Mississippi River Wetlands Creation – A Success Story

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Abstract:

Louisiana is known for its gumbo – a rich mixture of a variety of ingredients that combine for a dish that is known and enjoyed worldwide. Similarly, a number of groups contribute to freight movement on the Lower Mississippi River – a major supply chain artery for U. S. freight movement to and from the global marketplace. This paper describes how a variety of interests came together to collectively address Lower Mississippi River shipping, channel maintenance and the beneficial use of dredged material, resulting in progress in the battle over wetlands loss in a 28-mile reach of the Mississippi River.

Introduction:

The loss of wetlands in south Louisiana has been well documented and extensively studied. Louisiana is experiencing the greatest amount of wetlands deterioration and loss of any state in the Nation; an estimated 80 percent of the Nation's tidal wetlands loss has occurred in Louisiana, and by current estimates, as much as 29 square miles are lost each year, primarily in the Mississippi River deltaic plain region of south-central Louisiana. The rallying cry for coastal restoration has been heard through the most famous coastal wetlands loss statement known to man, "Louisiana losses a football field of land every hour." (United States Geological Survey).

One recent exception to this trend is marsh creation and nourishment adjacent to the Mississippi River Delta along Southwest Pass. Nearly 5,000 acres of marsh have been established and/or nourished in this area resulting from the recycling of dredged material from the Federal navigation channel maintained by the U.S. Army Corps of Engineers (USACE) more specifically by the USACE's Mississippi Valley New Orleans District (MVN). An overview of the various agencies and groups that have worked together to address safe

shipping, channel maintenance and increased marsh creation are described below.

Dredging and material placement:

Navigation channel maintenance in the area of Southwest Pass (Mississippi River) has historically been performed by hopper dredges, which draw sediment from the river bottom and store the material inside the dredge (hopper). When the dredge hoppers are full there are two ways to empty the material, (1) open the hoppers and allow the material to drop out, usually after transporting the material a number of miles to the Head of Passes Hopper Dredge Disposal Site (HDDA) or to the offshore Ocean Dredged Material Disposal Site (ODMDS) approved by the Environmental Protection Agency (EPA);

(2) connect to a pump-out facility **(picture)** where the material can be pumped via pipeline to a placement area.

The cost of these methods varies with the distance the dredged material has to be transported versus the time to empty the hopper. Cutterhead dredges function differently than hopper dredges and have different strengths. Cutterhead dredges use pipelines to transfer the material from the navigation channel to the placement area. Hopper dredges are basically specialized ships with dragarms for dredging and a hopper for storing the removed sediment. Hopper dredges are mobile and often preferred in high-traffic navigation channels, while cutterhead dredges require anchoring spuds and cables and require the assistance of a pushboat to move in and out of the channel. Thus representing a challenge for safe transits when working on or near a shipping channel.

Shipping overview:

The navigation channel on the Lower Mississippi River, Baton Rouge to the Gulf is the busiest shipping channel in the U.S., with four of the top 10 public

ports locating in this reach. An average of 6,000 ships a year enter and depart this channel through Southwest Pass. The navigation channel is authorized at 45 feet deep and 750 feet wide throughout the majority of Southwest Pass to provide two-way traffic, near the jetty end the width is reduced to 600 feet wide. Constrained Federal funding often leaves the MVN unable to maintain full project dimensions (depth and width) on this critical navigation channel. Swift currents, frequent river bends and ship operating characteristics make safe navigation a challenge for the Bar Pilots tasked with bringing ships to and from the open Gulf of Mexico to Pilottown (River Mile 2 Above Head of Passes). Pilotage from Pilottown to the Port of New Orleans is the responsibility of the Crescent River Port Pilots' Association.

Federal Standard:

USACE seeks to beneficially use material dredged from Federal navigation channels. There are numerous examples of successful stakeholder partnering to make this happen, several of which are highlighted by USACE Regional Sediment Management program. That said, constrained Federal funding results in USACE having to make difficult decisions. The practice emerging has come to be called the 'Federal Standard'. It can be summarized as dredged material will be placed in the least costly, most environmentally acceptable manner. Environmental acceptance is established through the State Water Quality Certification and Coastal Zone Consistency programs. In cases where a desired placement of dredged material results in additional cost, interested parties, generally through the non-Federal cost-sharing partner, may fund this cost.

Lower Mississippi Sediment Recycling:

Past practice for the Lower Mississippi River dredging was performed by hopper dredges with the dredged material taken to either the HDDA or the ODMDS. This material ranges in consistency from fine silt to coarse sand. The operating manner of cutterhead pipeline dredges with swing anchors, spuds and the required tug assist to move out of the channel was feared to increase the risks for safe navigation by ships. When anchored in cutterhead dredges are simply not able to move out of the way quickly especially when compared to hopper dredges or other ships.

Big River Coalition Formation:

The Big River Coalition (BRC), like many others, remembered the destruction of Hurricane Katrina and adopted the rallying cry heralded across the Gulf Coast, that the region had to achieve meaningful coastal restoration in the next decade. The process began with seeking to use the material being dredged from the Federal navigation channel to help change the perception of the navigation industry in Louisiana. The BRC was aware of the USACE's annual challenge to maintain the fully authorized dimensions (width and depth) of the navigation channel from the perspectives of constrained Federal funding and at times limited dredge availability. The BRC became an early supporter and vocal advocate for the Restore America's Maritime Promise (RAMP) initiative to fully use the Harbor Maintenance Tax for its intended purpose, maintenance of Federal navigation channels.

The BRC, from its initial formation, has focused on convincing others that material removed from navigation channels are a resource to be used to benefit the environment rather than "dredge spoils" - a waste product to be disposed of. They began to use and promote the term 'sediment recycling' to highlight the benefits of placing dredged sediment along the Louisiana coast or channel edges along Southwest Pass. The Coalition membership represents a broad cross section of navigation interests – deep-water and inland ports, shippers, barge and towing companies, stevedoring or cargo handling companies and private companies that engaged in the international trade of maritime commerce.

Corps Report on Hopper Dredge Pump-out:

The MVN issued a report titled Mississippi River Southwest Pass Hopper Dredge Pump-Out Review on November 9, 2007. This report evaluated the benefits and costs of using hopper dredge pump-out facilities in order to perform Mississippi River maintenance dredging work. After the release of this report BRC and other navigation stakeholders continued to meet with members of the MVN, the dredging industry and representatives of the Louisiana Department of Natural Resources' Office of Coastal Management to discuss the idea of hopper dredge pump-out. These discussions led to the formation of the Beneficial Use of Dredged Material Subcommittee. While the stakeholders effort developed beneficial use of dredged material ideas or opportunities, the cost of the pump-out equipment and additional pipeline and the slower cycle times of the hopper dredge connecting to the pump-out

station, emptying the hopper and returning to dredging was greater than the cost of transporting the material to the HDDA or ODMDS. Therefore, in keeping with the Federal Standard, the Corps would need a financial commitment from the Louisiana Office of Coastal Management for the incremental cost difference over the normal dredging operations as per the Federal Standard. Corps and State discussions over the next two years did not lead to an agreement between the State and MVN on funding for the pump-out's additional cost. The result was continued use of the hopper dredges dumping their hopper into the HDDA or ODMDS.

Channel Maintenance by Cutterhead Dredges:

Productivity between varying types of dredging equipment is often compared by a reviewing a combination of the equipment cost and the quantities of dredged material removed, usually described as the cost per cubic yard, ($/cy). In the initial 2007 report the Corps indicated the cost per cubic yard was lower than the cost of a normal functioning hopper dredge discharging into the HDDA or OMDDS. A Corps reassessment in 2009 concluded that cutterhead pipeline dredge method of channel maintenance was aprroximately equal to the cost of hopper dredges.

The Bar Pilots had legitimate concerns about the use of cutterhead dredges working in Southwest Pass because cutterheads dredges are less maneuverable than hopper dredges and are anchored in place. The Bar Pilots and MVN reduced the use of cutterhead dredges in Southwest Pass since the channel was deepened from 40 feet to 45 feet (1988) and ceased cutterhead dredging in 2002. However, in an effort to increase the beneficial use of dredged material the Bar Pilots agreed to increase cutterhead dredging operations. In 2009, the industry cutterhead dredge E.W. ELLEFSEN was utilized for channel maintenance in Southwest Pass. The project was determined to be successful by all parties. When the ELLEFSEN pumped dredged material over the foreshore rock dikes along the Pass, 46 new acres of land were created in Louisiana's environmentally sensitive delta of the Mississippi River, while allowing safe passage for deep-draft navigation. Communications between the Bar Pilots and the dredging contractors resulted in good coordination on dredge location and safe ship passing arrangements. Additionally, the Bar Pilots noticed in post-dredge surveys that cutterhead dredges leave a consistent well-manicured channel. The Pilots are also proud of the new acreage being created each year and agree with the BRC's view that the increased beneficial use of dredged material serves to protect the navigation channel from storm surge and encroachment from the Gulf of Mexico.

Current Sediment Placement Efforts

Since the initial willingness to try using different equipment in 2009, cutterhead dredges have evolved to be an important tool in channel maintenance toolbox and benefits of the sediment recycling program continue to gain recognition. Navigation channel maintenance is now conducted using a combination of hopper and cutterhead dredges, working cooperatively and in tandem with each other.

The BRC led a successful effort through stakeholder coordination with the State of Louisiana to get an exception to the maximum elevation for dredged material placement. This agreement equates to increase of approximately 2.5 feet higher that beneficial placed sediment can be placed. This allows additional quantities to be placed in areas immediately adjacent to the channel and helps reduce the overall costs.

The MVN continues to host monthly stakeholder meetings at which presentations are made on river flows and resulting dredging requirements, the Operations and Maintenance funding situation, and dredging plans are discussed in an open forum. This is highlighted as exemplary 'partnering' by dredging contractors and navigation interests in regional and national meetings.

In 2014, two cutterheads were utilized for the first time in channel maintenance in the same fiscal year since the sediment recycling program started. In Fiscal Year 2015 a record amount of sediment recycling was achieved with 20.7 million cubic yards beneficially placed to create approximately 2,000 new acres of Louisiana along the bird's-foot delta. The new cubic yard record is the highest amount of beneficial use ever achieved by the United States Army Corps of Engineers although the previous two records were also directly related to dredging on the Mississippi River. The previous record amounts of cubic yards were both achieved when the Mississippi River Ship Channel was deepened, the second (previously first) in 1961 when the channel was deepened from 35 feet to 40 feet and the third in 1987 when the channel was deepened from 40 feet to 45 feet. Since the cutterheads were added to the toolbox for channel maintenance and coupled with the cutterheads being used to dredge beneficial material from the Hopper Dredge Disposal Area at the Head of Pass, nearly 5,000 acres of new Louisiana have been created.

Along the Louisiana coastline there are few areas that have more land than they did 10 years ago, with the land loss attributed to factors like: sea-level rise, subsidence and even tectonic fault slippage being the common suspects. However, due to the sediment recycling program as demonstrated by the following photos there is clearly more land along the Mississippi River Delta than there was 30 years ago (1985 to 2015). The Big River Coalition, Bar Pilots and MVN have made advancements through the sediment recycling program that will prove valuable if the Mississippi River Ship Channel is deepened to 50 feet. However, there is no doubting that because of the additional acreage that the critical shipping channel is better protected from storm surge than it was prior to 2009.

The Birds Foot on Lower Mississippi River, 1938

The Birds Foot on Lower Mississippi River, 1985

The Birds Foot on Lower Mississippi River, 2015