

TURNING 'WASTE' INTO VALUABLE RESOURCE

Dredged Materials in Coastal Management

As maritime commerce evolves towards the use of larger vessels with greater cargo capacity, new and innovative techniques for the use of dredged material complement the need for wise management of coastal resources.

Dredging to maintain navigable waterways remains a constant effort, and the need to increase navigable water depths has accelerated over the years with increases in size and draft of vessel. At the same time, the ability of existing disposal facilities to accommodate dredged material has become increasingly limited. As a result of these challenges, new and innovative management techniques have been adopted for the use of dredged materials.

(No) Waste

Traditionally, dredged material has been viewed as waste, to be disposed of in facilities similar to landfills for the dumping of solid and hazardous waste. At the same time, sand was effectively ‘mined’ or dredged from offshore borrow sites and placed on-shore for beach nourishment and control of erosion. The ‘beneficial use’ of dredged material recognises it as a resource, not always waste to be discarded but to be used for public benefit. Such material may be used to offset the environmental impact of dredging, or in ways quite unrelated to the dredging of a waterway. In the United States, state and regional coastal management authorities have responded to the growing need for placement of dredged material by developing policies requiring or encouraging its use as a resource. The manner of use varies from state to state, depending upon their specific characteristics and needs.

Given the rapid loss of wetlands in the State of Louisiana, it has developed a long-term management strategy for each of its ten federally maintained navigational channels. These strategies address the use of dredged material for wetland creation and protection. The state also has a coastal planning effort, Coast 2050, which includes long-term guidance on coastal restoration efforts that include the beneficial use of dredged material from channel maintenance as standard procedure in all its coastal parishes. The neighbouring state of Mississippi encourages the beneficial use of dredged material in beach replenishment and construction, sanitary landfill, and agricultural-soil improvement. Other beneficial uses practised throughout the US include the development of habitat such as nesting islands and offshore reefs, expansion or capping of landfill, raising the height of a land-base, and construction of banks, levees and dikes.

Regulating Use

The disposal of dredged material becomes more difficult and costly when the material to be dredged and disposed of is contaminated. The US Environmental Protection Agency (EPA), the US Army Corps of Engineers (USACE) and the states have developed tests to determine the chemical composition of material and establish acceptable contaminant limits. While some states require only dredged material tested and determined contaminated to be disposed of in accordance with waste-disposal regulations, some are more stringent in their regulation. One state considers all dredged material to be construction/demolition waste and needing a landfill permit prior to disposal, and a general permit for beneficial use.

The process by which decisions are made regarding dredging and use of dredged materials on federal navigation projects may involve a range of agencies at federal, state and local level. It may also involve a number of funding authorities and environmental laws and regulations. The US Coastal Zone Management Act (CZMA) (16 U.S.C. 1451-1465) ‘federal consistency’ provision (16 U.S.C. 1456) mandates that any actions proposed by federal agencies that may be reasonably foreseen to affect any land or water use or resource of the coastal zone be consistent with the maximum extent practicable under enforceable policies of approved state CZMA programmes. Non-federal entities applying for federal licenses or permits for activities with reasonably foreseeable coastal effects must be fully consistent with enforceable policies of state CZMA programmes. Among the federal actions subject to the CZMA federal-consistency requirement are federally managed or assisted harbour and navigation dredging, dredged-material disposal, and beach re-nourishment.

Practical Experience

For example, at Conneaut Harbour on Lake Erie in Ohio the USACE constructed jetties to stabilise the channel leading into the harbour. However, this resulted in blocking the natural transport of sediments along the shore, increasing rates of bluff recession and erosion in Pennsylvania. When the USACE proposed dredging Conneaut Harbour and disposing of the dredged material at an open-water disposal site in Lake Erie, Pennsylvania, under the CZMA federal consistency provision, informed the USACE that open-water disposal would affect Pennsylvanian bluffs and shoreline. Therefore the USACE must dispose of the material near-shore to feed the natural sand-transport system. With the assistance of the US National Oceanic and Atmospheric Administration, an arrangement was facilitated whereby USACE modified its dredging contract to establish a sand by-pass system to enable dredged material to be placed back into the down-drift system.

It is customary for a state to co-ordinate its efforts with the appropriate federal agencies early in the planning of any navigation project. The

aim here is to determine the scope and nature of the project, evaluate any adverse impact on coastal resources from dredging, and consider opportunities for beneficial use of dredged material. It also allows the federal agency and the state to pursue adequate funding for the project, including applicable federal cost sharing and, if necessary, mitigation funds.

Reusing Material

A typical federal harbour-dredging project might include beach nourishment using clean, sandy, dredged material from the outer harbour, wetland/habitat enhancement using fine-grained material dredged from the river channel, and confined disposal for contaminated materials. The development of islands for wildlife habitat using dredged material is usually done by direct placement from a pipeline. For upland uses, such as landscaping or construction fill, the dredged material is normally placed in a storage area or confined disposal facility for de-watering and then transported to the site. A number of port authorities actively pursue the development of local markets and applications for dredged material.

Communities in hazard-prone coastal areas may also benefit from the use of dredged material in restoring or preserving natural features such as barrier islands, dunes, wetlands and other vegetated areas that offer protection against coastal flooding and erosion. With this in mind, decision-makers at local level should consider dredged material as a resource for building the resilience of coastal communities to storms and other natural hazards.

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