

To shorten winter, borrow some money due in spring.
~W.J. Vogel

Nummy Island CDF (Confined Disposal Facility)

DREDGE MATERIALS & MARSHES: PERFECT TOGETHER?

By Dr. Lenore Tedesco of The Wetlands Institute

There has been a lot of talk recently about opportunities to utilize dredge materials for environmental benefit, especially to help restore wetlands. This is a complex discussion with many considerations, especially as shore communities are faced with the need for back-bay dredging projects.

Back-bay channels and basins behind 7 Mile Beach have been shallowing for some time and both Avalon and Stone Harbor have been undertaking dredging projects to improve navigation and deepen basins for recreational use. The Army Corp of Engineers recently dredged the Intra-coastal Waterway behind 7 Mile Beach to maintain navigation channels. In all cases, one of the most difficult aspects of the projects has been what to do with the dredge material. The standard method has historically been to pump dredge material into Confined Disposal Facilities (CDFs) and allow it to dry out, or dewater, in those locations. CDFs are the trapezoid-shaped mountains that are visible on Nummy Island just south of Stone Harbor and on Graven's Island along the Avalon Causeway.

The challenge is that they are all full and require emptying before they

can be refilled. This is an expensive proposition that is not without environmental impacts. When CDFs are unavailable, dredge material may be mechanically dewatered at an onshore site. Materials need to be trucked from dewatering sites, whether they are CDFs or other onshore areas, to disposal or reuse sites. This material can be beneficially used to cap landfills, in road-construction projects, in agriculture, and in many other ways. A challenge with this approach is that in many cases, it is removing materials from the bay and taking it to upland sites and out of the system, perhaps at a time when those sediments can be better used inside the system.

Scientists at The Wetlands Institute have been working to understand how rising sea level and climate change is affecting our local marshes and the wildlife that depend on them. We are also working to understand how dredge materials can be used to restore degraded marshes or provide nesting habitat for marsh-dependent species as habitat becomes lost.

Sea level is rising and has been for quite some time. If you drive across the causeways, you have probably noticed how frequently the marsh is now flooded. In our area, sea level has risen more than 6 inches since 1980 and an important question we are studying is how this

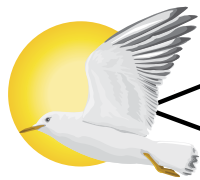
rise in sea level might be impacting the health and sustainability of our marshes. Marsh grasses grow well over a very narrow range of water depth. During times of slowly rising sea level, they can do quite well and "keep up" with rising water levels by building dense root structures and trapping storm-transported mud and sand. If sea level rises too fast, though, marshes can begin to drown and shift to open-water areas or mudflats. Flooding during the nesting season can destroy bird nests or chicks of American oystercatchers, laughing gulls, clapper rails and many other bird species that depend on the marsh to nest and raise young.

In areas where marshes are falling behind rising sea level, a technique called thin-layer placement (TLP) may be a suitable marsh-restoration technique. TLP works under the presumption that clean dredge material can be spread on the marsh in a layer thin enough to allow marsh grasses to regrow, while raising the marsh elevation to offset elevation losses due to rising sea level. This sounds promising but is actually quite difficult and challenging to accomplish, and great care must be taken to not damage the marsh more than help it. For these

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Marsh surface seven months after TLP (thin-layer placement).



Winter is not a season, it's an occupation.
~Sinclair Lewis



Ring Island habitat and TLP from the air.



Ring Island habitat construction.

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reasons, it's important TLP be applied only as a marsh-restoration technique – and not as a way to dispose of dredge material.

A second type of beneficial reuse for dredge material involves the creation of wildlife habitat. This habitat creation involves the loss of the original habitat and may involve conversion of wetland to sandy upland or bay bottom to intertidal areas. This is always a difficult decision, but with continually rising sea level, higher-elevation marsh areas are becoming relatively rare. Finally, shoreline stabiliza-

tion is a technique where marsh edges can be restored by building out a new edge and then backfilling the area with dredge materials and planting marsh grass on top. This is usually important in areas where storm waves or boat wakes are causing blocks of marsh to break off and wash away. This is an especially important problem along the Intracoastal Waterway, where there have been hundreds of feet of wetland loss due to this edge erosion.

There are pros and cons to all of these approaches. The impacts to wildlife and the marsh itself need to be

carefully considered. Our area has been a focus of pilot projects for beneficial reuse with two project areas in our backyard. Working with the Army Corp of Engineers, New Jersey Department of Environmental Protection, Nature Conservancy and others, an area of Ring Island – the marsh south of the 96th Street bridge – was treated with a thin-layer placement and also a wildlife habitat creation area in August 2015. Last winter, a larger area of thin-layer placement was tested behind Avalon. The projects were undertaken because the marsh showed

signs of drowning. In the Avalon project, scientists documented expansion of open-water areas and mudflats forming within the marsh itself.

The initial results from the Ring Island habitat creation have been positive with respect to successful nesting of sensitive bird species. It has also been used by diamondback terrapins and horseshoe crabs for nesting and spawning. During some of the higher tides and during storms, the habitat is a pretty popular place for birds looking for a place to get out of the water.

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