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STUDY TITLE: Identification of OCS Renewable Energy Space-Use Conflicts and Analysis of Potential Mitigation Measures

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APPLICABLE PLANNING AREA(S): North Atlantic, Mid-Atlantic, South Atlantic, Straits of Florida, Washington/Oregon/Northern California

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PROJECT MANAGER(S): D. Hudgens, J. Weiss

AFFILIATION: Industrial Economics, Incorporated

ADDRESS: 2067 Massachusetts Avenue, Cambridge, MA 02140

PRINCIPAL INVESTIGATOR(S)*: M. Hall Arber, J. Wiggin, T. Murray, F. Conway, C. Pomeroy

KEY WORDS: renewable energy; mitigation; coastal and marine spatial planning; space-use conflicts; multiple-use, natural resource management; policy; fishing; shipping; boating; stakeholders; tribal

BACKGROUND: The ocean accommodates a wide variety of uses that are separated by time of day, season, location, and zones that are set aside for specific users. Conflict can and does occur, however, when two or more groups wish to use the same space at the same time in an exclusive manner. The potential for conflict is well known and the management of ocean space and resources has been, and is being, addressed by a number of state, regional, and federal organizations, including coastal zone management agencies, state task forces, and regional fisheries management councils. However, with new and emerging uses of the ocean, such as aquaculture and offshore renewable energy, comes the potential for new types of space-use conflicts in ocean waters.

In recent years, the Bureau of Ocean Energy Management (BOEM) has examined ocean space-use conflicts and mitigation strategies in the context of its oil and gas and sand and gravel dredging activities. BOEM now has authority to issue leases on the outer continental shelf (OCS) for renewable energy projects, but lacks information on potential conflicts between existing uses of the ocean environment and this new form of activity and on measures that policymakers could employ or encourage to avoid or mitigate any conflicts that might arise during the development of a renewable energy project.

OBJECTIVES: (1) Identify and enhance our understanding of potential multiple-use conflicts that may occur in coastal and offshore waters due to offshore renewable energy development; and (2) offer recommendations for measures that BOEM can consider in order to help avoid or mitigate conflicts.

DESCRIPTION: The research comprised: a literature review, the development of regional geospatial databases, and a program of ethnographic research. The literature review focused on case studies or other documented examples, from the professional, grey, and peer-reviewed literature, of similar spatial conflicts in the marine environment and how they were resolved, mitigated, or otherwise addressed by stakeholders. A limited amount of additional effort focused on literature describing analogous conflicts and mitigation in the onshore environment, as well as general best practices in conflict management. Development of the geospatial databases included collection of available GIS data as well as the generation of new GIS files from raw data sources. The study team initially integrated data already in BOEM's possession, specifically the human use data layers included in the BOEM/NOAA Multipurpose Marine Cadastre (MMC). Additional datasets, as well as raw data that the study team converted into original data layers, were obtained from online geodatabase repositories and through direct outreach to a wide range of Federal, regional, and State organizations, non-governmental organizations, and specific marine resource user groups. Each data layer is accompanied by a metadata record; the extent of the record depended on the availability of data. The ethnographic research comprised multiple, parallel efforts focused on specific geographic regions (Northeast, Mid-Atlantic/South Atlantic, Washington/Oregon, Northern California, see Figure 1). While the focus of this research was on the fishing and boating (commercial, recreational, and charter) communities, the study team made efforts to engage with other important interests, including tribal interests, the U.S. Navy and Coast Guard, and the scientific research community. Most of the ethnographic data collection occurred through more than 200 guided, one-on-one or small group conversations. In addition, the study team convened or participated in six larger group meetings (three each on the Atlantic and Pacific coasts), primarily as a way to describe the study and to identify additional contacts for more in-depth guided conversations. Maps generated from the geospatial database served as a tool for the collection of ethnographic information, as participants in guided conversations and group meetings were invited to use them to convey their perspectives on uses of space and place. The study team digitized, and incorporated into the geospatial database, information collected in this manner.

SIGNIFICANT CONCLUSIONS: A primary objective of this study was to recommend measures that BOEM can consider as means to avoid or mitigate conflicts between renewable energy development and other ocean uses on the outer continental shelf. The literature review completed as part of this study as well as the study team's original ethnographic research resulted in a list of 31 avoidance and mitigation strategies. Project and location circumstances will determine whether one or more of these strategies would be appropriate for further consideration. BOEM has the regulatory or statutory authority to implement at least 12 of the identified strategies. In cases where it would not be considered the "primary" implementation authority, BOEM may be able to influence the actions of other governmental authorities, especially given the coordination among government agencies required for the review and approval of offshore renewable energy development project plans and operations.

The study also notes the importance of recognizing that management of offshore renewable energy development is a new and evolving challenge. While we can learn from and build upon the offshore wind energy experience already gained in other markets (most notably Europe), as well as from the implementation of avoidance and mitigation strategies that have been successfully employed in other (non-renewable energy) contexts, the actual conflicts created by offshore renewable energy development, and the most appropriate conflict management techniques, will truly be known only upon completion of at least one, and likely several, utility-scale project in U.S. waters. Finally, the study findings suggest that the stakeholder engagement *process* (i.e., actions that occur well before any consideration of the need for avoidance or mitigation strategies) is important, and that the establishment of an effective communication and process platform would likely make the need for mitigation a less frequent occurrence while also facilitating quicker resolutions when mitigation does become necessary and appropriate.

STUDY RESULTS: The literature review resulted in a database of more than 350 unique references. Of these, 192 were considered highly, moderately or somewhat relevant to this study. Many that did not address the marine environment or renewable energy were deselected, as well as those that did not address the topics with any depth. One hundred three of the 192 in this literature synthesis are cited in the text; all 192 are listed in a bibliography (an appendix to the study report), with the highly and moderately relevant citations annotated. Overall, the literature points to a field that is not well developed in terms of conflict description and resolution. Of the 192 citations, only 86 directly address offshore renewable energy uses. Much of the discussion is general and describes potential conflicts rather than specific instances with productive resolutions. Even so, there appears to be consistency between offshore renewable energy development and past experience with offshore oil and gas exploration and development as well as sand and gravel operations. The context, scale, and severity of conflicts differ on a case-by-case basis and cannot be divorced from underlying causes and human values. Data included in the geospatial databases are organized by geographic coverage (east coast, west coast, both coasts) and comprise more than 850 individual data layers. The study team also created a user-friendly, Microsoft Access-based inventory database to track each file within the geodatabases. The inventory database holds the basic information about each shapefile such as the coverage area, the category, subcategory, source, and more detailed location extent information. The specific geodatabases holding each file is also tracked in the inventory geodatabase. The ethnographic research produced a rich compendium of diverse perspectives on compatible and conflicting uses of the OCS, mitigation concepts, and communication needs.

STUDY PRODUCT(S): Industrial Economics, Inc. 2012. Identification of OCS renewable energy space-use conflicts and analysis of potential mitigation measures. U.S. Department of the Interior, Bureau of Ocean Energy Management, Herndon, VA. OCS Study BOEM 2012-083. 414 pp.

Industrial Economics Inc. 2012. Geospatial Database of Space Use on the Atlantic and Pacific Coasts.

Weiss, J. 2012. *Avoidance and Mitigation of Potential Conflicts between Offshore Renewable Energy and Commercial Fishing* (in process)

[*] Principal Investigator affiliation may be different than that listed for Project Manager(s).

Figure 1 Study Area Regions