Dredging for Safe Passage

www.mpasafepassage.org

Each year, nearly 2,000 cargo vessels and cruise ships venture through the Chesapeake Bay, up the Patapsco River, and into the Port of Baltimore. They also make outbound journeys to the Atlantic Ocean and ports abroad.

These ships support a stream of commerce by transporting tourists, automobiles, coal, construction materials, luxury goods, food, paper, and other products. The process provides Maryland with nearly 42,300 jobs, of which 19,300 directly relate to the Port. It also generates $2.4 billion in wage and salary income and $1.9 billion in business revenue.

As ships move to and from Baltimore, they travel approximately 125 miles of shipping channels. Dredging those channels is essential. The safe passage of ships, and continued prosperity for the Port of Baltimore, depends on it.

Why Dredge?

Dredging has been vital to Maryland's shipping industry since its earliest history.

Sediment builds up in shipping channels as clay, sand, and silt erode into streams and rivers, and eventually wash into the Chesapeake Bay. Natural forces like currents, tides, wind, and rain cause erosion. However, in the Bay region, colonial land-clearing and poor agricultural practices triggered a great increase. Early ports like Joppatowne and Port Tobacco became landlocked as sediment flushed into the rivers. By the 1800s, dredging was a common practice.

Today, development, forest loss, and sea-level rise continue to amplify the problem. On average, 4 to 5 million cubic yards of material must be removed each year just to maintain existing shipping channels, berths, and anchorages. Dredging is also needed to deepen, straighten, or widen channels to ensure the safety of large modern ships.

Dredging in Action

Sediment is cleared from shipping channels primarily using either a mechanical dredge or a hydraulic pipeline dredge. Both types of dredges are mounted on barges, but they operate differently.

A mechanical dredge in the Baltimore Harbor.

A mechanical dredge scoops or grabs sediment from the bottom of the waterway, much like an excavator at a construction site, and places it onto a barge for transport. A mechanical dredge is especially good for removing hard packed material and debris.

A hydraulic pipeline dredge removes bottom material by suction and removes fine sediment better than a mechanical dredge. The dredged material is moved through a pipe directly to a placement site or into a holding

bin for transport. A hydraulic pipeline dredge can operate almost continuously, and is especially effective in deep water or rough weather.

At the placement site, material from a hydraulic dredge is process through a series of basins that allow excess water to drain off and return to the adjacent water body.

The Placement of Dredged Material

The placement and use of dredged material has changed dramatically in recent decades. For centuries, dredged material was simply placed in the open waters of the Bay. As environmental impacts became better understood, these practices began to change.

Dredged material placement sites must meet federal and state requirements. And Maryland has high standards in order to protect the Bay. In 2001, the state's Dredged Material Management Act dictated an end to open water placement by 2010 and instated "beneficial use" and "innovative use" as the preferred management options.

Blue Heron resting on Poplar Island containment dike.

Beneficial use means putting dredge material to work for environmental benefits, such as creating wildlife habitat and restoring eroded islands. Beneficial use projects exist at Poplar Island, Hart-Miller Island, and Cox Creek.

Innovative use has applied dredged material to replenish beach sand, protect shorelines, and generate top soil for use in agriculture.

These practices have increasingly transformed dredged material into a resource, rather than waste awaiting disposal.

Public & Environmental Safety

The Maryland Port Administration (MPA) works with many partners to ensure that dredging operations protect both human and environmental health.

Most dredged material is considered "clean" because the levels of contaminants are considered environmentally safe. However, its placement has a short-term impact on oyster beds, fish habitat, and water clarity. Experts conduct rigorous studies of possible placement sites and manage placement practices to avoid problems and address concerns immediately. Poplar Island is the primary placement site for clean dredged material.

Some sediment dredged from the Baltimore Harbor poses a special challenge, because it is contaminated with heavy metals and chemicals. These elements are bound to the sediment. No effective process exists to remove them. As a result, this material must be placed in a confined disposal facility, a diked area constructed in open water, along a shoreline, or at an upland site. These structures are in use at Hart-Miller Island and Cox Creek.

Even with containment dikes in place, scientists continually monitor conditions in the sediment and aquatic environment. Placement is managed and regulated to ensure that contaminants remain within the dikes and that water released from the dikes meets state and federal water quality standards.

Planning Ahead

The MPA develops long-term dredging plans through the Dredged Material Management Program. This open, science-based process relies on several hard-working committees supported by teams of scientists who review and recommend studies on the environmental and social implications of a potential site.

The goal is to have a rolling plan for dredged material management that will meet the Port's needs for at least 20 years into the future.