## Environmental Studies Program: Studies Development Plan | FY 2023–2024

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| Title | Facilitating Resilience and Adaptation in Commercial Fisheries in Response to Offshore Renewable Energy Development and Climate Change (PC-23-03) |
| Administered by | Pacific OCS Regional Office |
| BOEM Contact(s) | Donna Schroeder (donna.schroeder@boem.gov) |
| Procurement Type(s) | Inter-agency Agreement and/or Cooperative Agreement |
| Conducting Organization(s) | TBD |
| Total BOEM Cost | TBD |
| Performance Period | FY 2023–2024 |
| Final Report Due | TBD |
| Date Revised | August 5, 2022 |
| PICOC Summary | |
| *Problem* | Although the public and decision-makers may be aware of the general debate regarding climate change, there is a lack of understanding as to how expected changes can be addressed at the local or project scale. |
| *Intervention* | A series of analyses that will encompass the offshore causal-change progression (climate-oceanographic-biological-socioeconomic) will be developed for Pacific Region fisheries in areas currently prospective for offshore renewable energy development. |
| *Comparison* | Oceanographic, biological, and socio-economic outcomes will be compared across various climate change scenarios. |
| *Outcome* | Study products will be useful for stakeholder outreach, National Environmental Policy Act (NEPA) analyses, and evaluation of construction and operation plans for offshore energy development. |
| *Context* | The spatial scope of the project will be the Pacific OCS Region, with initial analyses focusing on the Southern California and Northern California Planning Areas. |

**BOEM Information Need(s):** Most commercial fishery sectors will be precluded from OCS leases when development of floating wind or marine hydrokinetic energy occurs. The potential consequences of these restrictions represent a challenge to understand, predict and mitigate due to a variety of factors, including how climate change may interact with potential effects of a proposed offshore energy project.

Impact analyses for commercial fishing often focus on short-term negative effects and neglect to elucidate the long-term and frequently beneficial aspects of offshore renewable energy development. Although the public and decision-makers may be aware of the general debate regarding climate change, there is a lack of understanding as to how expected changes can be addressed at the local or project scale. Enhancing the predictive capacity of managers to determine the scope of potential impacts from offshore energy in the context of climate change scenarios will have widespread utility, and aid BOEM in developing complete impact analyses for NEPA documents, reviewing construction and operation plans for appropriate mitigation measures, and communicating with stakeholders, including affected State governments and renewable energy task forces.

**Background:** Given the ubiquity of fishing activity on the OCS, any site selected for offshore energy development will overlap with areas currently used by one or more commercial fishing sectors. Thus, to reduce conflicts among industries, a detailed understanding of potential short- and long-term impacts is necessary to develop a successful mitigation strategy.

An additional consideration to the above challenge is that it will have to be met at a time when the effects of climate change will be increasingly prominent. Climate change is expected to heavily impact the marine life and productivity of oceans (Pinsky et al. 2013; Free et al. 2019; Lotze et al. 2019), and these changes will propagate to marine fisheries (Young et al. 2019; Fisher et al. 2021). Observable changes are already occurring along the West Coast of the U.S. (Chavez et al. 2017) and elsewhere (Barange et al. 2018), but linking theoretical impacts to local communities so that specific mitigative actions can be developed and implemented has rarely been attempted (Mason et al. 2022).

This study will analyze how potential impacts from offshore energy development and climate change may interact. It will build upon two ongoing BOEM-funded studies (BOEM 2021a, 2021b) and past work detailing potential mitigation measures for the commercial fishing industry (IE 2012; EEI 2014).

**Objectives:** The objective of this study is to select a range of potential climate change scenarios and conduct a series of analyses that examines the offshore causal-change progression (climate-oceanography-biology-socioeconomics) focused initially in the Pacific Region fisheries and (1) describes potential changes, (2) describes how these changes may interact with changes expected from offshore energy development, and (3) offers potential mitigation strategies that will increase the resilience or adaptability of the commercial fishing industry.

**Methods:** Researchers will first review the available evidence and possible scenarios of climate change, and then synthesize this information into a final framework useful for commercial fisheries focusing initially within the Pacific Region. This impact framework will be used alongside models detailing the changes expected in oceanographic parameters and species distributions for a range of climate change scenarios. Next, information on existing commercial fisheries and the status of their harvested populations near prospective offshore energy development will be used to construct coupled social-ecological systems to understand potential responses to climate change scenarios. Finally, potential impacts from offshore energy projects will be added to the system, and a comprehensive resilience framework will be developed to examine how conflicts can be avoided, minimized, or compensated.

**Specific Research Question(s):**

1. Using a range of climate change scenarios foreseeable within the next 20 to 50 years, what are the potential impacts to U.S. commercial fisheries and are there patterns emerging according to gear and harvested species categories?
2. Using the climate change scenarios described in question 1, what is the expected local manifestation of *biological changes* in areas prospective for offshore energy development in the Pacific Region, focusing on harvested, keystone, and protected species?
3. Using species distribution and biological productivity models developed in question 2, what is the expected local manifestation of *changes to fisheries* in areas prospective for offshore energy development, focusing on fisheries most likely to be impacted from offshore energy activities?
4. Using the analyses developed in question 3, what potential mitigation measures would be useful to avoid, minimize, compensate, or enhance local fisheries in areas prospective for offshore energy development?

**Current Status:** N/A

**Publications Completed:** N/A

**Affiliated WWW Sites:** N/A

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