

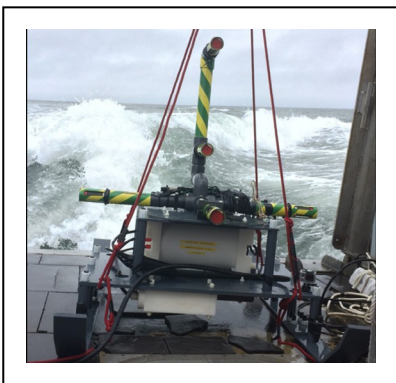
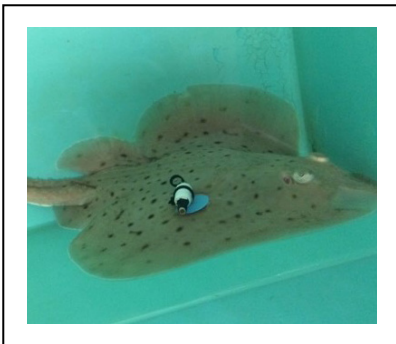
Electromagnetic Field (EMF) Impacts on Elasmobranch (Shark, Rays, and Skates) and American Lobster Movement and Migration from Direct Current Cables

Conducted by: University of Rhode Island

Key Researchers: Z. Hutchison, P. Sigray, H. He, A. Gill, J. King, C. Gibson



Funded by: Bureau of Ocean Energy Management (BOEM)



From top: Lobster with tag, skate with tag, Swedish Electromagnetic Low-noise Apparatus used to measure electric and magnetic fields from subsea cables

EMFs are produced by offshore renewable energy infrastructure, such as submerged power transmission cables, and they have the potential to cause ecological effects or impacts on marine organisms. This study investigated the effects of EMF on two model organisms: the American lobster (to see if the EMF from cables restricts their movements and migration) and the little skate, a member of the most electro-sensitive taxa, which may be attracted to the EMF from cables, altering their foraging or movement behavior. Field surveys of EMF were undertaken on three subsea power cables: two high voltage direct current (HVDC) cables and one alternating current cable. This study developed a field experiment using large netted enclosures to assess the behavioral response when exposed to the EMF from an HVDC cable. The experiment used novel 3D acoustic telemetry to quantify animal movements.

Findings

- Field-deployed animal enclosures and acoustic telemetry methods successfully allowed the collection of in situ, high frequency, three-dimensional positional data on individual animals.
- The American lobster exhibited a statistically significant but subtle change in behavioral activity when exposed to the EMF of the HVDC cable.
- The little skate exhibited a strong behavioral response to the EMF from the HVDC cable.
- EMF associated with the HVDC cable did not constitute a barrier to movements across the cable for either lobsters or skates.

How BOEM will use this information

- Evaluate future wind projects and effects of EMF from the associated cables
- Characterize the cumulative impacts from multiple wind facilities

Additional information

Final report: marinecadastre.gov/espis/#/search/study/100067