



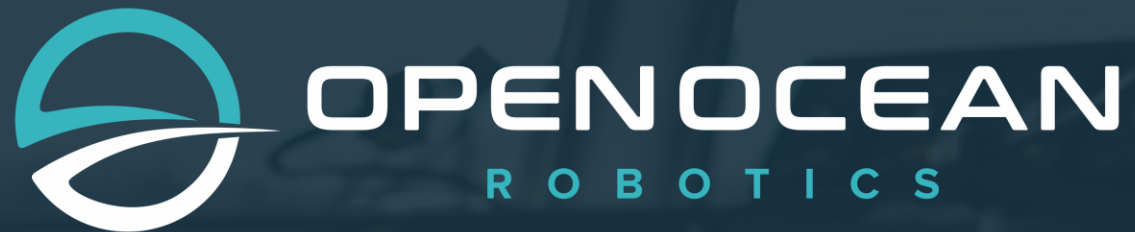
OPENOCEAN
R O B O T I C S

New opportunities for data collection and environmental monitoring in the Salish Sea

Oliver Kirsebom
Senior Data Scientist

VENUS/Salish Sea Workshop

2025.07.16



Enabling safer, more affordable and sustainable ocean observations



Founded in 2018
Headquartered in Victoria, B.C., Canada

TEAM

25 people

TECHNOLOGY

Granted patent and proprietary IP

FACILITY

12,000 sqft manufacturing, R&D, and offices

DataXplorer™

CAMERAS & SENSORS

360° visual and thermal cameras for safe day and night operations

PATENTED SELF-RIGHTING SYSTEM

High sea state and surf zone capable

CUSTOMIZABLE SENSOR PAYLOAD

Multiple modular sensor bays allow diverse sensor integration for broad market needs

CORE SENSORS

Monitor weather conditions, ocean currents, water depth, and water temperature. And AIS vessel traffic

LONG ENDURANCE MISSIONS

Solar panels charge battery bank to repower at sea enabling extended duration deployments

SHALLOW WATER CAPABLE

Shallow draft and debris-shedding keel enable use in limited depth waters



DataXplorer Technical Specifications

Length	3.6 meters (11.8 ft.)
Beam	0.9 meters (2.9 ft.)
Draft	0.5 meters (1.5 ft.)
Height (abv WL)	1.3 meters (4.3 ft.)
Dry weight*	132 kg (291 lbs)
Payload weight	65 kg (144 lbs)
Hull material	Fiberglass composite
Communications	Satellite, cellular, radio
Solar power	300 watts
Batteries	10.5 kWh (*dry weight above), 17.5 kWh opt.
Sensor spaces	Under- & in-hull, in air
Propulsion	Electric motor-pod
Speed through water	6 kts max., 2 kts cruise
Mission duration	>1 month, depending on solar input
Sea state & wind	Up to force 10 storm conditions
Deployment	Ramp, beach, ship

Solar-powered, uncrewed surface vehicle, equipped with patented technologies for resilient, emission-free ocean data collection in extreme conditions.

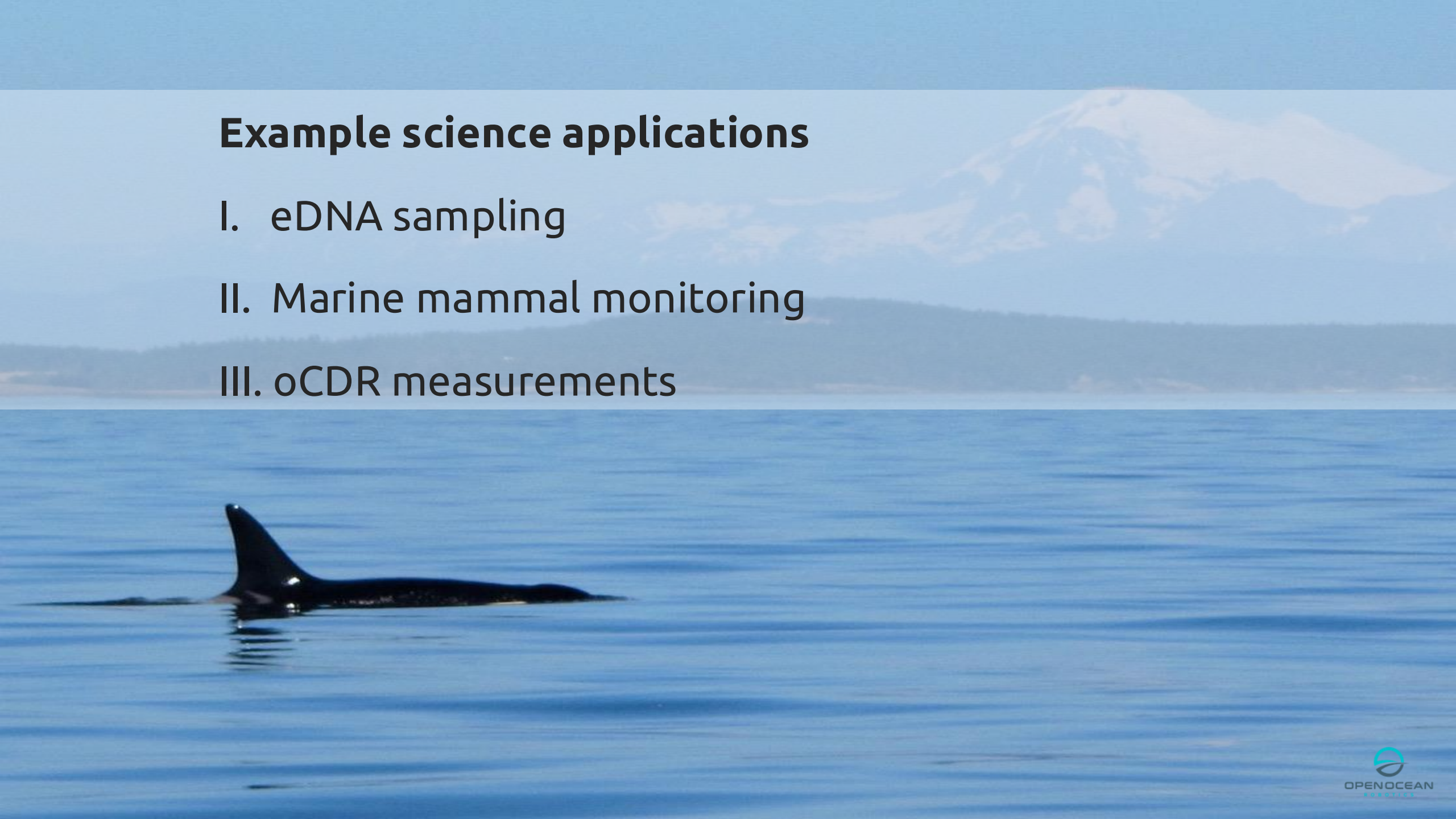


Easy Launch, Retrieval, Transport

- Trailer launch
- Beach launch
- Ship launch
- Person portable
- Truck transportable

Example science applications

- I. eDNA sampling
- II. Marine mammal monitoring
- III. oCDR measurements



Example I: eDNA

Shinnecock Bay Restoration Program (ShiRP)

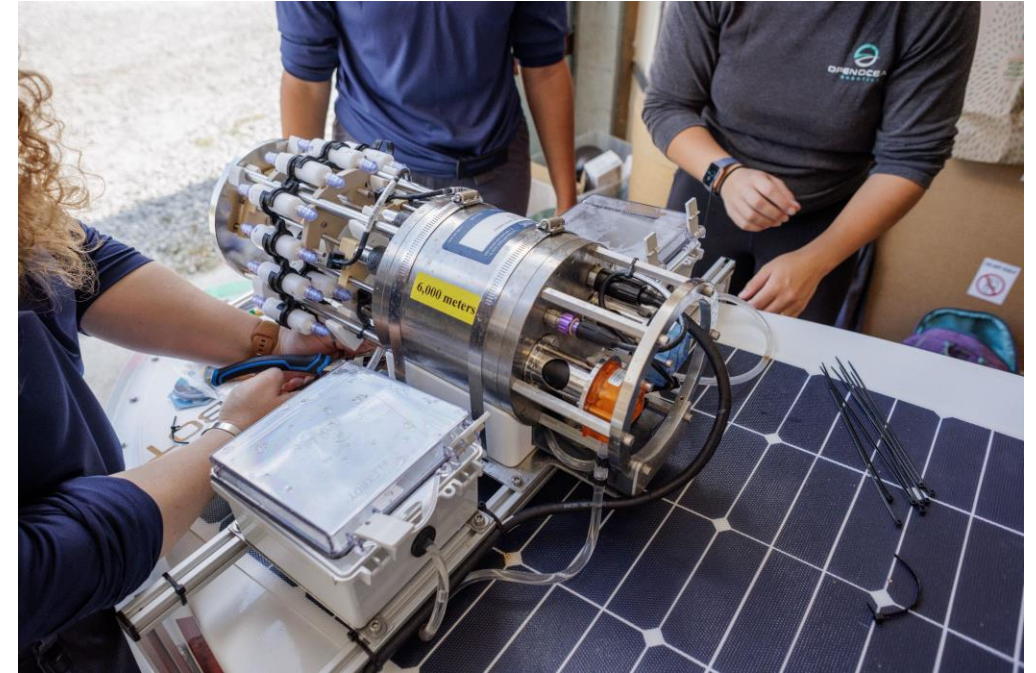
Goal: Collect eDNA samples for post-hoc analysis

Project-specific Integrations:

- McLane RoCSI eDNA Sampler
- AML-3 CTD Sensor
- RBRSolo3 DO Sensor



No. of Deployments	8
Time On Water	105.6 hrs
Average Speed	2.08
Largest Power Consumption	5.20 kWh
Depth Range	0.5-5 m
No. of Samples Taken	162
No. of Viable Samples	101
No. of Pilots Trained	7



Example II: Marine mammal monitoring

Realtime detection of marine mammals:

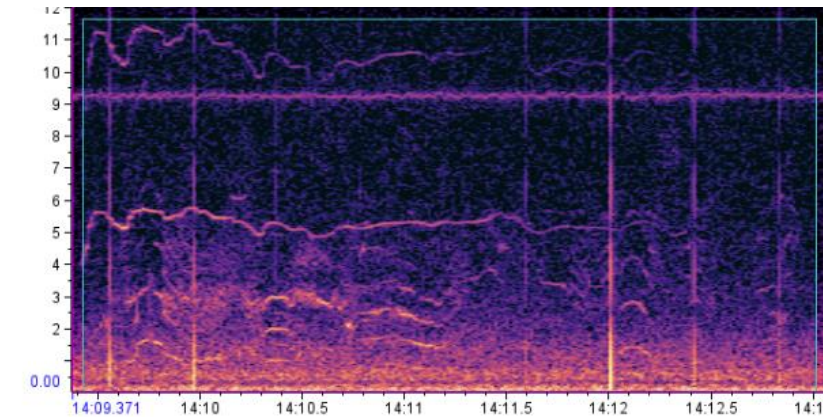
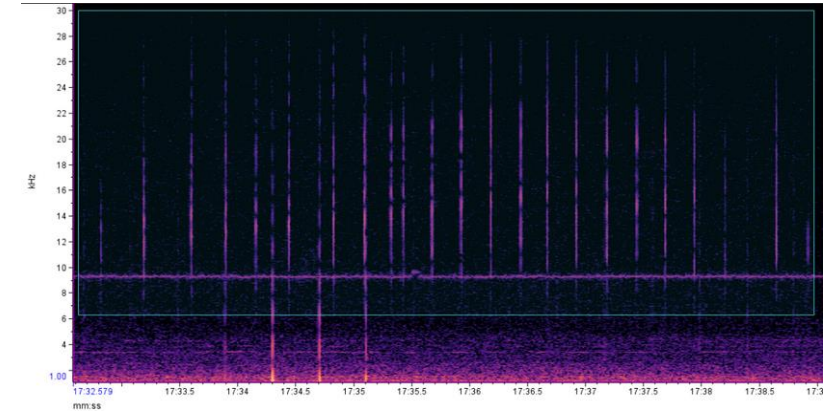
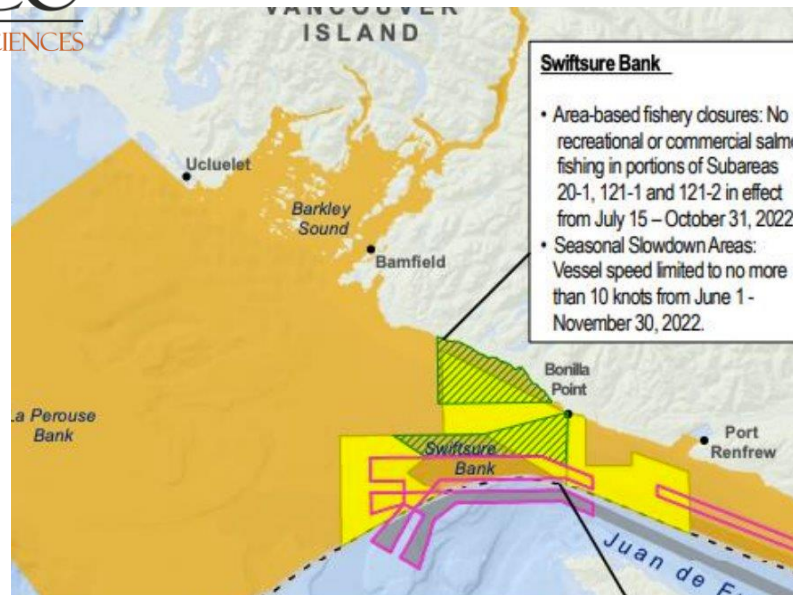
- Sightings in visual and infrared wavelengths
- Passive acoustics with towed hydrophone array

Fisheries and Oceans
Canada

Pêches et Océans
Canada

JASCO
APPLIED SCIENCES

- DATES: June 21-29, 2023
- MISSION LENGTH: 306 hours
- DISTANCE TRAVELLED: 705 km (381 nm)
- AVG. USV SPEED: 2.4 kph (1.3 kts)
- AVG. WIND SPEED: 18.5 kph (10 kts)
- MAX. WIND SPEED: 72.2 kph (39 kts)



Spectrograms depicting killer whale echolocating clicks (ABOVE) and whistles (BELOW)

Example III: oCDR

Goal:

Quantifying the amount of carbon captured through ocean carbon dioxide removal (oCDR)

Sensor integrations:

- RBR Concerto/Maestro CTD
- ProOceanus pCO₂
- ANB OC300 pH
- Nortek Signature 500/1000 ADCP



Winch with ~100 m conducting cable



REACH
SYSTEMS

 Carbon to Sea
Initiative




DALHOUSIE
UNIVERSITY

 **OCEAN**
FRONTIER INSTITUTE


OPENOCEAN
ROBOTICS

Thank you!

Questions?

