



M A R I N E I P

Marine Induced Polarization Methods for Detection and Mapping of Oil in an Arctic Marine Oil Spill Including Investigation of Oil Within and Under Broken Ice Fields

The objective of this project is to identify the current state-of-the-art Arctic maritime oil spill response modeling, potential integration of these models, and specific needs to be addressed to obtain models that will be functional and effective in the response time scale to advance the Federal On-Scene Coordinator's decision making during an incident. This will be accomplished through an Arctic Maritime Spill Response Modeling workshop focused on goals to provide pathways towards a useful oil spill response model that will inform decision-makers during spills.

Federal on-scene spill responses benefit from remote sensing tools to detect and map oil in the open-Arctic ocean, broken ice fields, and oil under and in ice. Marine Induced Polarization (Marine IP) is a proven tool to detect hydrocarbons in the sediment in fresh, brackish, and seawater at all ocean depths, and current research is underway assessing the performance for Marine IP's suitability in Arctic environmental conditions. ADAC Program Year 6 research tests performed at the Cold Regions Research and Engineering Laboratory (CRREL) demonstrated the importance for the Marine IP field kit to be more compact and resistant to the effects of temperature, as well as vibration and jarring during transport and setup. Based on investigations conducted in ADAC Program Year 6, researchers assessed that the field kit needs to be redesigned to be a turn-key system that is easy to transport, set up and deploy by trained personnel, and the software interface and functionality needs to be redesigned to guide a user through the steps needed to collect data using the Marine IP system.

This research effort will leverage the previous Marine IP oil under ice detection research to inform the design, build, and delivery of an Arctic-ready, rugged Marine IP field kit for transition of the Marine IP technology into operational use.

