oceanSAMP

The Rhode Island Ocean Special Area Management Plan: Managing Ocean Resources Through Coastal and Marine Spatial Planning

A Practitioner's Guide

2013
By Jennifer McCann and Sarah Schumann
With Grover Fugate, Sue Kennedy, and Chip Young
Monica Allard-Cox, Editor

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Foreword

By JENNIFER McCANN
and GROVER FUGATE

In 2008, we found ourselves with the project of a lifetime: the opportunity to give the state a comprehensive regulatory plan for its ocean waters that reflects exceptional science, rigorous yet flexible policies, and extensive public participation—a plan that would give Rhode Islanders a significant role in determining how the state's offshore waters should be developed, or simply be left alone.

The project seemed daunting. In two years—a short time frame, as coastal and ocean planning goes—we would try as fully as possible to understand how the ocean waters off of Rhode Island are already being used by people and wildlife, develop regulations to minimize conflict between uses, determine where offshore renewable energy should be sited and managed, and gain public approval and buy-in for the process and its future goals. This venture would demand that we apply our existing knowledge of coastal management tools and techniques to the ocean realm, a bigger challenge than any of us had faced before.

Now, thanks to innumerable skilled, talented, and concerned individuals and organizations that daily brought their best thinking and brightest talents to the task, Rhode Island has an ocean spatial plan that is a leading national model for how to both develop and implement such a plan. Called the Rhode Island Ocean Special Area Management Plan (Ocean SAMP), the finished product accommodates present uses and responsibly accounts for the emergence of new ones. It is now, and always will be, a dynamic, adaptive plan.

The Ocean SAMP is helping Rhode Island decide, as collaboratively and openly as possible, where it makes the most sense for people to do many things: build offshore renewable wind turbines, fish commercially and recreationally, protect habitat, sail and race boats—the list is long and varied. The array of coastal management tools and strategies to achieve that aim is equally far-ranging, and includes strengthening federal consistency capabilities and coordination policies, establishing advisory boards, and ensuring that major stakeholders and regulatory agencies are connected to the effort as it moves into implementation.

It was developed through a process designed to honor traditional uses and reduce conflicts. Its policies reflect science and stakeholder involvement. We have established a diverse team of experts who have created the University of Rhode Island Center of Excellence for Ocean Spatial Planning and Offshore Renewable Energy, and nurtured a partnership with other organizations, including Roger Williams University in Rhode Island, Cranfield University in the United Kingdom, and Denmark's University of Aarhus, that continues to grow and prosper. For Rhode Islanders, the Ocean SAMP,

A healthy economy and a healthy ocean go hand in hand. This plan enables both. This plan will create jobs, while helping to meet the White House's energy goal of reducing the nation's use of oil by one-third by a little more than a decade from now.

DR. JANE LUBCHENCO,
FORMER UNDER SECRETARY OF COMMERCE FOR
OCEANS AND ATMOSPHERE AND NOAA ADMINISTRATOR

an area that includes a body of water almost the same size as the entire state, has been able to:

- Provide 54 percent of the entire study area with increased ecological protection
- Identify a 13 square-mile renewable energy zone in state waters that directs development to a location with the least conflict between existing uses and the natural environment, while streamlining the regulatory process
- Place Rhode Island in a powerful position to determine how and where development should take place in nearby federal waters
- Provide a specific and required framework that constructively engages major stakeholders including fishermen, alternative energy proponents, environmentalists, scientists, federal and state agencies, the Narragansett Indian tribe, and concerned citizens in the implementation of the Ocean SAMP
- Streamline the regulatory process for the installation of offshore wind turbines, while minimizing the impact on natural systems and existing activities such as commercial and recreational fishing

New science continues to provide the Ocean SAMP with better information to implement regulatory actions in both federal and state waters specifically for offshore wind turbines. Developers are required to meet with fishermen from Rhode Island and neighboring Massachusetts as development proceeds. Researchers and environmentalists are working together to identify and help resolve habitat concerns. Federal agencies, including the Bureau of Ocean Energy Management, are required to fully employ the content of the Ocean SAMP and its process as they make decisions on future wind turbine development and siting.

The pages of this publication describe the Ocean SAMP process, as well as present some of the strategies that were applied to achieve its goals. As we start sharing lessons learned with others from prior planning and current implementation, others can collaboratively "SAMP" their coastal and ocean waters.

We invite you to explore this practitioner's guide. It is exciting and rewarding to be able to share Rhode Island's ocean planning effort and help build the capacities of other coastal places—perhaps yours—to ensure the protection and use of marine resources for this and ongoing generations.

Jennifer McCann
Director of U.S. Coastal Programs,
URI Coastal Resources Center
Director of Extension Programs,
Rhode Island Sea Grant College Program

Grover Fugate
Executive Director
R.I. Coastal Resources Management Council

"The ocean is critical to our economy and our way of life here in Rhode Island. The SAMP is an important tool that relies on both science and public input to help us develop strategies to protect and manage our ocean and coastal resources. The Ocean SAMP could help set the national standard for developing a comprehensive and cooperative approach to state and regional ocean resource management."

U.S. SENATOR JACK REED

A SPECIAL PLAN FOR A SPECIAL PLACE:

Creating the Ocean SAMP

The Process

Rhode Island's Ocean Special Area Management Plan (Ocean SAMP) is a multi-pronged planning tool built on three integrated approaches: research, policy making, and public engagement. Each of these elements provides a unique perspective on the Ocean SAMP area; combined, they provide a comprehensive, versatile and powerful means to manage this valuable resource.

In October 2010, the R.I. Coastal Resources Management Council (CRMC) formally approved the state's Ocean SAMP. The document maps Rhode Island's ocean waters and surrounding federal waters in order to identify how this region is used, and guide balanced management of its human and natural resources in keeping with the state's environmental, social, and economic needs and concerns.

Federal approval by NOAA soon followed in summer 2011. According to Jane Lubchenco, under secretary of commerce for oceans and atmosphere and NOAA Administrator, the Ocean SAMP "takes into account all ocean uses for enhancing commercial, recreational, and environmental goals. This plan is what President Obama envisioned in the National Ocean Policy, and it sets a great example for other coastal states."

The CRMC holds regulatory authority to manage most activities in state waters, which extend 3 miles from shore. Responding to the governor's call for streamlining the regulatory process for wind turbine installation, and recognizing the need for additional information and public buy-in in order for this to be a successful project, the Council proposed to the governor the development of an Ocean SAMP. (See next page)

The Ocean SAMP is not a final answer, but a start—a start to ensuring that Rhode Island manages its ocean waters not only to protect its riches of natural resources, but to promise they will be there for generations to come.

The Energy Imperative

In 2007, Rhode Island Governor Donald Carcieri and the state's Office of Energy Resources determined that tapping Rhode Island's offshore wind resources would be an essential step to meeting the state's goal of deriving 16 percent of its electrical power from Rhode Island's own renewable sources by 2019.

The governor invited representatives from Rhode Island municipalities, the state's environmental community, maritime businesses and industry, and governmental officials to participate in discussions regarding the development of offshore wind energy in state waters. A study developed on behalf of this group determined that offshore wind farms could supply 15 percent or more of Rhode Island's electricity. The study also showed that 10 specific areas in state waters were suitable for consideration as wind farm locations, based on existing information and considering the "monopile" wind turbine structure, which could only be installed in waters no deeper than 25 meters.

What's a SAMP?

Special Area Management Plans - SAMPs are ecosystem-based management strategies designed to preserve and restore ecological systems. Recognized at the federal level as a regulatory document, SAMPs are developed and implemented in coordination with local municipalities, as well as government agencies and community organizations. Plan elements incorporate the best available science and are amended as new research and issues arise.

Through more than 100 public meetings and a public review period that garnered over 2,000 responses, everyone from large advocacy groups to individual community members expressed their connections to the Ocean SAMP area and their concerns about its future use. Some spoke of a direct economic interest in the area's resources, others of the recreational fulfillment they derive from its use, and many more of its ecological role in conserving and enhancing regional marine life. All emphasized the importance of using caution when permitting future uses, and of the need to understand and address, before the fact, potential impacts from these uses.

By contributing content and commentary to the SAMP document, stakeholders helped craft a governance system for the Ocean SAMP area that will serve the public's needs in the long run. The role of stakeholders did not end with approval of the Ocean SAMP document; various ongoing stakeholder advisory panels give the public a permanent role in guiding Ocean SAMP implementation.

Over one hundred scientists played a significant role in working with regulators and stakeholders on better understanding the natural environment and also the potential effects new development, including offshore renewable energy, could have on Rhode Island's offshore system.

With Ocean SAMP adoption achieved and implementation underway, Rhode Island continues to better understand state ocean waters and the tools with which marine resources can be managed and enhanced for decades to come.

This is evident in the state's effort to make full use of its federal consistency authority, and to secure a "geographic location description"— a designation that will streamline the state's input to federal decisions concerning development applications in the Ocean SAMP area. Ongoing research projects continue to provide new information about the organisms, habitats, geology, and human uses significant to the area.

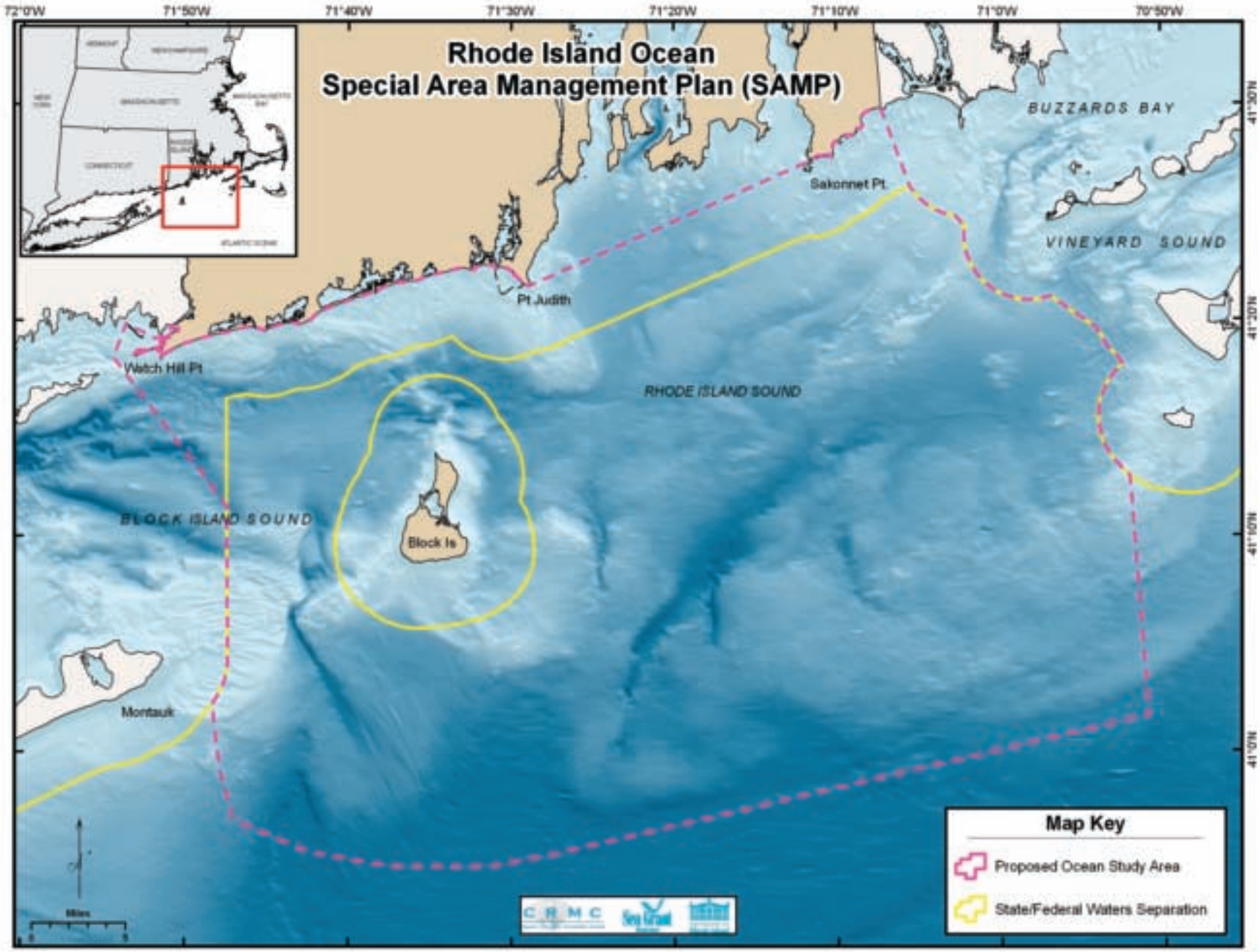
The Area

The waters featured in the Ocean SAMP research and planning process begin 500 feet seaward of the Rhode Island coastline and stretch as far as 30 miles offshore, encompassing portions of Block Island Sound, Rhode Island Sound, and the Atlantic Ocean. This 1,467 square-mile area, nearly the size of the state itself, was selected for special attention due to its ecological, economic, and cultural value to Rhode Island. Although portions of the Ocean SAMP region lie beyond the 3-mile reach of Rhode Island jurisdiction, the entire area is vital to the state's way of life.

The Team

Creation of the Ocean SAMP was aided by having scientists and project management professionals at URI undertake the necessary research, outreach, and project coordination. These experts had hands-on experience with the study area and the SAMP process. They also lived in the state or nearby region, giving their work personal as well as professional significance.

And because many of the people involved had already established close working relationships from prior projects, the plan was able to move forward more quickly. It also aided project managers in identifying such things as who worked well together and who could work under pressure and deal comfortably with the public, which maximized everyone's overall contribution.


Rhode Island Ocean
Special Area Management Plan (SAMP)
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71°30'W
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71°10'W
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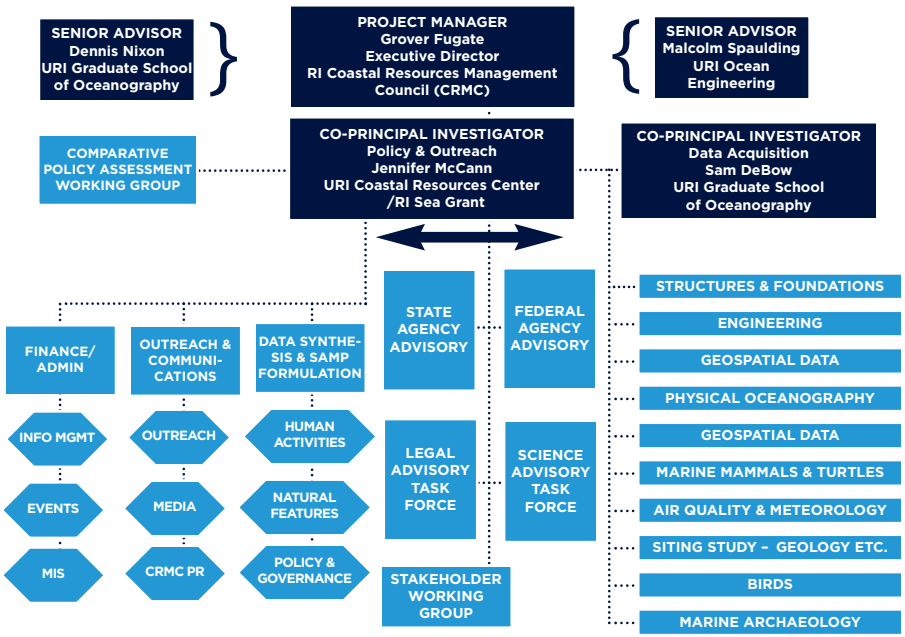
70°50'W
41°30'N
41°20'N
41°10'N
41°0'N
BUZZARDS BAY
Sakonnet Pt
VINEYARD SOUND
Pt Judith
Watch Hill Pt
RHODE ISLAND SOUND
BLOCK ISLAND SOUND
Block Is
Montauk
Miles
CRMC
Map Key
Proposed Ocean Study Area
State/Federal Waters Separation

The Organization

As seen on the organizational chart, special legal, scientific, stakeholder, state, and federal committees were set up to ensure ample engagement by all parties in the process. (Because New York, Connecticut, and Massachusetts abutted the study area, relevant state agencies from these three states also served on the state agencies committee.) The intent of setting up legal and scientific committees was to ensure that major aspects of the Ocean SAMP initiative were reviewed, and advice provided by these experts. Unfortunately, because of the accelerated Ocean SAMP process timeline—among other factors—these two committees were not as effective as expected. Major legal and scientific decisions were necessary on a daily basis, and there was no time to wait what might have been weeks to coordinate schedules and set up meetings. The Ocean SAMP management team therefore changed its initial operational process, and involved legal and scientific experts from the committees individually, rather than as a group.



CRMC looked to URI—particularly its Graduate School of Oceanography, Department of Ocean Engineering, College of the Environment and Life Sciences, and Rhode Island Sea Grant College Program—to play leadership roles in the development of the SAMP.

URI was respected by many resource users, state and federal agencies, academics, and non-governmental organizations for its ability both to facilitate an open and transparent process, as well as to provide objective, science-based research. Members of this URI team had previously completed six other SAMPs for other coastal ecosystems throughout the state, and had experience in facilitating discussions between organizations and individuals with intense conflicts. They were also able to develop and implement a communications strategy that engaged all stakeholders, and utilized diverse media outlets (e.g., web, public lectures, and stakeholder meetings) to reach the public.

The project team also involved the Roger Williams University School of Law Marine Law Institute, home of the Rhode Island Sea Grant Legal Program, to provide legal expertise as the plan was being developed.

Unlike the state and federal government agencies involved, URI's charge was not to determine where offshore wind energy turbines should be placed. Rather, it was to do an overall strategic mapping of the waters in the Ocean SAMP boundary area, stressing future-use priorities, and identifying conflicts and possible impacts on the marine environment. As for a potential wind farm, it was an open question whether there would be any place at all suitable for offshore wind turbines, and if so, where and how should this new industry be managed in a way that minimized conflict with existing and future human uses, and the natural ecosystem?

High-level decision makers at URI were key to making things happen. For example, Graduate School of Oceanography academic deans served on the management team, and attended bi-weekly meetings to assist the project leaders in overcoming political, technical, and administrative challenges that that could have stalled the process.

The Data

To identify research needs, the team reviewed the federal Bureau of Ocean Energy Management (BOEM)-required information for offshore wind siting and installation, the Cape Wind Environmental Impact Statement, the topics discussed in other Rhode Island SAMPs, and spoke to many of the stakeholders.

Early on, Rhode Island Sea Grant held a multi-day event with researchers who had, over the years, researched different aspects of the Ocean SAMP study area to gain a

Expanding the Research Focus

The management team regularly met with the researchers to ensure that the research was responding to the issues and could be incorporated into the development of the SAMP. The Ocean SAMP team developed a set of questions that was constantly asked of the researchers. These questions included:

1. Describe how your findings help us understand how the SAMP study area functions as an ecosystem that is heavily impacted by human activities.

2. Has your research identified areas, processes, or resources that should be protected, conserved, or otherwise given special consideration by the SAMP?

3. To the best of your knowledge, what has your work revealed that may be relevant to designating areas suitable/unsuitable for activities such as marine transportation, wind turbines, fisheries, recreational boating, etc.?

4. What, in your opinion, are the potentially significant unknowns in your topic or in the SAMP area that are relevant to the use-zoning and policy development process for the Ocean SAMP? Identify the unknowns you will likely be providing us at the end of your research.

5. As you look to the future and the likely trajectory of change in human activities and ecosystem conditions over the next 50 years, what are the changes that may be anticipated in the features of the SAMP area? What are the potential implications of such changes as we consider use zoning and the siting of wind farms?

6. Are there specific recommended actions (e.g., regulatory, policy, management) you would like the Ocean SAMP to support or implement in response to your findings?

7. What do you think the implications of global climate change will be on your research topic?

This process enabled the team to move research activities beyond simply data-gathering and analysis into the shaping of policy and providing a future vision for the area. In the long run, that resulted in two important decisions made by the management team:

- To designate all waters less than 20 meters in depth to be areas of preservation where no large-scale development would be allowed, which was directly based on the research done by URI and international avian experts.
- To determine the location of the renewable energy zone, which was directly attributable to models by the ocean engineers, seabed characterizations and other research completed by geologists and physical oceanographers, and the information collected from discussions with Ocean SAMP stakeholders.

better understanding of available information. Through this process not only was the most current and published information identified, but several insightful but overlooked gray literature and dissertations were discovered in the URI library. Stakeholders identified existing economic studies done by consultants, and retired university professors stepped forward to provide economic data—thought to be nonexistent—on past international sailboat racing regattas, such as the renowned Newport-to-Bermuda race. Team members also contacted European researchers as well as professionals working in the oil and gas industry to identify existing research on the economic, biological, and environmental effects of offshore oil and gas development.

The research topics were prioritized and projects planned based on the issues identified and the gaps in existing information.

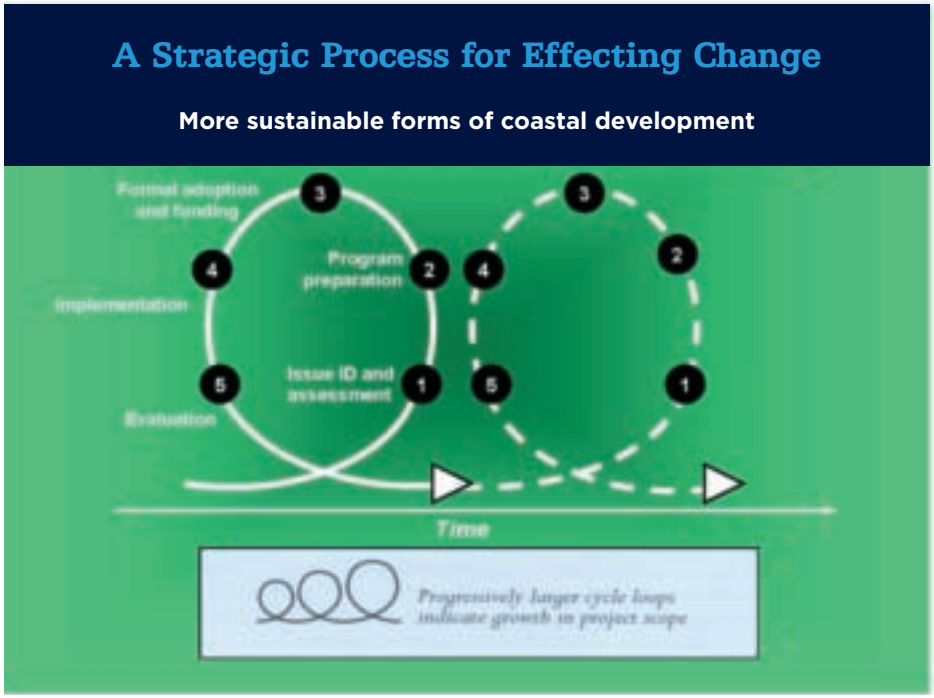
Early in 2011, some scopes of work were revised once the team realized that the developer was not focusing just on waters shallower than 25 meters, to accommodate monopile wind energy turbines. Instead, due to new technology, the preferred developer proposed to install a "jacketed turbine design," with which the viable depth for installation now could reach to 60 meters. In addition, in 2011, more funds were provided to the team by the state and the U.S. Department of Energy, which allowed the Ocean SAMP team to complete necessary additional research tasks.

The process of prioritizing the research as well as describing its scope was shared during stakeholder meetings and through the web site. When a researcher was going out on a research vessel or deploying a buoy to collect data, the Ocean SAMP team sent out a description to the stakeholders of what was happening, what they should look for, and why this research was going on. When possible, this was captured and disseminated on video to provide stakeholders more information on the process.

Whenever possible, researchers employed local fishermen to engage in the Ocean SAMP research. Fishermen felt that more research should be done on fishing and fisheries, and pointed the team in the right direction based upon their local knowledge. The Ocean SAMP team appropriately incorporated this as the research agenda was developed. In addition, the team met with Narragansett Tribal representatives periodically to exchange information and share results. (There were attempts to invite tribal members onto the research cruises; however, this never succeeded.) One major tribal concern was that a geologist might look at something as a researcher and not consider its value or significance to the tribe.

In the effort to learn as much as possible about the Ocean SAMP area, researchers conducted a broad array of research activities, including:

- Assessing coastal and offshore bird abundance and distribution through land-based, ship-based, and aerial bird counts
- Performing archaeological surveys to identify submerged cultural sites
- Mapping the ocean floor and its geological features, using sonar, grab-samples, and underwater video cameras
- Mapping commercial and recreational fishing grounds collaboratively with fishermen
- Measuring phytoplankton productivity, using water samples gathered by fishermen
- Mapping recreational uses through consultation with charter boat captains, sailing regatta organizers, dive boat captains, and whale watch guides
- Gathering a complete oral history of the Narragansett Indian tribe
- Considering the impacts of climate change off Rhode Island's shores based on projections of current regional trends
- Modeling the meteorological, acoustic, and wave environments of the Ocean SAMP area in order to identify appropriate sites and possible impacts of wind turbines
- Developing an index to rank sites in terms of their suitability for wind turbine installation



The Policy Cycle

To develop the Ocean SAMP process, the SAMP team applied the policy cycle developed by the URI Coastal Resources Center, which had helped create the state's first coastal management policy in the 1970s.

- The process, adopted by the United Nations, is a five-step approach to plan and track ecosystem-based management projects over short-term and long-term time frames. The team focused on completing steps 1 through 3 in the policy cycle. Major components of this cycle included the need to:

- Develop time-bound and measurable social and environmental goals that were supported and understood by all user groups
- Build support from well-informed resource users
- Develop sufficient capacity to both develop and implement the Ocean SAMP
- Obtain formal adoption of the Ocean SAMP at both the state and federal levels

The Ocean SAMP Timeline August 1, 2008 – July 31, 2010

In order to ensure the public and the Ocean SAMP team was clear on the process and when the different components of the policy cycle were planned to be implemented, the team developed a general timeline. To maintain accountability, the timeline was featured at every major meeting and prominent on the web site.

Step 1: Issue Identification/ Assessment

JULY 2008

- Define boundaries, goals and principles
- Set up public engagement
- Prepare technical information
- Identify issues/ concerns and opportunities
- Prepare draft ecosystem and use zone maps

Step 2: SAMP Preparation

JULY 2009

- Review goals and boundaries
- Develop objectives and policies
- Draft SAMP chapters
- Continue to conduct research
- Develop burdens of proof for permit applicants

Step 3: Formal Adoption

JULY 2010

- Formal hearings and reviews of the draft SAMP
- Adoption of the SAMP by CRMC
- Submit to federal agencies for approval

The Funding

Although the Ocean SAMP team initially requested $6 million to complete the SAMP, the state initially only provided the effort with $3.2 million from the Rhode Island Renewable Energy Fund. Several months later, the state recognized that the SAMP process would likely put Rhode Island in the lead on offshore renewable energy installation and additional funds ($2.8 million) were provided by the Rhode Island Economic Development Corporation. During Year 2, the U.S. Department of Energy also contributed funds ($666,050) to fill in data gaps and continue research activity. Over 200 members of the URI faculty and staff also recognized the significance of this project, and many of them dedicated a significant amount of their state-funded time to the completion of the effort. In addition, the University agreed to donate the use of its research vessel, the Endeavor, to complete many of the required research activities. This in-kind support totaled at least $1 million.

Because the major driver for this project was to identify locations for wind farm placement that would have the minimum impact on existing uses, the Ocean SAMP required a significant amount of new information, and most of the funding was devoted to research. Although also significant, the smallest component of the budget was the SAMP document development and outreach. This aspect of the budget was applied to project management, including developing the supported goals, sharing the information with the public and decision makers for the formation of policy, synthesizing the science, and writing the document.

Estimate of Ocean SAMP Funds Distribution

YEAR SECURED	FUNDING AMOUNT (IN MILLIONS) AND SOURCE	SYNTHESIS OF EXISTING INFO	GENERATING NEW INFO	SAMP DOCUMENT DEVELOP & OUTREACH	ADMIN. (APP.)
2010	$3.2 (RI)	40%	15%	35%	10%
2011	$2.8 (RI)	10%	80%	0%	10%
2011	$0.61 (DOE)	30%	40%	20%	10%
2011	$1 (In-kind)	20%	80%	0%	0%

The Goals & Principles

The Ocean SAMP team believed in establishing goals that would respond to the priority issues identified by the stakeholders, and define desired societal and environmental outcomes. Although the proposed wind power projects made accomplishing these goals all the more urgent, the goals themselves reflect a more comprehensive approach to managing ocean resources for the benefit of the many users, human and otherwise, that depend on them. This strategy produced the following set of goals everyone working on the project, including the stakeholders, sought to adhere to in creating the final plan.

Goals

FOSTER A PROPERLY FUNCTIONING ECOSYSTEM THAT IS BOTH ECOLOGICALLY SOUND AND ECONOMICALLY BENEFICIAL. The marine ecosystem off Rhode Island's shores provides a range of environmental, economic, and social benefits. But prior to the Ocean SAMP, gaps in understanding of this environment stymied comprehensive management of the area. Accordingly, a major goal of the Ocean SAMP is to improve knowledge about the area's ecology and to create policies that restore and maintain its integrity and resilience. Attaining this goal requires adaptive policies to safeguard the natural

INITIAL PUBLIC CONCERNS

The Ocean SAMP team knew from the start that the issues surrounding the project, notably the placement of offshore wind turbines, would be contentious. In many cases, such as for those involved in the fishing industry, people felt their livelihoods were being threatened. Others were worried about possible threats to the ocean environment and wildlife.

Despite their misgivings, many of the individuals and groups affected became immediately involved in the process using the vehicles created by the Ocean SAMP team. While being understandably concerned, fishermen, shippers, sailors, and others were also open to the new science and research being conducted on the area before passing judgment on the project.

Thanks to a formal but flexible stakeholder process that was designed to encourage input and participation by as many people and civic organizations as possible, many voices were heard. The team strived to find the right way to engage the various stakeholders and to provide them with the information they needed in order to feel more comfortable with the process.

Some of the initial concerns stakeholders expressed included:

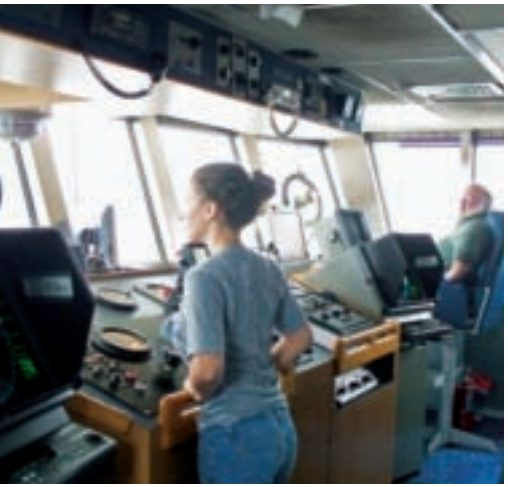
Ocean SAMP Process-Based Issues

- This is a "done deal" since the developer of the wind farm was selected and sites were identified prior to the Ocean SAMP process
- The developer will have more access to the information and the public will not be treated equally
- Stakeholders will not have influence over siting or any other regulations
- The timeframe is too short to do a well-thought-out process
- How can the Ocean SAMP really reduce the permitting time frame for the installation of offshore wind turbines?
- How can the Ocean SAMP be just a routine program change to the state's coastal program and not require a major review by NOAA?

Ocean SAMP Place-Based Issues (Turbine-specific)

- Wind turbines will restrict fishing and business
- Collisions with the turbines by boats will be significant
- The area's marine life and wildlife will be harmed
- Tourists will hate looking at the turbines, as they spoil the natural vista
- Power cables are going to affect the health of marine life, wildlife, and all Rhode Islanders

The Ocean SAMP team worked to bring these concerns to the attention of stakeholders and project staff alike, and back-and-forth discussions allowed everyone involved to understand the issues more clearly in order to find an agreeable solution. The trust built between the Ocean SAMP team and all the stakeholders over the course of developing the plan helped in great part to resolve many of these issues.



resources of the area in the face of climate change, current human uses, and potential impacts of new uses.

PROMOTE AND ENHANCE EXISTING USES. Many different uses take place in the Ocean SAMP area; all contribute to Rhode Island's vibrant maritime culture. In support of these uses, there needs to be a focus on improving understanding of existing activities in the Ocean SAMP area, building productive relationships with current resource users, and crafting policies to minimize potential negative impacts on the way the area is currently employed by identified and projected future uses.

ENCOURAGE MARINE-BASED ECONOMIC DEVELOPMENT THAT CONSIDERS THE ASPIRATIONS OF LOCAL COMMUNITIES, AND IS CONSISTENT WITH AND COMPLEMENTARY TO THE STATE'S OVERALL ECONOMIC HEALTH, FULLY INTEGRATED WITH SOCIAL AND ENVIRONMENTAL NEEDS AND GOALS. New uses of the ocean environment, such as offshore wind farms, have the potential to spur economic development and advance progress towards societal goals, such as reducing greenhouse gas emissions. However, to assure a net benefit to society, the promise of new uses must be balanced with the benefits of protecting ecosystems and current uses. For that reason, it is paramount to develop decision-making tools, standards, and performance measures to help determine appropriate roles for future activities, including offshore renewable energy, in the Ocean SAMP area.

BUILD A FRAMEWORK FOR COORDINATED DECISION-MAKING BETWEEN STATE AND FEDERAL MANAGEMENT AGENCIES. The Ocean SAMP area contains both federal and Rhode Island state waters, and abuts the state waters of Massachusetts, Connecticut, and New York. In light of the multiple jurisdictions affected by uses within this area, engaging combined federal and state agencies in all phases of the Ocean SAMP process is necessary, all the while promoting regular communication among neighboring states.

Setting the Goals

We learned that goals and principles cannot be formalized during the first months, but should be developed once the project team and managers have engaged in constructive dialog and once the stakeholders have a better feel for the project. Eventually, the stakeholder issues will be incorporated into the goals and principles. This does not mean the stakeholders are 100 percent in agreement with the project, but at least they know their opinions and concerns are being taken into consideration, that they are legitimate and recognized members of the planning process, and that the project team is responding to their issues. We publicly acknowledged stakeholders' list of concerns and posted it on the project web site, and we proposed ways the Ocean SAMP team would respond to these issues, including providing experts to respond to them. We also worked with stakeholders to document how, where, and when the stakeholders used the marine ecosystem in the study area and how that interaction affected the natural resources. We feel that this process developed a mutual respect among project staff and stakeholders, and that this helped us ultimately to create a workable and credible plan.

Principles

Several key principles were created to guide the collaborative development of the Ocean SAMP. The principles responded to the issue of information being available at the same time to everyone involved, and to ensure that decisions were not made behind closed doors or without input from the entire group. These principles also helped to ensure that user groups understood and actively supported the Ocean SAMP goals, there was wide public support for the Ocean SAMP process, and the Ocean SAMP was recognized as important and legitimate by institutions that would be involved in its implementation.

DEVELOP THE OCEAN SAMP DOCUMENT IN A TRANSPARENT MANNER. Transparency guides the development of all documents and procedures related to the Ocean SAMP project. Project activities and phases are designed to be easily understandable to the general public. Accurate information must be made available to the public in an appropriate, diverse, and timely manner.

INVOLVE ALL STAKEHOLDERS. Targeted outreach efforts ensure opportunity is available for all stakeholders to have access to the Ocean SAMP planning process as early as possible. Stakeholder participation ensures that a broad range of issues, concerns, and creative ideas are heard and examined throughout the SAMP process.

HONOR EXISTING ACTIVITIES. The Ocean SAMP area is a highly employed and biologically and economically valuable place, with major uses such as fishing, recreation and tourism, transportation, and military activities taking place within its boundaries. These uses, along with the area's biology and habitat, must be fully understood and highly respected as decisions for the incorporation of future activities are determined.

BASE ALL DECISIONS ON THE BEST AVAILABLE SCIENCE. All management and regulatory decisions will be based on the best available science and on ecosystem-based management approaches. The Ocean SAMP will require that the necessary studies be performed to better understand the impact of an activity on the ecosystem before that future use is approved. These studies might include gathering information on baseline resource conditions, potential environmental and economic impacts, and possible mitigation measures.

ESTABLISH MONITORING AND EVALUATION THAT SUPPORTS ADAPTIVE MANAGEMENT. Incorporating monitoring and evaluation in the Ocean SAMP will contribute towards implementing a systematic process for continually improving management policies and practices—in other words, adaptive management—in an environment exposed to constant change. The SAMP process is flexible enough to react to such changes, and allow plans to be revised in due course. A strong stakeholder process, coordination among federal and state regulatory agencies, and a transparent monitoring and evaluation mechanism ensures this activity.

The Stakeholders

One of the major components of the Ocean SAMP process was the development of the stakeholder process. There were three main objectives in bringing together as many interested groups and individuals as possible:

- Identify and prioritize stakeholder and client issues
- Design a public process that would provide stakeholders with both access and influence over decisions
- Collect available information to direct research and policy development

The SAMP team contacted organizations large and small when forming the stakeholder group. In addition to formal groups, members of the public were invited to attend meetings and were granted equal footing with the organizations. Due to the visibility of this effort, the Ocean SAMP team used an experienced, well-respected facilitator familiar with the team and the issue, who worked as a volunteer to lead the monthly stakeholder meetings and serve as an additional liaison to the group's members.

During one of the first meetings, the ground rules for the stakeholder process were set down clearly and firmly: That the Ocean SAMP stakeholder process would be a comprehensive and meaningful involvement of the stakeholders through operating principles which described group processes and member roles. This included the following:

- The stakeholder process will respect that there are legitimate and informative minority views and concerns that need to be recognized and recorded
- Stakeholder meetings will have the dual purposes of first, providing participants information about what is happening in the development of the Ocean SAMP, and second, hearing from stakeholders and the public, regarding their positions, opinions, and perspectives

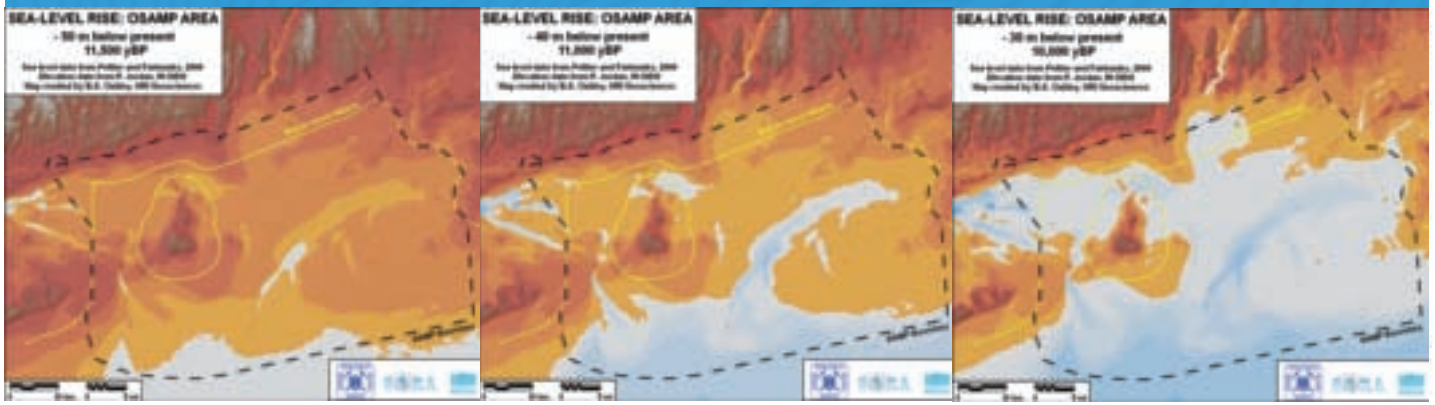
"What the stakeholder process confirmed is that Rhode Islanders strongly and enduringly value the waters off their coast. What takes place in these waters is important to life in Rhode Island. The Ocean SAMP as a marine spatial plan is a vital expression of those valuations. The Ocean SAMP is more than a scientific and technical document; it is an expression of the interests of the State."

KEN PAYNE,
STAKEHOLDER FACILITATOR

One Stakeholder's Story

Doug Harris is the Preservationist for Ceremonial Landscapes for the Narragansett Indian Tribal Historic Preservation Office. These comments were taken from an interview with him at the 2012 Ronald C. Baird Sea Grant Science Symposium on international marine spatial planning.

"In the first stakeholder meeting at the University of Rhode Island, I was one of the first people to stand up to present, and I explained to the rest of the stakeholders there that the oral history of the Narragansett Indian Tribe says that more than 15,000 years ago, the ancient villages of the Narragansett were out where the ocean is now. And that, as the story goes, the ocean waters began to rise and the people had to evacuate. So what I presented to the stakeholders was, 'What will you do or what will this process do about these ancient sites that may, in fact, still be intact down under the sediment of the ocean floor out on the continental shelf?' That question sort of floated around the room for a number of sessions, and a year and a half later, the ocean geologists came back and said that their studies had determined that not only 15,000 years ago, but as long ago as 24,000 years ago, what is now the ocean was an open and grassy plain out on the continental shelf."



- The chairperson will seek to have the discussion at stakeholder meetings be vibrant, and explore nuances of meaning and the value of issues and concerns raised, while placing a priority on assuring that all persons are fairly heard and their views considered

The overall goal of the stakeholder process was to engage a well-informed and well-represented constituency that would understand the Ocean SAMP issues and become involved in the creation of the plan.

The Ocean SAMP team set specific objectives to reach this goal:

- Ensure all stakeholders and citizens have an opportunity to engage, and are provided access to researchers and decision makers and influence over the final plan
- Organize educational and informational outreach efforts and/or support existing events that offer the project team and stakeholders an opportunity to better understand issues
- Develop communication tools that will provide up-to-date information to all those involved and to the public as a whole

Strategies for stakeholder involvement

CONSIDER BOTH TRADITIONAL AND NON-TRADITIONAL STAKEHOLDERS. The team met with all stakeholders individually to identify their specific issues. These groups included, but were not limited to, fishermen, the marine trades industry, the Narragansett Tribe, and local unions. Ocean SAMP staff explained the project, ensured the stakeholders knew they were invited to fully participate in the development of the Ocean SAMP, and determined appropriate mechanisms to ensure stakeholders were engaged if the proposed activities (e.g., monthly stakeholder group meetings, web site) were not adequate.

ASK OTHERS TO IDENTIFY STAKEHOLDERS. Based on recommendations from the stakeholders, the team met with individual citizens and/or organizations who had a special story to tell or who had a direct link to the SAMP that may not have been clearly evident. For example, researchers were initially not aware that shark diving was an active industry within the Ocean SAMP area, a commercial enterprise that was in danger of being overlooked.

DETERMINE IF ANYONE ON THE TEAM HAD AN EXISTING RELATIONSHIP WITH SPECIFIC PEOPLE OR ORGANIZATIONS. The Ocean SAMP team realized that the personal touch was always best wherever it could be utilized. It was also a practical consideration in a very small state, where over time people's networks tend to interweave in ways that may not occur in a larger population. The team identified members who had an existing relationship with each stakeholder group to initiate discussions. In this case, the project leader from the state coastal council already had an existing relationship with the local Narragansett Tribe, so he facilitated that discussion. Other team members with strong relationships with municipalities and the fishing community did the first outreach there. It was important to meet stakeholders in small groups. In addition, at least two project team members attended every meeting with stakeholders. Sometimes one person on the team could pick up on an item the other did not notice. As the process moved forward, stakeholders had the luxury of reaching out to different members of the team with whom they were comfortable or had a prior working relationship. At times, stakeholders preferred to contact and ask a "silly" question of a graduate student rather than the head of the coastal zone management program. All questions were informally collected and shared with the entire team. This helped project staff to respond more effectively to what was on the minds of the stakeholders.

RESEARCH PRIOR TO MEETINGS WHAT STAKEHOLDERS' INTERESTS WERE, AND ANTICIPATE AND RESPOND TO THEIR QUESTIONS. The Ocean SAMP team understood prior to their meetings that fishermen would be

Ocean SAMP Stakeholders

Ken Payne, volunteer moderator

Dan Beardsley, Rhode Island League of Cities and Towns

Jeff Broadhead, Washington County Regional Planning Council

Paige Bronk, City of Newport

John Brown, Narragansett Indian Tribe

Chris Brown, RICFA

Alison Buckser, Rhode Island Chapter of the Sierra Club

Charlie Cannon, Rhode Island School of Design

Jeffry Ceasrine, Town of Narragansett

Paul Costabile, NMPA

Vicki deAngeli, Jamestown Chamber of Commerce

Lanny Dellinger, RILA

Julio DiGiando, Jamestown Town Council

Denny Dillon, RIPCBA

Tina Dolen, Aquidneck Island Planning Commission

Charlene Dunn, Charlestown Town Council

Bernard Fishman, Rhode Island Historical Society

Richard Fuka, RIFA

Gina Fuller, Westerly Town Council

Kim Gaffett, Town of New Shoreham

Myrna George, South County Tourism Council

Tricia Jedele, CLF

Doug Harris, Narragansett Indian Tribe

Debbie Kelso, Narragansett Chamber of Commerce

Michael Keyworth, RIMTA

John F. Killoy III, Rhode Island AFL-CIO

Karina Lutz, People's Power & Light

Mike Marchetti, ENESA

Gregg Mataronas, SPFA

Steve Medeiros, RISAA

Robert Mushen, Town of Little Compton

Ray Nickerson, Town of South Kingstown

Eleftherios Pavlides, Wind Power RI Project, RWU

Margaret Petruny-Parker, CFRF

Ted Platz, RIMA

David Prescott, Rhode Island Chapter of the Surfrider Foundation

Michael Ryan, National Grid

Paul Sanroma, Rhode Island Wind Alliance

Bill Silkes, Ocean State Aquaculture Association

Evan Smith, NBCCVB

David Spencer, Atlantic Offshore Lobstermen's Association

Keith Stokes, Newport County Chamber of Commerce

Larry Taft, Audubon Society of Rhode Island

Darlene Towne Evans, South Kingstown Chamber of Commerce

Kathleen Wainwright, TNC

Russell Wallis, OSFA

Wendy Waller, STB

Laurie White, Greater Providence Chamber of Commerce

Jessica Dugan Willi, Block Island Tourism Council

Ronald Wolanski, Town of Middletown

concerned about access and possible impacts on all aspects of fish and the fishing industry. The team learned that the fishermen were extremely concerned about the potential effects that electromagnetic fields and noise (e.g., pile driving) would have on fish. Team leaders invited European experts to meet with the fishermen to discuss the more advanced European fisheries experience. The team recognized that environmental organizations would be very concerned about wildlife, and was able to respond comprehensively to those concerns. One aspect, however, that was not anticipated was that environmental attorneys were very concerned about what "real" regulatory power the SAMP would have. In response, the team organized special meetings among NOAA legal staff and the concerned organizations to discuss this critical, long-term issue.

LISTEN AND UNDERSTAND. Team members recognized that stakeholders should not have to always go to Ocean SAMP events; rather the team established a two-way street for learning and communication, which included having members of the Ocean SAMP team attend or participate in stakeholders' events. Additionally, in meeting with stakeholders, the team not only asked about their concerns, they also asked stakeholders specifically what they would like to get out of the effort. The team sought to address issues personally or through arranging meetings with experts, and they also ensured these concerns were reflected in the SAMP document. Stakeholders reviewed the SAMP chapter by chapter, and CRMC established an extended comment period for the final document to allow extensive public input.

PROVE YOU ARE LISTENING. The team wrote down what members heard at meetings or at outreach events, and sent the summary to the people who offered their input. For the fishermen, the team wrote up their issues of concern as they were perceived and ways in which the team could best respond to their needs, and most importantly, followed up on any agreed-upon actions. This work was also posted on the web site.

Eventually, an entire section of the site was dedicated to this communication with the fishing community.

IF STAKEHOLDERS ARE NOT ENGAGING, CALL THEM AND MEET AGAIN. The Ocean SAMP team frequently communicated with the stakeholders who would clearly be the most impacted or would have expertise to contribute to the effort (e.g., fishermen, government, tribal representatives, and trade unions). One-on-one meetings were the most effective. Phone calls or Skype were second resorts, but distance between offices made those methods most practical in some cases. Team members tried to minimize use of e-mail, as the ability for intentions or information to be misinterpreted or poorly understood is high.

MEET FREQUENTLY WITH LEGISLATORS AND FEDERAL REPRESENTATIVES. At the very beginning of the SAMP process, the team met for background briefing sessions with state legislative leaders and the Rhode Island Congressional delegation (and/or their top aides) to answer their questions and ensure they understood the process, so that when a constituent contacted them, they could respond accurately and appropriately. The Ocean SAMP team repeated this process when significant new information emerged. At each briefing session, team members asked policymakers to contact them if they heard something that contradicted the information the team had provided them with. This helped legislators respond quickly to their constituents with the correct information, which benefitted both the legislators and the project's ultimate success.

MAKE THE PUBLIC AWARE OF YOUR SHARED EFFORTS. Team members encouraged stakeholders to play an active, visible role in the process, including asking stakeholders to write opinion pieces or co-author them with SAMP members for publication in local news outlets.

CULTIVATE STRATEGIC PARTNERS. The Ocean SAMP team worked to develop strategic partnerships with organizations for mutual benefit. For example, the Ocean SAMP team joined with Rhode Island Natural History Survey (RINHS), a local organization active in environmental education issues, to organize a public lecture series on the environmental effects of offshore wind turbines, as well as to hold a conference on the same topic. The Ocean SAMP team was able to promote marine planning to a diverse audience on a topic that many people—especially RINHS

members—were extremely passionate about. The RINHS benefited in bringing a critical issue to its membership with financial and planning resources provided by the Ocean SAMP.

DEVELOP DIVERSE COMMUNICATIONS.
The Ocean SAMP team developed different mechanisms to communicate information: a web site, listserv, and podcasts to summarize information, in addition to traditional public relations and printed outreach materials.

Annual public reports, monthly stakeholder meetings, and individual stakeholder meetings with fishermen and environmental organizations were also part of the communications strategy. The team partnered with the public libraries to enable researchers to share their information in public forums and provide citizens a chance to ask questions. The team also joined forces with Rogers Williams University, Rhode Island Sea Grant, and the RINHS to organize events on specific legal, environmental, and ecological aspects of the effort, and all benefitted by pooling their financial resources to make the most impact at least expense. Team leaders also met with the media and state and federal government leaders to ensure they were aware of the progress to date. Backgrounding briefings with media, politicians, and major local organizations not only worked to build trust, but also offered answers to questions those groups would likely be asked. This helped to avoid confusion and address misrepresentations by opponents of the project.

TAKE CARE OF THE TEAM—THE MOST IMPORTANT STRATEGY OF ALL
In a project of this magnitude, in which a number of individuals with different specialties worked on different aspects of the larger plan, it might have been easy for team members to feel that they were working alone. Project leaders worked to set aside time was for everyone to share what he or she was hearing on the street or learning from the new research. This was of particular help at times when frustrations mounted or an individual faced personal attacks when reaching out in public situations on an issue as controversial as the plan could appear. Efforts made to take care of the team proved extremely important in ensuring that the team remained strong and healthy, and maximized the individuals' strengths and expertise.

While long hours were common, project leaders strove to make members of the team rest when they needed it. The team also regularly celebrated successes—even if that was just recognition at a meeting or going out to lunch. These actions were very important in building trust and camaraderie within the team.

Ocean SAMP Implementation

Implementing the Ocean SAMP involves several activities, from enhancing policies with the knowledge gleaned from new research, to testing marine spatial planning tools and techniques for improved ecosystem-based management, to sharing the SAMP lessons learned with other places. Going forward, as even more data is collected and used to support and refine state policies, the SAMP will increasingly provide guidance on offshore development in state waters. The table on page 26 offers the current permitting stipulations for new development in the Ocean SAMP area, requirements that will continue to be honed as more is learned about the potential impacts and benefits of development on ocean resources and uses.

Encouraging appropriate development

The Ocean SAMP recognizes offshore renewable energy as an option to mitigate climate change, create jobs, and diversify Rhode Island's energy base. It establishes a thorough and transparent offshore development permitting process oriented towards realizing the promise of offshore renewable energy while avoiding significant adverse impacts on ecological and long-standing human uses of the area.

To assure that permitting decisions are well-informed and complementary to the regulatory requirements of relevant agencies, the Ocean SAMP establishes a Joint Agency Working Group (JAWG) composed of all federal and state agencies with a regulatory responsibility towards a proposed project, as well as the Narragansett Indian Tribe. The function of this group is to work collaboratively in determining project-specific requirements to be followed during construction, operations, and decommissioning of a project, including those pertaining to monitoring and mitigation of adverse impacts that the project may cause.

To foster sound permitting decisions, improve knowledge of the Ocean SAMP area, and enable adaptive management that responds to impacts of development as they are detected, the Ocean SAMP requires developers to track ecological and human-use trends at a project site before, during, and after construction. Prior to the start of a project, a developer must submit two data-based documents: a pre-construction Site Assessment Plan (SAP) detailing the studies that it intends to perform for characterization of the project site, and a Construction and Operations Plan (COP) outlining construction, operations, and decommissioning plans for a proposed facility. Pending approval of the SAP and COP, a developer must fund an independent review of the design, fabrication, and installation of a proposed facility to certify that the project complies with sound engineering practices. Once a project is underway, the JAWG determines a suite of monitoring requirements that a developer must follow.

Monitoring requirements for development

The Council, in coordination with the JAWG, shall determine requirements for monitoring prior to, during, and after construction. Specific monitoring requirements shall be determined on a project-by-project basis and may include but are not limited to the monitoring of:

i. Coastal processes and physical oceanography
ii. Underwater noise
iii. Benthic ecology
iv. Avian species
v. Marine mammals
vi. Sea turtles
vii. Fish and fish habitat
viii. Commercial and recreational fishing
ix. Recreation and tourism
x. Marine transportation, navigation, and existing infrastructure
xi. Cultural and historic resources

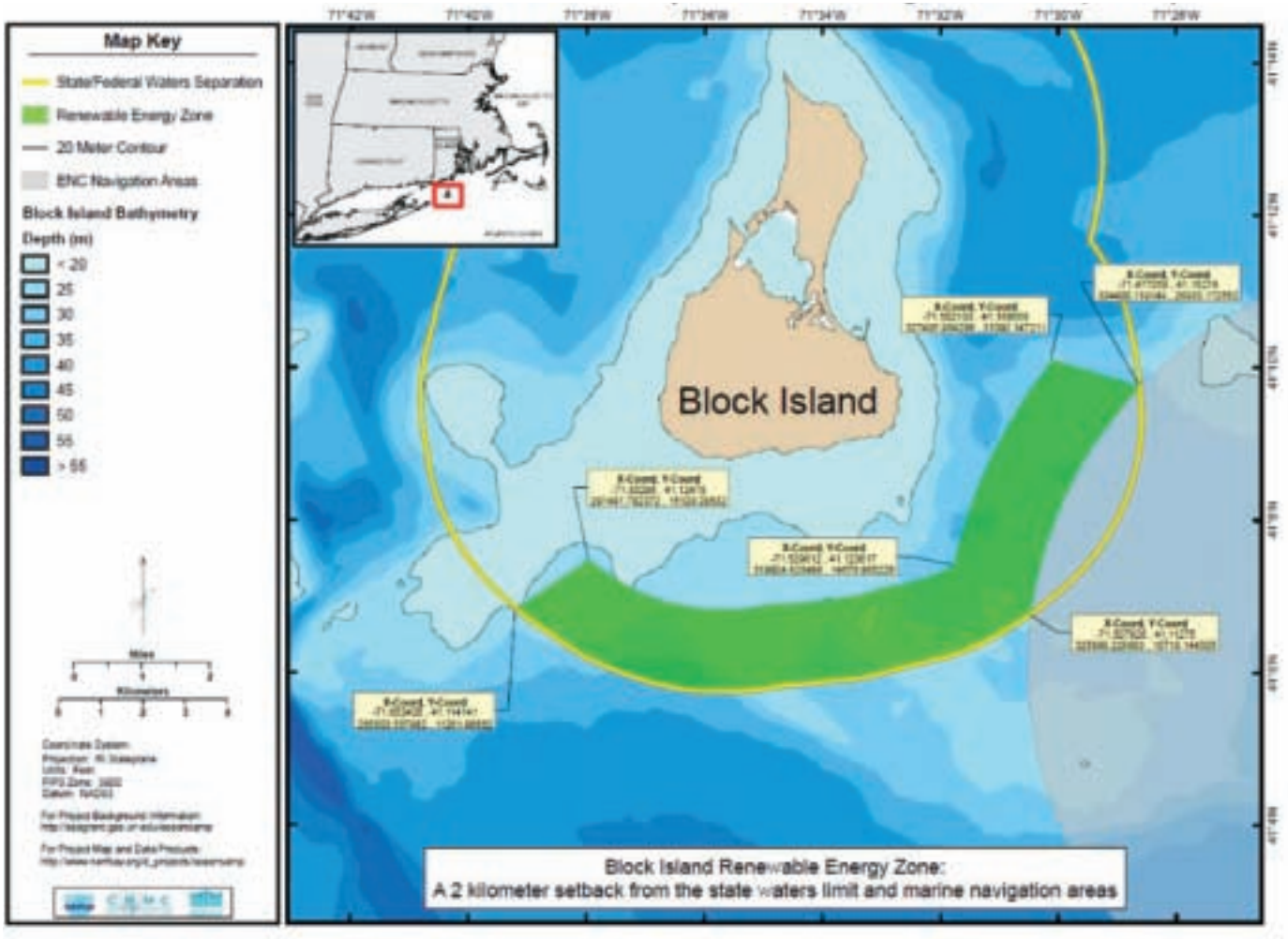
RECREATIONAL BOATING: The Council shall require, where appropriate, that project developers perform systematic observations of recreational boating intensity at the project area at least three times: pre-construction, during construction, and post-construction. Observations may be made while conducting other field work or aerial surveys and may include either visual surveys or analysis of aerial photography or video photography. The Council shall require, where appropriate, that observations capture both weekdays and weekends and reflect high-activity periods including the July 4th holiday

Summary of Permitting Requirements for New Development in the Ocean SAMP Area

Permitting Requirement	Ecological Resources	Cultural & Historical Resources	Fishing Resources	Transportation Resources	Recreational Resources
CRMC will deny or modify proposed new uses with potential for the following:	Adverse impacts on natural resources, particularly fish spawning and nursery habitats	Adverse impacts on cultural, historical, and tribal resources in the Ocean SAMP area	Significant long-term (greater than two seasons) adverse impacts on fisheries stocks and practices	Significant impacts on marine transportation and navigation	Significant impacts on marine recreation and tourism or on the ecological services supporting wildlife viewing opportunities
When making permitting decisions, the CRMC will consult with the following:	Habitat Advisory Board (six members appointed from non-profit and research communities)	Federal and state agencies and the Narragansett Indian Tribe	Fishermen's Advisory Board (nine members, from R.I. and MA) and other interested commercial and recreational fishermen	The U.S. Coast Guard, the U.S. Navy, the U.S. Army Corps of Engineers, NOAA, marine pilot organizations, and marine safety organizations	Recreational boating organizations
Survey requirements (vary by project):	Physical, geological, and biological characteristics of a proposed development site; potential impacts of a project on water quality, biological resources, threatened and endangered species, sensitive biological habitats, and fisheries resources	Assessment of potential impacts to archaeological resources; visual impact assessment	Fish and fishery uses in a proposed project area; potential impacts on these uses resulting from development	Risks posed by a project to navigational uses in the vicinity	Recreational boating intensity at a project site
Monitoring requirements (vary by project):	Coastal processes, physical oceanography, underwater noise, benthic ecology, avian species, marine mammals, sea turtles, fish, and fish habitat	Status of adjacent cultural and historical resources	Changes in commercial and recreational fishing practices, abundance of targeted species, and landings in the area	Changes in marine transportation, navigation, and existing infrastructure in and around the project site	Recreational boating and other facets of recreational usage at the site
The following areas receive varying levels of special protection:	Areas with unique or fragile physical features, important habitats, and high natural productivity; waters measuring less than 20 meters (about 65 feet) in depth; Areas identified as critical under the Endangered Species Act	Features of particular historical significance or cultural value	Areas of high fishing activity, including glacial moraines	Navigation, military, and infrastructure areas; Areas where development poses risks to navigation in areas of high-intensity commercial marine traffic	Areas of substantial recreational value
Developers must construct project infrastructure in compliance with the following:	Use the best available technology and techniques to mitigate any adverse impacts to threatened and endangered species, marine mammals and critical habitat	Halt activity and notify the Council if a potential archeological resource is discovered	Configuration must minimize disruption of fishing activities, for instance by including vessel traffic lanes	Configuration must minimize disruption of navigation, for instance by including vessel traffic lanes.	Configuration must minimize disruption of recreational boat traffic, for instance by including moorings and vessel traffic lanes

Renewable Energy Zone Map

RENEWABLE ENERGY ZONE. Based on the analysis of information including wind speeds, water depth, substrate types, existing uses, and protected areas, as well as considering the potential effects of offshore wind turbines on wildlife and existing uses from renewable energy, the Ocean SAMP has a designated Renewable Energy Zone (REZ). Approximately 2 kilometers (1.2 miles) wide and 34 square kilometers (13 square feet) long, this area extends from the east to the south-west of Block Island, just landward of the state water boundary. Developers that submit development proposals within the REZ within two years of Ocean SAMP approval may use data from the SAMP to complete their permitting process.



weekend and the period in June when Block Island Race Week takes place. The quantitative results of such observations, including raw boat counts and average number of vessels per day, will be provided to the Council.

COMMERCIAL AND RECREATIONAL FISHING ACTIVITY: A biological assessment of commercially and recreationally targeted fish species shall be required within the project area for all offshore developments. This assessment shall examine the relative abundance, distribution, and different life stages of these species at all four seasons of the year. This assessment shall comprise a series of surveys, employing survey equipment and methods that are appropriate for sampling finfish, shellfish, and crustacean species at the project's proposed location. Such an assessment shall be performed at least four times: pre-construction (to assess baseline conditions); during construction; and at two different intervals during operation. At each time this assessment must capture all four seasons of the year. This assessment may include evaluation of survey data collected through an existing survey program, if data are available for the proposed site. The Council will not require this assessment for proposed projects within the REZ that are proposed within two years of the adoption of the Ocean SAMP.

An assessment of commercial and recreational fisheries effort, landings, and landings value shall be required for all proposed offshore developments. Assessment shall focus on the proposed project area and alternatives. This assessment shall evaluate commercial and recreational fishing effort, landings, and landings value at three different stages: preconstruction (to assess baseline conditions); during construction; and during operation. At each stage, all four seasons of the year must be evaluated. Assessment may use existing fisheries monitoring data but shall be supplemented by interviews with commercial and recreational fishermen. Assessment shall address whether fishing effort, landings, and landings value has changed in comparison to baseline conditions. The Council will not require this assessment for proposed projects within the REZ that are proposed within two years of the adoption of the Ocean SAMP.

FACILITY AND INFRASTRUCTURE: The Council in coordination with the JAWG may also require facility and infrastructure monitoring requirements, that may include but are not limited to post-construction monitoring including regular visual inspection of inner array cables and the primary export cable to ensure proper burial, foundation, and substructure inspection.

Coordination

FEDERAL AGENCIES

Because the Ocean SAMP area includes both state and federal waters, implementing the Ocean SAMP to its full potential requires seamless synchronization between the CRMC and federal agencies. The primary federal agencies relevant to the Ocean SAMP are BOEM and the U.S. Army Corps of Engineers, the permitting authority for energy structures in state waters.

The CRMC set an early precedent for collaborating with these agencies by involving them in definition of the Ocean SAMP's scope and objectives, and maintained these relationships by periodically checking in with these agencies to assure compatibility of Ocean SAMP policies with federal regulatory requirements. As a result, the Ocean SAMP creates state renewable energy permitting requirements that dovetail with those utilized by BOEM, producing a streamlined permitting process and decision-making efficiency.

As noted previously, the Ocean SAMP creates an ongoing role for federal agencies in carrying out its policies by designating the JAWG, whose task is to establish case-by-case monitoring and mitigation requirements for proposed offshore development projects.

Since the Ocean SAMP area extends as far as 27 miles beyond Rhode Island's 3-mile state waters boundary, large parts of it are not directly manageable under Ocean SAMP policies. The key to bringing these parts into line with Ocean SAMP priorities is the federal consistency provision of the federal CZMA. This provision gives states legal grounds to contest activities undertaken or permitted by federal agencies in federal waters that (a) have reason-

ably foreseeable effects on human uses or natural resources in state waters, and (b) conflict with the state's coastal zone management plan. Additionally, due to the importance of the Ocean SAMP area to the state of Rhode Island, the CRMC opted to go beyond federal consistency and secured a Geographic Location Description (GLD) from NOAA's Office of Coastal Resources Management. As its name implies, a GLD is based on a description of the location for which it is sought and an assessment of the types of federally permitted activities that might take place there and how federally approved projects may have a foreseeable effect on the state's coastal resources and uses. Thanks to Ocean SAMP research, the CRMC was able to document how projects and activities permitted in federal waters could affect Rhode Island's coastal zone. A GLD has one important advantage over the traditional federal consistency provision: rather than placing the onus on the state to request federal consistency review over proposed projects in federal waters, it requires federal agencies to consult with states on proposed projects they permit or approve to ensure consistency with a state's coastal zone management program. This assures that projects, whether in state or federal waters, adhere to the same policies and standards.

NEIGHBORING STATES

Federal waters lying directly south of the border of Rhode Island and Massachusetts possess some of the best conditions for offshore wind power in the Ocean SAMP area. Because this region lies equidistant from Rhode Island and Massachusetts, both states have an interest in developing wind energy there.

On July 26, 2010, governors of Rhode Island and Massachusetts signed a memorandum of understanding (MOU) concerning a 400-square-mile area in this region, which they labeled the Area of Mutual Interest (AMI). The MOU is a pledge by both states to collaborate in the development of offshore wind energy projects in the AMI, and to share equitably in the ensuing benefits. It prohibits each state from developing projects in the AMI without the support of its neighbor.

The MOU designates a crucial role for Ocean SAMP in this collaboration, by making it the governing planning document for the entire AMI. Moreover, the MOU instructs the CRMC to designate the Massachusetts Executive Office of Energy and Environmental Affairs as a formal stakeholder in the SAMP process, to be considered on equal footing with other Ocean SAMP stakeholders in decisions concerning the AMI. Massachusetts fishermen are also included on the Ocean SAMP Fishermen's Advisory Board.

Since the AMI is in federal waters, the decision to permit development of wind energy there ultimately falls to BOEM. To facilitate this process, Ocean SAMP policies highlight the AMI as an optimal location for offshore wind energy development and make Ocean SAMP data available to BOEM for permitting evaluations. Ocean SAMP information is being incorporated into the BOEM Environmental Assessments for this area. Furthermore, due to the GLD and federal consistency, the policies of the Ocean SAMP still apply to this area.

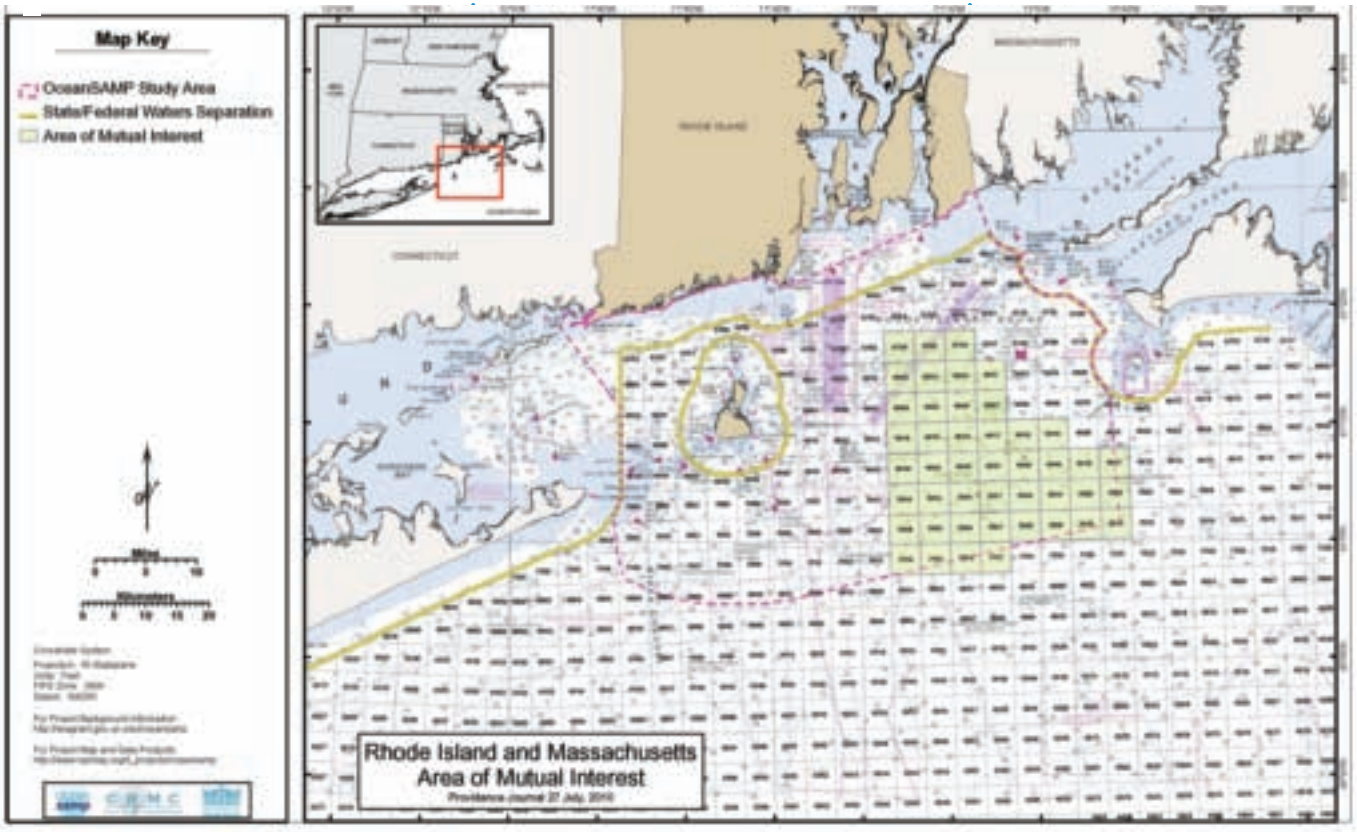
THE NARRAGANSETT INDIAN TRIBE

The tribe's proximity to the Rhode Island seacoast, longstanding connection to the Ocean SAMP area, and status as a federally recognized tribe make it an essential collaborator in Ocean SAMP implementation. The tribe's historic preservation office plays a role in SAMP implementation through its position on the JAWG. Through this role, the tribe will evaluate proposed new uses of the SAMP area in light of cultural, historic, and other relevant concerns.

Putting the Ocean SAMP into practice

Two years of research, interagency coordination, and participatory public planning generated a comprehensive set of Ocean SAMP policies that are fair, efficient, and grounded in sound science. As the CRMC puts these policies into practice, it will continue to rely on input from the scientists, state and federal agencies, and stakeholders that made this achievement possible. These collaborations ensure that the CRMC's decisions pertaining to the Ocean SAMP area reflect the broadest possible public interest and the best available science.

Areas of Mutual Interest for Rhode Island and Massachusetts



SCIENTISTS

The CRMC will confer with state and federal agencies, academic institutions, environmental organizations, and scientists when making decisions governing the selection of future development sites and identification of most valuable ecological areas within the Ocean SAMP area. Consultation with scientists will ensure that these decisions are based on the best available science and modeling tools.

The Council will convene a panel of scientists biannually to advise on findings of current climate science for the region and the implications for Rhode Island's coastal and offshore regions, as well as the possible management ramifications. The horizon for evaluation and planning needs to include both the short term (10 years) and longer term (50 years). The Science Advisory Panel for Climate Change will provide the Council with expertise on the most current global climate change-related science, monitoring, policy, and development design standards relevant to activities within its jurisdiction of the Ocean SAMP and its associated land-based infrastructure to proactively plan for and adapt to climate change impacts such as increased storminess, temperature change, and acidification in addition to accelerated sea level rise. The findings of this panel will be forwarded on to the legislatively appointed Rhode Island Climate Change Commission for their consideration.

INTERAGENCY COORDINATION

The Ocean SAMP JAWG, comprised of representatives of relevant state and federal agencies as well as the Narragansett Indian Tribe, will create project-specific construction and

operation requirements that conform to the regulatory requirements of all agencies involved.

STAKEHOLDERS
The CRMC will work with resource users and advocacy organizations to achieve a balance of uses within the Ocean SAMP area and to protect valuable habitat as well as recreational, navigational, and fishing sites from impacts of future development and climate change. Regular stakeholder participation in implementation is prescribed through semi-annual meetings of the Fishermen's Advisory Board and the Habitat Advisory Board. On an as-needed basis, the CRMC will also confer with public advocacy and citizens' groups, recreational organizations, marine pilots associations, and marine safety organizations to assure compatibility among current and future uses of the Ocean SAMP area.

A living document

The Ocean SAMP is more than a set of policies that respond to proposed projects, it is also a dynamic structure for continually studying, monitoring, and planning for the Ocean SAMP area in the face of changes and challenges that may arise in the future. The Ocean SAMP's systematic evaluation and revision framework assures that it adapts to changing environmental conditions and evolving public assessments of the Ocean SAMP area.

PROGRESS ASSESSMENT AND MONITORING PROCESS
The CRMC will monitor progress towards Ocean SAMP goals, objectives, and principles on an ongoing basis. It will communicate results of these assessments continually through the Ocean SAMP website and through formal biannual communications to the public.

OCEAN SAMP SCIENCE RESEARCH AGENDA
In conjunction with federal, state, and local governments, scientists, environmental organizations, and users of the Ocean SAMP area, the CRMC will oversee a permanent science research agenda designed to promote continual learning about the Ocean SAMP area. This group will help the Council identify data gaps, research priorities, potential partners, and potential funding sources for further research. Newly gathered information on the area's natural resources, human activities, impacts due to climate change, and interactions with offshore development will inform ongoing revisions to Ocean SAMP policies.

OCEAN SAMP BIANNUAL PUBLIC FORUM
Every two years, the CRMC will convene a public forum featuring progress updates on Ocean SAMP implementation and new research findings, including updated projections of the impacts of global climate change on the area. The biannual forum will provide opportunities for exchange of information, ideas, and strategies, and identify potential revisions to Ocean SAMP policies.

FIVE-YEAR REVIEW
Although the Ocean SAMP may be amended at any time through administrative process, the CRMC will conduct a major review of the document every five years. In keeping with SAMP principles, the review process will rely heavily on participation of stakeholders and on use of the best available science.

Conclusion

With Ocean SAMP adoption achieved and implementation underway, the Ocean SAMP project continues to enable Rhode Island to move forward in understanding state ocean waters and the tools with which marine resources can be managed and enhanced for decades to come. The state's effort to make full use of its federal consistency authority and secure a GLD not only allowed the Ocean SAMP to apply across federal and state waters, but will also streamline dialogue concerning development applications in the Ocean SAMP study area. Learning continues to take place with research projects on the animals, habitats, geology, and human uses significant to the area. Other states are studying the example of the Rhode Island Ocean SAMP, and in turn, the experiences of other places are helping Rhode Island to enhance its approach to ecosystem-based management. The Ocean SAMP has demonstrated the strong links that people and communities share with their ocean waters. It's not a final answer, but a start—a start to ensuring that Rhode Island manages its ocean waters not only to protect its riches of natural resources, but to promise them to future generations to come.

Ocean SAMP Resources and Research

The Ecosystem

The Rhode Island Ocean SAMP area comprises portions of Rhode Island Sound and Block Island Sound as well as a section of the Atlantic Ocean out to the continental shelf slope. It is an ecologically unique transition zone characterized by the mixing of deep offshore waters with the shallower, more productive estuarine waters of Narragansett Bay and Long Island Sound.

Abundant marine life

The Ocean SAMP area is a biologically productive area, with an abundance of finfish, shellfish and crustacean species, marine mammals, sea turtles, and birds. Block Island Sound and Rhode Island Sound are characterized by a seasonal flux of offshore organisms: every summer, there is an influx of plankton from offshore. Animals including commercially and recreationally important finfish and crustacean species as well as whales and other marine mammals, follow this source of food inshore. This seasonal influx of plankton also includes larvae of commercially important species such as lobster and menhaden, which spawn offshore but grow to adulthood further inshore. Birds are also a key part of the Ocean SAMP area ecosystem. Passerines regularly migrate through, with Block Island being an important stopover point in this migratory path, and waterbirds are abundant in the Ocean SAMP area during the winter months.

Supportive habitats

Much of this marine life relies on the rich benthic habitats found in the Ocean SAMP area. For example, glacial moraines are important habitat areas for a diversity of fish and other organisms because of their relative permanence and structural complexity. Glacial moraines create environments that exhibit some of the highest biodiversity within the Ocean SAMP area. Most of the glacial moraines mapped through the Ocean SAMP research effort are located in federal waters. The glacial moraines and other unique features create and define the value of the area for fisheries, tourism, recreation, and other human uses, as well as its ecological value to the eastern North Atlantic ecosystem. The Ocean SAMP is helping define the distinct linkages between the resources in this offshore area and the coastal uses and resources of Rhode Island's coastal zone.

Protecting ecosystems

The Ocean SAMP formally recognizes the importance of preserving and restoring the area's ecosystem, particularly in light of the vast uncertainties imposed by climate change. Its policies strive to maintain a delicate ecological balance in the area through comprehensive and forward-looking

Ecological Impacts of Climate Change

Ten thousand years ago, rapid sea level rise transformed the terrestrial ecosystem that then dominated the Ocean SAMP area into the marine ecosystem that occupies it now. Science indicates that the area is again undergoing rapid climatic change, this time associated with rising greenhouse gas concentrations in the atmosphere. Global trends towards warming waters, ocean acidification, rising sea levels, and increasing storms are expected to have significant yet hard-to-predict implications for the area.

SHIFTING SPECIES RANGES **As Ocean SAMP area waters warm, cold-water species like cod and lobster are expected to retreat northward, with warm-water species taking their place. Such a shift could have major implications for fisheries.**

SHIFTING MIGRATION SCHEDULES **Temperature-induced modifications in the timing and intensity of annual migrations may throw predator-prey cycles off kilter. For instance, early arrival of a comb jelly species is thought to have an adverse effect on crab and lobster larvae, with potential consequences for local fisheries.**

HABITAT LOSS **Physical elimination or alteration of ocean and coastal habitat may negatively affect certain species. For instance, piping plovers and least terns, which are both threatened species, may lose critical beach nesting habitat due to sea level rise.**

ACIDIFICATION **As ocean waters absorb atmospheric carbon dioxide, they become more acidic. Acidity impairs the shell-building ability of lobsters, clams, and plankton, interferes with the oxygen intake mechanisms of squid and fish, and disrupts the olfactory cues used by larval fish to locate suitable habitat.**

DISEASE **Warming waters are expected to facilitate the spread of marine diseases. Increased temperatures have already been implicated in the increased incidence of shell disease among lobsters in the Ocean SAMP area, further threatening an already vulnerable fisheries resource.**

INVASIVE SPECIES **Warming waters are expected to decrease the resilience of native species while expanding hospitable ranges for invasive species that disrupt or prey upon local marine life. No data yet exist on this compounding effect in the Ocean SAMP area.**

New Insights Gained about Seaduck Feeding Behavior

Through the Ocean SAMP, URI avian researchers have been able to take a closer look at how a wide variety of birds, including wintering sea ducks, make use of Rhode Island's nearshore and offshore waters. URI professor and avian expert Peter Paton explains that until recently, the body of research on sea duck habitat use has maintained that most species typically only utilize and forage in waters with maximum depths of 20 meters, or nearly 66 feet, to feed on the seafloor for their staple foods of clams, mussels, snails, and marine worms. Paton's recent low-altitude aerial bird surveys over the Ocean SAMP study area have documented black scoters, a common wintering sea duck species on the East Coast, in waters up to 40 meters (nearly 130 feet) deep, where wintering sea ducks are not typically found. Black scoters have been found to be particularly sensitive to offshore wind development. At this point it is unclear if the birds are foraging in these deeper waters, says Paton, but the sightings are important, because they suggest that these birds, and perhaps other species, may be accessing their habitats more extensively than previously understood. Thanks to the ongoing nature of the SAMP, the opportunity exists for researchers like Paton to continue to update the plan as new findings emerge.

decision-making structures that draw on the expertise of both scientists and resources users. These include:

- A Habitat Advisory Board (HAB) composed of nine members drawn from the research and non-profit communities and charged with advising the CRMC on potential impacts of new uses and prioritization of future ecological research;
- A science research agenda—developed by scientists, partner federal and state agencies, environmental organizations, and users of the Ocean SAMP area—to help the CRMC identify data gaps, research priorities, potential partners, and available funding sources relevant to understanding the area's changing natural resources; and
- A panel of climate scientists that will update the CRMC biannually on newly detected climate change impacts and options for adaptation in the Ocean SAMP area.

The Ocean SAMP makes ecological protection a major consideration in the permitting of new uses of the Ocean SAMP area. To assure that new uses do not create adverse impacts on the area's ecosystem, the Ocean SAMP holds that prospective developers must avoid significant adverse ecological impacts, in particular those affecting fish spawning and nursery habitats.

Where impacts are unavoidable, developers are responsible for minimizing and mitigating them. Extensive research and mapping work allowed the Ocean SAMP to apply several levels of protection for ecologically sensitive areas:

- Areas with unique or fragile physical features, important habitats, and high natural productivity are listed as Areas of Particular Concern (APCs). Developers must avoid them, and, where avoidance is not possible, must minimize and mitigate impacts to the resources they contain.
- Waters measuring less than 20 meters (about 65 feet) in depth are listed as Areas Designated for Protection (ADPs) due to their function as sea duck foraging habitat. Large-scale offshore developments (e.g., offshore wind farms consisting of more than five turbines, wave or tidal energy generation devices, offshore liquified natural gas (LNG) platforms, and artificial reefs) are prohibited in these areas.
- Areas identified as critical under the Endangered Species Act are off limits to all offshore development.

Moraines act as a magnet for commercially and recreationally important species of fish and lobster. The Ocean SAMP protects moraines by classifying them as Areas of Particular Concern (APC).

Ocean SAMP Habitats

MORAINES Moraines are mounds of glacially deposited geological debris that crisscross the floor of the Ocean SAMP area. Their elevation and intricacy makes them some of the richest habitat in the Ocean SAMP area. As a result, numerous organisms depend on them for food and shelter. Moraines act as a magnet for commercially and recreationally important species of fish and lobster. The Ocean SAMP protects moraines by classifying them as Areas of Particular Concern (APC).

FISH HABITAT Many fish species depend on habitat found within the Ocean SAMP area during some stage in their life cycles. Ocean SAMP policies highlight the importance of spawning and nursery areas, since these habitats provide a vital link during the most vulnerable stages of fish life cycles. Mapping currently underway will provide a more complete picture of key fish habitats in the Ocean SAMP area.

SEA DUCK FORAGING HABITAT Sea ducks, which include eiders and scoters, feed by diving for worms and other invertebrates on the seafloor. To protect vital duck foraging habitat, the Ocean SAMP classifies all waters with depths less than or equal to 65.6 feet (20 meters) as Areas Designated for Preservation (ADP).

"The SAMP is an exhaustive resource inventory for a lot of data that was out there. That lets us know what needs to be protected, and where there are opportunities for new development without forcing major environmental or other tradeoffs."

JOHN TORGAN,
FORMERLY BAYKEEPER FOR SAVE THE BAY, AND MEMBER OF THE OCEAN SAMP STAKEHOLDER GROUP

Cultural and Historical Resources

Human life has been intertwined with the Ocean SAMP area for at least 7,500 years. Humans may have even lived in the area during the ice age, when sea levels were much lower than they are today. Archaeological surveys and historical research conducted for the Ocean SAMP highlight the rich and still-evolving heritage of the area.

FOOD The Ocean SAMP area has nourished humans ever since the Narragansett and Wampanoag Indian Tribes first feasted from its shores. With the advent of commercial harvesting methods in the 1600s, fishing became a source not only of food but of profit. The abundance of fish resources was a motivating factor in the migration of tens of thousands of Europeans to New England.

ENERGY Beginning with the harvest of firewood and peat on Block Island during colonial days, the Ocean SAMP area has played a critical role in powering Rhode Island. Since the dawn of the fossil fuel age, the area has been a key passageway for hundreds of thousands of vessels carrying coal and petroleum to Rhode Island ports. The grounding of the North Cape oil barge in 1996 was but the latest in a centuries-long string of energy-related transportation accidents; most of the ships lying in the depths of the Ocean SAMP area sank while transporting coal during a busy industrialization period between 1870 and 1920. Offshore renewable energy represents a new chapter in the evolving role of the Ocean SAMP area in providing for Rhode Island's energy needs.

LEISURE Rhode Island's shores have been a choice vacation destination

"A largely forgotten chapter": The Ocean SAMP Area and the 19th-Century Coal Trade

While the SAMP lays out policies and practices for managing a wide spectrum of coastal and ocean resources and uses, the question of how Rhode Island will approach the issue of developing its offshore renewable energy resources, mainly windpower, has emerged as a subject of SAMP dialogue. But this is far from the first time that Rhode Island's ocean waters have served as the backdrop against which local, regional, and national energy issues have played out for two centuries. Consider the 19th-century coal trade, says URI underwater archeologist Rod Mather, whose research is captured in the Cultural and Historical Resources chapter of the SAMP: "The Ocean SAMP area's energy landscape is very important in the history of Rhode Island and greater New England. The coal vessels provided critical infrastructure without which the region would have languished economically after the Civil War. It has been a largely forgotten chapter in the state's maritime or industrial history. Where merchant vessels such as the famous Brown family East Indiaman *Ann and Hope* that wrecked at Block Island in 1815 were highly visible in cultural terms and associated with the wealth and social status of their owners, the coal vessels, with a few notable exceptions, rarely contributed to the social status to their owners, officers, or crew. Indeed other merchant mariners regarded the grimy armada of coaling vessels and their crews with mixture contempt and pity due to the low wages, harsh living conditions, mixed racial composition of the workforce, and the frequent accidents they endured (The Seaman's Bill, Hearings Held Before the Committee on Merchant Marine and Fisheries on House Bill 11372, December 14, 1911)."

since the late 19th century. Newport's extravagant seaside cottages hail from the Gilded Age of the late 19th century, while the state's numerous beaches have drawn Rhode Island's urban residents for more than 100 years. Rhode Island has hosted international America's Cup yachting races, and seaside vistas and maritime pastimes continue to spur major economic and cultural activities within and around the Ocean SAMP area.

DEFENSE The Ocean SAMP area has played a role in at least 20 military conflicts since colonial times. The area has been the site of skirmishes, transit of vessels, training and testing, and development of weapons. Military presence peaked during World War II, with the establishment of several naval stations along Rhode Island's coast. Vestiges remain, in the form of unexploded ordnance and ship and plane wrecks littering the seafloor. The most notable is the wreck of the German U-boat 853, sunk off of Block Island only days before Germany's World War II surrender.

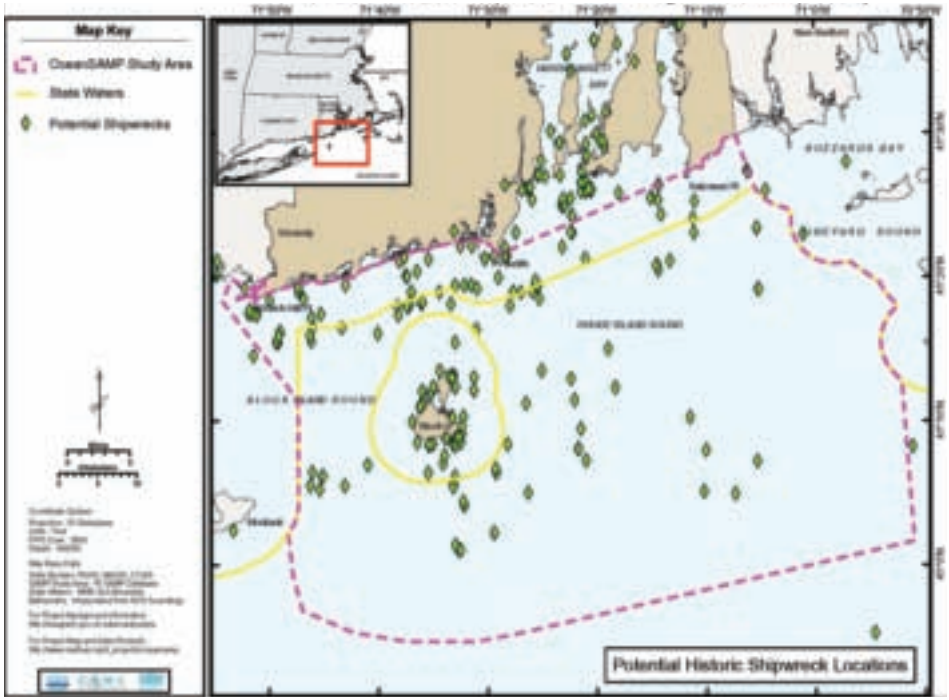
NARRAGANSETT INDIAN TRIBE ORAL HISTORY The Narragansett Indian Tribe is the oldest known culture in Rhode Island. Archaeological evidence and oral history suggest that the tribe has lived in the area for over 30,000 years. Thanks to work by Dr. Ella W. T. Sekatau, the tribe's official historian, the Ocean SAMP contains the first-ever recorded version of the tribe's oral history, covering events from its first known origins until the present time.

Protecting cultural and historical resources

The Ocean SAMP formally recognizes the area's cultural and historical significance for Rhode Island, and calls upon the CRMC to engage state, federal, and tribal entities when evaluating potential impacts of new uses on these resources.

Features of particular cultural or historical value, such as shipwrecks and underwater archaeological sites, receive special protection. The Ocean SAMP designates these sites as APCs; prospective developers must avoid APCs, and, where avoidance is not possible, must minimize and mitigate impacts to the resources they contain.

Potential Historic Shipwreck Locations



SHIPWRECKS The Ocean SAMP area's history remains in evidence on its seafloor, in the form of sunken ships. At least 600 ships—schooners, steamers, fishing boats, submarines, tugs, and barges—are estimated to have sunk within the Ocean SAMP area. Fifty of these lie at known locations, and are listed as APCs.

Commercial and Recreational Fishing

Fishing is one of the oldest and the most significant human uses in the Ocean SAMP area in both economic and cultural terms. Catching fish—for profit, sport, or food—occurs in almost every segment of the Ocean SAMP area at some point during the year. Fishermen collaborated with SAMP researchers to generate an account of where they fish, when they fish, and what gear they use. This data will help shield fisheries from impacts associated with offshore development.

COMMERCIAL FISHING Commercial fishing in the Ocean SAMP area occurs year-round and encompasses an array of gear types and species. Fishing includes bottom trawling for flatfish, cod, and squid; mid-water trawling for herring and mackerel; dredging for scallops; rod-and-reel fishing for striped bass, fluke, and tuna; gillnetting for skate, fluke, and monkfish; and trap fishing for lobster, sea bass, and scup.

According to fishermen who helped craft the Ocean SAMP, fishing patterns are highly seasonal, due to the influx of warm-water migrants in summer and cold-water migrants in winter. Fishermen follow the fish, often concentrating on transitional habitats where fish converge during their migrations. A prime fishing area is Cox's Ledge, which is used by many different commercial gear types as well as recreational anglers.

RECREATIONAL AND FOR-HIRE FISHING Recreational fishing is a popular pastime for Rhode Islanders and a major attraction for out-of-state tourists. In 2007, 182,000 anglers fished Rhode Island waters, making total of 1.2 million trips. The bulk of recreational fishing takes place in the summer, during the migrations of top recreational fish like tuna, scup, bluefish, and striped bass. The Rhode Island Saltwater Anglers Association sponsors 15 tournaments per year, as well as a "yearlong" tournament targeting 15 species; all of the tournaments involve species found in the Ocean SAMP area.

Recreational fishermen may try their luck from shore, from private boats, or from one of the approximately 150 charter and party boats licensed in Rhode Island. The waters surrounding Block Island are a particularly popular spot for recreational fishing.

Estimated Added Income in Rhode Island from Fishing

$75.2 million generated by commercial fishing (National Oceanic and Atmospheric Administration/National Marine Fisheries Service [NOAA/NMFS]. 2008)

$69 million generated by seafood processors and wholesalers (NOAA/NMFS. 2008)

$52 million generated by recreational fishing (U.S. Department of Commerce. 2008)

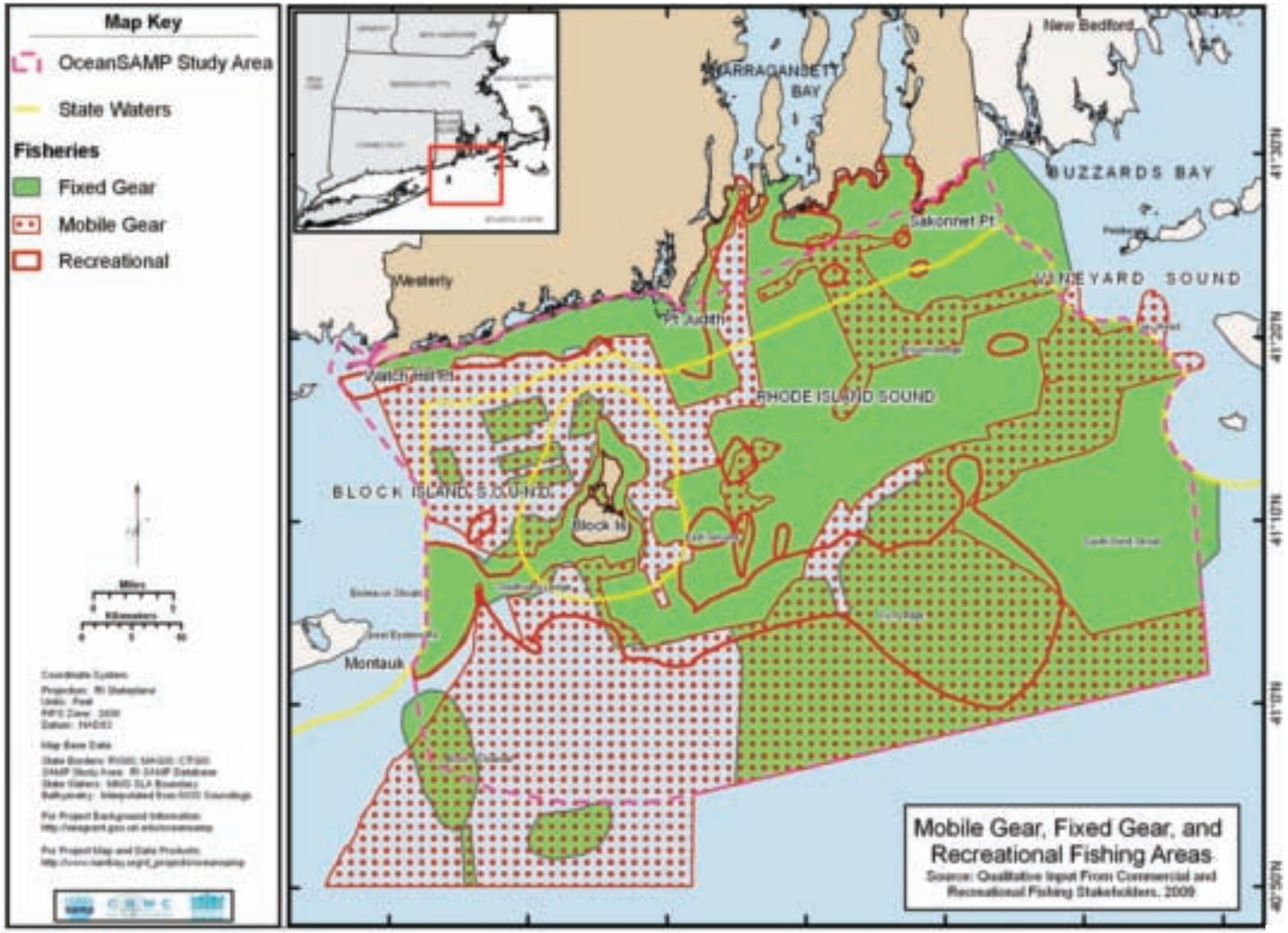
Promoting and enhancing fishing

The Ocean SAMP formally recognizes the paramount economic, cultural, and social value to Rhode Island of the commercial and recreational fisheries taking place throughout the Ocean SAMP area. It calls for a two-fold approach that simultaneously safeguards fisheries from adverse impacts associated with new development while improving the sustainability of fishing practices.

The Ocean SAMP creates a role for commercial and recreational

Commercial and Recreational Fishing Areas

AREAS OF HIGH FISHING ACTIVITY Although the entire Ocean SAMP area is used for fishing, some areas are especially fertile. These often lie along the edges of distinct habitats, where mud meets sand, sand meets gravel, gravel meets boulders, or boulders meet ledge. The FAB will identify areas of high fishing activity in or around proposed developments. These areas will be treated as APCs.



"This area includes some of the best fishing locations in the R.I. area. Any development must be done in such a manner that recreational fishing interests are considered."

RICH HITTINGER,
FIRST VICE PRESIDENT,
R.I. SALTWATER ANGLERS ASSOCIATION

"Every square inch of the Ocean SAMP is being used at some time during the year. We must use the SAMP to ensure that the Rhode Island fishing and coastal communities that the industry supports do not become collateral damage in the effort to develop renewable energy. "

LANNY DELLINGER, PRESIDENT,
R.I. LOBSTERMEN'S ASSOCIATION

fishermen in shaping implementation of its fisheries-related policies through a nine-member Fishermen's Advisory Board (FAB). Composed of six Rhode Island fishermen and three Massachusetts fishermen, the FAB is tasked with advising the CRMC on proper siting of new developments and mitigation of any ensuing impacts. Mitigation requirements will be established by the CRMC on a case-by-case basis, and may include financial compensation, effort reduction, habitat preservation and restoration, or infrastructure improvements.

Moreover, the Ocean SAMP creates a pathway for all fishermen to access developers, by requiring each developer to appoint and fund a third-party fisheries liaison for the duration of a project.

The Ocean SAMP designates areas of high fishing activity, including glacial moraines, as APCs. The CRMC may, through consultation with the FAB, specify additional prime fishing areas as APCs. The Ocean SAMP requires prospective developers to avoid APCs, and, where avoidance is not possible, to minimize and mitigate impacts to the resources they contain.

Transportation and Navigation Resources

Located at the center of a constellation of ports and the shipping lanes, the Ocean SAMP area is a busy maritime thoroughfare. By cataloging maritime activities and navigation patterns, the Ocean SAMP offers a deeper understanding of these uses and protects them from the impacts of development and climate change. Knowledge contributed by the U.S. Coast Guard (USCG), NOAA, the Northeast Marine Pilots, R.I. Department of Environmental Management (RIDEM), and local port and vessel operators was key to this effort.

SHIPPING Freight vessels enter Narragansett Bay daily through the Ocean SAMP area, most bound for Providence and Fall River with cargos of petroleum and coal. In addition, many other ships traverse the Ocean SAMP area en route between New York, Boston, and points north and south. Four official pilot boarding areas at the entrance of Narragansett Bay indicate places where commercial ships pick up pilots to guide them through state waters.

TRANSPORTATION Passenger ferry service connects Block Island to points in Rhode Island, Connecticut, Massachusetts, and New York. In 2006, ferries traveling through the Ocean SAMP area conveyed over 700,000 passengers to their destinations.

NAVY USE The Navy controls two restricted zones in the Ocean SAMP area, one for torpedo testing and another for mine-laying exercises. In addition, U.S. Naval Undersea Warfare Center (NUWC) tests equipment such as unmanned vehicles in the area. Roughly seven naval vessels pass through the Ocean SAMP area en route to Newport each year, and New London-based submarines cross its southwest corner to reach offshore transit lanes.

Promoting and enhancing transportation and navigation

The Ocean SAMP formally recognizes the economic, historic, and cultural value to Rhode Island of transportation and navigation in the Ocean SAMP area. It ensures that consideration of these uses is a priority when permitting proposed new uses of the area, and creates a role for federal agencies and marine pilots organizations when evaluating these proposals.

Extensive mapping of navigation and transportation activities throughout the Ocean SAMP area pinpointed sites that are indispensable to shipping and military areas. The Ocean SAMP lists these as APCs. Prospective developers must avoid these areas, and where avoidance is not possible, they must minimize and mitigate impacts there. In addition, the Ocean SAMP prohibits large-scale offshore development in areas of high-intensity commercial marine traffic if it poses risks to navigation in area.

Employment Value of Transportation and Navigation to Rhode Island

2,053 jobs at the Ports of Providence and Davisville (FXM Associates, 2008)

2,602 jobs at Naval Undersea Warfare Center (NUWC Division Newport, 2009)

"My agency, the Coast Guard, is committed to ensuring a balanced, safe use of our waterways by all those with an interest in our ocean resources. The Ocean SAMP process provided us with an opportunity to participate with other local, state, and federal stakeholders in a truly comprehensive review of the current and potential future uses of Rhode Island's coastal waters."

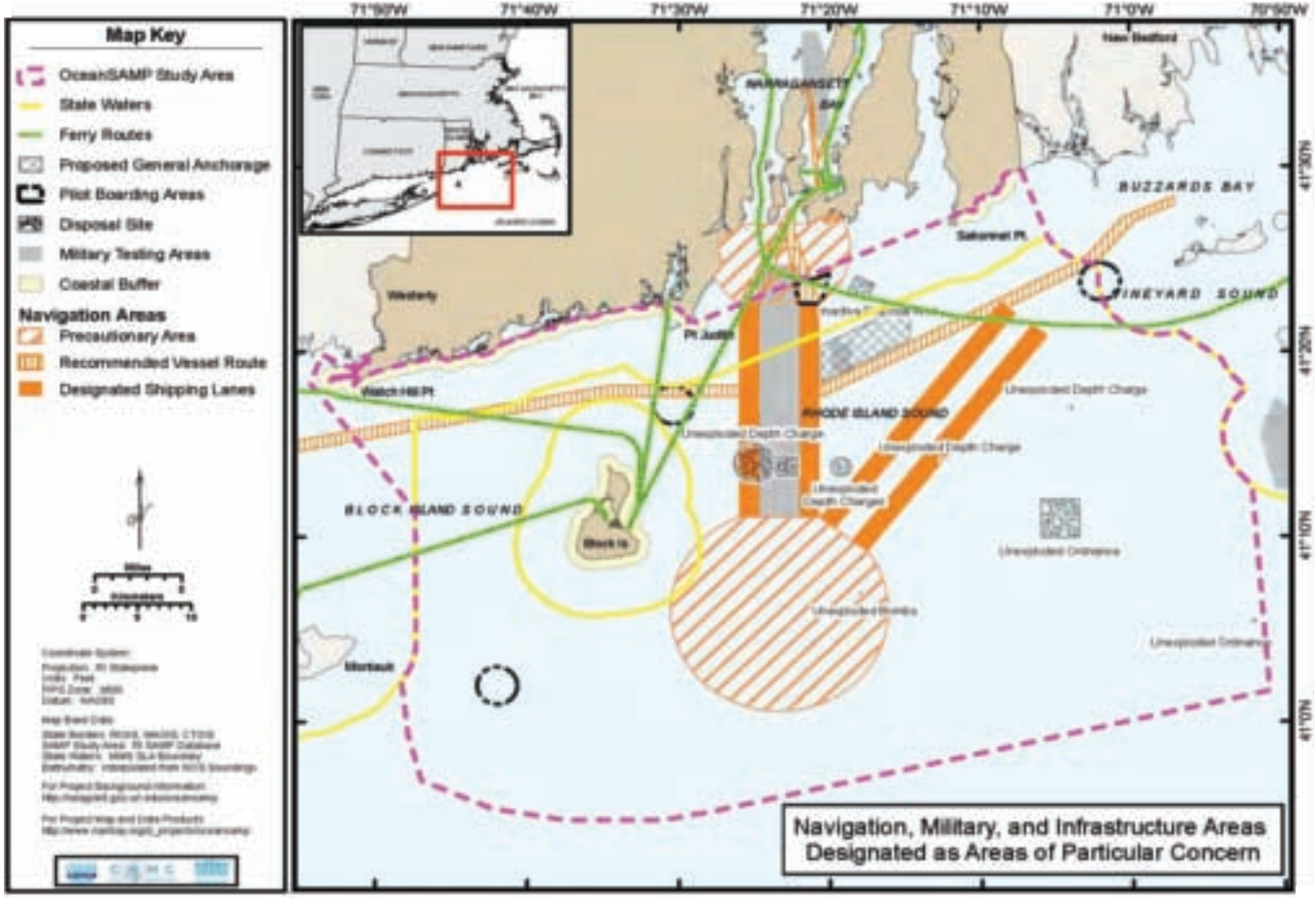
— EDWARD LEBLANC, USCG

Eyeing the Potential for Short Sea Shipping

As a living document, the SAMP always considers the past, addresses present needs, and looks ahead to possible future uses. One potential transportation use being raised is short sea shipping, as described in the Marine Transportation, Navigation & Infrastructure chapter of the Ocean SAMP: "Commercial traffic in the Ocean SAMP area may increase in the future if a short sea shipping industry develops in Rhode Island. Short sea shipping is the movement of goods (usually containerized) domestically aboard barges, with the goal of reducing truck traffic on congested highways. The corridor between Boston, New York, and Washington, D.C., has been proposed as an attractive region in which to develop short sea shipping routes due to the amount of traffic congestion, the region's population density, and the availability of port facilities (R.I. Economic Monitoring Collaborative 2007). No short sea shipping routes are currently in use in the area, but some sources indicate that if this use were to develop, Rhode Island ports, particularly Providence, could serve as a central hub (R.I. Economic Monitoring Collaborative 2007; National Ports and Waterways Institute, University of New Orleans 2004). If short sea shipping were to develop in Rhode Island, it would greatly increase the number and frequency of vessel transits through the Ocean SAMP area."

Navigation, Military, and Infrastructure Areas Designated as Areas of Particular Concern

NAVIGATION, MILITARY, AND INFRASTRUCTURE AREAS The Ocean SAMP area is crisscrossed by shipping lanes, ferry routes, dredge disposal sites, military testing areas, unexploded ordnance, pilot boarding areas, anchorages, and submarine transit lanes. Because all of these represent vital uses that cannot be displaced or altered without provoking danger or economic disruption, the Ocean SAMP lists them as APCs.



Recreation and Tourism Resources

The Ocean SAMP area's winds, waters, and wildlife make it a prime destination for adventure and relaxation, particularly during summer months. These amenities not only enrich life for Rhode Islanders, but also act as a major draw for tourists. As Rhode Island's fourth largest industry, tourism accounts for $6.8 billion of spending in the state and generates 12 percent of tax revenues. Based on input from boaters, tour operators, and other stakeholders, the Ocean SAMP describes recreational usage patterns in the area and offers policies to protect these uses from potential impacts of future development.

BOATING Ocean SAMP research highlights the popularity of the area for sport fishing, sailing, and long-distance cruising between ports. Of particular economic importance are the seven inshore and 16 long-distance sailing races that are held on a regular basis in the area and sustain Rhode Island's century-old reputation a world-class sailing center.

DIVING Scuba divers are drawn to the shipwrecks and marine life found in the Ocean SAMP area, particularly during warmer months. Ocean SAMP research found that approximately 10 licensed dive boats operate in the area, in addition to an unidentified number of private boats.

WILDLIFE WATCHING The opportunity to glimpse whales, birds, and sharks is a small but highly valued use of the Ocean SAMP area. Conversations with tour guides uncovered geographic and seasonal patterns in wildlife viewing, noting that whale watching is best in July and August; bird watching occurs throughout the year, in locations determined by migration patterns; and shark viewing, which takes place within floating or submersible cages, occurs over a large geographical range during summer months.

BEACHES From the shore, the Ocean SAMP area provides spectacular views and cultivates a maritime character valued by locals and tourists alike. Portions of coastal Rhode Island adjacent to the Ocean SAMP area are heavily dependent on these primarily seasonal amenities for income associated with recreation and tourism.

Value of Boating in Rhode Island

2,071 people employed in the boating industry (Thunberg, 2008)

43,000 boats registered in Rhode Island (Ninigret Partners, 2006)

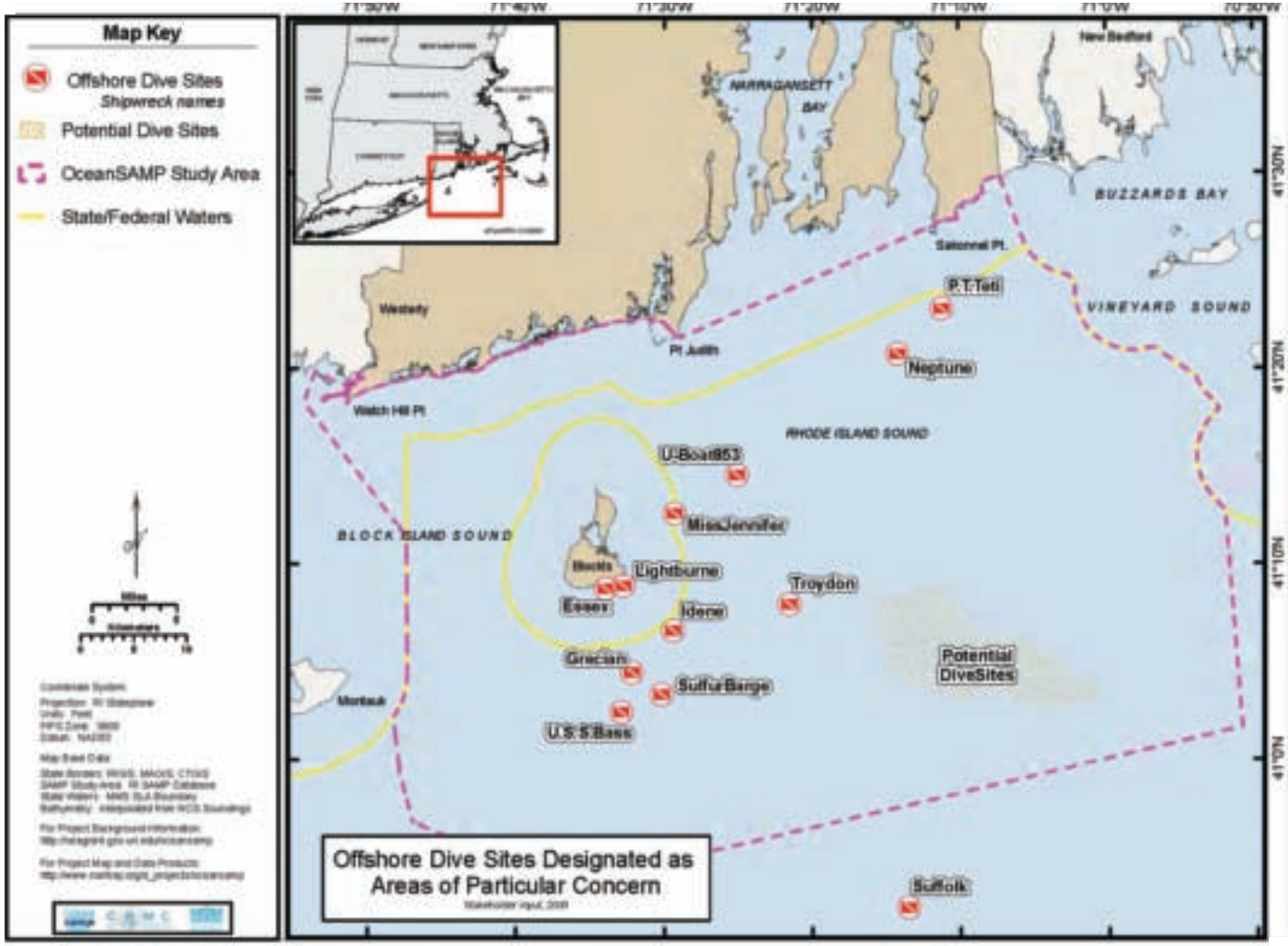
Promoting and enhancing recreation and tourism

The Ocean SAMP recognizes that marine recreation and tourism are not only vital to Rhode Island's economy but are also instrumental in shaping the state's culture and identity. These uses are a prime consideration when permitting proposed new uses in the Ocean SAMP area, and recreational boating organizations have a role in evaluating these proposals.

Extensive mapping of recreational activities throughout the Ocean SAMP area located sites of substantial recreational value, such as sailboat racing grounds and offshore dive locations. The Ocean SAMP lists these as APCs. Prospective developers must avoid these areas, and where avoidance is not possible, must minimize and mitigate impacts to the resources these areas contain.

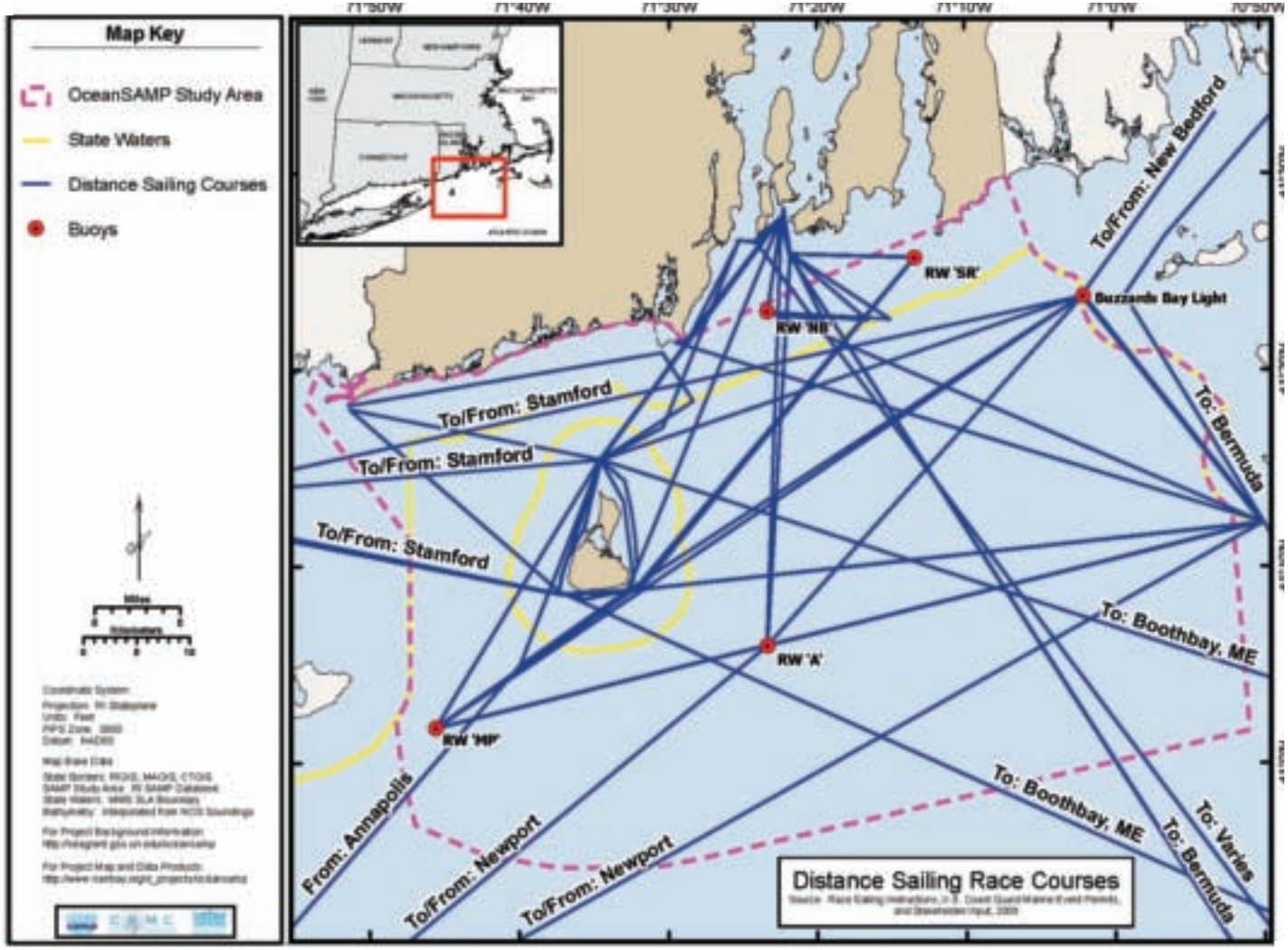
Offshore Dive Sites Designated as Areas of Particular Concern

DIVE SITES Offshore recreational divers prize the adventure and historic value of the Ocean SAMP area's shipwrecks. Due to the irreplaceable and highly valuable nature of these dive sites for recreation and tourism, the Ocean SAMP lists them as APCs.



Sailboat Racing in the Ocean SAMP Area

SAILBOAT RACING AREAS Sailboat races are a valued cultural and recreational tradition in the Ocean SAMP area, and represent a significant boon to Rhode Island's economy. The waters south of Brenton Point are a hub for buoy racing, and many long-distance races also start or end in these waters; from 1930 to 1983, this was the site of the internationally renowned America's Cup race. Block Island is a popular destination or waypoint for many races, including Block Island Race Week. Because of the importance of these two areas in sailboat racing, the Ocean SAMP lists them as APCs.



A Long and Valued History as an Ideal Sailing and Boating Locale

The Ocean SAMP Recreation and Tourism chapter offers rich detail about the tradition of boating—from race sailing to pleasure cruising—in Rhode Island's ocean waters and harbors. Heralded events such as the America's Cup and the Newport-Bermuda Race have earned Rhode Island global recognition as a yachting capital, while waters closer to shore provided relaxation and respite to those lucky enough to own a vessel: "In addition to seaside tourism, Block Island has historically been a popular destination for recreational boaters and sailors. A 1948 cruising guide, *Yachting in North America*, identifies Block Island as a recommended destination and directs boats to anchor in the Great Salt Pond, rather than Old Harbor on the east side of the island. It identifies Block Island as "a place where you'll meet every cruising yacht and yachtsman between Cape Cod and New York. It's the goal of many a small boat's cruise from both the western end of Long Island Sound and the ports to the eastward, the place where bigger yachts almost always stop in when bound either east or west, and the scene of many a yacht club rendezvous and cruising-race finish" (Connett 1948).

Climate Change

Records show that over the last hundred years, New England has experienced increases in air and ocean surface temperatures, sea level, wetness and storminess, and acidity of sea water, with a concomitant decrease of wind speeds. In anticipation of these changes, the Ocean SAMP process convened scientists and resource users to speculate on possible implications for human uses of the Ocean SAMP area. This forethought forms the basis of flexible policy mechanisms capable of adapting to the impacts of climate change as they become better understood.

Rising temperatures

Ostensibly, increases in air and water temperatures may benefit recreation and transportation in the Ocean SAMP area by lengthening shipping and boating seasons and reducing winter icing of vessels and waterways. At the same time, however, warmer water temperatures may harm recreation and tourism in the area by increasing populations of jellyfish and harmful algae and by shortening the viewing season for seals and winter migratory birds.

Human activities in the Ocean SAMP may also endure impacts from the reshuffling of species that is expected to occur as a result of warming waters. Species at the southern end of their range in the Ocean SAMP area are likely to either decrease within the area, become available for a shorter amount of time, or shift their presence to the area's deeper waters. Several commercially important species, including American lobster, Atlantic cod, silver hake, and winter flounder, belong in this group. In contrast, species at the northern end of their range in the Ocean SAMP area are likely to become available in larger quantities or for longer periods of time. These include Atlantic croaker, black sea bass, blue crab, butterfish, scup, and summer flounder. These changes may exert pressure on fishermen to travel further in pursuit of fish, target different species, and employ different fishing methods.

Increasing precipitation and storm intensity

Projected increases in overall wetness, storm frequency, and storm intensity may pose negative consequences for boat travel in the Ocean SAMP area. Greater and more frequent storms may damage infrastructure and vessels, diminish visibility at sea, increase erosion around coastal infrastructure, disrupt cargo loading and unloading procedures, interfere with ferry schedules, and make fishing and recreational boating more dangerous. Storms may also shorten the boating season, counteracting the positive effect of warmer weather on recreation and tourism in the Ocean SAMP area. Indirectly, greater precipitation may increase runoff from land, leading to higher rates of water pollution, nutrient enrichment, and sedimentation of waterways.

Sea level rise

Rising sea level poses a variety of complications for marine activities. Sea level rise may improve navigability of waterways by increasing water depth, but it may also reduce vessel passing heights under bridges, increase the vulnerability of coastal infrastructure, and eliminate or alter the barrier beaches, salt marshes, and other habitats that make Rhode Island's shoreline appealing for recreation.

Diminishing wind speeds

Projected weakening of wind speeds may make the Ocean SAMP area less attractive for sailing, putting a damper on the area's popular sailboat races. In addition, changes in wind patterns may alter ocean currents, requiring modifications of vessel routes.

Ocean acidification

By causing faster rates of corrosion, ocean acidification is expected to increase the vulnerability of infrastructure and vessels and speed the rate of decay of the area's culturally and recreationally important shipwrecks. Moreover, acidification may have devastating effects on marine

invertebrates, undermining the marine food web that sustains both commercial and recreational fisheries.

Economic and legal aspects

Climate change may indirectly affect human activities in the Ocean SAMP area by altering economic and legal aspects pertinent to the area's use. Warming temperatures are expected to shift energy demand from cooler to warmer months, altering the traffic patterns of vessels supplying fuel to the region. Insurance companies may raise premiums on shipping and coastal infrastructure, affecting pricing and profitability of port and shipping activities. Sea level rise effectively shifts the line between state property and private or local property landward, which may result in legal complications with repercussions for the Ocean SAMP area. Combined with storm hazards and rising temperatures, sea level rise may decrease coastal property values and reduce income from tourism. Complex effects like these illustrate the wide-ranging significance of climate change for Rhode Island and the Ocean SAMP area.

Adapting to climate change

The Ocean SAMP integrates anticipated impacts from climate change into every aspect of its planning process. Its policies simultaneously promote energy conservation and renewable energy to mitigate the greenhouse gas pollution that causes climate change, while establishing adaptive policies to plan for and respond to impacts that are unavoidable.

Through the Ocean SAMP, the CRMC commits itself to evaluating the feasibility, safety, and effectiveness of proposed Ocean SAMP area uses under projected conditions in a climate changed world; barring projects that would threaten public safety or not perform as intended under such conditions; supporting enhanced building standards for coastal infrastructure such as ports, docks, and bridges; and encouraging public education about climate change and its impacts on the area. The Ocean SAMP calls for periodic updates on the information underpinning these and future measures through formal engagement with scientists in relevant fields.

Prospective New Uses of the Ocean SAMP Area

While recognizing the contribution that the Ocean SAMP area makes to Rhode Island's economy and culture, the Ocean SAMP recognizes that potential new uses of the Ocean SAMP area are on the horizon, and includes policies dictating how such uses will be evaluated when they are formally proposed. Proposals will be rigorously reviewed for negative impacts, and areas already targeted for protection (APCs and ADPs) will continue to be protected. Mitigation measures will be determined on a project-by-project basis to ensure they are tailored to address specific impacts and issues.

Flexibility in the Face of Climate Change

The Ocean SAMP recognizes that global climate change is occurring at rates faster than originally predicted and that management must adapt in response. Current research on climate change in the region shows that:

Average annual air temperatures in Rhode Island have risen by 1.7°F since 1905.

Annual average water temperatures off the southern New England coast have risen by about 2.2°F since the 1970s.

In Newport, sea level has risen an average of 0.1 inch per year since 1930. Over the past century, precipitation in Rhode Island has increased by 0.12 inch per year.

Renewable energy

Growing demand for electricity in New England, coupled with concerns about climate change and oil supplies, prompted Rhode Island to pledge to obtain 16 percent of its energy from renewable sources by 2019. Because wind power is currently the only renewable energy generation technology capable of providing utility-scale energy to Rhode Island, the Ocean SAMP area's offshore wind resources are expected to play a key role in meeting this pledge. Ocean SAMP research assessed various potential impacts of offshore renewable energy.

Mining

Sand and gravel are increasingly hard to find on land in Rhode Island. The Ocean SAMP area may possess these resources in exploitable quantities, and mining them could become of interest in the future. Potential impacts include destruction of bottom habitat and increased suspended sediment, which can lead to water quality issues.

Liquefied natural gas (LNG)

Natural gas shipped overland to Rhode Island homes falls short of current demand, particularly in winter. Offshore LNG facilities, which store gas shipped in from afar by tankers, present a prospective solution, and are considered by some to be safer than onshore LNG storage. Potential impacts of offshore LNG include increased ship traffic and accidental spills.

Short sea shipping

As East Coast highways become further congested, New England may turn to short sea shipping—the regional-scale movement of cargo via small, versatile vessels—to move cargo from port to port. Potential impacts include increased vessel traffic, influx of new invasive species, and increased underwater sound that could affect marine mammals and fish.

Artificial reefs

Artificial reefs are boulders, concrete slabs, tires, or wrecks, purposefully placed or left in the water to attract fish. Fishermen benefit from resulting fish aggregations, although it is debatable whether artificial reefs increase overall fish abundance.

Aquaculture

Seafood farming has the potential to complement commercial fishing as a productive use of the Ocean SAMP area's marine environment. Researchers are exploring possibilities for aquaculture in conjunction with offshore energy structures. Potential impacts include competition with wild fisheries and conflicts with energy usage.

Marine reserves and parks

Marine reserves ban the taking or disruption of wildlife and habitats; marine parks allow limited fishing activity. Both provide benefits for conservation and fishery enhancement. Potential impacts include the removal of space from extractive uses and conflicts with fishermen.

Wind energy

The Ocean SAMP area possesses many attributes of an ideal wind power venue: high wind speeds, strong regional demand for electricity, and well-established local maritime skills and infrastructure. Moreover, ecological trade-offs appear to be less significant in the Ocean SAMP area than in adjacent waters.

But while the Ocean SAMP area offers many advantages for wind power generation, not all parts of the area are equally favorable. An essential task facing Ocean SAMP researchers was to pinpoint individual locations throughout the Ocean SAMP optimal for wind power. This meant not only assessing the economic costs and benefits of wind power throughout the Ocean SAMP area, but also considering the ecological, economic, and social impacts of constructing wind turbines in different areas. By ruling out locations of high value or sensitivity in advance, Ocean SAMP research gives developers greater confidence that their projects will be approved,

satisfies stakeholder demands without the need for proposal-by-proposal battles, and protects the natural resources and human uses found in the areas in question.

Choosing appropriate locations for wind energy

The most significant challenge in identifying favorable sites for wind power stems from the trade-off between maximizing wind speeds, which increase with distance from shore, and minimizing construction effort, which is lower in shallow waters closer to shore. Ocean SAMP researchers resolved this opposition by creating the TDI.

The TDI is a site-specific ratio weighing the challenges of wind turbine construction to the expected energy output in a given location. Construction challenges are a function of water depth, seafloor hardness, and distance from land; energy output is a function of wind speeds. The SAMP team calculated a TDI for every 10,000 square-meter block of the Ocean SAMP area.

By mapping the results of this analysis, Ocean SAMP researchers created a visual representation of the distribution of costs and benefits of wind power. Based on this picture, they identified two optimal locations for wind power in the Ocean SAMP area: a small zone just south of Block Island in state waters, and a larger zone just north of Cox's Ledge in the federal waters of Rhode Island Sound. These represent areas where the benefits of wind power outweigh the costs by the largest margin.

Potential impacts of wind energy production on ecosystems and existing human uses

Installation of utility-scale wind farms in the Ocean SAMP area is predicted to have a number of benefits for Rhode Island, ranging from avoided emissions of greenhouse gases and other pollutants, to diversification of energy sources, to port development and job creation. However, Ocean SAMP research points out that offshore wind farms pose a variety of possible impacts on existing ecosystems and human uses that must be considered when evaluating any proposed development.

CONSTRUCTION

Research and modeling suggest that the most significant impacts in the wind farm life cycle take place during construction. Installation of cables and turbine foundations may stir up sediment, possibly smothering organisms that live on the sea floor and affecting phytoplankton production and fish eggs and larvae. The noise of pile driving may repel fish and interfere with marine mammal communication, possibly leading to temporary or permanent hearing loss in these animals. Increased vessel traffic may cause a decline in water quality and can disturb and even lead to collision with marine animals. Incidence of these effects is expected to last from a few months to a few years, but cumulative impacts may last longer.

TURBINE FOUNDATIONS AND OPERATIONS

Research indicates that turbine foundations can affect their environs in negative and positive ways. At very small scales, they may alter water flow, alter sediment composition, and reconfigure species composition on the seafloor. Noise produced from the moving parts of a turbine can be transmitted into the water column and be audible to mammals; for most species, this noise is perceptible only within a range of tens of yards, but some can hear it over several miles. By providing hard surfaces in the water column, turbine foundations act as artificial reefs, attracting fish, invertebrates, or other species. By creating refuge from birds and mobile fishing gear, turbines may act as marine reserves, causing fish and invertebrate populations in and around them to swell. Combined, these effects may alter food webs and associated fisheries in unpredictable ways.

TURBINE BLADES

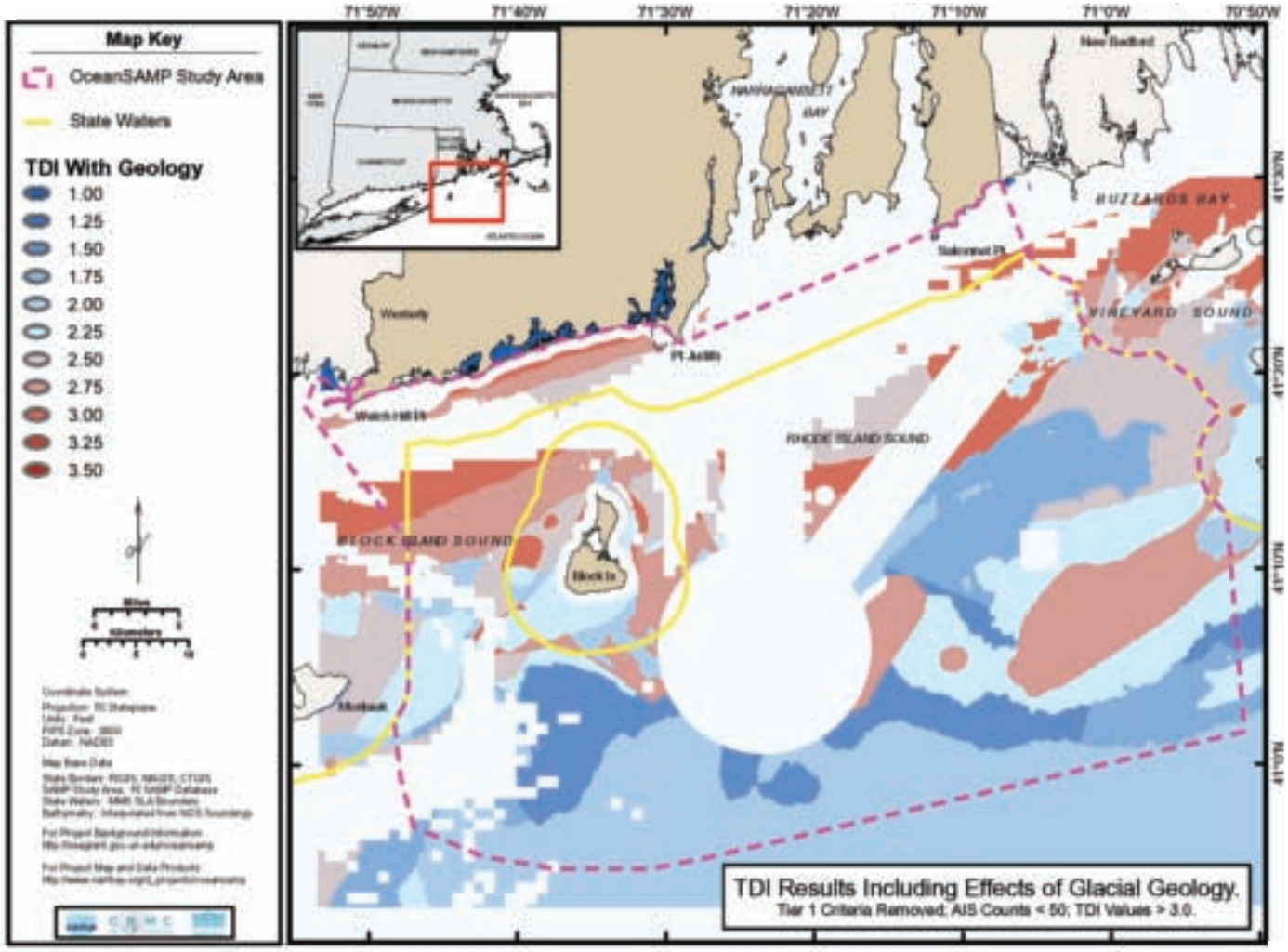
Rotation of turbine blades is thought to have potential effects on bird behavior. Prior research has shown that some birds, such as gulls and cormorants, appear to be drawn to wind turbines, while others, such as ducks, seem to avoid them. Potential emigration of sea duck populations could have positive repercussions for

their bottom-dwelling prey species. Presence of turbine blades may also affect human uses of the Ocean SAMP area by obstructing navigation and transforming visual panoramas.

CABLES

Little is known about the ecological impacts of the submarine cables used to transmit electricity from wind farms to land. These cables may produce electromagnetic fields, which have been linked to delayed development of fish eggs and to both avoidance and attraction behavior in fish and crustaceans. Further study may discover additional effects.

TDI Results Including Effects of Glacial Geology



"The TDI considers the whole study area, and so you end up with the optimal area. That's opposed to what goes on historically, which is that the developer picks a prime site and then several alternatives, compares the alternatives to the prime, and one is suspicious about how the sites were selected."

DR. MALCOLM SPAULDING,
URI OCEAN ENGINEER

Assessing Progress

Marine spatial planning (MSP) is a tool for understanding the governance system and structuring coastal ecosystem change

The Ocean SAMP project reflects a significant focus on understanding the governance context and offering practical policies and solutions that are appropriate for this context. A governance baseline is seen as a foundation for an adaptive process that uses the principles of ecosystem-based management in the implementation of MSP. When applied to MSP, a governance baseline helps answer such questions as:

- What are the features of the existing governance system and its strengths and weaknesses as these relate to the desired outcomes of a MSP initiative?
- What are the features and long-term trends in the ecosystems of concern and the flows of goods and services that the MSP initiative should address?
- How has the planning process been structured to win trust and foster collaboration among a diversity of stakeholders?
- Has the MSP initiative been designed to incorporate the science most relevant to the issues of the ecosystem?
- To what degree are the enabling conditions present for the effective implementation of the MSP initiative?
- What aspects of the governance structure are weak and merit additional attention? (Olsen and McCann 2011)

Tracking the processes of coastal governance

A simple and widely used framework for documenting coastal governance processes is the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection Cycle (GESAMP Cycle). The cycle begins with an analysis of problems and opportunities (Step 1). It then proceeds to the formulation of a course of action (Step 2). Next is a stage when stakeholders, managers, and political leaders commit to a set of policies and a plan of action and allocate the resources by which the necessary actions will be implemented (Step 3). Implementation of the policies and actions is Step 4. Evaluation and a re-examination of how the issues themselves have changed rounds out a generation of the management cycle as Step 5.

Ideally, ecosystem governance evolves as a process of sustained learning and adaptation that proceeds through a sequence of these cycles. Each cycle or generation of management may address an expanding agenda of issues and/or a larger geographic area. This conceptually simple cycle —the Policy Cycle—is useful because it draws attention to the interdependencies between the steps within each generation and between

The Policy Cycle

Rhode Island Ocean SAMP Policy Cycle: Identification of Key Activities

STEP	KEY ACTIVITIES
Step 1: Issue Identification and Assessment	**Taking Stock:** 1. Define local, state, and global drivers and determine how they influence the process. 2. Establish the core team. 3. Determine project end date/milestones and budget. **Pre-planning:** 4. Identify and prioritize stakeholder and client issues. 5. Collect available information for issues and drivers. 6. Determine and prioritize research agenda based on meetings and collected information. 7. Define Ocean SAMP boundaries, goals and principles. 8. Design a public process that provides stakeholders with both access and influence over decisions.
Step 2: Preparation of the SAMP	**Defining and Communicating Existing Conditions:** 1. Implement the research agenda, focusing on the priorities identified in the "Taking Stock" phase. 2. Engage stakeholders in research. 3. Communicate research to stakeholders. **Developing Policies Transparently:** 4. Craft policies for each Ocean SAMP chapter, using stakeholder input and the best available science. 5. Organize workshops and meetings with stakeholders to review chapters and ensure expertise and concerns incorporated into chapter.
Step 3: Formal Adoption	1. Formal public workshops and public comment period implemented. 2. Ocean SAMP is adopted by CRMC. 3. Ocean SAMP is adopted NOAA as a routine programmatic change to the Rhode Island Coastal Management Program. 4. The Ocean SAMP is endorsed by lead federal agencies.
Step 4: Implementation	1. Ocean SAMP implementation funding is secured. 2. CRMC is implementing adaptive management approaches. 3. Permits for new activities within the Ocean SAMP boundaries are processed. 4. Performance standards for permitted activities are monitored and enforced. 5. Impacts on the ecosystem and selected human activities are monitored. 6. Mechanisms to ensure the Ocean SAMP is the guiding document for the entire study area (both federal and state waters) are put in place. 7. Joint Advisory Working Group is organized. 8. Stakeholder advisory committees are organized and commence meeting.
Step 5: Evaluation (Moving Forward with Implementation)	1. Program outcomes are documented. 2. Management issues are reassessed. 3. Priorities and policies are adjusted to reflect experience and changing social and environmental conditions. 4. External evaluations are conducted at junctures in the program's evolution. 5. New issues or areas are identified for inclusion in the program. 6. Biannual public forums are held to review monitoring results and revise policies to address the SAMP goals.

successive generations of management. The five steps may be completed in other sequences, as for example, when an initiative begins with enactment of a law (Step 3) that provides the mandate for analyzing issues and developing a detailed plan of action (Steps 1 and 2). Altering the sequence, however, often comes at the cost of efficiency, as when it becomes apparent that the authorities provided by the law prove to be inadequate for implementing the actions that are required. Progress and learning are greatest when there are many feedback loops within and between the steps (GESAMP 1996; Olsen et al. 1997, 1999).

In the case of the Ocean SAMP, the plan was shaped around a set of goals that aim at: 1) Fostering a properly functioning ecosystem that is both ecologically sound and economically beneficial; 2) Promoting and enhancing existing uses; 3) Encouraging marine-based economic development that considers the aspirations of local communities and is consistent with, and complementary to, the state's overall economic development, social, and environmental needs and goals; and 4) Building a framework for coordinated decision making between state and federal management agencies.

How effective the SAMP is will be determined by the degree to which the plan achieves the goals.

Tracking the outcomes of coastal governance

The "Orders of Outcomes" (Olsen, 2003; UNEP/GPA, 2006; Olsen et al, 2009) provides a framework to assess progress toward the goals of an ecosystem-based management program. Each order is composed of two to five categories of indicators that mark the path toward more sustainable forms of development. The framework demonstrates tangible levels of achievement toward the ultimate and distant goal of sustainable development.

The First Order defines the results of completing Steps 1 through 3 of the policy cycle. In the case of the Ocean SAMP, the First Order examines whether the enabling conditions have been assembled for the formal adoption of the Ocean SAMP and its subsequent successful implementation.

The Second Order defines the outcomes that are the result of implementing a plan of action (Steps 3 and 4 of the policy cycle). These are grouped into three categories: changes in the behavior of target user groups, changes in the

Orders of Outcomes

behavior of key institutions, and changes in how and where financial investments are made.

The Third Order marks the achievement of the specific societal and environmental quality goals that prompted the entire effort. For the Ocean SAMP, Third Order impacts are anticipated to include an efficient and equitable decision-making process for new offshore facilities, the generation of electrical power from offshore wind turbines, and a related decrease in the state's contributions to carbon dioxide production. Environmental outcomes may include the mitigation or avoidance of negative impacts from new offshore facilities on fish, shellfish, birds, bats, and marine mammals. Evidence of Third Order outcomes usually requires several years to accumulate.

The Fourth Order asks whether the conditions achieved are contributing to a healthy, just, and equitable society that is sustaining the qualities of the ecosystem as a whole. The Fourth Order goal is commensurate to "sustainable development." Progress towards the Fourth Order must be assessed over the long term.

Assessing the achievement of the first order outcomes

Based on experience in a wide diversity of settings (Olsen, 2003, Olsen et al, 2009), the hypothesis is that the following four categories of outcomes, or enabling conditions, must be present:

1. Unambiguous goals have been adopted against which the efforts of the program can be measured. Such goals must provide the rationale for the SAMP's objectives and policies as these are applied to the: 1) Activities permitted in specific areas and; 2) Performance standards that must be met by activities under the purview of the SAMP. Such goals and objectives must be based upon a thorough understanding of the issues that the SAMP will address.

2. A core of well-informed and supportive stakeholder constituencies and government agencies actively supports the program. Ideally, there should be a foundation of support for the SAMP among the public and within the user groups that will be affected by the SAMP's implementation.

3. Governmental commitment to the initiative is expressed by the delegation of the necessary authorities and the allocation of the financial resources required for long-term implementation. Such commitment may be expressed by legislation or through formal agreements among governmental agencies. Either approach requires consistent and clear governance arrangements, institutional roles (including clarity on a lead agency) and decision-making rules. Formal approval of program policies and action plan, by the appropriate level of government, signals that the First Order threshold of governmental commitment is in place.

4. Sufficient capacity is present within the institutions responsible for the program to assemble and implement the SAMP policies and action plan. Such capacity is expressed by the ability to: 1) Collect and apply scientific information for decision making; 2) Coordinate interdisciplinary teams and resolve conflicts; and 3) Design and implement associated public education programs.

Assessing the success of the Ocean SAMP in terms of the Second and Third Orders can occur only after a proposal for an offshore wind farm or another large offshore development has been filed with the appropriate state and federal agencies and has been evaluated according to the Ocean SAMP policies and procedures. It will then become apparent whether the application of the SAMP approach to a CMSP process incorporating areas under both state and federal jurisdiction will produce a more efficient and less contentious decision-making process. Over the long-term, it will be possible to assess whether the SAMP approach has produced an expression of ecosystem management that strikes a balance between competing human activities and sustains the flows of goods and services to its associated human population.

Baseline Conditions for the Rhode Island Ocean Special Area Management Plan Process: Progress in Assembling the Enabling Conditions (First Order Outcomes) as of Time 1, August 2009 and Time 2, March 2011

Clear Goals (Three Indicators)

QUESTION	0	1	2	3	Time 1	Time 2
Have management issues to be addressed by the SAMP been identified and prioritized?	No action to date	Broad issues identified by project team; some stakeholder involvement.	Some issues identified with stakeholders; prioritization underway.	Issues have been identified and prioritized with stakeholders.	2	3

Justification for the rankings: At the time of the first ranking, the largest strides, in terms of prioritization of management issues, were being made through the TDI effort, which addressed siting potential for offshore renewable energy resources projects. Now, several other key issues are being addressed, in great part due to: 1) Significant public input and collaboration among researchers and stakeholders; 2) Issues identified from the European offshore wind turbine experience; and 3) Topics which federal agencies (e.g. BOEM and Army Corps of Engineers) would require for the siting of offshore renewable energy. For example, due to the success of the SAMP bird studies (studies that would be required by the federal agencies), we have been able to put forth specific protection areas for duck species that forage off the coast in the SAMP area. In another example, we have been able to develop a regional advisory body comprised of Rhode Island and Massachusetts fishermen who are committed to enhancing the SAMP further and are providing ongoing feedback on fish resources and fisheries issues. While the work of this group, the Fisherman's Advisory Board, has not been evaluated yet, a framework has been put in place through the SAMP.

QUESTION	0	1	2	3	Time 1	Time 2
Do the SAMP's goals define both desired societal and environmental conditions?	No goals defined	Preliminary goals are being discussed with stakeholders.	Desired long-term goals address either societal or environmental outcomes.	Goals define both desired societal and environmental outcomes.	1	3

Justification for the rankings: At the time of the first ranking, SAMP goals had been discussed in initial fashion with the stakeholder group, but not formalized. By Time 2, through an in-depth public process, goals had been defined that address both societal and environmental outcomes.

QUESTION	0	1	2	3	Time 1	Time 2
Are the SAMP goals detailed through time bound and quantitative targets (how much, by when)?	No targets defined	Targets are expressed in non-quantitative terms.	Targets specify either a date or a quantitative measure, but not both.	Targets have been defined in quantitative terms (how much, by when).	1	1

Justification for the rankings: SAMP policies are not currently detailed in this manner. The team is considering if it has enough information to develop these goals.

Constituencies (Three Indicators)

QUESTION	0	1	2	3	Time 1	Time 2
Do the user groups who will be affected by the Ocean SAMP's actions understand and support its goals, strategies and targets?	Many important user groups are unaware of the Ocean SAMP's goals, strategies and targets.	User groups are aware of Ocean SAMP goals and targets but the degree of support varies.	With a few important exceptions, user groups understand and support the Ocean SAMP.	Relevant user groups understand Ocean SAMP goals and targets and actively support them.	1	3

Justification for the rankings: While major stakeholder groups, including commercial and and recreational fishermen, had been identified and contacted by Time 1, the process of identifying specific issues was only getting underway. By time 2, intensive consultations and information gathering – including, especially, the integration of local knowledge—had been completed for the formally adopted Ocean SAMP document. User groups continue to be engaged in amendment development and implementation. The high ranking awarded for Time 2 is based on the responses of those who have chosen to engage in the planning process.

QUESTION	0	1	2	3	Time 1	Time 2
Is there public support for the Ocean SAMP?	There is little public awareness of the Ocean SAMP.	Public awareness is incipient.	Public support is building up due to public education efforts, positive press coverage, and endorsement from community leaders.	Surveys reveal that there is wide public support for the Ocean SAMP and its goals and targets.	1	3

Justification for the rankings: Again, these ratings are based upon the reactions of those who have chosen to engage in the process and the generally favorable reactions of the media.

QUESTION	0	1	2	3	Time 1	Time 2
Do the institutions that will assist in implementing the Ocean SAMP and/or will be affected by its actions understand and support its agenda?	There is little awareness of the Ocean SAMP within institutions that will be important partners during implementation.	While pertinent institutions are aware of the Ocean SAMP, their degree of support is unclear.	With few exceptions, pertinent institutions understand and support the MSP and have publicly endorsed it.	The Ocean SAMP is recognized as important and legitimate by institutions that will be involved in its implementation.	1	3

Justification for the rankings: State agencies, including the Rhode Island Department of Environmental Management, the Rhode Island Economic Development Corporation and the Rhode Island Historical Preservation & Heritage Commission were actively engaged in SAMP development and will be active in its implementation. At the federal level, close communication and consultation with the lead federal agencies has been sustained and there is strong support for the Ocean SAMP process and products.

Formal Commitment (Three Indicators)

QUESTION	0	1	2	3	Time 1	Time 2
Has the Ocean SAMP been formally approved?	Formal approval process has not been initiated.	There is a legislative mandate for SAMPs.	Policies and actions are being negotiated with approving authorities.	The SAMP has obtained approval required for implementation	1	2

Justification for the rankings: At the time of the first ranking, the SAMP was in the development phase. Now, the SAMP has been approved by the state of Rhode Island and is in the process of obtaining federal approval.

QUESTION	0	1	2	3	Time 1	Time 2
Has the CRMC been provided with the authorities it needs to successfully implement the Ocean SAMP?	CRMC authorities are inadequate.	CRMC has the necessary mandate and authorities.	The necessary agreements with state and federal agencies are being negotiated.	The necessary agreements for SAMP implementation have been negotiated with state and federal agencies.	2	2

Justifications for the rankings: As of Time 2, the CRMC has the necessary agreements to implement the SAMP within state waters, so the ranking is 3 for that portion of the SAMP area. However, the majority of the SAMP area lies in federal waters beyond the 3-mile limit of state jurisdiction. The Ocean SAMP has been designed to plan for this larger area on the assumption that the consistency clause in the federal Coastal Zone Management Act will: 1) Enable the state to partner with the responsible state agencies when federal permitting actions are made; and 2) Simplify the federal review and permitting process within the SAMP area. The SAMP is being developed in close coordination with the relevant federal agencies. CRMC is working to secure a Geographic Location Description (GLD) which, when approved by the U.S. National Oceanic and Atmospheric Administration, would extend the state's authority to exercise its federal consistency over a wide range of federal actions occurring within a geographically defined area of federal waters within the Ocean SAMP area. CRMC is also planning to develop MOUs with lead offshore renewable agencies (BOEM and the U.S. Federal Energy Regulatory Commission [FERC]) to ensure that the Ocean SAMP document is recognized as the guiding regulatory document for this area.

QUESTION	0	1	2	3	Time 1	Time 2
Have sufficient financial resources been committed to fully develop and implement the SAMP over the long term?	No financial resources committed for implementation of the SAMP	Some pledges and commitments are secured, but significant funding gaps remain.	Adequate short term funding (two years) is secured for developing the SAMP	.Sufficient financial resources are in place to fully implement the SAMP over the long term.	2	2

Justification for the rankings: The SAMP project is sufficiently funded for planned 2011—2012 implementation, due to the infusion of federal stimulus funds, but there is no formal line item or commitment from any source to support SAMP refinement and continued implementation for the long term.

Institutional Capacity (Four Indicators)

QUESTION	0	1	2	3	Time 1	Time 2
Have the institutions responsible for SAMP implementation demonstrated their capacity to implement its plan of action?	Institutional capacity necessary to implement the SAMP is not present.	Institutional capacity to implement the SAMP is marginal.	In some key institutions institutional capacity is adequate but there are important weaknesses in others.	Sufficient institutional capacity is present in institutions with responsibilities for implementing the SAMP.	2	2

Justification for the rankings: CRMC recognizes that it does not currently have the staff capacity necessary for implementing the SAMP in both state and federal waters. It does have the necessary capacity for SAMP implementation in state waters. The Ocean SAMP regulations, however, require that when CRMC is engaged in the review and oversight for large offshore development anywhere within the Ocean SAMP area, the developer will cover the cost for CRMC to contract the necessary expertise that is required. CRMC will also continue to maintain its relationship with URI to acquire science and technical expertise as needed.

QUESTION	0	1	2	3	Time 1	Time 2
Have important actions and policies been successfully tested at the pilot scale?	No pilot actions have been initiated.	Pilots are underway to assess viability of actions and policies.	Pilots are completed and outcomes have shaped actions and policies.	Policies and construction standards have been successfully tested at pilot level.	2	2

Justification for the rankings: The ranking remains at a 2 because two potential pilot projects are awaiting possible development and implementation. First, there is the possibility that five to eight wind turbines may be installed off the southeast shore of Block Island. This would, in effect, be a pilot project for the proposed 100 larger turbines to be subsequently sited in federal waters within the SAMP region. Second, there is the Area of Mutual Interest (AMI) effort which would provide an innovative test case in terms of regional coordination between Rhode Island and Massachusetts on offshore renewable energy siting initiatives in federal waters. However, the planning for these projects is at a standstill.

QUESTION	0	1	2	3	Time 1	Time 2
Does the Ocean SAMP project possess the human resources to implement its plan of action?	No personnel have been assigned responsibility for program implementation.	Staffing for program implementation is inadequate.	Staffing is adequate in some institutions but not in others.	Sufficient human resources are in place to fully implement the program.	2	2

Justification for the rankings: CRMC has established a strong working relationship with URI to provide continuous technical support to implement the SAMP. This relationship, however, is based on grant or soft money. Through the Ocean SAMP regulations, CRMC will need to gain the necessary technical expertise for making decisions on large offshore development when necessary.

QUESTION	0	1	2	3	Time 1	Time 2
Has the Ocean SAMP project demonstrated the ability to practice adaptive management?	No evidence of adaptive management.	Practice of adaptive management is incipient and is being expressed as minor adjustments to operational procedures.	Important institutions engage in periodic self assessments and have modified their behavior based on experience and learning.	Program as a whole has demonstrated its ability to learn and adapt by modifying important targets and/or policies.	2	3

Justification for the rankings: As the SAMP is now being implemented within state waters, the project has had the opportunity to undergo its first round of program amendments and revisions, and to benefit from the ongoing incorporation of new research data. Thus, SAMP policies and the science that informs them are being integrated into the process and are expressions of adaptive management. This will be monitored as the SAMP process continues. The greater challenges of adaptive management will likely occur as the process for negotiating permits for major offshore facilities gets underway.

Acronyms

ACOE: U.S. Army Corps of Engineers

ADP: Area Designated for Protection

AMI: Area of Mutual Interest

APC: Area of Particular Concern

BOEM: U.S. Bureau of Energy Management

CMSP: Coastal and Marine Spatial Planning

COP: Construction and Operations Plan

CRC: URI Coastal Resources Center

CRC/RISG: University of Rhode Island Coastal Resources Center/Rhode Island Sea Grant College Program

CRMC: Rhode Island Coastal Resources Management Council Coastal Zone Management Act

FAB: Fishermen's Advisory Board

FERC: Federal Energy Regulatory Commission

GESAMP: Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection

GLD: Geographic Location Designation

HAB: Habitat Advisory Board

JAWG: Joint Agency Working Group

LNG: Liquified Natural Gas

MOU: Memorandum of Understanding

MSP: Marine Spatial Planning

NIT: Narragansett Indian Tribe

NOAA: National Oceanographic and Atmospheric Administration

NOAA/NMFS: National Oceanographic and Atmospheric Administration/National Marine Fisheries Service

NOAA/OCRM: National Oceanographic and Atmospheric Administration/Office of Ocean and Coastal Resource Management

NOPP: National Oceanographic Partnership Program

NUWC: U.S. Naval Undersea Warfare Center

Ocean SAMP: Rhode Island Ocean Special Area Management Plan

REZ: Renewable Energy Zone

RIDEM: Rhode Island Department of Environmental Management

RIOER: Rhode Island Office of Energy Resources

RISAA: Rhode Island Saltwater Anglers Association

RISG: Rhode Island Sea Grant College Program

SAMP: Special Area Management Plan

SAP: Site Assessment Plan

TAC: Technical Advisory Committee

TDI: Technology Development Index

URI: University of Rhode Island

USCG: U.S. Coast Guard

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