

CASE STUDY

UNCREWED SURFACE VEHICLE (USV) REAL-TIME MARINE MAMMAL MONITORING

OVERVIEW

Open Ocean Robotics' uncrewed surface vehicle (USV) Data Xplorer was deployed in support of JASCO Applied Science's 'Real-time Marine Mammal Monitoring Service Via Uncrewed Surface Vessel' demonstration project sponsored by Innovative Solutions Canada. The USV was equipped with a high-resolution camera system, oceanographic sensors, and JASCO's OceanObserver passive acoustic sensor in a 3-day trial for Defence Research and Development Canada (DRDC). The project is to demonstrate how an USV enabled Passive Acoustic Monitoring service could be used by the Royal Canadian Navy to avoid harm to marine mammals during sonar training operations.

GOALS

- Demonstrate a USV based service for real-time marine mammal monitoring.
- Utilize an advanced passive acoustic monitoring system on a USV to detect and localize marine mammals.
- Provide Royal Canadian Navy (RCN) stakeholders with near-real-time acoustic and visual actionable data and information for decision making.

HIGHLIGHTS

Open Ocean Robotics and JASCO demonstrated reliable, real-time, and zero-emission marine mammal monitoring as a service using an uncrewed surface vehicle. This mission showcased a service merging world class acoustic expertise and equipment with cutting edge marine robotics to deliver an innovative solution to protect marine life.

RESULTS

The Data Xplorer USV was deployed in the Pacific Ocean in proximity to Esquimalt, B.C over the course of three days to conduct real-time marine mammal monitoring. The USV was operated by shore-based pilots in Victoria, BC and data was transmitted in real-time to both Open Ocean Robotics' and JASCO's cloud-based portals. In-situ detections were made by JASCO's OceanObserver system and detection information was transmitted for verification and validation by JASCO's acoustic analysts using the PortListen web-portal. Additional data transmitted in real-time included wind speed and direction, barometric pressure, water temperature, water depth, ocean temperature, AIS detections, and optical and thermal camera video, which was available for viewing on Open Ocean Robotics' web-portal XplorerView.



LOCATION



Pacific Ocean in proximity to
Esquimalt, B.C

CLIENT



Defense Research and
Development Canada (DRDC)

MISSION DETAILS

DATE	November 2021
MISSION DURATION	3 days

TECHNICAL SPECIFICATIONS

PASSIVE ACOUSTIC MONITORING SYSTEM	JASCO OceanObserver with Geospectrum M512 towed array
CAMERAS	360-degree custom optical camera, Flir Boson thermal camera.
OTHER SENSORS	Airmar 200WX weather station, Airmar DST800 transducer, AIS transponder.



ADVANTAGES WE OFFER



QUIET OPERATIONS STANDARDS

Near silent operations with low noise brushless gearless motor system and precise speed control for optimal data collection.



ZERO GREENHOUSE GAS EMISSIONS

Completely solar-powered for no GHG emissions, risk of oil spills, and near-silent operations.



OVER THE HORIZON CONTROL

Autonomous or remote control from shore, vessel, or remote operations centre using satellite, cellular, or radio communications.



OFFSHORE, NEARSHORE & COASTAL OPERATION

High maneuverability allows use in shallow nearshore waters and self-righting structure enables offshore use.



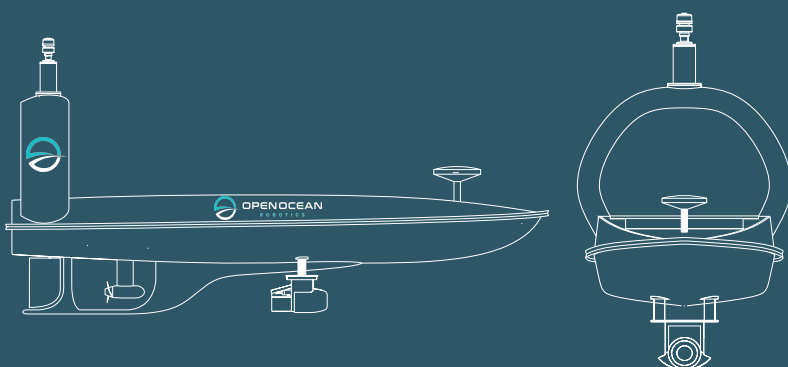
SOLO, FLEET, OR FORCE MULTIPLIER DEPLOYMENT

Can be deployed solo or in a fleet, as well as with other assets to enhance data collection.



NO RISK TO PERSONNEL OR ENVIRONMENT

Can be deployed in hazardous waters, both day and night, and easily transported to poorly accessible locations without impacting coastal communities.



DATA XPLOER TECHNICAL SPECIFICATIONS

LENGTH	3.56 Meters (11.66 feet)
BEAM	0.89 Meters (35 inches)
DRAFT	0.46 Meters (18 inches)
DRY WEIGHT	200 lbs
PAYLOAD WEIGHT	75 kg (165 lbs)
PROPULSION	1.1 kW / 2.0 kW exchangeable pod motor
SPEED	Cruising 1.2-2 kn, max 8-13 kn
COMMUNICATIONS	Satellite, 3G/4G cellular, and 900 MHz radio
HULL MATERIAL	Carbon fiber and S-glass
SOLAR POWER	300 watts



6 CLEAN WATER AND SANITATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION



13 CLIMATE ACTION



14 LIFE BELOW WATER

AWARDS & RECOGNITION

