

Environmental Studies Program: Ongoing Study

Study Area(s): Southern California, Central California, Northern California, Washington Oregon, Hawaii

Administered By: Pacific OCS Region

Title: Using Ongoing Activities as Surrogates to Predict Potential Ecological Impacts from Marine Renewable Energy (PC-13-02)

BOEM Information Need(s) to be Addressed: The purpose of this study is to identify and analyze available data from ongoing projects or activities (surrogates) with stressors and receptors similar to those expected from marine renewable energy projects. Stressor-receptor pairs that may be particularly useful to analyze from surrogates include: (1) electromagnetic fields from operating power cables as impediments to migration of marine mammals and anadromous fishes (salmonids and green sturgeon), and (2) mooring configurations of offshore aquaculture facilities and oceanographic buoys as entanglement hazards for marine mammals. Given that no current marine renewable energy facilities exist, and because BOEM may receive applications for renewable energy projects in the near future, analyzing data from surrogates will provide some of the best available and most timely information to make informed decisions regarding project permitting and guide future research efforts. BOEM will use results from this study for impact assessments contained within NEPA documents, and also in consultations required by the Endangered Species Act and the 1996 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act.

Total BOEM Cost: \$300,000

Period of Performance: FY 2014–2016

Conducting Organization(s): U.S. Department of Energy

Principal Investigator(s): U.S. Department of Energy

BOEM Contact(s): [Donna Schroeder](#)

Description:

Background: There are currently no marine renewable energy arrays operating on a commercial scale in United States waters. This compromises the ability to understand, predict, manage and mitigate potential impacts of proposed marine renewable energy projects. To perform timely environmental review, data from ongoing projects and activities (surrogates) with stressors and receptors similar to those expected from marine renewable energy projects can be analyzed to reduce the uncertainty in the range of outcomes and intensity of environmental consequences. Stressor-receptor pairs that may be particularly useful to analyze from surrogates include: (1) electromagnetic fields from operating power cables as impediments to migration of marine mammals and anadromous fishes (salmonids and green sturgeon), and (2) mooring configurations of offshore aquaculture facilities and oceanographic buoys as entanglement hazards for

marine mammals. Other useful stressor-receptor pairs from appropriate surrogates may be identified. Proposed studies will complement but not duplicate information already available from renewable energy projects present in other parts of the world.

Objectives: The objective of this study is to analyze existing data from surrogate projects to predict the ecological consequences of proposed marine renewable energy facilities.

Methods: To meet the study objective, BOEM has partnered with the Department of Energy (DOE). Under a Funding Opportunity Announcement (FOA), DOE will solicit proposals with varying technical/scientific approaches to address the information need. Approximately three projects will be funded under this FOA. Given the need for timely review, each proposed project must complete the final report within 18 months of the initial financial award. No new data are to be collected as part of this study; proposed work shall analyze information already available.

Current Status: This study was awarded as an interagency agreement with DOE, which subsequently awarded it as openly competitive contracts. Final reports from all three projects have been submitted. The study is in the process of close-out. At least one, maybe two, additional peer-reviewed papers are expected.

First Report: Completed March 2015 (Kramer 2015)
Second Report: Completed December 2015 (Claisse et al. 2015)
Third Report: Completed December 2016 (Kavet et al. 2016b)

Publications Completed:

Kramer, S. 2015. Evaluating the potential for Marine and Hydrokinetic Devices to Act as Artificial Reefs or Fish Aggregating Devices. H.T. Harvey & Associates. Prepared for U.S. Department of Energy. 83 pp.

Claisse, J.T., D.J. Pondella, C.M. Williams, L.A. Zahn, and J.P. Williams. 2015. Current ability to assess impacts of electromagnetic fields associated with marine and hydrokinetic technologies on marine fishes in Hawaii. DOE Award Number: DE-EE0006390.000. OCS Study BOEM 2015-042. 135 pp.

Kavet, R., Wyman, M.T. and Klimley, A.P. 2016a. Modeling magnetic fields from a DC power cable buried beneath San Francisco Bay based on empirical measurements. PloS one, 11(2), p.e0148543.

Kavet, R., Wyman, M.T. and Klimley, A.P. 2016b. Assessment of Potential Impact of Electromagnetic Fields from Undersea Cable on Migratory Fish Behavior. Final Technical Report, 2016. DOE Award Number: DE-EE0006382, OCS Study BOEM 2016-041.

Affiliated WWW Sites: <https://marinecadastre.gov/epis/#/search/study/26974>

Revised Date: February 3, 2017