

FINAL TECHNICAL SUMMARY

STUDY TITLE: OREGON RENEWABLE ENERGY SCIENCE CONFERENCE

REPORT TITLE: Oregon Marine Renewable Energy Environmental Science Conference Proceedings

CONTRACT NUMBER: Cooperative Agreement Number M12AC00012

SPONSORING OCS REGION: Pacific

APPLICABLE PLANNING AREA(S): Washington/Oregon/northern California

FISCAL YEAR(S) OF PROJECT FUNDING: FY 2012-2013

COMPLETION DATE OF REPORT: April 2013

COSTS: FY2012 \$149,751

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KEY WORDS: marine renewable energy, wave energy, marine resources, environmental effects, offshore wind energy, mitigation

BACKGROUND: Development of marine renewable energy, focused on the extraction of energy from wind and waves, is anticipated on the Outer Continental Shelf (OCS) off Oregon and much of the Pacific Northwest in the near future. Multiple issues related to the environmental considerations and information needs for these emerging industries remain, which are of interest to researchers, agencies and stakeholders. Currently, university research addresses diverse questions regarding potential environmental effects while state and federal entities evaluate potential projects via permitting processes and collectively review draft plans. The last workshop examining the environmental effects of marine renewables off the Oregon Coast, held in 2007, dealt specifically with wave energy. New research, technology development, and other activities have taken place in the intervening five years which create a need to assess the current research inventory and identify information gaps and priorities for new research associated with marine renewable energy based on this updated information. No similar workshops have been held dedicated to understanding the environmental effects of offshore wind development off Oregon, so our understanding of the impacts of these technologies has been based on assessments of wind technologies operating at other locations; regional considerations were evaluated for development of environmental study protocols for the West Coast, most of which have been funded by BOEM.

This conference was stimulated by the formation and deliberations of the Bureau of Ocean Energy Management (BOEM) Oregon OCS Renewable Energy Task Force. This intergovernmental group, comprised of seven federal agencies, nine state agencies, three county governments, and four tribal governments, was formed in 2011 to coordinate and consult with the State of Oregon and others on potential marine renewable energy activities, such as leasing, on the Outer Continental Shelf off Oregon. In January 2012, the State of Oregon's Department of Land Conservation and Development sent a letter to BOEM requesting a science conference to address needed environmental studies. BOEM agreed to set up this conference and contracted with Oregon State University to convene the conference in November 2012. The development

and implementation of the conference (and associated Experts Workshop) was overseen by a Steering Committee with three members from BOEM, two from Oregon State University, and two from State of Oregon resource agencies.

OBJECTIVES: The conference was developed with three major goals. The first goal was to showcase primary research recently completed or currently underway that addresses environmental questions associated with wave and wind energy development in the Pacific Northwest. The second was to synthesize new research and existing information with the aim of distilling it into products that agencies and resource managers can use to carry out their planning and management duties. The third goal was to identify gaps in our understanding of the technologies or potentially affected systems that then can help scientists, managers, and funders determine where to focus future resources and research efforts.

The Steering Committee determined to array the discussions by categories dictated by the National Environmental Policy Act (NEPA); however it was agreed early in the planning process that socioeconomic aspects as identified in NEPA would not be considered in this forum. The Committee felt that focusing on environmental issues represented an attainable goal for the conference, given the time and logistic constraints. Important issues in the socioeconomic realm likely will require a like number of specialists and an equal amount of time and effort.

In light of the conference goals, the Steering Committee worked to develop a set of objectives and an agenda that would serve to accomplish these goals. Specifically, the Committee sought to:

- assemble scientists with relevant expertise, key regulatory agency staff, and stakeholders in a workshop setting conducive to free information exchange;
- identify existing and planned scientific research that addresses environmental concerns associated with the development of marine renewable energy;
- identify data gaps related to evaluation of environmental effects and the scientific approaches needed to address these data gaps;
- improve communication among all stakeholders in marine renewable energy development off Oregon; and
- develop workshop products (website, proceedings document) that will make this information broadly available to all Oregon marine renewable energy stakeholders.

DESCRIPTION: The conference was developed as a two-day event to meet the goals and objectives noted above. The first day was designed as an open conference for to up 100 registrants, and 94 individuals participated in the first day's events. The intent was to encourage broad participation ranging from technical experts and agency scientists to the general public, and this diverse representation was indeed achieved. The first day was divided into five sessions; the first three featured invited speakers selected by the Steering Committee to include i) presentations on how state and federal agencies utilize the environmental information collected, ii) review papers summarizing the state of knowledge or research addressing environmental interactions on topics ranging from marine mammals and protected species through an experience paper on European research, and iii) presentation of featured environmental studies, providing information on the newest research, much of it in progress at the present time. A presentation on the gap analysis paper distributed prior to the conference was given, setting the stage for the breakout groups the following day. The final session was a reception and poster session of contributed papers, where other relevant research studies could be highlighted by conference participants.

The second day was an "Experts Workshop" where 43 invited scientists with technical expertise on marine ecosystems and environmental effects of marine renewable energy met to review the gap analysis and provide advice on priority studies. A focal point of the workshop was a set of three facilitated breakout sessions with specific objectives. These sessions track with Federal/State agency energy project review processes, allowing the participants to provide feedback to directly inform their review. The three breakout session topics were: i) baseline

studies, ii) impact and short-term studies, and iii) monitoring and long-term studies. The steering committee pre-assigned the participants to breakout groups, and the instructions to the breakout groups, distributed prior to the workshop, were very specific, asking participants to develop priorities based on a matrix of NEPA criteria. This approach provided a clear context of applicability to agency requirements, requesting that participants develop priorities that could be mapped to the categories that agencies must address as projects are proposed and reviewed in the OCS region off Oregon. The breakout groups also addressed a variety of key questions related to the conference's scientific objectives.

SIGNIFICANT CONCLUSIONS: The significant outcomes of this conference and associated Experts Workshop are the lists of high priority research projects identified by the breakout groups. As noted below under Study Results, expert groups refined known gaps in our knowledge and identified baseline information needs, impact studies, and long-term monitoring studies that must be accomplished to ultimately develop wave and offshore wind marine renewable projects off Oregon. Existing and needed environmental information was used to identify and prioritize information and research gaps related to the technologies or potentially affected systems that can help scientists, managers and funders focus future research efforts. Some of the identified data gaps and research needs are already being addressed by BOEM's Pacific Region Environmental Studies Program. The success, and significance, of this conference will be determined by the degree to which the recommended research and projects are incorporated into future BOEM Pacific Region Environmental Studies Development Plans as well as the plans of other agencies with similar interests.

STUDY RESULTS: The principal research priorities identified were specific to the three breakout groups. The Baseline breakout group focused on those studies needed to evaluate the ecological compatibility of an area with marine renewable energy development. The recommended studies focused on better characterization of habitats and ecosystems, including broad-scale seafloor characterization at distances of 3-10 miles offshore to help locate sensitive but unidentified ecological resources, distributions of non-commercial species (i.e., forage fish species) integral to ecosystem dynamics, and identification of ecological hotspots. Studies on spatial and temporal distribution of seabirds, terrestrial birds, bats, and marine mammals are needed to understand whether interactions with marine renewable installations are likely to occur.

The Impacts/Short-term breakout group identified diverse high priority studies for both wind and wave energy project development that will be needed. The highest priority studies for both wave and offshore wind fell into categories associated with sediments and oceanography, acoustics, electromagnetic fields, biology focused on listed species (marine mammals, seabirds, fish), and ecological features like seafloor habitats and essential fish habitat.

The Monitoring breakout group focused on specific deployment scenarios, and identified their top priorities under the categories of marine mammals, seabirds, fishes and essential fish habitat, the acoustic environment, and the pelagic environment (forage fish). As wave and offshore wind facilities are deployed off the Oregon coast, the nature of monitoring required will be informed by the results of impact studies.

Group reports also addressed the importance of partnerships and maximizing the use of existing studies and programs, for example baseline and monitoring data from ocean observing systems or agency survey programs. Impact studies can benefit from work conducted elsewhere on renewable energy projects and those addressing similar topics on analog systems, like oil platforms; the Impact group discussed the conditions under which these results can be beneficially applied to marine renewable energy facilities off Oregon.

STUDY PRODUCT(S): The results of this conference will be widely disseminated. The final report includes introductory material, extended abstracts of presented papers and the gap analysis,

and the reports of the breakout groups. Appendices include abstracts of contributed posters, the gap analysis report, and lists of participants. The report is available in PDF format at the BOEM website (http://www.data.boem.gov/homepg/data_center/other/espis/espismaster.asp?appid=1), and on the conference website (<http://hmsc.oregonstate.edu/rec/>). It will also be housed in a “Scholar’s Archive,” a permanent electronic archive in Oregon State University Libraries (<http://hdl.handle.net/1957/36597>) that will also include additional material from the conference such as slides from presentations at the conference.

130°0'0"W

120°0'0"W

Queen Charlotte Sound

Legend



Study_Area



200 & 2,000 m isoabaths

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50°0'0"N

45°0'0"N

45°0'0"N

40°0'0"N

40°0'0"N

35°0'0"N

35°0'0"N

Cascadia Basin

Blanco Fracture Zone

Gorda Escarpment

Vancouver

Victoria

Seattle

Olympia

Portland

Salem

Corvallis

Medford

Sacramento

San Francisco

San Jose

Fresno

Kelowna

Spokane

Kennewick

Boise

Carson City

NEVADA

MT. Whitney

CALIFORNIA

WASHINGTON

OREGON

GREAT BASIN



130°0'0"W

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