Opportunities for Offshore Wind Energy in State Territorial Waters

Prepared in response to
Acts of Assembly 2009, Chapter 766
(SB1350)

By
Virginia Marine Resources Commission

Acts of Assembly 2009
Chapter 766
(SB1350)
Amendment to *§ 28.2-1208* of the Code of Virginia, relating to offshore renewable energy resources

- provides the Virginia Marine Resources Commission (VMRC) with the authority to **lease subaqueous lands** for the purpose of generating electrical energy from wave or tidal action, currents, offshore winds, or thermal or salinity gradients and transmit energy from such sources to shore (in addition to permits required pursuant to § § 28.2-1203 and 28.2-1204 of the Code of Virginia),

- requires that any leases **require a royalty** to be appropriated to the Virginia Coastal Energy Research Consortium (VCERC),

- requires the maintenance of a **State Subaqueous Minerals and Coastal Energy Management Plan** (in lieu of a Subaqueous Minerals Management plan) as a supplement to the State Minerals Management Plan as well as the Virginia Energy Plan , and

- directs VMRC to:
  - identify 100 acres suitable for use by the VCERC as a research site,
  - in consultation with the VCERC, other state agencies, conservation and industry representatives, and other interested parties as appropriate, **determine whether sufficient and appropriate subaqueous land exists in state territorial waters to support the generation and transmission of electrical or compressed air energy from offshore wind**, and
    - by March 1, 2010 submit its findings in a written **report to the General Assembly**.

Emerging Marine Renewables

Tidal Currents

Marine Current Turbines

300 kW *SeaFlow* protoype

installed May 2003

Devon, UK

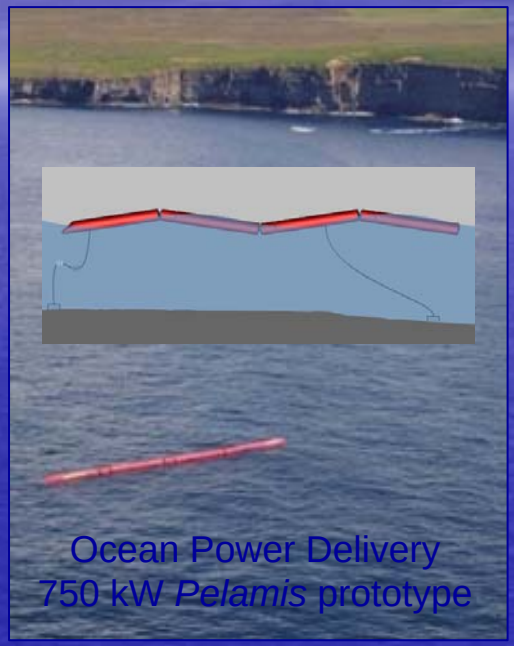
Offshore Winds

National Power
60 MW commercial project

30 x 2 MW Vestas
80m dia turbines
installed May 2003

North Hoyle, UK

Ocean Waves



Ocean Power Delivery
750 kW *Pelamis* prototype

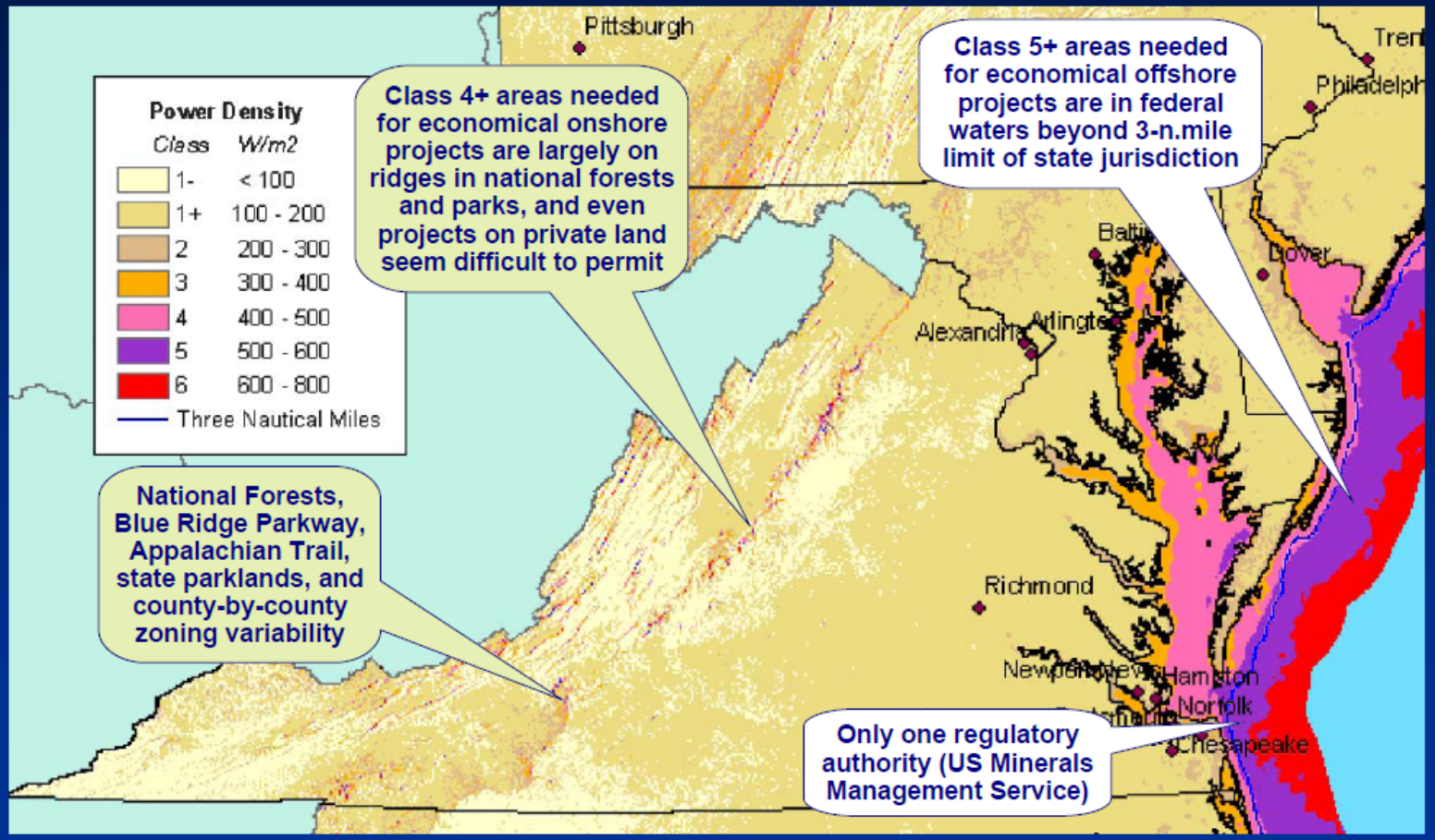
3.5 m dia x 150 m long

installed Aug 2004

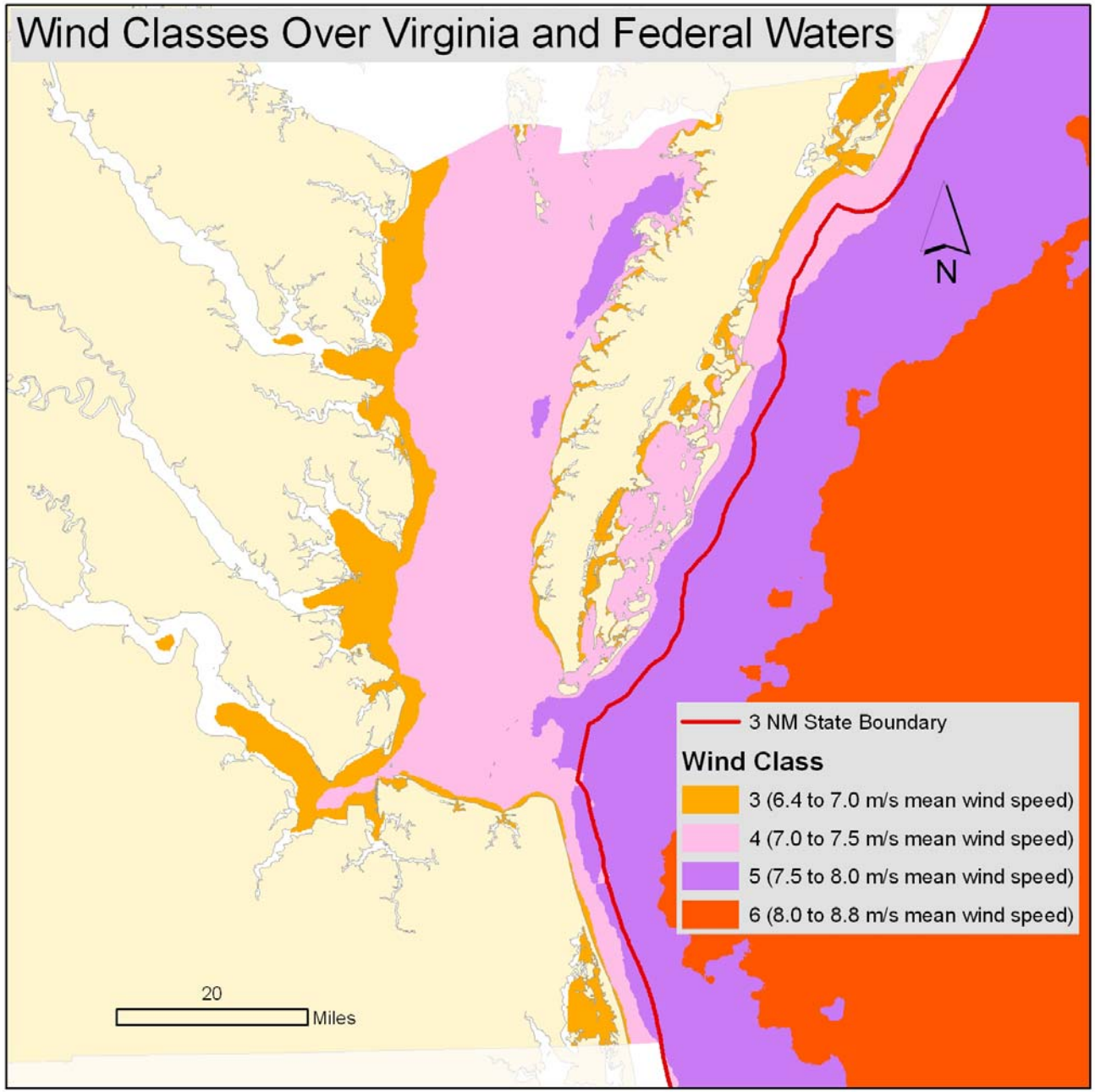
Stromness, UK

VCERC

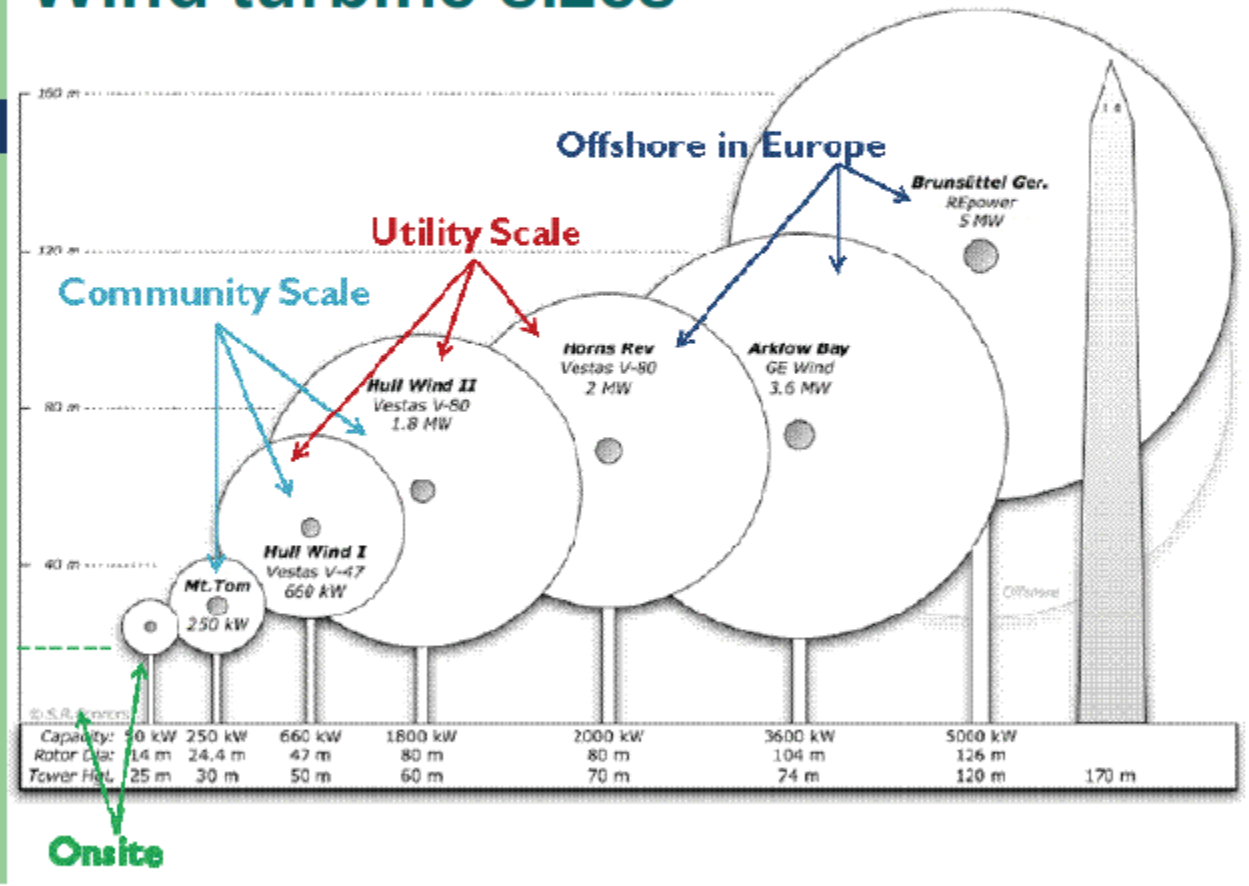
Virginia's Wind Energy Resources Offshore are Much Larger than on Land



VCERC


Wind Classes Over Virginia and Federal Waters
N
3 NM State Boundary
Wind Class
3 (6.4 to 7.0 m/s mean wind speed)
4 (7.0 to 7.5 m/s mean wind speed)
5 (7.5 to 8.0 m/s mean wind speed)
6 (8.0 to 8.8 m/s mean wind speed)
20
Miles

Wind turbine sizes



Evaluation Process

- Identify areas where resource and use conflicts would preclude offshore wind development
- Identify and evaluate other potential resources that require further analysis in remaining areas to determine suitability for offshore wind development
- Develop leasing and permit requirements

Offshore Wind Energy
Possible
Lease Conflict Issues

Use Conflicts

- Navigation
- Recreation
- Military operations/training/security
- Recreational fishing (security zone)
- Commercial fishing (gear/use restriction)
- Fishing Reefs
- Sand dredging for beach nourishment
- Shell mining for oyster restoration
- Local government zoning and viewshed issues
- State Parks, National Parks/Seashore and National Wildlife Refuge management

Resource Conflicts

- Fisheries (finfish and blue crabs - habitat and migration issues)
- Shellfish (public shellfish grounds-Baylor grounds and Private shellfish leases)
- Marine mammals
- Sea turtles
- Avian species (habitat and migration issues)
- Shallow water habitats
- Benthic resources
- Cultural and Historic resources

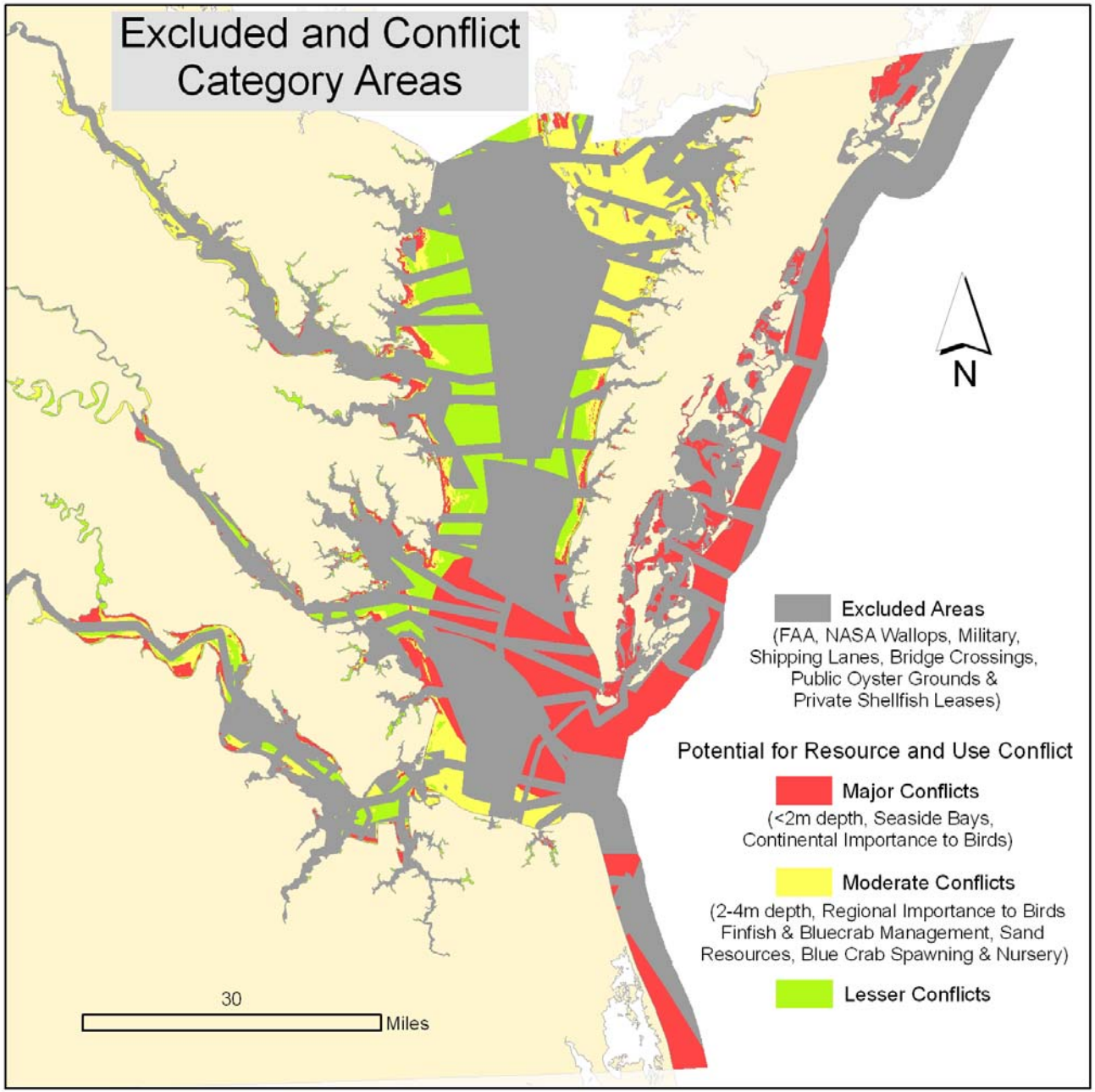
Classification Terms for Excluded and Conflict Category Areas

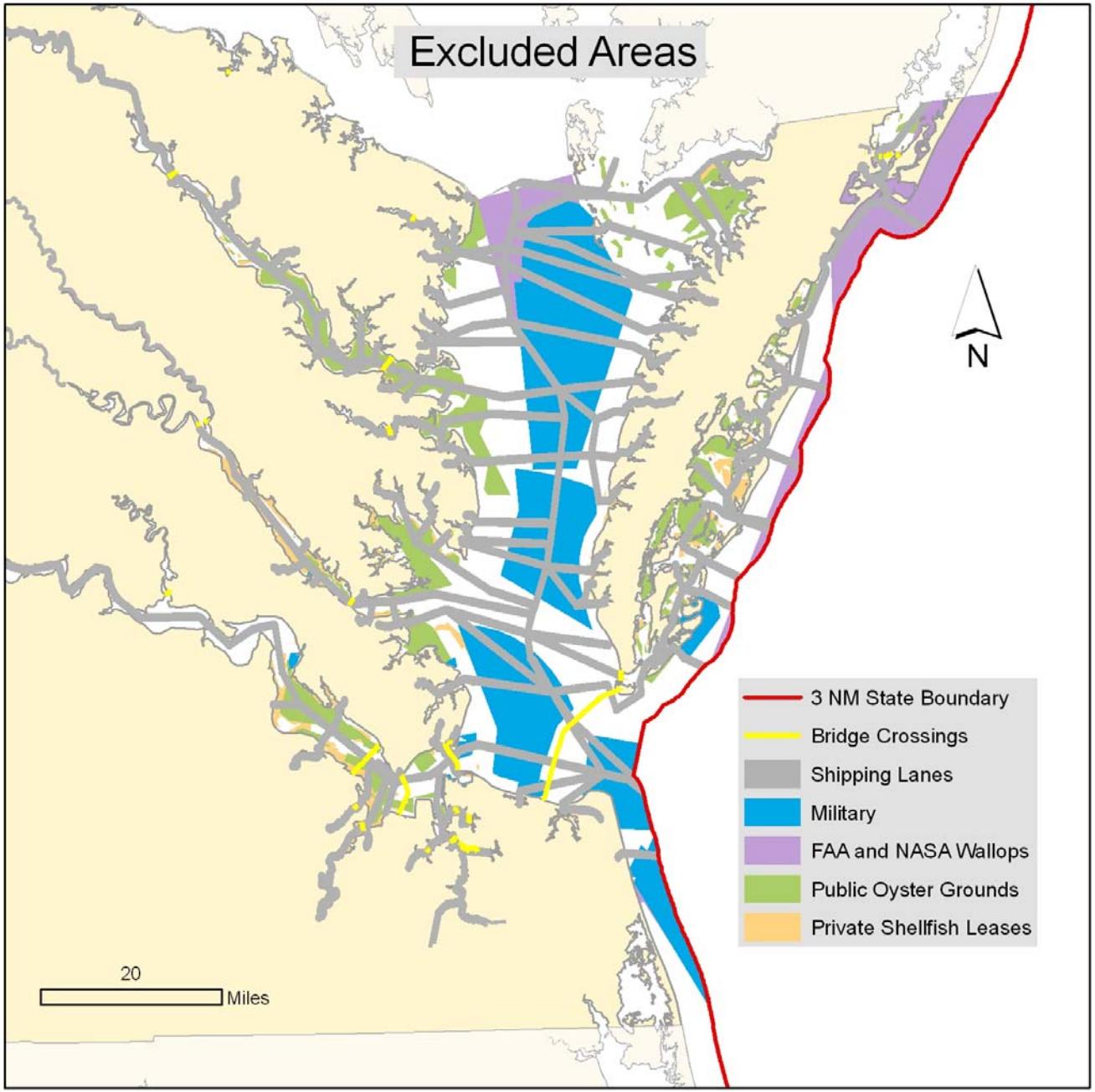
Excluded Areas:
Areas with defined use such as navigation channels and anchorages, military security and training areas, FAA restriction areas, the NASA Wallops Flight Facility range, Baylor Grounds (public oyster grounds) and private shellfish leases.

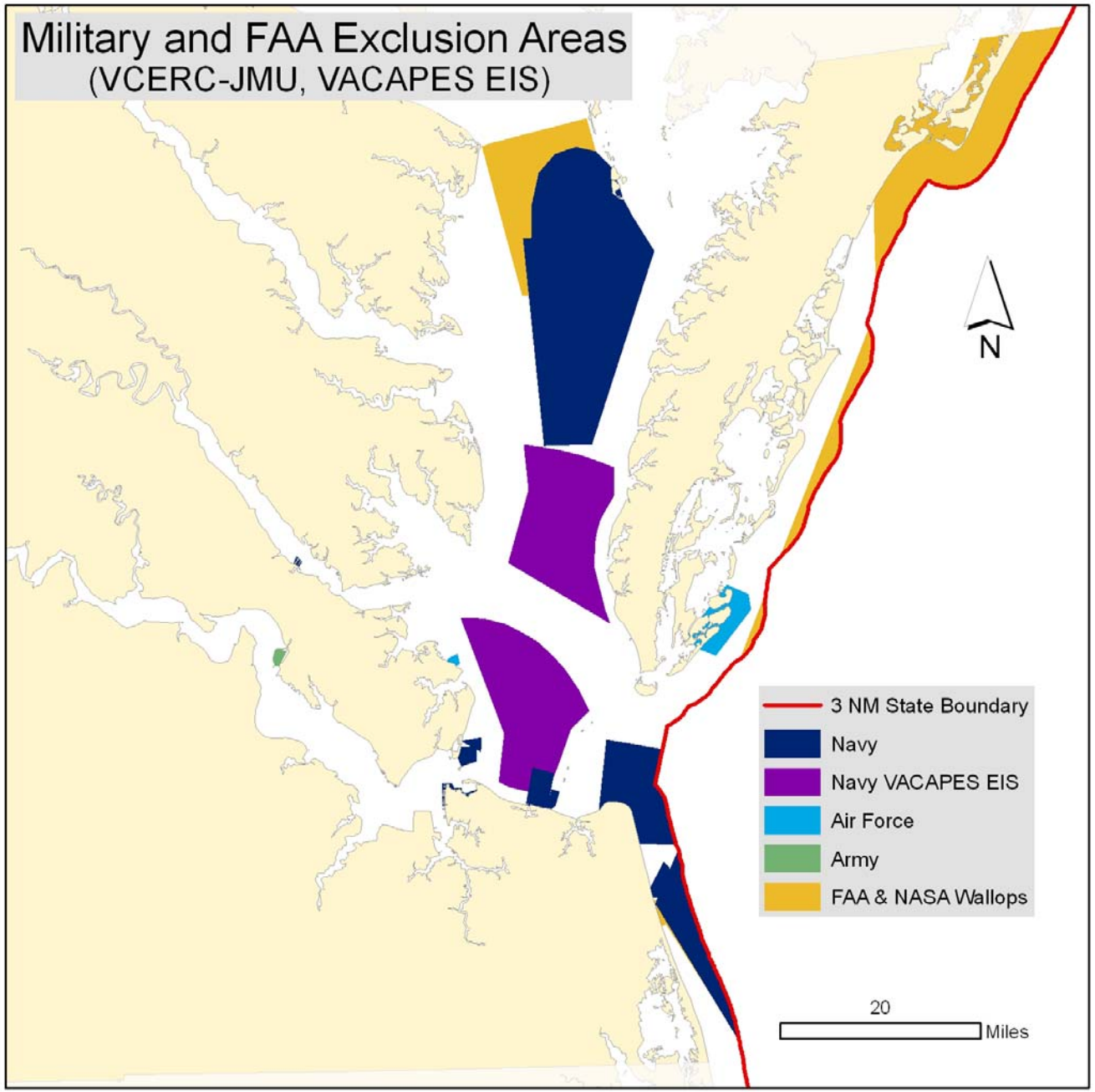
Major Potential for Resource and Use Conflict:
Areas where there are significant use or resources conflicts. Sensitive shallow water areas with depths less than 2 meters, including the Eastern Shore lagoon system behind Virginia's barrier islands, and areas of continental and global importance to birds. This includes much of the Bay mouth that overlaps or is near blue crab spawning and nursery areas and fishery, marine mammal and turtle migratory corridors as well as high commercial shipping and recreational use areas including those near recreational beaches.

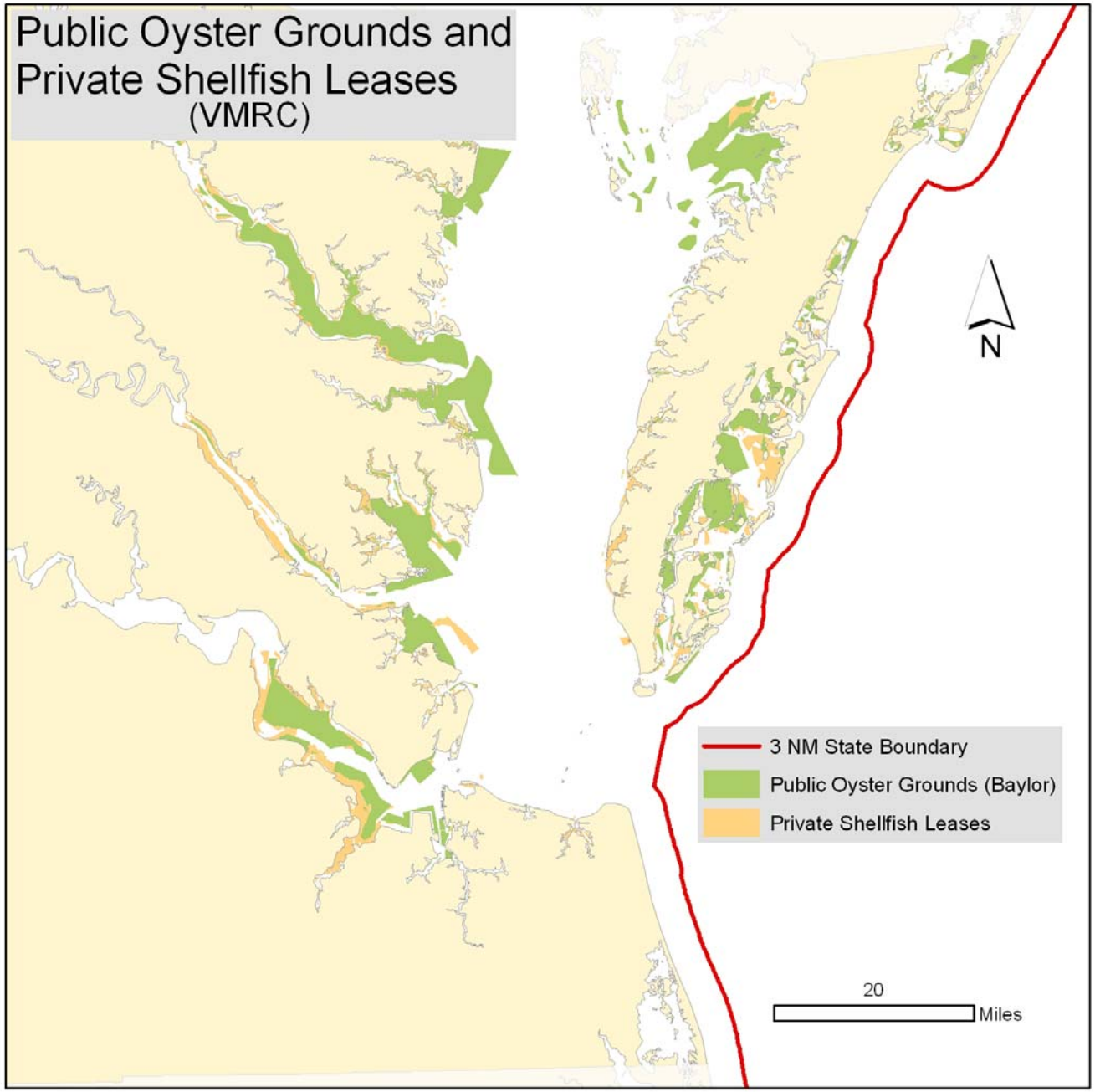
Moderate Potential for Resource and Use Conflict:
Areas where there appears to be some use or resource conflict, but with further analysis might possibly be considered suitable for leasing. Examples of areas suggested for this category include areas with depths from 2 to 4 meters and areas of regional bird importance due to the concentration of breeding and overwintering species. This may also include sand resource areas, and fishing reefs, as well as certain important fishery management areas as established by State Code or regulation.

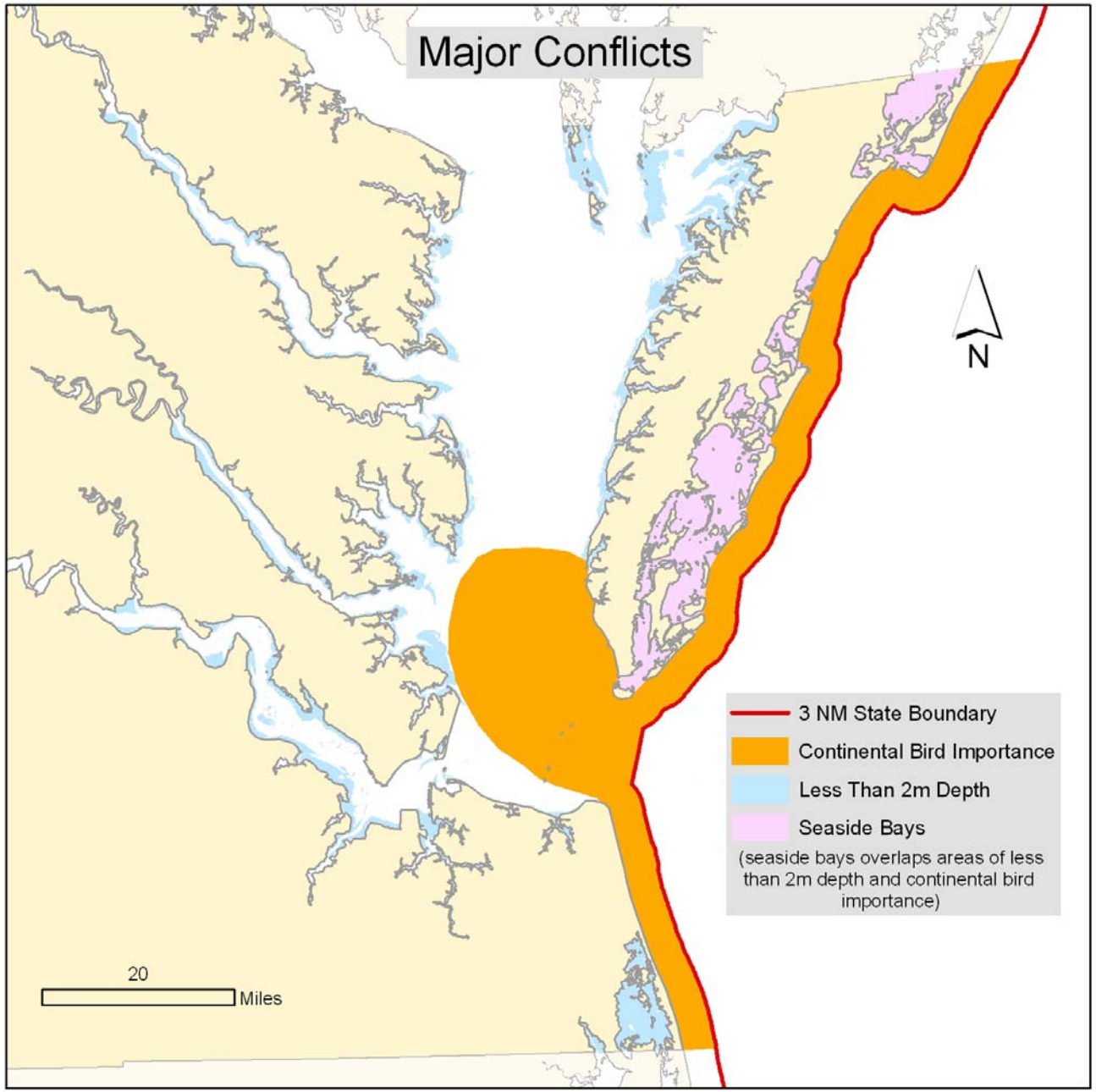
Lesser Potential for Resource and Use Conflict:
Areas that may be suitable for leasing recognizing that detailed environmental and use analysis will be needed before permits and leases can be issued. This, however, includes portions of the designated blue crab sanctuary within the main-stem of the Bay, potential hard clam resource areas and fishery management areas, as well as potential historic resource conflict areas and areas near dredge disposal sites that are not already within areas considered to contain other excluded, moderate and major resource or use conflicts.

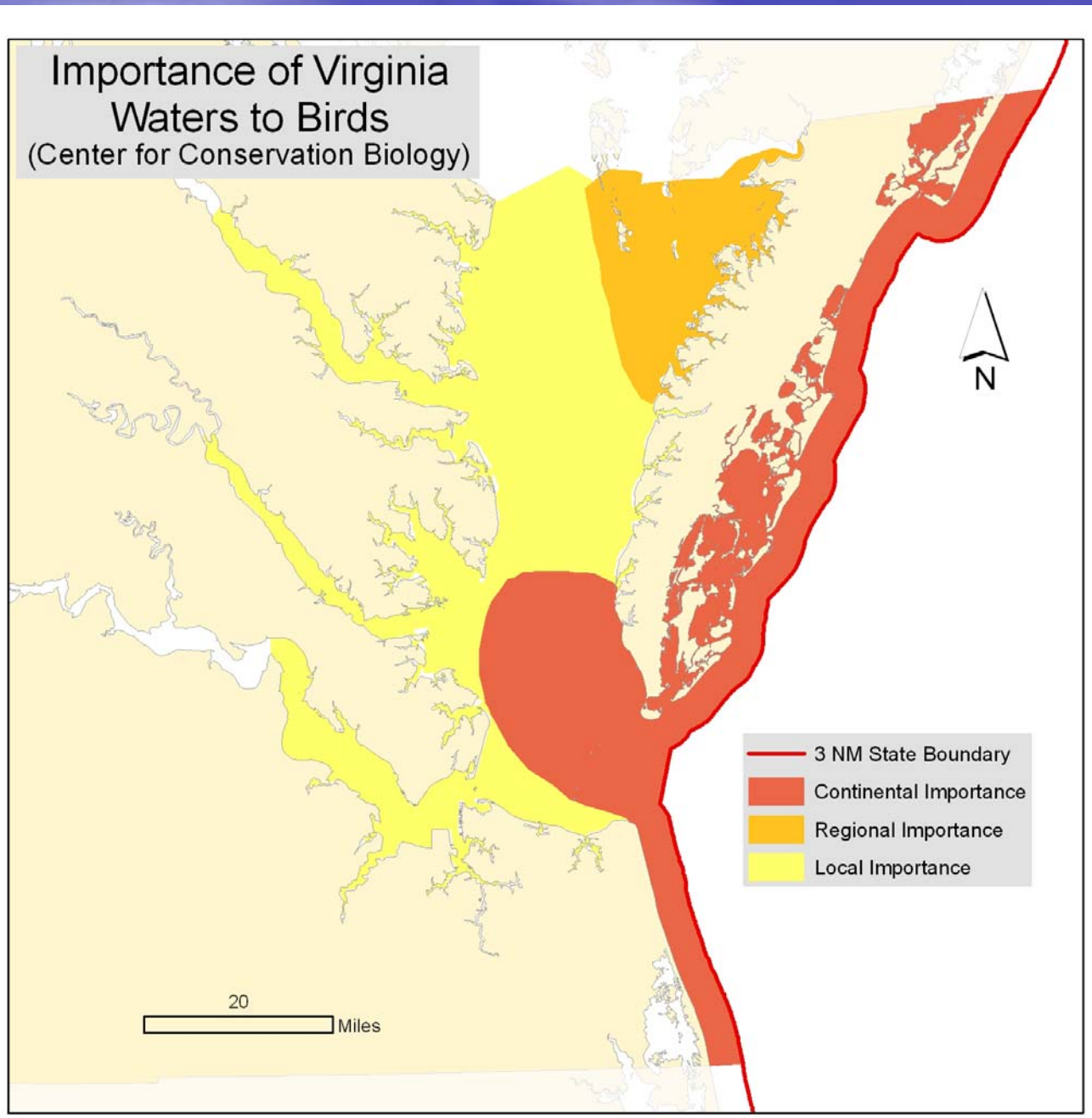

Excluded and Conflict Category Areas
N
Excluded Areas
(FAA, NASA Wallops, Military, Shipping Lanes, Bridge Crossings, Public Oyster Grounds & Private Shellfish Leases)
Potential for Resource and Use Conflict
Major Conflicts
(<2m depth, Seaside Bays, Continental Importance to Birds)
Moderate Conflicts
(2-4m depth, Regional Importance to Birds Finfish & Bluecrab Management, Sand Resources, Blue Crab Spawning & Nursery)
Lesser Conflicts
30
Miles

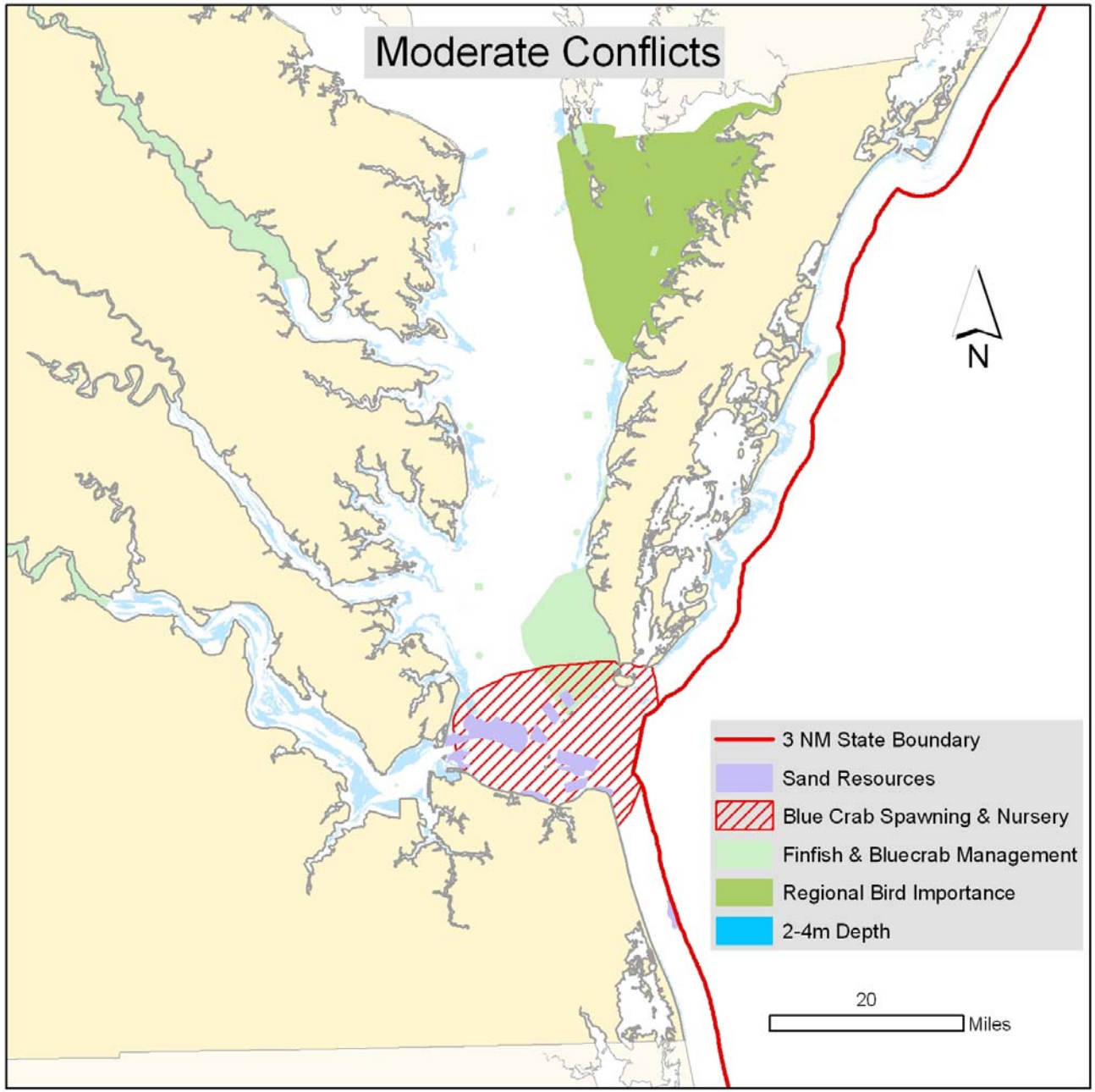

Excluded Areas
N
3 NM State Boundary
Bridge Crossings
Shipping Lanes
Military
FAA and NASA Wallops
Public Oyster Grounds
Private Shellfish Leases
20
Miles

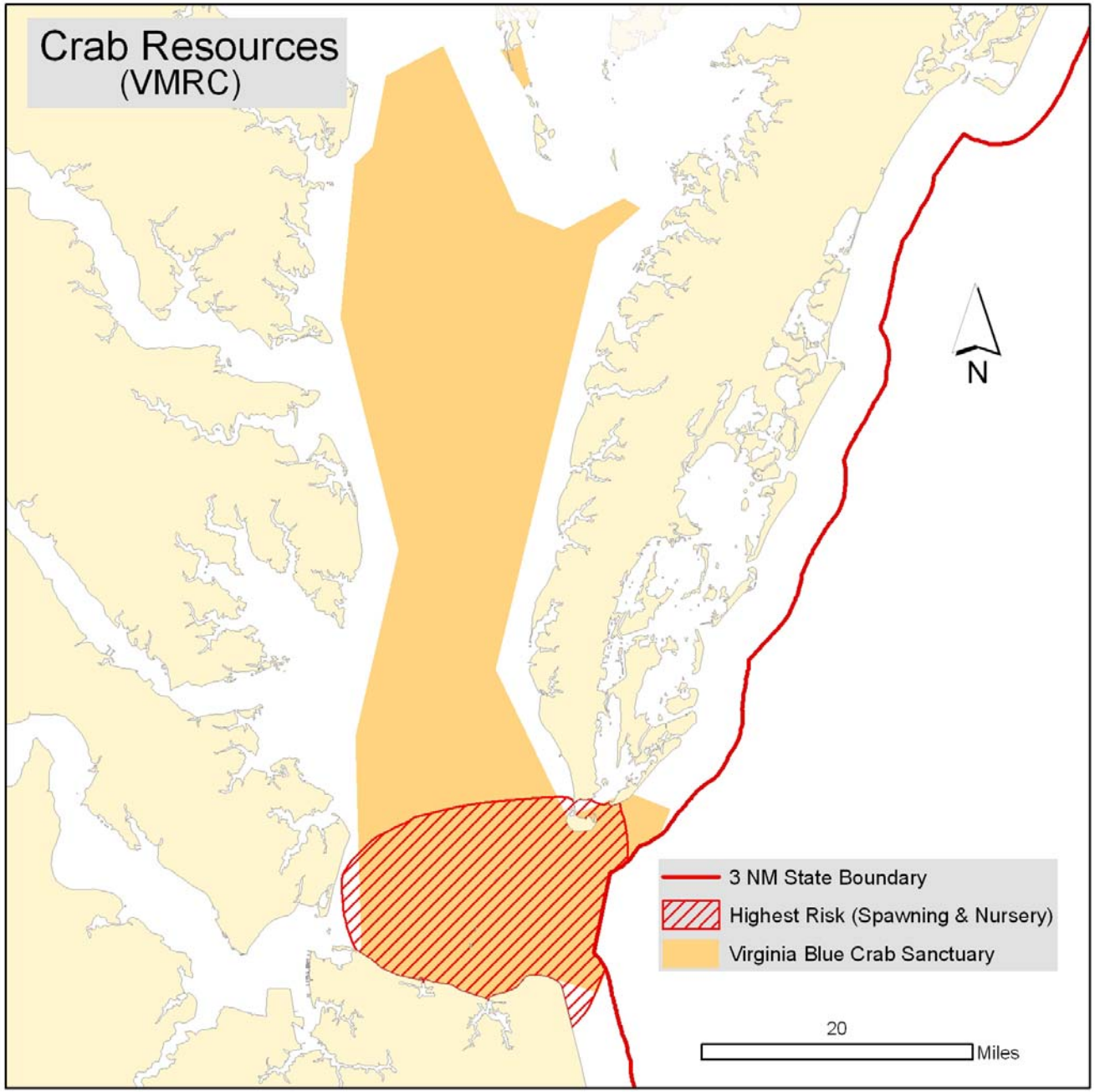

Military and FAA Exclusion Areas
(VCERC-JMU, VACAPES EIS)
N
3 NM State Boundary
Navy
Navy VACAPES EIS
Air Force
Army
FAA & NASA Wallops
20
Miles

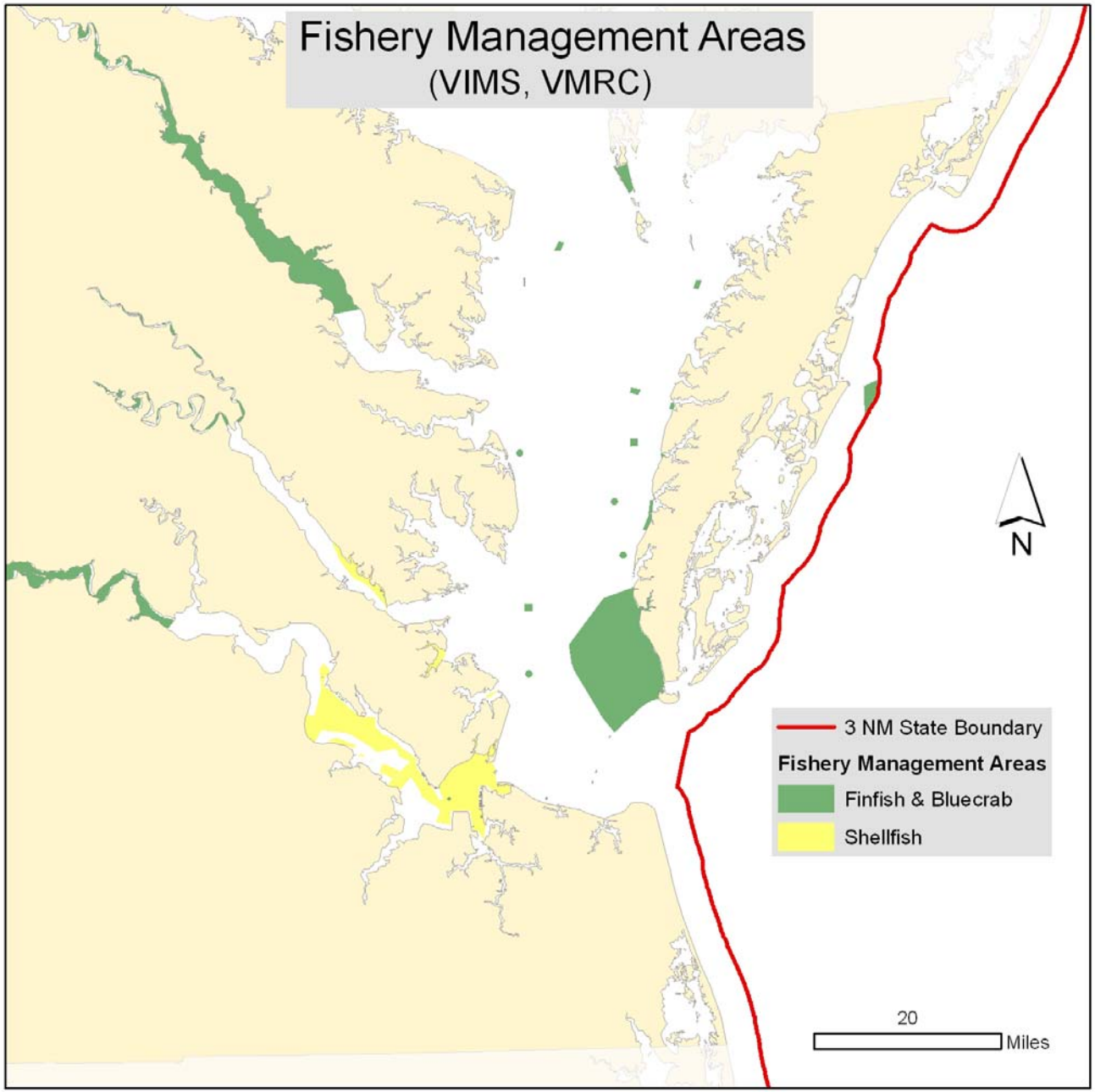

Public Oyster Grounds and
Private Shellfish Leases
(VMRC)
N
3 NM State Boundary
Public Oyster Grounds (Baylor)
Private Shellfish Leases
20
Miles

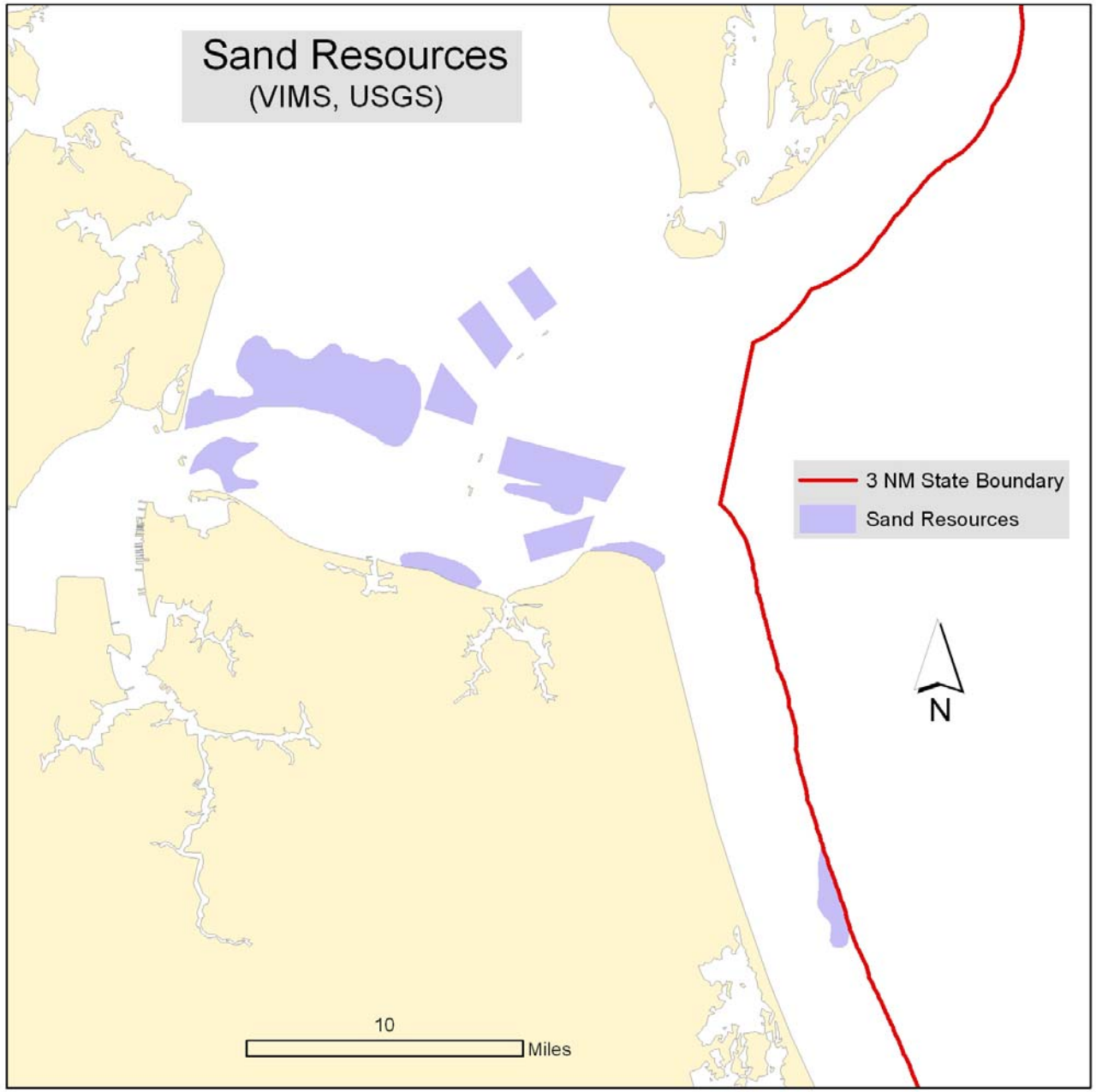

Major Conflicts
N
3 NM State Boundary
Continental Bird Importance
Less Than 2m Depth
Seaside Bays
(seaside bays overlaps areas of less than 2m depth and continental bird importance)
20
Miles

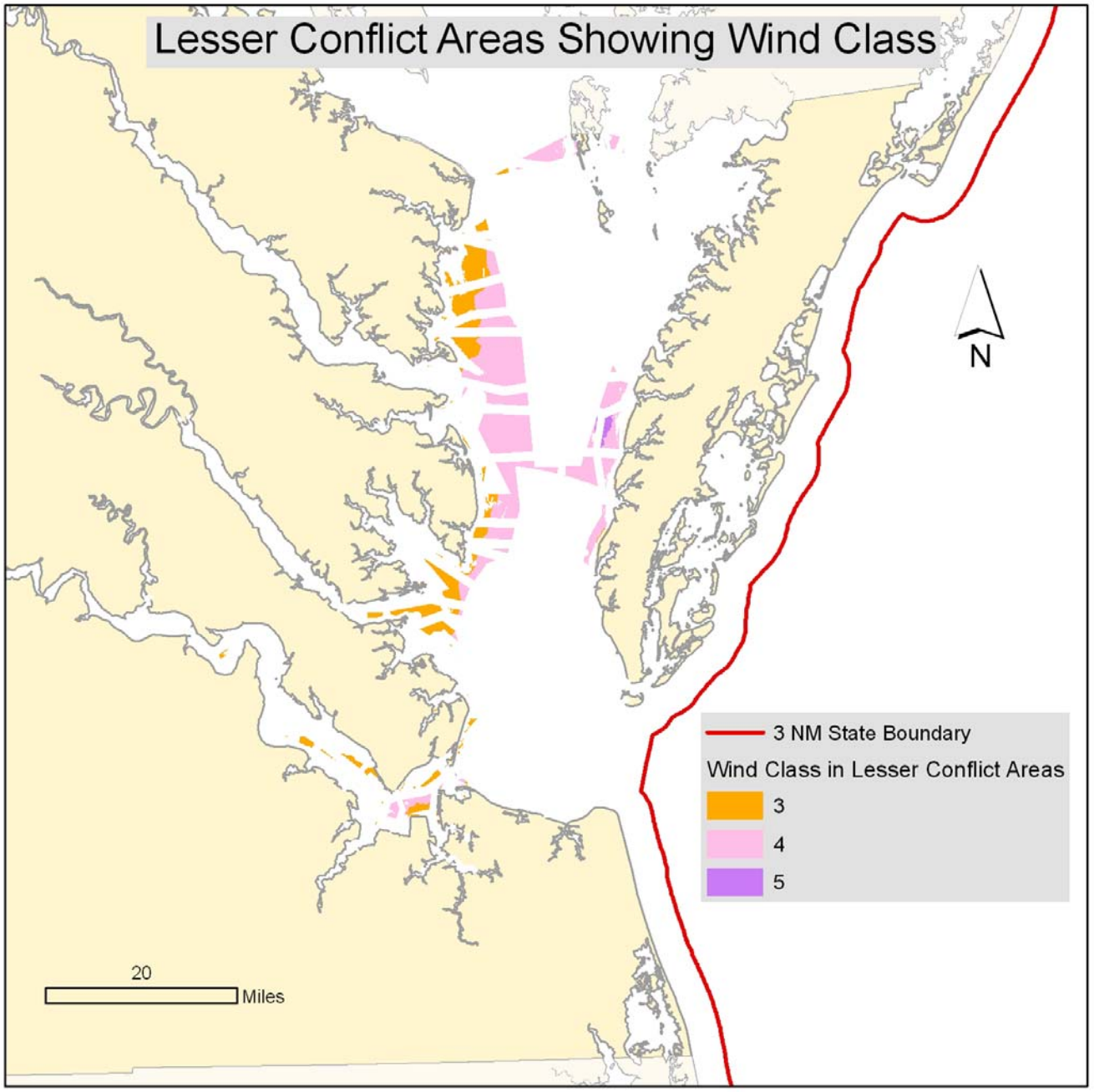

Importance of Virginia Waters to Birds
(Center for Conservation Biology)
N
3 NM State Boundary
Continental Importance
Regional Importance
Local Importance
20
Miles

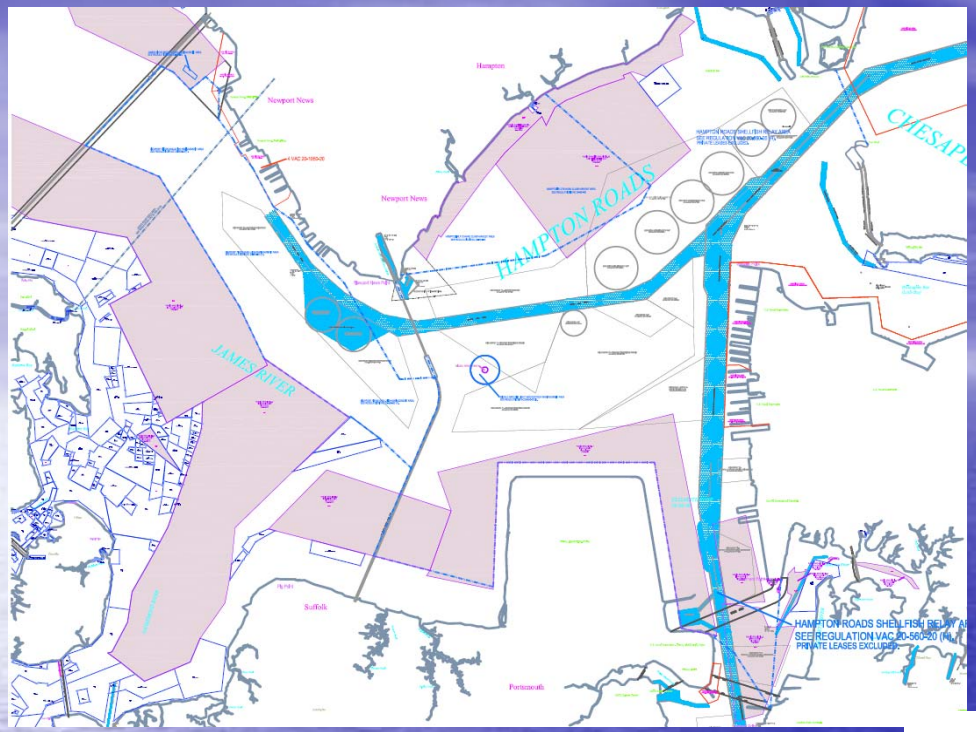

Moderate Conflicts
N
3 NM State Boundary
Sand Resources
Blue Crab Spawning & Nursery
Finfish & Bluecrab Management
Regional Bird Importance
2-4m Depth
20
Miles

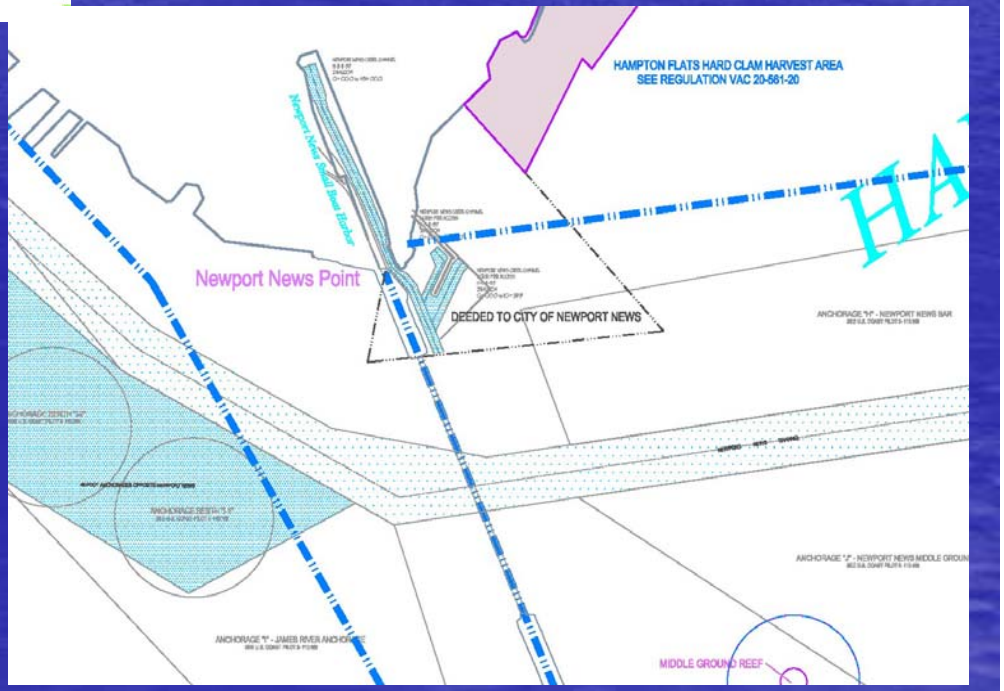

Crab Resources
(VMRC)
N
3 NM State Boundary
Highest Risk (Spawning & Nursery)
Virginia Blue Crab Sanctuary
20
Miles


Fishery Management Areas
(VIMS, VMRC)
N
3 NM State Boundary
Fishery Management Areas
Finfish & Bluecrab
Shellfish
20
Miles

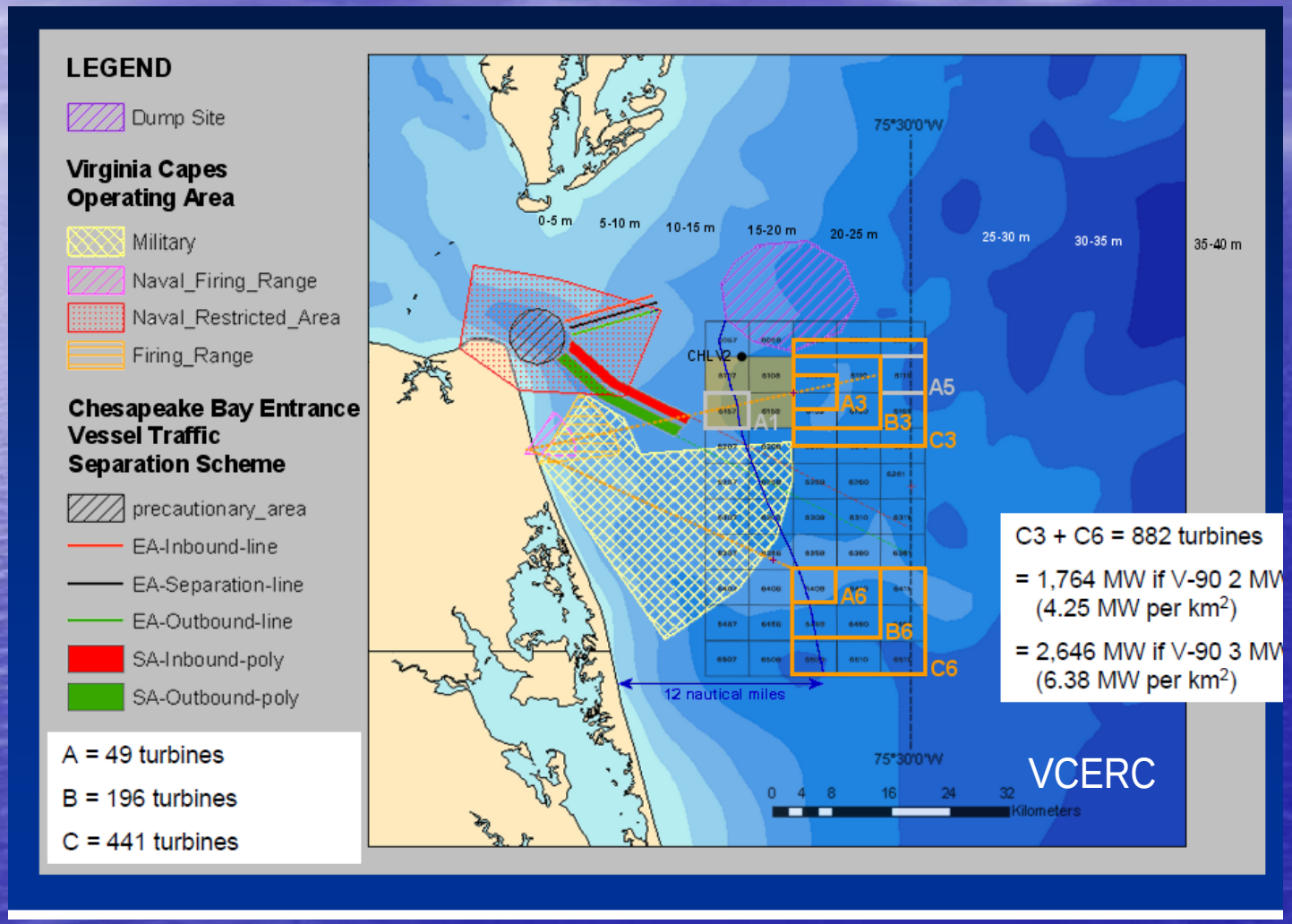

Sand Resources
(VIMS, USGS)
3 NM State Boundary
Sand Resources
N
10
Miles

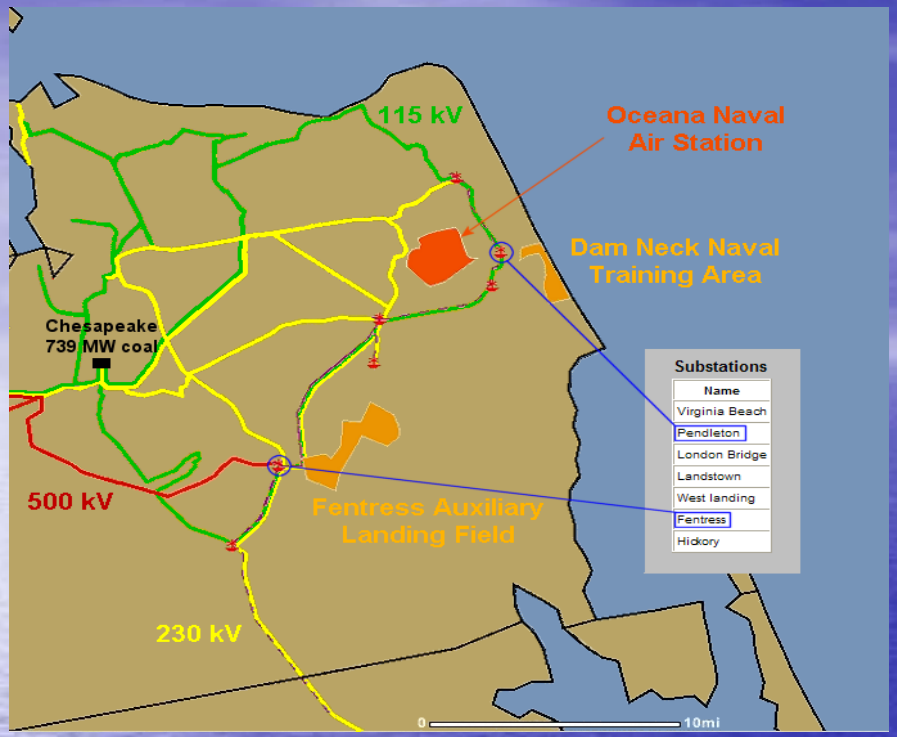

Lesser Conflict Areas Showing Wind Class
N
3 NM State Boundary
Wind Class in Lesser Conflict Areas
3
4
5
20
Miles

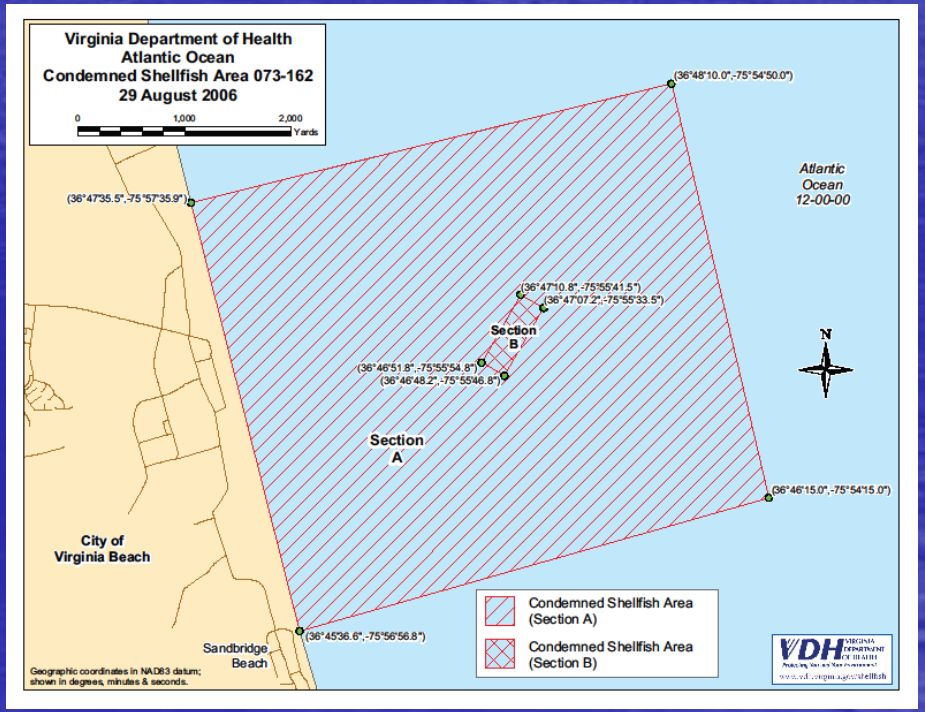

Hampton
Newport News
Newport News
HAMPTON ROADS
JAMES RIVER
Suffolk
Portsmouth
HAMPTON ROADS SHELLFISH RELAY A
SEE REGULATION VAC 20-560-20 (
PRIVATE LEASES EXCLUDED


HAMPTON FLATS HARD CLAM HARVEST AREA
SEE REGULATION VAC 20-561-20
Newport News Small Boat Harbor
Newport News Point
DEEDED TO CITY OF NEWPORT NEWS
ANCHORAGE "F" - NEWPORT NEWS BAR
ANCHORAGE "F" - NEWPORT NEWS MIDDLE GROUN
ANCHORAGE "F" - JAMES RIVER ANCHORAGE
MIDDLE GROUND REEF

Transmission of Electrical Energy form Potential Wind Projects in Federal Waters




115 kV
Oceana Naval Air Station
Dam Neck Naval Training Area
Chesapeake 739 MW coal
500 kV
Fentress Auxiliary Landing Field
230 kV
Substations
Name
Virginia Beach
Pendleton
London Bridge
Landstown
West landing
Fentress
Hickory
0
10mi


Virginia Department of Health
Atlantic Ocean
Condemned Shellfish Area 073-162
29 August 2006
0
1,000
2,000
Yards
(36°48'10.0",-75°54'50.0")
Atlantic Ocean 12-00-00
(36°47'35.5",-75°57'35.9")
(36°47'10.8",-75°55'41.5")
(36°47'07.2",-75°55'33.5")
Section B
(36°46'51.8",-75°55'54.8")
(36°46'48.2",-75°55'46.8")
N
Section A
(36°46'15.0",-75°54'15.0")
City of Virginia Beach
(36°45'36.6",-75°56'56.8")
Sandbridge Beach
Condemned Shellfish Area (Section A)
Condemned Shellfish Area (Section B)
Geographic coordinates in NAD83 datum; shown in degrees, minutes & seconds.
VDH

Potential information needed prior to final lease issuance, and which should be considered for any permit review, depending on the site selected:

- Specific wind resource assessment
- Benthic assessment
- Fishery and/or Essential Fish Habitat assessment
- Fishing activity assessment
- Marine mammal and sea turtle assessment
- Marine, coastal bird and bat assessment
- Threatened and endangered species assessment
- Cultural/historic assessment
- Sediment and geo-technical assessment
- Tidal current and sediment movement
- Development of a specific site plan for permitting
- Interconnection agreement
- Identification of the cable route to shore
- Decommissioning plan

Public interest review, public comment including local government and Public hearings

Next steps

- Public interest review for to update the Subaqueous Minerals Management Plan to State Subaqueous Minerals and Coastal Energy Management Plan

Acknowledgement:

The information included in the maps was provided by James Madison University (JMU) based on their work in association with the Virginia Coastal Energy Research Consortium (VCERC), The Virginia Coastal Zone Management (CZM) Program and/or other agencies and organizations that participated in the Ad-Hoc advisory workgroup process. The maps were assembled and created by Nick Meade of the Virginia CZM Program with assistance of Remy Loursen of JMU unless otherwise noted. As such, we are grateful for the efforts of JMU and the Virginia CZM Program and especially for the support of the Manager of the Virginia CZM Program, Laura McKay.

For this assessment effort, VMRC invited interested parties to participate in an Ad-Hoc advisory workgroup and sought input from members of the Coastal Policy Team of the Virginia Coastal Zone Management Program.

Questions and Discussion