

## Environmental Studies Program: Studies Development Plan | FY 2019–2021

Title	Supplemental Data Regarding the Behavioral Response of Rock Crabs to the EMF of Subsea Cables and Potential Impact to Fisheries
Administered by	Pacific OCS Region
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Procurement Type(s)	Contract or Cooperative Agreement
Approx. Cost	\$150 (in thousands)
Performance Period	FY 2019–2020
Date Revised	March 2, 2018
PICOC Summary	
<i>Problem</i>	BOEM requires information concerning the level of impacts from seafloor power cables on marine fisheries. Fishermen are concerned that electromagnetic fields (EMF) associated with renewable energy power cables will present an electrified fence on the seafloor that their resource will not cross. BOEM funded an earlier study that showed crabs can cross an electrified cable but the effectiveness of the experimental design should be confirmed.
<i>Intervention</i>	Conduct additional field surveys to supplement earlier work to verify and resolve experimental design of the initial study.
<i>Comparison</i>	Compare original conclusions with new conclusions that will be derived using supplemental data to determine if they are different
<i>Outcome</i>	EMF impacts to the crab west coast fishery needs to be addressed and completely examined. This supplemental study enable a full discussion and will enhance the interpretation of the original work.
<i>Context</i>	All Pacific OCS Planning Areas (U.S. West Coast and Hawaii)

**BOEM Information Need(s):** BOEM requires information concerning the level of impacts from seafloor power cables on marine fisheries. Fishermen are concerned that electromagnetic fields (EMF) associated with renewable energy power cables will present an electrified fence on the seafloor that their resource will not cross. BOEM also needs scientific results can be interpreted clearly for decision-making.

**Background:** BOEM funded a study, Potential Impacts of Submarine Power Cables on Crab Harvest (NSL #PC-14-02), designed to test the fear of crab fishermen that their target species will not traverse power cables, even in response to baited traps. Combined with the assistance of professional fishermen, submarine transmission cables that electrify communities and offshore oil platforms in the Pacific Region provided an opportunity to test frequency within which rock crab and Dungeness crab cross power cables. Results of this study show that crabs will indeed cross an electrified cable in response to a baited trap. However, in order to support a conclusion that electrified cables have “no impact” on these fisheries, BOEM needs to do additional work. It is possible that due to the design, the responses are confounded with other environmental

responses other than EMF. That issue needs to be clearly resolved in order to report a clear results, which is of interest to the fishing community.

**Objectives:** To verify the behavioral response of commercial crab species in the presence of electrified cables associated with renewable energy projects and controlling for environmental conditions.

**Methods:** Conduct field experiments that place baited traps up current at Santa Ynez Unit power cables and in a control area away from the cables offshore of Santa Barbara, California. This will be done by catching and holding rock crab, releasing crabs down current from power cables and at similar distance from control traps, and maintain traps, monitor, and record catch per fishermen's practice. Prior to the field work, a power analysis will determine the number of crabs, number of traps, and number of trials needed. Current direction and intensity will be measured throughout the experiment. EMF will be measured before and after the trials.

**Specific Research Question(s):**

1) Do electromagnetic fields from subsea cables affect the behavior of commercially important rock crabs?