

Rhode Island
OCEAN
samp

- Michael M. Tikoian, Chair
- Paul E. Lemont, Vice Chair
- David Abedon
- Robert Driscoll
- Donald Gomez
- Raymond Coia
- W. Michael Sullivan, RIDEM Director
- Bruce Dawson
- Grover Fugate, Executive Director




SAMPs for Ecosystem Management

- Describe the dynamics of marine ecosystems
- Characterize the salient issues
- Set clear policies and standards for permitting and regulation by federal /state/municipal governments
- Establish an integrated decision-making process
- Build an informed constituency for long term stewardship



Providence Harbor Zone



-  Type 1 - Conservation Areas
-  Type 2 - Low Intensity Uses
-  Type 3 - High Intensity Boating
-  Type 4 - Multipurpose Waters
-  Type 5 - Commercial and Recreational Harbors
-  Type 6 - Industrial Waterfronts/Com. Nav. Channels
-  Development Sites

a

Sept. 2005

Dalvina R. Gao

Marine National Map Accuracy Standards



Section 200.1 Type I Conservation Areas

A. Definition

Included in this category are one or more of the following: (1) water areas that are within or adjacent to the boundaries of designated wildlife refuges and conservation areas, (2) water areas that have retained natural habitat or maintain scenic values of unique or unusual significance, and (3) water areas that are particularly unsuitable for structures due to their exposure to severe wave action, flooding, and erosion.

B. Findings:

1. The coastline that fronts directly on Long Island and Block Island Sounds includes some of the most dynamic and naturally scenic features in Rhode Island. These include but are not limited to the South Shore barriers and headlands, the erosion-prone bluffs of Block Island, and Newport's rocky promontories. In order to adequately preserve these shorelines in these conservation areas, many activities proposed on shoreline features or in the tidal waters directly adjacent to these features must be severely restricted or prohibited.
2. Brigg's Marsh in Little Compton, Sachem Pond on Block Island, and Hundred Acre Cove in Barrington are examples of water areas which have exceptional value as waterfowl nesting and feeding habitat. Rare and unique assemblages of plants and animals and rich shellfish beds are found in these undisturbed waters. Many, but not all, water areas of well-recognized significance to wildlife are within established sanctuaries or management areas.
3. Opportunities for scientific research and education have been enhanced by the designation of a National Estuarine Sanctuary in the upper Bay, one of some 15 similar designations nationwide. The sanctuary includes Bay waters extending to the 18-foot depth contour around Patience Island, the northern half of Prudence Island, and Hope Island.
4. Valuable conservation areas are not all in clean, rural environments. For example, Watchemoket Cove in the heart of the East Providence industrial waterfront is an important waterfowl resting area, particularly during the winter months when large numbers of canvasbacks, scaup, widgeon, and black ducks are present.
5. Several stretches of shoreline within Narragansett Bay have survived the rapid proliferation of residential development during recent decades in pristine condition. Examples include the Potowomut River, the Palmer River in Barrington and Warren, and the Mt. Hope Cliffs in Bristol. It is important that as much of this land as practicable be preserved from alteration to assure that Rhode Island's rich diversity of shoreline types and high scenic value are preserved.

C. Policies

1. The Council's goal is to preserve and protect Type I waters from activities and uses that have the potential to degrade scenic, wildlife, and plant habitat values, or which may adversely impact water quality or natural shoreline types.
2. The mooring of houseboats and floating businesses, the construction of recreational boating facilities, filling below mean high water, point discharge of substances other than properly treated runoff water (see Section 300.6), and the placement of industrial or commercial structures or operations (excluding fishing and aquaculture) are all prohibited in Type I waters.
3. In Type I waters, activities and alterations including dredging, dredged materials disposal, and grading and excavation on abutting shoreline features are all prohibited unless the primary purpose of the alteration or activity is to preserve or enhance the area as a natural habitat for native plants and

Ocean SAMP Document

- Ecology of the Study Area
- Cultural and Historical
- Fisheries Resources
- Recreation and Tourism
- Marine Transportation
- Infrastructure
- Renewable Energy
- Climate Change
- Future Uses



SAMP Research

Research Topics Include...

- Wind resources
- Marine mammals and birds
- Fisheries uses
- Physical oceanography
- Ecosystem interactions
- Sediment and benthic habitat
- Cultural resources
- Acoustics and electromagnetic effects
- Meteorology
- Engineering
- Marine transportation uses



Tier #1 Screening (Hard Constraints)

Wind Resource

- Adequate Wind Resources (greater than 7 m/sec at 80 m, hub height)

Exclusions

- Navigation Areas -Regulated (shipping lanes, precautionary areas, preferred routes)
- Vessel tracks (AIS data)
- Ferry Routes
- Regulated areas (disposal site, military areas, unexploded ordnance, marine protected areas)
- Airport buffer zones
- Coastal buffer zone (1 km)
- Cable Areas (?)

Rhode Island Ocean Special Area Management Plan (SAMP)

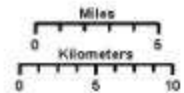
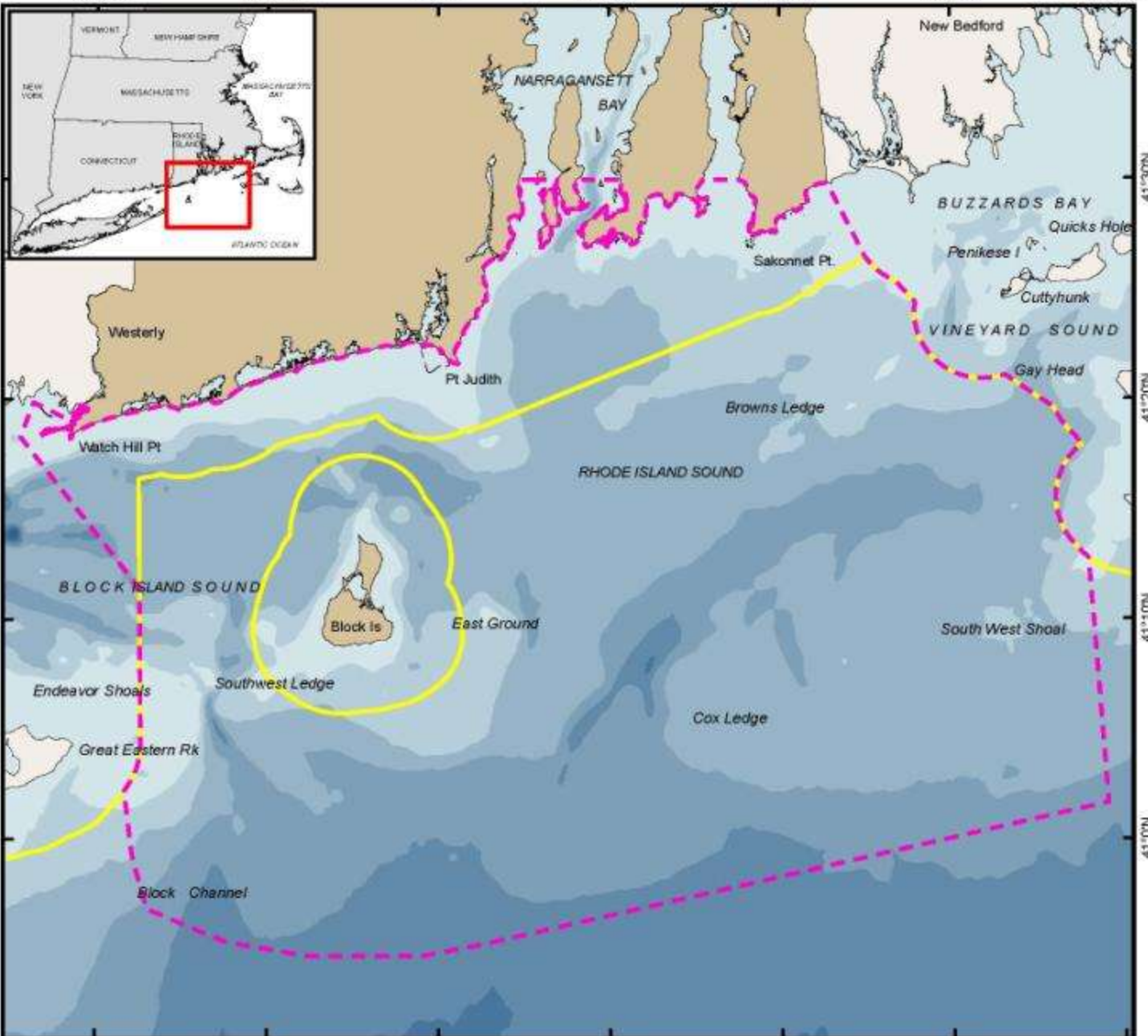
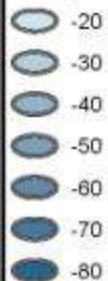
71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

 Proposed Ocean Study Area

 State/Federal Waters Separation

Bathymetry (m)

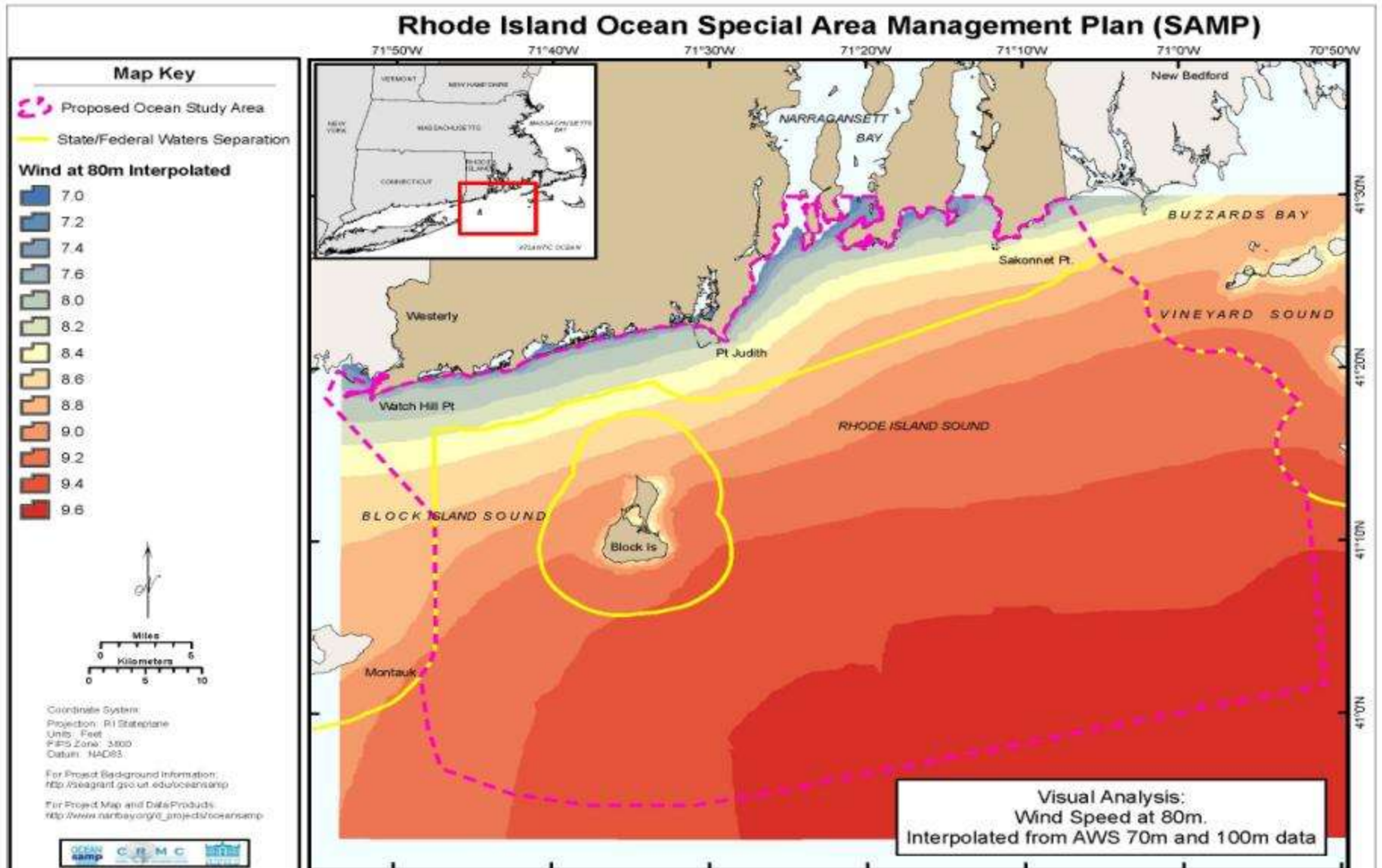


Coordinate System
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3600
Datum: NAD83

For Project Map and Data Products:
http://www.narrbay.org/d_projects/oceansamp





Estimates of 80 m wind speeds AWS TrueWinds data



Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

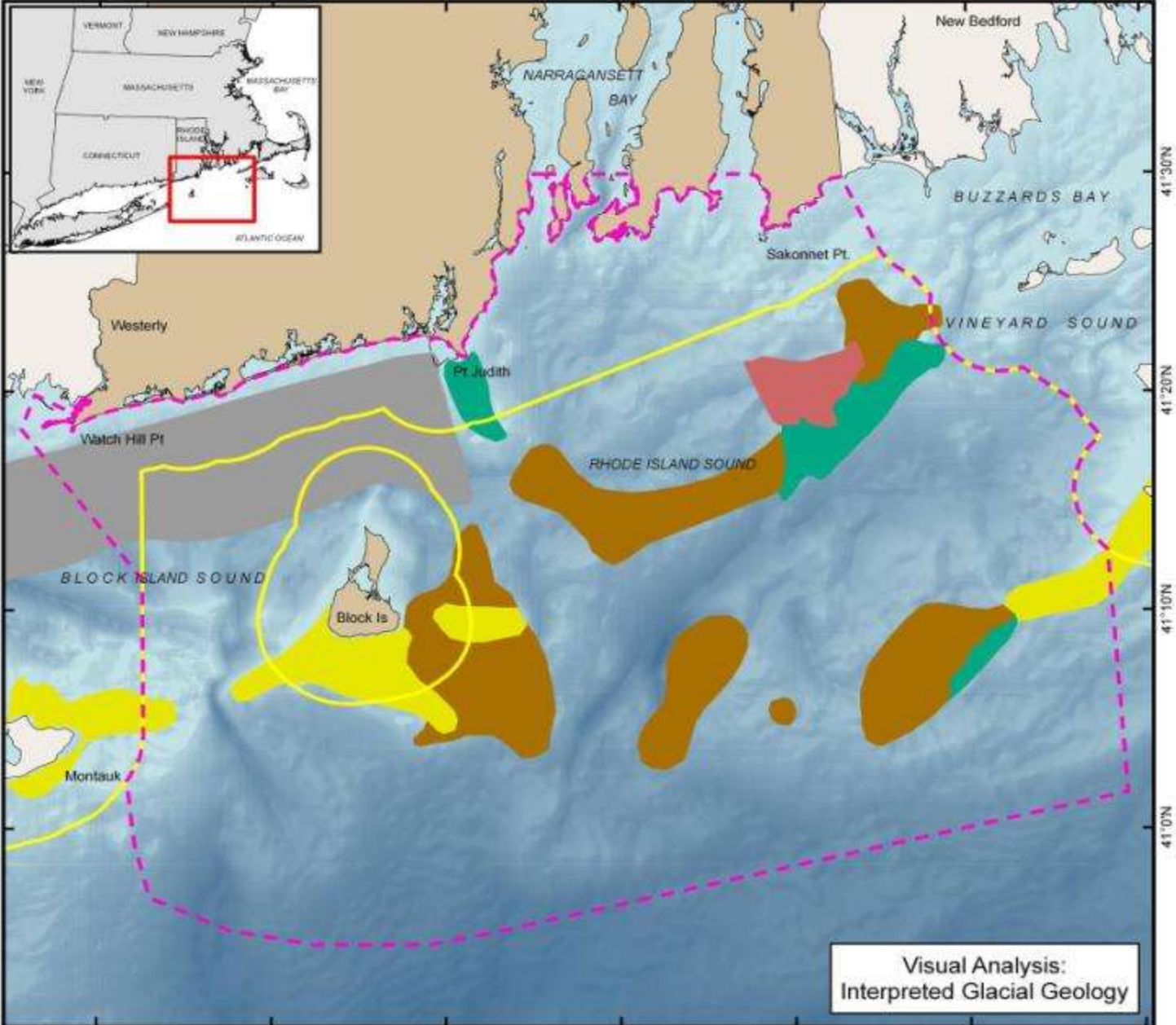
Map Key

-  Proposed Ocean Study Area
-  State/Federal Waters Separation

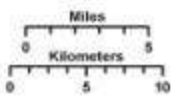
Glacial Geology

Stone-Borns 1986

-  Glacial Lakefloor
-  End Moraine - Blocky
-  End moraine - Boulder
-  End moraine - Bold., Cob., Sand
-  Tertiary Manetto Gravel



41°30'N
41°20'N
41°10'N
41°0'N



Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3800
Datum: NAD83

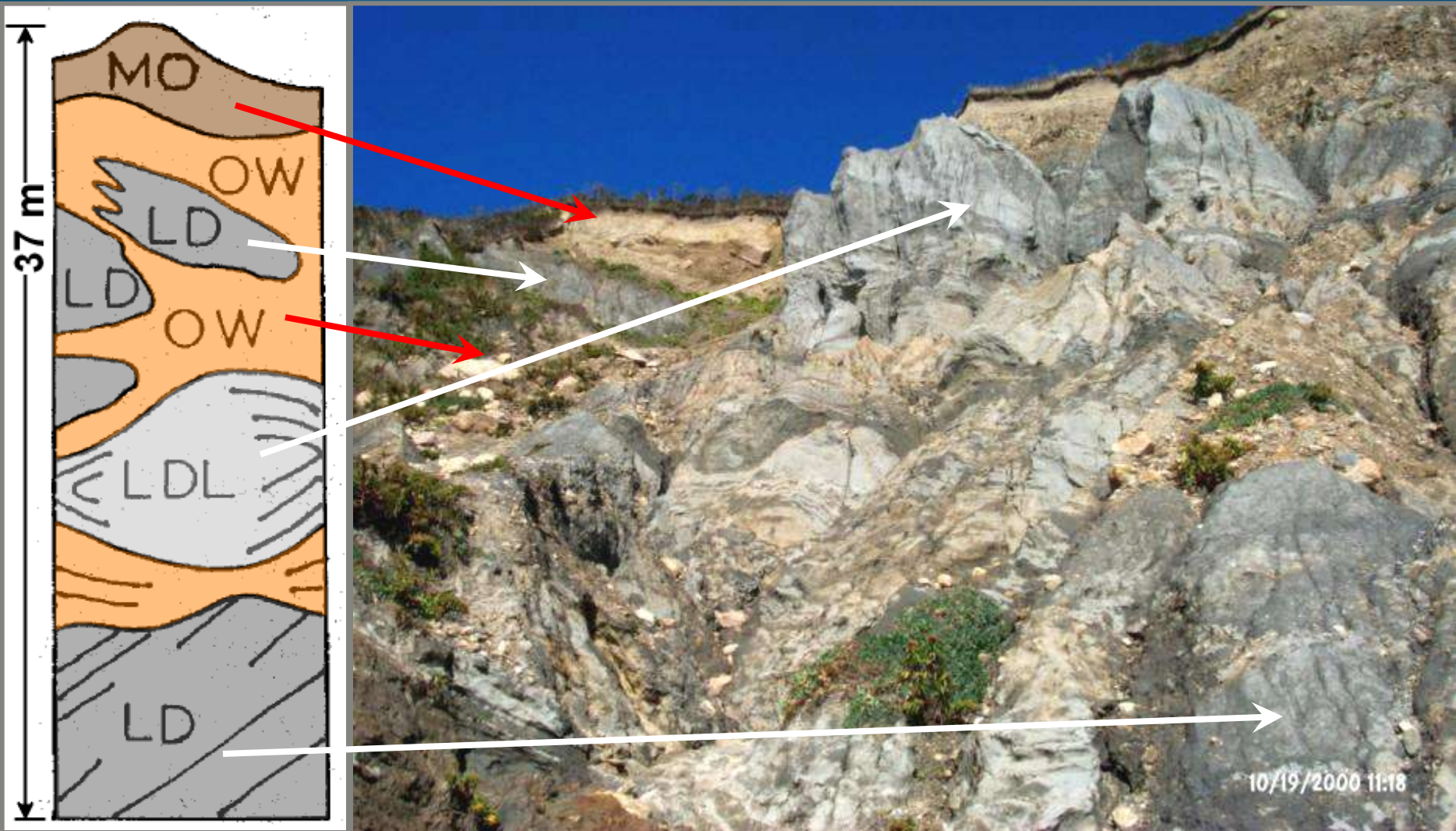
For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/d_projects/oceansamp



Visual Analysis:
Interpreted Glacial Geology



Mohegan Bluffs, BI - Complex Stratigraphy







Rhode Island Ocean Special Area Management Plan (SAMP)

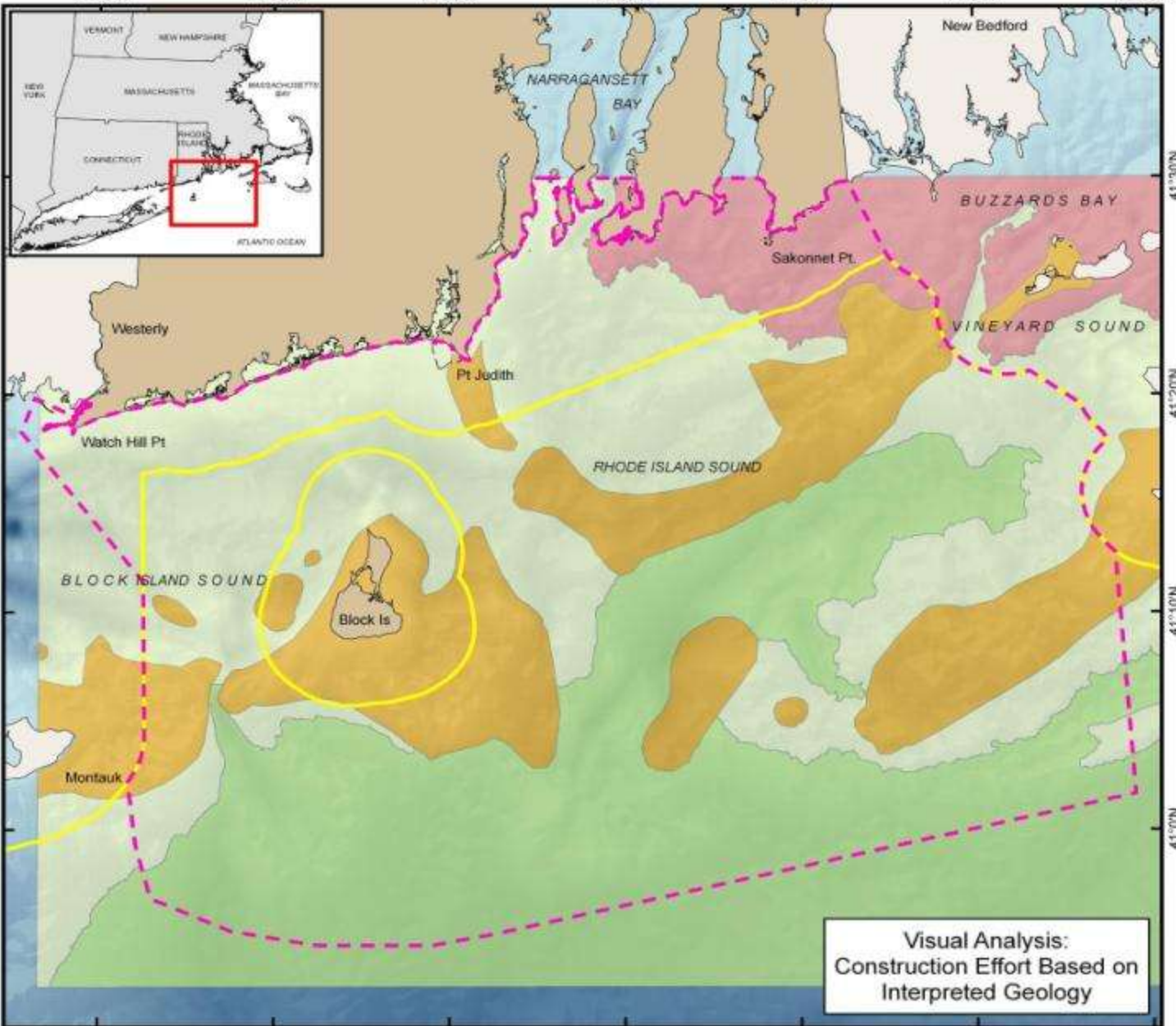
71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

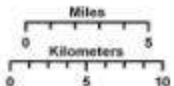
-  Proposed Ocean Study Area
-  State/Federal Waters Separation

Construction Effort

-  1 - 2
-  3
-  4 - 5
-  5



41°30'N
41°20'N
41°10'N
41°0'N



Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3800
Datum: NAD83

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

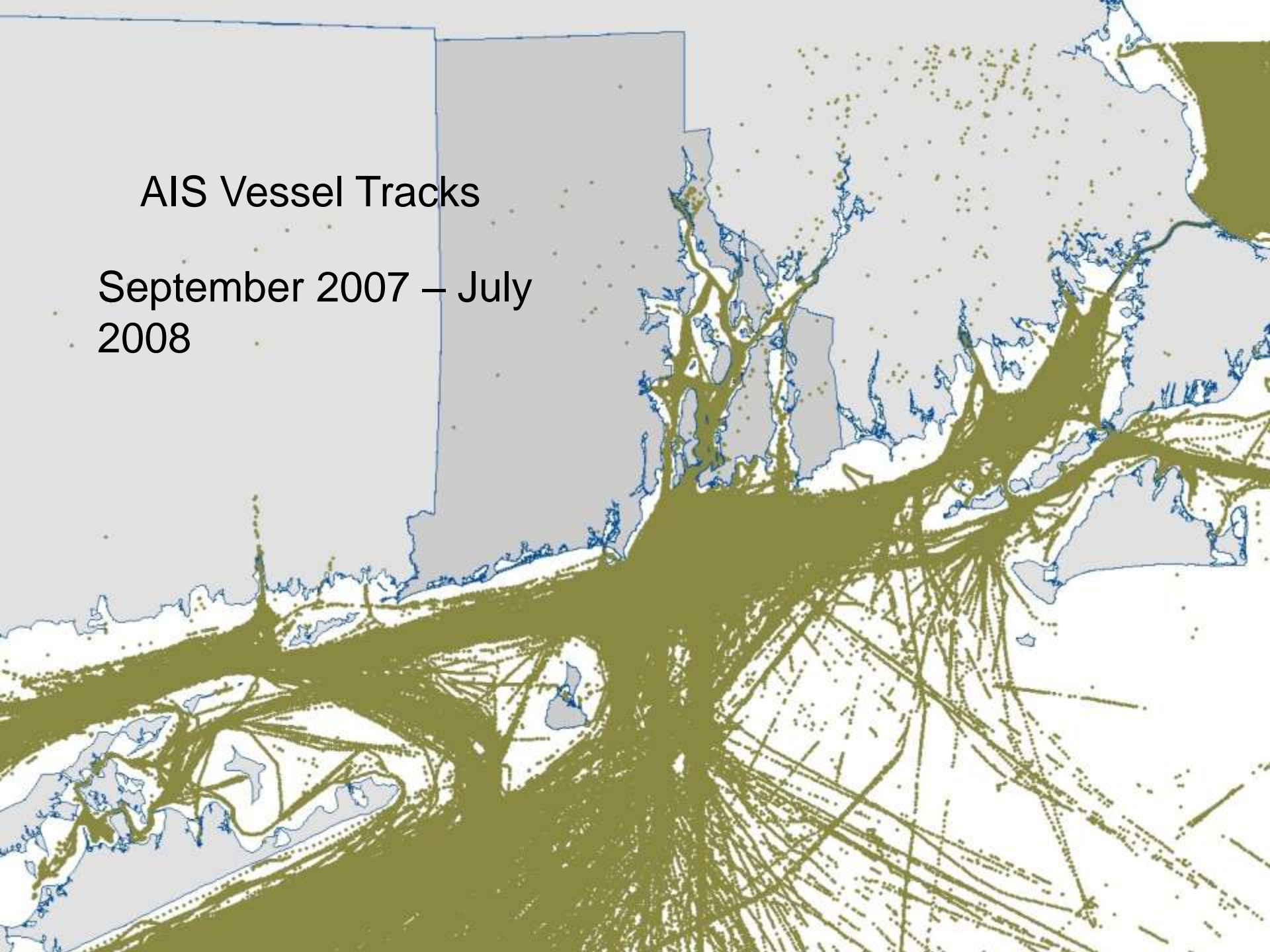
For Project Map and Data Products:
http://www.narrbay.org/ri_projects/oceansamp



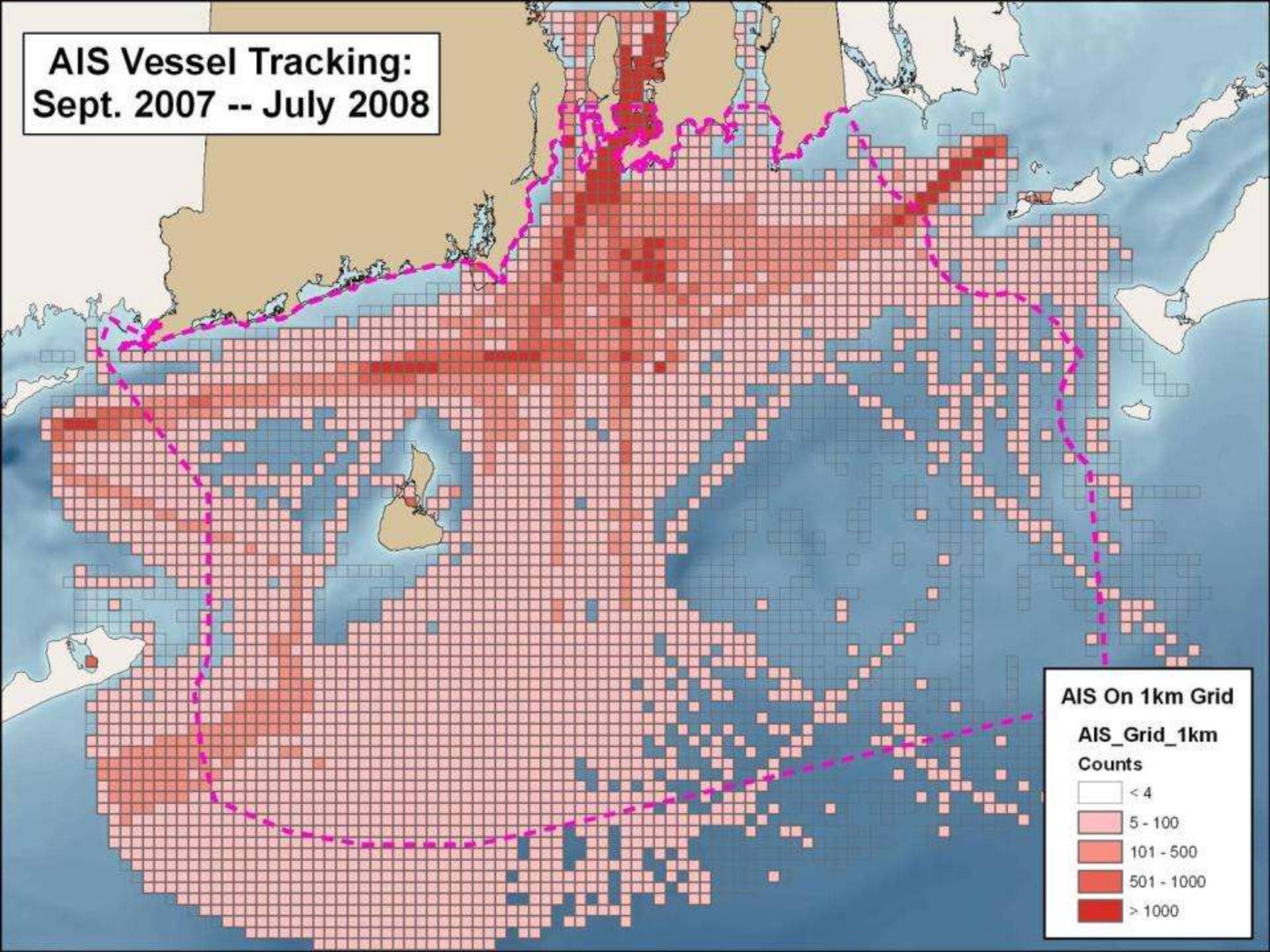
**Visual Analysis:
Construction Effort Based on
Interpreted Geology**

AIS Vessel Tracks

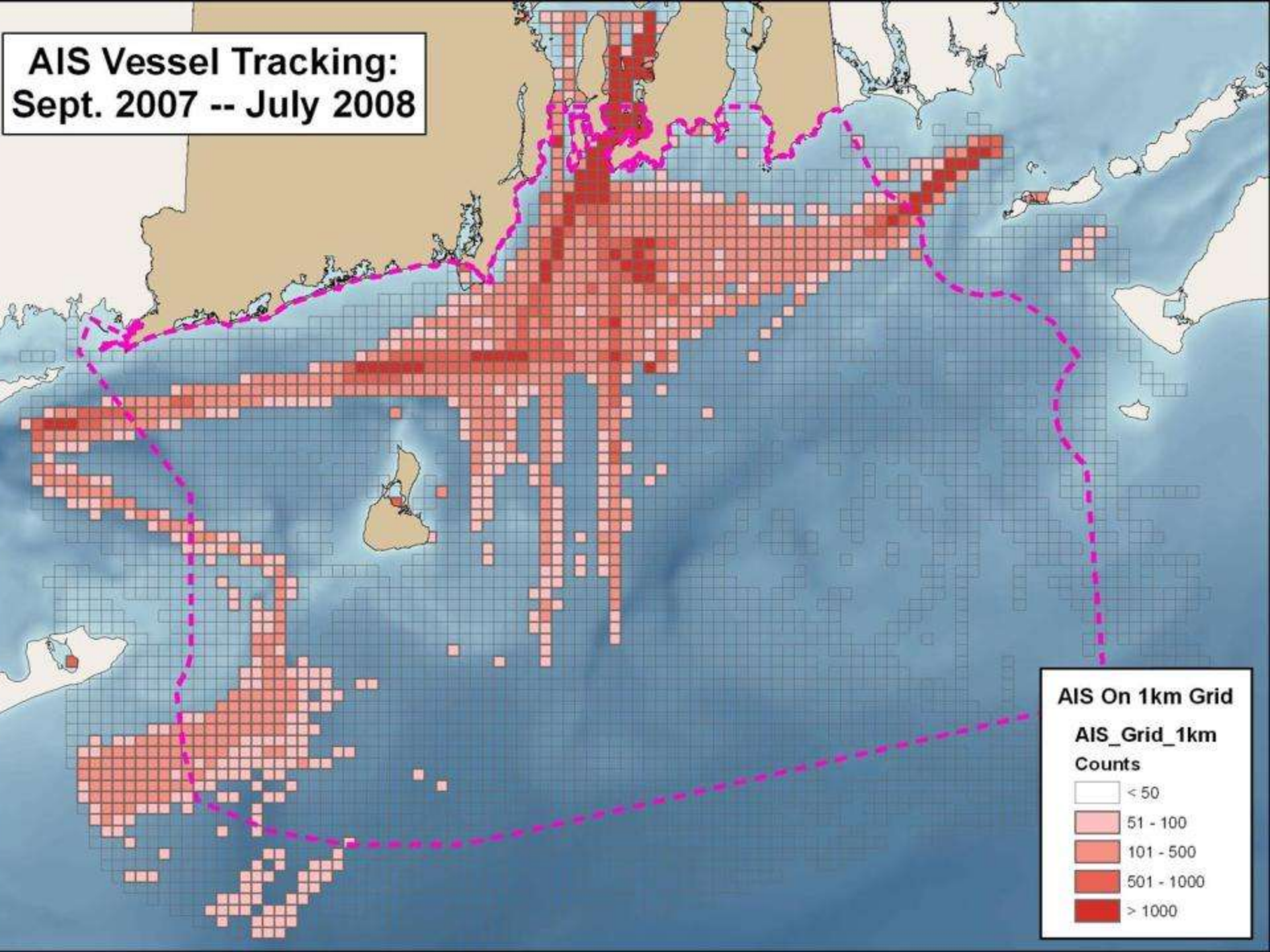
September 2007 – July
2008



AIS Vessel Tracking: Sept. 2007 -- July 2008








**AIS Vessel Tracking:
Sept. 2007 -- July 2008**

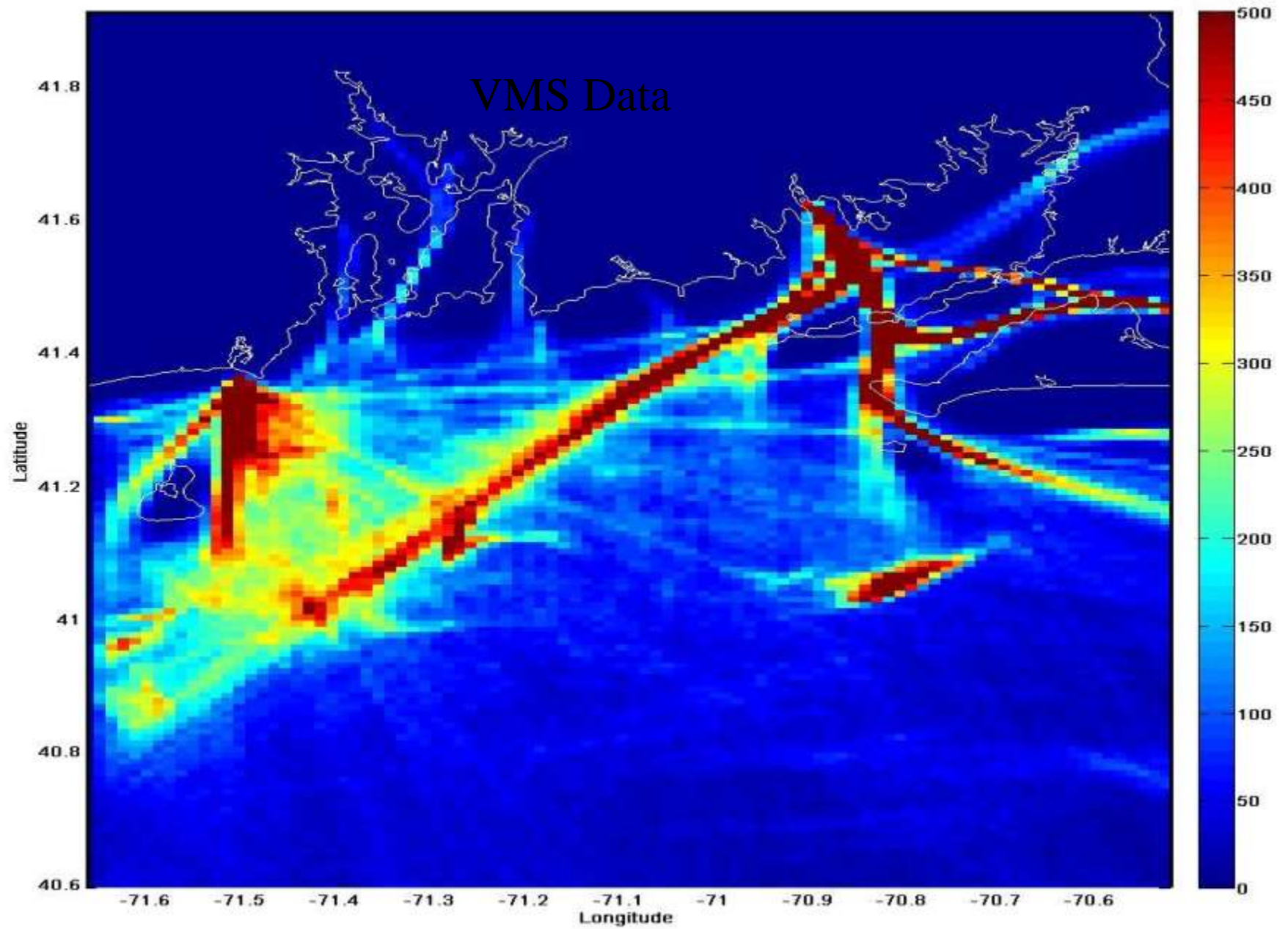


AIS On 1km Grid

AIS_Grid_1km

Counts

-  < 50
-  51 - 100
-  101 - 500
-  501 - 1000
-  > 1000

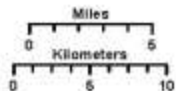
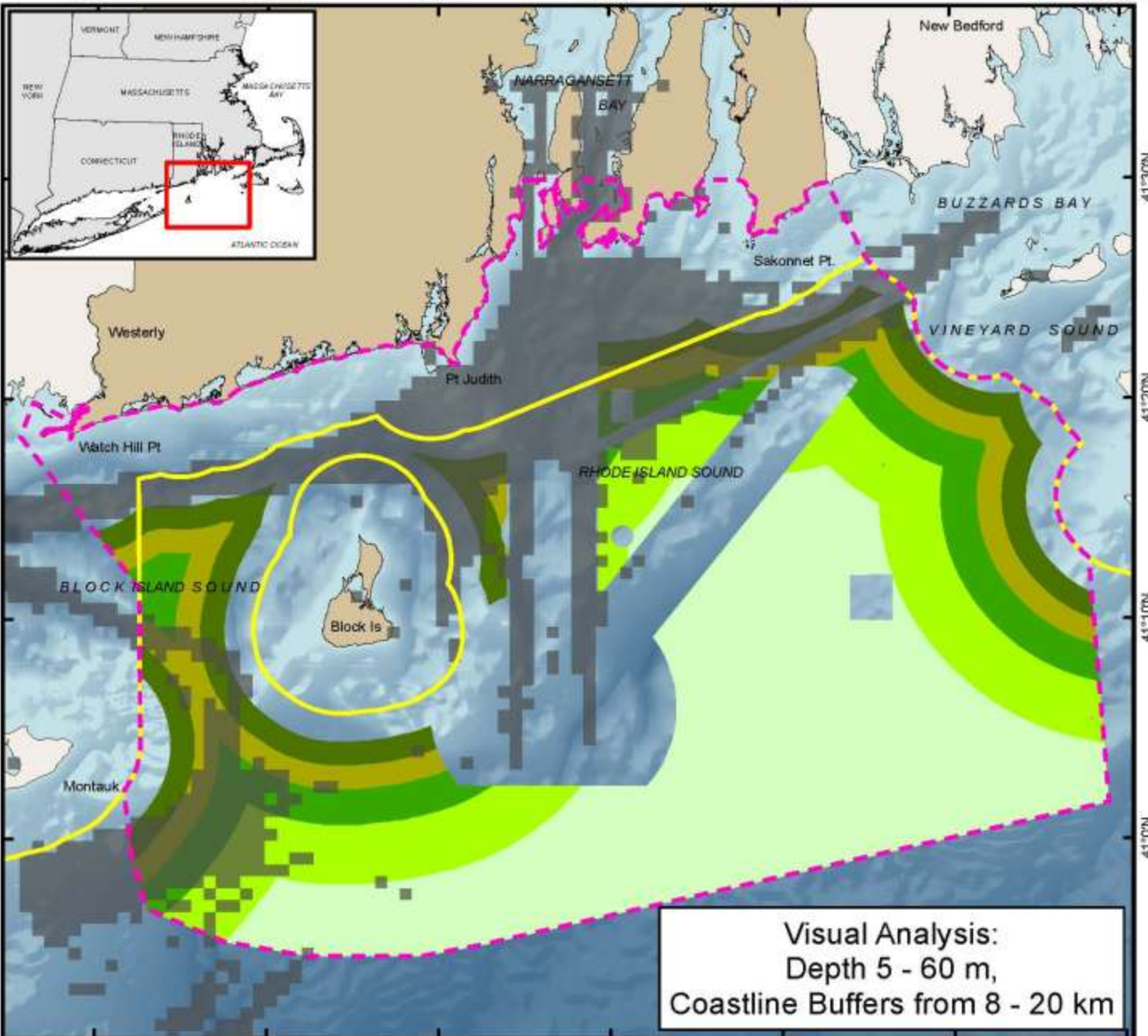


Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

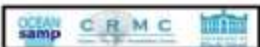
-  Proposed Ocean Study Area
-  State/Federal Waters Separation
-  AIS Vessel Traffic
-  20 Kilometer Buffer
-  15 Kilometer Buffer
-  12 Kilometer Buffer
-  10 Kilometer Buffer
-  8 Kilometer Buffer



Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3800
 Datum: NAD83

For Project Background Information:
<http://seagrant.gso.unh.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/d_projects/oceansamp



Visual Analysis:
 Depth 5 - 60 m,
 Coastline Buffers from 8 - 20 km

Technology Based Assessment

Objective: Develop a metric based on technical challenge to power production potential to screen for sites.

$$\text{TDI} = \text{TCI}/\text{PPP}$$

where TDI – Technical Development Index

TCI- Technical Challenge Index



PPP- Power Production Potential

Presented in form of dimensionless values (Predicted TDI divided by lowest TDI possible in area of interest)













Rhode Island Ocean Special Area Management Plan (SAMP)

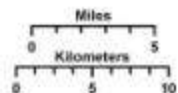
71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

-  Proposed Ocean Study Area
-  State/Federal Waters Separation

TDI - No Geology

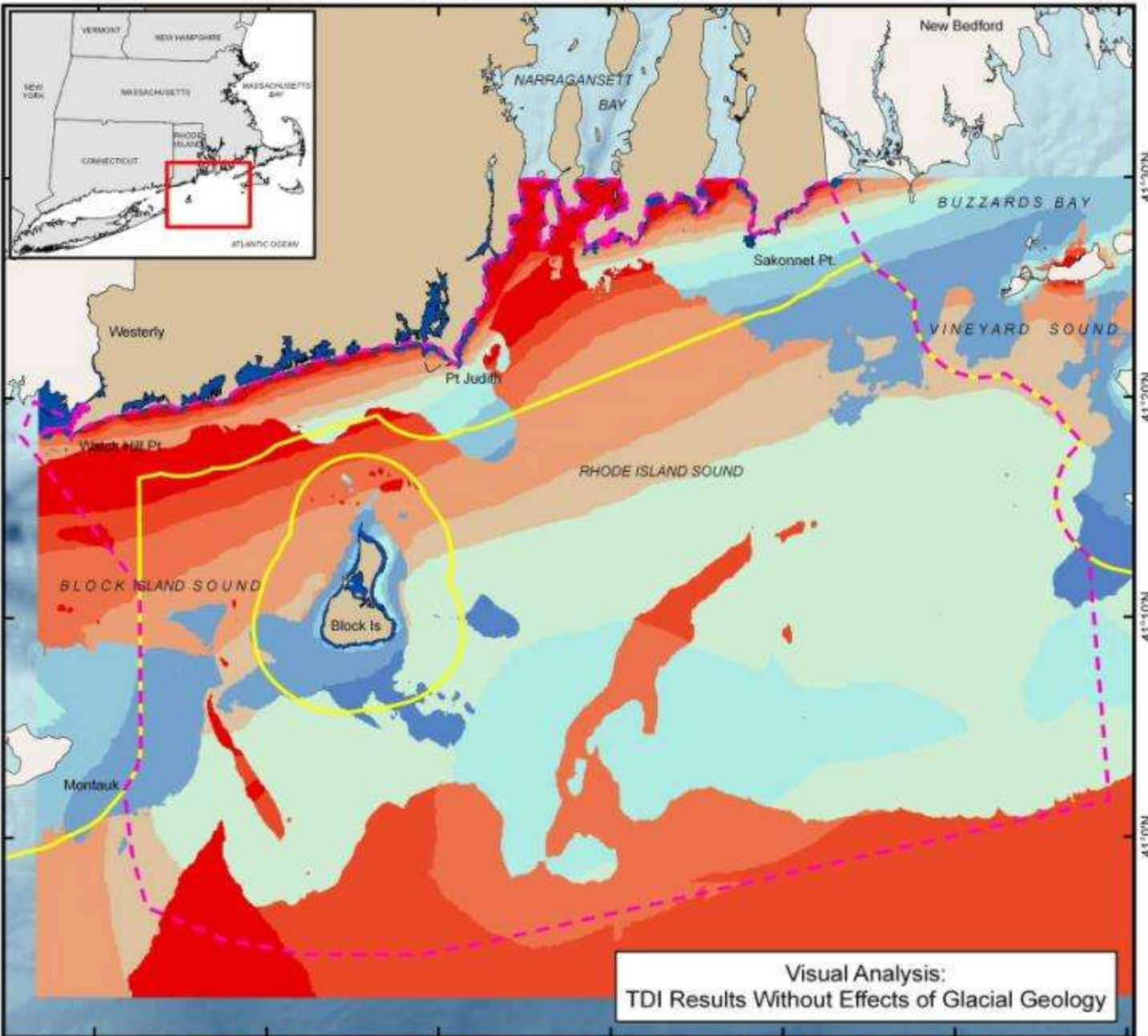
-  1.0
-  1.1
-  1.2
-  1.3
-  1.4
-  1.5
-  1.6
-  1.7
-  1.8
-  1.9
-  2.0
-  2.1



Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3800
 Datum: NAD83

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/ri_projects/oceansamp





Visual Analysis:
 TDI Results Without Effects of Glacial Geology

41°30'N
41°20'N
41°10'N
41°0'N












Rhode Island Ocean Special Area Management Plan (SAMP)

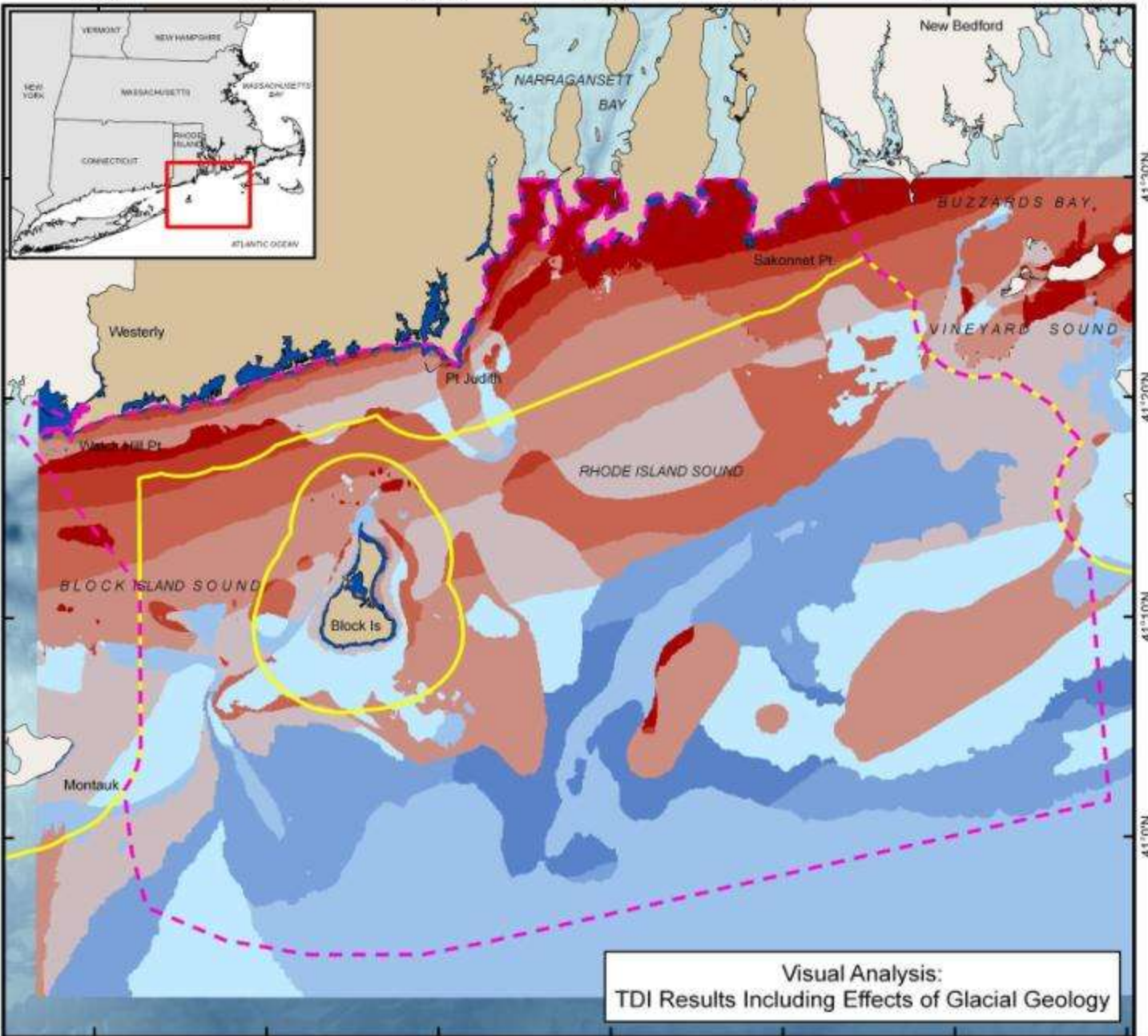
71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

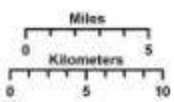
-  Proposed Ocean Study Area
-  State/Federal Waters Separation

TDI - With Geology

-  1.00
-  1.25
-  1.50
-  1.75
-  2.00
-  2.25
-  2.50
-  2.75
-  3.00
-  3.25
-  3.50



41°30'N
41°20'N
41°10'N
41°0'N



Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3600
 Datum: NAD83

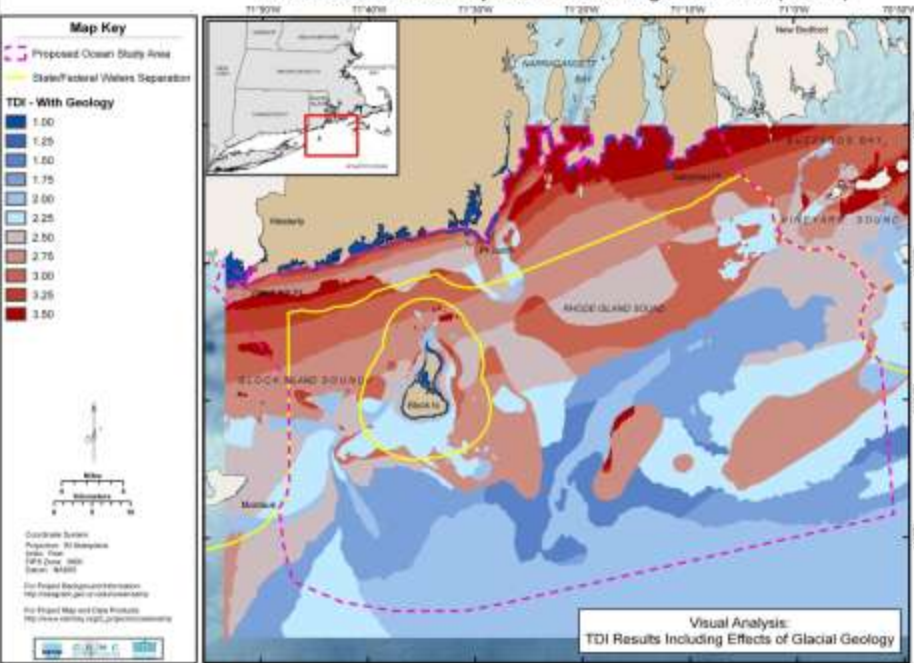
For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/ri_projects/oceansamp

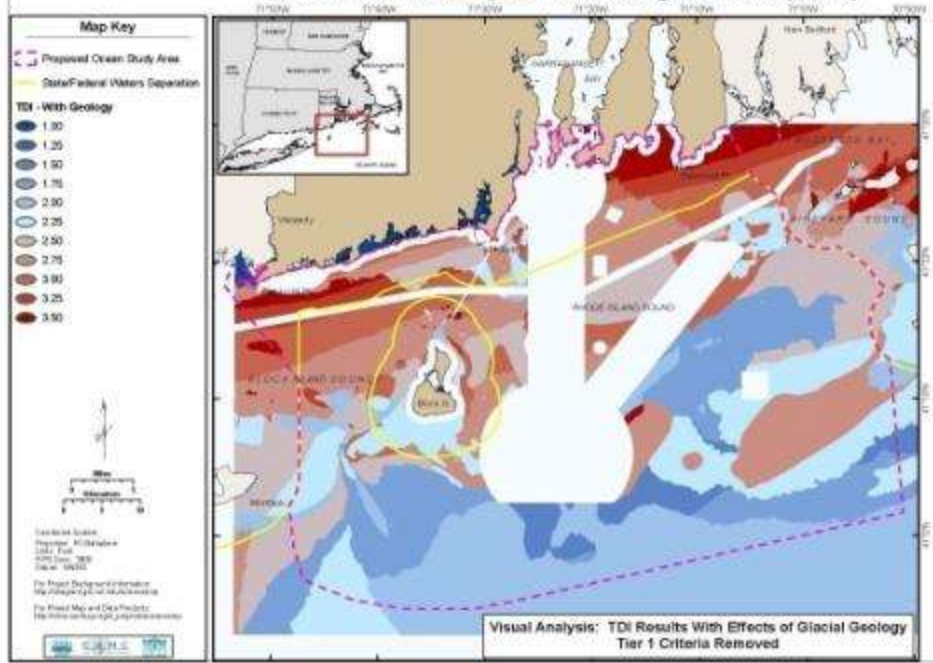


Visual Analysis:
 TDI Results Including Effects of Glacial Geology

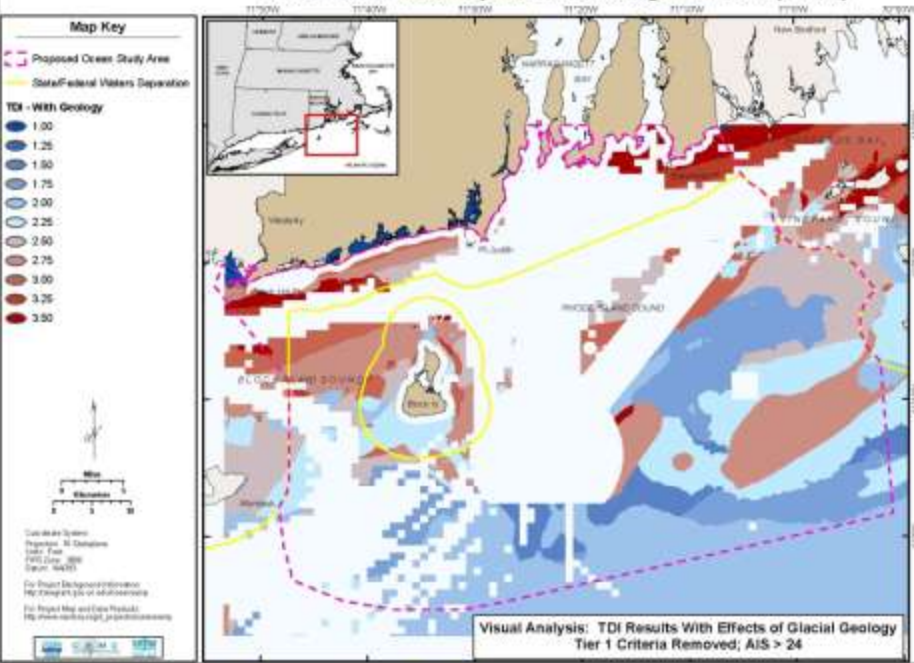
Rhode Island Ocean Special Area Management Plan (SAMP)



Rhode Island Ocean Special Area Management Plan (SAMP)



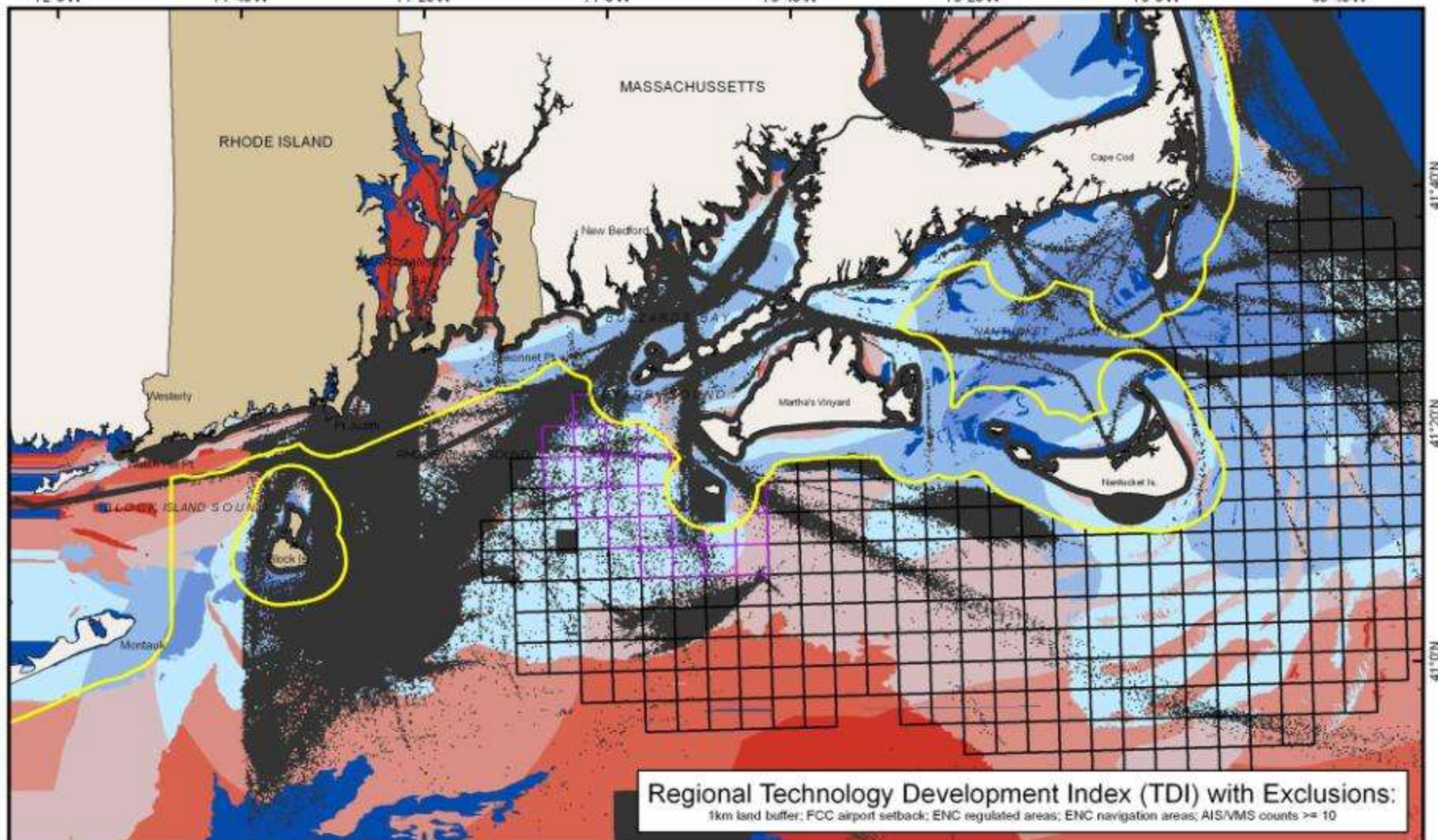
Rhode Island Ocean Special Area Management Plan (SAMP)



AIS SERIES

Rhode Island Ocean Special Area Management Plan (SAMP)

72°0'W 71°40'W 71°20'W 71°0'W 70°40'W 70°20'W 70°0'W 69°40'W



41°40'N
41°20'N
41°0'N

Regional Technology Development Index (TDI) with Exclusions:
1km land buffer; FCC airport setback; ENC regulated areas; ENC navigation areas; AIS/VMS counts >= 10

Exclusion Areas	MOP Proposed Screening Areas	MOP Potential Deepwater Sites
Technology Development Index Values		
1.0	1.2	1.4
1.6	1.8	2.0
2.2	2.4	2.6

Miles
0 5

Kilometers
0 5 10

Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3800
Datum: NAD83

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narbay.org/ri_projects/oceansamp

Marine User Data

Commercial and recreational fishing

Recreational boating

Existing licenses (leases)

Aggregate extraction

Conservation

Aquaculture

Natural Resource Data

Birds

Fish and fish habitat

Marine mammals and turtles




Water and air quality

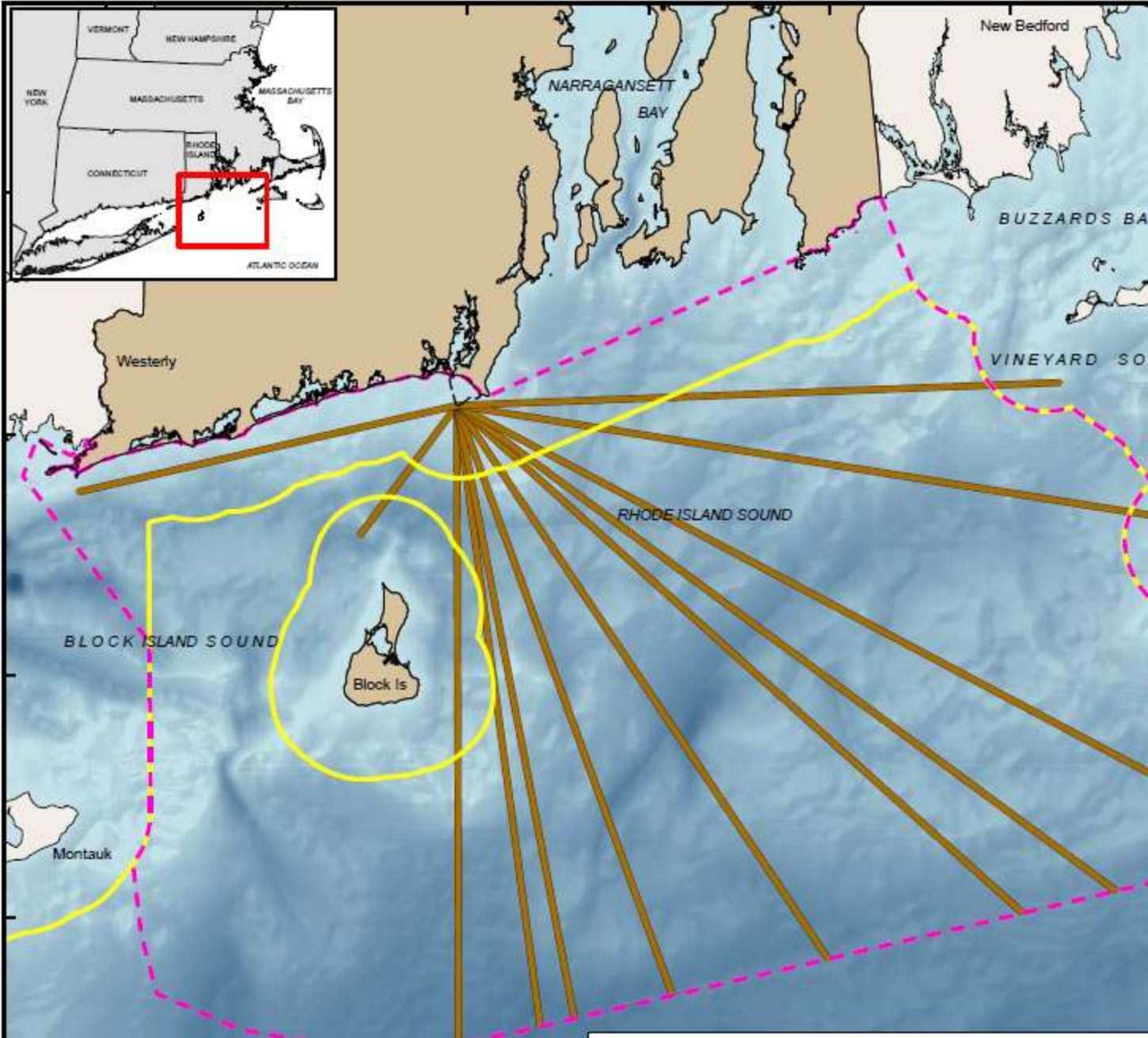
Historical and cultural resources

Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W

Map Key

-  OceanSAMP Study Area
-  State/Federal Waters
-  Common Fishing Transit Routes






Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3800
Datum: NAD83

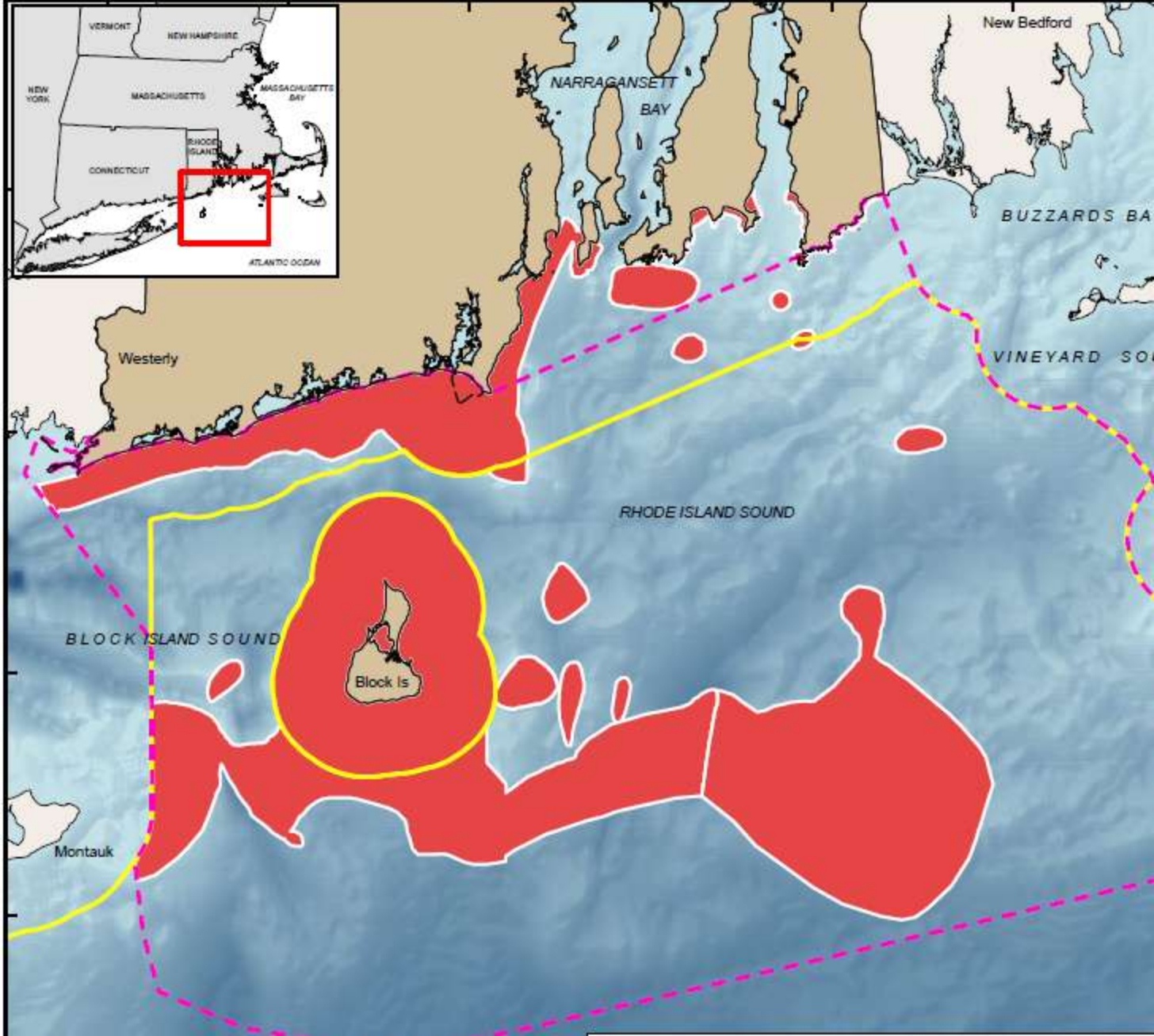
For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W

Map Key

-  OceanSAMP Study Area
-  State/Federal Waters
-  Recreational Fishing Areas






Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3800
Datum: NAD83

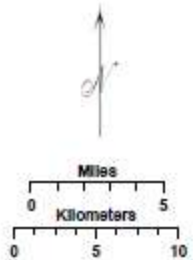
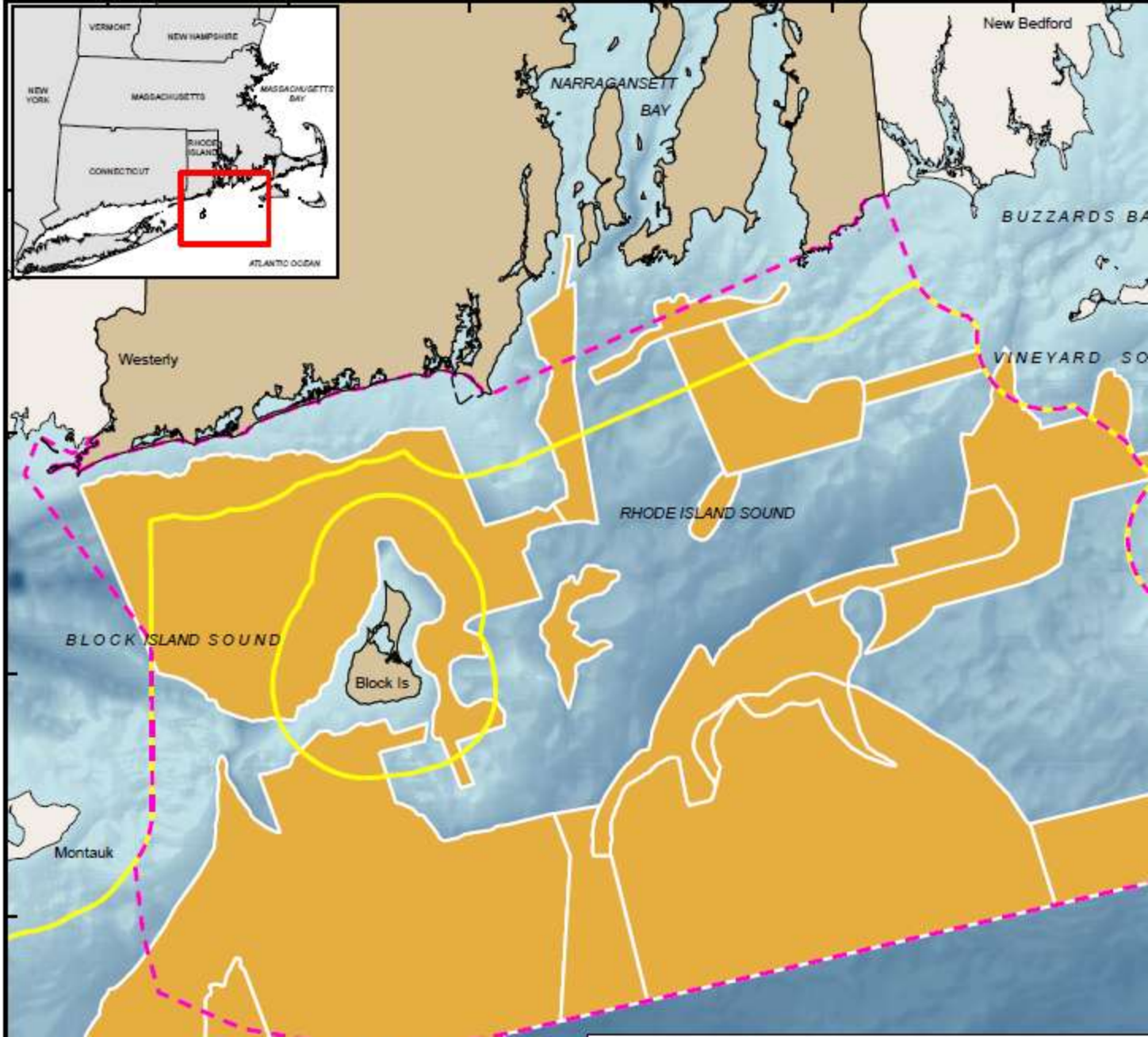
For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W

Map Key

-  OceanSAMP Study Area
-  State/Federal Waters
-  Mobile Gear Fishing Areas






Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3800
Datum: NAD83

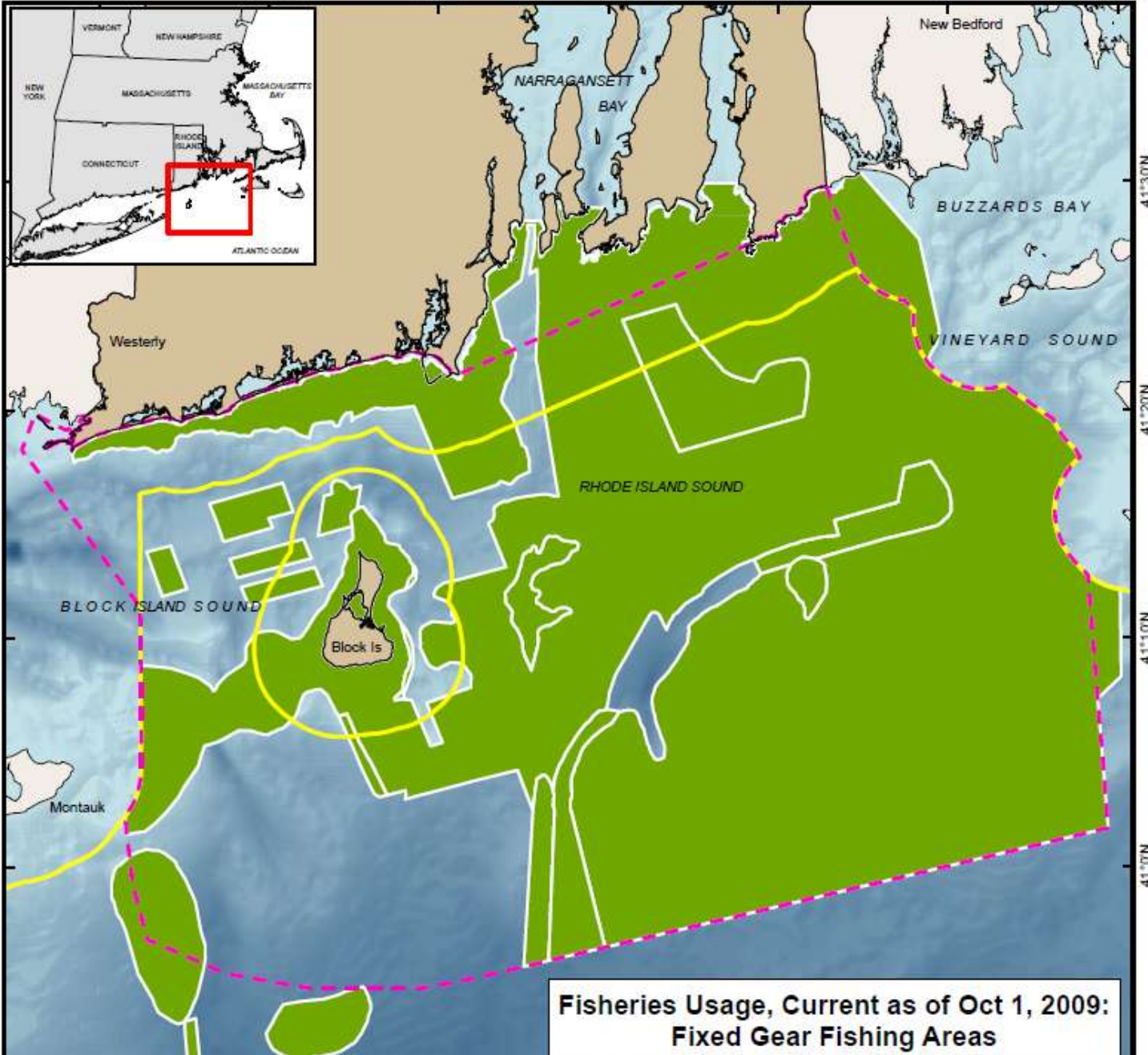
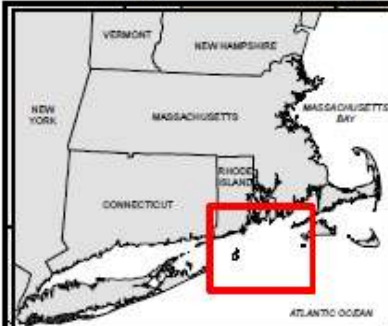
For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

Rhode Island Ocean Special Area Management Plan (SAMP)

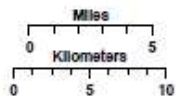
71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

-  OceanSAMP Study Area
-  State/Federal Waters
-  Fixed Gear Fishing Areas



41°30'N
41°20'N
41°10'N
41°0'N



Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3800
Datum: NAD83

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/d_projects/oceansamp






**Fisheries Usage, Current as of Oct 1, 2009:
Fixed Gear Fishing Areas**

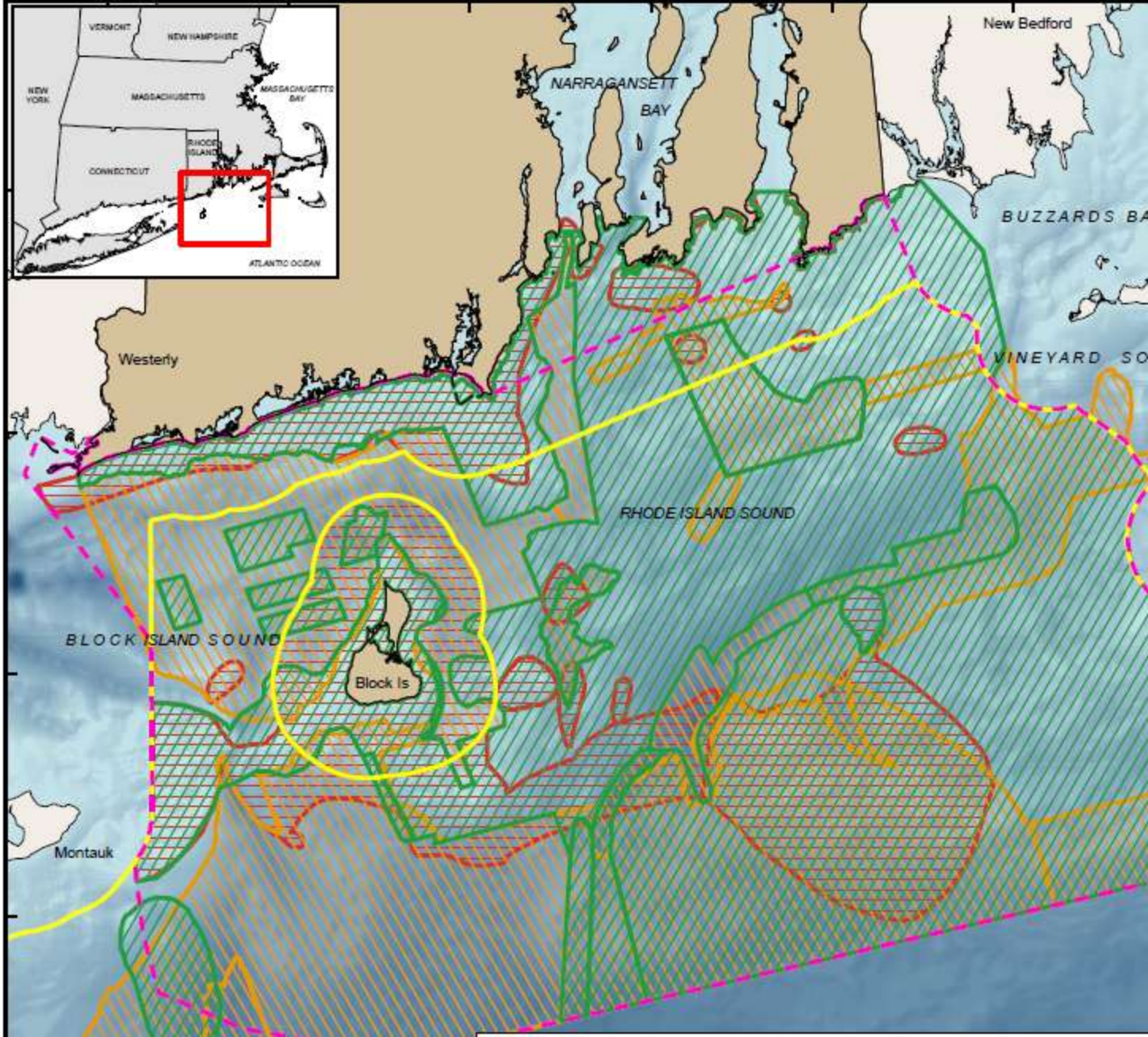


Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W

Map Key








-  OceanSAMP Study Area
-  State/Federal Waters
-  Fixed Gear Fishing Areas
-  Mobile Gear Fishing Areas
-  Recreational Fishing Areas

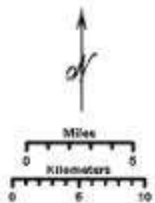


Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

-  OceanSAMP Study Area
-  State/Federal Waters
- Number of Trips per Cell**
-  6 - 50
-  51 - 100
-  101 - 200
-  201 - 300
-  301+

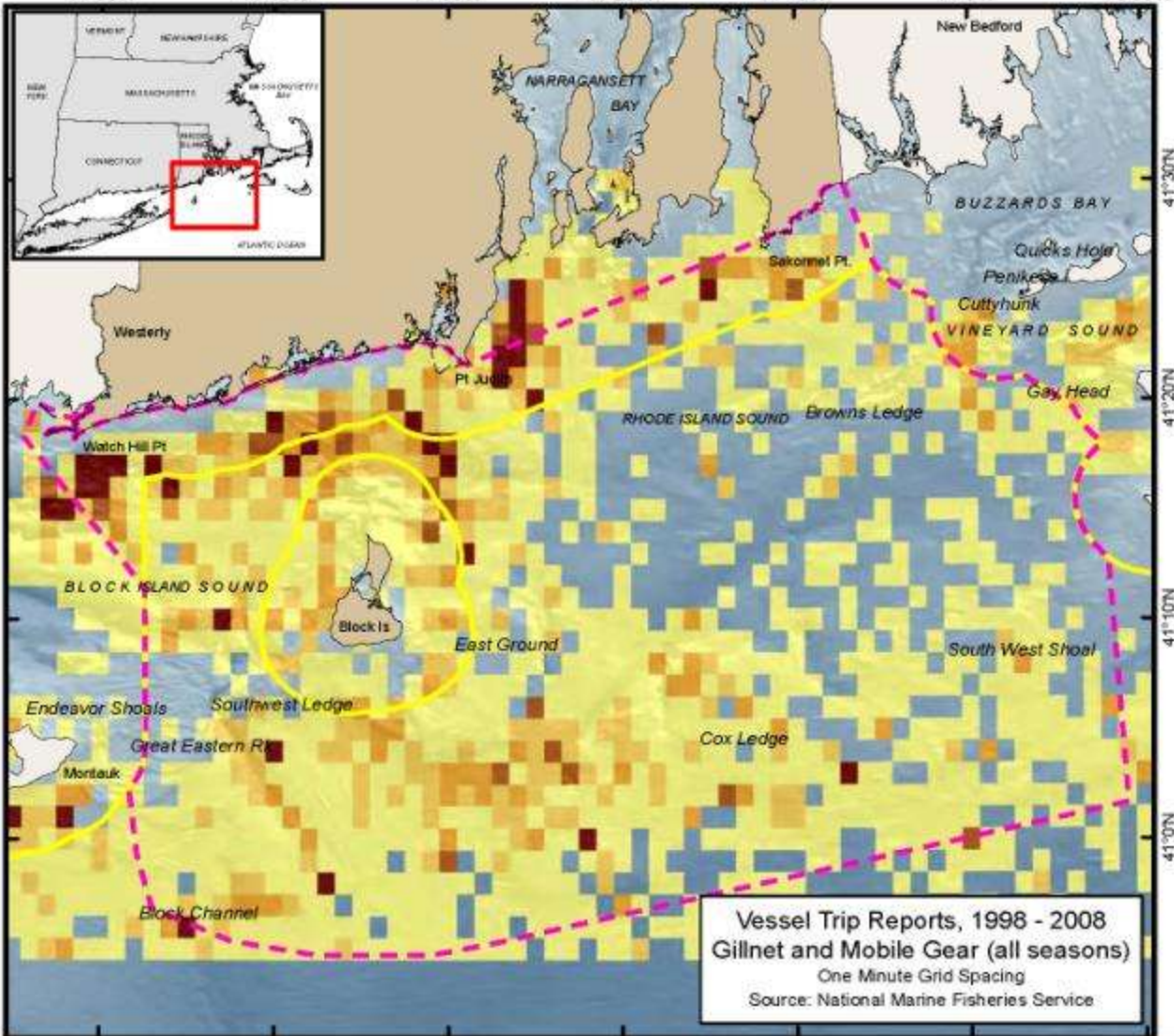


Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3810
 Datum: NAD83

Map Base Data:
 State Borders: RIGIS, MAGIS, CTIGIS
 SAMP Study Area: RI SAMP Database
 State Waters: MMS SLA Boundary
 Bathymetry: Interpolated from NIOS Soundings

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

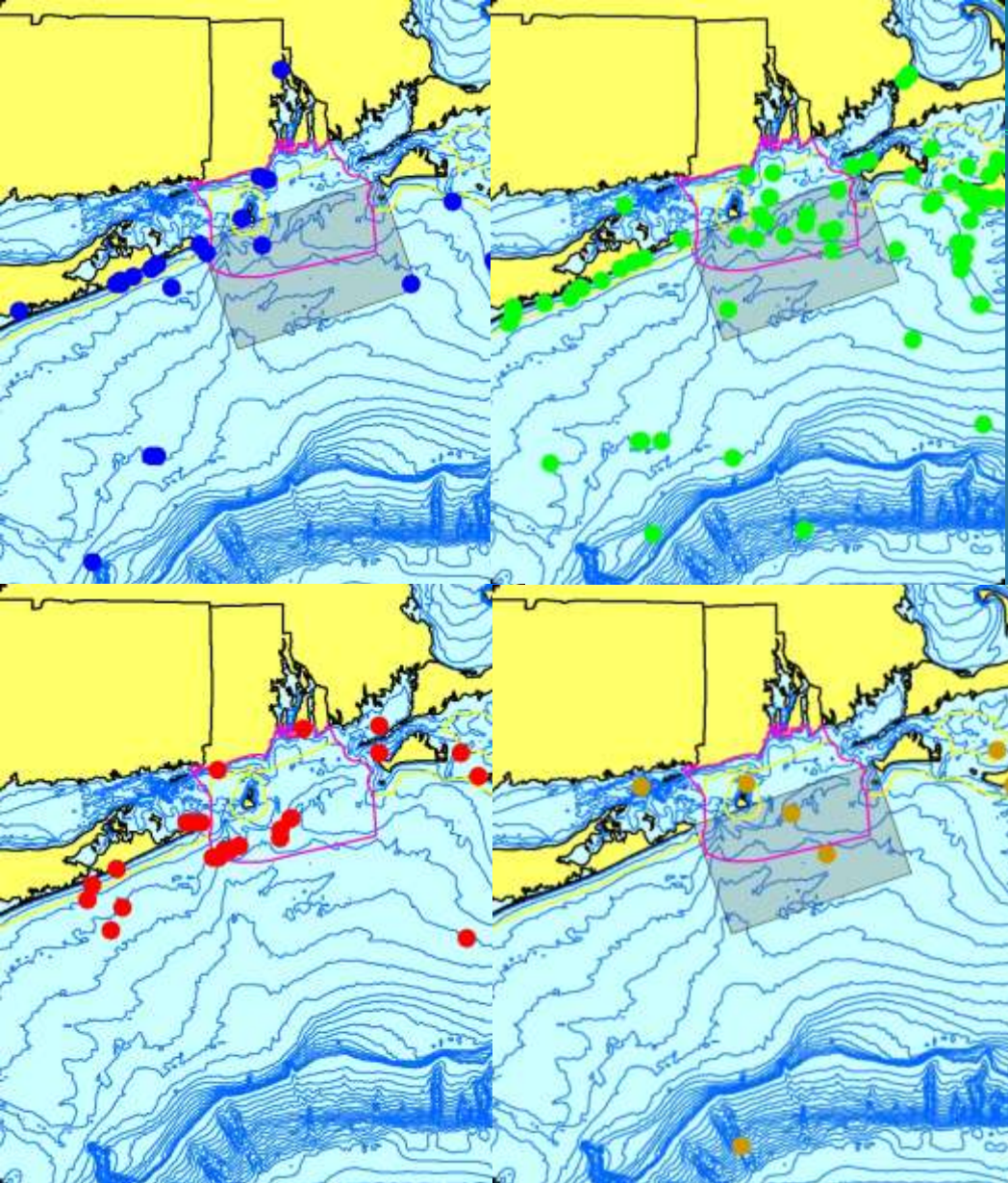
For Project Map and Data Products:
http://www.namby.org/ri_projects/oceansamp



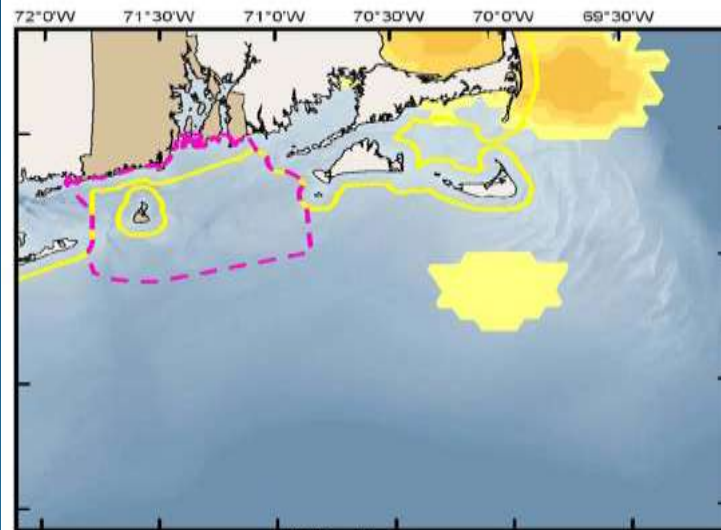
Vessel Trip Reports, 1998 - 2008
Gillnet and Mobile Gear (all seasons)
 One Minute Grid Spacing
 Source: National Marine Fisheries Service

41°30'N
41°20'N
41°10'N
41°0'N

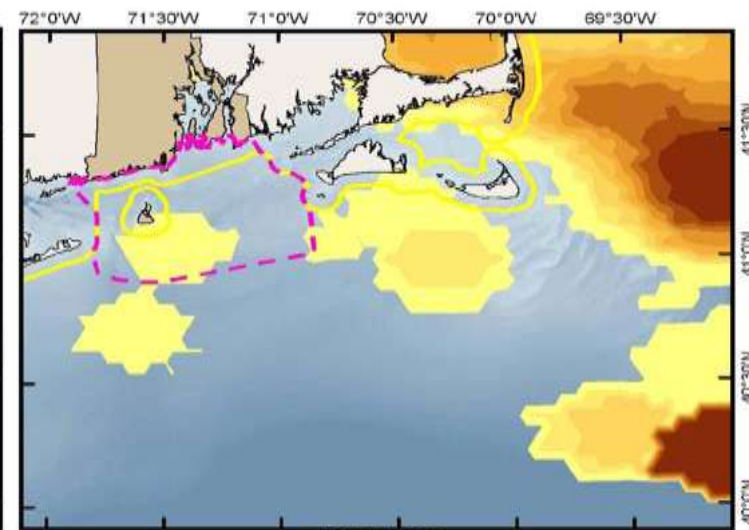
North Atlantic Right Whale, 1828-2007



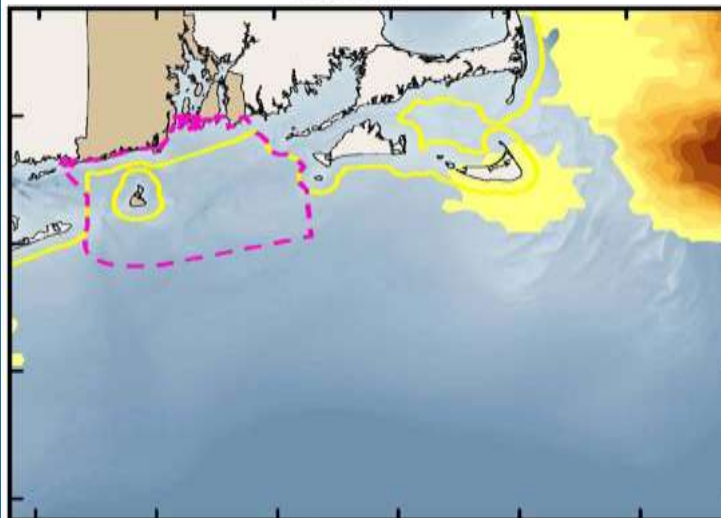
Dr. Robert Kenney, URI



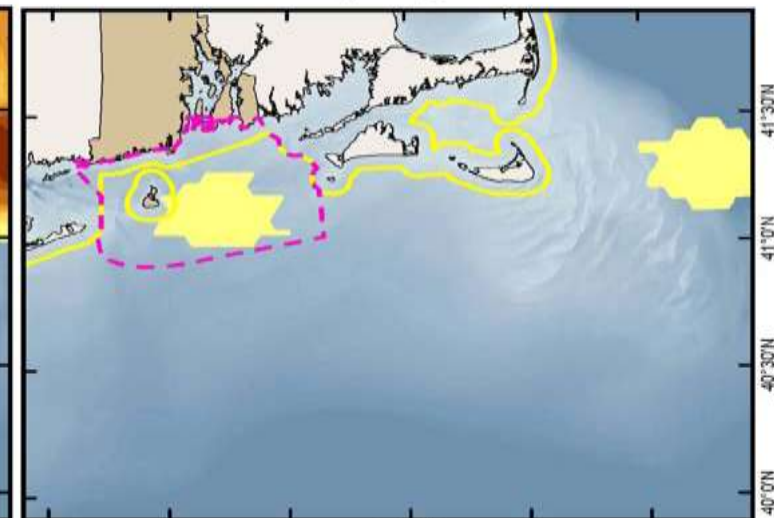
Winter



Spring



Summer

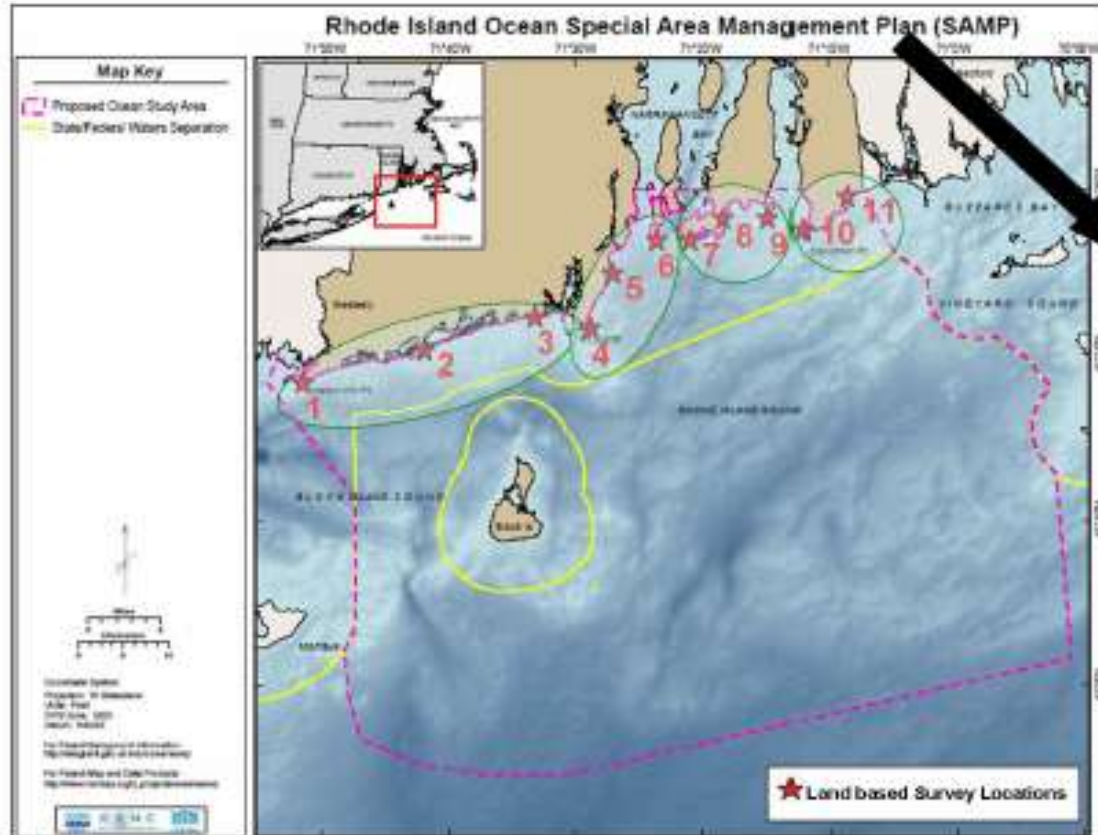
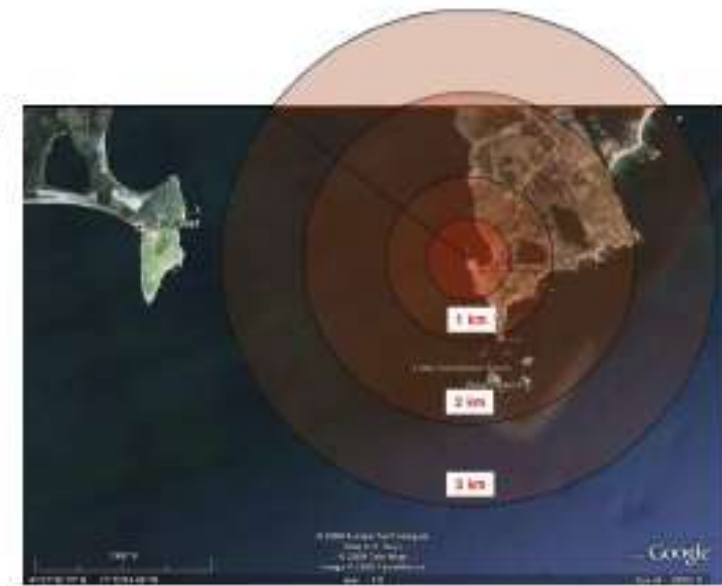


Fall

Land-based Surveys (Jan 2009 – May 2010)

11 sites

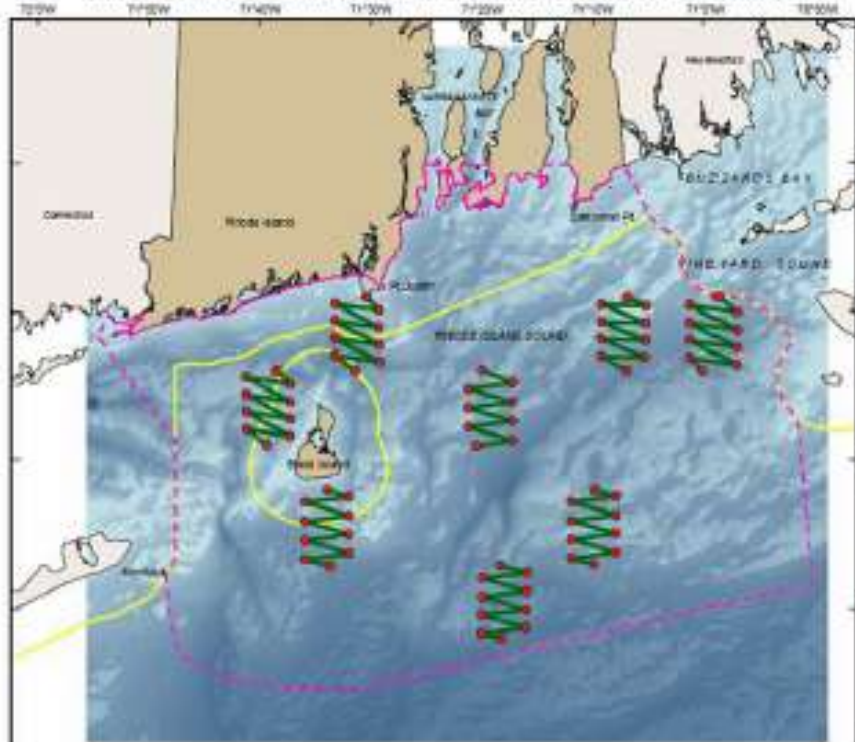
- each surveyed 6 times per month
- 1 to 2 hours per survey, to 3 km offshore
- 3 morning and 3 evening surveys per month



Boat-based Surveys (February 2009 – May 2010)

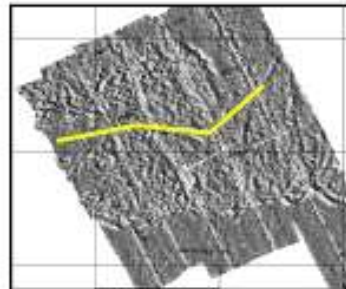
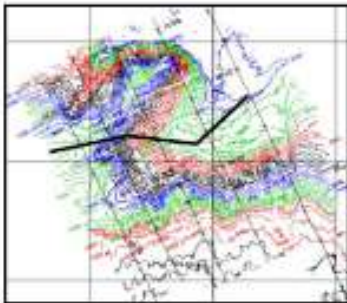
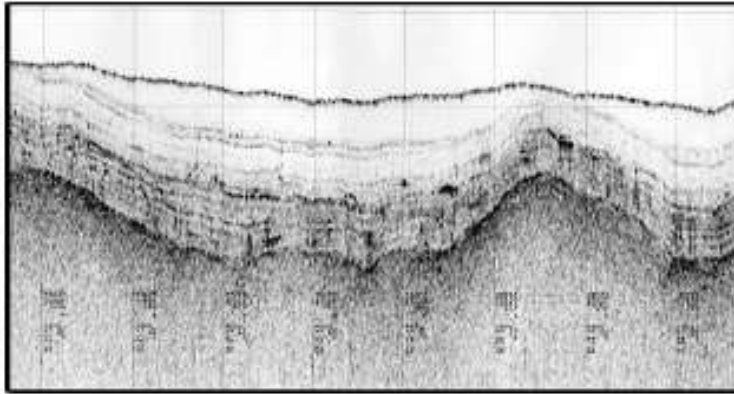
- 8 randomly-located sawtooth line transects to estimate density
- One survey per week conducted on 2 grids
- Each 4 by 5 nm grid gets surveyed once per month

Rhode Island Ocean Special Area Management Plan (SAMP)



Marine route survey

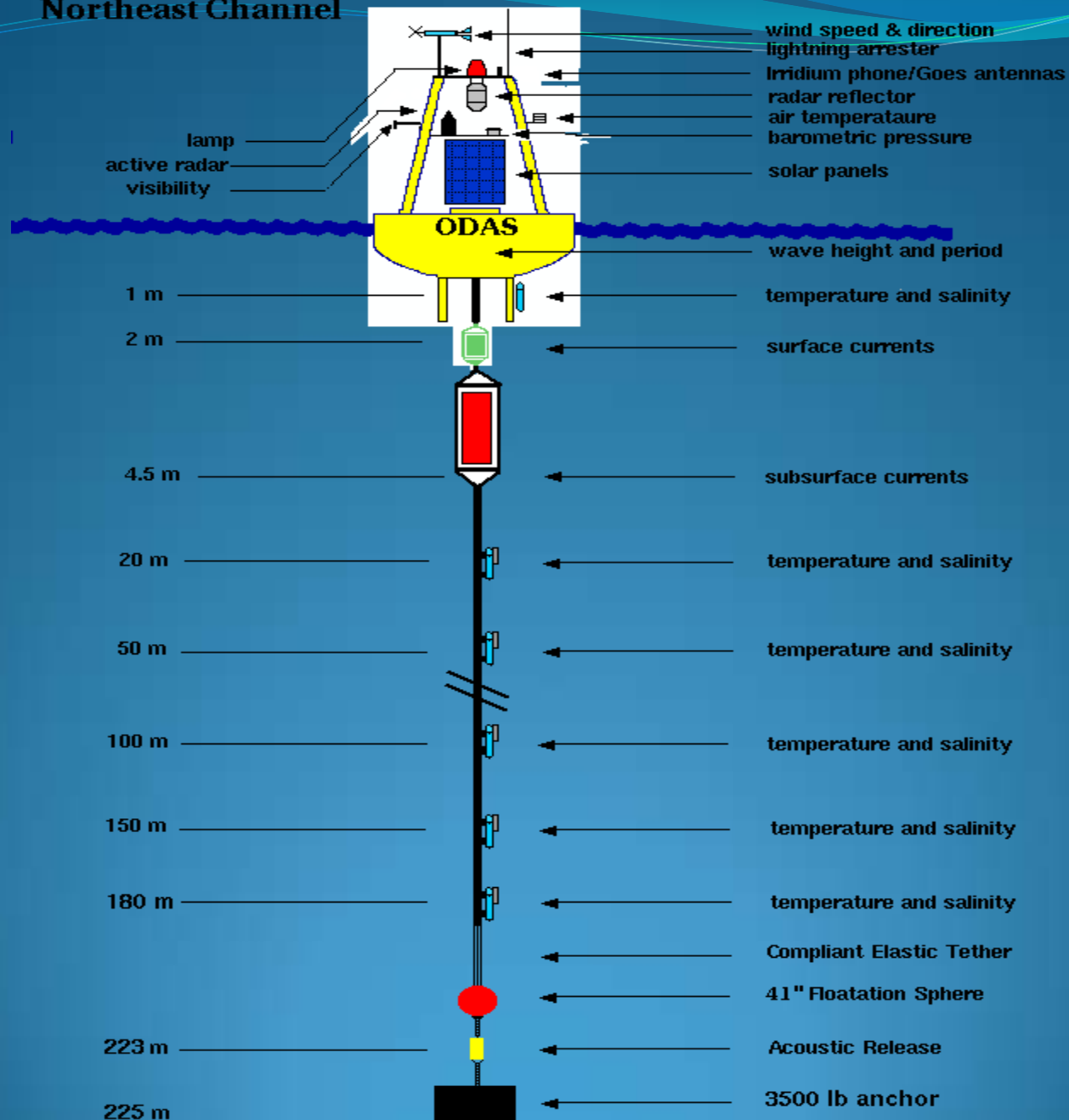
To be performed in the Spring of 2010



- Bathymetry
- Side scan sonar
- Sub-bottom profiler
- Burial assessment survey
- Archeological survey
- Route position list
- Finalize cable length

MOORING N Northeast Channel

N01



Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W


Map Key

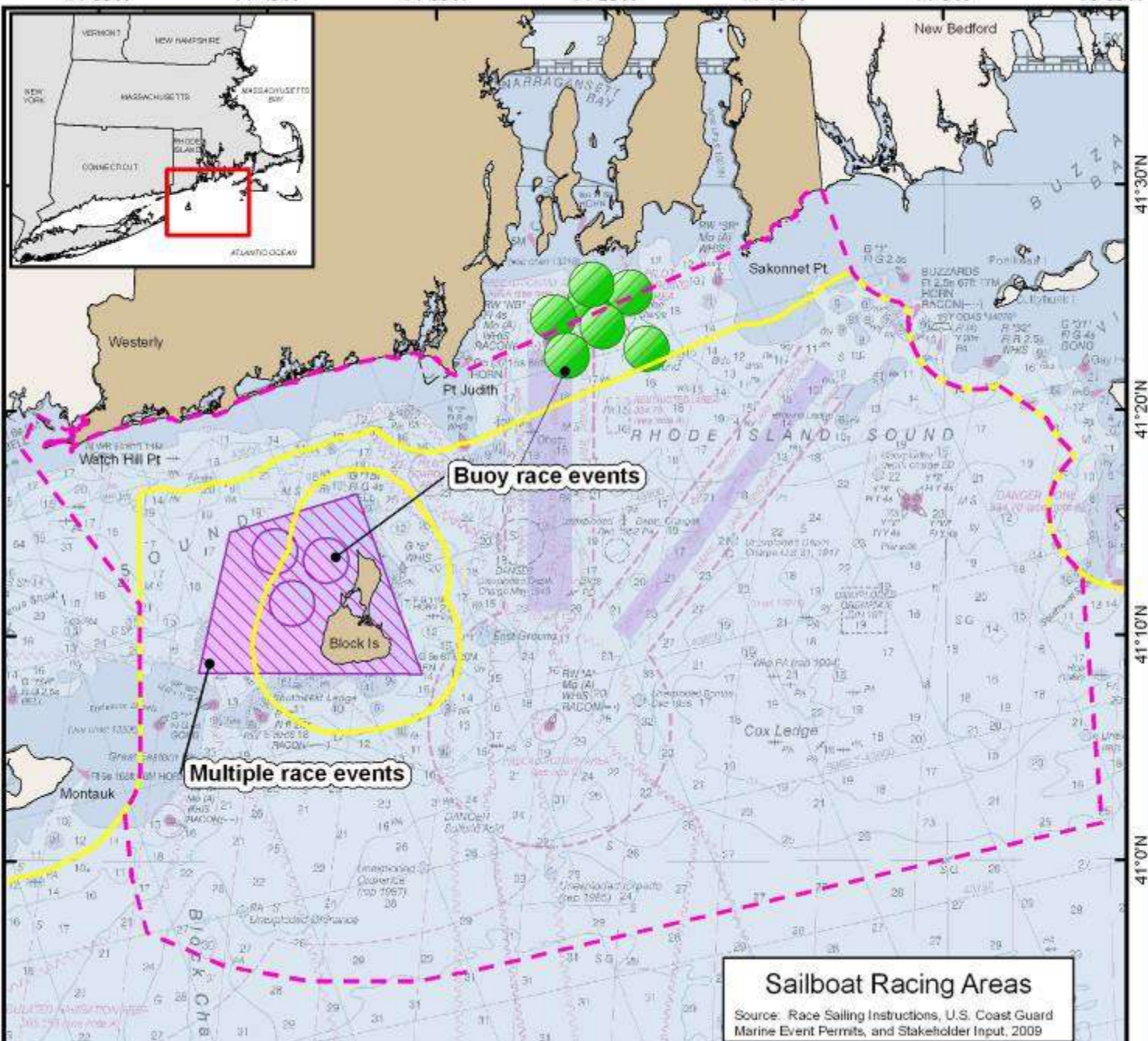
 OceanSAMP Study Area

 State Waters

Sailboat Racing Areas

 Newport Area Sailing Events

 Block Island Sailing Events

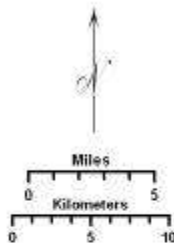


41°30'N

41°20'N

41°10'N

41°0'N



Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3800
 Datum: NAD83

Map Base Data:
 State Borders: RIGIS; MAGIS; CTGIS
 SAMP Study Area: RI SAMP Database
 State Waters: MMS SLA Boundary
 Bathymetry: Interpolated from NOS Soundings

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/id_projects/oceansamp



Buoy race events




Multiple race events

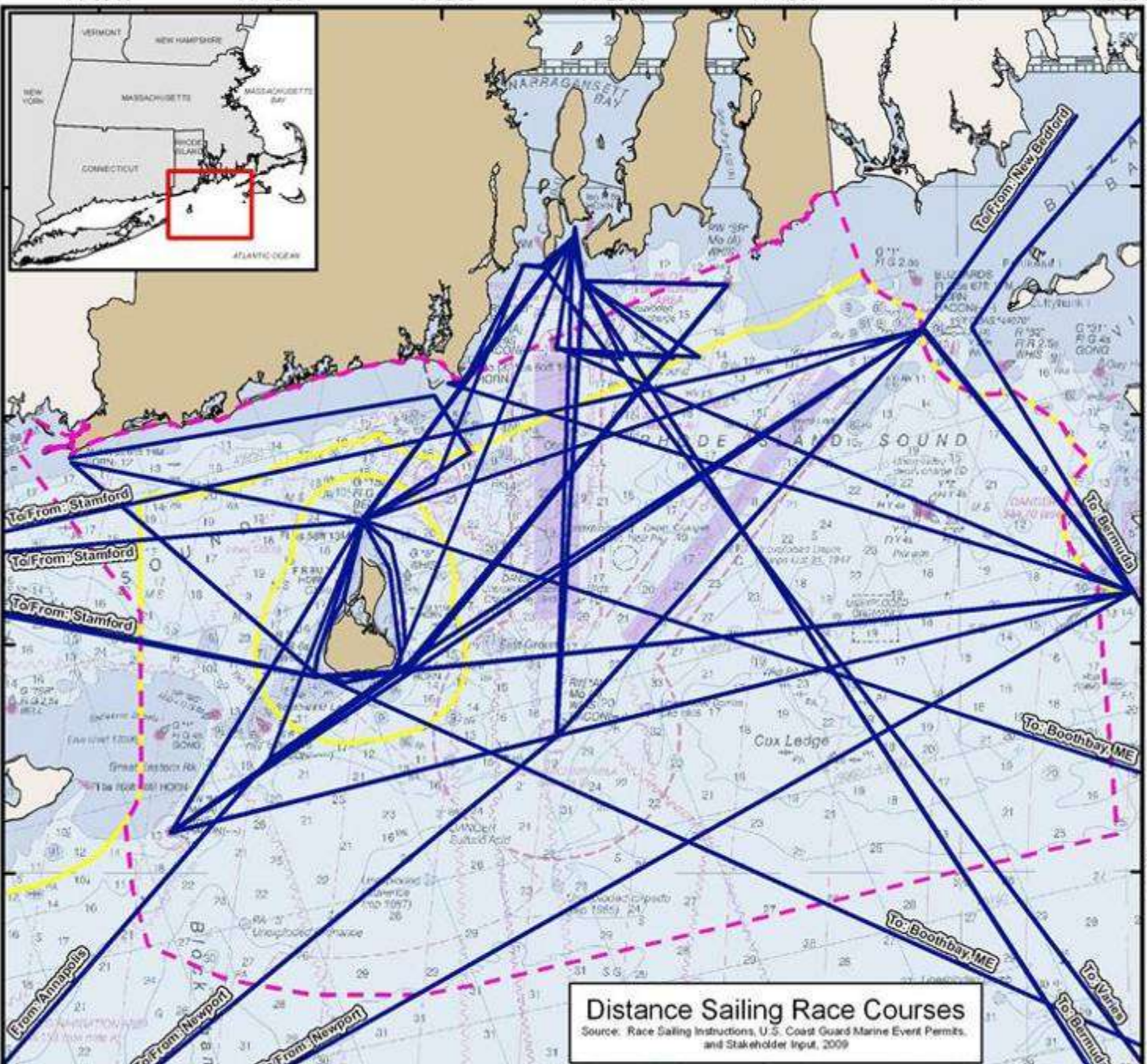
Sailboat Racing Areas
 Source: Race Sailing Instructions, U.S. Coast Guard Marine Event Permits, and Stakeholder Input, 2009

Rhode Island Ocean Special Area Management Plan (SAMP)

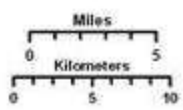
71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

-  OceanSAMP Study Area
-  State Waters
-  Distance Sailing Courses



41°30'N
41°20'N
41°10'N
41°0'N



Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3500
 Datum: NAD83

Map Base Data:
 State Borders: RIGIS; MAGIS; CTGIS
 SAMP Study Area: RI SAMP Database
 State Waters: MMS SLA Boundary
 Bathymetry: Interpolated from NOS Soundings

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/id_projects/oceansamp




Distance Sailing Race Courses
 Source: Race Sailing Instructions, U.S. Coast Guard Marine Event Permits, and Stakeholder Input, 2009

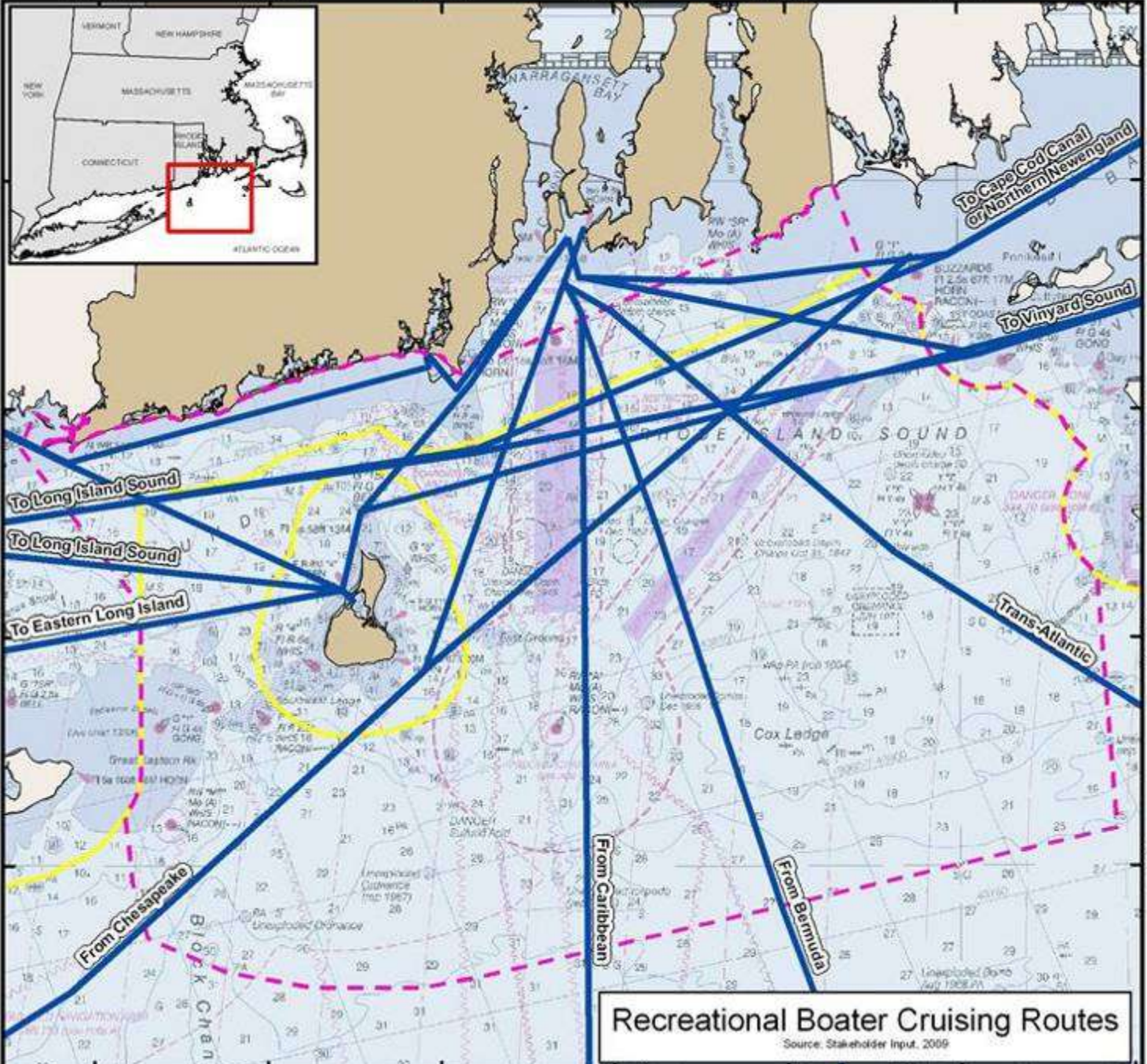


Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

-  OceanSAMP Study Area
-  State Waters
-  Sailing and Cruising Routes



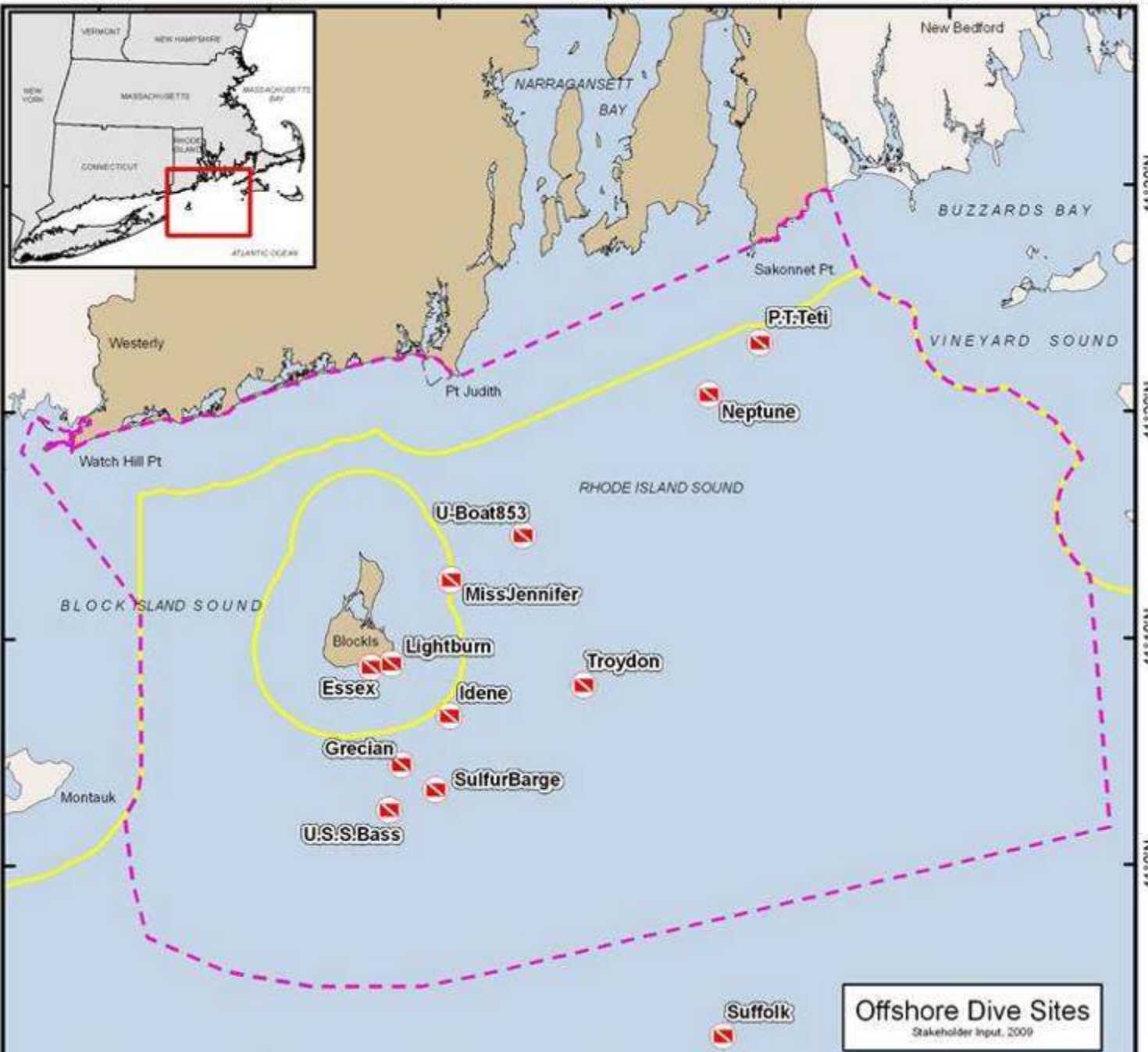
41°30'N
41°20'N
41°10'N
41°0'N

Recreational Boater Cruising Routes
Source: Stakeholder Input, 2009

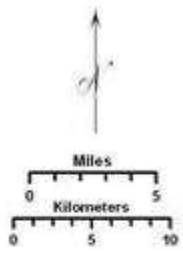
Rhode Island Ocean Special Area Management Plan (SAMP)

71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

- ### Map Key
-  OceanSAMP Study Area
 -  State/Federal Waters
 -  Offshore Dive Sites
Shipwreck names



41°30'N
41°20'N
41°10'N
41°0'N



Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3500
 Datum: NAD83

Map Base Data:
 State Borders: RIGIS; MAGIS; CTGIS
 SAMP Study Area: RI SAMP Database
 State Waters: NMS SLA Boundary
 Bathymetry: Interpolated from NOS Soundings

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/ld_projects/oceansamp



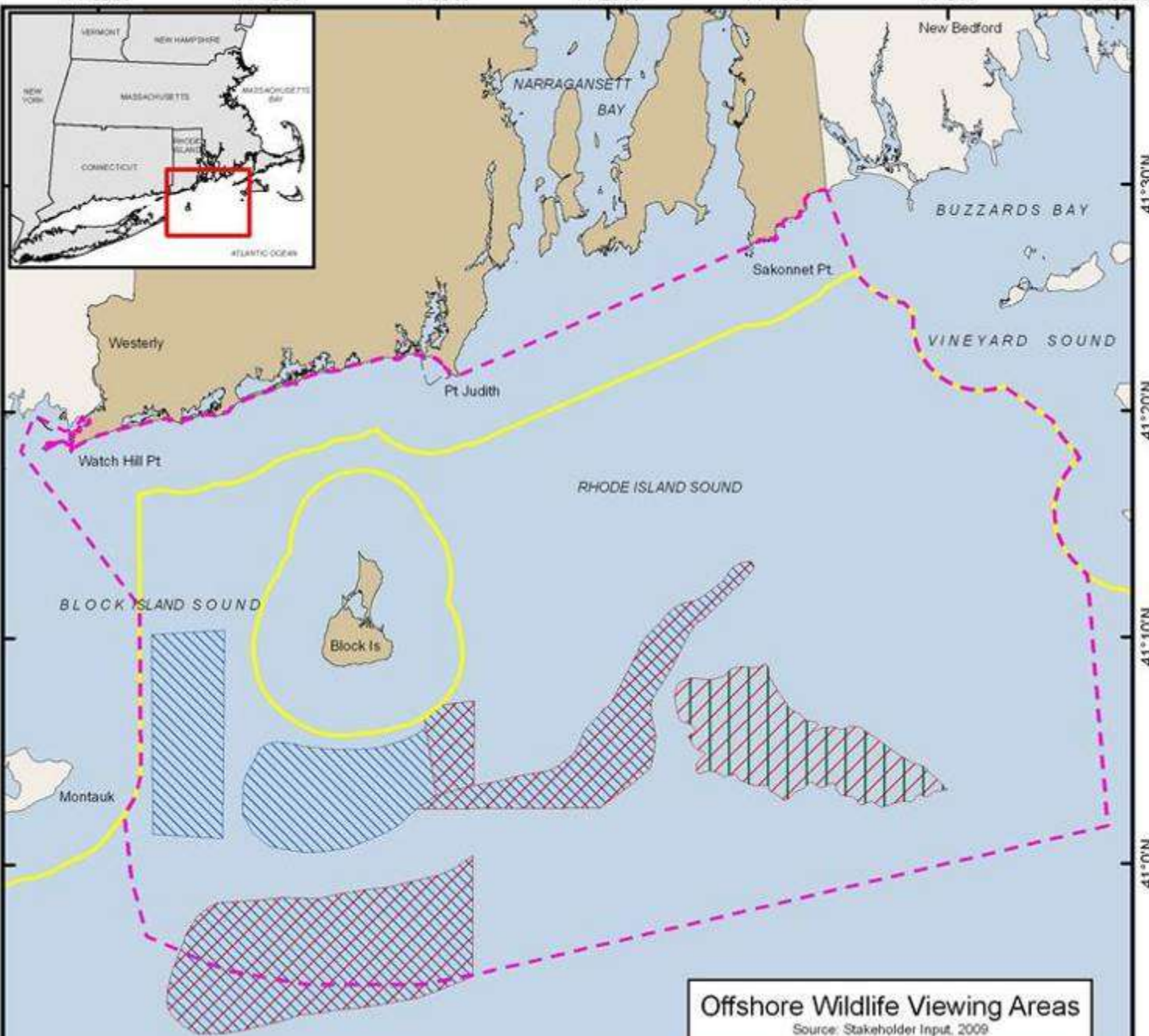
Offshore Dive Sites
 Stakeholder Input, 2009

Rhode Island Ocean Special Area Management Plan (SAMP)

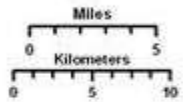
71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W

Map Key

-  OceanSAMP Study Area
-  State/Federal Waters
-  Bird Watching Areas
-  Shark Cage Diving Areas
-  Whale Watching Areas



41°30'N
41°20'N
41°10'N
41°0'N



Coordinate System:
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3500
 Datum: NAD83

Map Base Data:
 State Borders: RIGIS; MAGIS; CTGIS
 SAMP Study Area: RI SAMP Database
 State Waters: MMS SLA Boundary
 Bathymetry: Interpolated from NOS Soundings

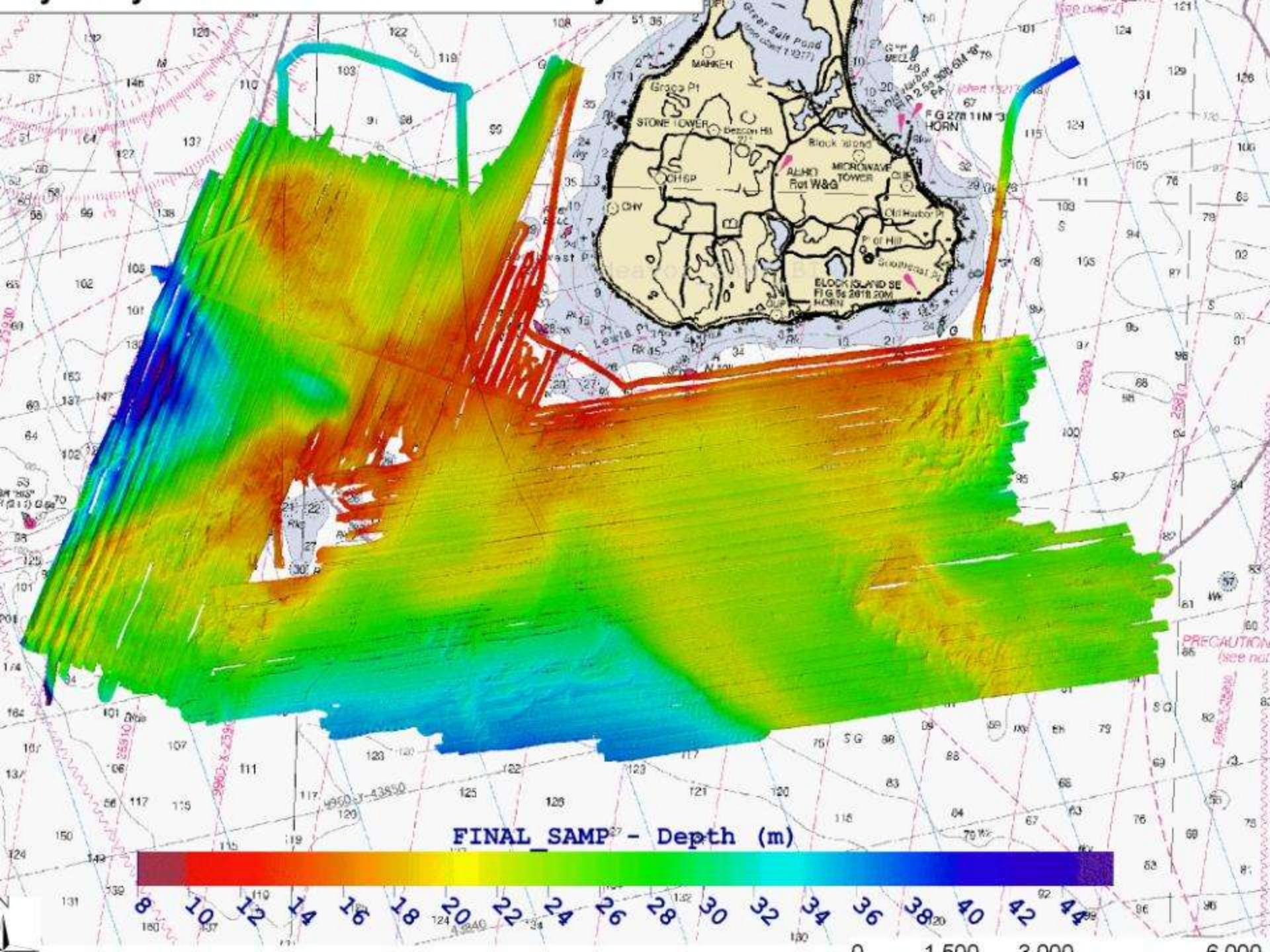
For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

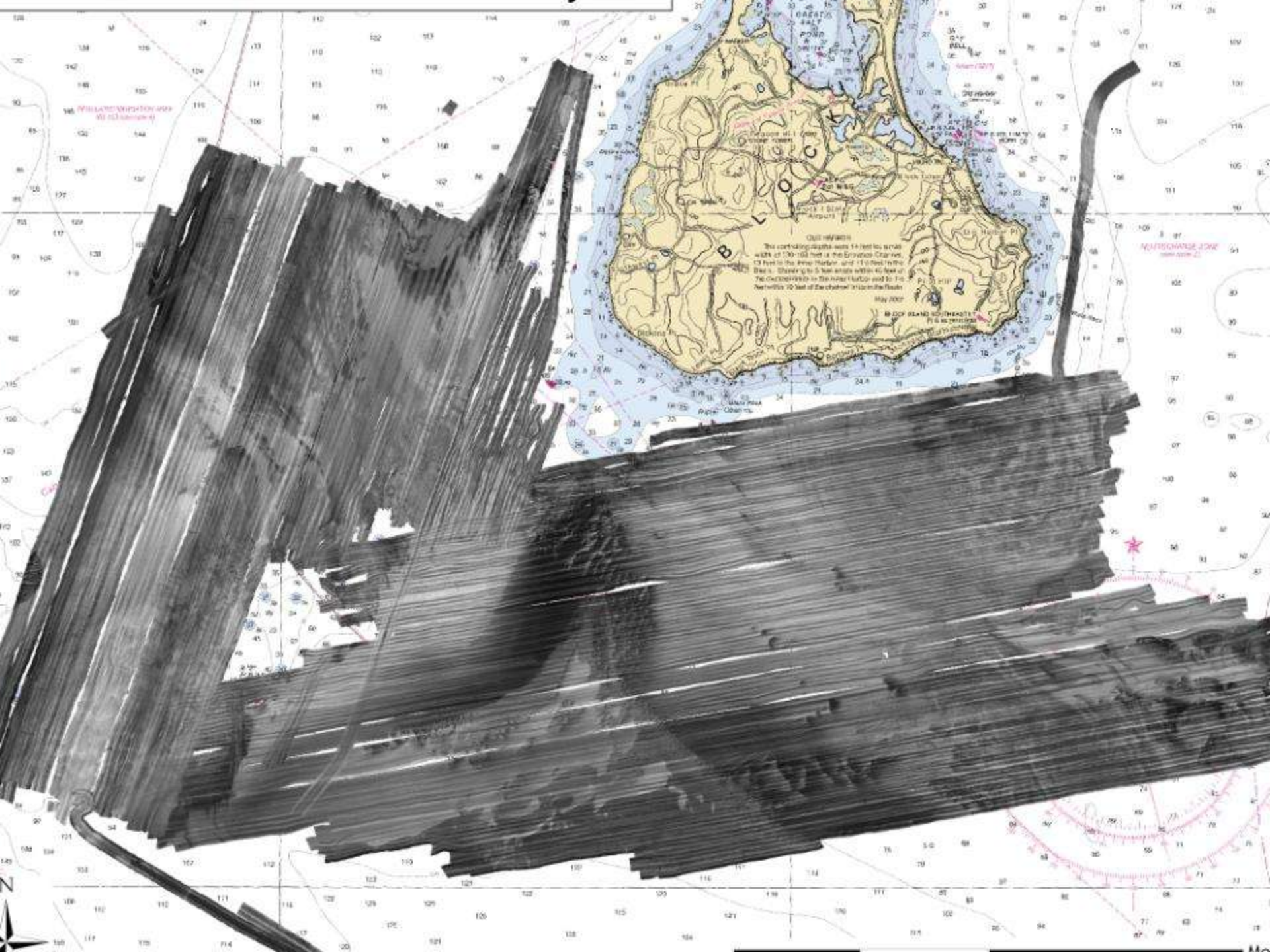
For Project Map and Data Products:
http://www.narrabay.org/ld_projects/oceansamp

Offshore Wildlife Viewing Areas
 Source: Stakeholder Input, 2009









WILLIAMSBURG (1853)

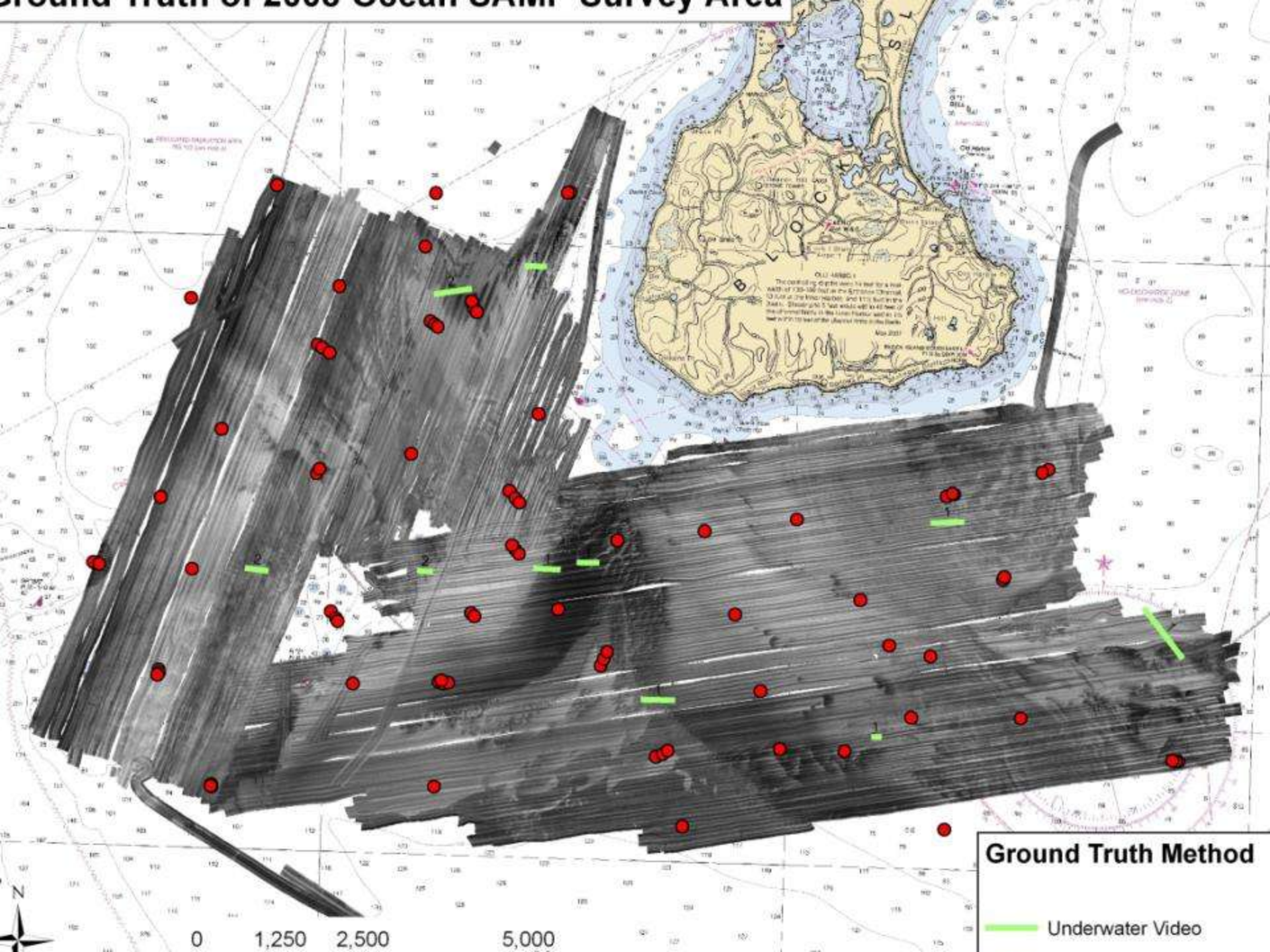
Chart No. 1100
The charting depths were taken by a crew
of 100-120 feet at the Gravel Point, and
13 feet in the deep channel, and 10 feet in the
Bay. Soundings are taken within 40 feet of
the charted depth in the near harbor and to 10
feet within 20 feet of the channel in the open bay.

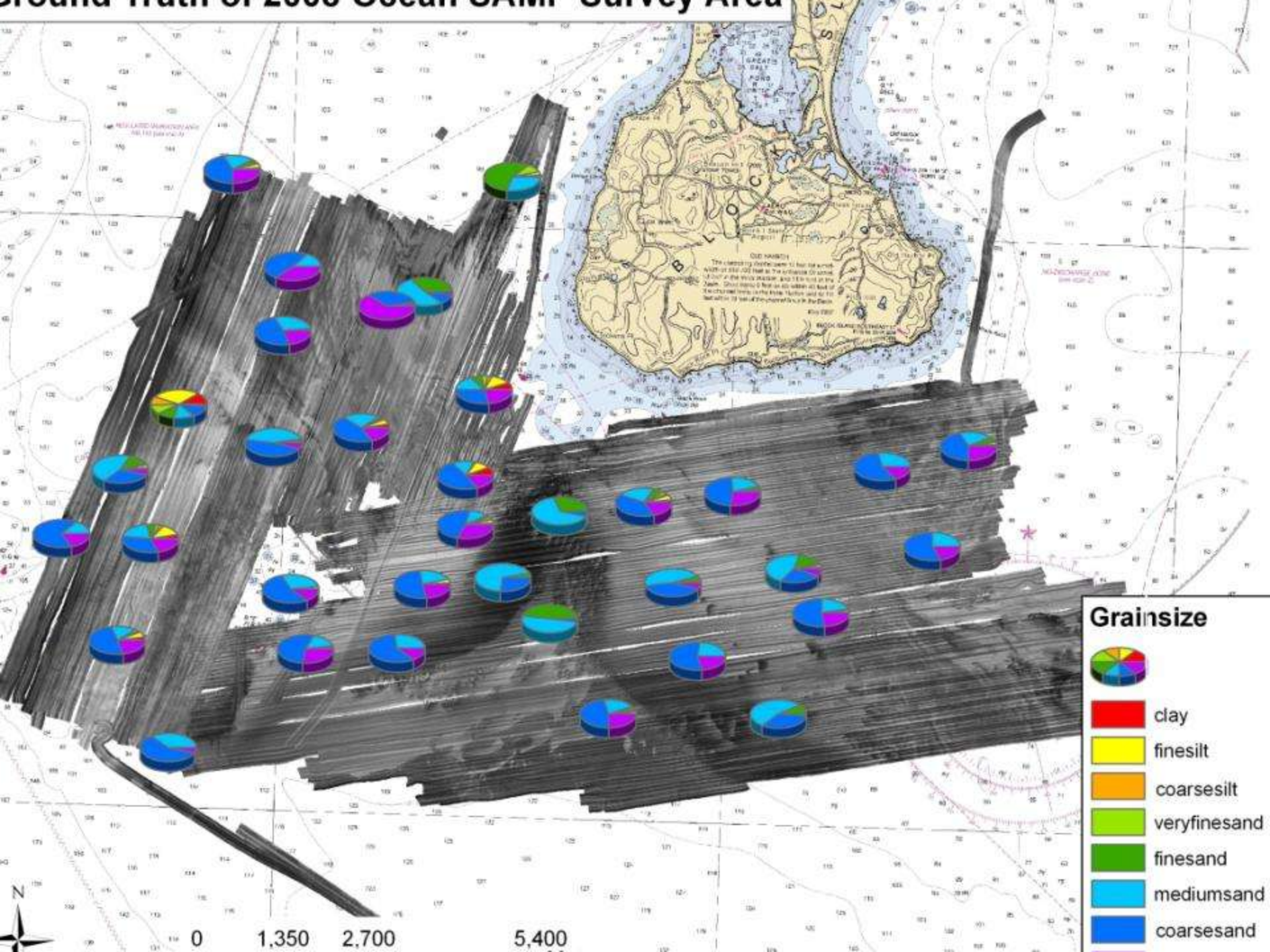
May 2007

NAUTICAL CHART



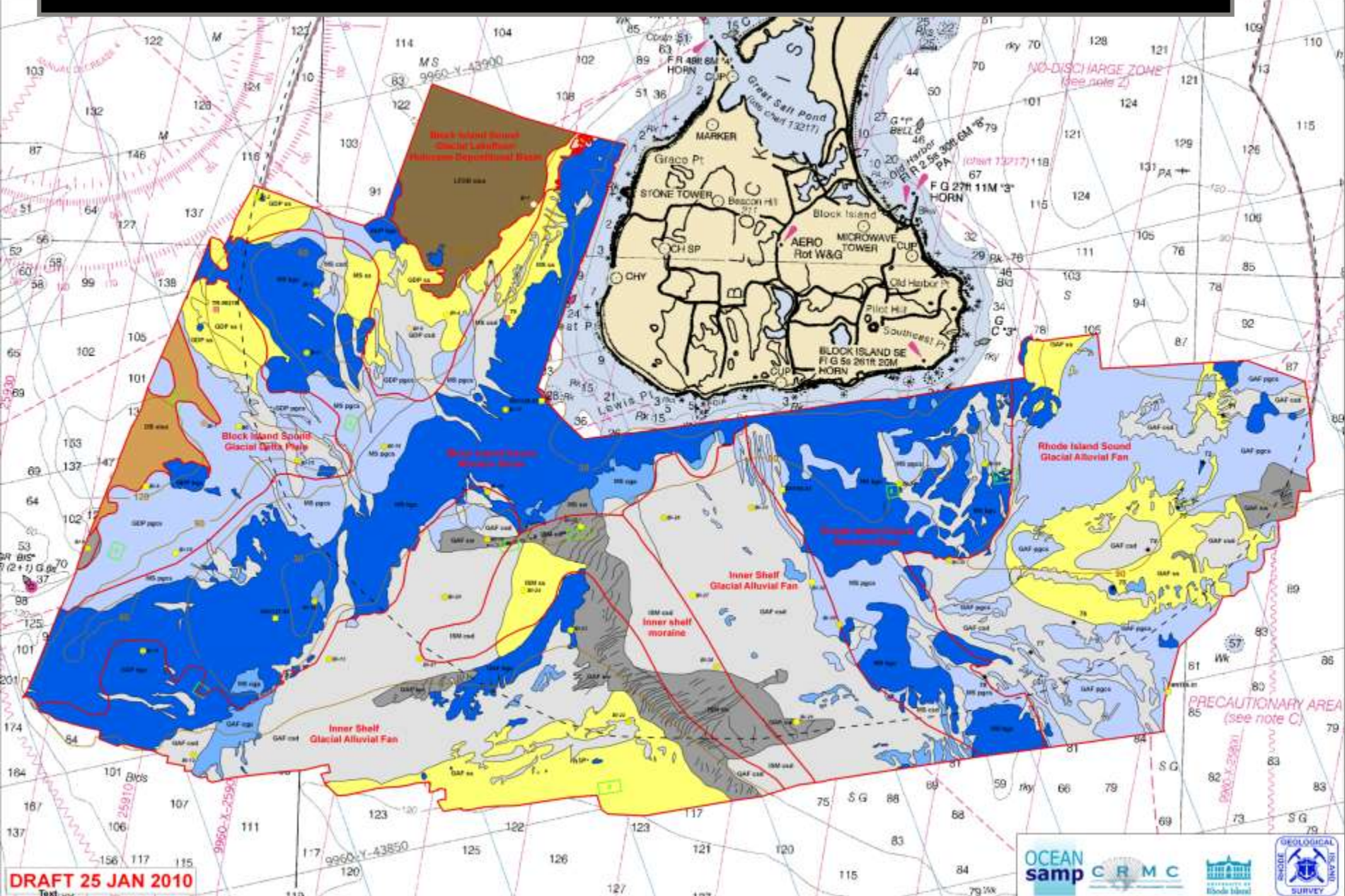
Ground Truth of 2008 Ocean GAIM Survey Area





0 1,350 2,700 5,400

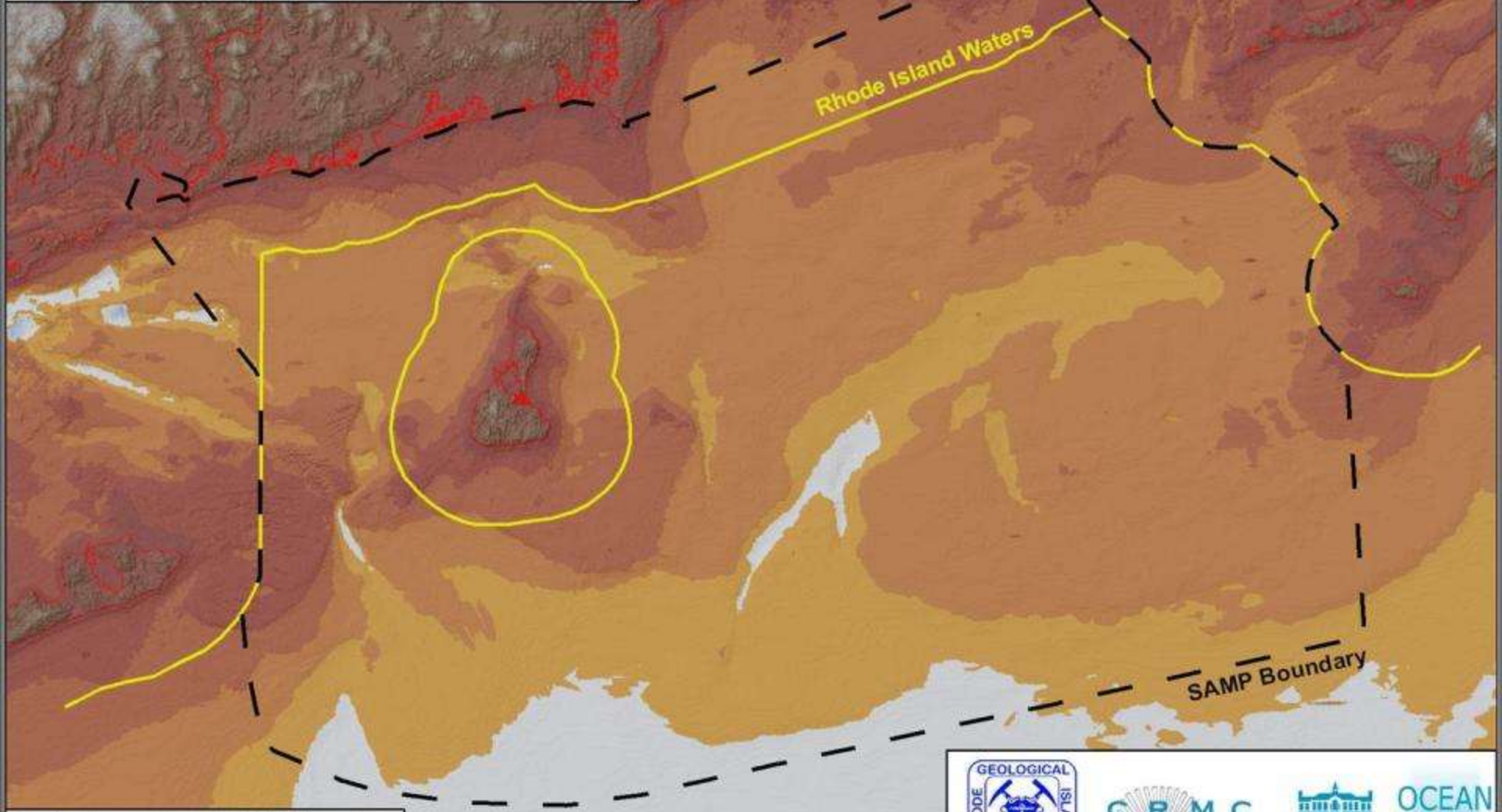
Benthic Geologic Habitats/Depositional Environments and Facies: Southern Block Island OSAMP Area



SEA-LEVEL RISE: OSAMP AREA

- 50 m below present
11,500 yBP

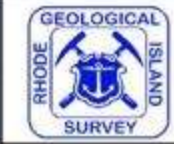
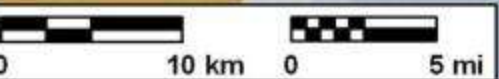
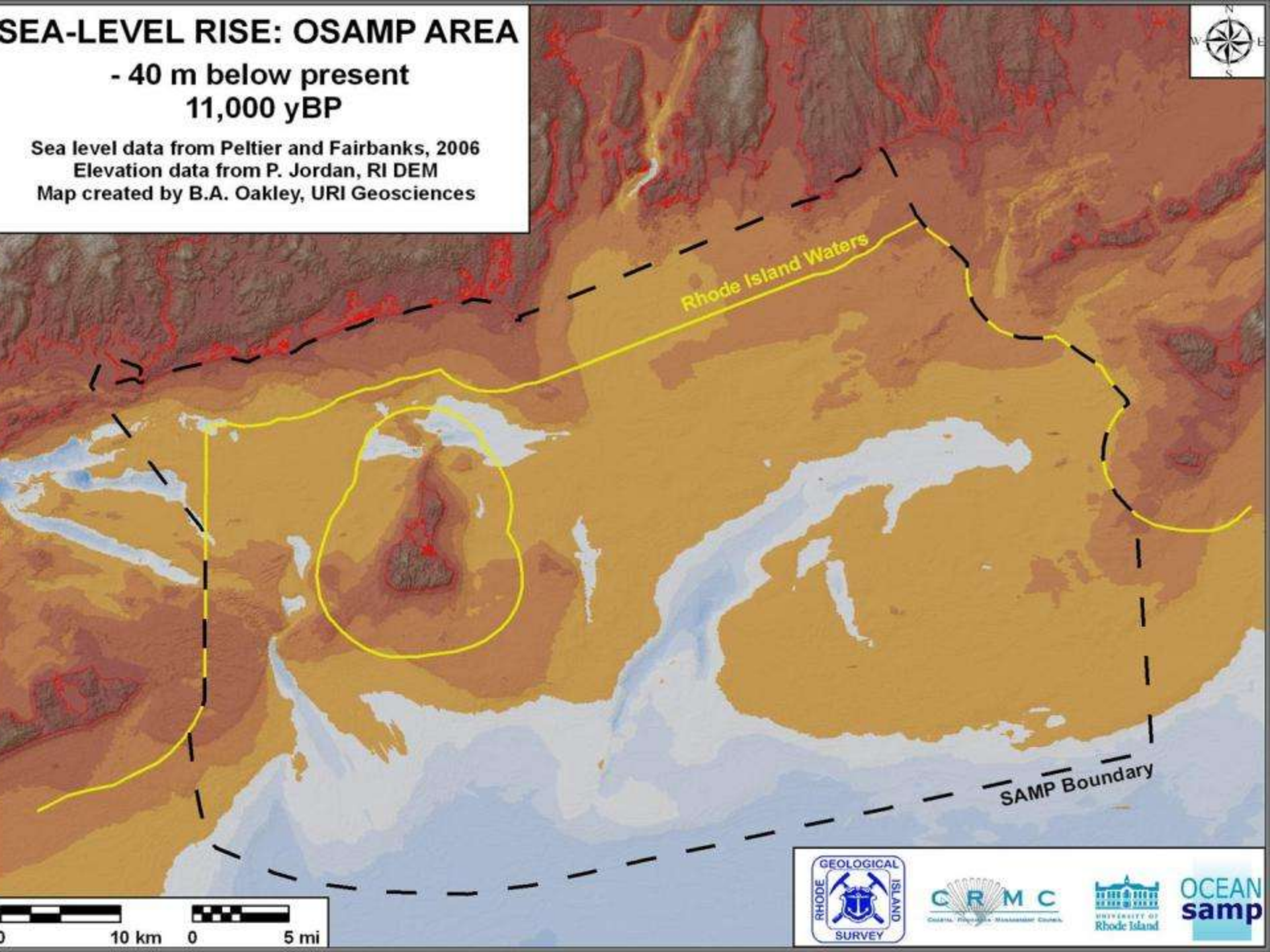
Sea level data from Peltier and Fairbanks, 2006
Elevation data from P. Jordan, RI DEM
Map created by B.A. Oakley, URI Geosciences



SEA-LEVEL RISE: OSAMP AREA

- 40 m below present
11,000 yBP

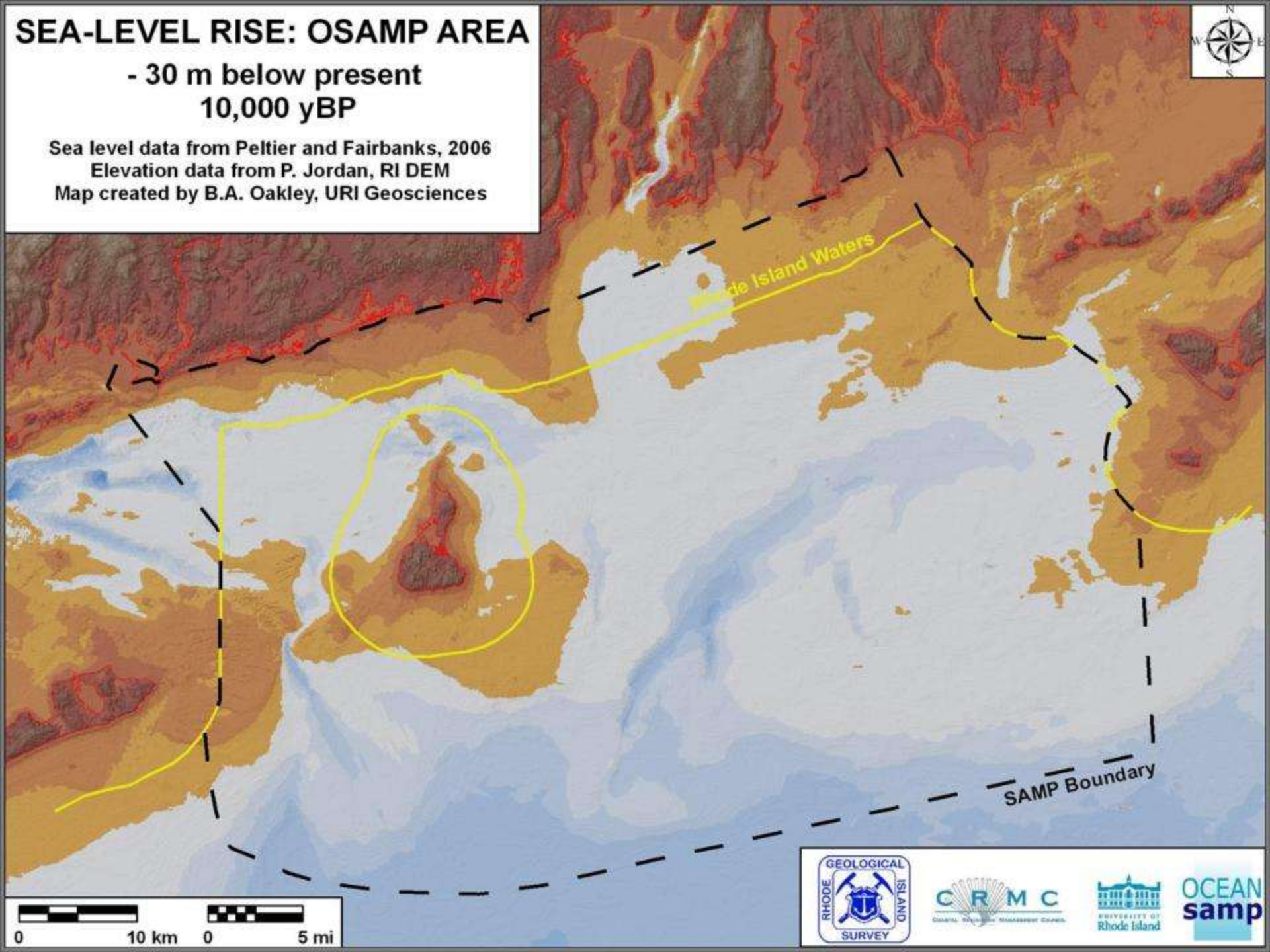
Sea level data from Peltier and Fairbanks, 2006
Elevation data from P. Jordan, RI DEM
Map created by B.A. Oakley, URI Geosciences

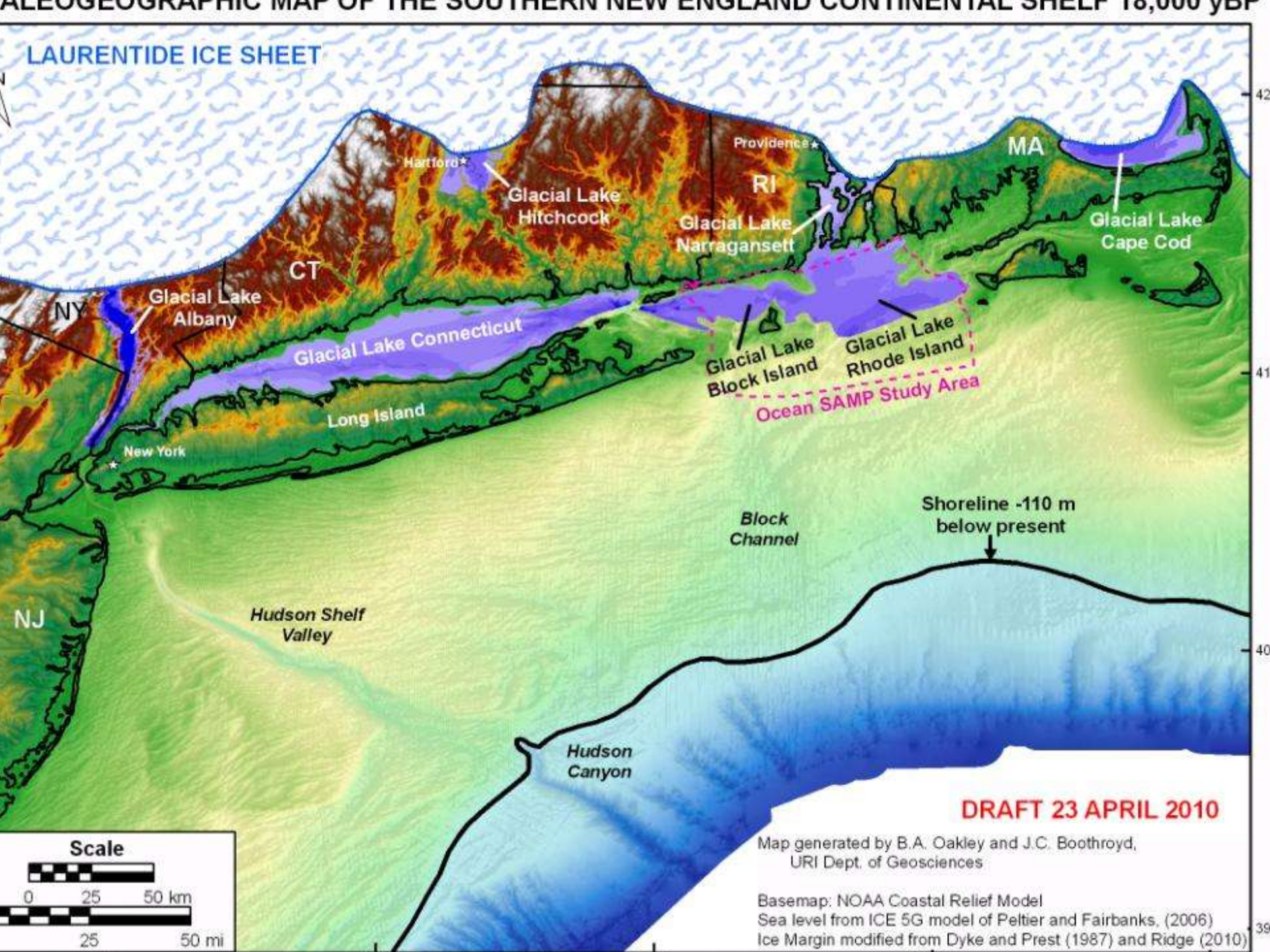


SEA-LEVEL RISE: OSAMP AREA

- 30 m below present
10,000 yBP

Sea level data from Peltier and Fairbanks, 2006
Elevation data from P. Jordan, RI DEM
Map created by B.A. Oakley, URI Geosciences

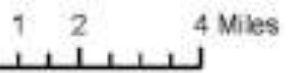




Habitat Type

- Undisturbed cobble
- Washed gravel
- Mobile sand
- Silty sand
- Soft silt

- Alternative3
- Narragansett Connection
- Pt. Judith Shoal
- Block Island Connection
- Alt 1 Connection
- Alt 2 Connection
- Alt 2 SE Shoal
- Overland_Alt1_092509
- State/Federal Waters Separation



Water Wind

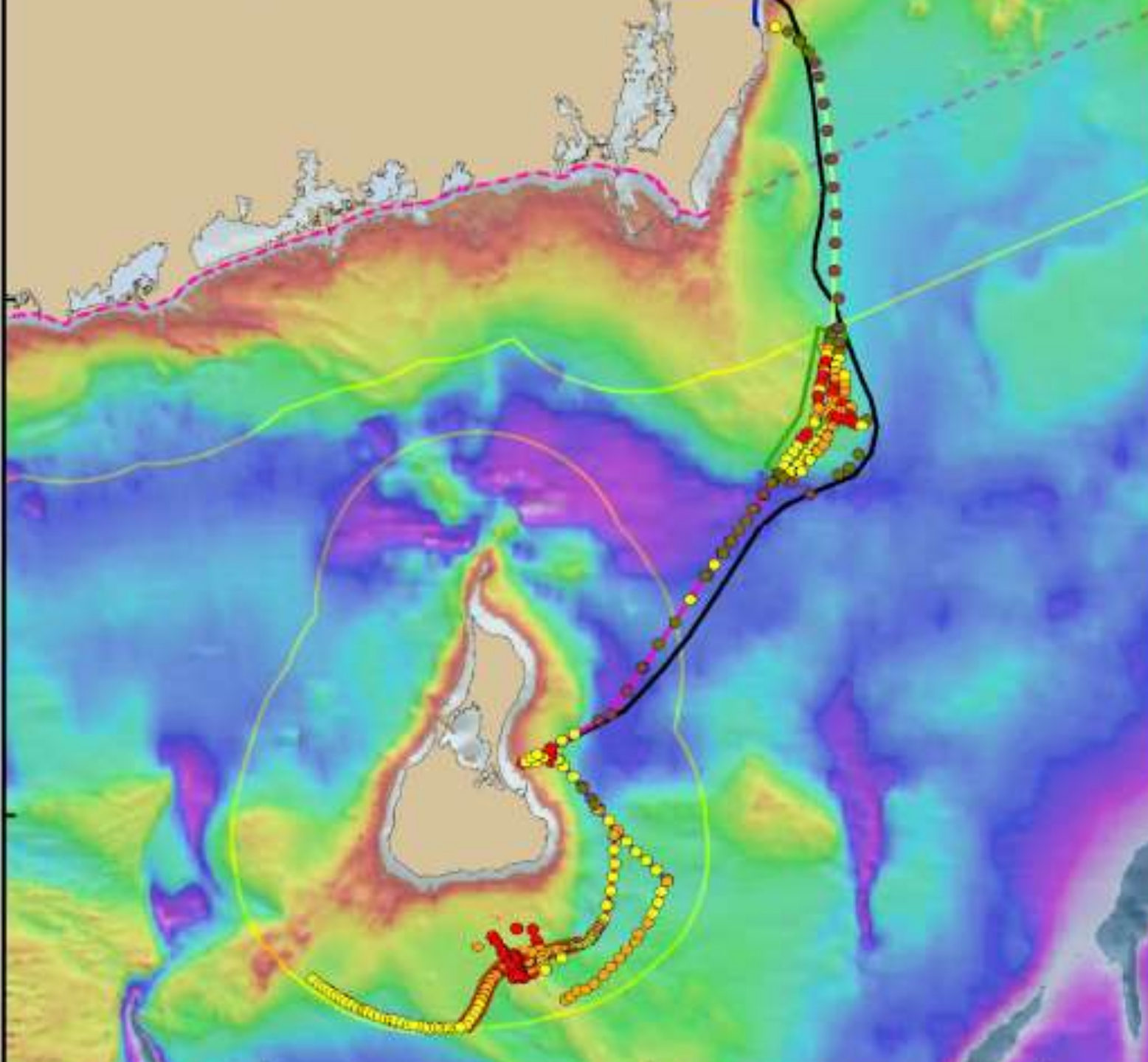
Technology and Environment

CostalVision

Mano & Associates

Environmental




Coordinate System
 Projection: RI Stateplane
 Units: Feet
 FIPS Zone: 3800
 Datum: NAD 83

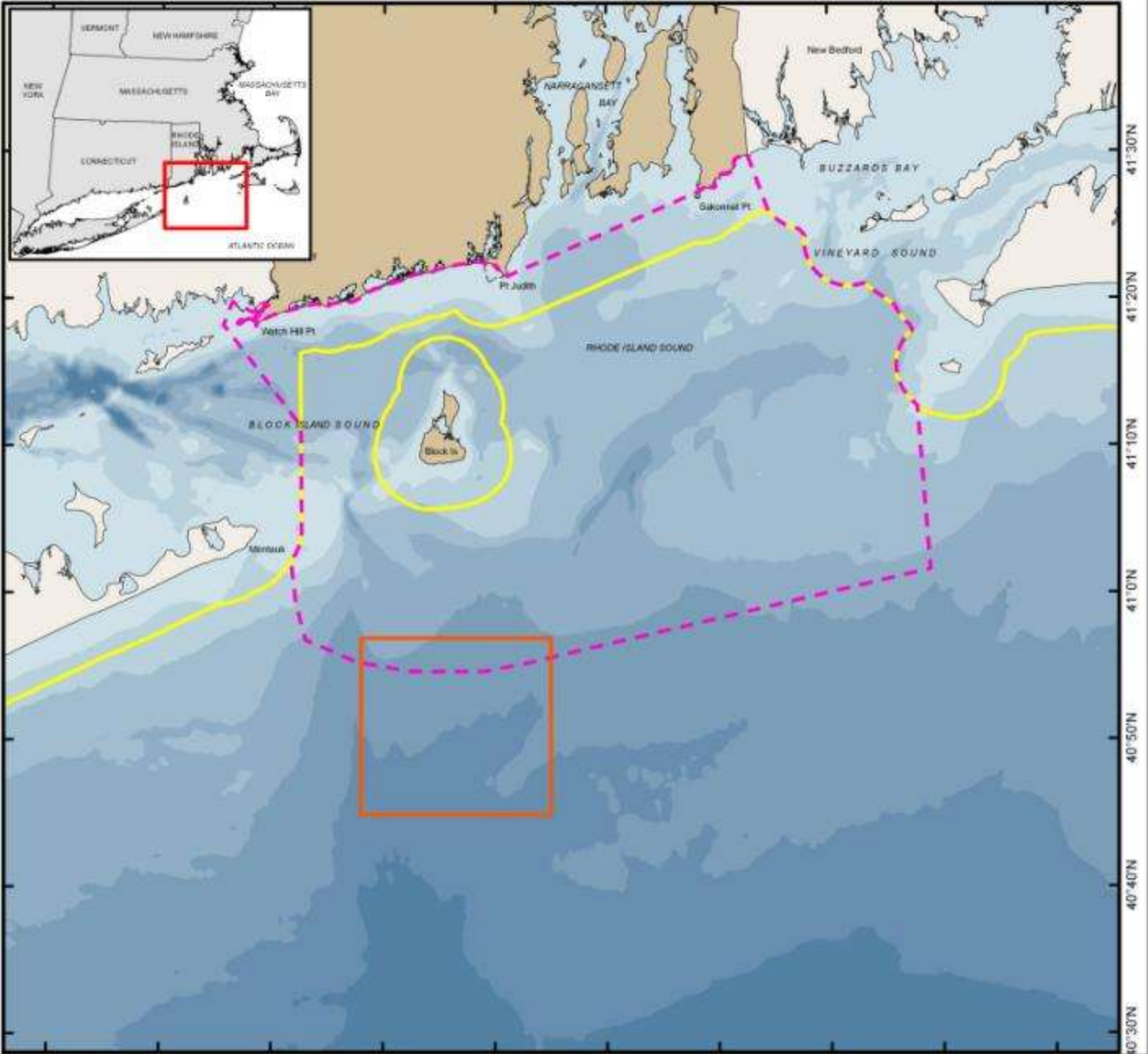


Rhode Island Ocean Special Area Management Plan (SAMP)

72°10'W 72°0'W 71°50'W 71°40'W 71°30'W 71°20'W 71°10'W 71°0'W 70°50'W 70°40'W

Map Key

-  Grays Harbor Proposed Site
-  OceanSAMP Study Area
-  State/Federal Waters Separation



Coordinate System:





Projection: RI Stateplane
Units: Feet
FIPS Zone: 3600
Datum: NAD83

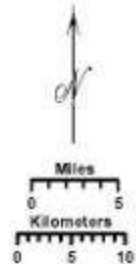
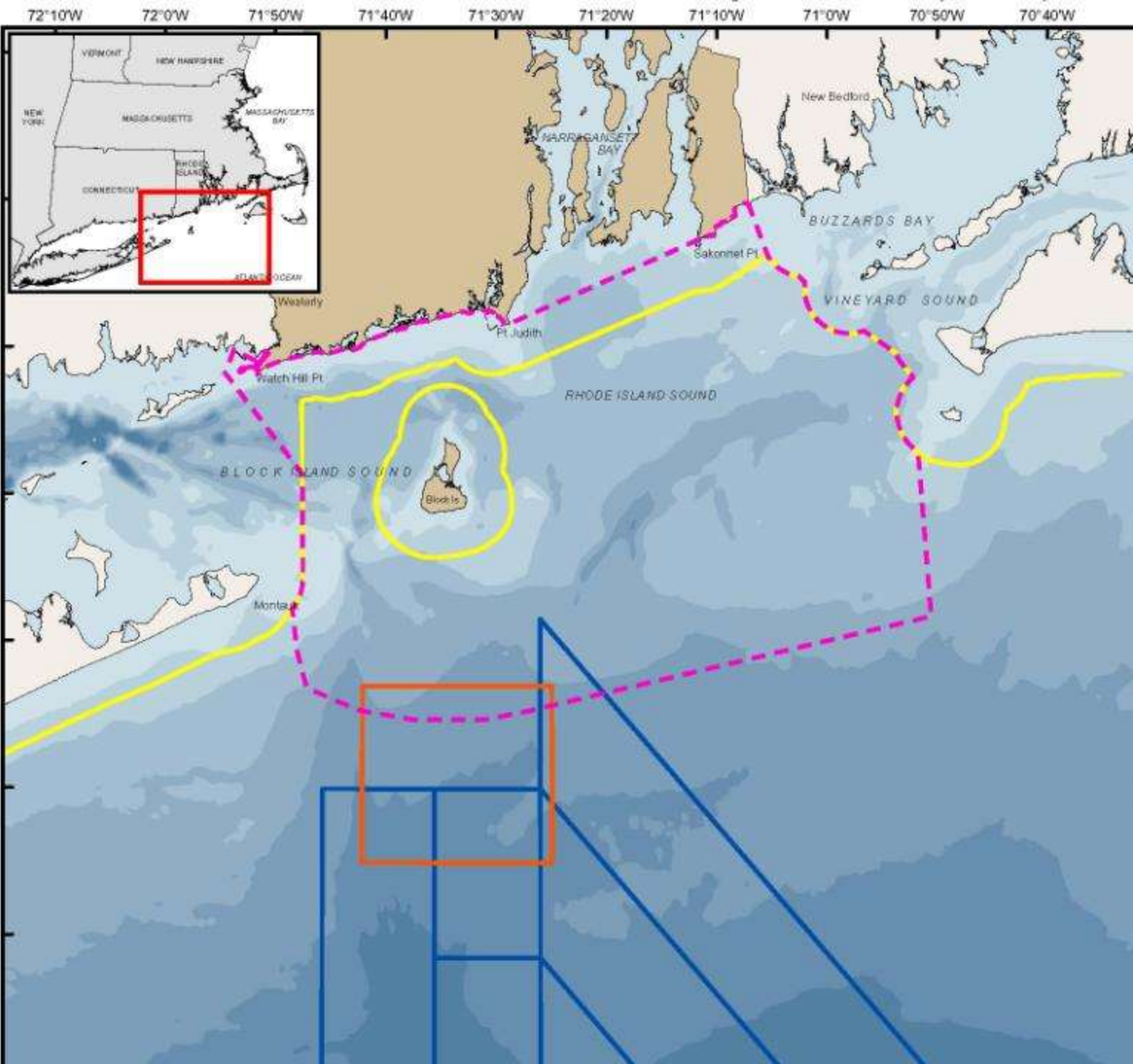
For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/ld_projects/oceansamp



Map Key

-  OceanSAMP Study Area
-  State/Federal Waters Separation
-  Grays Harbor Proposed Site
-  Navy Op Area Sub Lanes



Coordinate System:
Projection: RI Stateplane
Units: Feet
FIPS Zone: 3600
Datum: NAD83

For Project Background Information:
<http://seagrant.gso.uri.edu/oceansamp>

For Project Map and Data Products:
http://www.narrbay.org/d_projects/oceansamp