable Electric CSD
- Pump Distance 30,000 lf to 35,000 lf

Dredged material reused for farmland augmentation, grass land development, and habitat use.



GLDD Beneficial Reuse of Dredge Material

THE NATURAL INFRASTRUCTURE INITIATIVE

The Natural Infrastructure Initiative (NII) is a group of companies and organizations working to promote the use of natural infrastructure projects that advance economic vitality, environmental health and security in our communities.



- ✓ GLDD has partnered with Caterpillar's NII.
- ✓ With Caterpillar's leadership, and collaboration with other team members (see below), discussions around the inclusion of natural infrastructure have gone to new places.

CATERPILLAR

The Nature Conservancy



AECOM



Brown & Root



DAWSON & ASSOCIATES



UNIVERSITY OF GEORGIA
Institute for Resilient Infrastructure Systems



GLDD Beneficial Reuse of Dredge Material OPPORTUNITY IN THE U.S.

USACE NAVIGATION PROGRAM

- 12,000 miles of shallow-draft waterways (9-14')
- 13,000 miles of deep draft waterways (14'+)
- 400 ports, harbors, and turning stations

NON-USACE DREDGING PROGRAMS

- Annual dredging ~200M yds. of sediment
- ~50M yd³ beneficially reused
- ~150M yd³ of opportunity



THE PENTAGON
6.6M sq. feet
Buried 625' deep
annually

STANDARD FOOTBALL FIELD
120 x 53 yds.
Buried 60,000'
deep annually

HAULED BY CAT 797B
314 yd. capacity
Loaded every 2.5 minutes
19,904 hrs. (2.27 years running 24x7)



If Used for
New Land Creation
Deposited 6' deep
15,495 acres
(24 sq. miles) / year
42 acres / day



Inland utilization opportunity is also significant.

GLDD Beneficial Reuse of Dredge Material

STRATEGIC IMPERATIVES



GROW INVESTMENTS

& embed NII influence into active projects.



DEVELOP & PROMOTE

new tools, processes & capabilities.



ADVOCATE for POLICY & LEGISLATION to accelerate the number & velocity of water-based NI projects.



CREATE AWARENESS

by supporting the uses & benefits of NI

OBJECTIVES

- ✓ Increasing the flow of public and private capital funds to NI projects
- ✓ Improving Alternative Delivery Models including Public/Private Partnerships
- ✓ Identifying and implementing long-term funding models
- ✓ Identifying and advocating for improvements to policy, regulatory and legislative mechanisms
- ✓ Encouraging increased beneficial reuse of dredged material
- ✓ Encouraging large public projects to be reviewed for P3 opportunities
- ✓ Developing/implementing pilot projects to demonstrate NII success/potential



GLDD Beneficial Reuse of Dredge Material

GLOBAL INFRASTRUCTURE NEEDS & NATURAL INFRASTRUCTURE'S POTENTIAL ROLE

- ✓ Ecological processes and the “built environment” are increasingly at-risk.
- ✓ Infrastructure improvements are not keeping pace with needs.

OPPORTUNITY / MEGA TRENDS

- **\$69T** 19 year capital need
- **\$3.7T** annual need
- **How much could / should be NI?**

ANNUAL GLOBAL INFRASTRUCTURE SPEND

- **\$2.5T vs. \$3.7T** potential need
- **Can NI help close a \$1.2T annual gap?**



GLDD Beneficial Reuse of Dredge Material

GLOBAL INFRASTRUCTURE NEEDS & NATURAL INFRASTRUCTURE'S POTENTIAL ROLE

KEY INDUSTRIES CAPITAL NEEDS

- ✓ POWER - **\$20.2T**
- ✓ ROADS - **\$18.0T**
- ✓ WATER & PORTS - **\$10.7T**
- ✓ TELECOM - **\$10.4T**
- ✓ RAIL - **\$7.9T**
- ✓ AIRPORTS – **\$2.1T**



GLOBAL POPULATION¹
→ 2030 → 2050
8.5B 9.7B

GLOBAL MIDDLE CLASS²
→ 2020 → 2030
3.2B 4.9B



URBAN POPULATION³
→ 2050
66%



2016–2030

\$3.3 TRILLION

Annual Global Infrastructure Investment
Needed to Keep Pace with Expected Growth⁴

2016–2021

60 NEW AIRPORTS IN CHINA^{5,6}



GLDD Beneficial Reuse of Dredge Material

PARTNERS

GLDD...

- ✓ Is working with the Corps and stakeholders like AAPA, WCI, NWC, ASBPA & NII to identify and promote projects that deserve consideration.
- ✓ Notes that we don't necessarily think beneficial use of dredged material has to cost more money and we want to challenge old thought that it does.
- ✓ Has examples *around the country* where beneficial use, in tandem with collaborative efforts, has *saved money*. Not always done in a few months, but if given time, we can accomplish good things.
- ✓ Has been involved with Louisiana for many years on Coastal Restoration. The Coastal Protection and Restoration Authority Master Plan has served as a blueprint to other "master plans" that have been developed in the Northeast, Southeast, Gulf, and the Great Lakes.

GLDD can, *and has*, developed new equipment and techniques to accomplish difficult projects. For those of us who are engineers and dredgers, it is often a simple question of steel and horsepower. The earlier we can get involved in a potential project, the more ideas we can offer.



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