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The newsletter of the Great Lakes Commission



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DREDGING NEEDS DON'T DISAPPEAR WITH RISING WATER LEVELS



T HIS ISSUE OF THE ADVISOR showcases the interconnectedness of dredging with coastal restoration, maritime infrastructure, invasive species management, water levels and climate change. So why does dredging matter? Well, for many reasons, but mainly because the economic vitality of our ports and coastal communities is directly dependent on their accessibility. Dredging keeps our channels and harbors open and safe for navigation for both commercial and recreational interests.

The Great Lakes Commission (GLC) has been the secretariat for the Great Lakes Dredging Team (GLDT) for more than two decades – offering a forum for both governmental and non-governmental Great Lakes dredging interests to discuss the region's dredging needs. For more information, visit greatlakesdredging.net.

On the pages to follow, GLC Commissioner Steve Galarneau (WI) and Pauline Thorndike from the U.S. Army Corps of Engineers (USACE) – current co-chairs of the Great Lakes Dredging Team – discuss the concerns and inherent regulatory hurdles of dredged material management within the Great Lakes basin, including open-water placement of dredged material, which has been a hot-button issue in Lake Erie over the past year.

Given the many challenges with open-water placement and alternative dredged sediment management options, cooperation between state, local and federal governments is necessary. This type of cooperation is exemplified by Wisconsin's Cat Island Chain project (see cover photo), which is using dredged material from the navigation channel in Green Bay to restore habitat in a string of barrier islands. Also, in Ohio, the state has offered \$10 million to support beneficial use projects, further underscoring Ohio's commitment to finding alternatives to open-water placement.

This year Congress passed the Water Resources Recovery and Development Act (WRRDA), which, for the first time, designates the Great Lakes as a single navigation system and aims to make the Harbor Maintenance Trust Fund (HMTF) expenditures more equitable

and beneficial to the Great Lakes. WRRDA also speaks to invasive species management, authorizing the U.S. Fish and Wildlife Service to coordinate Asian carp efforts in the upper Mississippi and Ohio rivers, and directing USACE to undertake emergency and interim measures to prevent invasive species from entering the Great Lakes.

In this *Advisor*, you'll also read about some innovative actions taking place at Baltic seaports to safely remove layers of bottom material contaminated by a legacy of industrial discharge without stirring up and resuspending toxics in the water column. In the Great Lakes, in addition to concerns about contaminated sediments, open-water disposal of dredged material has also given rise to concerns that it could be exacerbating harmful algal blooms in parts of the Great Lakes.

We must critically evaluate our coastal infrastructure and dredging needs. Even with rising water levels on the Great Lakes in 2014, regular maintenance dredging is essential to maintain safe navigation in Great Lakes harbors and channels. And the challenges will continue with long-range climate projections and ongoing uncertainty about the future of federal support for navigation dredging and maintenance of coastal infrastructure such as piers and breakwaters. ●

TIM EDER

Executive Director

The dredging equation

A calculation with economic, environmental and public safety factors

ALMOST ALL GREAT Lakes harbors were initially defined by nature – at river mouths, inlets, straits and coves – but refined by humans. By deepening channels through dredging and protecting approaches with piers and breakwaters, coastal communities opened their doors to maritime commerce, an economic driver that continues to produce jobs and investment in many forms today. The 139 federally authorized working harbors on the U.S. side of the Great Lakes, 60 commercial and 79 recreational, also provide public safety benefits as harbors of refuge, and contribute greatly to the region's quality of life.

But working harbors require investment. Harbor maintenance, particularly dredging, is as critical to the maritime infrastructure of the Great Lakes as highway maintenance is to the surface transportation modes. The natural forces that had to be contended with when Great Lakes harbors were built, such as erosion and sedimentation from upland areas, littoral (coastwise) drifting of sand, wind, waves and storms, are continuing processes, and thus, so is the job of harbor maintenance.

In a given year, the U.S. Army Corps of Engineers (USACE) is allocated roughly \$20 million to \$30 million to remove 2-3 million cubic yards of sediment from navigation channels (see the article by

Pauline Thorndike in this *Advisor*) to assure at least minimally safe depths for cargo vessels and recreational boaters. It is estimated that upward of \$40 million annually would be needed to maintain channels to full authorized depth and width.

The return on the investment is well documented. Recent economic impact studies indicate that the Great Lakes navigation system annually generates \$33.6 billion in business revenue and an additional \$115.5 billion from related user industries. But management of the Great Lakes water resource today demands more than an economic rationale; the harbor maintenance function must also protect, and even enhance Great Lakes ecological integrity. To that end, navigation dredging of Great Lakes waterways now employs advanced technologies and equipment emphasizing best practices, and a more collaborative approach among federal, state and local interests to get the job done with maximum cost efficiency and minimum environmental impact.

The fact that the Great Lakes have a legacy of pollution to overcome adds significantly to the challenge. Remediation efforts over the past five decades have reduced point sources of pollution in the Great Lakes, and the U.S. and Canadian commitment to clean up industrial legacy hot spots – Areas of

Concern (AOCs) – continues. The city of Buffalo, N.Y., as an example, has recently undertaken a large remediation project to bring life back to a once nearly dead river. Through a unique collaborative strategy, the project will not only achieve its remediation goals, but will also enable a more sustainable navigation dredging program in the future.

Long plagued by the city's once vigorous manufacturing industry, the Buffalo River and Ship Canal have historically been one of the dirtiest connecting channels in the Great Lakes. In fact, it caught fire before the infamous Cuyahoga River blaze in Ohio in the late 1960s. This once industrial waste dump is being revitalized by the cooperative efforts of the USACE and the U.S. Environmental Protection Agency (U.S. EPA).

With a boost from Great Lakes Restoration Initiative funding, USACE and U.S. EPA along with local nonprofits and private companies are working toward revitalizing the river by removing 488,000 cubic yards of contaminated sediment. With this material permanently removed, future sediment dredged from navigation channels will not have to be managed as toxic waste, but rather be made available for other management options, including beneficial use.

Management of dredged material continues to be one of the most challenging

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The dredging equation, continued from page 3

aspects of Great Lakes navigation dredging. Historically, much of the dredged material, like Buffalo's, carried the legacy of the region's industrial economy in the form of toxic chemicals, and thus had to be managed as hazardous waste and placed in confined disposal facilities (CDFs). With many of those facilities currently at or near capacity, and with many of the toxics cleaned up, the need has increased for more environmentally sustainable options, such as beneficial use.

As a result of improved land and water management practices, and successful remediation projects, sediment dredged from navigation channels is increasingly cleaner and more suitable for use as a commodity with value rather than a solid waste. Dredged sediment is now being used successfully for civil engineering and construction projects, landscaping and fill, brownfield reclamation, and wildlife habitat restoration.

In one of the most creative and successful restoration examples, sediment dredged from approach channels to the port of Green Bay is being used to recreate the Cat Island chain of barrier islands, some 270 acres of upland habitat that will also protect another 1,400 acres of shallow water for vegetation and fish habitat.

By building sustainability and value-adding components into its already critical role in assuring safe, reliable maritime transportation, dredging on the Great Lakes continues to be a vital part of the overall Great Lakes management function. ●

New WRRDA applauded for Great Lakes navigation system reforms

E **NACTMENT IN 2014** of an updated Water Resources and Development Act (re-titled the Water Resources Reform and Development Act, or WRRDA) was a welcome development for Great Lakes ports and navigation interests.

"If properly implemented, WRRDA 2014 could change both how the Great Lakes Navigation System is managed and how much maintenance money it receives," said James Weakley, president of the Lake Carriers' Association, and a member of the Great Lakes Commission's Ohio delegation. "It could be the most significant event since the opening of the Seaway and the first step in the restoration of our ports and connecting channels."

The WRRDA bill passed by the 113th Congress replaces WRDA legislation last amended in 2007. After six months of negotiation, both chambers successfully agreed on language and released a conference report in May. President Obama signed WRRDA in June. The updated legislation addresses a number of regional priorities including new funding opportunities for Great Lakes navigation and maintenance programs.

One of the most significant features of WRRDA is designation of the Great Lakes as a single navigation system. Great Lakes navigation advocates,

including the Council of Great Lakes Governors, the Great Lakes Commission and the Lake Carriers' Association, have long supported such a designation for budgetary reasons. As a single system consisting of a network of interdependent ports, it is thought, the Great Lakes will be able to compete more effectively with other U.S. regional navigation systems for upkeep and maintenance funding.

Historically, Great Lakes navigation maintenance funding has been allocated on a project-by-project basis. Supporters of the new system designation hope it will enable the U.S. Army Corps of Engineers to structure a more holistic approach, with greater flexibility to apply resources on a needs basis.

The authorization bill also includes major reforms to the Harbor Maintenance Trust Fund (HMTF), which is fed by the Harbor Maintenance Tax (HMT) on waterborne cargo. It is estimated that by the beginning of FY2015, the surplus of HMT collections over expenditures will grow to approximately \$8.5 billion. Rather than being used for their intended purpose, these user fees are instead siphoned off to balance the federal budget each year.

The newly enacted WRRDA aims to balance HMTF revenues with expenditures by 2025. It also provides three set asides or "funding buckets" applicable to the Great Lakes. The first is a specific Great Lakes set aside of 10 percent above FY12 levels for Great Lakes ports. The second and third specifically set aside five percent for "Emerging Harbors" and 10 percent from overall HMTF expenditures for "Underserved Harbors."

"Emerging Harbors," which include some Great Lakes harbors, are those that handle less than one million tons of cargo annually. These harbors are currently known as "low-use harbors." "Underserved Harbors" are defined as having less than 10 million tons of cargo throughput annually. The authorizing bill also sets funding targets for appropriations bills and ties those goals to specific expanded uses of the HMTF. ●





CONVERGING CRISES

Many Great Lakes harbors adjusting to new playing field

C H A N G I N G P A T T E R N S – in both climate and government funding policies – have prompted many U.S. Great Lakes coastal communities to rethink long-term harbor maintenance strategies for the coming years.

Two converging trends, in particular, are causing growing concern: long-range climate projections, which may include lower water levels over time with increased storm volatility; and ongoing uncertainty about the future of federal support for navigation dredging and maintenance of coastal structures such as piers and breakwaters.

While the unusually heavy snowfall and extensive ice cover experienced in 2014 helped to lift lake levels as much as two feet in lakes Superior, Michigan and Huron from the previous year, memories of the 13 prior years of below-average water levels are still vivid. Few discount the possibility that a lengthy low-water trend could return to the Great Lakes and, with it, the associated economic losses to shipping and boating interests, not to mention the health and safety risks posed by groundings and loss of access to

harbors of refuge during storms.

Even when water levels are at or near their long-term average, regular dredging is essential to maintain safe navigation in Great Lakes harbors and channels. Budget constraints for maintenance dredging over the past 10 years or more have challenged the U.S. Army Corps of Engineers (USACE) to keep up with the dredging backlog exacerbated by lower water levels. This backlog of undredged sediment in federal Great Lakes harbors and channels is currently about 18 million cubic yards, a volume that USACE estimates will cost some \$200 million to remove. Recent annual USACE Great Lakes dredging budgets have been in the \$25 million to \$40 million range, enough to dredge between 2 million and 3 million cubic yards per year.

A recently established national directive limits USACE navigation dredging to commercial, deep draft ports only, with priority going to harbors with at least 1 million tons of annual cargo throughput. Based on that metric, only 37 of the 140 federally authorized Great Lakes harbors qualify. That leaves a sizeable cohort in the Great Lakes – about

a hundred other recreational harbors and small commercial ports – seemingly unbudgetable. Currently, 13 harbors (plus four connecting channel projects) are proposed for dredging in the Fiscal Year 2015 President’s budget request, all of them deep draft commercial ports.

“In essence, the Great Lakes [federally authorized] small harbors and their communities have been sustained by an ‘IV drip’ of earmarks for the past 15 years,” said Chuck May, chair of the Great Lakes Small Harbors Coalition, which represents shallow draft, largely recreational Great Lakes harbor communities. “Now even that IV drip has been shut off, cutting adrift some 98 harbors of the Great Lakes.”

Legislative reform efforts are underway to restore adequate funding for the U.S. federal Great Lakes dredging program, and hopefully make the funding “pie” large enough to satisfy all its constituents, large and small. But given a federal interest favoring commerce over recreation, Great Lakes small harbors will likely continue to struggle for the federal dollars upon which they have relied since the early 1900s to dredge their channels and repair their piers and breakwalls.

“The overall quality of life of the 1.6 million citizens in these small harbor communities and the 9 million in the counties these harbors anchor is truly at risk if we do not correct this crisis situation,” May says.

Going forward, approaches taken by these communities may have to employ more creativity, adaptability, resilience and partnership than ever before to ensure reliable navigation access to their harbor.

Creativity will be helpful to identify both new funding sources and new efficiencies to reduce the costs of dredging and dredged material management. Adaptability will be critical in the response to the full range of Great Lakes climate extremes, including high water as well as low. Resilience must be incorporated into long-lived structure repairs and replacements, using new engineering designs aimed more at working with natural forces, and not so much against them.

Finally, partnership and collaboration will be essential among neighboring harbors, states and users, all of whom share a stake in the future viability of these harbors. ●



Dredging material off Erie Pier, Port of Duluth-Superior, Duluth, Minn., ©Wisconsin Sea Grant.

PROGRAM SPOTLIGHT

Great Lakes Dredging Team hosts Open Water Placement Summit

P L A C E M E N T O F sediment dredged from Great Lakes navigation channels into the open waters of the lakes has long been standard procedure at some harbors, simply because it is often the easiest and most cost-efficient place to put the material. Currently some 23 percent of all material dredged for navigation projects in the Great Lakes is placed in the open waters of the lakes.

But questions persist, particularly among state regulators, about the cumulative impact of this practice on Great Lakes water quality. Most recently, concerns have focused on potential connections between open water placement of dredged material from approach channels at the port of Toledo to excess nutrient loading and harmful algal blooms in western Lake Erie.

To address these and other issues where state interests and federal policy converge, a recent Open Water Placement Summit was convened by the Great Lakes Dredging Team. The summit brought together state agency regulators, representing all eight Great Lakes states, to share and compare their respective open water placement policies, and U.S. Army Corps of Engineers (USACE) personnel who manage the Great Lakes dredging and dredged material management programs.

Much discussion centered on the Federal Standard for dredged material management, a fiscal policy requiring USACE to maximize efficiency by pursuing the least-cost alternatives for dredged material placement. Several state participants voiced interest in greater flexibility within the Federal Standard to explore alternatives to open water placement.

Also discussed was the Great Lakes Testing Manual used by USACE to determine the suitability of dredged material for open water placement.

Among outcomes of the summit was interest in strengthening relationships between the state and federal agencies involved in open water placement policy, and increasing collaboration in development of that policy. To better evaluate risks associated with open water placement to the Great Lakes aquatic ecosystem, the USACE Engineer Research and Development Center (ERDC) is currently conducting a literature review and synthesis due for completion in 2015.

A more detailed summary of the Open Water Placement Summit is available on the Great Lakes Dredging Team website at: <http://greatlakesdredging.net/news-events/meetings>. ●

CASE STUDY STOCKHOLM, SWEDEN - THE BALTIC SEA

A Baltic approach to sediment removal: “freeze dredging”

M A N Y G R E A T L A K E S H A R B O R S F A C E the difficult problem of having to dredge navigation channels clogged by polluted sediment. The challenge of removing a layer of bottom material contaminated by legacy industrial pollutants without disturbing the sediment and re-suspending toxics in the water column is a decades-old conundrum.

One clever approach, called “freeze dredging,” is being pioneered at the Baltic Sea port of Stockholm, Sweden. It was described by Stockholm port engineer Magnus Sjöberg at the recent Great Lakes Ports and Regional Growth conference convened by the Illinois Department of Natural Resources, Federal Reserve Bank of Chicago and the Great Lakes Commission in November 2013.

This in situ technology involves lowering large cast iron plates to the bottom of the site to be dredged. The plates, containing hoses filled with a salt solution that can be cooled to -22°F, are rested on the bottom for two days. When raised, the plates bring along with them about a foot of the frozen, toxic sediment which can then be placed



Cranes lift a slab of frozen toxic sediment at the Swedish port of Stockholm.

in an appropriate facility, leaving the water and natural sediment relatively undisturbed.

Applying an emerging technology like this could help to lessen the negative effects of increased turbidity in areas that are dredged often. ●



GLC COMMISSIONER STEVE GALARNEAU (WI)
CO-CHAIR, GREAT LAKES DREDGING TEAM

Dredged material placement: dialogue, flexibility and creative solutions needed

IT IS AN HONOR TO SERVE AS THE CO-CHAIR of the Great Lakes Dredging Team (GLDT). The U.S. Army Corps of Engineers (USACE) brings vast experience and technical skills to the challenges we all face when we work to meet our navigational dredging needs in the Great Lakes waters. The partnership between USACE, the U.S. Environmental Protection Agency, states and locals is crucial to meeting this charge. The GLDT offers the opportunity to work together to discuss and resolve tough issues, which is why we took on the discussion of open-water placement of dredged material.

Wisconsin, as with the other Great Lakes states, has seen increased navigation dredging needs as a result of lower lake levels and increased opportunities to remediate contaminated sediment sites through the Great Lakes Restoration Initiative Legacy Act Program. Dredging activities inherently call for a degree of flexibility, creativity and innovation to be successful. Wisconsin has worked closely with partners cleaning up sites. Wisconsin continues to seek good social-environmental options for dredged material management. As we make progress on remediating sites it affords us greater flexibility in the future for

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Cat Island Chain project,
Green Bay, Wis. ©Brown County /
U.S. Army Corps of Engineers

PAULINE THORNDIKE, U.S. ARMY CORPS OF ENGINEERS
CO-CHAIR, GREAT LAKES DREDGING TEAM

Dredged sediment management options are a shared responsibility



THE U.S. ARMY CORPS OF Engineers (Corps) annually dredges 2 to 5 million cubic yards of sediment from 25-50 federal harbors, projects and connecting channels across the complex U.S. Great Lakes Navigation System spanning from Duluth, Minn., to Ogdensburg, N.Y.

One of the biggest challenges in this dredging mission is finding mutually acceptable locations to place dredged sediment while adhering to an important requirement known as the Federal Standard. The Federal Standard is defined in federal regulations as the dredged sediment disposal alternative(s) identified by the Corps which represents the least costly alternative consistent with sound engineering practices and

meeting the environmental standards established by the Clean Water Act Section 404(b)(1) Evaluation process. It ensures that federal dredging funds are equitably distributed across harbors and states. Some state agencies impose requirements that exceed those of the Federal Standard. In such cases, the state (or another non-federal entity) will be asked to fund the difference in cost.

Open-water placement is a nationally common method of dredged sediment management, and is often the least costly alternative due to efficiencies in handling, low transportation costs and lack of real estate requirements. Although dredged sediments are getting cleaner across the Great Lakes due to decades of environmental efforts, some state agencies refrain from supporting open-water placement even if the sediment meets protective and

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Great Lakes Dredging Team Co-Chair Commentaries, continued

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maintaining navigation dredge depths in our ports and harbors. It is great to see all of the progress here in Wisconsin and across the Great Lakes in remediating contaminated sediment and the focus on beneficial use of dredged material.

Some of the issues particularly of interest to Wisconsin are dredged material placement options, beneficial use possibilities, and potential “mining” of existing confined disposal facilities for space allotment. Wisconsin agrees that more dialogue and flexibility in our decision processes will facilitate more dredging projects. It is also about finding creative funding mechanisms and opportunities to leverage resources at the state, local and federal levels to help make projects happen.

An example of a creative project in Wisconsin is the Cat Island Chain project. A rock-spine was built out into Green Bay essentially recreating islands that had eroded away as a result of high water levels in the past and loss of protective vegetation. This project is going to be a long-term site for beneficial use of dredged material from the navigation channel maintenance in Green Bay. This is truly a win-win project as a long-term solution to dredged material placement and critical habitat restoration (see <http://www.seagrant.wisc.edu/Home/Topics/HabitatsandEcosystems/Details.aspx?PostID=413>) for details). ●

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legal federal guidelines. At the same time, a large dredging backlog exists, confined disposal facility (CDF) capacity is dwindling and funds for construction of new CDFs are limited. Therefore, the Corps faces new challenges to corroborate open-water placement and help find alternative dredged sediment management options.

Beneficial use involves using dredged sediment for goals such as habitat restoration, beach nourishment, and industrial and commercial development. If a beneficial use option exceeds the cost of the Federal Standard, costs need to be shared by a non-federal entity. While beneficial use options can be hampered by state requirements, they can also be enabled through public and private grants or subsidies. Early and close interagency and local collaboration is paramount to successful beneficial use projects.

Strategies used to facilitate the management of dredged sediment must be economically and technically feasible, environmentally acceptable, and fiscally attainable if we are to achieve the goal of not impeding navigation on the Great Lakes. State and local governments must become actively engaged to find solutions to dredged sediment management needs. The continued economic viability of their harbors depend on their ability and willingness to share this responsibility. ●



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