Sand Extraction for Coastal Restoration Projects and the Siting of Alternative Energy Structures on the Federal OCS: Past, Present and Future

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OCS Marine Minerals Program

Provides policy direction for the development of marine mineral resources on the OCS

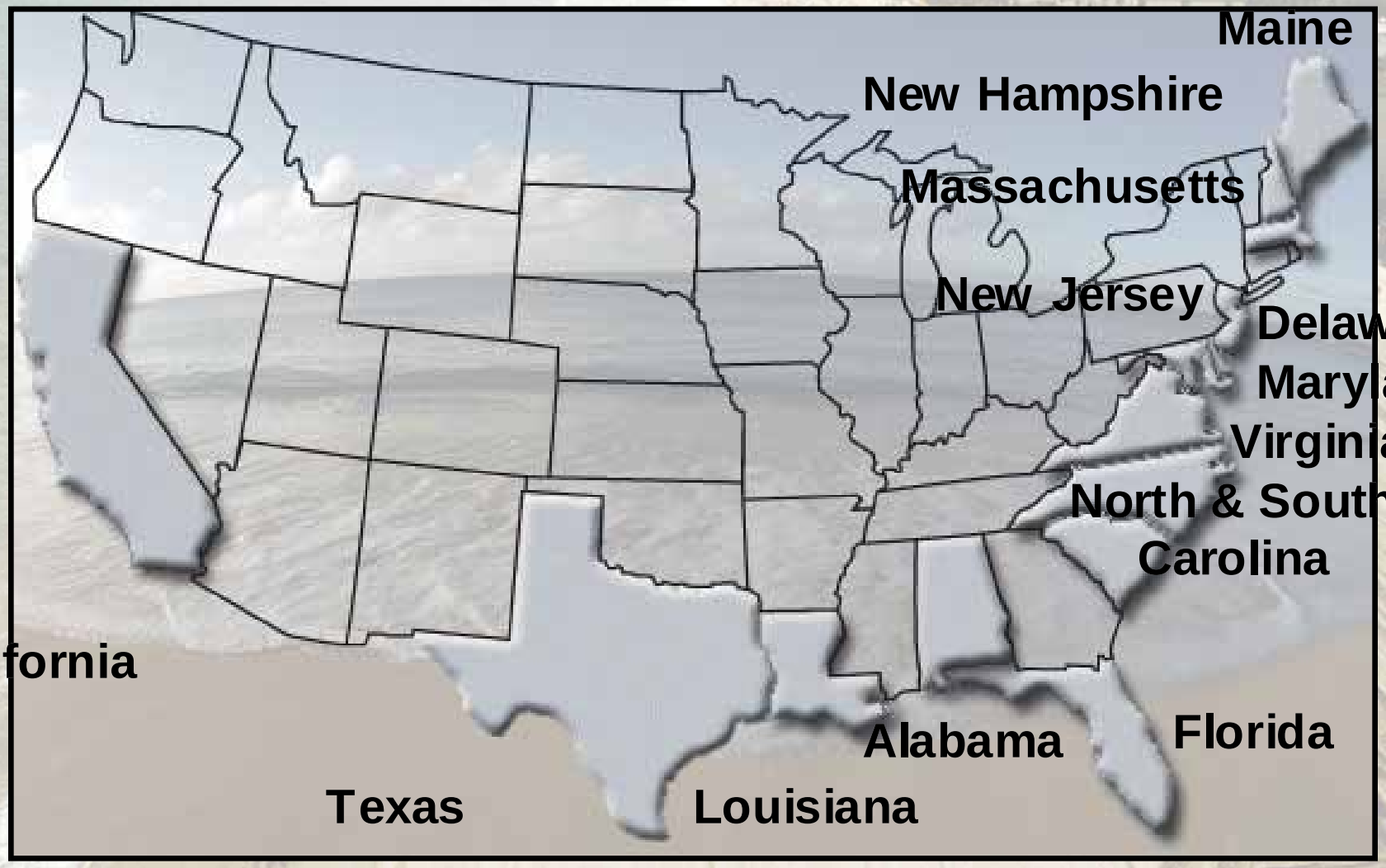
Collects and provides geologic and environmental information, developed through partnerships with 14 coastal States

Identifies and makes available OCS sand deposits suitable for beach nourishment and wetlands protection projects

Legislative Authority

- The OCS Lands Act authorized the Secretary to convey minerals only by competitive bidding
- In 1994 the OCSLA was amended to authorize noncompetitive conveyance of sand and gravel used in public works projects and to allow MMS to charge a fee for the material
- In 1999 another amendment to OCSLA removed the authority to charge for the material conveyed for public works projects

Cooperative Agreements with States



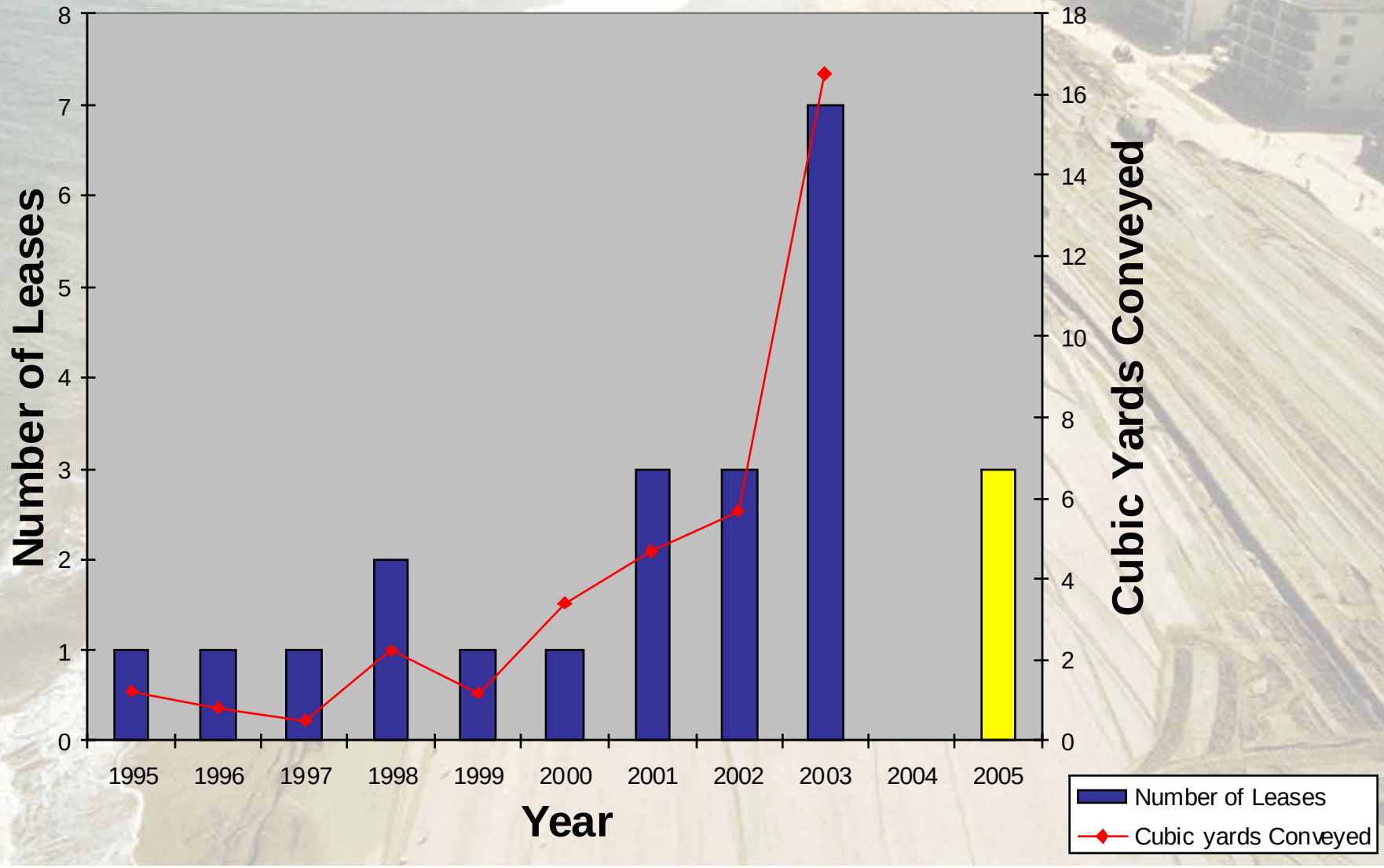
Cooperative Agreements

- Focus on assessment of OCS sand resources as sources of material for public works projects.
- Coordinate with State and local agencies, U.S Army Corps of Engineers, and public interest.
- Emphasize cost sharing between State and MMS to as close to 50-50 as possible.

16 Projects 5 States
Over 23 Million Cubic Yards

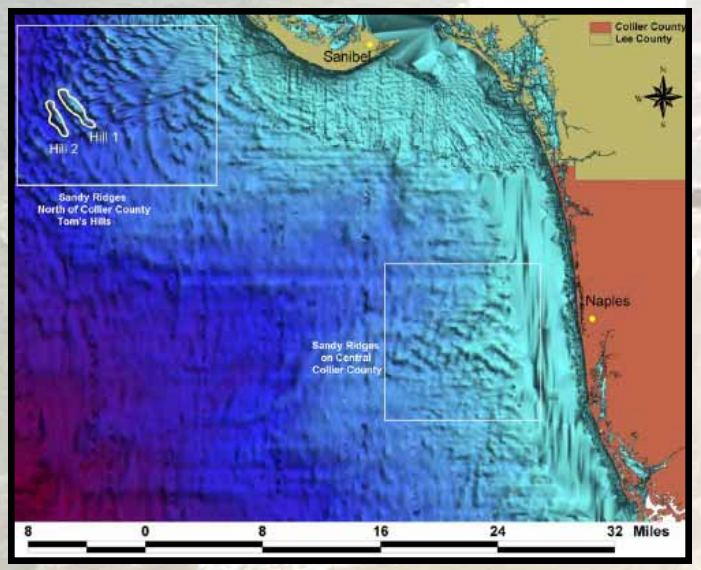
State	*Locality*	*Sand (cubic yards)*
FLORIDA	**Jacksonville (Duval County)**	**1,240,000**
SOUTH CAROLINA	**Myrtle Beach (Surfside)**	**150,000**
VIRGINIA	**Dam Neck Naval Facility**	**808,000**
VIRGINIA	**Dam Neck Naval Facility**	**700,000**
VIRGINIA	**Sandbridge Beach**	**1,100,000**
VIRGINIA	**Sandbridge Beach**	**2,000,000**
MARYLAND	**Assateague National Seashore**	**134,000**
MARYLAND	**Assateague National Seashore**	**2,000,000**
MARYLAND	**Assateague State Park**	**100,000**
FLORIDA	**Brevard County – North**	**4,500,000**
FLORIDA	**Brevard County – South**	**2,800,000**
FLORIDA	**Patrick Air Force Base**	**600,000**
LOUISIANA	**Holly Beach**	**4,200,000**
FLORIDA	**Brevard County**	**2,000,000**
FLORIDA	**Patrick Air Force Base**	**350,000**
FLORIDA	**Jacksonville (Duval County)**	**1,500,000**

Non-competitive Sand Leases by Year

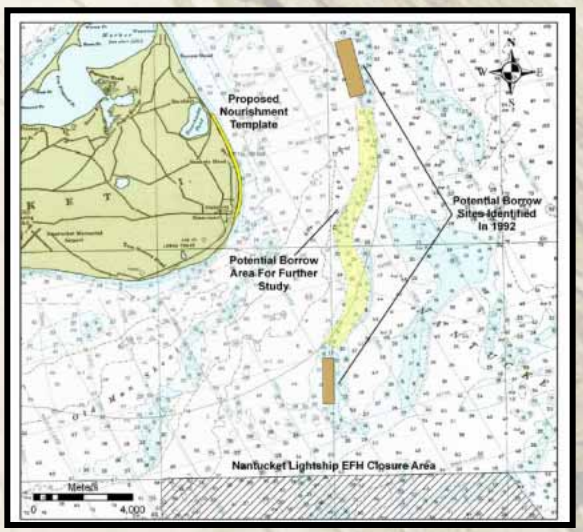


Pending Negotiated Agreements

Louisiana
Pelican Island (Sandy Point)
Whiskey Island (Ship Shoal)

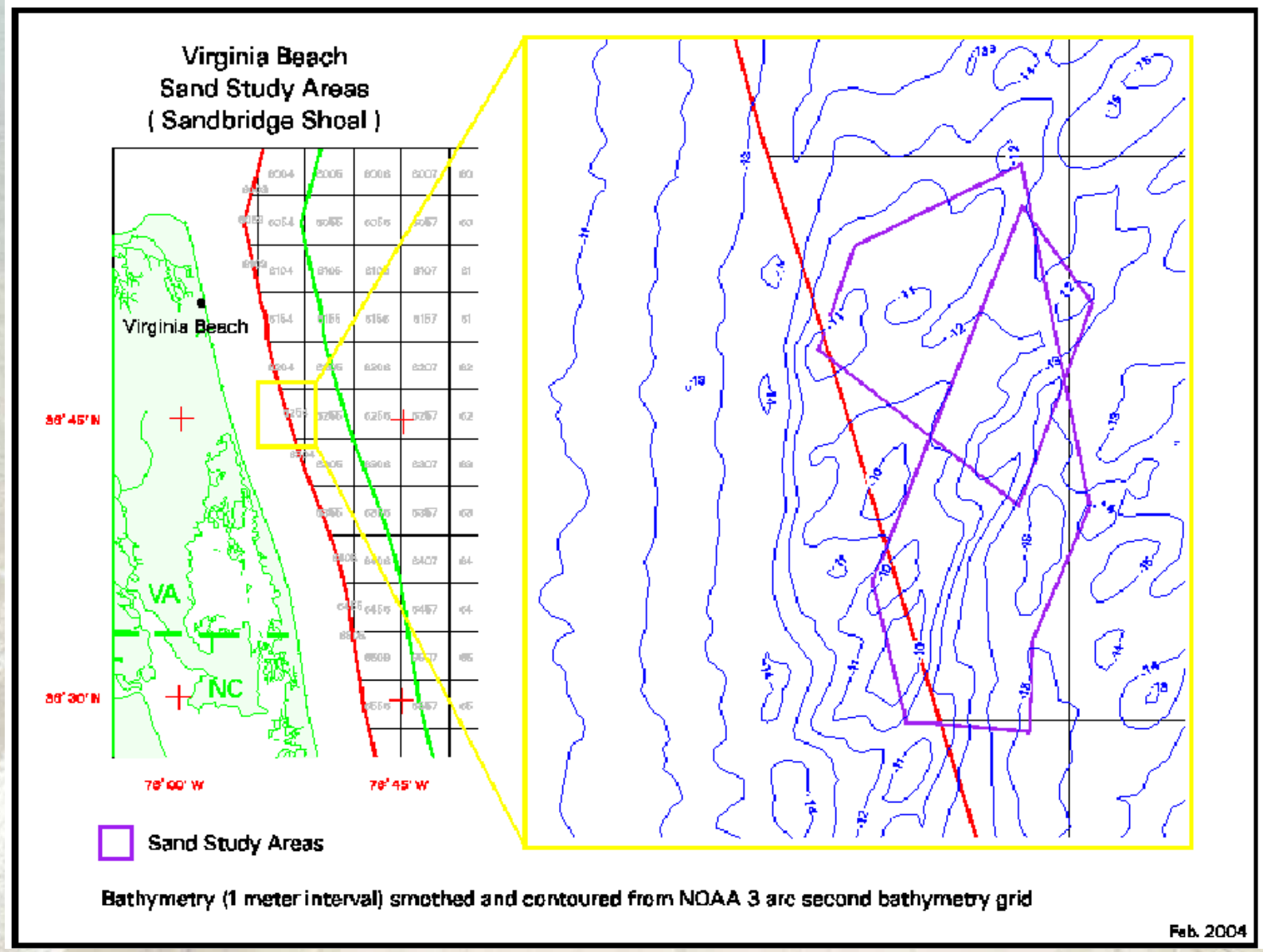


Florida
Collier County (Offshore
Sanibel Island)



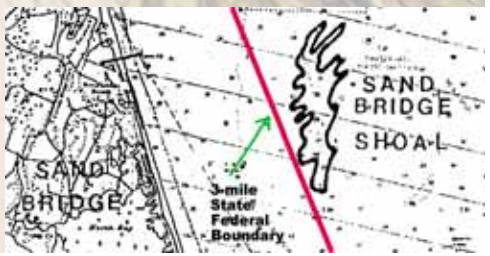
Massachusetts
Nantuckett (Sconset Beach)
Barnstable?

Sandbridge Shoal



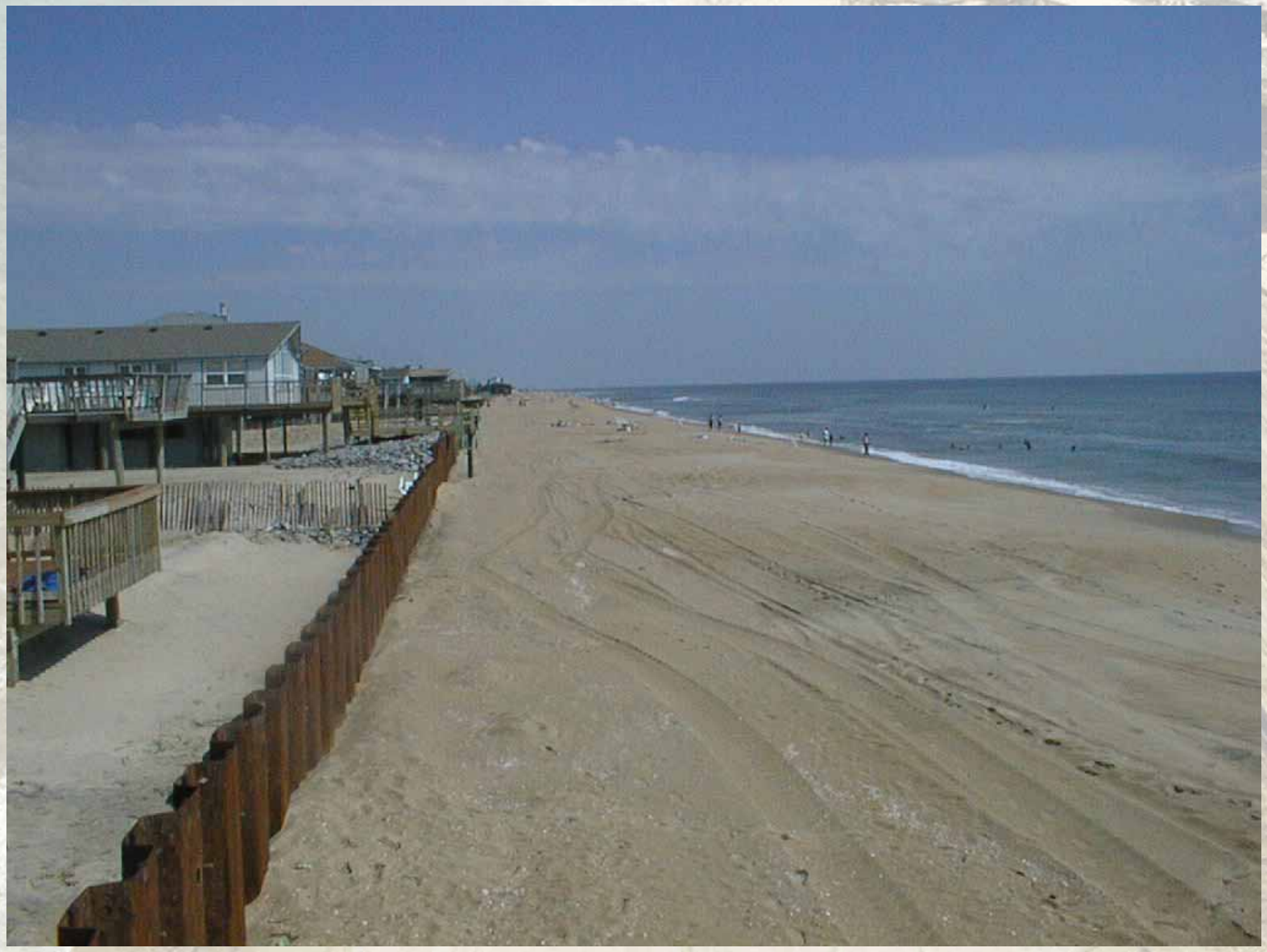
Sandbridge Shoal: Past Usage

- Navy: 810,000 cubic yards (1996-$4 million)
- Sandbridge Beach: 1.1 million cubic yards (1998-$9 million)
- Sandbridge Beach: 1.1 million cubic yards (2002-$ 1 million)
- Navy: 700,000 cubic yards (2003-$ 4 million)



Sandbridge, VA -Pre - Nourishment

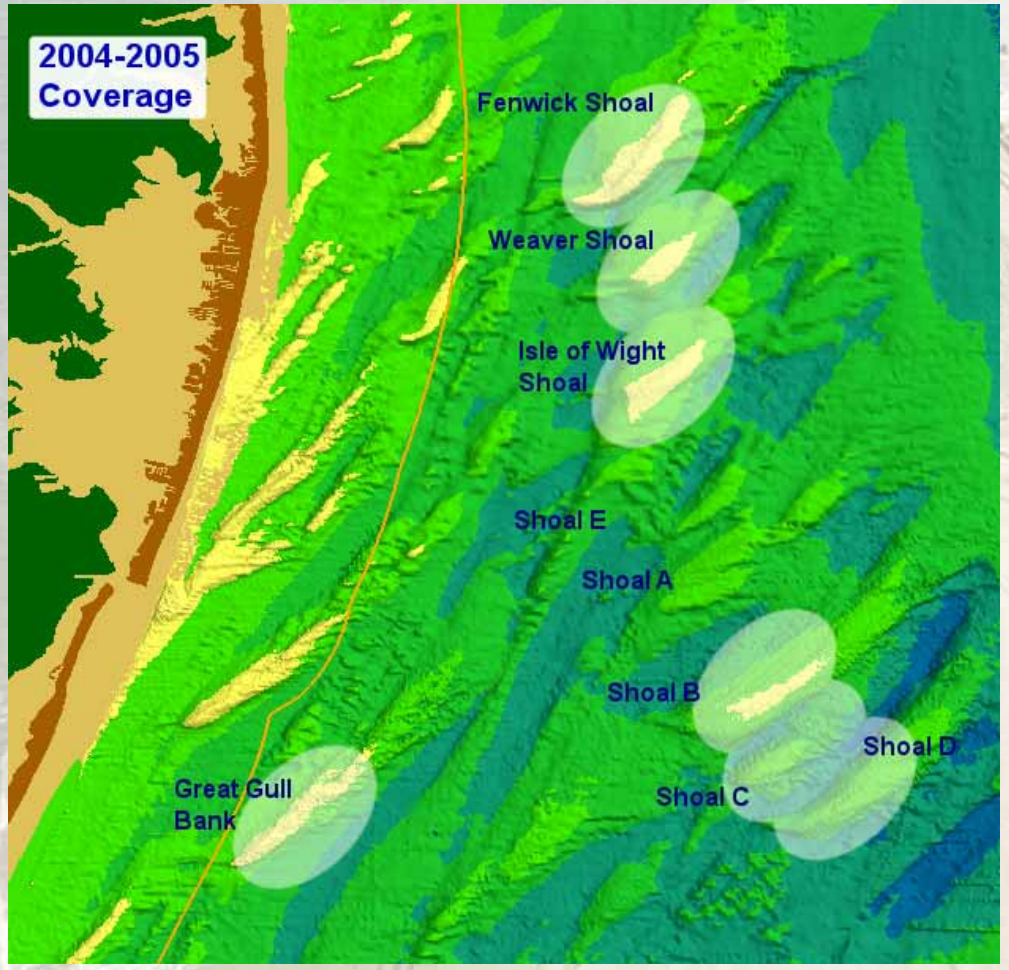
Sandbridge, VA -Post Nourishment

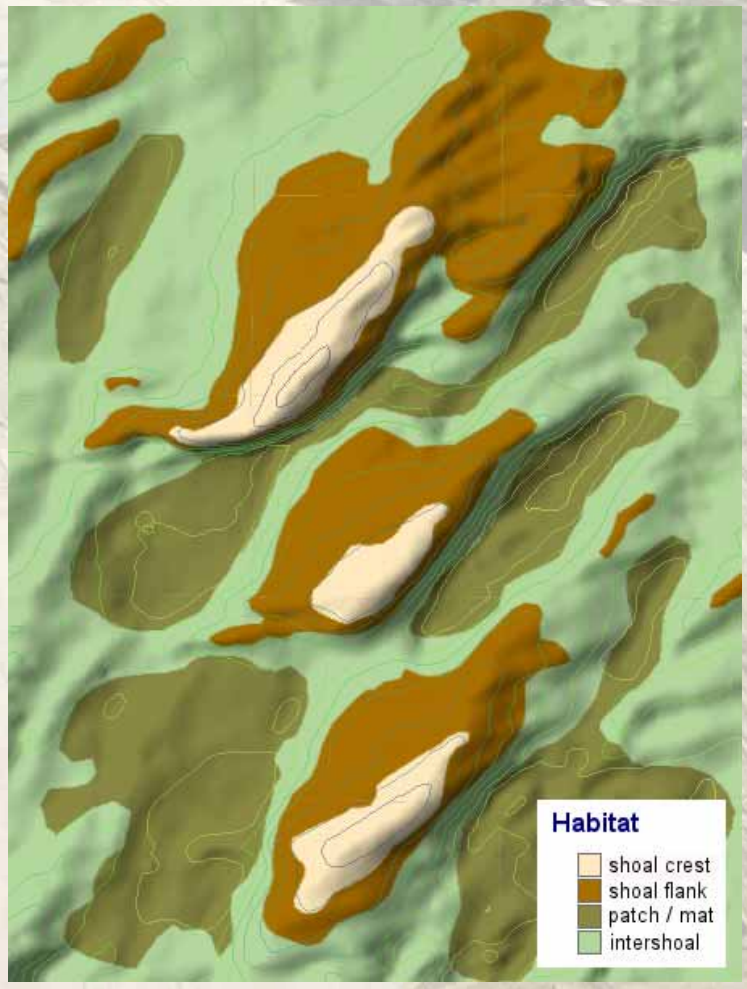


Great Gull Bank: Past Usage

- 1998 - Assateague Island (NPS/ACOE): 134,000 cubic yards
- 2001 - Assateague State Park (MDNR): 100,000 cubic yards
- 2001 - Assateague Island (NPS/ACOE): 1.8 million cubic yards

Maryland/Delaware Sand Sources

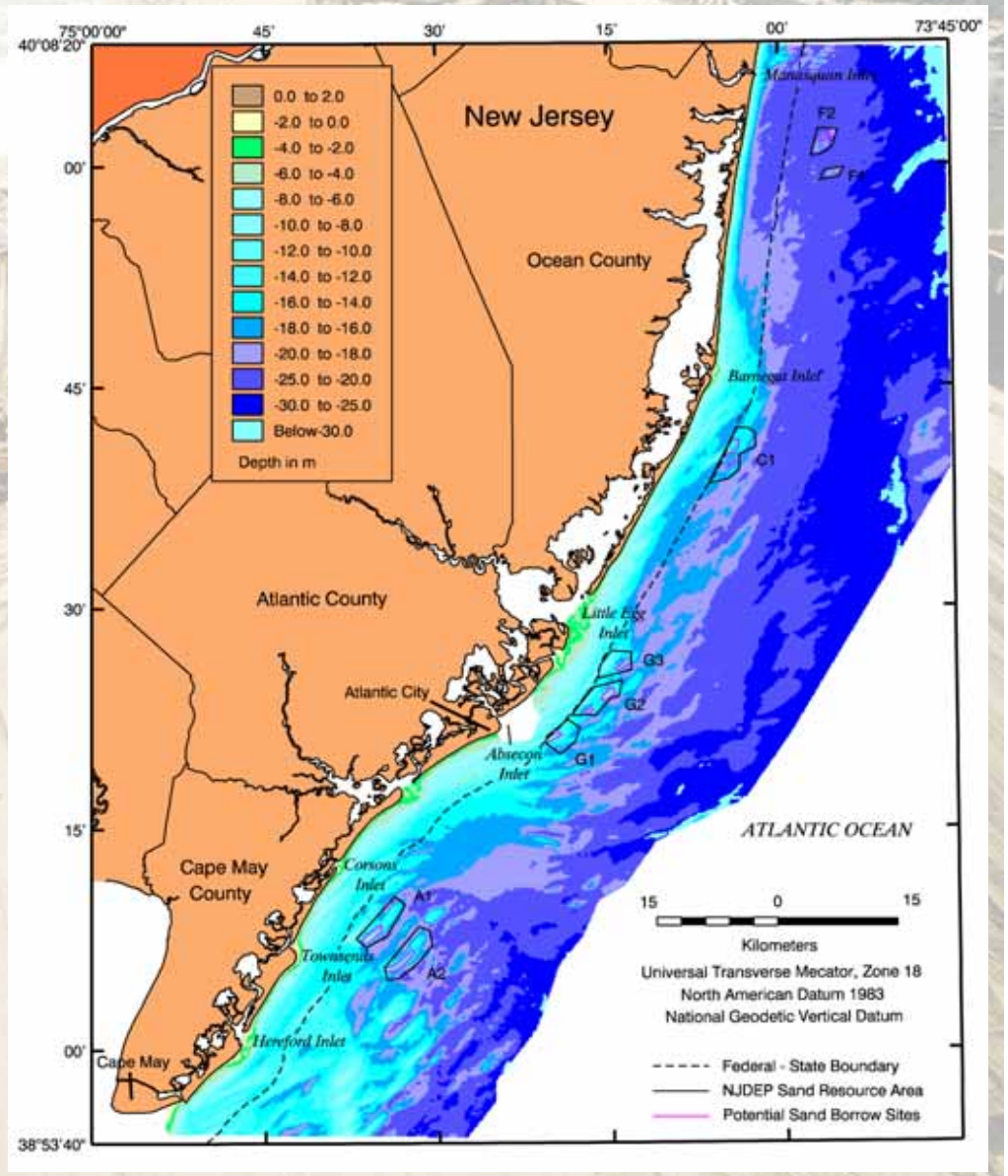




New Jersey

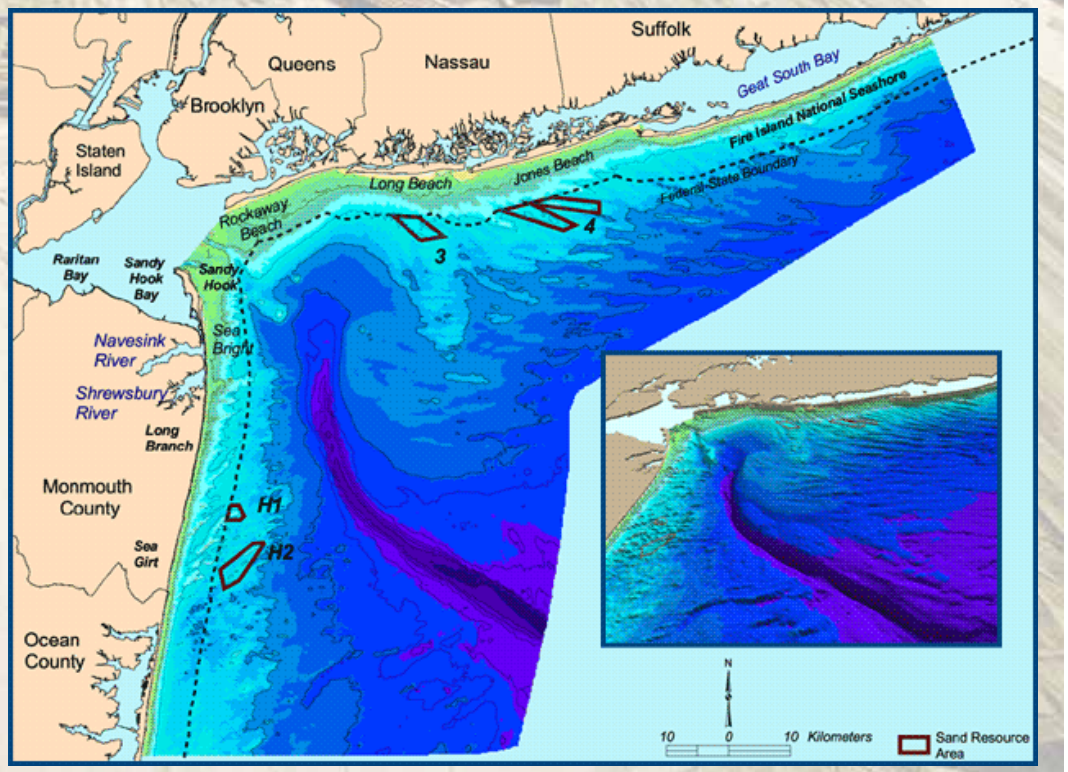
Possible Upcoming Sand Lease Requests: 2006-2008

- Avalon-Stone Harbor
- Brigantine Beach
- Sea Bright-Belmar
- Manasquan-Barnegat



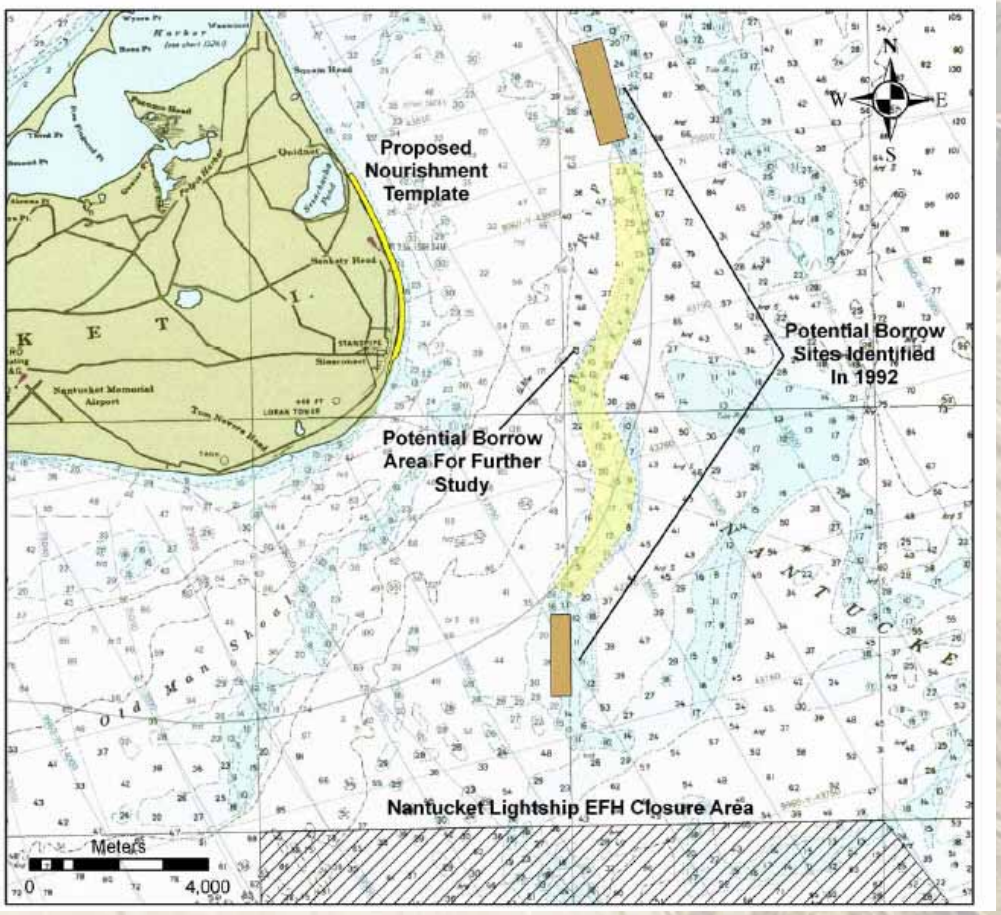
New York

- No past or present lease request but there are rumors.
- MMS received NY's request in April 2005 to initiate a sand coop program.
- The State wants to evaluate sand resources off central and western Long Island.



Nantucket/Sconset Project, MA

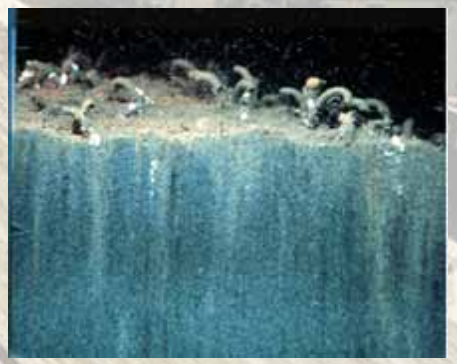
- Base project (2 miles) from Sankaty Head Lighthouse to Codfish Park (1.6 mcy)
- Extended beds project (3 miles +) from Town sewer to Sesachacha Pond (3 mcy)
- Goal: Fall 2006

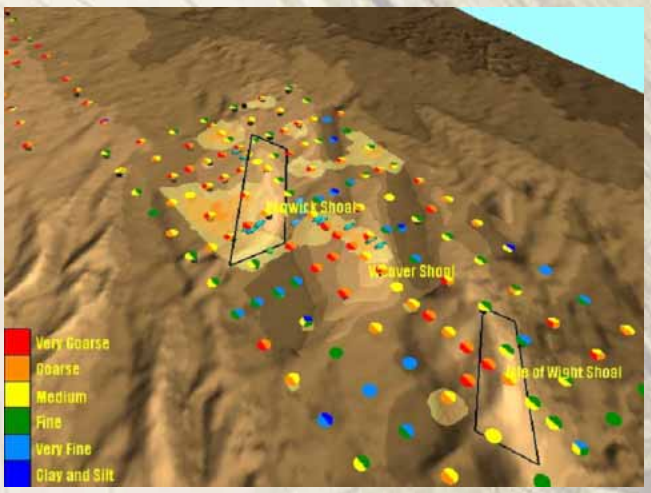


Environmental Studies

MMS has invested $14 million in sand and gravel research focusing on:

- Biological/physical impacts of sand dredging at site-specific borrow sites identified thru state coops.
- Generic impacts/effects/issues common to all borrow sites.





Environmental Issues

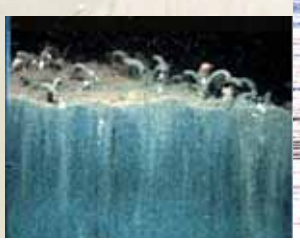
- Is there a threshold above which continuous mining results in significant damage to marine ecosystems?
- Are there operational methods that can be changed to reduce negative impacts to physical or biological conditions?
- Does sand dredging result in predicted impacts?
- Are there impacts that were not predicted or anticipated?
- Do the predicted impacts occur and recover as expected?

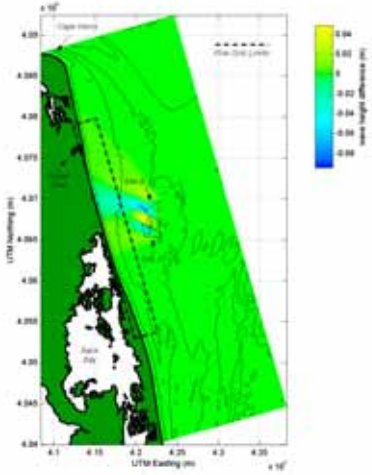
Monitoring Protocols to Evaluate Possible Long-term Impacts of Dredging

- Contract awarded to Research Planning, Inc in April 2000
- Subcontractors: Baird and Associates (Physical tasks); Applied Science Associates (Biological tasks)
- Completed October 2001
- Report provides detailed specification to measure various environmental parameters including cost.
- Provide MMS with appropriate and sound designs/protocols for monitoring the physical/biological OCS environment to evaluate the long-term and cumulative effects of using Federal sand borrow areas.

Biological & Physical Considerations

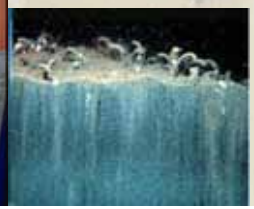
- Benthos
- Nekton
- Marine Wildlife
- Bathymetric changes
- Changes in local wave regime: influence on shoreline inshore of borrow site
- Any subsequent changes in wave patterns after dredging





Protocols: Benthic Communities

- Before-After-Control-Impact (BACI) sampling design: utilizes several control areas
- Sampling sites should be located among strata known to influence communities (ridge top, slope, etc).
- Assess long-term impacts: sampling for organism density, abundance, secondary production and fish prey utilization.
- Sampling conducted during summer seasons, pre/post dredging, years 1, 3, 5 and 7.

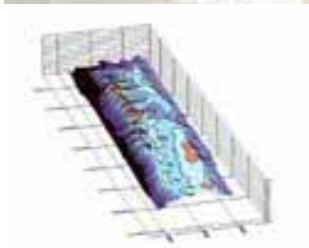


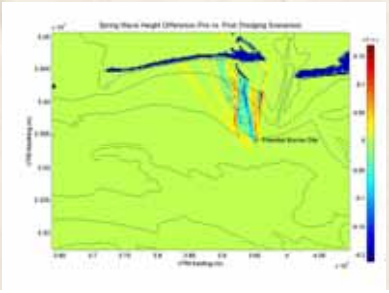
Protocols: Fish Assemblages

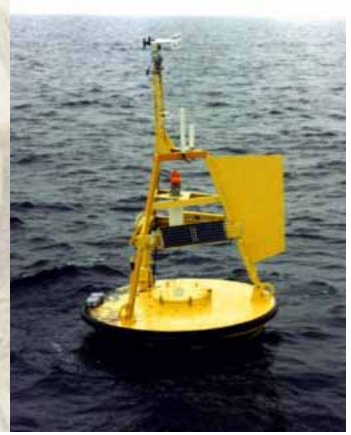
- Focus on most abundant species and recreationally/commercially important species.
- Fish Trawling (Night and Day)
- Trawls taken over identified strata.
- Transfer of energy through trophic levels through gut contents and stable isotope of C and N.

Protocols: Physical

- Bathymetric Changes
  - Pre and post dredge surveys
  - Combination of single-beam echo sounder plus side-scan or high-resolution multibeam echo sounder surveys
- Shoreline Changes
  - Shoreline monitoring and profiling
  - Shoreline Modeling (e.g. GENESIS)
- Wave Pattern Changes
  - Long-term wave record using directional buoys.
  - Numerical wave modeling/transformation
  - modeling (e.g. STWAVE, SWAN, MIKE 21)







Incorporation of Adaptive Management Strategy During Monitoring

- Scientific Advisory Board
  - Duration and frequency of sampling
  - Inclusion of new monitoring elements (Birds??)
  - Adapting the program to new locations and technologies
  - Detecting regional differences

Field Testing of Monitoring Protocols at Sandbridge, VA (Virginia Institute of Marine Science)

- All data collection timed to dredging events: close coordination with USACE-Norfolk District and Navy.
- Analysis and evaluation of monitoring protocols in early 2006 by MMS, VIMS, RPI team and outside reviewers.
- Progress reports available online @ http://www.mms.gov/sandandgravel/Virginiastudies.htm

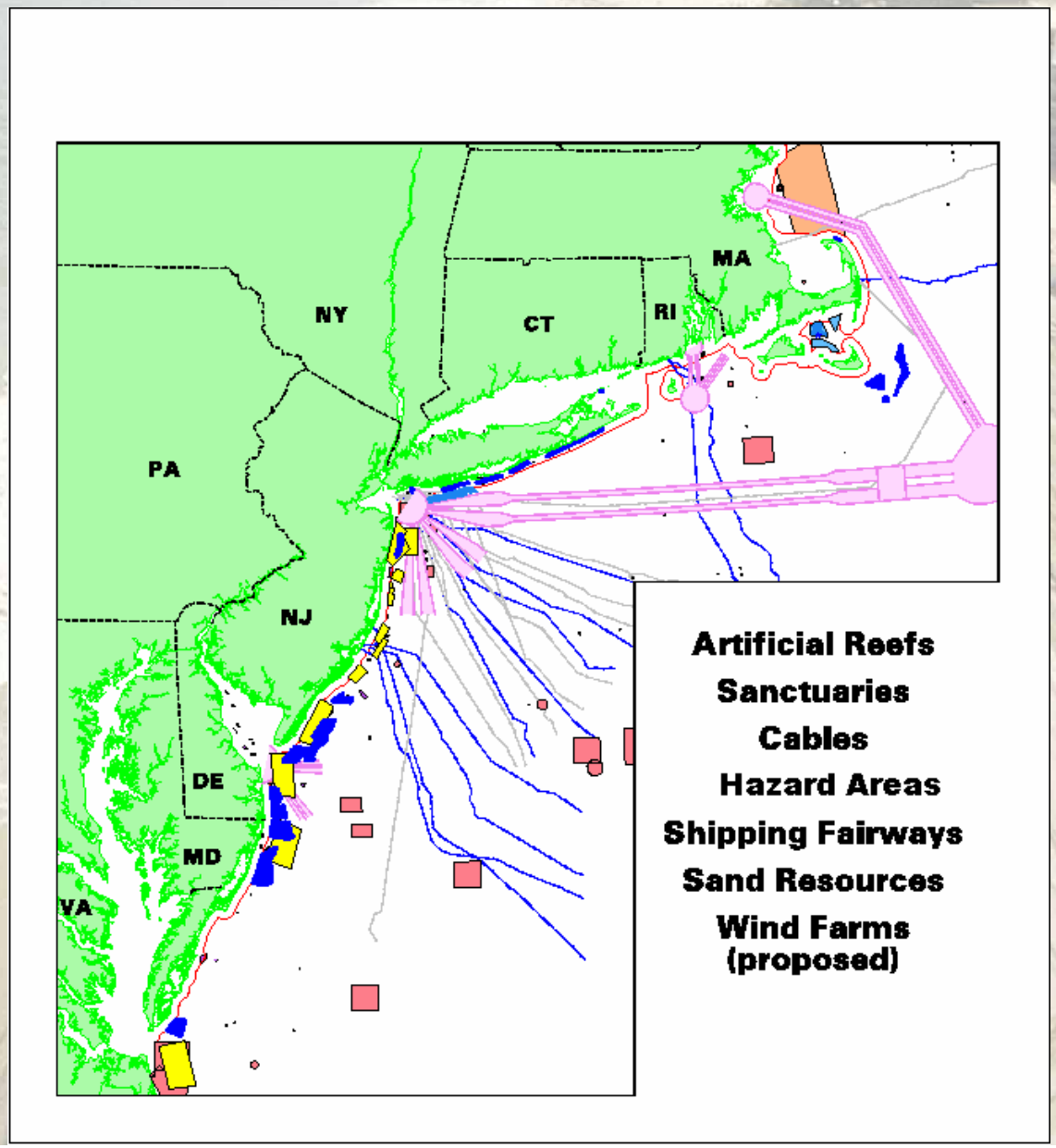
The Real Questions:
Can data collected be used to make sound management decisions relative to the continued use of Federal sand borrow areas?
Is data being collected the right data?

National Energy Policy Act 2005

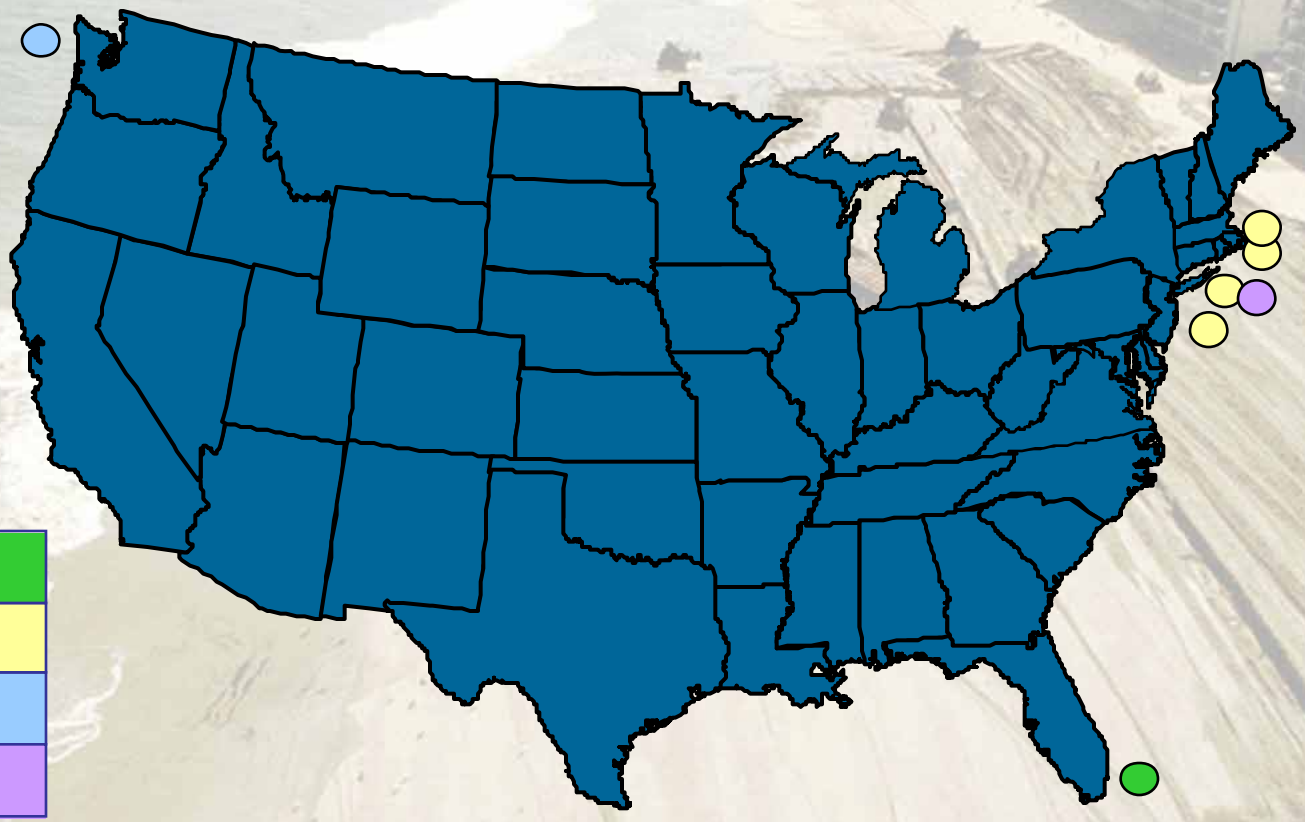
Section 388 authorizes DOI to:

- Ensure consultation with States and other stakeholders.
- Grant easements and rights-of-way for alternative energy-related uses on the OCS.
- Act as the lead agency.
- Regulate, monitor and determine fair return to the nation.

Multiple Use Conflict

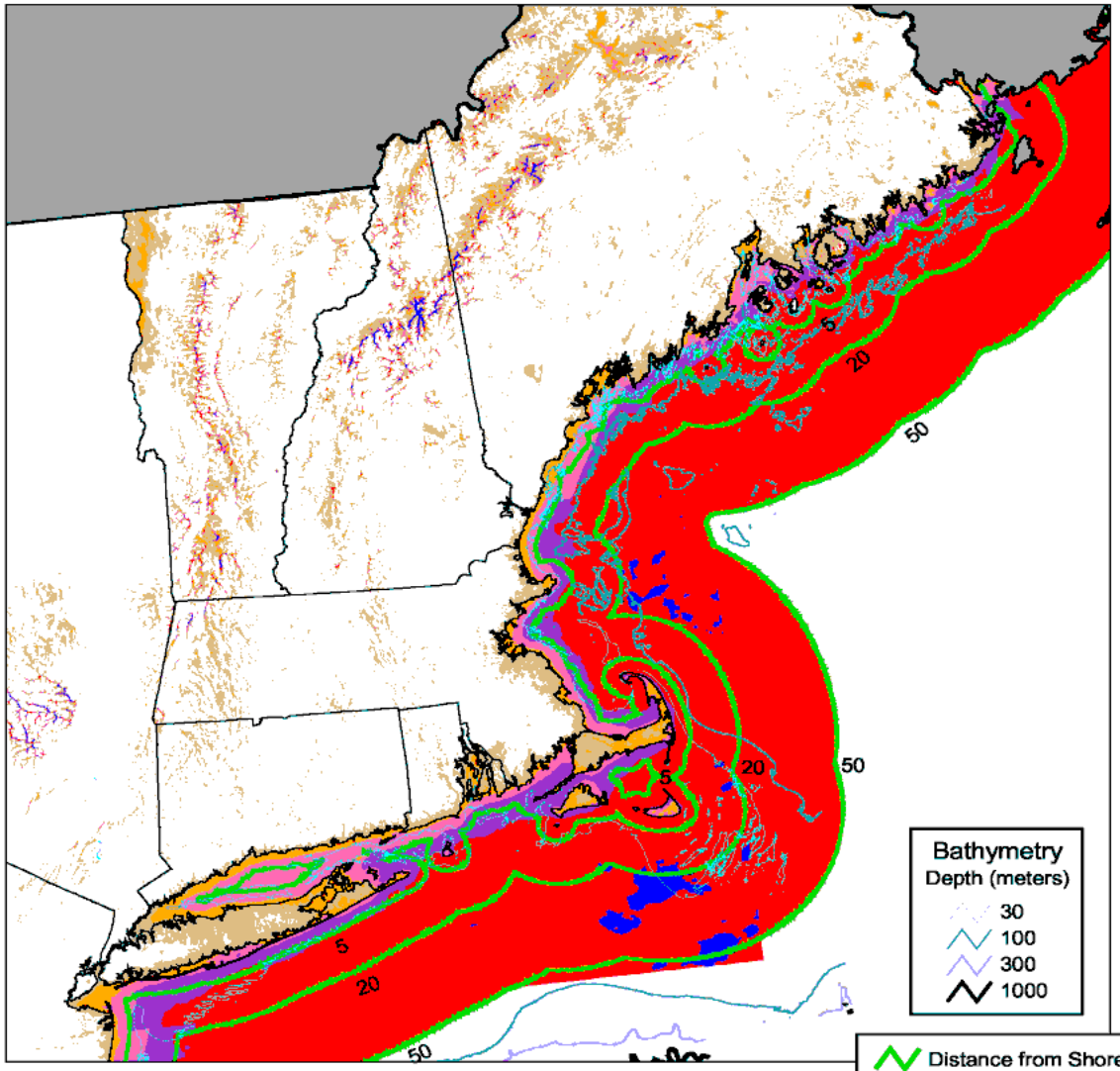


Where are the proposed projects?



Current
Wind
Wave
Hydrogen

New England Potential



Bathymetry
Depth (meters)
30
100
300
1000

Distance from Shore
(Nautical Miles)

New England Offshore Wind Resource Potential

All areas > 5 nautical miles offshore likely to be class 4 resource or better.

Area 5-20 nautical miles from shore (67% excluded):
10,300 sq. km. (51,500 MW)
1,980 sq km (9,900 MW) <30m depth

Area 20-50 nautical miles from shore (33% excluded):
33,800 sq. km. (169,000 MW)
540 sq km (2,700 MW) <30m depth

The wind power resource data for this map was produced by TrueWind Solutions using the Mesomap system and historical weather data, and has been validated by NREL.

The bathymetry contour lines were derived from NOAA's coastal relief models (nominal resolution 1 km) from NOAA's National Geo-physical Data Center.

Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m²	Wind Speed[a] at 50 m m/s	Wind Speed[a] at 50 m mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	> 800	> 8.8	> 19.7

[a] Wind speeds are based on a Weibull k value of 2.0

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National Renewable Energy Laboratory

NREL

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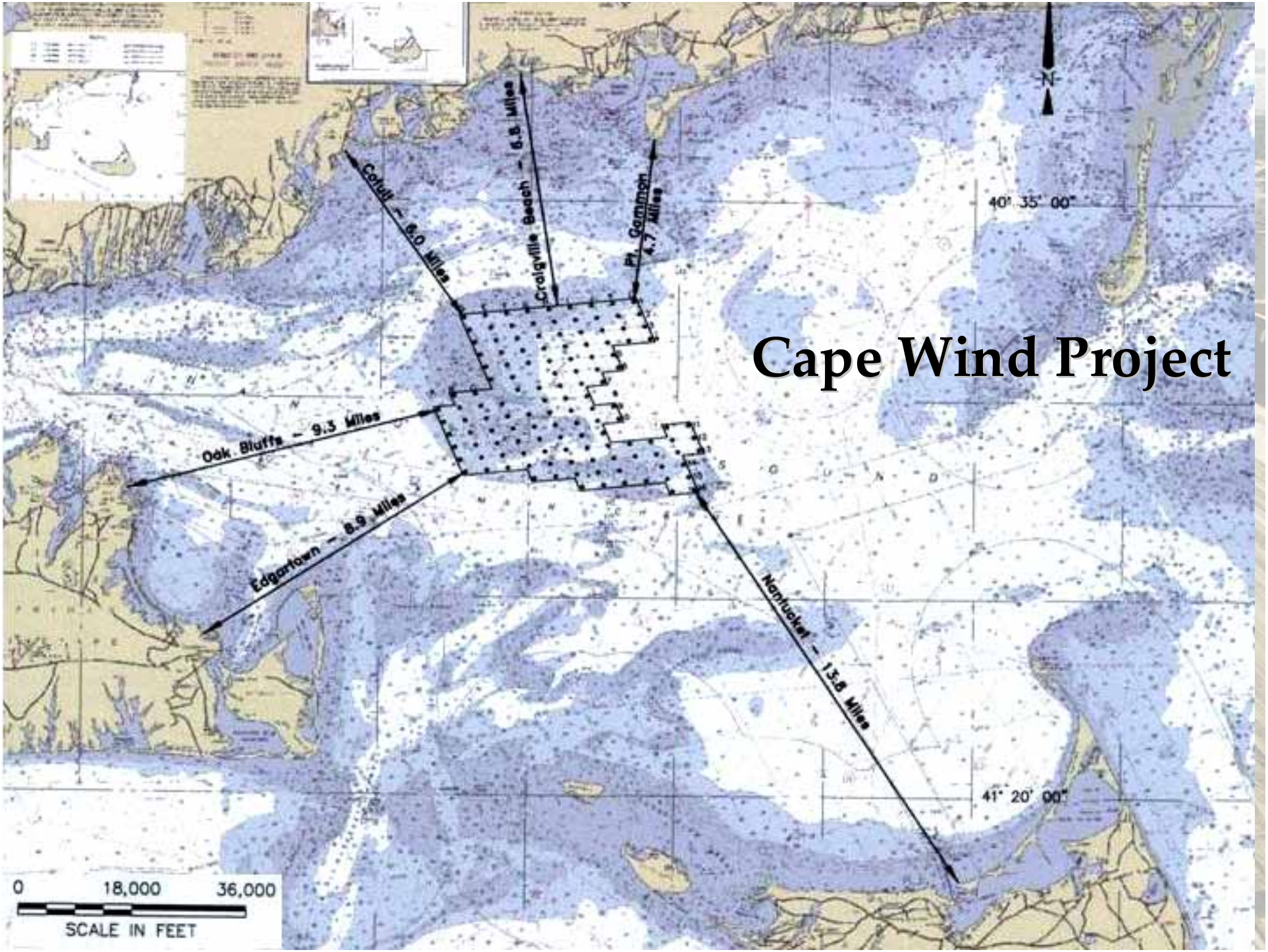
Cape Wind Project
Craigville Beach – 6.8 Miles
Ph. Gammon – 4.7 Miles
Cotuit – 6.0 Miles
Oak Bluffs – 9.3 Miles
Edgartown – 8.9 Miles
Nantucket – 13.8 Miles
40° 35' 00"
41° 20' 00"
N
0
18,000
36,000
SCALE IN FEET


Questions???