June 21, 2010

Mr. J. Michael Saul
Deputy Director
The Rhode Island Economic Development Corporation
315 Iron Horse Way
Providence, RI 02908

Dear Director Saul:

On behalf of the Rhode Island Coastal Resources Management Council's Ocean SAMP subcommittee, I respectfully submit the seventh period (January 1st to March 30th) narrative and financial Ocean SAMP progress report which was approved by the subcommittee on June 15, 2010.

The Ocean SAMP continues to make progress in the areas of research and public engagement. We continue to work effectively and efficiently with the assigned budget, and we have built a strong team to carry out SAMP activities.

Thank you for reviewing the attached progress report. My contact information is listed on the cover page of the document.

Sincerely,

Grover J Fugate

Grover Fugate
Executive Director, Rhode Island Coastal Resources Management Council
On behalf of the CRMC Ocean SAMP Subcommittee

RHODE ISLAND RENEWABLE ENERGY DEVELOPMENT FUND SPECIAL AREA MANAGEMENT PLAN

Seventh Period Narrative and Financial Report (January 1, 2010 to March 30, 2010)

Submitted to:

The Rhode Island Economic Development Corporation (RIEDC), 315 Iron Horse Way, Suite 01, Providence, RI 02908, Attn: J. Michael Saul

Narrative and Financial Report:

Seventh period January 1, 2010 to March 30, 2010. Narrative and Financial Report for the Rhode Island Renewable Energy Development Fund/Ocean Special Area Management Plan

Submitted by:

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Senior Advisors:

Dennis Nixon, URI Graduate School of Oceanography (GSO)
Malcolm Spaulding, URI Department of Ocean Engineering

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Ocean SAMP Seventh Period Narrative & Financial Report (Jan. 1 to Mar. 30, 2010)

The Rhode Island Coastal Resources Management Council's Ocean Special Area Management Plan (Ocean SAMP) continued to make significant progress during this time period. The following is a summary of progress during this time period, based on the Goals specified in the work plan:

Goal 1: Assemble background information on the project boundary's natural features, human activities and policy and procedures to assist in the understanding of this Ocean SAMP region.

During this time period, the Ocean SAMP research team carried out approved activities to achieve the below assigned tasks. For descriptions of the individual research activities, please see the attached document (Kingsley report/Attachment 1).

Assess the spatial distribution, abundance, and movement ecology of water and land birds for the Ocean SAMP study area. The purpose of the task is to assess the spatial distribution and abundance of birds in the offshore waters. The task is 80 percent complete. The project team has conducted boat and aerial surveys to systematically survey the entire Ocean SAMP study area. The surveys were designed to quantify the distribution of foraging waterbirds and their local and regional movement patterns throughout the year to assess changes in the spatial distribution of resident and migratory species. The results of the surveys will appear in a technical report, with the interim report scheduled for June 1, 2010 and the final report scheduled for January 31, 2011. Specifically, key progress has been achieved in: 1) Quantifying spatial distribution and abundance of water birds using offshore habitats within Ocean SAMP study boundaries; 2) Assessing the migration phenology of water birds throughout the year using offshore habitats; 3) Determining movement ecology of water birds (flight elevation of birds above water surface, movement dynamics of birds in offshore habitats); and 4) Monitoring Roseate Tern use of nearshore habitats. This species is of interest because it is federally listed as endangered, thus a focal species for the US Fish and Wildlife Service. The results will be reflected in a suite of deliverables which includes: 1) GIS maps maps showing distribution and abundance of water birds and Roseate Terns in study area; 2) Quantitative assessment of movement ecology of water birds and Roseate Terns in study area; 3) An Interim report due June 1, 2010; and 4) a Final report summarizing the study due January 31, 2011.

Develop a better understanding of the fishery ecosystem dynamics of the Ocean SAMP study area. The purpose of the task is to develop a better understanding of the fishery ecosystem dynamics of Rhode Island's transitional sea (Block Island and Rhode Island Sounds). The task is 50 percent complete. The project team is classifying and mapping fisheries habitats, based on benthic characteristics and site-specific fisheries data, and is assessing the functional importance of fish habitat in providing shelter and food for dermersal fish species. The results of the classification and mapping activities will appear in a technical report, with the interim

report scheduled for June 1, 2010 and the final report scheduled for January 31, 2011. Specifically, key progress has been achieved in: 1) Compiling existing maps of bottom sediment composition; 2) Surveying additional representative areas within the SAMP region using sidescan sonar and bathymetry; 3) Groundtruthing the benthic habitat of these areas with underwater video, still images, and other means of evidence; 4) Selecting 30 sampling stations from these areas to provide informative spatial contrasts in benthic habitats; 5) Comparing areas of different spatial uses, including traditional grounds for mobile and fixed fishing gear, and sites proposed for dredge disposal and wind turbine development; 6) Analyzing bottom photos; 6) Conducting spatial contrasts between sampling locations; 7) Evaluating associations between the fish species composition and habitat type; and 8) Determining the diet composition of the principal fish species collected from trawl surveys (e.g., flounder, scup, butterfish, skates, dogfish, tautog, black sea bass, sculpin) through visual analysis of stomach contents. The results will be reflected in a suite of deliverables which includes: 1) Maps of critical fisheries habitat; 2) Distribution maps of critical fish species; 3) Simple model of fish species composition related to habitat type; 4) Fall data set on fish distribution in SAMP waters; 5) An Interim report due June 1, 2010; and 6) a Final report summarizing the study due January 31, 2011.

Inventory all recreational uses in the Ocean SAMP study area to assess the interrelationships and impacts between recreational uses and other existing activities and also potential impacts from the development of an offshore wind farm. The purpose of the task is to analyze all recreational uses in the Ocean SAMP study area to better understand how people are recreating within the Ocean SAMP boundary and to determine potential impacts with offshore renewable energy. The task is 50 percent complete. The inventory and the results of the impacts analysis are part of a draft Recreational Uses SAMP chapter scheduled for adoption in August 2010. Specifically, key progress has been achieved in: 1) Conducting a literature review of all relevant local, state and federal recreational plans/documents pertaining to the Ocean SAMP study area; 2) Meeting with recreational users and managers to review data and identify potential impacts from offshore renewable energy; 3) Analyzing recreational uses data with other Ocean SAMP data to assess the potential impacts of offshore renewable energy development on these users; and 4) Identifying actions and/or policies that can be put in place to better manage recreational activities within the SAMP study area as well as reduce the impact of offshore renewable energy and recreational activities. The results will be reflected in a suite of deliverables which includes: 1) Draft report for review by experts and the public by June 1, 2010; 2) A Final report summarizing the study due August 31, 2010; and 3) GIS maps showing the recreational activities within the SAMP boundary.

Develop and apply the Ocean SAMP ecological service value index to implement tradeoff analysis for various management options for the Ocean SAMP region. The purpose of the task is to develop a tool to implement tradeoff analysis for various management options for the Ocean SAMP region. The task is 35 percent complete and addresses Objective 1 and Outcome 2. The project team is applying a model that considers ocean measuring ecological service values of coastal waters for various natural resource uses, as well as an overall Ecological

Services Value Index (ESVI), that will be applied to areas being considered in the Ocean SAMP. An Interim report is due on June 1, 2010 and a Final report is due on September 1, 2010. Specifically, key progress has been achieved in: 1) Developing comprehensive maps of seasonal relative density, or use, for each ecological service; 2) Modeling relative ecological service values (ESV) for individual natural resource uses; and 3) Combining individual indices for each ecological service using relative weighing schemes, to develop an overall index (the ESVI). The results will be reflected in a suite of deliverables which includes: 1) An Interim report due on June 1, 2010; 2) a Final report due on September 1, 2010; 3) GIS maps of Relative Ecological Service Values (ESV) for each natural resource and usage; and 4) a Combined index of total ecological service values, the Ecological Services Value Index (ESVI).

Preparation and submission of research memoranda and information to inform preparation of O-SAMP Chapter 1000, "Legal Authorities." The assignments and tasks were developed jointly between CRMC Legal Counsel, Brian Goldman, and the Marine Affairs Institute staff and were conducted between July, 2009 and January, 2010. Research was undertaken reviewing federal and state statutes, case law, regulations and policy regarding marine jurisdictional issues and planning at several levels of government. This research was then analyzed and condensed into several draft documents. After the initial submission to Brain Goldman in November, 2009, several additional issues were identified both internally and through the public comment process and additional research was undertaken and developed for the Chapter. A final submission was delivered in November, 2009, with supplemental information requested and provided on Memoranda of Understanding and fisheries in December, 2009 and January, 2010.

Goal 2: Identify best practices and strategies for overcoming obstacles in planning, policy, and implementation of marine renewable energy that can be transferred to the Ocean SAMP initiative based on a comparative assessment of lessons learned from other initiatives in the United States and worldwide. Evaluate what works and what does not work in the Ocean SAMP initiative so that this model effort can be used as a case study for future efforts.

During this time period, the Ocean SAMP outreach team carried out approved activities to achieve the below assigned task. For individual documents related to technical expertise provided in April 2009 by Drs. Andrew Gill and Frank Thomsen,

Review and summarize the current global state of knowledge about the effects of offshore wind farms on fish and fisheries of different gear types and marine mammals. The purpose of the task is to incorporate what Europe has learned concerning the effects of offshore wind farms on fish and fisheries and marine mammals for different gear types. The task is 50 percent complete. University of Rhode Island staff, in coordination with the European Centre for Environment, Fisheries & Aquaculture (CEFA), are reviewing and summarizing the current state of knowledge about the effects of offshore wind farms on fish and fisheries of different gear types. The results of the task will be an ecosystem monitoring protocol to be used during all phases of potential wind turbine activity (construction, operation and maintenance, decommissioning) in the SAMP area. The protocol is scheduled for completion as part of a technical report in August 2010. Specifically, key progress has been achieved in: 1)

Summarizing the potential impacts on fish and fisheries (differentiated by gear type), and marine mammals of: turbine construction and associated underwater noise emissions; cable laying; scour protection; various turbine foundations; the location and configuration of turbines and cables; and wind farm operation; 2) Describing, based on European experience, strategies and methods for mitigating the potential impacts of offshore wind farm construction and operation on fish and fisheries and marine mammals; 3) Collecting European protocols for fisheries and marine mammal monitoring at offshore wind farms as well as the outcomes, to date, of such monitoring programs; 4) Providing insight into fishermen's concerns with regard to offshore wind farms as well as the potential impacts of offshore wind farms on fishermen's livelihoods (differentiated by gear type); and 5) Advising the SAMP management team on development of the SAMP chapters as well as work with stakeholders. The results will be reflected in a suite of deliverables which includes: 1) Final technical report due August 31, 2010; and 2) an Annotated bibliography of select literature of relevance to the SAMP.

Goal 3. Engage a well informed and well represented constituency that understands the Ocean SAMP issues and is involved in the creation of the Ocean SAMP.

During this time period, the Ocean SAMP outreach team carried out the following approved activities:

Engaging stakeholders in the chapter development and review processes: During the reporting period, we met with numerous stakeholders and interest groups to identify and groundtruth the purposes and goals of the SAMP chapters, and to then collect stakeholders' experiential and technical information for several draft chapters (Ecology/Global Climate Change/Fisheries Resources and Uses/Existing Policies). We also conducted three formal monthly stakeholder meetings during the reporting period. These meetings and presentations were as follows: January/Physical Oceanography (Dan Codiga), Historical and Archaeological Resources (Rod Mather) ; February/Existing Statutes (Brian Goldman), Air Quality (John Merrill); and March/Renewable Energy Infrastructure (Michelle Armsby), Ecology (Alan Desbonnet). We ensured that for each stakeholder meeting, stakeholders and the public had access to the draft chapters and were provided opportunities for submitting written comments about the draft material. We have created and posted a Public Review Process for the Ocean SAMP Rulemaking which illustrates when each chapter proceeds through the nine-step CRMC rulemaking and approval process (See the timeline at http://seagrant.gso.uri.edu/oceansamp/pdf/samp/samp_develop_timeline.pdf)

Developing opportunities for the public to learn about the research results. The purpose of the task is to ensure that research results are communicated and understood by the public, including the Ocean SAMP stakeholders. The task is 75 percent complete. An extensive series of monthly stakeholder meetings and twice-yearly lecture series have been provided to the public for more than one year and will continue to be provided through August 2010, and likely beyond. Specifically, key progress has been achieved in: 1) Providing innovative and practical opportunities for communicating the SAMP research to the public, including major

stakeholders, in the form of monthly stakeholder meetings, a twice-yearly lecture series, a traveling display, and speaking engagements for members of the research and outreach teams; and 2) Furnishing them with appropriate education tools, including a suite of deliverables which includes: 1) An extensive Ocean SAMP web site geared to public understanding; 2) the Ocean SAMP community lecture series showcases the research activities and allows the public to better understand ongoing research; 3) a series of Ocean SAMP hard copy documents, including fact sheets, displays, and summary documents present the research; and 4) Researcher presentations for public consumption; 5) an Interim report due on June 1, 2010 and 6) a Final report due January 31, 2011.

Providing SAMP education and learning opportunities to the legal community: We worked with our Sea Grant Legal Program at the Roger Williams School of Law to ensure that students and staff could learn about the SAMP process through law school publications and informal presentations, and incorporation into a summer, 2010 course on ocean management and policy to be taught at the RWU School of Law.

Goal 4: Develop a SAMP for Rhode Island's Coastal waters that serves as a tool to encourage regulatory and management coordination and consistency among Rhode Island state agencies (CRMC, OER, DEM), federal agencies (U.S. Department of Energy, ACOE, MMS, and the U.S. Federal Energy Regulatory Commission), neighboring states (MA, CT, NY) and other public entities, developers, and environmentalists within this project area.

Integrate research results into SAMP policy and management decisions. The purpose of the task is to integrate new research results into Ocean SAMP policies and procedures, including the siting of offshore renewable energy. The task is 50 percent complete and addresses Objective 2 and Expected Outcome 1. Research results are in the process of being incorporated into draft SAMP chapters, with the entire document scheduled for adoption in August 2010. Specifically, key progress has been achieved in: 1) Engaging researchers and resource users in collaborative dialogues (working sessions) to discuss research results and how they should influence policy and future management decisions, especially concerning the siting of offshore renewable energy; and 2) Developing and/or revising Ocean SAMP policies and/or regulatory standards based on research findings and recommendations. The results will be reflected in a suite of deliverables which includes:1) A series of working sessions with researchers, resource users, and policy makers; 2) Final policies and/or regulatory standards based on research findings and recommendations; 3) an Interim report due on June 1, 2010; 4) a Final report due on January 31, 2011.

Building communication with State, Federal and Tribal Ocean SAMP partners: We continued during the reporting period to work closely with state and federal agencies, through periodic meetings with the Ocean SAMP State Advisory Task Force and the Ocean SAMP Federal Advisory Task Force, to ensure SAMP development answers the needs of both state and federal governments. We also continued to work towards developing a working relationship with the Narragansett Indian Tribe (NIT) and engaged the NIT in identifying appropriate NIT representatives to attend SAMP meetings participate in the development and review of the

Cultural, Archeological and Visual Resources Chapter. As part of these successful discussions, we were able to gain NIT engagement in crafting a portion of the chapter to reflect the NIT SAMP area historical perspective – a collaborative activity that has never taken place before in a state coastal management document.

Assembling preliminary research regarding the determination of the Rhode Island and Massachusetts offshore coastal adjacent boundary. This research is examining procedural and substantive issues under international, national and interstate laws, treaties, principles and compacts regarding the delimitation of boundaries of adjacent coastal sovereigns. The research was requested by CRMC Counsel Brian Goldman, in consultation with the Rhode Island Attorney General's office and Marine Affairs Institute staff, begun in February, 2010 and anticipated to be completed by May, 2010.

OCEAN SAMP PROJECT FINANCIAL/PROGRESS REPORT-RHODE ISLAND ECONOMIC DEVELOPMENT CORPORATION

	March 31, 2010	SCHEDULE			FUNDING INVOICING REQUESTS				PROGRESS			BUDGET			
Activity #	OCEAN SAMP PROJECT ACTIVITY/STUDY	Budget	*Funding Source	Expected End Date	Prior SAMP Invoices to EDC/DOE	Current Invoice to EDC/*DOE	**Outstanding Encumbrances	Total Invoices	Prior Progress	Current Progress	Total Progress	Budget Completion	Projected Completion	Budget/Project Variance	Comments
	RIEDC-Ocean SAMP FUNDING														
1-S052	Policy & Outreach-McCann	$ 1,436,816	YI, YII, 2.8M	7/31/10	$ 951,384.62	$ 96,065.12	$ 48,270	$ 1,047,449.74	74%	3%	77%	73%	77%	4%	
2-S053	Project Management & Coordination-DeBow	$ 132,043	YI, YII, 2.8M	7/31/10	$ 66,296.57	$ 5,134.45	$ 1,148.76	$ 71,431.02	70%	4%	74%	54%	74%	20%	
3-S054	Technological Assessment-Hu	$ 67,307	YI, YII	2/1/10	$ 67,182.13	$ -	$ -	$ 67,182.13	97%	0%	97%	100%	97%	-3%	
4-S055	Temperature & Salinity Review/Moored Vessel Survey-Codiga	$ 327,300	YI, YII, 2.8M	7/31/10	$ 260,903.02	$ 1,166.12	$ 7,211.16	$ 262,069.14	75%	0%	75%	80%	75%	-5%	*Bouy purchased and deployed.*
5-S056	Site Screening Mapping Study/GIS Training & Support-Damon	$ 293,589	YI, YII, 2.8M	7/31/10	$ 170,884.55	$ 15,167.16	$ 2,315.67	$ 186,051.71	78%	7%	85%	63%	85%	22%	
6-S057	Marine Mammal Analysis-Kenney	$ 21,317	YI	10/31/09	$ 19,867.76	$ -	$ -	$ 19,867.76	96%	0%	96%	93%	96%	3%	
7-S058	Geophysical, Geological, Biological & Transporation Analysis-King	$ 915,830	YI, YII, 2.8M	7/31/10	$ 735,129.97	$ 62,401.38	$ 16,799.67	$ 797,531.35	72%	3%	75%	87%	75%	-12%	*Equipment purchase.*
8-S059	Wind, Storm Occurrence & Precipitation Analysis-Merrill	$ 6,769	YI	12/31/09	$ 5,815.37	$ -	$ -	$ 5,815.37	88%	0%	88%	86%	88%	2%	
9-S060	Acoustic Noise & Electromagnetic Effects-Miller	$ 231,250	YI, YII, 2.8M	7/31/10	$ 142,351.37	$ 3,794.80	$ 13,473.25	$ 146,146.17	60%	0%	60%	63%	60%	-3%	
10-S061	Avian Study-Paton	$ 1,049,748	YI, YII, 2.8M	7/31/10	$ 509,609.34	$ 87,939.97	$ 225,915.20	$ 597,549.31	79%	6%	85%	57%	85%	28%	
11-S062	Wind, Wave and Storm Surge Analysis-Spaulding	$ 831,397	YI, YII, 2.8M	7/31/10	$ 369,182.16	$ 14,485.54	$ 273,140.45	$ 383,667.70	62%	8%	70%	46%	70%	24%	
12-S063	Ecosystems-Nixon	$ 341,632	YI, YII, 2.8M	7/31/10	$ 178,897.82	$ 31,501.02	$ 11,924.16	$ 210,398.84	79%	11%	90%	62%	90%	28%	
13-S092	Meteorological, Hydrodynamic, & Wave Modeling-Grilli, S.	$ 345,000	2.8M	7/31/10	$ 156,638.61	$ 2,530.37	$ 65,436.37	$ 159,168.98	35%	25%	60%	46%	60%	14%	
	*DOE-APPROPRIATION FUNDING														
14-S083	Fisheries/Mammal/Marine Recreation Impact Studies	$ 248,558	DOE	1/31/11	$ 323.22	$ 894.57	$ 45,530.00	$ 1,217.79	49%	1%	50%	0%	50%	50%	
15-S084	Mapping & Characterizing Fish Habitat	$ 120,000	DOE	1/31/11	$ 54,659.72	$ 16,423.88	$ 1,643.76	$ 71,083.60	51%	10%	61%	59%	61%	2%	
16-S085	Spatial Distribution, Abundance & Movement Ecology of Birds	$ 100,000	DOE	1/31/11	$ 54,684.59	$ -	$ -	$ 54,684.59	79%	6%	85%	55%	85%	30%	
17-S086	Ecological Services Index (ESI) Mapping-Grilll, A.	$ 165,522	DOE	1/31/11	$ 9,147.31	$ 3,907.97	$ 143,747.25	$ 13,055.28	35%	10%	45%	8%	45%	37%	
	TOTAL PROJECT FUNDING	$ 6,634,078			$ 3,752,958	$ 341,412	$ 856,555	$ 4,094,370							

FUNDING SOURCE	Amount
Year I-Ocean SAMP Funding:	$ 1,599,999
Year II- Ocean SAMP Funding	$ 1,600,001
2.8M-Additional Studies Funding	$ 2,800,000
DOE - Reed Appropriation for SAMP	$ 634,080
TOTAL	$ 6,634,080

Previously Billed	RIEDC 31-Mar	*Encumbrances*	INVOICES *Total to Date*	EDC *Payments*		EDC *Balance*
$ 3,634,143	$ 320,186	$ 665,634	$ - $ 3,954,329 $ -	$ 3,634,143.29		$ 320,185.93
$ 3,634,143	$ 320,186	$ 665,634	$ 3,954,329	$ 3,634,143.29		$ 320,185.93

*DOE-APPROPRIATION FUNDING:
2/19/2010-DOE Award has been released to CRMC. DOE Accts: 14-S083-86
Outstanding ENCUMBRANCES:
Are identified project expenses with specific purposes (i.e. Subcontracts) & have not been invoiced for payment by vendor and therefore amounts are not reflected in account expenditures.

Previously Exp.	**DOE 31-Mar		Total to Date		
$ 118,815	$ 21,226	$ 190,921	$ 140,041		
$ 3,752,958	$ 341,412	$ 856,555	$ 4,094,370	$ 4,950,926	TOTAL PROJECT ACTIVITY

ATTACHMENT 1: Narrative Report 1/1/2010 to 3/30/2010

Milestone 2

Note: Additional resources have been received to expand the scope of some research efforts.
Status of Individual Research Efforts is based on revised estimates for completion:

1: Engineering Studies in support of the Ocean SAMP

Principal Investigator: Malcolm L. Spaulding, URI Graduate School of Oceanography, Ocean Engineering

Revised Overall completion estimate: 70%

A. ***Wave, and storm surge characterization for RI coastal waters -***

1. Wind Analysis - DWW meteorological data from Block Island site obtained and compared and contrasted with observations at buoy stations (MDS and MDF). WinSim model now operational for area immediately adjacent to Block Island. Testing in progress for high resolution simulations, studying both topographic and wake effects. Wind simulations for eight points of the compass received from WeatherFlow (via Grilli et al project). Data downloaded and analysis performed to determine wind speed and power at stations from E -S- W of Block Island. Estimates of mean annual wind speed and power currently in progress. AWS TrueWinds white paper received, review in progress.
2. Wave and Surge Analysis - External review still in progress
3. Sight Analysis - TDI and PCCA paper published in January/February 2010 issue of Marine Technology Society Journal, Special Issue on Marine Technology for Offshore Wind Power. Summary of high resolution analysis prepared for SAMP renewable energy chapter.

B. Buoy Measurement Program

1. Buoys sensors continue in operation with data being served to SAMP investigators via Univ Maine and NERACOOS web sites. Meteorological data from two buoys and DWW meteorological tower on Block Island have been compared.

C. High Resolution Screening for Block Island Waters

1. High resolution TDI analysis is in progress for area south of Block Island. The analysis uses a revised construction effort map based on an interpretation of seabed geology from side scan and subbottom data. Sensitivity study to assumed wind data input planned. Preparation of brief letter report in progress.

2: RI Wind Farm Structures/Foundations Study – Support Structures and Foundations for Offshore Wind Turbines

Principal Investigator(s) & Staff: Sau-Lon James Hu

Overall completion estimate: 95%

1. Completed analysis of lattice (jacket) structures
2. Completed analysis on parameters: water depth, depth to bedrock
3. Completed technology type factor based on weight of structure
4. Final report will be completed in January, 2010

3: RI Wind Farm Siting Study- Acoustic Noise and Electromagnetic Effects

Principal Investigator: James H. Miller, URI Graduate School of Oceanography , Ocean Engineering

Overall completion estimate: 55%

1. Data analysis of acoustic data in progress. Underwater noise analysis complete. Air acoustic data collection complete and analysis in progress
2. Noise prediction model completed and undergoing testing
3. EM data collection plan begun and sensors being tested.
4. EM effects on fish and other animals researched, in discussions with Andrew Gill on criteria
5. Passive Acoustic Listener (PAL) data analysis complete
6. In air measurements complete at Jamestown underwater cable landing, in water measurements to be completed.

5: *Added* Engineering Studies in support of the Ocean SAMP

Principal Investigator: Stephan Grilli, URI Graduate School of Oceanography, Ocean Engineering

Overall completion estimate: 60%

A. Wind modeling and mapping S-SW and SE of Block Island

1. Following an analysis of WRF 2D (and limited 3D) wind modeling results, obtained to estimate BI lee effects, it was decided to reorient the remaining of the work in this task, towards more comprehensive 3D simulations, using a less computationally intensive wind wave model: RAM (Regional atmospheric model). This would allow performing a larger number of realistic simulations useful to the wind farm siting. To date, RAM has been used to simulate a series of past wind episodes over BI, lasting 30 hrs or so, with the wind mainly blowing from one of 8 major directions in the wind rose, and considering different situations of wind speed and atmospheric stability (i.e., ocean-atmosphere temperature difference). These results are currently being analyzed and summarized in terms of average wind speed and power available at various sites over each selected wind episode.

B. Regional wave and current modeling and mapping

1. The ROMS/SWAN model suite implemented for the SAMP regional area, is now operational in full parallel mode, which allows for larger size, faster , and longer lasting simulations. Relevant boundary conditions have been obtained from regional climatology for current and tidally forced surface elevation and we are in the process of establishing boundary conditions for wind waves based on regional and ocean basin scale modeling results (e.g., NOAA WAVEWATCH III).

C. Map bathymetry and surficial sediments

1. Bathymetric base maps were identified and implemented for setting-up the two hydrodynamic models (ROMS and SWAN) in the SAMP area. Data was identified, acquired and mapped for surficial sediment types and median grain equivalent diameter.

D. Apply WRF, ROMS and SWAN models

1. The WRF model was set-up and run by ASA for numerous 2D and some 3D cases around BI. WRF is being run URI's PE 72-node cluster Spock. These simulations led to further discussions between URI and ASA, and it was decided to continue running the 3D simulations with a different, less time consuming model (RAM). These simulations are in process. The ROMS/SWAN model suite was run for tidal forcing during 30 day episodes using ROMS alone. Typical wind wave cases were run with SWAN alone. Combined ROMS.SWAN cases in coupled mode are in progress.

E. Investigate vertical 2D structure of wind over BI

1. WRF was used to simulate wind in numerous 2D vertical sections across BI, in the 8 main directions of the wind rose. Various ocean/atmosphere temperature conditions are selected (neutral, stable, unstable) in order to simulate typical seasonal conditions. These results still need to be synthesized.

6: *New Effort:* Ecological Service Value Index ESVI for RI Ocean SAMP

Principal Investigator: Annette Grilli, URI Graduate School of Oceanography, Ocean Engineering

Overall completion estimate: 45%

A. Develop comprehensive maps of seasonal relative density, or use, for each ecological service.

1. Mapping of ecological services: mammals, fishes, fisheries.

B. Model relative ecological service values (ESV) for individual natural resource uses

1. Model development in progress.

C. Combine individual indices for each ecological service using relative weighing schemes, to develop an overall index (the ESVI)

1. Exhaustive bibliography and theoretical aspect have been discussed and an original methodology is defined..

D. Habitat mapping

1. Benthic habitat; mammals distribution; fish distribution development of spatial interpolation schemes

E. Apply wildlife movement (migration and behavior) model, WildMap

1. Preliminary Wildmap simulations under development

F. Develop human use maps of relative value

1. Fisheries use : map and index; ecological values map: methodology and model development underway

7: Characterizing Physical Oceanography of the Rhode Island Coastal Ocean

Principal Investigator: Dan Codiga, URI Graduate School of Oceanography

***Revised* Overall completion estimate: 75%**

1. Full draft "part 1" report complete; provided to writers of the Ecology SAMP chapter; and out for external review. Revision remains.
2. GIS maps will be created from figures in the "part 1" report, for which a full draft is complete and has been distributed for external review.
3. Equipment setup and three (of four) surveys are complete. Final survey, and analysis/interpretation for "part 2" report, remain.
4. Calculations with CODAR / model output are 100% / 80% complete
5. First Mooring deployment complete; recovery attempted Dec 15 but weathered off; rescheduled for Jan 14.
6. Second Mooring Deployment scheduled for March 2010, recovery for June 2010.
7. Equipment preparation and three surveys (of four) complete.

8: Geospatial Data/Mapping Support for the RI Ocean SAMP

Principal Investigator: Christopher Damon, URI Natural Resource Science

Overall completion estimate: 85%

Consolidate geospatial data and metadata to support the analytical, visualization, outreach, and communication needs of the wind farm assessment process.

1. Much data has been assembled and mapped in support of the OceanSAMP chapter releases. A significant amount of data is still needed from the individual researchers for addition to the centralized SAMP database.

Assist in the development and implementation of a Phase 2 site screening process for RI coastal waters

1. Criteria for a Phase 2/Environmental Valuation Index study are still being established, along with protocols for habitat weighting. ASA is addressing the valuation modeling, while the EDC is acting as the liaison between ASA and the SAMP database.

Develop a common graphic template for mapping products emerging from the site screening process and assist in the production of cartographic products to support project analysis and communication requirements

1. Basic templates complete for both 8.5 X 11 and 11x17 maps. May be revised as project proceeds. Templates are redesigned as needed, such as with the high-resolution TDI evaluation that focused specifically on the area south of Block Island.

Collect and assemble relevant and available geospatial data (raster, vector, image, photographic, tabular) to support the site screening process for wind farm assessment.

1. Make data handling recommendations to researchers as they process information from their studies. Examples of this work include: coordinating with the avian group to develop an analysis/visualization strategy for airborne survey track data; and database export/import for the high-resolution TDI analysis

Work with scientists developing screening criteria

1. This work is ongoing as project proceeds. The EDC has worked closely with PIs to generate useful interpretations of fisheries VTR and VMS data; to develop a benthic surface roughness dataset; and to test the validity of predictive modeling of surficial sediments.

Prepare cartographic products in hard-copy and digital form to support the screening process, outreach activities, development of educational materials, and project reporting

1. Documents are provided as requested to satisfy PI needs. Products have been developed for the high-resolution TDI assessment, stakeholder presentations, and SAMP fisheries, ecology and renewable energy chapters. In addition ad hoc maps have peen supplied to the Governor's Office and fishermen in support of the revised MMS lease block RFI and the offshore Renewable Energy Zone.

A web site within WWW.NARRBAY.ORG that will serve as a repository for geospatial data, metadata, analytical and cartographic products resulting from the study.

🗁✐ Framework exists with sections for paper maps, interactive maps, and geospatial data (http://www.narrbay.org/d_projects/oceansamp/). Pending approval by the management committee, data and maps are added for download. To date, many of the Tier1 datasets and maps have been made available to the public. A interactive mapping framework has been implemented via the website that allows users to create custom maps using SAMP data. This application will continually be improved with additional data as the project proceeds.

9: Marine Mammals and Sea Turtles Analysis

Principal Investigator: Robert D. Kenney, URI Graduate School of Oceanography

Overall completion estimate: 100%

Study Tasks:

1. The Final technical report has been reviewed and released.

10: Air quality and meteorology studies in support of ocean SAMP

Principal Investigator: John Merrill, Graduate School of Oceanography

Overall completion estimate: 80%

1. Gathered data and performed preliminary analysis.
2. Taking account of suggestions from DEM in regard to air emission impacts of construction project.

11: Wind Farm Siting Study -Regional Subsurface Geology, Surficial Sediment, Benthic Habitat Distribution, and Cultural Resources

Principal Investigator: John W. King, URI Department of Oceanography

Note: Effort extended into mapping of areas in Federal Waters.
***REVISED* Overall completion estimate: 75%**

<u>Objectives</u>:

Objective 1. Conduct coarse resolution, geophysical, geological, biological surveys and groundtruthing studies of sites. 95%

- Mapped 57.5 sq. mi. Block Island. Mapped 8.1 sq. mi. "the Dagger". Mapped 69.1 sq. mi. Rhode Island Sound. Groundtruth Block Island complete, RIS 70% done..

Objective 2. Develop a GIS data layer of regional subsurface geology, including depth to bedrock and type of subsurface materials. 95%

- Block Island area complete. RIS area 75% done.

Objective 3. Develop a GIS data layer of geological habitat. 85 %

- Block Island area complete. RIS area 75% done.

Objective 4. Develop a GIS layer of biological habitat using NOAA CMECS classification system. 85%

- Literature review completed, samples collected, BI samples analyzed, data analysis done BI, and data layer nearing completion. Sampling and analysis underway other areas.

Objectives 5-7: Assess the potential for submerged historic and archaeological sites within SAMP areas with first existing data and then newly acquired geophysical survey data 75%

- Literature review completed. New data analysis underway for BI.

Objective 8: Complete final reports and deliver to CRC. 65%

- Data layers under construction. Report writing initiated.

Tasks:

Objective 1. (Tasks 1-3)

1. Collect existing data from literature. 100%
   • Literature collected and largely analyzed.

2. Conduct low resolution, subbottom, sidescan, and interferometric sonar surveys of study sites. 100%
   • Mapped Block Island, Dagger, and Block Island Sound.

3. Conduct groundtruthing surveys, including SPI, underwater video, grab samples. 75%
   • Complete near Block Island; underway for other areas.

Objective 2. (Tasks 4-5)

4. Analyze and interpret subbottom sonar data. 80%
   • Data analysis complete for Block Island and lines collected and analyzed in RIS; need to collect and analyze more lines in RIS.

5. Construct a GIS data layer of subbottom geology, including depth to bedrock and type of subsurface materials. 70%
   • Task nearing completion for Block Island; well underway for other areas.

Objective 3. (Tasks 6-8)

6. Analyze and interpret sidescan and bathymetry data; pick areas for groundtruth studies. 80%
   • Data analyzed, sites picked, grab samples obtained, video studies complete for BI; underway for other areas.

7. Obtain groundtruth data (SPI, video, grab samples). 85%
   • Fieldwork complete for BI; underway for other areas.

8. Construct a GIS data layer of geologic habitat needed for floating zone tool. 75%
   • Work underway.

Objective 4. (Tasks 9-11)

9. Collect existing data from literature. 100%
   • Work complete.

10. Analyze benthic grab samples. 80%

• Samples collected, samples counted, and data analysis completed for BI; underway other areas.

11. Prepare a biological habitat GIS data layer needed for floating zone tool. 75%
• Work underway.

Objectives 5-7. (Tasks 12-14)

12. Collect and assess existing data, and conduct ground truthing studies. 95%
• Work nearing completion - virtually all diving operations complete.

13. Assess newly acquired geophysical data. 75%
• Data being analyzed. Analysis of survey data from Block Island well underway.

14. Construct a GIS layer of archaeological sites needed for floating zone tool. 60%
• Work in progress.

Objective 8. (Task 15)

15. Final report completion and submission to CRC. 60%
• Work underway.

12: Spatial distribution and abundance, and flight ecology of Marine and Coastal Birds off coastal Rhode Island

Principal Investigator: Dr. Peter Paton, URI Department of Natural Resources Science

Overall completion estimate: 85%

1. During this quarter, collected data from 19 Feb to 19 Mar from N end of Block Island, 24 hrs per day, 7 days per week, completed radar data collection
2. Have three full-time biologists on staff to conduct surveys, acquired optical equipment, Initiated land-based survey points at 11 points along 4 survey routes, each point will be surveyed 6 times monthly (3 morning and 3 afternoons), collected data from 1 Jan to 31 March 2010
3. Conducted offshore transect surveys on 8 4X5 nm grids offshore using Francis Fleet boats - tried to conduct approx. 1 survey (2 grids) per week for this quarter. Aerial surveys were initiated in Oct 2009 that survey entire SAMP area. Conducted approx. weekly through late December - 1 survey per week during this period. Will continue boat surveys to June 2010 and aerial surveys through April 2010
4. Completed protocols for when and where radar data will be collected. Coordinated with Deepwater Wind, who also has an avain radar unit on Block Island, although that radar is focused on an area E of Block Island.
5. Collected radar data from 1 Oct through 15 Dec 2009 at N end of island. Data were 24 hrs per day/ 7 days per week. Minimal problems with sea clutter at N end. Data collected during

this time period primarily focused on quantifying movement ecology of passerines during nocturnal migration, although waterbirds were surveyed as well.

6. Assessed impact of sea clutter on radar data, assessed quality of data collected to date. Initial analysis of data collected at S end of island. Also cleaned data collected at N end collected up through Sept 2009.
7. Conducted preliminary analyses to assess altitudinal distributions of nocturnal and diurnal migrants based on radar data. From March through May, approx. 12% of nocturnal migrants were flying below 100 m, while 26% were below 200 m.
8. Sent draft reports to Ocean SAMP committee on Timelines of spatial distribution and abundances of individual avian species and groups of species (e.g., waterfowl, shorebirds) in SAMP area and Estimates of diurnal flight behavior of birds in nearshore waters at Pt. Judith
9. Developed protocols for land-based and offshore surveys. Also, developed protocols for Roseate Tern surveys to be initiated in May 2009 - sent this protocol out for peer-review.
10. Initiated analyses of land-based and offshore survey data collected to date. Presented results for Ocean SAMP at two meetings - Biologists from Mass Audubon and USFWS at Kettle Pond Visitor Center on 5 Feb 2010 and to the public at Audubon Society of Rhode Island in Bristol on 4 March 2010.
11. Completed protocols for radar data collection and data analysis. Due to sea clutter issues on SW end, field tested a parabolic dish antenna to reduce sea clutter issues - which it did not.
12. Conducted preliminary analysis of data collected at S and N end of island, have post-doc working on data analysis.

13: Ecology

Principal Investigator: Dr. Scott Nixon, URI Department of Oceanography

Overall completion estimate: 90%

Task 1: Measures of plant abundance in the surface water of Rhode Island and Block Island Sounds using extracted chlorophyll pigments, model simulations and intercalibration with SeaWiff satellite imaging:

1. Completed a total of 99 boat surveys of Rhode Island and Block Island Sounds; 38 cruises by R. Sykes (fisherman), 29 by M. Marchetti (fisherman), 12 SAMP bird survey trips (P. Paton), and 18 additional cruises including 8 with Ullman and Codiga and 2 Endeavor cruises. This task is 95% complete.
2. Field surveys collected 1,878 water samples from 626 stations (3 replicates per each station) documenting seasonal/annual variations in extracted chlorophyll and nutrient concentrations in the SAMP study area. This task is 90% complete.
3. 89 measures of water clarity (extinction coefficient values) were taken at various locations in the sounds. These measures are used along with the abundance of plankton (measured by extracting plant pigments) to model plankton production. 41 Secchi disk measurements from R. Sykes, 26 Secchi disk measurements from M. Marchetti, 8 Secchi disk were taken during cruises on RV Hudner, 5 vertical light profiles using submarine photometer, approx. 22 CTD and 8 CTD casts during Endeavor cruise. This task is 90% complete
4. Completed intercalibration of light measurements on Block Island with monitoring stations at Kingston, RI and Falmouth, MA. We used a 78 day record of incident light, from a

monitoring station we established at the Block Island Airport, to determine how incident light varies through the SAMP region. Sunshine data will be used along with water clarity to drive plankton production models. This task is 100% complete.

Task 2:Measures of carbon input to RI/BI Sound sediments:

1. Particle traps were deployed on two occasions at 2 stations in Rhode Island Sound and 1 station in Block Island Sound to collect material settling to the sediments from overlying water. Collected particles were analyzed for plant pigments and organic content. This task is 80 % complete

Task 3:Metabolic rates and nutrient cycling in sediments:

1. Collected intact benthic cores twice from three stations (2 in Rhode Island Sound and 1 in Block Island Sound). Sediment oxygen demand and nutrient remineralization rates were determined by incubation. This task is 90% complete