

Technical Summary

- **STUDY TITLE:** BOEM HDCC Oregon Renewable Energy
- **REPORT TITLE:** Human Dimensions of Climate Change in Coastal Oregon
- **CONTRACT NUMBER(S):** M15PG00008
- **SPONSORING OCS REGION:** Headquarters
- **APPLICABLE PLANNING AREA(S):** Washington-Oregon
- **FISCAL YEAR(S) OF PROJECT FUNDING:** 2015 and 2016
- **COMPLETION DATE OF REPORT:** May, 2017
- **COST(S):** FY 15 \$72,817; CUMULATIVE PROJECT COST: \$72,817
- **PROJECT MANAGER(S):** John Primo
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- **PRINCIPAL INVESTIGATORS:** Rudy Schuster (USGS); Kristin Hoelting (USGS)
- **KEY WORDS:** Climate Effects; Environmental Change; Human Dimensions; Social Impacts
- **BACKGROUND:** This study was undertaken to support environmental assessment activities for potential renewable offshore energy projects off the central coast of Oregon; specifically WindFloat Pacific Lease Area and the Marine Hydrokinetic Research Lease Area (see map on following page). This study is aimed at enhancing the understanding of the social characteristics of the communities of Coos Bay and Newport, Oregon and the surrounding area, and toward building the understanding of the social, cultural and economic impacts (e.g., direct, cumulative) of climate change. The need for this study arose in response to several mandates including the National Environmental Policy Act (NEPA) and Executive Order 13653.
- **OBJECTIVES:** BOEM and USGS undertook this case study to fulfill the management needs highlighted above through the exploration of environmental change and associated human dimensions in coastal Oregon. The research investigated the cultural, social, and economic effects (HDCC effects) of environmental change, with specific objectives to gain a broader understanding of the current and future impacts of climate change on the people of Oregon, with an emphasis on the state's coastal populations, and to enhance our understanding of: 1) The current effects of climate change on Oregon's coastal peoples; specifying social, cultural and economic impacts; 2) Climate change's potential impacts on coastal peoples in the future; 3) The potential cumulative effects of climate change on social systems; 4) The major issues and trends that characterize environmental change in the region; 5) Information gaps

and barriers to policy implementation related to the effects of climate change on human systems with particular relevance to OCS policy making.

— **DESCRIPTION:** A review of literature and secondary data sources provided background information for this study, including history and a socio-economic profile of the study area, and selection of key resource/livelihoods to guide sample selection. Fifty-five conversations were carried out during four weeks of primary data collection in 2015, involving a total of 77 respondents representing a range of affiliations (Tribes, Federal agencies, State agencies, county offices, local governing bodies, academic institutions, non-profit organizations, small businesses, and industry) and resource/livelihood expertise categories (fisheries, forests, tourism and recreation, and coastal infrastructure).

— **SIGNIFICANT CONCLUSIONS:** Individual and cumulative HDCC effects were perceived by study respondents to arise from a variety of climate-related environmental changes. The most frequently noted HDCC effects (social, cultural, and economic) arose from six key environmental changes, as summarized here:

- 1) Increasingly warm, sunny climate, making the Oregon climate more comfortable relative to climate stresses elsewhere in the state and nation and contributing to increased movement of people to the Oregon coast, including increased tourist traffic and possible demographic shifts in the permanent population.
- 2) Longer, drier summers, leading to: 1) Longer recreation seasons; 2) Increased risk of forest fire and associated impacts to commercial timber and recreational resource access; 3) Decreased freshwater supply, with associated impacts on the health of forest and fish and wildlife species; and 4) Concerns regarding suitability of existing community water infrastructure.
- 3) Increased frequency of high volume rain events in winter, leading to: 1) Increased scouring of river systems with associated changes to coastal sediment loads; and 2) Increased potential for soil erosion and land instability, with impacts to timber harvesters and increased threats to private and public infrastructure.
- 4) Higher water temperatures, contributing to: 1) Shifting ranges of aquatic organisms and associated changes in ecosystem composition and species abundance; 2) Increased risk of toxic algae blooms; 3) Salmon die offs in rivers; 4) Declining health and survival of Dungeness crab; and 5) Potential concerns around changing wind patterns' influence on coastal upwelling, and associated primary productivity of coastal waters, with impacts to commercial and recreational fisheries.
- 5) Increasing acidity (decreasing pH) of ocean waters, leading to: 1) Current physiological impacts to oysters; 2) Potential direct impacts on other species with calcium carbonate shells; and 3) Potential links between acidification and increased incidence of hypoxia, with impacts to commercial and recreational fisheries.
- 6) Increasing sea levels and storm intensities, resulting in increased rates of coastal erosion and associated threats to public and private infrastructure.

Key social science information gaps in the study area were noted to include information regarding: demographics; cultural and economic values; assessment of public values, perceptions, and attitudes; and factors that influence risk, vulnerability, and adaptability.

Barriers to integration of social science in policy- and decision-making included: poor data quality and availability (i.e., existence of datasets and/or ability to gain access); insufficient environmental awareness and political will; procedural inadequacies; high costs; scale mismatches; and established scientific and institutional paradigms. Factors noted to facilitate integration included: economic incentives and government regulations; community leadership and community cohesion, and activism promoting integration of public values.

— **STUDY RESULTS:** Results included: 1) Most frequently mentioned environmental issues and changes (current and potential future); 2) Most frequently mentioned HDCC effects (current and potential future); 3) Examples of cumulative impacts described by respondents (current and potential future); 4) Types of social science data most frequently noted as information gaps; and 5) Most frequently mentioned barriers and enabling factors to social science integration.

Environmental issues most frequently mentioned as drivers of HDCC effects included key climate projections in the study area: increasing temperature, changes in the seasonality and intensity of precipitation, changes in storm frequency and intensity, and increasing sea level. In addition, secondary environmental changes arising from climate shifts were noted as drivers of HDCC effects. These included forest fires, drought, changes in species distribution and survival, and pest and disease dynamics.

HDCC effects most frequently mentioned as intermediate drivers of additional HDCC effects included: shifting patterns in migration and settlement of people in the study area, changes in risk associated with extreme weather events, economic impacts on key livelihoods and activities, diminished access to natural resources, changes in environmental policy, increasing resource management challenges, human adaptations in response to climate-related environmental change.

— **STUDY PRODUCT(S):** Technical Report

— Map showing area of study: Map of Proposed BOEM Outer Continental Shelf Renewable Energy Projects - 2014

