

Filling the White Ribbon

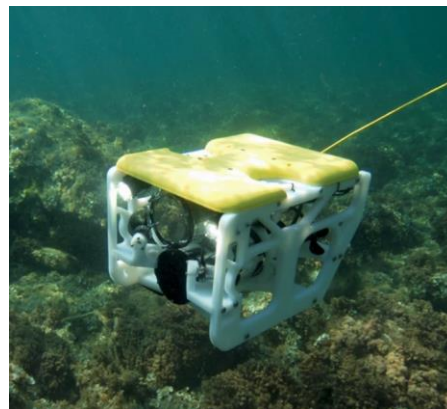
MASTS Technology, Platforms and Sensors Forum

Craig Smeaton

School of Geography and Sustainable Development, University of St-Andrews

Purpose of Grant

The MASTS TPS forum small grant was used to purchase and develop a tool to allow the seabed within the white ribbon (data gap within the coastal zone where offshore data collection has been difficult) to be mapped. The grant allowed for the purchase of Sibiu Nano ROV (www.nido.ai/shop/rovs-2/sibiu-nano-ready-to-dive) to undertake seabed photogrammetry of the near shore sediments.



Sibiu Nano ROV

The Sibiu Nano provides a portable, efficient underwater ROV with 6 degrees of freedom. It weighs only 5 kg and has a built-in 1080p camera that has an inclination range of +/- 90 degrees (180° total range). The software used in the ROVs is an open source solution (GPLv3) based upon drone software that consists of the following two modules:

ArduSub: is part of the ArduPilot project, it is installed in the ROV as an on-board software. It controls the dynamics of the ROV, as well as the functions of self-stabilization and telemetry.

QGroundControl: is a multi-platform application which allows the user to pilot the ROV while viewing the video and navigation data in real time.

Initial Deployment

The initial testing of the ROV took place in Loch Creran in autumn 2017. Where additional GoPro cameras were attached to allow both video and time-lapse photography of the seabed. The ROV was utilised as part of a larger mapping exercise where high resolution multi-beam and backscatter geophysics alongside advanced photogrammetry (BTV100 Benthic Towfish) were utilised. The ROV was successfully used to map the transition from rocky shore to soft sediments in the upper basin of Loch Creran an area not accessible by the other methods. This data was utilised by for an honour student project and is currently being developed into a manuscript (**Target Journal:** Marine Geology).

MASTS Usage

The ROV has been utilised by the wider MASTS research community in highly varying research projects these include Dr Bernie McConnell (University of St Andrews) surveying sea mammals around Shetland and Dr Richard Bates (University of St Andrews) in the Dornoch Firth mapping shellfish as part of the Scottish Inshore Fisheries Integrated Data System. There is further plans to use the ROV system to map both kelp and maerl as part of the Scottish Blue Carbon forum initiative. As stated in the application the ROV is fully available for use by members of MASTS.