

## **Environmental Studies Program: Ongoing Study**

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

**Administered By:** Pacific OCS Region

**Title:** Potential Impacts of Submarine Power Cables on Crab Harvest (NSL #PC-14-02)

**Note:** *The conducting organization has concluded work on this study. The final report will be published after a supplemental study collects and analyzes additional data. The additional work is planned for 2019 and the report is expected in 2020.*

**BOEM Information Need(s) to be Addressed:** BOEM requires information concerning potential effects from offshore energy development to marine fisheries. West Coast fishers have expressed concern that electromagnetic fields (EMF) emitted from renewable energy power cables may negatively affect their ability to harvest Dungeness crabs and that the cable EMF may create a barrier that individuals will not cross. If true, crab harvest near power cables could be negatively impacted. This study is designed to assess whether or not target crab species will traverse power cables in response to baited traps that are nearly identical to those traps used by fishers. Existing submarine transmission cables that support communities and offshore oil platforms in the Pacific Region provide an opportunity to test the behavior of crab species in relation to operating power cables. The information will be applicable to consideration of offshore renewable energy projects and inform National Environmental Policy Act assessments.

**Total BOEM Cost:** \$600,000

**Period of Performance:** FY 2014–2018

**Conducting Organization(s):** University of California, Santa Barbara

**Principal Investigator(s):** [Dr. Mary Nishimoto](#)

**BOEM Contact(s):** [Dr. Michael Rasser](#)

### **Description:**

Renewable energy technologies focus on the generation of electricity. In all cases, individual devices within an offshore wind or wave facility will be connected with intra-array power cables and then shipped to shore via a larger transmission cable. One of the potential impacts from offshore energy development may be the local attraction or repulsion of economically important crab species due to the electromagnetic fields (EMF) emitted by the operating power cables. Several important commercial crab species are found in the immediate vicinity of existing cables within areas where fishermen harvest, including red rock crab (*Cancer productus*) and Dungeness crab (*Metacarcinus magister*). This provides a unique opportunity to determine whether or not the target crab species will traverse power cables in response to baited traps.

**Objectives:** The objective of this study is to determine if red rock crab and Dungeness crab will traverse energized power cables and be caught in commercial traps.

**Methods:** BOEM is planning on additional sampling over the next two years to confirm results collected from this first portion of the study. The first part of this study placed crabs in modified baited traps, and one crab could either traverse an adjacent active cable on the seafloor or move in the opposite direction. Crabs were placed on both sides of the cable and in buried and unburied portions of the cable. Data were collected for 529 red rock crabs (*Cancer productus*) in the Santa Barbara Channel from January through June of 2015 adjacent to an 8” diameter 35kV energized cable. Dungeness crab (*Metacarcinus magister*, n = 307) were tested in the Puget Sound during August and September of 2015 crossing a 6” diameter 69 kV energized cable. BOEM will repeat some of this work using additional controls to estimate the proportion of crabs, if any, that may be repelled by energized cable effects.

**Current Status:** The conducting organization concluded work on this study in April 2018. Based on experimental data collected for red rock crab in the Santa Barbara Channel and Dungeness crab in Puget Sound, the conducting organization found that crabs did traverse the cables; a proportion of both species, and in both locations. BOEM feels that additional experimental data are needed to confirm and expand upon these findings. The final report will be published after a supplemental study collects and analyzes additional data.

**Final Report Due:** April 2018

**Publications Completed:**

Love, M.S., M.M. Nishimoto, S. Clark, M. McCrea, A.S. Bull. 2017. Assessing potential impacts of energized submarine power cables on crab harvests. Continental Shelf Research, 151 (23-29).

**Affiliated WWW Sites:**

<https://marinecadastre.gov/epis/#/search/study/26989>  
[http://www.lovelab.id.ucsb.edu/power\\_cable\\_impacts.html](http://www.lovelab.id.ucsb.edu/power_cable_impacts.html)

**Revised Date:** July 13, 2018