

Chapoquoit Beach Restoration - Feasibility Study



June 1, 2016

Chapoquoit Beach Project

Key Project Components

- *beach nourishment*
- *Cape Cod Canal sand source*
- *nearshore rehandling site*
- *cooperation with USACE*
- *public and private interests*

Feasibility Assessment

- *engineering*
- *environmental*
- *financial*
- *public/private partnership*



Funded By CZM Coastal Resilience Grant

Project History

Permitted Nourishment Project in 2002

- *CA, Town of Falmouth, Bowerman's*
- *Cape Cod Canal sand source*
- *Direct pump to the beach*
- *~100,000 cy over 3,200 ft*
- *Project not constructed*

Current Beach Conditions

- *still eroding (1.5 to 2.0 ft/yr)*
- *loss of recreational resource*
- *loss of storm damage protection*
- *damage to seawall/causeway*



Meeting Agenda

Describe Feasibility Study

- *purpose*
- *scope*
- *preliminary findings*

Address Key Questions

- *nourishment design*
- *sand quality*
- *sediment transport/impacts*
- *project lifetime*
- *access easements*
- *cost*



Scope of Study

Purpose

- *evaluate feasibility of restoring Chapoquoit Beach through beneficial reuse of sand dredged from the Cape Cod Canal*

Scope & Project Tasks

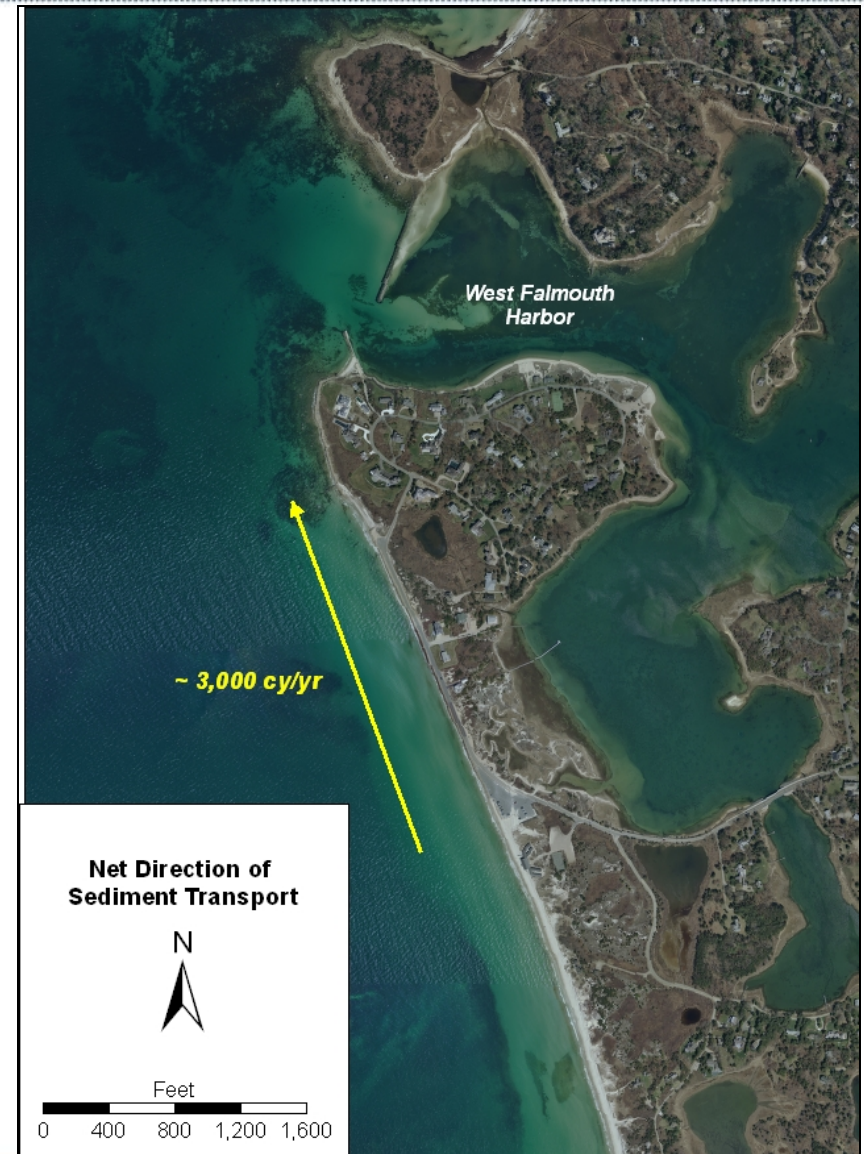
- *coordinate with USACE*
- *beach investigations*
- *engineering design*
- *nearshore investigations*
- *public education*



Beach Investigations

Existing Conditions

- *rates of shoreline change*
- *topographic survey*
- *resource area mapping*
- *sediment sampling*
- *shellfish survey*
- *wave modeling*
- *sediment transport modeling*



Engineering Design

Beach Nourishment

- footprint ~13 acres
- ~3,000 linear ft
- ~100,000 cy
- 9 parcels (public & private)
 - 2 Chapoquoit Assoc.
 - 2 Town of Falmouth
 - 1 Bowerman's Beach Club
 - 4 private



Engineering Design

Cross Section

- *increase beach elevation by ~ 7 ft*
- *move MHW seaward 75 to 120 ft*

Typical Cross-Section



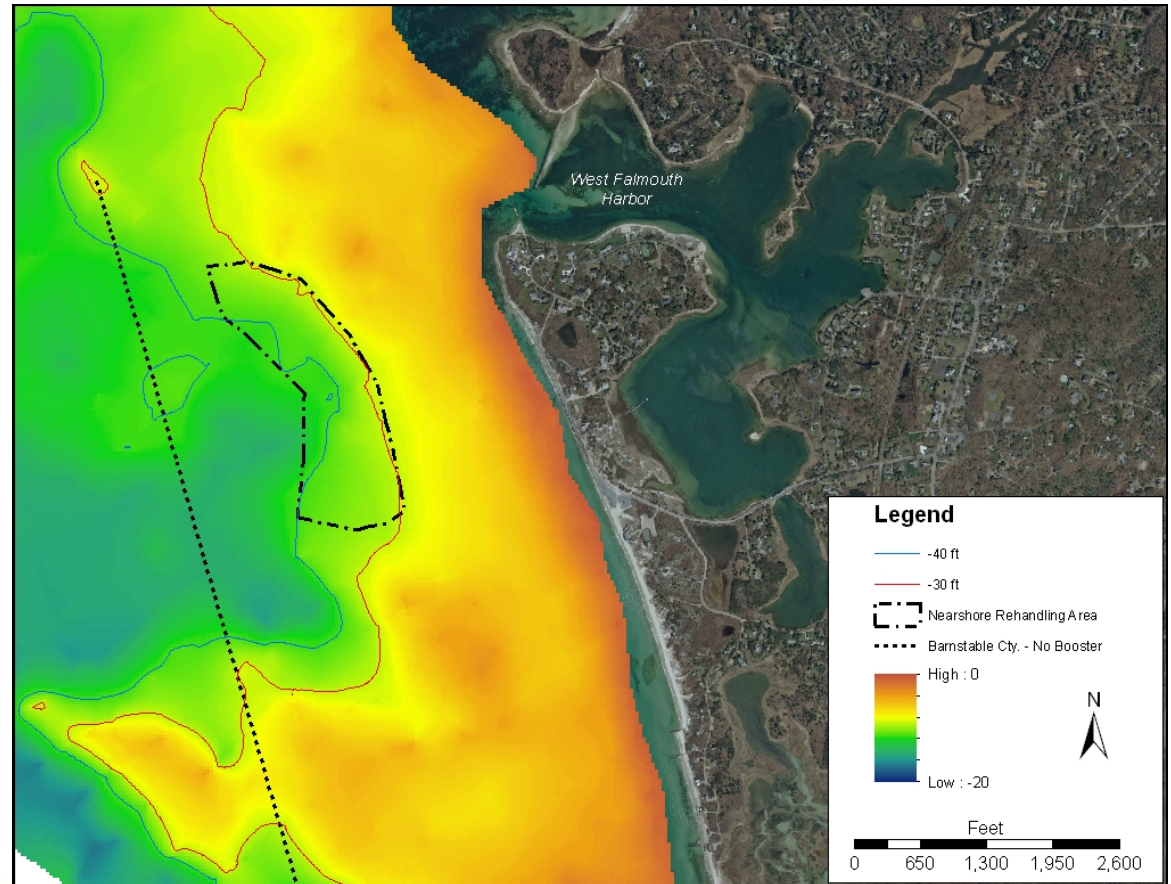
Nearshore Investigations

Existing Conditions

- *bathymetric survey*
- *benthic/seafloor habitat*
- *sediment sampling*
- *avoid hard bottom*

Constraints

- *30 to 40 ft depth*
- *4,000 ft from shore*
- *designate area*



Key Questions

Nourishment Design

Sand Quality

Sediment Transport/Impacts to W Falmouth Harbor

Project Lifetime

- *cross shore and longshore spreading*
- *updates to previous models*
- *~16 to 30% fill remaining after 10 years*

Public Access Easements

- *required if public funds spent to nourish private beaches*
- *private interests must pay for their share of sand*
- *USACE direct pump to beach would trigger need for easements*

Construction Costs

Canal to Nearshore Rehandling Site – Phase 1

- *USACE split hull hopper dredge*
- *100% of cost above and beyond disposal at Cleveland Ledge*

Nearshore Rehandling Site to Beach – Phase 2

- *Barnstable County dredge*
- *\$9/cy without booster; \$13/cy with booster pump*

Construction Cost Estimate

- *\$1.7 to \$2.0 million*
- *~ \$.8 to 1.1 mil for Phase I plus \$900,000 for Phase 2*
- *\$560 to \$660/linear ft of beach*
- *Environmental permitting costs*

Next Steps

Ongoing Studies

- *shellfish survey along beach*
- *nearshore benthic habitat and sediment sampling*
- *wave and sediment transport modeling*
- *impact assessment on W. Falmouth Harbor*
- *fine tune costs (construction and permitting)*
- *MOU with USACE*
- *Public meeting (end of June)*

Questions



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