



SCONSET BEACH NOURISHMENT PROJECT

Nantucket, Massachusetts

August 2005

Siasconset Beach Preservation Fund

www.sconsetbeach.org

Siasconset Beach Preservation Fund

- Not-for-profit group dedicated to protecting the Sconset shoreline since 1992
- Has funded several preservation efforts to date
 - Beach dewatering system
 - Duneguard fencing
 - Coastal bank toe terraces
 - Coastal bank slope terraces
 - Perched aquifer drainage wells
 - Extensive monitoring of the coastal bank and beach

Siasconset Beach Preservation Fund

Trustees

- Arthur Broll
- William Charlton
- Judith Darby
- Caroline Ellis
- Samuel Furrow
- Richard Green
- William Holding, Jr.
- Constance Keller
- Albert Lussier, Jr.
- John Osborn
- Joshua Posner
- Fred Singer
- Robert Wilner

Executive Committee

- Kermit Roosevelt, President
- F. Helmut Weymar, Vice President
- James Walker III, Vice President
- Bruce Ritter, Treasurer
- Amos Hostetter, Jr.
- J. Daniel Lugosch

Staff

- Cheryl Bartlett, Executive Director
- Jenny Garneau, Clerk

Technical Advisors

- Les Smith, Epsilon Associates
- Mark Rits, Epsilon Associates
- Maria Hartnett, Epsilon Associates
- Bob Hamilton, Woods Hole Group
- George Hampson, Woods Hole Group
- John DeVillars, BlueWave Strategies

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Project Goal

To protect 2 to 3 miles of Sconset shoreline in the most environmentally sensitive, timely and cost effective manner possible

Privately funded project with significant public benefits



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Project Benefits: Public Enjoyment

- Restores 2 to 3 miles of public beach for the residents of Sconset Village, Nantucket and the general public
- Improves public access and recreational opportunities
 - Better beach access for pedestrians
 - Better beach access for fishermen
 - Preserves the historic Sankaty Lighthouse
 - Maintains the historic Sconset Bluff Walk



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Project Benefits: Town Resources

- Protects public infrastructure
 - Sewer and water services
 - Town sewer beds
 - Baxter Road (access road to the lighthouse and homes)
 - Codfish Park Road (emergency vehicle access to the beach and 50+ homes)
- Protects valuable tax assets
 - Revenues from the property owners along the project shoreline represent 4% of total Nantucket tax revenues for 2005

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Project Benefits: **Historic and Environmental**

- Protects Sankaty Head Lighthouse (National Historic Monument)
- Protects historic homes and properties
- Restores habitat for endangered shorebirds



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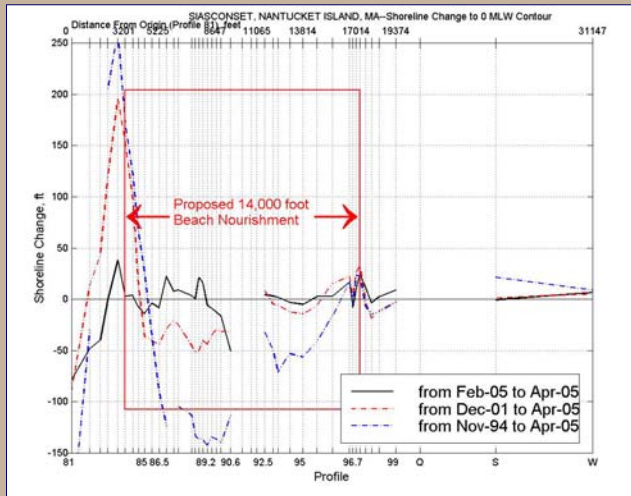
Erosion at Sconset Beach

- Erosion at Sconset Beach has increased significantly in recent years
- The average 15-year erosion rate for dunes is 40% greater than the average 50-year erosion rate for dunes
- Three major storms in Winter 2005 led to an average loss of 5 to 10 feet of bank and 40 to 60 feet of dunes

	Bank	Dunes
Average 50-year Erosion Rate	3 feet/year	7 feet/year
Average 15-year Erosion Rate	3 feet/year	10 feet/year
Winter 2005	5 to 10 feet (average)	40 to 60 feet (average)

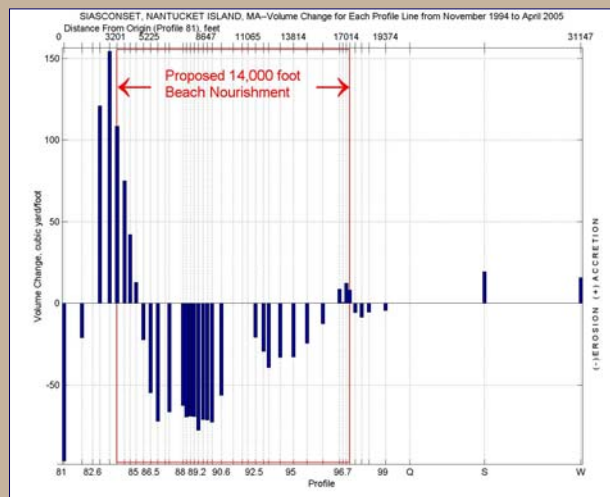
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Shoreline Change



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Volume Change



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Alternatives Considered

1. No Build Alternative
2. Armoring
3. Bank Stabilization
4. Preferred Alternative: Beach Nourishment

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Alternatives: No Build

- ✓ A good alternative in undeveloped areas
- ✗ Not an option in Sconset because there are no available lots to retreat to
- ✗ Will ultimately result in the destruction of homes, roads and the lighthouse



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Alternatives: Armoring

- ✓ A good option for protecting upland infrastructure where there is little interest in maintaining the actual beach
- ✗ Has environmental impacts
- ✗ Highly unlikely to be permissible at every level of government
- ✗ Limits public enjoyment of the beach



Montauk Lighthouse, Long Island, New York

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Alternatives: Bank Stabilization

- ✓ A good option for less drastic situations or in combination with beach nourishment
- ✗ Does not provide adequate storm damage protection
- ✗ Waves can still erode the base of the bank



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Preferred Alternative: Beach Nourishment

- Preferred option to protect upland property and preserve the beach environment
- First beach nourishment at Coney Island, New York in 1922
- More than 1,500 beach nourishment projects completed in the United States
- Volume of sand exceeds 1 billion cubic yards
- Most beach nourishment projects are publicly funded

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Preferred Alternative: Beach Nourishment



States that have undertaken beach nourishment projects

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Massachusetts Beach Nourishment Projects

- Massachusetts success stories include Dead Neck Island and Craigville/Long Beach
 - Craigville used an off-shore sand source, achieved its 7 to 10-year design life and was successfully renourished
 - Sand mining for Craigville resulted in environmental benefits – the borrow site colonized with eel grass
 - Dead Neck is a long-term barrier beach erosion management project that achieved its 10-year design life

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Conceptual Project Design

- **Base Project:** 2 miles from sewer beds to Sankaty Head Lighthouse (1.6 million cubic yards of sand)
- **Extended Project:** 3 miles extended from Lighthouse to Sesachacha Pond (2.4 million cubic yards of sand)



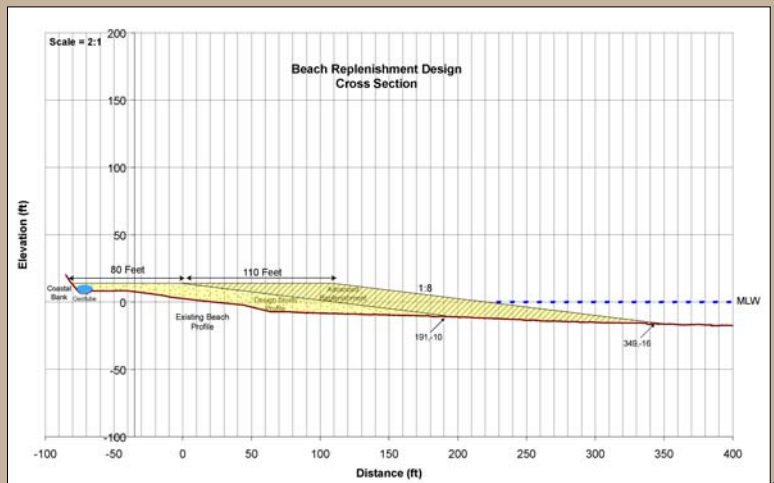
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Conceptual Project Design

- Provide lasting protection of the Sconset coastline
- Withstand severe coastal storms
- Increase the beach width to 200 – 250 feet
- Create a berm 10 feet above the high-tide elevation line

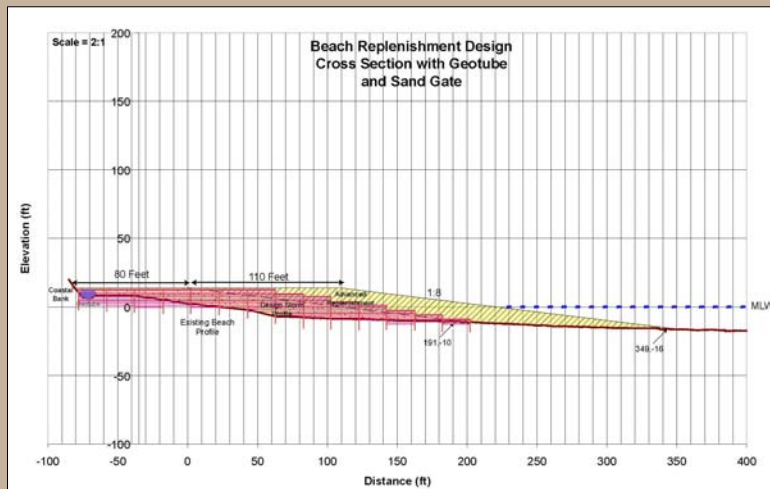
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Conceptual Beach Replenishment Design



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Conceptual Beach Replenishment Design



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Potential Sources of Sand

- Base project requires 1.6 million cubic yards of sand
- Extended project requires 2.4 to 3 million cubic yards of sand
- On-island upland sources are in very limited supply
- Off-island upland sources are economically infeasible for this large a beach nourishment project

Preferred Alternative: Nourish with sand from an off-shore borrow site

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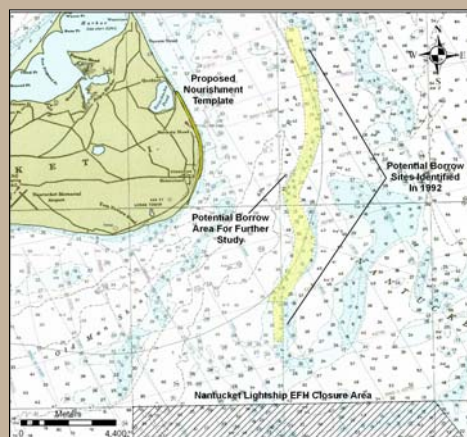
Evaluating Offshore Borrow Sites

- Must meet the design needs for the beach
 - Volume of sand
 - Grain size
- Must minimize environmental impacts
- Must be able to use cost effective dredging equipment

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Potential Offshore Borrow Sites

- Several borrow sites have been examined and additional locations will be considered
- Minimum size of the borrow site will be 100 acres
- Potential regional borrow site for Cape Cod and the Islands
- Final location will be selected as part of the engineering design and environmental review process



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Maintaining the Beach Over Time

- Re-nourishment every 5 to 7 years
 - Over time less sand is required for nourishment
 - Over time the number of years between re-nourishment will increase
- Semi-permeable sand retaining devices (sandgates) to hold sand in place and allow for some active transport
- Beach dewatering (similar to the system successfully implemented at Codfish Park) using existing systems where applicable
- Coastal bluff stabilization measures
- Geotextile tubes buried in the beach backshore to provide a last line of defense, subject to all required permits

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Monitoring and Assessment Activities

- In the coming months the Siasconset Beach Preservation Fund will collect data and look more closely at several potential on- and off-shore issues
- We are committed to an open and transparent process and look forward to engaging in productive dialogs with all stakeholders
- We plan to hold at least one public meeting before submitting the Draft Environmental Impact Report

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Required Permits and Approvals

Federal		
U.S. ACE	Section 10/404 Permit	Discharge of dredged or fill material
Marine Minerals Management License	Negotiated Agreement Public Law 103-426	Sand mining in Federal waters
State		
MEPA	Certificates for ENF, DEIR and EIR	State permitted projects exceeding certain environmental thresholds
DEP	401 Water Quality Certificate	Filling and other activities in wetlands and waterways
DEP	Chap. 91 Waterways License	Activity in filled or flowed tidelands
DEP	Wetlands Protection Act Order of Conditions (issued by local Con Com)	Work in or within 100 feet of a wetland resource area
CZM	Federal Consistency Review	Projects requiring a Federal permit or receiving Federal funds that are in or may affect the land or water resources or uses of the MA coastal zone
Local		
Conservation Commission	Order of Conditions, Nantucket Wetlands Bylaw	Work in or within 100 feet of a wetland resource area 27

Environmental and Permitting Team



- **The Woods Hole Group** is one of the nation's top coastal and oceanographic environmental firms. Their highly experienced professionals conduct scientifically-based studies of coastal and oceanographic problems, with an emphasis on beach processes, sediment transport, dredging and beach nourishment, oceanographic data analysis, ecological risk/impact assessment, and wave and current measurements and modeling.
- **Epsilon** is a leading provider of environmental management and permitting services in New England. Their Coastal Resources and Waterways group specializes in waterfront permitting, dredging analysis, coastal science and management studies, coastal erosion issues, and complex regulatory analysis. Epsilon has successfully completed numerous projects for government agencies and private clients throughout New England including several major coastal sites on Cape Cod, Martha's Vineyard and Nantucket.
- **BlueWave Strategies** is a team of dedicated environmental professionals who help businesses, organizations and real estate developers design and implement environmental strategies that add real economic value to their ventures. The BlueWave team has a deep understanding of the various factors involved in local, state and Federal permitting and political processes, and the ability to leverage their knowledge and network to develop and execute strategies for cost-effective and timely approvals.

Key Professionals

- **Bob Hamilton (Vice President, Woods Hole Group)** Mr. Hamilton is an expert in solving problems and managing projects related to shoreline erosion, water quality and environmental permitting for government agencies and private clients. He specializes in developing shore protection strategies and has technical skills in numerical modeling, data collection and analysis, and the implementation of scientific and engineering strategies to solve complex coastal problems. Mr. Hamilton has managed and/or played a key role in several successful beach nourishment efforts throughout the country.

- **Les Smith (Founding Partner, Epsilon Associates)** Mr. Smith has more than 30 years of experience in the environmental field including waterfront permitting projects, shoreline morphology analysis, dredging analysis, environmental management plans and large commercial and government projects involving complex environmental regulatory analysis. Earlier in his career, he directed the scientific and engineering staff at the Massachusetts Coastal Zone Management Office where he co-authored the Massachusetts Coastal Wetlands Regulations and assisted in writing CZM policies. Mr. Smith also authored the Beach Management Plan for Smith Point, Nantucket under contract with the Board of Selectmen, Town of Nantucket.

- **John DeVillars (Managing Partner, BlueWave Strategies)** Mr. DeVillars has more than 25 years of experience in developing innovative solutions to environmental problems. He advises numerous businesses, organizations and real estate developers in the areas of project management, regulatory approvals, community and government relations, capital sourcing, green design, market research and business development. Mr. DeVillars previously served as the Administrator of U.S. EPA New England, Environmental Secretary of Massachusetts and Chairman of the Board of the MWRA.

- **Stephanie Pollack, Esq. (Director, BlueWave Strategies)** Ms. Pollack is a nationally-known environmental attorney. Prior to joining BlueWave, she worked for 20+ years at the Conservation Law Foundation where she served as the Senior Vice President for Advocacy and Communications. Ms. Pollack brings to BlueWave's projects both legal expertise and extensive hands-on experience in navigating complex permitting processes and in executing effective community outreach, risk communication, and stakeholder alignment strategies.

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Other Team Members

In addition to the core consultants we have assembled a highly qualified, multi-disciplinary team of specialists to ensure the project's success

Groundfish data collection	Marine Research Inc.
Vessel support	Capt. Pete Kaiser, Cape Cod Hook Fishing Association, other local fishermen and mariners
Sediment Coring	Alpine Surveys*
Archaeological resource surveys	The Public Archaeology Laboratory Inc.
Benthic sorting laboratory	Rutgers University*
Sediments grain size laboratory	Woods Hole Group Environmental Laboratories*
Land surveying/ground control	Blackwell Associates
Geophysical Survey Support	CR Environmental*

*This firm or an equivalent firm

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Potential On-shore Issues

- Sand grain size compatibility
- Sediment transport and effects on adjacent beaches
- Nesting shorebirds
- Benthic organisms
- Water quality (turbidity)
- Impacts on marine mammals

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Potential Off-shore Issues

- Marine habitat
- Benthic organisms
- Marine fisheries
- Shoaling and sedimentation patterns
- Wave focusing
- Marine mammals
- Cultural resources – marine archaeology

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Data Collection Framework

- Seasonal off-shore environmental surveys
 - Spring/Summer 2005
 - Fall 2005
- Geophysical surveys
 - Spring/Summer 2005 – Bathymetry, sub-bottom, magnetometer
 - Summer 2005 – Sediment coring

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Data Collection Parameters: Sediment Grain Size

Data Type	Sediment grain size
Number of Samples	25 off-shore samples 10 on-shore samples
Purpose	Seasonal surface grabs with grain size analysis to: <ul style="list-style-type: none">▪ Develop a baseline for sediment compatibility analysis▪ Measure benthic habitat characteristics

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Data Collection Parameters: Benthic Invertebrates

Data Type	Benthic invertebrates
Number of Samples	15 off-shore samples 5 on-shore samples
Purpose	Seasonal taxonomic sorts to characterize abundance and diversity as a basis for environmental impact assessment

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Data Collection Parameters: Water Quality

Data Type	Water quality
Number of Samples	5 off-shore samples
Purpose	Temperature and salinity casts to establish hydrographic conditions during surveys

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Data Collection Parameters: Fisheries and Shellfish

Data Type	Fisheries and shellfish
Number of Samples	5 off-shore samples 2 on-shore samples
Purpose	Seasonal trawls, clam dredging, and interviews with fisherman to characterize fish and shellfish resources as basis for the environmental assessment.

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Data Analysis: Environmental

- Benthos and fisheries statistics
- Grain size compatibility
- Wave transformation and sediment transport
 - Nearshore – effects of nourishment and sand gates on adjacent beaches and resource areas
 - Off-shore – borrow shoaling rates, wave focusing

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Data Analysis: Engineering

- Design parameters
- Alternatives analysis – balance cost and performance
- Cross-sections, quantities, etc.

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Schedule

- | | |
|---------------------------|---|
| January 19, 2005 | ▪ U.S. ACE/Resource Agencies |
| February 28, 2005 | ▪ MEPA Environmental Notification Form Filing |
| April 4, 2005 | ▪ MEPA Scoping Meeting |
| May 12, 2005 | ▪ Decision on Environmental Notification Form |
| Spring 2005 - Summer 2006 | ▪ Data Collection and Public Meetings |
| November 2005 | ▪ Submit DEIR |
| March 2006 | ▪ Submit Final EIR |
| Fall 2006 | ▪ Federal, state and local permits issued |
| Fall 2006 | ▪ Project Commencement |

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