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BENEFICIAL USE OF DREDGED MATERIAL

- Rocks
- Sand and Gravel
- Consolidated Clay
- Silt/Soft Clay
- Contaminated

TYPES OF DREDGED MATERIAL

- Artificial Reefs
- Artificial Shoals/Berms
- Oyster Reef Restoration/Construction
- Beach Nourishment
- Intertidal Marsh Creation
- Mudflat Creation
- Bathymetric Recontouring
- Filling Dead-End Canals/Basins
- Creation of Bird/Wildlife Islands
- Landfill/Brownfields Reclamation

USES OF DREDGED MATERIAL

- U.S. Army Corps of Engineers
- Local and State Port Authorities
- U.S. Navy
- Marinas and Private Dredgers

DREDGING ORGANIZATIONS

Potential Benefits

- Increase in number of species
- Increase in overall population
- Increase in average length of finfish

Design Considerations

- Reduced navigational mobility

ARTIFICIAL REEFS

Potential Benefits

- Protect shorelines from erosion
- Provide habitats for finfish & crustaceans
- Reduce energy of storm waves

Design Considerations

- Height & shape of berm
- Effects on local hydrodynamics
- Potential development of benthic & epibenthic prey sources

ARTIFICIAL SHOALS/BERMS

Optimal Sediment:

- Coarse sand & shells
- Oyster shell cap

Design Consideration:

- Illegal harvesting (damage to habitat/consumption of pathogens)

OYSTER REEF RESTORATION/CONSTRUCTION

- Counteracts erosion

Design Considerations:

- Material used should closely match beach
- Displacement of substrate
- Changes in topography/bathymetry
- Destruction of immobile benthic communities

BEACH NOURISHMENT

Possible Benefits:

- Nesting & foraging habitat
- Surface & ground water filtration
- Filtration near CSOs
- Shoreline stabilization

INTERTIDAL MARSH CREATION

Design Considerations:

- Local hydrodynamics
- Potential for re-suspension of fine sediments

MUDFLAT CREATION

Potential effects of subaqueous borrow pits:

- Increased wave energy
- Increased tidal range
- Increased sedimentation rates
- Altered numbers & diversity of organisms

Potential effects of Recontouring:

- Restore shallow water habitats
- Improve water quality & flow
- Reduce contaminant sinks/sources
- Decrease sedimentation rates

BATHYMETRIC RECONTOURING

FILLING DEAD-END CANALS/BASINS

Dead-End Effects:

- Habitat & water degradation
- Poor water circulation
- Prolonged hypoxia/anoxia
- Low numbers of species

Intermediate Fill:

- Raise bottom into photic zone
- Encourage production of benthic micro-algae
- Recolonize benthic invertebrates
- Increase tidal circulation
- Isolate contaminated sediments

Complete Fill:

- Improve water quality
- Improve sediment quality

Design Considerations:

- Sand or silt-sand
- Rip-rap, wooden cribs, bulkheads
- Can be stabilized with vegetation
- Desalinization & soil amendments

Potential Benefits:

- Habitats for birds and wildlife
- Recreational activities

CREATION OF BIRD/WILDLIFE ISLANDS

Potential Effects:

- Contamination of aquatic habitats through leachate & runoff

Design Considerations:

- May not have undergone final closure
- Vegetation can be planted over the material
- High costs associated with acquiring site & transportation of dredged material to site

LANDFILL/BROWNFIELDS RECLAMATION

Beneficial Use Alternatives	Placement Capacity (MCY)	Est. cost (S/CY)	Potential environmental benefits	Environmental/other concerns
Artificial reefs (rock)	Unlimited	24	Potential increase in nearshore and offshore fish production	Navigation hazard (inshore reefs)
Landfill and brownfields remediation	100 +	10-35	Habitat for upland bird and wildlife species	Trophic transfer of contaminants, human health concerns
Borrow pit restoration	40	5-10	Improved benthic habitat, hydrodynamic and water quality benefits	Potential loss of fish habitat, trophic transfer of contaminants, contaminant mobility
Intertidal wetland and mudflat creation	7-10	15-35	Point-source effluent polishing, habitat for estuarine-dependent fish and wildlife species	Odor, trophic transfer of contaminants, navigation hazard, loss of shallow-water habitat
Filling dead-end basins	3-5	35	Hydrodynamic benefits and water quality improvement	Contaminant mobility, urban infrastructure concerns
Bird/wildlife habitat	1-3	7-10	Nesting habitat for wading and shore birds, mammals	Navigation hazard, habitat trade-off, trophic transfer of contaminants
Oyster reef restoration	0.5	5-15	Habitat for resident and transient finfish and crustaceans, water column filtration	Navigation hazard, trophic transfer of contaminants

BENEFICIAL USE ALTERNATIVES FOR NEW YORK/NEW JERSEY HARBOR, RANKED BY POTENTIAL CAPACITY (MILLIONS OF CUBIC YDS) (FROM USACE (2002))

- Material from Matanzas Pass (southwest coast of Florida)
- Material placed 600 ft offshore, depth of 6 ft
- Fine sediment dispersion downdrift and offshore of natural bar
- Sand sediments migrated onshore

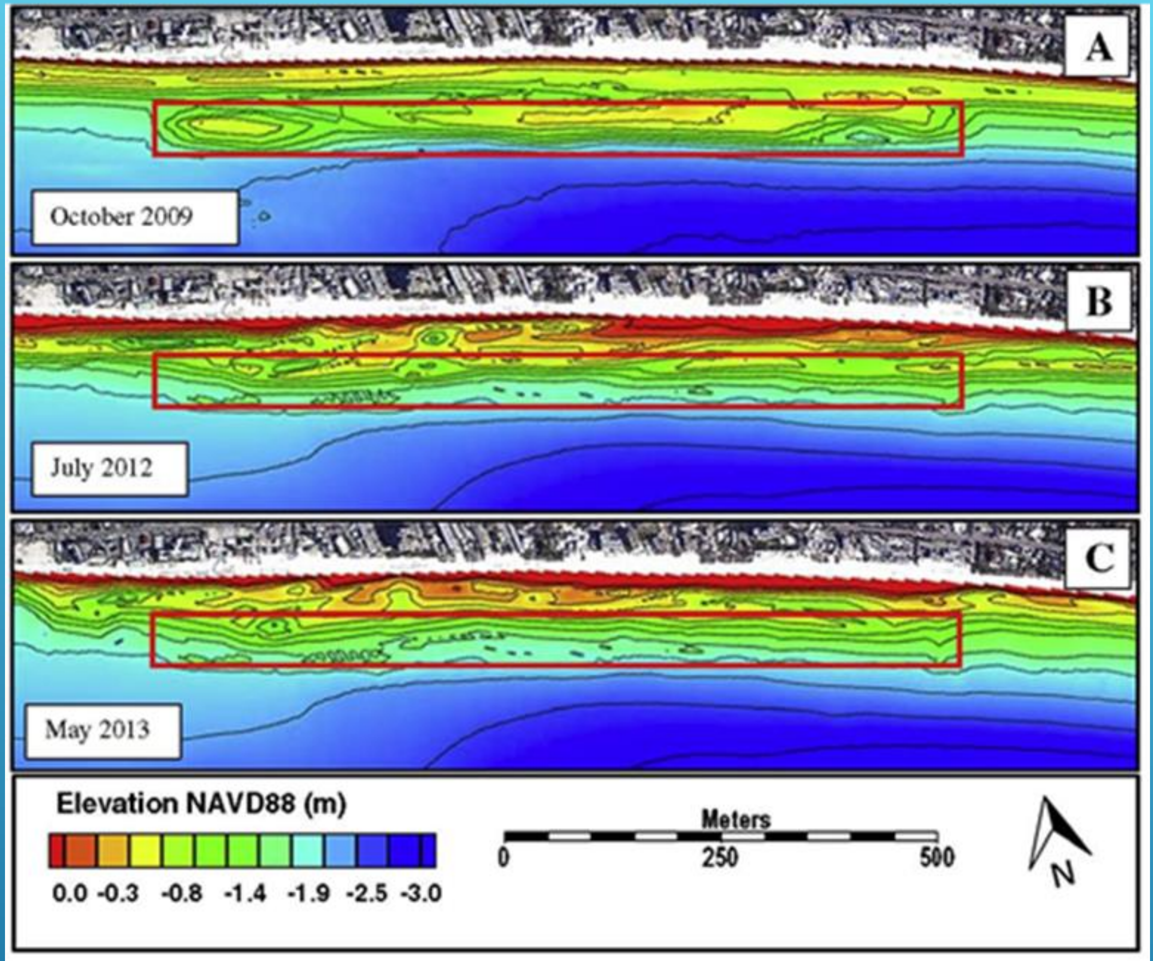
FT. MYERS NEARSHORE BERM

- One year after construction:
  - Berm migrated 150-200 ft onshore
  - Berm crest increased 1.0 to 1.5 ft
  - Height of constructed berm remained the same

FT. MYERS NEARSHORE BERM

- Mud content of surface sediment on berm: <3%
- Mud content of surface sediment on control area: up to 40%
- Mud content of surface sediment of offshore area: <4%

FT. MYERS NEARSHORE BERM



- Time-series onshore migration of the nearshore berm
- A) Initial berm morphology immediately post-construction
- B) Nearshore berm morphology following the Tropical Storm Debby impact
- C) Morphology four years post-construction

FT. MYERS NEARSHORE BERM

Morphological evolution of a submerged artificial nearshore berm along a low-wavemicrotidal coast, FortMyers Beach, west-central Florida, USA. Katherine E. Brutsché a, PingWanga, TanyaM. Beck b, Julie D. Rosati b, Kelly R. Legault.

Factors to consider:

- Type of dredged material available
- Proximity of potential material placement site
- Habitat trade-off

SUMMARY

QUESTIONS?