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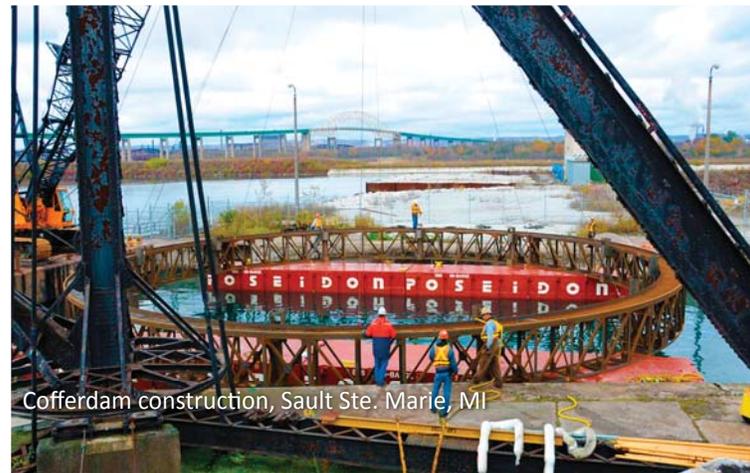
# 2009 Great Lakes Navigation Program Benefits

## Great Lakes Navigation Program: Benefits Achieved in 2009

The year 2009 was very successful for the Great Lakes Navigation Program. With very strong funding in the 2009 Omnibus Bill plus additional funds provided through the American Recovery and Reinvestment Act (ARRA), 2009 presented the largest Great Lakes navigation workload in recent memory. Total funding to Great Lakes navigation priorities amounted to \$186M, compared to a typical funding of around \$100 million. The \$114M of funding in the 2009 Omnibus Bill plus \$72M in ARRA funding came very close to the optimal funding for Great Lakes navigation needs (\$188M). With this strong program, dredging backlog was reduced by nearly 2 million cubic yards. Substantial progress was made in lock repairs at all three locks in the system (Soo Locks, Chicago Lock, and Black Rock Lock) and construction began on the new Soo lock. Major repairs were made to 7 navigation structures and significant progress was made on 8 dredged material management facilities.

The Corps has worked closely with our customers and stakeholders in recent years to identify and prioritize system needs. That communication greatly aided develop-

ment of the 2009 program, which was designed to maximize benefits to navigation customers and stakeholders. This document summarizes some of the many benefits achieved as a result of the healthy program in 2009. Benefits are not limited to navigation customers; the repair or restoration of navigation infrastructure also pays great dividends to local communities, industrial users, and the general public.



## Locks

All three Great Lakes Locks systems - the Soo Locks (Poe and MacArthur), Chicago Lock, and Black Rock Lock - must operate with an extremely high degree of reliability to meet their mission requirements. All locks in the system are facing the inevitable problems inherent with aging, requiring significant reinvestment for upgrades and repairs.

**Soo Locks:** In 2009, the Soo Locks Asset Renewal program was funded for over \$16M. This allowed purchase of a new hydraulics system to replace the one responsible for 4 unscheduled outages in 2008. The lock's new hydraulics system replaces the 24 existing, non-redundant hydraulic power units with 4 new units. Each new unit is equipped with a redundant pump and motor. The Poe Lock is often referred to as the Achilles' heel of the Great Lakes Navigation System and this much-needed work will greatly improve reliability of the lock. Additional funding for the Soo Locks went to upgrades to the Poe and Mac Lock utility lines, including new steam lines which are critical for deicing the lock walls. In addition, ARRA funding allowed for the purchase of stoplogs for the Poe Lock so that the gates can be removed and repaired if necessary. FY09 funds also initiated construction on the new Soo lock with the erection of the first cofferdam.

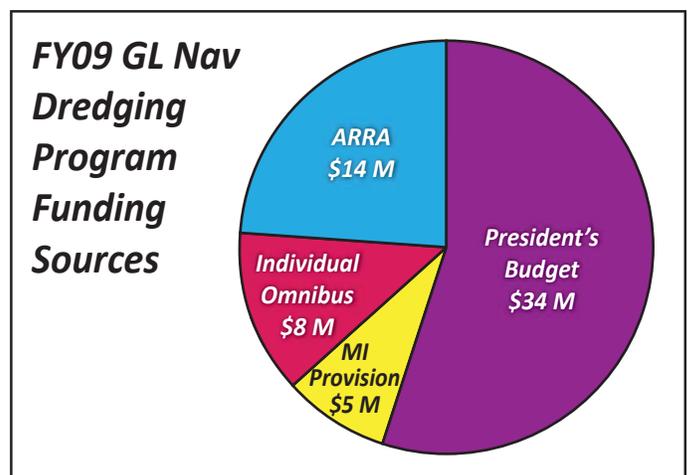
**Chicago Lock:** Over \$17M in ARRA funding allowed for the purchase of new east and west gates at the Chicago Lock. All four lock gates are over 70 years old and have outlived their design life. The replacement of these lock gates will ensure that the Chicago Lock is able to perform one of its primary missions - protecting downtown Chicago's \$1.4B in real estate from flood waters of the Chicago River, while ensuring that the lock also reliably meets its critical navigation mission.

**Black Rock Lock:** In FY09 ARRA funds were used to replace the Black Rock Lock's lower operating and guard gate sill. Additionally, funds were received through the Omnibus Bill to replace the upper operating gate sills. The lock provides the only means for deep draft commercial vessels to reach delivery

ports on the upper Niagara River; including a major coal power generation plant, fuel storage facilities, and a refinery. These repairs ensure the continued safe and reliable operation of the lock.

### **Dredging**

Increased FY09 funding levels allowed for the dredging of 33 commercial and 12 shallow draft harbors across the Great Lakes. The Great Lakes dredging program received a total of \$61M in 2009 (see pie chart). The benefit from this substantial



level of funding was increased even further by a 5% reduction in the average contract cost per cubic yard. The team continues to work on many different strategies to gain additional efficiency in our dredging program. The FY09 dredging dollars resulted in a total removal of 5.2M cubic yards, which is almost 2M cubic yards more than the 3.3M cubic yards that must be removed annually to stay even with the annual sediment load. With this program, dredging backlog was reduced to approximately 15M cubic yards. Dredging backlog had peaked at 18M cubic yards following the 2007 season. This substantial amount of funding allowed critical maintenance dredging to re-open harbors, provide safer navigation channels with less light-loading, and also

provided safe navigation into many shallow draft harbors of refuge throughout the lakes.

*FY09 Dredging Success Stories:*

- **Fairport Harbor, OH** is a deep draft commercial harbor with an annual tonnage of 2.5M, most of which is limestone for the area's construction industry and the steel mills in Cleveland. In 2009, over \$2M was received through the Omnibus Bill and \$400K was received in ARRA funds. This higher-than-average funding level allowed for the removal of outer harbor shoals which caused the grounding of a Seaway Marine vessel in 2008 and annually results in the formation of ice jams.

- **Dunkirk Harbor, NY** boasts a significant success story in 2009 that will hopefully lead to a return of commercial traffic to the harbor. Prior to 2005, U.S.-Flag lakers hauled 500K tons of coal to the power plant in Dunkirk. However, due to inadequate dredging, deliveries ceased in 2005. Funding in 2009 (\$376K Omnibus Bill and \$820K ARRA funds), allowed for the reopening of Dunkirk Harbor. Shifting the coal trade at this harbor back to lake carriers rather than rail would ease congestion on rail lines and reduce greenhouse gases.

- **Burns Harbor, IN** received dredging funds (\$2.6M in the Omnibus Bill) to remove shoals that threatened the blockage of power plant cooling water intakes at the NIPSCO Bailly Generating Station, which employs over 100 work-

ers and serves more than 457,000 homes and businesses in Northern Indiana, including the heart of Indiana's steel and manufacturing sector.

- Through increased FY09 funding **St. Joseph Harbor, MI** (\$793K Omnibus Bill, and \$750K ARRA funds) and **Grand Haven Harbor, MI** (\$1.2M Omnibus Bill and \$1M ARRA funds) were able to avoid closure. These harbors have had a recent history of annually developing 3-5 foot shoals in their outer harbors due to fall and winter storm events, often resulting in impassable federal channels by spring. FY09 funding allowed for these shoals to be removed from both harbors in early spring, opening the harbor to commercial navigation. Dredging in these harbors, also supports U.S. Coast Guard missions including ice breaking, search and rescue, and buoy tending. Additionally, because of its deep draft capabilities, St.

Joseph harbor was able to aid in military recruitment efforts by hosting a Naval Frigate which was docked in the harbor for a long weekend and resulted in a 300% increase in recruitment in the area. Among many annual maritime events in Grand Haven, the annual USCG Festival attracts over 500,000 visitors to this federal project.

- With \$815K in FY09 ARRA funding **Harbor Beach, MI** will be dredged in early 2010, providing continued support to the Detroit Edison Harbor Beach Power Plant, which relies solely on vessels for the delivery of coal. The plant requires



approximately 100K tons of coal on an annual basis. Delivering coal to this plant via rail is not an option. If waterborne coal delivery was not possible at the plant it would likely close, resulting in an increase in rates to Edison's Michigan customers.

- The Omnibus Bill provided \$5M in a regional provision for dredging at any of a list of 30 harbors in the State of Michigan (25 were shallow draft and 5 were commercial). Under the regional provision, the \$5M was distributed to 9 harbors. The regional provision is an extremely valuable tool that allows the Corps to apply funds to the most critical needs in the year of execution. By evaluating recent surveys and considering input from local communities and stakeholder groups, the regional funds are allocated to the most critical needs, thus optimizing scarce dredging funds in the most efficient means possible. One of the recipient harbors of part of the \$5M regional dredging provision was **Les Cheneaux Islands Channels, MI**; dredging is scheduled for completion in 2010. Les Cheneaux has over 7.5 miles of Federal channels that provide the sole linkage between the islands' residential community and the mainland services. The channels were shoaled in and in critical need of dredging. Because shallow draft harbors have a lower priority in the budgeting process, they had not received funding for dredging in over 30 years. The funding provided by the regional dredging provision (\$1.9M) combined with ARRA funding (\$500k) will provide a substantial dredging project that will restore functionality to these critical channels.



Harbor Beach, MI





Dredging  
St. Marys River, MI

### ***Dredged Material Management***

Great Lakes dredged material management activities were significantly funded in FY09 at nearly \$27M. The FY09 Omnibus Bill provided \$16M in funding and an additional \$11M was received in ARRA funds. These dollars were spread across many harbors for use in creating dredged material management plans (DMMPs), fill management in existing confined disposal facilities (CDFs), design and construction of new CDFs, and beneficial reuse of material in CDFs to create additional capacity. Without adequate dredged material storage capacity, critical maintenance dredging cannot be performed. Funding of dredged material management not only benefits commercial and recreational stakeholders, allowing dredging to take place, but it also benefits the environment by allowing for the proper placement of dredged material and the beneficial reuse of dredged material.

#### ***FY09 Dredged Material Management Success Stories:***

- In FY09 **Cleveland Harbor, OH** received \$3.1M through the Omnibus Bill and \$7.4M in ARRA funding for dredged material management. The existing CDF cells at Cleveland Harbor are nearing capacity; funding allowed for continued work on the DMMP, which is scheduled for completion in FY10. Because construction of a new CDF, if funded, would not be complete until 2017 at the earliest, interim dredged material management must be employed to allow dredging to continue. Interim measures funded in FY09 included fill management at Cleveland Harbor CDF cell 10B, which created an



Beneficial reuse activities  
Holland Harbor, MI

additional 400,000 cubic yards of capacity; completion of the design and Federal Aviation Administration application for reuse of CDF cell 9, which will provide additional capacity; and the award of a fill management contract for CDF cells 10B & 12 which will also provide additional capacity through regrading and dewatering of CDF sediments.

**-Lorain Harbor, OH** received \$595K in Omnibus funding, which allowed for completion of the harbor's DMMP in August of 2009, establishing long term dredged material management at an upland site without cost to the Federal government. Interim fill management measures are critical to ensure dredging of the harbor until the scheduled availability of this site in 2014. FY09 funding also allowed for the 2nd berm raising at Lorain CDF ensuring that the harbor will continue to be dredged and federal channels will remain navigable at this deep draft commercial harbor.

- The new **Indiana Harbor, IN** CDF received \$8.3M in the FY09 Omnibus Bill funding the design and continued construction of the new CDF's Ground Water Treatment Plant and Groundwater Gradient Control System, preventing outflow of contaminants from the CDF. The new CDF will receive additional funding in FY10 and FY11 and the CDF is expected to come on-line in 2011. Due to the lack of a suitable disposal facility for the Indiana Harbor's highly contaminated sediment, this project has not been dredged since 1972 and the average shoaling depth

in the channel areas is 3'. Light loading due to this shoaling and recent low lake levels result in increased transportation costs of between \$9.7M and \$13.1M annually to one of the largest steel making

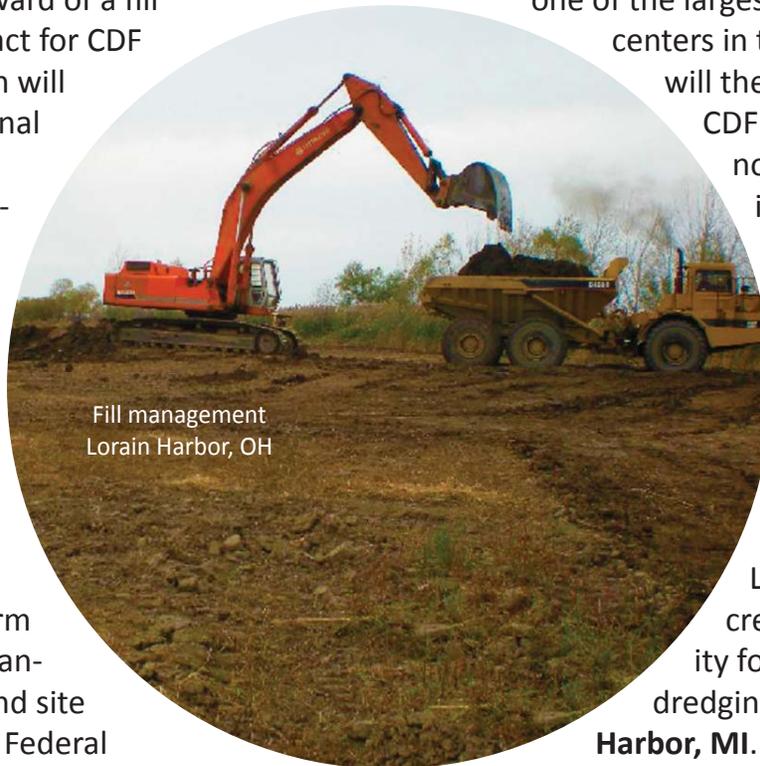
centers in the nation. Not only will the new Indiana Harbor CDF provide an economic benefit to

industry, it will also benefit the environment by removing contaminated sediments from the harbor.

- FY09 funding was used to mine material from the Lakeshore CDF to create adequate capacity for FY10 maintenance dredging of Inner **Holland Harbor, MI**. USACE partnered

with local entities in mining material for beneficial reuse by the cities of Holland and Zeeland, and Laketown Township. Future use of the material includes fill in parks, playgrounds and public gardens. Creation of CDF capacity was a necessity for FY10 dredging of this harbor, which supports a coal fired power plant. The power plant is not accessible by rail and the local utility estimates it would incur an increase of \$3M annually to truck coal to service the plant. Dredging and thus CDF maintenance is critical to continued operations of the Power Plant.

-FY09 funding of **Grand Haven Harbor, MI** allowed for site work and fill management on an upland placement site necessary to meet FY 10 maintenance dredging requirements. USACE partnered with local stakeholders on these efforts. Material excavated to create the placement site was



Fill management  
Lorain Harbor, OH

taken to the City of Grand Haven's composting facility to create compost for possible commercial sale.

### **Structures**

Navigation structure repair by contract across the Great Lakes System received a total of \$27M in FY09 ARRA funds. The 104 miles of breakwaters on the Great Lakes provide critical protection to navigation channels, harbors, and vital city infrastructure. Nearly a quarter of these structures are over 120 years old and 80 percent exceed the typical 50 year design life. The over \$27M in funding allocated to Great Lakes structures was used to repair 7 critical structures that typically receive a lower priority in funding.

#### ***FY09 Structures Success Stories:***

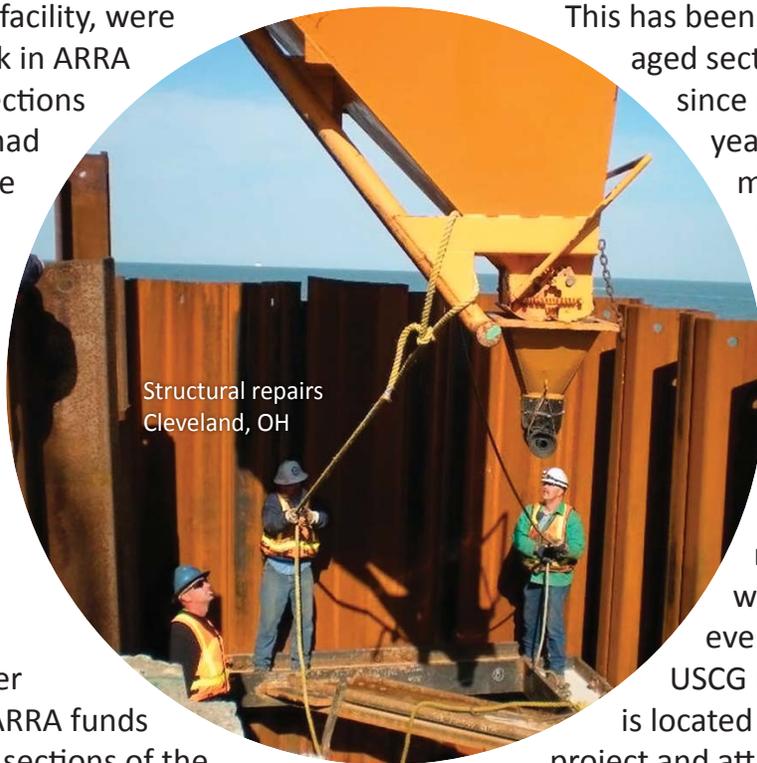
- Two areas of **Bird Island Pier** in NY, part of the Black Rock Lock facility, were repaired using \$400k in ARRA funding. The two sections that were repaired had been damaged by ice and erosion. In addition to functioning as one of the guide walls for the Black Rock Channel the pier also serves as a walkway that is used extensively by the public.

- **Chicago Harbor's** northeast breakwater received \$3.5 M in ARRA funds for stabilization of 2 sections of the northeast breakwater crib. Exposed timber cribs had become rotten due to recent low lake levels and several crib sections had failed. The northeast breakwater is the

harbor's primary shield from damaging wave action and potential flooding. Among other infrastructure protected by the northeast breakwater are Navy Pier, the Chicago Lock facility, and the Jardine Water Purification Plant. Navy Pier annually hosts 9M visitors, generating nearly \$138M in sales; the Jardine Water Purification Plant serves nearly 5M consumers in 118 municipalities. Breakwater repairs completed with FY09 ARRA funds help protect these critical infrastructure facilities.

- **Grand Haven Harbor, MI** received \$400k in ARRA funding to repair a damaged portion of the harbor's south revetment caused by a vessel strike. Without this project, the revetment would have continued to wash out from wave energy and further damage would have occurred, possibly closing the federal navigation channel and therefore eliminating commercial traffic to the harbor.

This has been a very visible damaged section of the structure since it happened several years ago. Over 1 million people annually visit the Grand Haven State Park, which is adjacent to the Federal Navigation project. Additionally, the community in Grand Haven holds many annual events with the most popular event being the annual USCG Festival. This festival is located on the federal project and attracts over 500,000 visitors annually. The structure repair was completed just in time for the annual USCG festival, which provided an extra reason to celebrate this year.



Structural repairs  
Cleveland, OH

- **Petoskey Harbor, MI** received \$4M in ARRA funding to complete a full reconstruction of the 1,400-foot-long breakwater. A 50-foot section of the breakwater was washed out several years ago during a winter storm. The integrity of the entire structure was in question. Without the repairs made possible through this funding, the municipal marina would be extremely vulnerable to wave energy, potentially leading to closure of the marina, and causing severe economic impacts to the area. Petoskey is a prime summer and fall destination, with the city population swelling up to 4 times its normal residential population in the busy summer months. The breakwater provides important protection to the city marina, park, and state highway.



Breakwater repairs  
Petoskey Harbor, MI

### **Conclusion**

Significant progress was made in 2009 on the dredging backlog, breakwater repairs, lock repairs and upgrades, and dredged material management projects. Funds in the amount of \$186M were received, which is very close to the annual optimal funding needs of \$188M for Great Lakes navigation projects. The dredging backlog decreased by 2M cubic yards and substantial progress was made on the reconstruction or rehabilitation of 7 structures projects. Key dredged material management projects were completed, increasing available capacity at 8 CDFs, which will extend their life and allow continued dredging in those harbors. In

addition, work was conducted at all three lock projects, improving reliability and reducing risks of unscheduled closures. Through the continued partnership of the Great Lakes Navigation Team and stakeholders, the 2009 Great Lakes navigation program provided many benefits to commercial and recreational navigation interests, industry, and local communities.

### **Contacts & Additional Information**

For additional information,  
visit our website:

U.S. Army Corps of Engineers  
Great Lakes Navigation Website  
[www.lre.usace.army.mil/greatlakes/navigation](http://www.lre.usace.army.mil/greatlakes/navigation)

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