Navy Maritime Domain Awareness (MDA) Systems Leveraged for North Atlantic Right Whale Alerting

NRL hosts an unclassified MDA system, Proteus, which provides a common operational picture of vessels worldwide. Proteus contains a fusion engine that forms tracks via various data sources: land based sensors (RADAR and AIS), space based sensors (Polar, Epsilon, NOAA VIIRS, and Hawkeye 360), OSINT, airborne sensors (USCG and CB Minotaur), cargo, and other assets. A capability included in Proteus is user-defined area of interest alerting. Seasonal and Dynamic Management Areas for North Atlantic right whales have been layered into Proteus to generate automatic alerts on management area violators. NOAA and USCG users are undergoing a pilot programming for this system and may set and test these aforementioned alerts. A data source currently being investigated for Proteus ingest is commercial high resolution imagery for dark vessel tracking. The dark target vessel tracking effort has synergy with another effort ongoing at NRL, Geospatial Artificial Intelligence for Animals (GAIA). With funding through Office of Naval Research and NOAA Northeast Fisheries, GAIA is workflow being developed to automatically detect marine mammals in commercial imagery using COTS/GOTS machine learning products. In collaboration with NOAA, Bureau of Ocean Energy Management, and University of Cambridge, a training data set of commercial imagery containing Southern right whales and manual annotations have been leveraged to test detection performance. We will first provide a demonstration of current North Atlantic right whale situational awareness measures in Proteus and how imagery may use to enrich situational awareness. We will then provide current workflow and detection performance for the identification of Southern right whales and how this work may be applied to North Atlantic right whales.