



L R A U V

Long Range Autonomous Underwater Vehicle

The increasing level of commercial marine activity in high latitudes creates an ever-growing risk of oil spills. Even in logistically accessible, ice-free oceans, characterizing the extent and nature of a spill can be difficult, as the Deepwater Horizon incident highlighted. Currently, an autonomous underwater vehicle capable of under-ice oil detection, that is portable, has long-range endurance, and possesses variable speed capability is not available.

This project seeks to address key questions, such as:

- In the Arctic, how do you control the source of an oil spill if you cannot find it?
- How and where do you place your assets without the necessary and timely intelligence?

The objective of this research is to develop an Autonomous Underwater Vehicle (AUV) based capability to observe and sample dynamic processes in the ocean to characterize oil spills and other environmental hazards under ice. Creating a baseline of data for Arctic Ocean communities can systematically be carried out with the Long Range AUV, Tethys.

The vast majority of remote sensing techniques developed for oil detection in ice-covered waters have focused on airborne or “on-ice” systems. All of these techniques rely on the ability to effectively “see” through the ice and snow cover to detect oil trapped beneath the ice. While some of these methods have been moderately successful in detecting oil in ice covered seas, sensors mounted on AUV’s hold the potential to overcome constraints encountered with airborne or surface based methods, such as the need to sense through the ice and snow, and the logistical challenges in varying ice conditions.

The ability for the US Coast Guard to manage an oil spill response hinges on early information of the nature and magnitude of the spill. Our portable AUV based approach provides a solution and leverages a field proven technology that is helicopter-portable and can be rapidly deployed by the USCG, allowing rapid response and situational awareness for first responders in order to mitigate damages from an oil spill event.

