

# West Coast Governors' Agreement on Ocean Health: Renewable Ocean Energy Action Coordination Team Final Work Plan

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## Table of Contents

Background	3
Work Plan Summary	4
Potential Funding Sources	5
Sharing Lessons-learned Regionally	6
Task Descriptions	
Task 1: Information and Data Needs	7
Task 2: Coastal Siting Report	8
Task 3: Cumulative Effects Study	9
Task 4: Data Management and Communication	10
Task 5: Technology	12
Task 6: Energy Infrastructure	12
Task 7: Public Education on Regulatory Regimes	13

### Cover photos (1-r):

Top row: OpenHydro turbine, waves off Washington's coast (credit: Olympic Coast National Marine Sanctuary), Finavera Renewables AquaBuoy®

Bottom row: 3.6-MW GE Wind turbine at Arklow Bank offshore wind facility near Arklow, Ireland (credit: Robert Thresher), Ocean Power Technologies PowerBuoy®, Verdant Power's turbine (artist's rendering)

# Renewable Ocean Energy Action Coordination Team Final Work Plan

## I. Background

This work plan addresses West Coast Governors' Agreement on Ocean Health Action Plan:

**Priority Area 4:** *Reduce adverse impacts of offshore energy development*

**Action 4.2:** *Explore the feasibility for offshore alternative ocean energy development and evaluate the potential environmental impacts of these technologies.*

Quoting the West Coast Governors' Agreement on Ocean Health Action Plan directly,

“Washington, Oregon, and California will ensure that offshore energy development is environmentally sustainable through the following actions: oppose all new offshore oil and gas leasing, development, and production; evaluate the benefits and impacts of renewable ocean energy development; and develop a more consistent, effective, and efficient state and federal regulatory approach to renewable ocean energy development.”

This work plan addresses only activities related to renewable ocean energy. Offshore oil and gas exploration and development has already been addressed by letters from the governors to the White House and the Secretary of the Interior.

The overall context for this Renewable Ocean Energy Work Plan (RE Work Plan) has evolved over decades of energy policy, but the specific context has evolved over the past several years, and, in particular, following the enactment by Congress in August 2005 of the Energy Policy Act of 2005 (EPAAct). Under EPAAct the Minerals Management Service (MMS) has the authority to issue leases, easements, and rights-of-way for activities on the Outer Continental Shelf (OCS) that produce or support production, transportation, or transmission of energy from sources other than oil or gas. Such activities include electrical generation from wind and hydrokinetic resources. For wind resources, MMS has the lead role for all aspects—leasing, exploration, development, production, and decommissioning. MMS published an Interim Policy in 2007 and began drafting a rule for its program during 2008. MMS published the final rule in April 2009, and began accepting applications for OCS renewable energy leases and grants in June 2009. The MMS regulatory framework establishes requirements and procedures for leasing and related activities for renewable energy projects on the outer continental shelf.

For hydrokinetic resources, the Federal Energy Regulatory Commission (FERC) has the authority to issue licenses for construction and operation of generating facilities in state waters and on the OCS under the Federal Power Act. However, since FERC lacks the authority to issue property rights on the OCS and MMS has that authority under EPAAct, MMS's role will be to issue necessary leases, easements, and rights-of-way and to provide appropriate input to FERC's licensing process. The details of MMS-FERC interaction have been worked out through a Memorandum of Understanding (MOU) between the agencies in March 2009 and subsequent joint guidelines developed by the agencies.

Potential renewable energy developers began to apply for FERC preliminary permits in order to study the feasibility of project sites along the West Coast in 2006. Since then, FERC has issued nearly 20 preliminary permits for areas offshore northern California, Oregon and Washington for wave energy facilities; and in Puget Sound for tidal energy facilities. A five-year pilot project

license was issued to Finavera for the Makah Bay Offshore Wave Pilot Project in December 2007, which the company surrendered in early February 2009. A Settlement Agreement and License Application for the 2.3 MW Reedsport Wave Energy Project, near Reedsport, Oregon, is expected to be filed with FERC in early 2010.

## **II. Work Plan Summary**

A workshop entitled *Alternative Energy Development in the West Coast Ocean Environment* was conducted in Portland, Oregon, on September 23-24, 2008. The second day of this workshop provided a forum for some 60 federal, state and tribal agency representatives to begin discussions about how the various levels of government and tribes can plan and work together to address renewable ocean energy projects. These discussions continued in Seattle, Washington, on October 27-28, 2008, when the West Coast Governors' Agreement (WCGA) convened its first Action Coordination Teams (ACT) meeting.

The Renewable Ocean Energy Action Coordination Team (RE ACT or RE team) determined that the vision, *Explore the feasibility for responsible offshore renewable ocean energy development as part of the West Coast energy mix*, requires the following outcomes:

- Have an informed energy industry, ocean users, public, government, and tribal partners.
- Have a clear, efficient, and effective regulatory process.
- Encourage siting that maximizes energy benefits and avoids or minimizes environmental impacts.
- Improve understanding of environmental, social, cultural impacts/ramifications of technologies.

The RE team identified several problems or needs that were brought up at the September workshop that should be addressed or solved by the work plan:

- People, government, tribes, and ocean industries need good information about the energy industry and a better understanding of the regulatory, environmental and energy context.
- Identify benefits and costs (impacts) of development.
- Identify ways to improve and increase efficiency of governance regulatory paths.
- Address conflicting uses for the region through a planning process such as marine spatial planning.
- Identify locations and potential for renewable energy development (present, future, who, where).
- Identify necessary baseline data.

The team also articulated criteria for inclusion of components in this Plan, including the:

- Ability to advance the project vision.
- Ability to address one of the problems identified.
- Benefit of working together across three states and federal agencies to address this problem (i.e., value-added).
- Feasibility (financial, capability, partners, level of difficulty, etc.).

Individual members of the RE team were willing to accept project management responsibility for each of the tasks and were responsible for fleshing out the concept embodied in the summary table below. The seven tasks in the RE work plan are listed below and described in the remainder of the document. Each task of the regional framework is assigned a priority level which is indicated in each representative section. High priority tasks are presented first followed by those with medium priority. Implementation of each of the tasks will require working with a variety of partners from around the region, including ocean users, all levels and types of governments, academic institutions, non-governmental organizations, and interested citizens. These entities and interests have valuable knowledge and expertise regarding ocean resources and coastal communities. This work plan identifies some initial partners for the major tasks. Rather than add to the core membership, the RE ACT will seek to involve and utilize the appropriate and willing additional partners as they undertake the activities described in this work plan.

**Table 1:** Renewable Ocean Energy ACT Deliverables, Resource Needs and Schedule

<b>Task</b>	<b>Deliverable</b>	<b>Budget Need</b>	<b><sup>1</sup>Add'l Staff Need</b>	<b>Est. Dates</b>
1	Information/Data Report	\$200K	Yes	12/2010
2	Coastal Siting Report	TBD	Yes	12/2010
3	Cumulative Effects Study Phase 1	\$100K	Yes	12/2009
4a.	Data Management and Communication (DMAC) Mapping and Web Portal	\$100K	Yes	Ongoing Portal: 3/2010
4b.	Standard monitoring protocol and regulatory agency exchange	\$200K	Yes	Protocol: 12/2010 Ongoing: regulatory exchange
5	Technology Report	none	No	4/2010
6	Energy Infrastructure Report	none	Yes	4/2010
7	Public Education on Regulatory Regimes Report	\$100K	Yes	2/2010

<sup>1</sup>-This could signify either the creation of an expert sub-group or additional staff time not currently available within the ACT from one of the partners.

### **III. Potential Funding Sources**

In the description of each of the tasks, the work plan identifies current funding and opportunities to leverage existing work. However, the following list identifies some examples of additional potential sources for funds or partnered work to achieve progress on this work plan:

- Congressional funding – if funding requested by the three states is appropriated to the West Coast Governors’ Agreement for implementation of regional activities, it could be used to advance activities in this work plan.
- Federal agencies
  - Department of Commerce – National Oceanic and Atmospheric Administration
  - Department of Energy, including national labs and grant-funded projects
  - Department of the Interior – Minerals Management Service and U.S. Fish and Wildlife Service
- States
  - State coastal programs
  - Fish and wildlife agencies and land management agencies
  - Energy programs
- Non-governmental organizations
  - The Nature Conservancy
  - Oregon Wave Energy Trust
  - The Surfrider Foundation
  - Others
- Academic Institutions
  - Northwest National Marine Energy Center – Oregon State University and University of Washington

#### **IV. Sharing Lessons-learned Regionally: Oregon Demonstration Project**

All three states have valuable experiences and processes they will seek to share as possible models regarding renewable ocean energy projects and proposals under this work plan. This work plan does not attempt to provide a comprehensive listing of all the activities it will seek to partner with, but a few examples are highlighted specifically throughout the work plan. One example is the announcement of significant funding for Oregon to conduct many activities that will advance renewable ocean energy in that state, while benefitting the whole region. Oregon’s efforts will demonstrate possible ways to achieve many of the tasks described in this work plan for the rest of the region. Oregon’s update of its Territorial Sea Plan and associated collection of new data (Task 1 – Data and Information); use of that data in a spatial context to assist decision-making (Task 2 – Coastal Siting Report); and analysis of cumulative impacts, including socio-economic costs/benefits (Task 3 – Cumulative Effects Study) can provide valuable lessons-learned regarding feasibility and siting of renewable ocean energy for the other states, federal agencies, and stakeholders along the West Coast. The RE ACT will monitor and, as appropriate, engage with and share/adopt these activities as part of its work plan.

## **Task 1: Information and Data Needs**

### **Priority: High**

Understanding the physical, biological, ecological, and socio-economic effects from renewable ocean energy development is a growing field that requires the synthesis of data and information from a broad array of different sources. The purpose of this task is to identify the underlying data needs to support a comparative analysis of renewable energy sites. For example, there are a number of existing reports on the subject of effects of renewable energy development that this ACT will be analyzing and disseminating to interested parties. The reports include:

1. Report to Congress: Potential Environmental Effects of Marine and Hydrokinetic Technologies
2. Developing Wave Energy in Coastal California: Potential Socioeconomic and Environmental Effects
3. Ecological Effects of Wave Energy Development in the Pacific Northwest

These reports contain numerous additional sources of information that need to be reviewed and key references identified. The immediate goal is to develop a reference list of the seminal pieces of information that can be easily referred to in order to understand potential project impacts. Such an effort is already underway by some ACT members such as U.S. Fish and Wildlife Service. With additional funding, we could begin to address the data gaps with focused environmental studies. One example would be to augment the high resolution seafloor mapping that is currently being conducted at several locations in state waters along the West Coast. Additional sites that are known to have the potential for renewable energy activities could be studied, as well as locations on the outer continental shelf. Another example would be to collect new information concerning potential conflicts between existing uses of the ocean environment, such as fishing, recreation and renewable energy development. The ultimate goal is a full synthesis such that comparative assessments can be conducted. An ancillary objective is to use this information to identify key ecosystem components and indicators, and to standardize their use in assessments across the region. The analysis of available information and data, while important, will likely occur as part of task 3 (cumulative effects study) and task 4 (standard monitoring protocol and ecological effects workshops).

The ACT will also be working with interested parties to develop wave, wind, and tidal workshops. The workshop topics could include ecological effects and study needs. The ecological effects workshops would be similar to the Oregon ecological effects workshop (report Number 3 above). The workshops will build on existing information to identify site specific impacts and study needs for projects on a state-by-state basis. As data needs are established (e.g., mapping fishing use and non-consumptive ocean uses, and the seafloor of state and federal waters), this ACT will recommend additional studies and needed funding levels. The results of these workshops will also support other components of this work plan (e.g., cumulative effects and data management and communication).

## **Task 2: Coastal Siting Report**

### **Priority: High**

The coastal siting report is ranked high among the regional framework components of the Renewable Ocean Energy Work Plan. It is intended to be conducted at the scale of the California Current Large Marine Ecosystem (LME); hence, it is beyond the scope of a single state and is a value-added component for the WCGA. This working report will combine governance, data context, technology, and energy infrastructure key components at the regional level. The report will tie this information to multi-purpose maps that support decision-making on a site specific and regional scale (e.g. linking data layers to MMS/NOAA Multipurpose Marine Cadastre<sup>1</sup>). Cumulative effects analyses can be built into this report as they become available.

The aim is to produce a first version of the coastal siting report by December 2010 based on available data. The report will also denote, where possible, critical habitats and human uses. In particular, the first iteration will review the state and federal siting guidelines and policies, and analyze gaps and suggest solutions. The Department of Energy has current contractors assessing this issue on the West Coast and their outcomes may be easily incorporated into this working report. The coastal siting report will be updated periodically (with a suggested iteration of every 5 years) to incorporate changes in basic data, information, and governance. For example, as data becomes available on coastal habitats via seafloor mapping efforts or as guidelines and policies change, this information will further refine the siting report. The WCGA sponsored a workshop in October 2009 to gather early input on the scope and key elements of the coastal siting report project. RE ACT members assisted with planning and participating in this workshop.

This task relies heavily on other components in the Renewable Ocean Energy Work Plan, including basic data and information and cumulative effects. Existing state planning documents will also be useful in producing the coastal siting report. A decision support tool (e.g. Marxan-type) and maps would be useful to support report recommendations. While this effort does not currently seek outside resources, some additional resources (about \$50-100K) may be valuable to the coordination and production of this report. Furthermore, the report will be useful in identifying important data gaps, which could be filled with additional resources.

A key outcome of this project will be to assist with siting decisions at local and regional levels for renewable energy facilities. As more information on coastal resources and uses becomes available, the coastal siting report can continue to be of value in fine-tuning our siting decisions and incorporating cumulative effects in those decisions.

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<sup>1</sup> The MMS/NOAA multipurpose marine cadastre is an integrated submerged lands information system consisting of legal (e.g., property ownership or cadastre), physical, biological, and cultural information in a common reference framework.

### **Task 3: Cumulative Effects Study**

#### **Priority: High**

The Cumulative Effects Study is ranked high among the regional framework tasks of the Renewable Ocean Energy Work Plan. It is intended to be conducted at the scale of the California Current Large Marine Ecosystem (LME); hence, it is beyond the scope of a single state and is a value-added component for the WCGA. The scope of study is largely established by guidance for the National Environmental Policy Act (NEPA), defining “cumulative effects” as:

“the impact on the environment ... encompassing the environmental [ecology, biology, physical] parameters and human dimension (economic, social, etc.) which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions (40 CFR § 1508.7).”

Based on this scope, the study will extrapolate the biological, physical, and socioeconomic effects of single renewable energy developments (i.e., wind, wave and tidal) to those of multiple developments along the West Coast, also taking into account the effects of existing and future anthropogenic activities and the regional effects of global climate change.

There are two phases to the cumulative effects study. The first phase is to develop an analytical framework to assess the cumulative effects of wave energy development that incorporates risk and uncertainty parameters. The second phase of the study is to populate the analytical framework with the necessary data sets and to apply the framework and assess the cumulative effects of wave energy development. This second phase will not be ripe for implementation until the results of some of the basic *in-situ* measurements of stressors and their effects have become available as input for the models in the analytical framework. Work has commenced under a contract from the Oregon Wave Energy Trust for Phase 1 relating only to Oregon and limited to wave conversion technologies. This study is planned to be completed in December 2009 and will be updated as new information becomes available.

A key outcome of this project will be to determine the so-called carrying capacity of the California Current LME for renewable energy facilities. As more information on effects becomes available, the cumulative effects framework can continue to be of value in fine-tuning our predictions. This group will also explore connections between this task and the work by the WCGA’s Integrated Ecosystem Assessment ACT.

## **Task 4: Data Management and Communication**

### **Priority: Medium**

#### **Task 4a. Web portal and mapping**

One of the necessary tools to assist in analysis of the effects of renewable energy development on nearshore and ocean resources is the development of accurate map products of key resource areas and uses. This work plan element will help coordinate the development of west-coast regional map products and tools that includes:

1. Data sets for ecological, physical, biological, human uses, and generalized fishing grounds (multi-purpose marine maps).
2. A web portal that links to sources of geospatial data that can be used in the siting process for potential project development.
3. A web portal ("West Coast Offshore Renewable Energy") with information on proposed projects, project maps, studies, governance, etc.

Work in this area is already underway. For example, the Minerals Management Service, in coordination with NOAA's Coastal Services Center, is developing a marine information system for the outer continental shelf and state waters – the Marine Multipurpose Cadastre. The data and information contained in this system are used to address a range of issues, including the growing interest in renewable energy development. The National Marine Fisheries Service's (NMFS) Northwest and Southwest regions have developed data bases and mapping products to characterize coastal resources for use in analyzing siting decisions of renewable energy projects. The Southwest region's efforts have also been included in the above mentioned work of the Coastal Services Center. For Oregon in particular, NMFS worked closely with Oregon State University and the Oregon Department of Land Conservation and Development (DLCD) in the development of those products. DLCD is also working with a number of coastal stakeholders and partners on a pilot project to map fishing grounds of the Oregon Coast. Each state also manages coastal data through coastal atlases. These entities are beginning to collaborate at the regional level, and state coastal atlases and related state geospatial databases may offer opportunities for connecting marine geospatial data with related shoreland information. At the national level, NOAA is also becoming interested in mapping products related to renewable energy development. These various spatial tools can assist with the coastal siting report and related decision-making.

The next steps in this effort will be to organize a subcommittee to prioritize actions and develop budgetary requests to ensure that state and federal efforts are coordinated, and potential redundancies in data base and mapping product development are minimized.

#### **Task 4b. Standard monitoring protocol and regulatory agency exchange**

Another facet of improving data management and communication is to develop consistent, scientifically and statistically robust guidelines for baseline and monitoring data collection for renewable ocean energy projects. Standardized monitoring protocols would result in data sets that are comparable and transferable among sites and technologies. The protocols would include a Before, After, Control, Impact (BACI) experimental study design. The RE team will need to consult with scientists to determine the methods and designs for monitoring protocols that will best answer key questions. The ultimate goal of applying consistent protocols would be an improvement in our ability to assess impacts of various technologies and evaluate cumulative impacts for both individual projects, and for multiple projects along the West Coast region or in various sub-regions.

The next step for this task will be to conduct a literature survey of the monitoring protocols that have been used for similar marine projects and renewable energy technologies in order to develop a draft protocol. One potential partner for this activity is the Northwest National Marine Renewable Energy Center (a partnership of Oregon State University and University of Washington). As part of this effort, the group plans to assess current projects in the region by bringing together regulatory contacts from the states and federal agencies along the West Coast to exchange information on specific renewable energy projects, including monitoring studies and processes being utilized to address impact questions for various technologies and sites along the West Coast. Some regulatory agencies have begun to exchange this type of information. However, providing an organized opportunity will improve collection and dissemination of information throughout the region as well as foster greater communication and efficiency. Once a draft protocol is developed, scientists should peer-review it and provide recommendations for the final protocol.

## **Task 5: Technology**

### **Priority: Medium**

Energy is a topic that continues to grow in importance on the West Coast. High prices coupled with government initiatives to move the energy mix toward a more renewable-based portfolio brings the topic of energy development to the forefront in American households. Today, the general public is increasingly interested in finding new ways to use our energy sources more wisely and economically while also minimizing potential impacts.

Recognizing the interest and need for a public that is literate in marine renewable energy, education materials on current and emerging technologies and their potential environmental impacts ranked medium among the regional framework components of the Renewable Ocean Energy Work Plan.

The goal of this task is to develop materials suitable for distribution at outreach meetings and other venues where the public will learn about or consider marine renewable energy projects. This effort will begin with the development of a short white paper that may include the following information:

- Description of the types of technology (wind, wave, and tidal);
- Images of the technology;
- Locations of current use;
- Known limitations;
- Possible environmental impacts or concerns; and
- Potential energy generation along the West Coast.

The aim is to produce the white paper by April 2010. Once completed, the white paper will serve as the foundation for subsequent technology education materials such as handouts, brochures, PowerPoint presentations, or websites. These materials will be developed as needed and compliment other components of this Renewable Ocean Energy Work Plan including tasks related to Information and Data Needs, the Coastal Siting Report, and Public Education on Regulatory Regimes.

## **Task 6: Energy Infrastructure**

### **Priority: Medium**

This task will provide a white paper that outlines existing onshore/offshore energy infrastructure for renewable ocean energy. The white paper will be suitable for distribution at public outreach meetings, converting into a PowerPoint presentation, or webpage. The white paper will define the need for this energy source from a state perspective. Projects being conducted by Oregon Wave Energy Trust addressing utility infrastructure and the potential market for renewable ocean energy will contribute to meeting this need.

## **Task 7: Public Education on Regulatory Regimes**

### **Priority: Medium**

The Public Education on Regulatory Regimes key component is ranked medium among the components of the Renewable Ocean Energy Work Plan. The ACT is pleased with the recent joint resolution to the MMS/FERC jurisdictional issue through the development of an MOU and guidelines. This ACT will monitor the resolution and engage in the future as needed. Given these recent developments, providing information to stakeholders and the public regarding the regulatory process is critical. The RE ACT intends to develop a more detailed communication and education plan over the fall that will identify target audiences, available resources, roles, deliverables and timelines needed for potentially elevating this task to a high priority.

Regulatory procedures have evolved over time in response to changes in the statutory framework, an increase in public awareness of the need for environmental protection, and as a result of efforts to make regulatory processes more efficient and effective. The siting of ocean energy projects along the West Coast will involve many federal and state agencies, Indian tribes, non-governmental organizations, and members of the interested public. Coordination, effective communication and a clear understanding of the various federal and state processes is necessary to achieve an efficient regulatory process for making decisions on energy projects while protecting environmental resources.

To achieve a clear understanding of the various processes, this key component identifies three tasks: 1) define and identify all regulatory jurisdictions; 2) review process and timelines for state, federal and local jurisdictions that have a regulatory role in siting a facility; and 3) identify areas for improvement to increase efficiency, effectiveness and gain consistency among the three states. This effort will assist and build on a related effort being undertaken by Department of Energy (DOE) funding to Pacific Energy Ventures.

Once a clear understanding of the regulatory processes is established, attention will focus on promoting coordination and effective communication with all groups involved in siting projects. This may be achieved by the ACT holding public outreach meetings at various places along the West Coast. Ultimately, the three goals of this key component include: 1) better informed project proponents and interested public; 2) states can better explain and coordinate their processes with each other and the federal regulatory agencies; and 3) more efficient process and well informed decisions are made on project siting.