

CASE STUDY

UNCREWED SURFACE VEHICLE (USV)
**MULTIBEAM
HYDROGRAPHIC
SURVEY**



OVERVIEW

Open Ocean Robotics' uncrewed surface vehicle (USV) Data Xplorer was deployed in a pilot project with the Canadian Coast Guard to demonstrate its ability to accurately, sustainably, and autonomously conduct multibeam hydrographic surveys. Data Xplorer successfully surveyed underwater areas to international standards at up to 130 metre depths, operating for a total of 38 hours. The vessel was powered by a combination of solar and stored energy.

GOALS

- Use a solar-powered USV to survey to IHO standards
- Demonstrate the USV's capability to continuously survey for longer than any other vessel in its class.
- Provide real-time QA and remote operations for over the horizon control

HIGHLIGHTS

Open Ocean Robotics completed the first ever multibeam hydrographic survey with a solar-powered uncrewed surface vehicle (USV). Quality of the data was excellent and met all criteria to meet IHO standards. The USV operated reliably, and demonstrated itself to be an efficient tool for conducting multibeam surveys.

RESULTS

Over the course of four days, Data Xplorer conducted 38 hours of uncrewed hydrographic survey operations. An onshore remote operator could continually assess both navigational and survey data in real-time through Wi-Fi and cellular networks, allowing him to adjust acquisition settings and vessel control for optimal performance. Open Ocean Robotics followed established best practices during calibration, acquisition, and data processing. Third party-analysis of the data and procedures confirmed that the data exceeded International Hydrographic Organization (IHO) Special Order Standards. The longest non-stop survey session (moving at 2 knots) was 12 hours, with 53% battery capacity remaining, demonstrating the vessel's ability to survey continuously for 20+ hours. Our new generation of ultra-efficient motor will allow for 30+ hours of continuous surveying. Maximum wind speed encountered was 46 km/hr with wave height exceeding one meter. Data quality remained good in these rougher conditions.

LOCATION



Okanagan Lake, BC, Canada

CLIENT



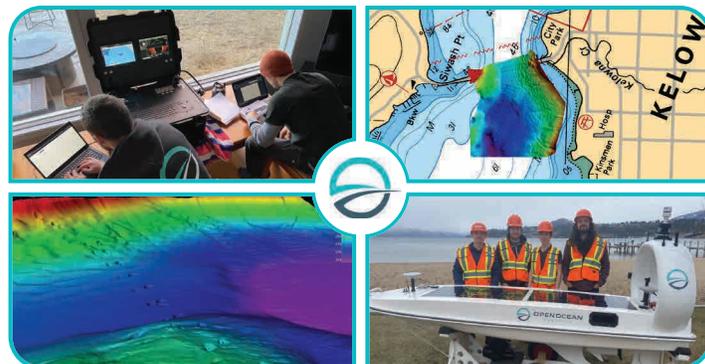
Canadian Coast Guard

MISSION DATA

DATE	March 2020
MISSION SPECS	Area: 3.33 sq. km Depth: 0.00-127.22 m
MISSION DURATION	4 days

TECHNICAL SPECIFICATIONS

TRANSDUCER	Norbit iWBMS
IMU	Applanix Wavemaster
SOUND VELOCITY PROFILER	AML
GPS & RTK	Trimble R10



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.



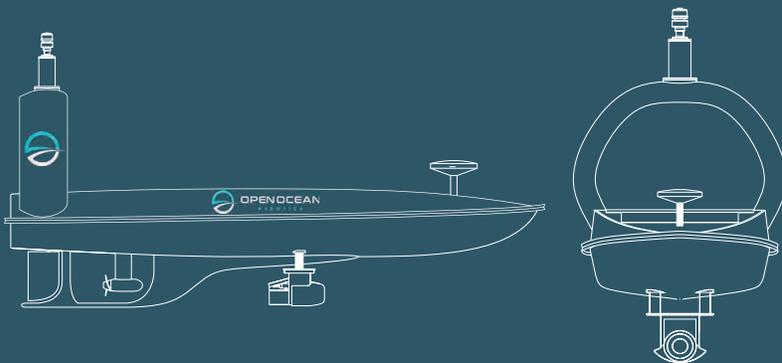
SOLO OR AS FORCE MULTIPLIER

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

