Waste to Resource: Beneficial Use of Great Lakes Dredged Material

Why do we dredge?
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Can my community become involved?

Great Lakes Commission
des Grands Lacs

Acknowledgments

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Why do we dredge?

Dredging involves the periodic removal of accumulated bottom sediments from waterways. In the Great Lakes this is usually done to maintain adequate water depths for safe and efficient navigation of vessels. Dredging is done also to enlarge or deepen existing navigation channels and recreational harbors. The U.S. Army Corps of Engineers (the Corps) is authorized to maintain more than 130 navigation-related projects in the Great Lakes, nearly all of them commercial and recreational harbors and navigation channels. Many of these projects require periodic dredging. Sometimes dredging is also necessary for waterfront construction, utilities placement and cleanup of contaminated sediments. Much of Great Lakes dredging is undertaken in response to soil erosion and sedimentation from rivers and streams. Efforts to control soil erosion and sedimentation from land uses around the Great Lakes are on the rise and may help reduce overall dredging needs.

What is beneficial use?

Beneficial use is the use of dredged material as a resource instead of disposing of it as a waste. This involves placing or using dredged material for some productive purpose, such as beach/nearshore nourishment, habitat creation or restoration, landscaping, topsoil creation or enhancement, road construction, land creation or reclamation (e.g., strip mines, brownfields), and in the manufacture of aggregates for marketable products such as ceramics or asphalt. The benefits may be derived from the dredged material itself or the design and location of a placement site.

Mixing dredged material and treated contaminated soil to create aggregate for construction materials in New York. *Credit: New York State Dept. of Environmental Conservation.*

Land Creation-Windmill Island

Windmill Island, part of a 33-acre park in Holland, Mich., was partially created with dredged material. This island, which supports acres of tulip beds, is also home to a working windmill transplanted from the Netherlands. Holland's interest in Dutch heritage has become key in the area's successful tourism promotion efforts. In the low-lying Netherlands, keeping the sea at bay and maximizing use of dredged material for elevating and expanding land areas has been a necessity for years. Windmill Island may change with time, but its roots in dredged material will be forever part of its past.

Credit: U.S. Army Corps of Engineers

Why do we need beneficial use?

The beneficial use of dredged material addresses the need for alternatives to conventional dredged material management. Currently most dredged material from the Great Lakes is either discharged into open waters, deposited on or near shores for beach nourishment, or placed in a confined disposal facility (CDF). For

contaminated sediments, CDF placement has been the only option. However, open water placement has become increasingly unacceptable to the public and Great Lakes CDF capacity is diminishing. Some Great Lakes CDFs have been filled to capacity and are no longer being used. Moreover, there is an emerging view that, where possible, reuse and recycling of dredged material should take priority over disposal. With proper testing and government guidelines that protect human health and the environment, beneficial use of dredged material allows the recycling of dredged material, offering a sustainable long-term management option for dredged material management in the Great Lakes basin.

Who is involved in beneficial use?

Governments at the federal, state and local levels, state agencies, environmental/citizen groups, and port authorities are all important players in deciding whether, when and how dredged material can be used beneficially. Local ports, city and county governments, private businesses and citizens groups must play key role in identifying opportunities for the beneficial use of dredged material, such as road construction projects that require fill material and park development with landscaping needs. Once a potential beneficial use has been identified, government agencies at the federal and state levels can work with local agencies, ports, businesses and citizens groups to decide if the beneficial use is appropriate. Among federal agencies, the Corps has primary responsibility for maintaining federal navigation channels in the Great Lakes. Congress has given the Corps special authority to engage in beneficial use projects that involve the protection and restoration of aquatic habitat and nourishment of beaches. The U.S. Environmental Protection Agency (U.S. EPA) and state and local environmental protection agencies have responsibility for protecting human health and the environment. State environmental agencies have an important role in writing policies that regulate if, when and how beneficial use can take place in their jurisdiction. Often this will involve issuing special permits for the storage, treatment or placement of the dredged material. Environmental and citizen groups can develop beneficial use project ideas, as well as review and comment on dredged material management plans and other plans or project proposals to ensure that beneficial use projects meet a community's needs and are environmentally sound. Port authorities have a key role in working with the Corps in developing dredged material management plans, which are required for all areas that need dredging for deep-draft navigation but do not have sufficient long-term disposal capacity. Port authorities also provide an important link to local businesses that benefit from port activities.

Obstacles and opportunities: Whether, when and how dredged material gets used beneficially

Numerous projects have demonstrated that dredged material can be used and/or recycled in a manner that is beneficial from environmental and economic standpoints. Though there are many factors that affect whether, when and how beneficial use of dredged material takes place, they can be placed into three general categories:

- state and federal laws and regulations
- costs
- physical and chemical properties of the material

State and federal laws and regulations

On the regulatory front, currently there are no federal regulations governing the beneficial use of dredged material in upland environments. Federal regulations under Section 404 of the Clean Water Act provide a framework for using dredged materials beneficially in water or wetlands. Great Lakes states do not

have uniform procedures for determining beneficial uses of dredged material. Some Great Lakes states, however, have attempted to develop their own standards and regulations for beneficial use.

Most of the dredged material disposed of in open water of the Great Lakes is not contaminated and can be used instead to enhance beaches, stabilize shorelines, or create or enhance habitat. Several Great Lakes states have procedures in place to allow clean, sandy dredged material to be placed on or near the shore to enhance beaches and replenish natural sources of migrating sand (littoral drift). For example, in Michigan, approximately 30 percent to 40 percent of dredged material from navigation channels is used for beach nourishment, compared to about 10 percent to 15 percent for the entire Great Lakes. Some of this disparity has to do with existence or type of regulatory framework in place for this type of beneficial use. It also depends on the type of material that is dredged. Material that is not sandy or is determined to be contaminated is not desirable or acceptable for placement on Great Lakes beaches. State regulations for beach nourishment generally require that the material contain a relatively high percentage of sand and that it be free of contamination.

State regulations for other types of beneficial uses are fewer and more cumbersome. Most Great Lakes states do not have standard regulatory procedures that facilitate other types of beneficial uses, such as habitat restoration, land reclamation or manufacture of products using dredged material. As a result, many Great Lakes beneficial use projects have been pilot projects or special cases. Where state laws and regulations do exist, they require that the dredged material be tested and evaluated and meet appropriate criteria to protect human health and the environment. These procedures are often part of a regulatory framework that treats dredged material as a waste to be disposed of, rather than a resource that has potential for reuse. Unfortunately, this can inappropriately magnify negative public perceptions about dredged material and create additional hurdles for its beneficial use.

Some Great Lakes states have been able to get around this "solid waste trap" by defining dredged material as an "excavated material," which can allow beneficial use to take place. Other Great Lakes states evaluate beneficial use projects on a case-by-case basis. Nonetheless, major differences in state laws and regulations and the lack of specific policies that treat dredged material as a resource continue to be significant obstacles to beneficial use. An important response in the management of municipal and solid wastes has been to encourage waste reduction, reuse and recycling. Applying these same concepts to dredged material will do much to advance beneficial use.

Great Lakes states, the Corps and the U.S. EPA are beginning to take a more rigorous look at ways that dredged material can be more widely reused and recycled. Efforts are underway by the Great Lakes Dredging Team and the Great Lakes Commission's Great Lakes Beneficial Use Task Force to try to develop a more regional approach to advance beneficial use of dredged material. These federal-state partnerships are working to improve policies and regulations so that dredged material can be tested, evaluated, treated (where necessary) and reused based on the specific physical and chemical characteristics and end use of the material. The use of exposure controls, based on risks and exposure pathways, can allow dredged material to be used beneficially while protecting human health and the environment. For example, dredged material used as backfill for a land reclamation project that will be capped with clean soil or paved over need not be pristine. The findings and recommendations of the Beneficial Use Task Force, published in 2001, present a number of ways to improve opportunities for beneficially using dredged material. The Great Lakes Beneficial Use Task Force Report also contains more detailed information abut Great Lakes beneficial use projects and state regulations pertaining to beneficial use. To obtain a copy of the report contact the Great Lakes Commission at 734-665-9135 or access it online at www.glc.org/dredging/benuse/benuse.html.

Beach/nearshore nourishment

Wind, waves and currents combine to move sand on and off beaches and along shores. This natural process has been disrupted through development of shorelands. Construction of piers and the general hardening of shoreline segments with sea walls, residential docks and other manmade modifications are examples. Beach and nearshore (or littoral) nourishment are means for protecting existing shore uses as well as compensating for disruption of natural sand replenishment. Approximately 10 percent to 15 percent of Great Lakes dredged material is used for these purposes.

Beach nourishment at Grand Haven, Michigan. *Credit: U.S. Army Corps of Engineers*

Pennsylvania's Presque Isle State Park is a 3,200-acre migrating sand spit on Lake Erie. With extensive recreational beaches and a protected embayment, this National Natural Designated Landmark attracts around 4 million visitors each year. The construction of 55 offshore breakwaters has substantially reduced the need for beach nourishment. About 40,000 cubic yards of sand is purchased annually from commercial sources and trucked to the beach. On the bay side of the park, erosion from fluctuating water levels and currents has threatened part of the park's main trail and created sand bars posing problems for small boats. A relatively low-cost solution with less ecological and aesthetic impact entailed the dredging of 1,200 cubic yards and rebuilding the eroded shore areas with a combination of 12-to 24-inch rock and dredged material. The area was further stabilized with downed trees, stumps and prepared mats of vegetative material as well as the planting of saplings.

Lake side placement of dredged sand at Presque Isle State Park. *Credit: Pennsylvania Dept. of Environmental Protection*

Bay side placement and stabilization of dredged material at Presque Isle State Park. *Credit: Pennsylvania Dept. of Environmental Protection.*

Costs

Costs associated with beneficial use are affected by state and federal policies, availability of other disposal alternatives, market conditions and technological developments. Since 1987, the Corps has conducted dredging and management of dredged material from federal harbors and channels in the Great Lakes with funds received from commercial ports and shippers through a user fee. Corps policies require that dredged material be managed using the least costly alternative that is in compliance with applicable environmental laws and regulations. About one-half of the sediments dredged from Great Lakes harbors and channels are not contaminated and are suitable for open water disposal. Clean materials that are predominantly sand are generally used for nourishment of beaches or the nearshore littoral system. Fine-grained sediments (silts and clays) that are not contaminated could be used beneficially but are often placed in deeper, open water disposal sites because this is the least costly alternative. Dredged material

Beach/nearshore nourishment (continued)

Since the early 1900s when Conneaut, Ohio's, harbor was first significantly altered for commercial navigation purposes, harbor structures have interfered with the natural eastward movement of sand along the area's Lake Erie shore. These structures block sediment movement, starving some beaches and creating sediment buildup requiring periodic dredging. In 1999 the U.S. Army Corps of Engineers proposed to conduct maintenance dredging of the municipal channel, coupled with open lake disposal of the coarse-grained sediments. Ohio and Pennsylvania, with policies promoting shoreline stability as part of their respective coastal zone management programs, were able to get the original Corps disposal plan changed. Under the revised plan, about half of this sediment, 40,000 cubic yards, was determined to be beach quality and was placed by hydraulic pipeline in 14 feet of water just east of the harbor. Further dredging and disposal at Conneaut Harbor may follow this example, which reduces open lake disposal and provides a benefit to beaches.

Credit: Pennsylvania Dept. of Environmental Protection

Credit: Illinois State Geological Survey

The 1987-88 construction of the 72-acre North Point Marina on the Illinois shore of Lake Michigan required the hydraulic dredging of approximately 1.5 million cubic yards of gravelly sand. This sediment was dispersed to the south side of the marina basin to form a feeder beach for downdrift nourishment. As of 1999, most of the available sand and gravel has been eroded from this initial nourishment area. Downdrift beaches are still benefiting as the sediment stream continues to nourish southward areas along the shore.

with contamination levels that preclude open water disposal are generally placed into confined disposal facilities (CDFs). Some of the dredged material placed into CDFs is only lightly contaminated and may be suitable for certain types of beneficial use. However, many of the existing CDFs (constructed in the 1970s) allow disposal at a lower cost than beneficial use. When beneficial use is more costly than other permitted disposal alternatives, a non-federal interest (state, county, city or non-profit group) is needed to pay for all or part of the difference.

The determination by the Corps of the least costly, environmentally acceptable disposal alternative for dredged material management is sometimes controversial. States and other federal agencies have encouraged the Corps to be flexible in making this determination in order to increase beneficial use. Creative cost sharing arrangements between federal, state and local governments, citizen groups, ports and others are key to promoting beneficial use projects.

Beneficial Use of Dredged Material in the Great Lakes

(selected U.S. projects)

Capping

Capping is the placement of clean or relatively clean dredged material on top of other land areas or in aquatic environments. Usually this is done to provide a layer of cleaner material over more contaminated material so that the contaminated area will not harm human health or the environment. In this way, the dredged material serves as a "cap" on top of other land / materials.

Land creation / improvement

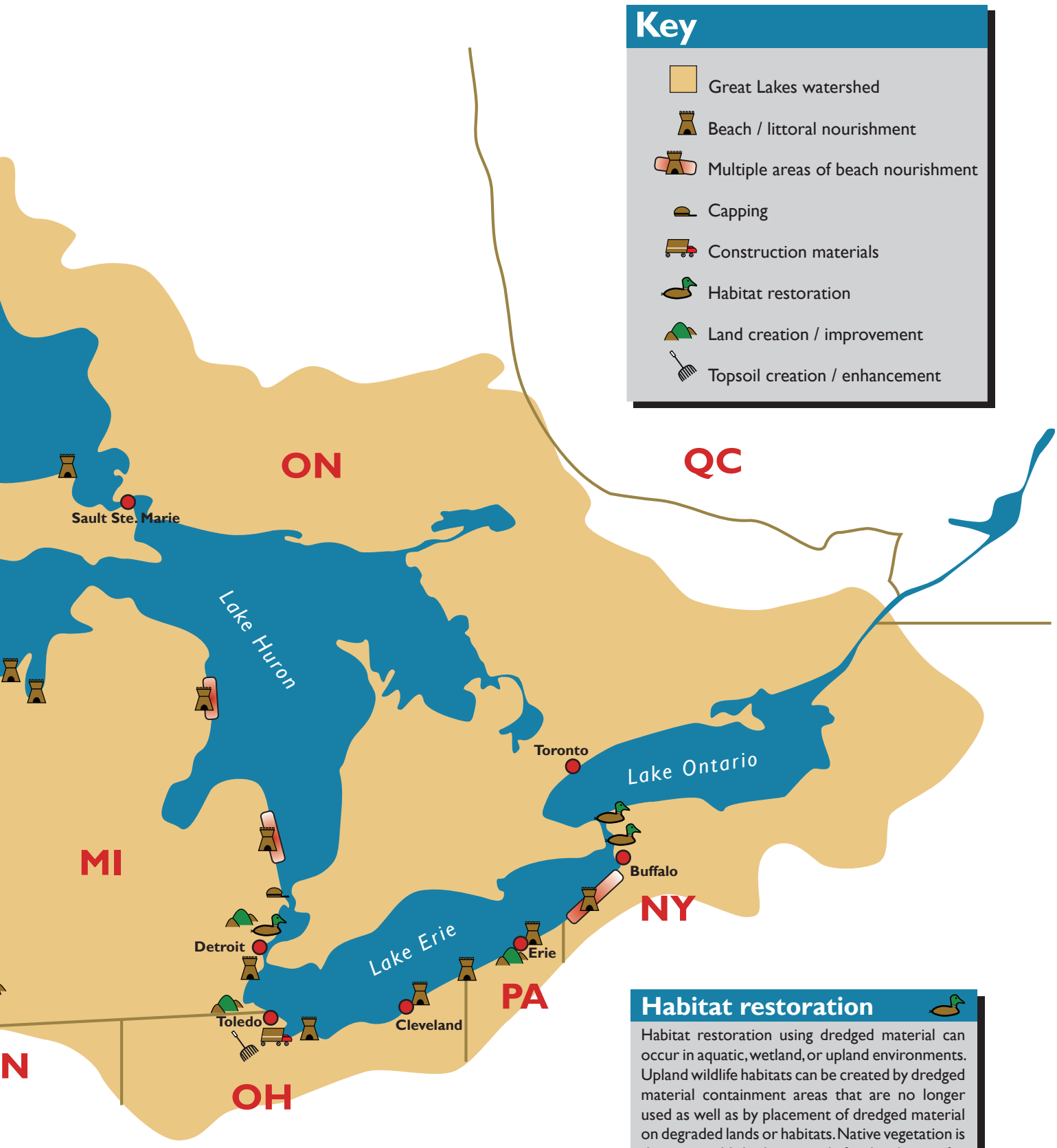
Land creation or improvement includes the building of dikes and berms for shore protection; filling, raising and protecting submerged and low-lying areas; and applying material to areas where the quality of existing land is poor, such as mineland or brownfields reclamation. Land creation and improvement with dredged material is often associated with other benefits, such as capping or habitat creation.

Topsoil creation / enhancement

Topsoil enhancement usually involves allowing dredged material to dry out and applying it alone or mixing it with other materials to make topsoil. Dredged material is commonly composed of silt, clay, and organic matter – all important components of topsoil. However, it often requires the addition of some components, such as biosolids or manure, to make it a valuable topsoil (Green Bay and Milwaukee are demonstration projects).

Beach / littoral nourishment

Beach/littoral nourishment is the placement of dredged material along the shore or in the nearshore area to provide a source of nourishment for natural sand (littoral) movement or recreational beach improvement and creation.



Habitat restoration

Habitat restoration using dredged material can occur in aquatic, wetland, or upland environments. Upland wildlife habitats can be created by dredged material containment areas that are no longer used as well as by placement of dredged material on degraded lands or habitats. Native vegetation is then re-established to provide food and cover for wildlife. Strategic placement of dredged material can also be used to restore and establish wetlands and to create aquaculture ponds for fisheries.

Construction materials

Construction materials can use the sand portion of dredged material in road construction and rip-rap. Dredged material can also be used as an ingredient in the manufacture of bricks, ceramics, and concrete.

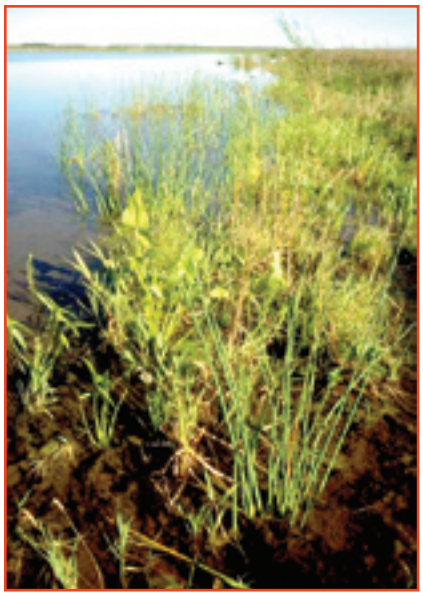
Multiple uses of dredged material at Duluth-Superior Harbor

The twin ports of Duluth, Minn., and Superior, Wis., combine to form one of the largest tonnage ports in North America. Their shared harbor was made possible by dredging and material placement for waterfront land. For example, Duluth's public marine terminal was created on 1.2 million cubic yards of dredged material. Waterfowl and wildlife also have benefited where islands were created in the harbor. The harbor generates more than 100,000 cubic yards of dredged material each year in regular channel maintenance. Finding places for this material has become a problem, but one with several beneficial use solutions. Almost all of the material is currently placed at the Erie Pier Confined Disposal Facility, a former coal dock used by dredgers since the late 1970s. This CDF is almost full, but substantial recycling of material diverts between 20 percent and 25 percent for productive uses.

Sediment separation plant in operation at Erie Pier CDF
Credit: U.S. Army Corps of Engineers

Construction fill being loaded at Erie Pier CDF
Credit: U.S. Army Corps of Engineers

At Erie Pier the recycling of the dredged material has employed a "soil washing" process to separate sediment particles by size. Contaminants often associate with particular sediment types (usually finer grain sizes). In a sloping part of the CDF, water is pumped over the dredged material allowing the coarser or cleaner material to settle out. This material is then removed and used as construction fill for highways and at building sites. In an experiment, a mechanical treatment plant was set up at the CDF to separate sediments and test the feasibility of mobile equipment. Another experiment promoting the recycling of Erie Pier sediments involves strip mine reclamation. On Minnesota's Iron Range there are 25,000 acres of tailings (mining waste) basins, many of them affecting wetlands. Dredged material, not contaminated by trace metals or organic compounds, was moved to a tailings basin and seeded. Plant growth was much greater where the dredged material had been applied, compared to areas where tailings were left as is. Although cost of transport remains an issue, such experiments are showing the way to new and needed uses for dredged material.



Wetland created using dredged material from Erie Pier. *Credit: Minnesota Dept. of Natural Resources*

Those interested in beneficial use, particularly states and localities, have requested a modification of the federal standard so that it can provide flexibility to allow for beneficial use by considering a wider range of costs and benefits associated with different management alternatives. In the Great Lakes region, the Corps is making efforts to apply the federal standard in a way that can allow for greater beneficial use.

The presence or absence of markets for using dredged material also makes a difference. When there is a need for material or a product that can be met with dredged material, then the costs of providing the dredged material can be compared to that of providing material from another source. In the case of highway construction in northeastern Minnesota, using dredged material from Erie Pier CDF in the Duluth Harbor has been more cost effective in some cases than using other sources. Many potential markets for dredged material exist, but are only beginning to be explored. Competition with other "waste" products, which have similar beneficial uses, and resistance by suppliers and transporters of conventional source materials are market barriers for beneficial use of dredged material. Markets for using dredged material will be advanced as more needs are identified and as dredged material continues to adequately serve

Physical and chemical characteristics of dredged material

Dredged material has unique chemical and physical characteristics depending on the source of the material, which is linked to past and present land uses in the watershed. Physically, dredged material can vary from fine clays and silts to coarse sand. Chemically, dredged material may contain valuable nutrients. In some cases the material is clean; other times, it can be burdened by any variety of contaminants from pathogens to polychlorinated biphenyls (PCBs).

Certain dredged materials lend themselves to certain end uses. Loamy materials are better for agricultural and land applications. Sandy material is appropriate for beach/littoral nourishment or replacement fill for construction projects, while less permeable clays and silts may be used for aquaculture ponds and also for the manufacture of construction products such as ceramic tile. In many cases, dredged material consists of a mixture of sand and clay and may need to be processed to separate coarse from fine materials in order to increase beneficial use options. Regardless of its physical characteristics, dredged material intended for upland beneficial use requires dewatering, which usually means temporary placement of the material so it can dry out.

Chemical characteristics also affect the type of beneficial use options available for dredged material. Material that has high organic content might be more appropriate for topsoil creation or enhancement. Material that is free of contaminants obviously has a wider range of beneficial use options available. While material from some areas within the Great Lakes basin is considered "clean," many sediments in and outside federal navigation channels are contaminated. The Corps routinely tests the physical and chemical characteristics of sediments to be dredged to determine the suitable disposal options.

Credit: U.S. Army Corps of Engineers

Island creation and habitat restoration

The Pointe Mouillee Confined Disposal Facility is a 700-acre diked area in Lake Erie designed to contain contaminated dredged material from the Detroit and Rouge rivers. Its beneficial use is linked to its role in providing and protecting different kinds of wildlife habitat. Pointe Mouillee is near the mouth of the Huron River, an area with extensive wetlands. Dams on the river have reduced sediment flow and, as a consequence, a natural barrier island that protected back barrier marshes was destroyed by wind and wave action. The CDF with its long, crescent shape was designed to protect the fragile wetlands as a substitute for the barrier island. The CDF with its internal diking system, along with the nearby Pointe Mouillee State Game Area, is managed as productive waterfowl habitat.

What about contaminated dredged material?

One of the key issues facing the beneficial use of dredged material is how to address contaminated sediments. Just because dredged material is not pristine and sandy does not mean it can't, or shouldn't, be used safely and beneficially in other ways. Where contamination exists, the type and level of contamination must be weighed against the end use of the dredged material to ensure that the beneficial use is protective of human health and the environment. Two approaches can be used to ensure that the use of dredged material is truly beneficial from an environmental standpoint.

Treatment

First, dredged material can be treated. Treatment involves reducing, separating, immobilizing and/or detoxifying contaminants. Treatment alternatives range from relatively inexpensive to very costly; from simple to sophisticated. The level of sophistication and cost of treatment depend on the physical makeup of the dredged material, the level of contamination and the end use. Soil washing, for example, can be relatively simple and inexpensive. It involves separating sediment particles based on size, density or surface chemistry differences. Since contaminants tend to associate with fine grain and organic materials, removal of these parts may render the remainder of the material suitable for beneficial uses. Soil washing technologies have been demonstrated in the Great Lakes basin at the Erie Pier CDF in Duluth, Minn.; the Bay Port CDF in Green Bay, Wis.; and at the Saginaw Bay CDF in Michigan. Composting, which involves mixing dredged material with organic matter and wood chips to degrade organic contaminants, is another "low-tech" treatment option. Composting certain dredged material has promise for creating a safe topsoil.

On the "high-tech" and more costly end, a variety of chemical, electrochemical and thermal technologies have been shown to break down or destroy contaminants. Thermal treatment involves heating contaminated materials to extremely high temperatures so that organic contaminants, like PCBs and polyaromatic hydrocarbons (PAHs), are destroyed and heavy metals are immobilized. Heavy metals, such as lead and mercury, are one class of contaminants that require such aggressive forms of treatment for their degradation. For example, a pilot project is underway to convert highly contaminated dredged sediment from the Fox River in Wisconsin into glass aggregate through a thermal treatment process technically known as vitrification. However, not all thermal treatments can degrade harmful metals, and some may cause metals to vaporize, which raises concerns about air emissions.

Exposure control

Second, contaminated dredged material can be used in a manner that eliminates the risks from contamination by eliminating exposure pathways (i.e., ways the contaminants can escape into the environment). This approach, known as exposure control, uses a risk analysis that examines potential exposure pathways and controls and/or restricts uses of the material or the property/product where the material is placed or applied so that the contamination exposure routes are eliminated. Exposures can be controlled through engineering methods that physically contain the material, such as pavement or sheet piling, or through institutional methods, such as deed restrictions that restrict the property to certain uses (e.g., industrial) where exposure pathways are more limited. An example would be using mildly contaminated dredged material as backfill where more contaminated soil was removed (e.g., a brownfields site) and where a site, comprised of impermeable clay soils, will be capped with clean material or will be permanently paved over, so there is no way for the contamination to escape into the environment. A combination of treatment and exposure controls/restricted uses can increase beneficial use options for dredged material.

Treating contaminated dredged material for beneficial use at Milwaukee CDF

Contaminated dredged material can be treated to make it suitable for beneficial use. At the Milwaukee Confined Disposal Facility, the Army Corps of Engineers has been involved in a demonstration project to treat dredged material in an old-fashioned way: composting. In this case, composting involved placing the dredged material in rows of mounds over wood chips and sewage sludge. Special equipment known as a SCAT turner was used to turn the biomounds allowing more oxygen to facilitate biodegradation. This process was repeated twice. Both times it resulted in a significant percent reduction in polychlorinated biphenyls (PCBs), a persistent organic contaminant, so that the PCBs were no longer considered a risk by U.S. EPA standards (though this standard is not universal). Another benefit to composting is that it typically reuses several solid "waste" products that would otherwise be going to landfills. The wood chips were provided by the city of Milwaukee's tree trimming efforts and the sewage sludge came from the city's waste water treatment plant.

Mixing dredged material with biosolids and woodchips at Milwaukee CDF. *Credit: U.S. Army Corps of Engineers*

Composting alone, however, does not seem to affect levels of polyaromatic hydrocarbons (PAHs), another persistent contaminant. A related demonstration project indicates that nature also may have a way for degrading PAHs through a process known as phytoremediation. Phytoremediation involves allowing certain plants to grow in the composted dredged material and naturally degrade the remaining PAH contaminants. Related studies conducted by the Corps indicate that the plants do not take up the contaminants, but rather have the ability to naturally break down PAHs. Composting and phytoremediation show promise for Mother Nature's ability to degrade harmful contaminants to allow for greater recycling and reuse of dredged material. In this case the goal of the composting and phytoremediation is to create a safe topsoil that can be sold commercially. Preliminary market studies indicate that the product could sell for about $10 a cubic yard, which would offset most or all of the costs of treating the dredged material.

Monitoring biomounds at Milwaukee CDF. *Credit: U.S. Army Corps of Engineers*

Laws, regulations, costs and technological developments directly influence beneficial use, but these factors also impact each other, creating a dynamic interplay of forces affecting beneficial use of dredged material. For example, even where market demand exists and cost is not an issue, the lack of adequate state policies or staff to evaluate beneficial use alternatives can stop beneficial use projects from happening. Policies that regulate beneficial use as a resource (to reduce/eliminate contamination or exposure to contamination) and technological advances make beneficial use possible. Lack of disposal space makes beneficial use imperative.

Topsoil creation: Recycling dredged material at the Toledo-Lucas County Port Authority

The Toledo-Lucas County Port Authority is involved with several initiatives to remove and reuse dredged material from the Toledo Harbor CDF. Most notable is a demonstration project that expands an ongoing partnership between the city of Toledo, the port authority and a private topsoil manufacturing company. Under contract with the city, the company recycles the city's sewage sludge for a fee and provides the city with 4 cubic yards of topsoil for every 1 cubic yard of sewage sludge removed. The company creates the topsoil by mixing the sewage sludge with dredged material and lime sludge, a by-product of the drinking water treatment process. The company pays the port about 95 cents per cubic yard to remove dredged material from the CDF for use in this process. The resulting topsoil has restricted uses due to concerns about pathogens from the sewage sludge, but has been used extensively as the final vegetative cover for the city of Toledo's landfill. This results in important cost savings for the city by eliminating the need to purchase other cover for the landfill. The material also has been used for landscaping at a state park, at the Toledo shipyard, at a local park and along roadways. Use restrictions could be removed if the material was allowed to sit for six months to a year so that pathogens could degrade naturally. The port is expanding the amount of acreage available for dredged material composting so that the material can be used without restrictions. In this way, the port hopes to create a program for permanent commercial-scale dredged material recycling.

Biosolid piles at Toledo CDF. *Credit: Great Lakes Commission*

Spreading biosolids at Toledo CDF. *Credit: Great Lakes Commission*

How can my community be involved with beneficial use?

Communities can get involved by identifying local projects that might be able to use dredged material instead of an original source material. Can a road construction project, a park or a brownfield reclamation project use dredged material? Communities also can pool their resources to promote dredged material recycling by forming a committee, task force or subgroup within existing groups. Whether you're an individual with a project idea or part of a group with an interest in dredged material recycling, an important first step is to discuss project ideas and engage in dialogue with local officials, a port authority and relevant businesses. (A list of state and regional agency contacts is provided on the inside back cover of this booklet.) Ask if there are any planned or current beneficial use projects underway and inquire how to get involved. Are there plans, project proposals or permits that can be reviewed? What is the timeline? Will there be public meetings for input or information sharing? If not, can one be organized? Aim to develop partnerships with other stakeholders. There is no one right way to get involved. Being determined and asking a lot of questions will likely lead to answers and results.

For more information...

State Agencies

Illinois
IL Environmental Protection Agency
Bureau of Water
1021 N. Grand Ave., East
P.O. box 19276
Springfield, IL 62794
Ph: 217-782-3362
Fax: 217-785-1225
Web: *www.epa.state.il.us*

Indiana
Sediment Remediation Coordinator
IN Dept. of Environmental Mgmt.
100 N. Senate Ave.
P.O. Box 6015
Indianapolis, IN 46206
Ph: 317-233-8905
Fax: 317-232-8406
Web: *www.in.gov/idem*

Michigan
Solid Waste Program
DEQ - Waste Management Division
P.O. Box 30241
Lansing, MI 48909-7741
Ph: 517-335-3383
Fax: 517-373-4797
Web: *www.deq.state.mi.us.wmd* and
www.deq.state.mi.us/lwm

Minnesota
Minnesota Dept. of Natural Resources
Waters
1568 Highway 2
Two Harbors, MN 55616
Ph: 218-834-6621
Fax: 218-834-6639
Web: *www.dnr.state.mn.us/waters/czm*

New York
New York State DEC
Beneficial Use Determinations
625 Broadway
Albany, NY 12233-7253
Ph: 518-402-8706
Web: *www.dec.state.ny.us/website/dshm/redrecy/bud.htm*

New York, *cont.*
Great Lakes Programs Coordinator
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Buffalo, NY 14203-2999
Ph. 716-851-7130
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Web: *www.dec.state.ny.us/website/greatlakes*

Ohio
Ohio EPA
Surface Water Division
Lazarus Government Center
P.O. Box 1049
Columbus, OH 43216-1049
Ph: 614-644-2041
Fax: 614-644-2745
Web: *www.epa.state.oh.us*

Pennsylvania
Pennsylvania Dept. of Environmental.
Protection, Office of the Great Lakes
230 Chestnut Street
Meadville, PA 16335
Ph: 814-332-6816
Fax: 814-332-6125
Web: *www.dep.state.pa.us*

Wisconsin
Wisconsin Dept. of Natural Resources
Water Division, Bureau of Watershed
P.O. Box 7921
Madison, WI 54307
Ph: 608-267-7694
Fax: 608-267-2800
Web: *www.state.dnr.state.wi.us*

Federal Agencies

U.S. Army Corps of Engineers
Great Lakes and Ohio River Division
U.S. Army Corps of Engineers
111 North Canal Street, 12th Floor
Chicago, IL 60606-7205
Ph: 312-353-6354
Fax: 312-353-3138

Detroit District
P.O. Box 1027
Detroit, MI 48231-1027
Ph: 313-226-6796
Fax: 313-226-3519
Web: *www.lre.usace.army.mil*

Buffalo District
1776 Niagara Street
Buffalo, NY 14207
Ph: 716- 879-4104
Fax: 716-879-4355
Web: *www.lrb.usace.army.mil*

Chicago District
111 N. Canal
Chicago, Il. 60606-7206
Ph: 312-353-6400
Fax: 312-353-2525
Web: *www.usace.army.mil/ncc*

U.S. EPA
Region 5
Environmental Protection Agency
77 West Jackson Blvd
Chicago, IL 60604-3590
Ph: 312-886-4885
Fax: 312-886-9697
Web: *www.epa.gov/region5*

Great Lakes Commission
400 Fourth St.
Ann Arbor, MI 48103-4816
Ph: 734-665-9135
Fax: 734-665-4370
Web: *www.glc.org*

Great Lakes Dredging Team
c/o Great Lakes Comission
Web: *www.glc.org/dredging*

About the Great Lakes Commission

The Great Lakes Commission, chaired by Nathaniel E. Robinson (Wisconsin), is a nonpartisan, binational compact agency created by state and U.S. federal law and dedicated to promoting a strong economy, healthy environment and high quality of life for the Great Lakes-St. Lawrence region and its residents. The Commission consists of state legislators, agency officials and governors' appointees from its eight member states. Associate membership for Ontario and Québec was established through the signing of a "Declaration of Partnership." The Commission maintains a formal Observer program involving U.S. and Canadian federal agencies, tribal authorities, binational agencies and other regional interests. The Commission offices are located in Ann Arbor, Michigan.

Great Lakes Commission
400 Fourth St., Argus II Bldg.
Ann Arbor, MI 48103-4816

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About the Great Lakes Dredging Team

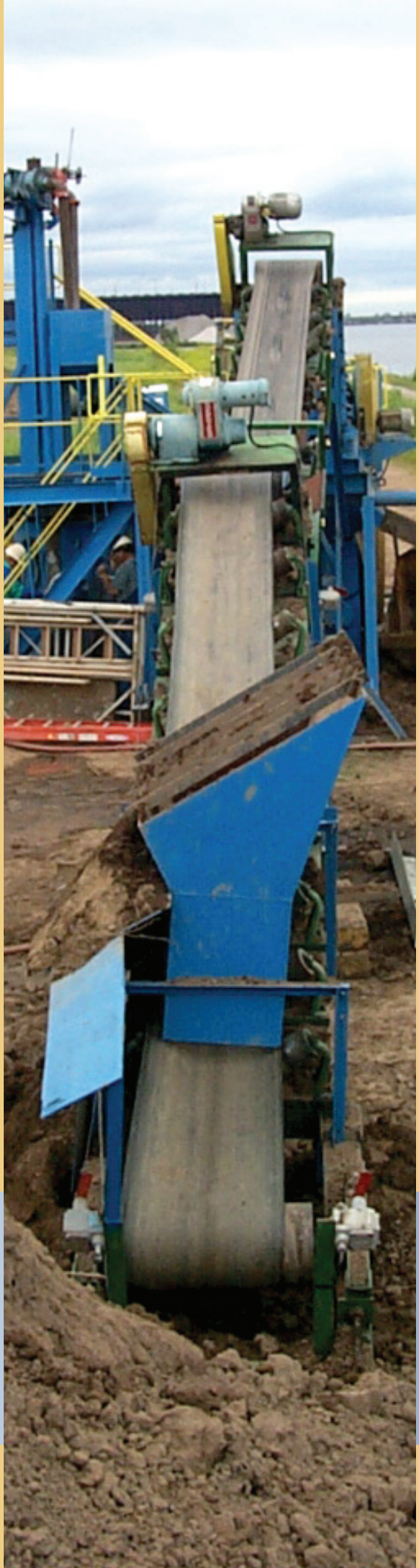
In 1993, the Department of Transportation's Maritime Administration initiated the Interagency Working Group on the Dredging Process to evaluate problems and delays encountered with dredging the nation's ports. The working group held public hearings at several locations, including Chicago, to obtain input and released a report of its findings in December, 1994. One of 18 recommendations was that National and Regional Dredging Teams be established to "provide a mechanism for timely resolution of conflicts by involving all agencies and maximizing interagency coordination." The Great Lakes Dredging Team was formed in 1996 in response to that recommendation and is composed of representatives (and alternates) from the following:

Federal Agencies
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Environmental Protection Agency
U.S. Fish & Wildlife Service
Maritime Administration
Natural Resources Conservation Service
National Oceanic & Atmospheric Administration (NOAA)

States / Interstate Agencies
State of Illinois
State of Indiana
State of Michigan
State of Minnesota
State of New York
State of Ohio
Commonwealth of Pennsylvania
State of Wisconsin
Great Lakes Commission

The Great Lakes Dredging Team is co-chaired by a federal and state representative. The State Chair also leads the State Caucus whose membership is the Great Lakes states and the Great Lakes Commission. The full Dredging Team meets twice per year; issue-specific work groups can meet at other times.

For Further Information
Call the Great Lakes Commission at 734-665-9135 or visit the Great Lakes Dredging Team website at *www.glc.org/dredging*



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