



Nearshore Berms Research

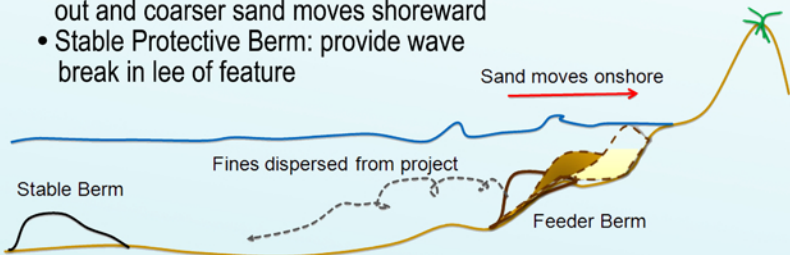


Regional Sediment Management & Coastal Inlets Research Programs
U.S. Army Engineer Research & Development Center • Coastal & Hydraulics Laboratory

Objective

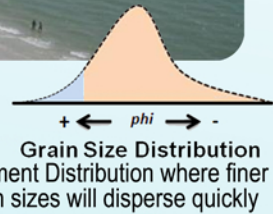
Develop design guidance and validate numerical technology for placement of two types of nearshore berms:

- Feeder Berm: selectively sort mixed sediments:
 - fines winnow
 - out and coarser sand moves shoreward
- Stable Protective Berm: provide wave break in lee of feature



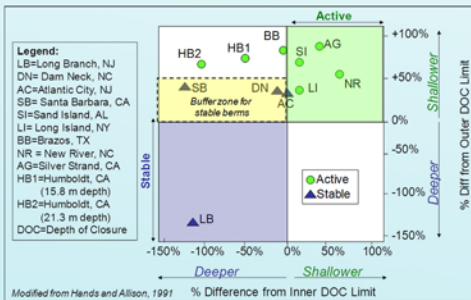
Research Goals

- Document the design and performance of regional projects
- Improve design guidance with data
- Validate numerical models

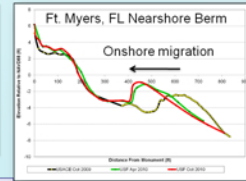
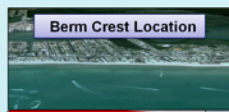


Field Data Collection

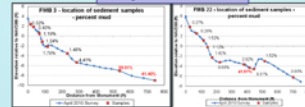
- Monitoring of nearshore berm projects with different design characteristics and placement techniques (hydraulically pumped or dumped)
- Quantitative analyses of migration rates, profile volumetric change, and percent dispersion of fine grain sizes



Hands and Allison (1991) Nearshore Berm Stability Graph



Migration of Fines



First Year Report on Ft. Myers Berm

Guideline Development

An Update on the present practices and available guidelines

Questions

Placement Method

- How does placement method (pumped vs. hopper) affect evolution?

Quantity and Rigor of Design

- Should the placement be a small quantity 'dumped' or a large quantity designed berm?

Cross-shore Location

- What are the most successful cross-shore and alongshore designs that will promote onshore migration and/or retention of the sediment?
- How do large, shallow nearshore berms behave as short-term shore protection through wave dissipation, and what are the social implications?

Alongshore Location

- Where should dredged sediment be placed with regards to nodal zones of longshore sediment transport to minimize rehandling (infilling navigation channel) and cost?

Environmental Concerns

- How will the distribution of various types of sediment disperse and be transported with regards to fine sediments and Submerged Aquatic Vegetation (SAV; seagrasses) or other ecological habitat (reefs)?

Berms Online:
A Nearshore Berm Historical Database
Compilation and assessment of literature and data



Simple Calculator Tool

- Developing flexible tools (rapid desk-top to detailed models) for design
- Dredged sediment size(s) and volume
- Placement position in cross-shore, and soon in alongshore
- Site processes represented through empirical formulae

