

ecoSUB robotics™

Advanced, small, low cost AUV technology



Innovative AUV technology Increasing accessibility to AUVs

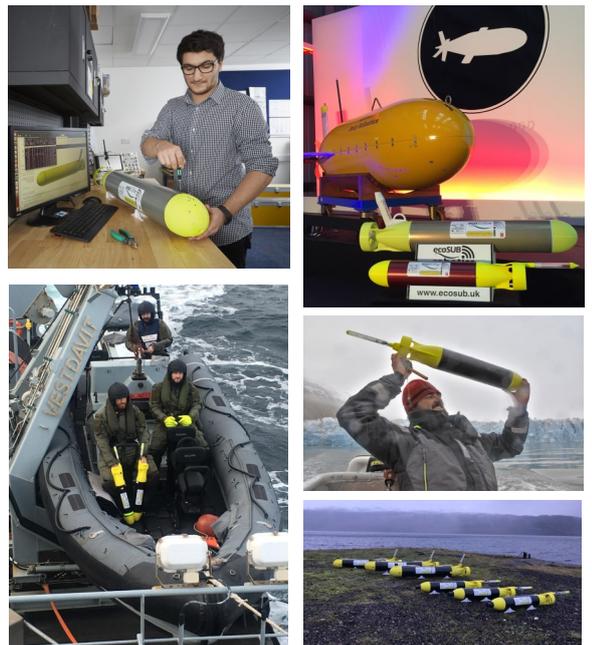
ecoSUB Robotics Limited is committed to making AUV technology accessible to all; reducing the barriers to autonomous system use in the underwater environment

ecoSUB AUVs serve a wide range of sectors, with the capability to deploy useful sensors including high accuracy CTD, speed of sound and fluorimeters.

Many more users from **research, academia and teaching** will be able to access marine autonomous systems (MAS) and apply the benefits of collecting wide spatial and temporal data.

The **defence** sector already recognises the potential for autonomous system use in their situational awareness and tactical operations, ecoSUB dramatically reduces barriers to MAS use, significantly reducing logistical challenges of launch, recovery and operations, with scope for integrated mission control and useful, focused data products to deliver key information when and where it is needed.

Commercial operators, especially in the **Oil & Gas** sector, see enormous potential in the affordable use of MAS for a whole range of activity, including rapid response to environmental challenges, subsea inspection and asset monitoring and support. The design of ecoSUBm was initiated by BP International who supported its development.



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ecoSUB μ 5



Specifications

Length (inc antenna)	925 mm—body 660 mm
Diameter	111 mm
Weight in air	4 kg with alkaline batteries
Depth	500m
Battery Technology	

	Manganese Alkaline	Lithium Thionyl Chloride
Speed	1 m/s	1 m/s
Range	40 km	72 km
Endurance	Up to 12 hours	Up to 20 hours

Range & endurance dependant upon payload, depth, speed and temperature

Communications	Surface: Iridium SBD, Wi-Fi, Submerged: Acoustic (optional)
Surface Location	GPS, infra red and visible light beacons
Housekeeping	Battery condition, Internal temperature, pressure and humidity
Sensors	<ul style="list-style-type: none"> •Star Oddi: conductivity, temperature •Valeport: sound velocity sensor •NOC: conductivity temperature, salinity, speed of sound, density •Valeport: Hyperion fluorimeter for fluorescein, chlorophyll, hydrocarbon, turbidity •Valeport: fast response temperature •Wave height and direction •Ocean Sonics KAYAK Hydrophone •Custom sensors upon request.

Specifications are subject to validation and alteration without notice.

ecoSUBm5 & ecoSUBm25



Specifications

Length (overall)	1000 mm
Diameter	146 mm
Weight in air	12 kg with alkaline batteries
Depth	m5—500m m25—2,500m
Battery Technology	

	Manganese Alkaline	Lithium Thionyl Chloride
Speed	1 m/s	1 m/s
Range	65 km	100 km
Endurance	Up to 18 hours	Up to 30 hours

Range & endurance dependant upon payload, depth, speed and temperature

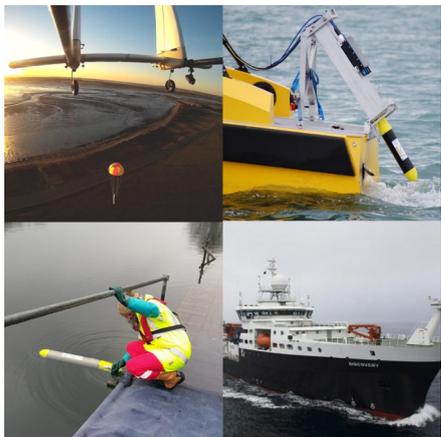
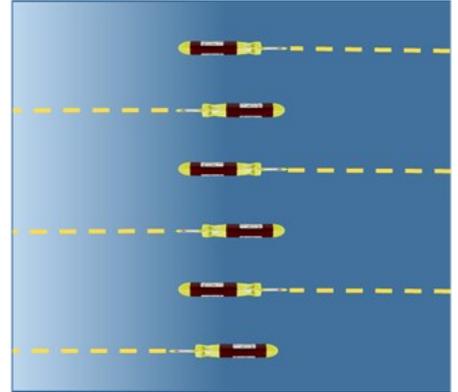
Communications	Surface: Iridium SBD, Wi-Fi, Submerged: Acoustic (optional)
Surface Location	GPS, infra red and visible light beacons
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Not all sensors can be carried on a single vehicle at the same time. Contact ecoSUB for advice about sensor mix capabilities

Big picture data, fast AUVs for mass deployment

A small, low cost AUV is an ideal platform to be deployed in a shoal, able to provide rapid acquisition of large spatial data sets, enabling quick assessment of situations and decision making.

Cover large areas quickly and affordably by deploying multiple ecoSUB AUVs. Target harmful algal blooms, hydrocarbon spills, oceanographic features like thermoclines, hydrocarbon leaks, or build a picture of the environmental situation in a fraction of the time of a research vessel or single AUV.



Easy launch & recovery

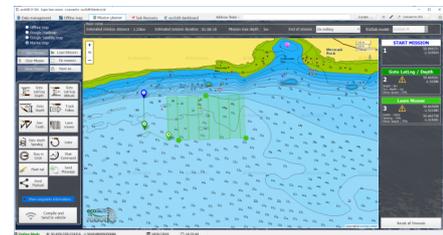
Small platforms reduce challenge of L&R

ecoSUB μ was conceived as part of a UK Innovate UK/DSTL project in collaboration with NOC, University of Southampton and ASV to enable the launch and recovery (L&R) of multiple AUVs from an autonomous surface vehicle, C-Worker. The μ -AUV is perfectly designed for autonomous L&R, maintaining a cylinder rule with no protruding features, like fins or antenna. The dimensions of the vehicle enable Sonobuoy tube deployment for potential air launch, and University of Southampton have worked with ecoSUB μ to deploy it from their fixed wing 'Spotter' unmanned aerial vehicle (UAV). ecoSUB AUVs are convenient to launch from any conventional platform or from the shoreline and with such a small platform, recovery is easy, significantly reducing the infrastructure required to operate an AUV.

Simple mission planning and recovery

Easy to use Graphical User Interface, simplifies mission planning

Key to the ecoSUB philosophy of simple to use is the ecoSUB GUI & HERMES C³ command control & communications box. Simple point and click waypoints and behaviours makes mission planning a breeze. No special programming knowledge required. Sanity checking of planned missions, a recovery helm guide, offline charts and maps, data visualisation and pre-launch dashboard makes ecoSUB the easiest to use AUV available at any size or price point. The ecoSUB GUI is provided **free of charge** to ecoSUB users, with an enhanced version available at additional price. The specially developed HERMES C³ box, is a portable unit which can be equipped with WiFi, Iridium and acoustic telemetry to allow connection to multiple ecoSUBs in a variety of situations. Incorporation of the Iridium channel allows direct communications with ecoSUB over the horizon and in internet denied environments for data, location, and mission uploads.



Developed with expertise

Designed & developed in partnership with the NOC MARS team

A joint development between Planet Ocean Limited and the National Oceanography Centre Marine Autonomous Robotics Systems Group has led to the ecoSUB AUV platforms.

The National Oceanography Centre has over 20 years of expertise in the development of their AutoSub program and a multi-discipline, multi-partner team who believe in great design and upsetting the status quo have worked together enthusiastically to develop the extremely sophisticated and beautifully designed ecoSUB AUVs.

