Rhode Island Ocean SAMP:
Fall 2008 Endeavor Cruise Results
and Proposed Future Work

John W. King
Graduate School of Oceanography
University of Rhode Island
## Project Team

<table>
<thead>
<tr>
<th>NAME</th>
<th>AFFILIATION</th>
<th>EXPERTISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>John W. King</td>
<td>Professor, URI Graduate School of Oceanography</td>
<td>Geology, Geophysics, Habitat Mapping</td>
</tr>
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<td>John Boothroyd</td>
<td>Professor, URI Department of Geosciences; Rhode Island State Geologist</td>
<td>Geology, Geophysics, Habitat Mapping</td>
</tr>
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<td>Rob Pockalny</td>
<td>Marine Research Scientist, Graduate School of Oceanography, URI</td>
<td>Geophysics, Geology, Mapping</td>
</tr>
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<td>Sheldon Pratt</td>
<td>Research Associate, Graduate School of Oceanography, URI</td>
<td>Benthic Biology, Habitat Mapping</td>
</tr>
<tr>
<td>Rod Mather</td>
<td>Professor, URI Department of History</td>
<td>Archeology, Maritime Archeology</td>
</tr>
<tr>
<td>Sam Debow</td>
<td>Manager, Operations, Graduate School of Oceanography, Special Research</td>
<td>Ship Operations, Batymetry and Side scan Sonar Mapping</td>
</tr>
</tbody>
</table>
Baymap Project Protocol
GROUNDTRUTHING: Benthic imaging equipment
GROUNDTRUTHING:  grab sampling
GROUNDTRUTHING: grab sampling
Creating a GIS Map Database

GIS DATA LAYERS
- Sedimentary Environments
- Sediment Texture
- Sidescan Imagery
- Geochemistry
- Ecologic Studies
- Total Organic Carbon
- Bathymetry
- Coastline
- State Bounds

Habitat Classification for Ninigret Pond
1997 Orthophotograph, RIGIS

<table>
<thead>
<tr>
<th>BOTTOM TYPE</th>
<th>ACOUSTIC</th>
<th>EELGRASS</th>
<th>HABITAT</th>
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</thead>
<tbody>
<tr>
<td>organic</td>
<td>a6</td>
<td>-</td>
<td>0.5-1.5m, organic substrate, boat scars</td>
</tr>
<tr>
<td>sand/organic</td>
<td>a6</td>
<td>yes</td>
<td>0.5-1.5m, some sand/organic substrate, eelgrass</td>
</tr>
<tr>
<td>sand</td>
<td>a6</td>
<td>yes</td>
<td>0-0.5m, sandy substrate, eelgrass</td>
</tr>
<tr>
<td>sand</td>
<td>a5</td>
<td>-</td>
<td>0-0.5m, sandy substrate</td>
</tr>
<tr>
<td>boulders</td>
<td>a4</td>
<td>-</td>
<td>0-0.5m, numerous boulders</td>
</tr>
<tr>
<td>organic</td>
<td>a6</td>
<td>yes</td>
<td>0.5-1.5m, organic substrate, eelgrass/dom</td>
</tr>
<tr>
<td>mixed-fine</td>
<td>a1</td>
<td>-</td>
<td>1.5-3.0m, mixed-fine substrate</td>
</tr>
</tbody>
</table>
DEVELOPING AN INVENTORY: Sediment types

Adapted from Oakley & Boothroyd, Benthic habitats of Greenwich Bay 2003

- Dredged
- Mud
- Silt
- Sand
- Vegetated flats
- Gravel
Subbottom profile showing geological features. Each dotted rectangle represents about 200 m horizontally, and 15 m vertically. 20x vertical exaggeration.
Topographic map for the time period 17,000 - 15,000 years BP. (After Uchupi, et al., 2001)
Bathymetric contour map. Areas between 18-26 meters depth are shown in shades of green, and represent retreating shorelines during the interval 10,000 - 8,000 years BP.
Possible paleo-geographic reconstruction off southern Block Island for the approximate period between 8,000 - 10,000 years BP, based on interpretation of subbottom profiles.
Mohegan Bluffs, Block Island complex
Key to Acoustic Units and Major Uneformities

Qb  Marine deposits
mu  Marine unconformity
Qfe Fluvial and estuarine deposits
fu1 Postglacial fluvial unconformity
Qdl Glaciolaeustrine deposits
Qdm Glacial moraine deposits
Qdo Glaciofluvial drift
fu2 Late Tertiary-early Pleistocene fluvial unconformity
Ku Coastal-plain strata
Pz  Bedrock

Horizontal scales are approximate.
Vertical scales are based on 1,500 m/s.
Reflectors are dashed where extrapolated.
Vertical exaggeration is abbreviated vert. exag.
Key to Acoustic Units and Major Unconformities

- **Qb**: Marine deposits
- **mu**: Marine unconformity
- **Qfe**: Fluvial and estuarine deposits
- **fu**: Postglacial fluvial unconformity
- **Qd1**: Glaciolacustrine deposits
- **Qdm**: Glacial moraine deposits
- **Qdo**: Glaciofluvial drift
- **fu**: Late Tertiary-early Pleistocene fluvial unconformity
- **Ku**: Coastal-plain strata
- **Pz**: Bedrock

Horizontal scales are approximate.
Vertical scales are based on 1,500 m/s.
Reflectors are dashed where extrapolated.
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SEISMIC PROFILE B
Key to Acoustic Units and Major Unconformities

- **Qb**: Marine deposits
- **mu**: Marine unconformity
- **Qfe**: Fluvial and estuarine deposits
- **fu₁**: Postglacial fluvial unconformity
- **Qdl**: Glaciolacustrine deposits
- **Qdm**: Glacial moraine deposits
- **Qdo**: Glaciofluvial drift
- **fu₂**: Late Tertiary-early Pleistocene fluvial unconformity
- **Ku**: Coastal-plain strata
- **Pz**: Bedrock

Horizontal scales are approximate.
Vertical scales are based on 1,500 m/s.
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Vertical exaggeration is abbreviated vert. exag.
End moraines of southeastern New England

Schafer and Hartshorn, 1965; Sirkin, 1982
## Estimated costs

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Science Staff of 10 on Endeavor</td>
<td>Total Personnel: $ 860 0 / day</td>
</tr>
<tr>
<td>2. Equipment and Insurance</td>
<td>$ 250 0 / day</td>
</tr>
<tr>
<td>3. Supplies</td>
<td>$ 500 / day</td>
</tr>
<tr>
<td>4. RV Endeavor</td>
<td>$ 23,000 / day</td>
</tr>
<tr>
<td>5. Endeavor can do 5 - 6 sq. miles / day</td>
<td>$ 576 0 - 692 0 / sq. mile</td>
</tr>
<tr>
<td>6. Post-cruise processing and ground-truth studies: Geology, Biology, and Archaeology</td>
<td>$ 300 0 / sq. mile</td>
</tr>
<tr>
<td></td>
<td>Total: $ 8767 - $ 992 0 / sq. mile</td>
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