Developing the Integrated Geospatial Framework to Support an Offshore Zoning Plan in Rhode Island's Coastal Waters

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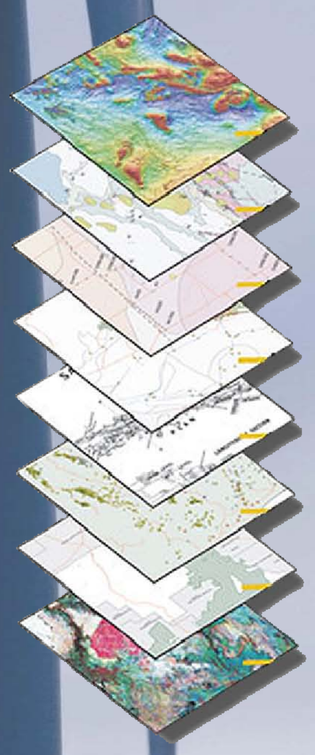
Abstract: The Rhode Island Ocean Special Area Management Plan Project (Ocean SAMP) is a two-year study to characterize and zone Rhode Island's offshore marine environment. The aim of this work is to integrate the best available science with active stakeholder participation to develop a management plan that balances development potential with existing uses and habitat protection. The University of Rhode Island's Environmental Data Center (EDC) is part of a consortium of researchers and planners assisting with this effort, and has been tasked with developing the data storage/retrieval system, assisting with spatial modeling and providing mapping/visualization support for the research teams and stakeholders. Much information will be collected and analyzed during the course of this work and it is imperative that these data of differing sources, scales and disciplines be logically organized and easily accessible by both researchers and the public. Technical challenges in creating an integrated geospatial database from all the baseline and preexisting studies include converting data to a common format and geographic specifications, compiling accurate metadata, and making data and derivate analytical products easily available to scientists and decision-makers. This poster provides an overview of the data handling procedures that have been implemented to streamline data consolidation and visualization procedures and protocols. Ultimately, all map and data products used to describe the OceanSAMP area will be web-accessible via the NARRBAY.org website.

Data Assimilation

The Ocean SAMP process will proceed simultaneously on several fronts, with the research teams undertaking studies on the multiple themes: wind, waves, and currents; marine transportation; wind farm technology; noise and electromagnetics; commercial and recreational fisheries; marine mammals and turtles; meteorology and air quality; subsurface geology and benthic habitats; cultural resources; and flying vertebrates.

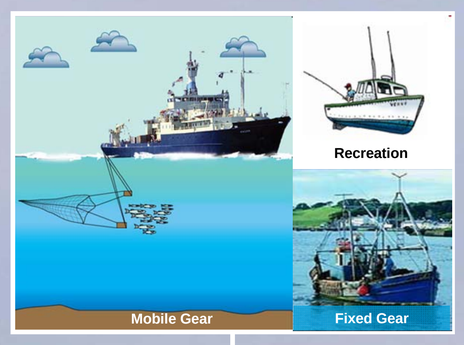
Work for this project will generate large amounts of geospatial data using multiple technologies and disparate software packages. To streamline the data consolidation process a list of preferred data formats and file structures was provided to all research teams. Explicit data protocols allows researchers to work with software they are most comfortable with while allowing findings to be quickly added to the OceanSAMP database.

Pre-Existing Data



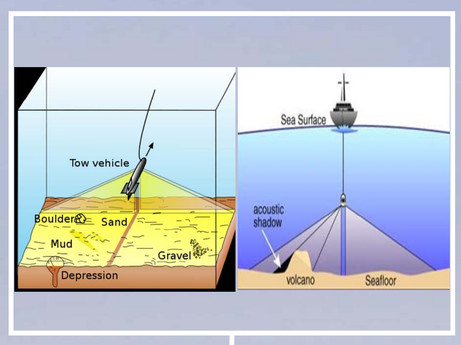
Stakeholder Meetings

Fishing Grounds, Cultural Resources, etc.



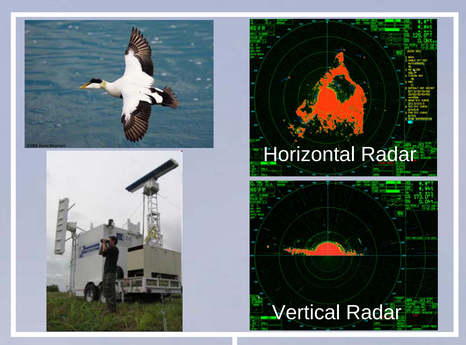
Shipboard Surveys

Geologic Profiles, Marine Archaeology Sites



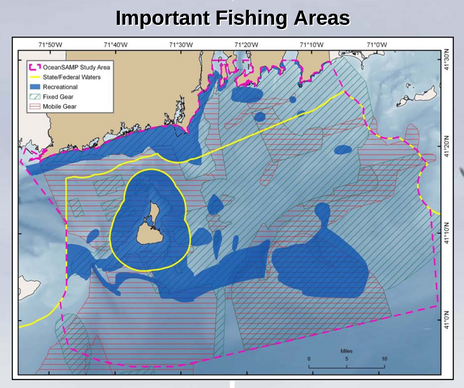
Remote Sensing

Avian RADAR, Current Flow, SST, etc.

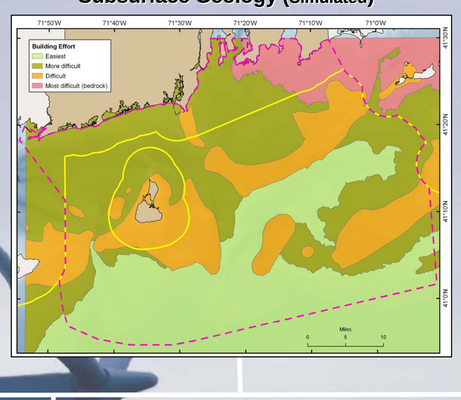


Common Coordinate System

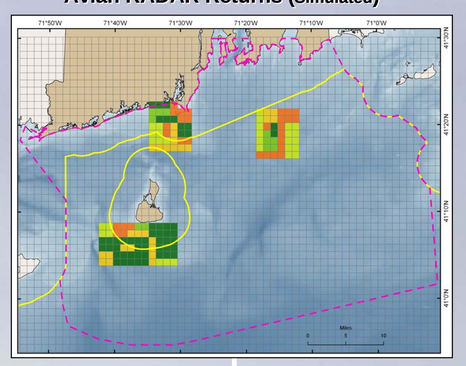
Important Fishing Areas



Subsurface Geology (Simulated)



Avian RADAR Returns (Simulated)



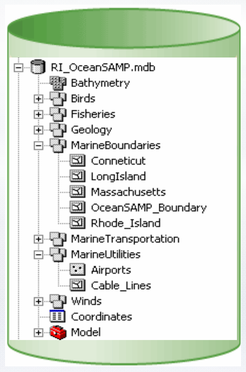
Storage and Retrieval

All data developed for the OceanSAMP project will reside in a single ArcGIS geodatabase. A geodatabase is the common data storage and management framework for the ArcGIS software platform that allows raster and vector geospatial data to be stored within a single, central data repository for analysis and management.

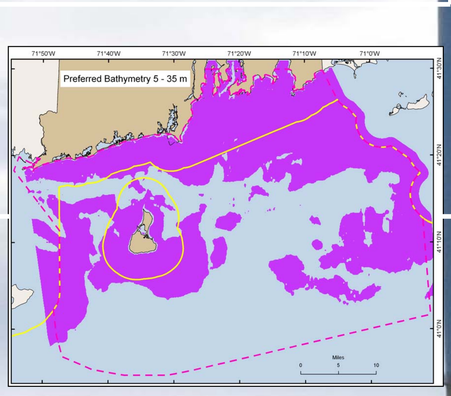
Prior to inclusion in the database, all information will be quality checked and each dataset will have a valid FGDC-compliant metadata record.

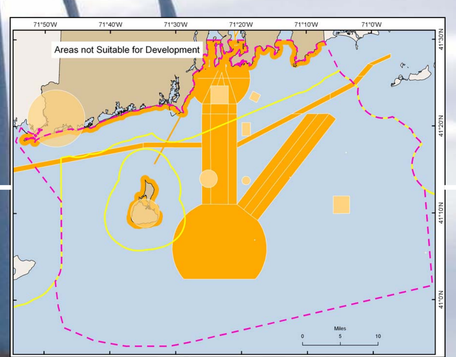
A final deliverable for the OceanSAMP project will be a single geodatabase with all of the source and derivative data used to describe the SAMP environment.

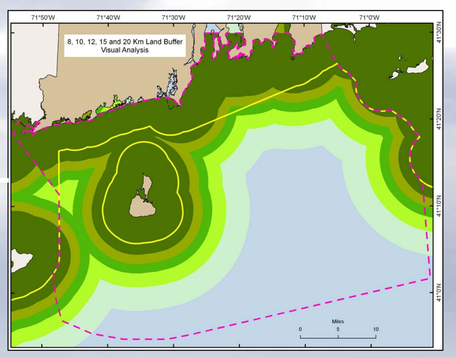
Centralized Storage



Geodatabase Storage Structure





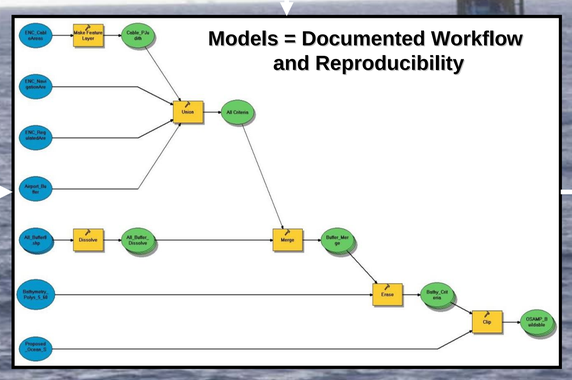


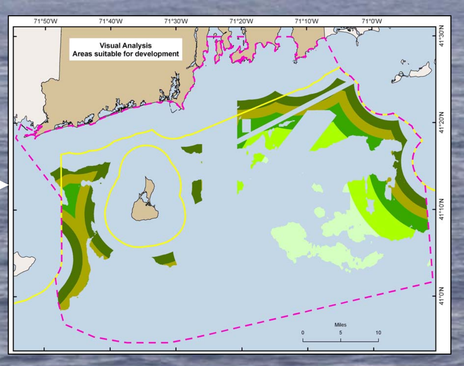
Analysis and Visualization

Centralized storage and a common spatial reference allows for easy data overlay and analysis. The modeling functionality of ArcGIS makes scenario testing possible, with all aspects of workflow captured for future reference – data inputs; processing steps; and outputs. Outputs feed back into the geodatabase and become available for mapping or additional processing.

Map and data support is provided to the research teams, stakeholder groups, and general public through the OceanSAMP portal on NARRBAY.org. Here, users have access to available GIS data files, printer-ready maps, and data documentation tools/standards.

Modeling and Analysis

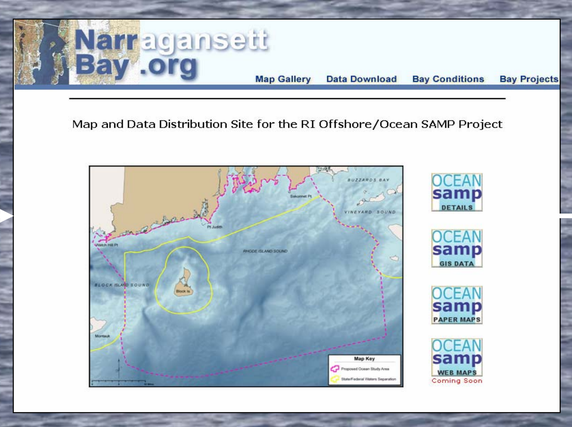


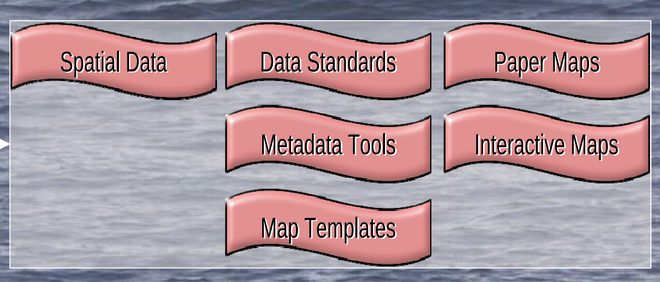


Next Steps

Thus far, the geospatial focus has been to develop the framework necessary to integrate data collection efforts with the marine spatial planning components. Next steps include an ecological analysis to map critical habitats, as well as distribution of birds, bats, marine mammals, sea turtles, and fisheries resources. Each species, habitat, or use will receive its own ecological service value (ESV). Individual ESVs will be combined into an overall Ecological Services Value Index (ESVI) for the SAMP study area. These index values will be the primary input for the offshore zoning plan and will be useful for evaluating impacts of future development proposals.

Web Distribution





For more information: Technical and background reports -- http://seagrant.gso.uri.edu/oceansamp Maps and Data -- http://www.narrbay.org