



OPEN OCEAN
ROBOTICS

CASE STUDY

UNCREWED SURFACE VEHICLE (USV)

Continuous Five-Day Met Ocean Data And Bathymetric Surveying



OVERVIEW

Data Xplorer conducted a five-day continuous voyage throughout the Southern Gulf Islands. The USV was tasked with the dual mission of continuously collecting meteorological data and conducting several bathymetric grid surveys in different locations. The continuous nature of the mission meant the vessel could not be recharged, and would have to rely solely on solar input and battery reserves. Data Xplorer was launched from a boat ramp near Victoria, BC, and began the mission by voyaging 61 km non-stop to waters off the De Courcy Group.

GOALS

- Demonstrate the use of Data Xplorer for continuous multi-day missions
- Test the USV's capability to operate simultaneously as both a mobile data-collection buoy and a survey platform .
- Provide real-time QA and remote operations for over the horizon control

HIGHLIGHTS

Data Xplorer voyaged continuously for 115 hours traveling 167.5 km. During this time it continuously collected an array of data in a range of weather conditions and sea states. At the end of the mission, the batteries still had 50% reserve capacity. Our new generation boats use thrusters requiring half the power, and it can be expected that overall efficiency will be even better.

RESULTS

Data Xplorer was launched from a boat ramp near Victoria, BC, and began the mission by voyaging 61 km non-stop to location near the De Courcy Group. Once in position, the vessel remained in proximity to Ruxton Island with the primary objective of collecting met data, including temperature, wind speed and direction, barometric pressure and solar levels. Additionally, water temperature and depth were recorded.

The USV was controlled from over the horizon using LTE communications, and vessel missions alternated between loitering, patrolling and conducting grid surveys. Grid surveys were performed for bathymetric mapping, and were conducted in two areas of interest near Ruxton Island.

A final grid survey was conducted in Mill Bay, about half way along the vessel's return voyage to Victoria. The USV performed reliably for the duration of this voyage, and demonstrated itself to be a cost-effective and easily-deployable mobile sensor platform.

LOCATION



Gulf Islands, BC, Canada

MISSION DATA

DATE	June, 2020
MISSION SPECS	Total Distance: 167.5 km Over the Horizon Control
MISSION DURATION	115 Hours Continuous

TECHNICAL SPECIFICATIONS

TRANSDUCER	Airmar P17
IMU	MPU9250 16G
WEATHER STATION	Airmar 200WX
LTE MODEM	Sierra Wireless LX40



ADVANTAGES WE OFFER



IHO SPECIAL ORDER STANDARDS

Hydrographic information can be collected, processed and delivered to meet unique project specifications or to achieve the required IHO Classification including Special Order.



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-based or remote-control centre using satellite, cellular or radio communications.



OFFSHORE, NEARSHORE & COASTAL OPERATION

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



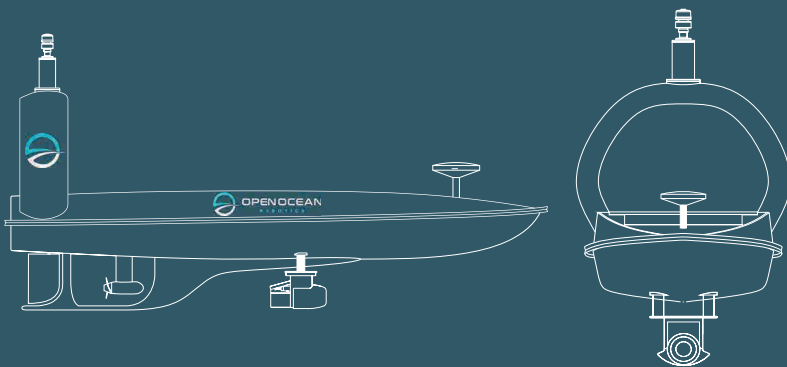
SOLO OR AS FORCE MULTIPLIER

Can be deployed with a crewed ship as a force multiplier to expedite data collection or solo for up to 40 hours continuously.



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 XPLORER TECHNICAL SPECIFICATIONS

LENGTH	3.56 Meters (11.66 feet)
BEAM	0.89 Meters (35 inches)
DRAFT	0.46 Meters (18 inches)
DRY WEIGHT	82 kg (184 lbs)
PAYLOAD WEIGHT	75 kg (165 lbs)
PROPULSION	1.1 kW / 2.0 kW / 4.0 kW exchangeable pod motor
SPEED	8 knots with base motor - 18 knots with 4.0
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

