



DREDGING BEST PRACTICES

Dredging, the excavation and removal of sediments and debris from the bottom of a water body, is necessary to ensure safe passage for ships and to maintain recreational access for boaters.

Dredging projects vary greatly — for example, some projects are part of an ongoing program of periodic maintenance necessitated by a natural filling in of sand and silt (sedimentation); some may be required for new harbor development; and some may be emergency responses to severe weather events that caused sudden navigation hazards

Dredging projects involve two operational components: removal of the sediment and disposal of the sediment (dredged material management). While there is an expanding industry that can make beneficial use of dredge material, there are still complications and special requirements if dredged material is or suspected to be contaminated. Contaminated dredged material should be transported and disposed of correctly, usually at a confined disposal facility.

For more information on dredging, including resources on portable dredges, beneficial use, contaminated sediment cleanup or a list of Great Lakes dredging contractors, see: *Ports, Harbors and Marinas: Harbor Dredging* (Wisconsin Sea Grant) — www.seagrants.wisc.edu/home/Topics/PortsHarborsandMarinas.aspx



Dredging the Grand River (Source: Michigan Sea Grant)

Increased storm intensities can increase the amount of stream and river sediment entering the lake, increasing sedimentation volumes in marina and harbor basins. Such sediment loading, the delivery and accumulation of sediments from a different location, as well as changing water levels will continue to influence the demand for dredging to clear access for boaters. This section provides an overview of the complexity of jurisdictional considerations, i.e., who is responsible for what areas when it comes to dredging and an overview of permit and funding requirements.

BEST MANAGEMENT PRACTICES

- Identify Jurisdiction for Dredging
- Collect Required Information
- Explore Funding Options

IDENTIFY JURISDICTION FOR DREDGING

Who is in charge? The U.S. Army Corps of Engineers (USACE) regulates dredging in the Great Lakes and all other navigable waters under Section 10 of the Rivers and Harbors Act of 1899. The navigable waters that fall under Section 10 are designated by Congress and are identified as those waters that are currently, historically and could in the future be used for interstate commerce (33 CFR 329.4). The Corps also regulates the discharge of dredged or fill material into waters of the United States, including Section 10 waters, tributaries and freshwater wetlands, under Section 404 of the Clean Water Act (CWA).

The federal government maintains 140 harbors in the Great Lakes. The depths to which the harbors and approach channels are dredged have been subject to U.S. Congressional authorizations, many of which date back to the



Dredging with booms and screens to contain suspended sediment. Dredged material must be properly disposed of. (Source: MDNR Emergency Dredging Toolkit)

19th century. The authorized depth for dredging varies with the type of traffic involved, ranging from a low of 9 feet deep in most recreational boating harbors, up to 30 feet deep in channels used for ocean-going freighters. Since some harbors serve both commercial and recreational purposes, it is common to encounter a deeper entrance channel near the harbor mouth for commercial vessels, with progressively shallower depths for recreational interests moving upstream (GLC-USACE, 1999).

When considering dredging and figuring out where to turn first, there are two jurisdictional considerations to take into account:

1. Who is responsible for permits?
2. Who is responsible for the actual dredging?

PERMITS

In many states, the Corps has given jurisdiction over the Section 404 dredging permits to a state agency. This usually is put into practice through development of a “joint application permit.” Contact your state agency for details. Typically this is a state’s department of natural resources or environmental quality agency. To find out how your state regulates dredging, contact your state agency’s regional representative.

GREAT LAKES NAVIGATION SYSTEM

The Great Lakes navigation system is a continuous, 27-foot deep draft waterway that extends through each of the five Great Lakes and connecting

channels, from the western end of Lake Superior at Duluth, Minn. to the Gulf of St. Lawrence on the Atlantic Ocean — a distance of more than 2,400 miles.

The Corps is responsible for maintaining the U.S. portion of the system, which includes 140 harbors (60 commercial; 80 recreational), 2 operational locks, 104 miles of breakwaters and jetties, and 610 miles of federal navigation channels.

For more information, see: *Great Lakes Navigation System* (USACE Detroit District) — www.lre.usace.army.mil/Missions/GreatLakesNavigation.aspx

PERFORMANCE

Dredging jurisdictions are complex. Depending on the location of the desired dredging project, the federal, state or local government may have jurisdiction to perform the dredging. For example, your location may be adjacent to a federal project, meaning the Corps would be responsible for dredging the main channel, but there would not be federal support for dredging your adjacent private marina basin.

To explore records of prior dredging projects, refer to federal and state resources:

- Federal resources: U.S. Army Corps of Engineers: Detroit District Operations provides detailed dredging and survey information regarding projects in Lake Superior, Lake Michigan, Lake Huron, Lake St. Clair and western Lake Erie;

includes project costs, maps and the date when a harbor was last dredged can be found here. For a comprehensive list of Corps-funded projects, see the *U.S. Army Corps of Engineers Dredging Database* (USACE), this includes information on date, location, quantity, material disposal, etc. — www.lre.usace.army.mil/Missions/Operations.aspx

- State resources: States vary in their approach to dredging work. For example, a color-coded map depicts a sampling of Michigan dredging projects and lead agencies: *2013 Emergency Dredging Plan Identified Locations* (Michigan Department of Natural Resources) — www.michigan.gov/documents/dnr/Appendix_A_3_2013_Emergency_Dredging_Plan_Identified_Locations_Map_411236_7.pdf

COLLECT REQUIRED INFORMATION

Now that you know where to turn to get started, a permit must be obtained before any dredging can be done. Permit forms require information about the quantity of materials to be dredged, the location and condition of the proposed disposal site, as well as names and addresses of nearby landowners and likely environmental impacts. A survey is usually needed to show the depths of the area to be dredged; it illustrates the reason dredging is needed.

In some cases, typically where there is a historical reason to suspect that the sediments have been contaminated by pollutants, the state or the Corps will require testing of the sediment and water to determine the likely impacts the dredging could have on water quality. The facility owner can complete most of the information on the permit application, but an experienced engineering company normally undertakes more complicated projects.

SEDIMENT TESTING

Permit applications often require a dredge material characterization, a report on what is known about the material. Sediment testing results

need to be submitted with a permit application to be evaluated as part of the proposed project.

If your facility is in need of dredging, it may streamline future permit applications to have sediment testing results on hand. Though this is an upfront cost for the facility or community, it may make the application more competitive in the future. Sediment testing may be waived for some small projects (e.g., <2000 cubic yards).

Your permitting agency will provide guidance on requirements. For example, the Michigan Department of Environmental Quality provides a flow chart available in the *Dredge Sediment Review document* (PDF, pg. 7), which visually outlines and summarizes which projects require sediment testing — www.michigan.gov/documents/deq/deq-policy-09-018_414753_7.pdf

CONTAMINATED SEDIMENTS

Marinas and harbor basins may contain contaminated sediments, including materials considered safe only because they are buried too deep to be disturbed by typical navigation traffic. Such sediments may have been contaminated by industrial or municipal discharges, combined sewer overflows, urban and agricultural non-point source runoff and other sources.

When dredging, it is possible that these contaminants could be reintroduced into the environment, posing serious human and ecological health concerns. Sediments can also be resuspended by storms, ship propellers and bottom-dwelling organisms.

SAMPLE DREDGING PLAN

Operators will also need to supply a dredging plan. A hand-drawn sketch of the work to be completed may be suitable. Check with your state agency for specific requirements. The drawing (Figure 1) may include cross sections showing before and after water depths and the proposed disposal site conditions, including any potential levees and water control structures.

TECHNICAL ASSISTANCE

Your state permitting program representatives will provide technical assistance to communities and individuals on the dredging permitting process. For assistance, contact your district representative.

- For projects in the federal navigation channel, contact your district (Detroit, Buffalo or Chicago for the Great Lakes region): *U.S. Army Corps of Engineers* — www.usace.army.mil

- Projects outside the federal channel often require permitting by individual states — sometimes through multiple agencies. Contact your state authority for more information.

Example: Michigan Contacts for Dredging Technical Assistance

- To obtain more information on permitting, testing and dredge material disposal, see: Michigan Department of Environmental Quality-Water Resources Division: Dredging Projects.
- For questions about a permit, see: *MDEQ Land/Water Interface Permitting Staff* (PDF map listing contacts by location) — www.michigan.gov/documents/deq/wrd-permit-staff_402908_7.pdf

For assistance in your state, contact your regional representative at the relevant permitting agency.

As a general resource for technical assistance, the Army Corps' Dredging Operations Technical Support Program (DOTS) provides environmental and engineering technical support for the Corps' navigation and dredging missions. For technical publications and content related to dredging, see:

- *Dredging Operations Technical Support Program* — el.erdc.usace.army.mil/dots/resources.html
- *Dredging Operations and Environmental Research* — el.erdc.usace.army.mil/dots/doer/doer.html

To learn more about regional dredging efforts:

- Participate in workshops providing technical dredging/project assistance from the Corps and applicable state agencies. This will increase familiarity with available opportunities and any changing requirements.
- Follow groups dedicated to dredging issues:
 - *Great Lakes Dredging Team* – Partnership of federal and state agencies created to assure that the dredging — of U.S. harbors and channels throughout the Great Lakes, connecting channels and tributaries — is

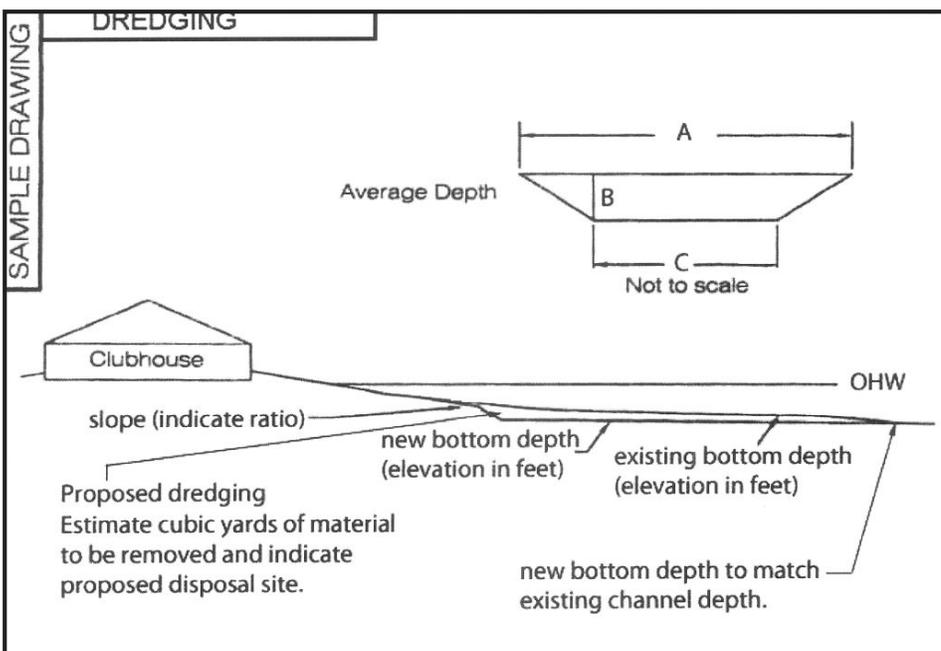


Figure 1: Sample dredging plan diagram. (Source: Ohio Dredging Fact Sheet, 2013)

conducted in a timely and cost effective manner, while meeting environmental protection, restoration and enhancement goals — greatlakesdredging.net

- Great Lakes Small Harbors Coalition – Group representing small harbors from around the Great Lakes where dredging and harbor maintenance issues are of particular concern — www.greatlakessmallharbors.org

EXPLORE FUNDING OPTIONS

The federal government, through the Corps' Operation and Maintenance (O&M) budget, funds dredging in the designated Great Lakes navigation system (i.e., federal navigation channel and federal harbors). This budget is funded through the Harbor Maintenance Tax (HMT), a tax on the value of waterborne cargo moved on the Great Lakes. In recent years HMT funds have been diverted, leaving less funding for dredging and infrastructure maintenance projects in the Great Lakes. Consequently, the federal government has prioritized funding for large commercial ports (those with the most cargo tonnage) before smaller commercial and recreational harbors.

Consequently, even operators who have had experience with dredging will encounter a changing regulatory landscape; communities are increasingly responsible for funding their own dredging projects.

Also, as a result of the budget limitations, there is currently a dredging backlog of more than 16 million cubic yards of sediment in Great Lakes federal harbors.

Advocacy efforts continue to restore full use of Harbor Maintenance Tax funds for their intended purpose and to reduce the dredging backlog.

When a facility's dredging project does not qualify for federal funds or has been de-prioritized, communities are increasingly pursuing alternate funding strategies.

To finance a dredging project:

- Prepare required permit information to be ready to respond if a funding opportunity becomes available. For example, a state agency may do a one-time allocation for emergency dredging work.
- Identify alternative sources for dredging funds. For example, to generate harbor maintenance funds at Kalamazoo Harbor in Michigan, a Water Resources Tax Improvement Finance Authority was introduced, allowing the harbor to raise its own funding.
- Evaluate options to identify more cost-effective strategies to ensure the viability of the harbor; for example, explore feasibility of dredging channels only in priority areas.
- Determine if project falls within a designated Great Lakes Area of Concern; federal funding may be available.
- Consider coordinating dredging efforts between marinas and harbors in a community. Often the greatest cost is in getting equipment to a site, efficiencies may be found if nearby projects are scheduled concurrently.

Resources:

- *Cost Estimate Tool and Case Study: Economic Valuation of Port Infrastructure* (Great Lakes Coastal Resilience Planning Guide) – An introduction to the Great Lakes Port & Harbor: Infrastructure Matrix & Dredging Cost Estimate Tool developed by Wisconsin and Minnesota Sea Grant programs — www.greatlakesresilience.org/case-studies/infrastructure/economic-valuation-port-infrastructure
- Case studies demonstrating how the tool was applied are available: *Great Lakes Port & Harbor: Infrastructure & Dredging Cost Estimate Matrix Tool and Duluth, MN/Superior, WI and Toledo, OH Case Studies* (PDF; Great Lakes Climate) — climategreatlakes.com/wp-content/uploads/2013/10/15-Great-Lakes-Port-Matrix-Tool-and-Case-Studies.pdf
- *Federal Funding for Coastal Infrastructure: Great Lakes Coastal Infrastructure Brochure* (PDF; USACE) – Overview of coastal infrastructure, including a strategy to prioritize limited federal funding and a guide to begin a dialogue with local and state officials to investigate potential options for local communities to fund maintenance — [www.lre.usace.army.mil/Portals/69/docs/Navigation/Risk Com - GLCI-CPR_Brochure_Jan_2012.pdf](http://www.lre.usace.army.mil/Portals/69/docs/Navigation/Risk%20Com%20-%20GLCI-CPR_Brochure_Jan_2012.pdf)

ACKNOWLEDGEMENTS

This work was supported in part by the Great Lakes Integrated Sciences and Assessments program (GLISA), a NOAA-funded partnership of the University of Michigan and Michigan State University. For more information on these topics, please see the Resources section of the Great Lakes Clean Marina Network website (www.glcleanmarina.org) or the Clean Marina Classroom website (www.cleanmarinaclassroom.org).

Project Number: R/CCD-25; GLISA Grant: NA10OAR4310213



MICHU-15-702

Sources: 2014 National Climate Assessment, Great Lakes Integrated Sciences and Assessments Center, International Upper Great Lakes Study, NOAA Great Lakes Environmental Research Laboratory, University of Wisconsin Sea Grant Institute, Michigan Clean Marina Program, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, National Working Waterfronts Network, The Nature Conservancy and others.