

Environmental Studies Program: Studies Development Plan | FY 2025–2026

Field	Study Information
Title	
Administered by	Pacific OCS Region
BOEM Contact(s)	Dr. Desray Reeb (desray.reeb@boem.gov)
Procurement Type(s)	Cooperative Agreement
Performance Period	FY 2025–2027
Final Report Due	TBD
Date Revised	August 26, 2025
Problem	Offshore energy infrastructure has been identified as a potential vector for secondary entanglement of protected species due to associated derelict fishing gear. There is currently no way of assessing the probability of this happening offshore California.
Intervention	Develop a drift model for derelict fishing gear, e.g., a particle tracking model based on where fishing is occurring and using the latest oceanographic and/or current models (e.g., UCSC West Coast Operational Forecast System [WCOFS]) to assess the cloud of possible interactions.
Comparison	This would be the first effort of its kind and will provide an important assessment tool that can be tested for validation using limited empirical data.
Outcome	With limited data on fishing gear loss, this model will provide resource managers, regulators, and industry with a tool to inform the probability of derelict gear associating with offshore energy infrastructure. This tool would allow for the more accurate assessment of the risk and/or need for mitigation of secondary entanglement of protected species in these systems. This approach could be replicated for other regions using regional ocean models.
Context	Pacific with potential application to all BOEM regions

BOEM Information Need(s): BOEM has active energy leases offshore California. There is no centralized, standardized data available on how much fishing gear is lost each year in the Pacific, and where these losses occur. To accurately assess the risk of secondary entanglement to protected species from derelict gear becoming associated with energy infrastructure. BOEM needs to understand the probability of this association occurring. Impact assessment information is required under NEPA, ESA, and MMPA.

Background: Numerous stakeholders along the U.S. West Coast have commented on their concerns that offshore energy infrastructure presents entanglement risks to marine wildlife.

Information on lost fishing gear is not systematically collected in the Pacific. Although information on replacement commercial fishing tags suggests loss up to 10% per season, experts from NOAA suggest that this is an overestimate, and that loss is more likely around 5% (<https://pacificoceanenergy.org/wp-content/uploads/2020/07/POET-Cetacean-Webinar-Slidedeck.pdf>).

Various modeling approaches have been used to understand the fate of objects or substances drifting in the ocean (Córdova and Flores 2022;) or for understanding and monitoring the environmental effects of marine renewable energy (Buenau et al. 2022; Johnson et al. 2021). Since there is currently no centralized, standardized data available on how much fishing gear is lost each year in the Pacific, or where the gear settles, drift models using oceanographic and available fisheries data can be developed to better understand the probability of derelict fishing gear become associated with offshore energy infrastructure.

Objectives: To assess the probability of derelict gear interactions with energy infrastructure offshore California, that can be used to identify regions of greatest risk.

Methods: Using oceanographic and publicly available fisheries data, a drift model will be developed for derelict gear e.g., a particle tracking model based on where fishing is occurring and using the latest current models. These models will allow us to explore multiple release sites and multiple release dates to get a cloud of possible interactions. Because the locations of gear loss are unknown, this approach would present regions with the greatest risk.

Specific Research Question(s): What is the risk of derelict fishing gear becoming associated with energy infrastructure offshore California?

Current Status: N/A

Publications Completed: N/A

Affiliated WWW Sites: N/A

References:

- Buenau KE, Garavelli L, Hemery LG, García Medina G. 2022. A review of modeling approaches for understanding and monitoring the environmental effects of marine renewable energy. J Mar Sci Eng. 10(1):94. <https://doi.org/10.3390/jmse10010094>
- Córdova P, Flores RP. 2022. Hydrodynamic and particle drift modeling as a support system for maritime Search and Rescue (SAR) emergencies: application to the C-212 aircraft accident on 2 September, 2011, in the Juan Fernández Archipelago, Chile. J Mar Sci Eng. 10. 1649. <https://doi.org/10.3390/jmse10111649>
- Johnson TL, van Berkel JJ, Mortensen LO, Bell MA, Tiong I, Hernandez B, Snyder DB, Thomsen F, Svenstrup Petersen O. 2021. Hydrodynamic modeling, particle tracking and agent-based modeling of larvae in the U.S. mid-Atlantic bight. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 232 p. Report no.: OCS Study BOEM 2021-049.