

# Marine Autonomous and Robotic Systems Facility at NOC



David White 20<sup>th</sup> March 2015

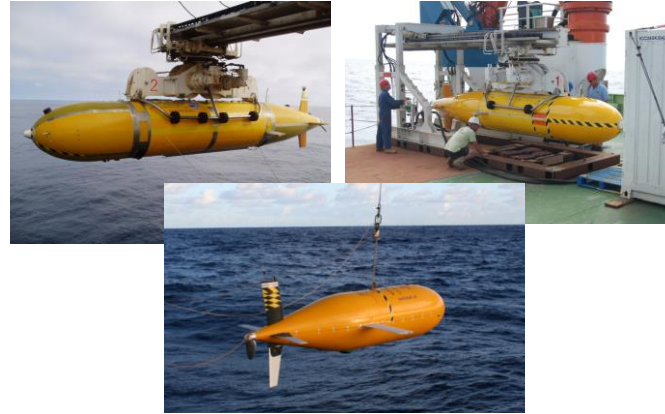
# MARS Fleet & Personnel

## Underwater Gliders



- Teledyne Webb Slocum (1000m) x 12
- Teledyne Webb Slocum (200m) x 11
- Kongsberg Seaglidors x 9

## AUVs



In-house developed:

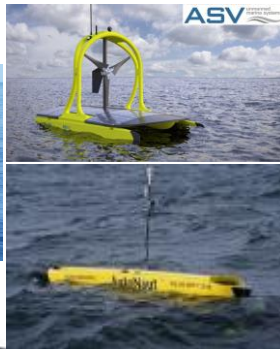
- Autosub 3
- Autosub6000
- Autosub Long Range x 3

## Tethered Systems



- Isis ROV
- HyBIS
- TOBI

## USVs



## STAFF

24 with a mix of:

- Mechanical
- Electronics
- Software
- Systems

All vehicles can be adapted for individual science needs

# AUTOSUB 6000

Launch And Recovery System  
Has been fitted to many ships from 18.5 m upwards

5.5 m, 0.9 m diameter 1800 kg

Acoustic Telemetry and Tracking System

Lithium Polymer Rechargeable Batteries.  
28 hour, 150 km

Precision Navigation  
(FOG INS + DVL)  
Drift <1 m per 1km

Collision Avoidance System

Pumped, Dual CTD  
Also EH, DO, Turbidity  
... + others

3 axis Magnetometer

Multibeam Sonar – EM2000  
200kHz, 400 m, 2m

Sub Bottom Profiler – Edgetech  
2 – 16 kHz

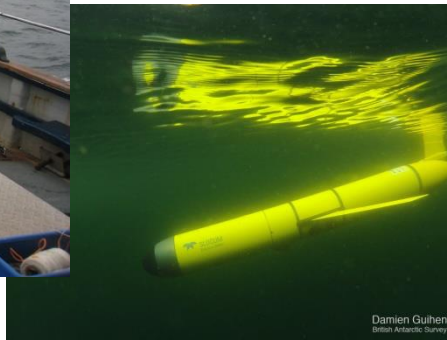
ADCP, 300 kHz  
Current Profiler

2 x High Resolution Colour Camera and Flash System  
(forwards and downward facing)  
15 m range in clear water

Dual Freq. SSS Edgetech  
410 kHz: 250m swath , 0.2 m  
120 kHz: 800 m swath 1m



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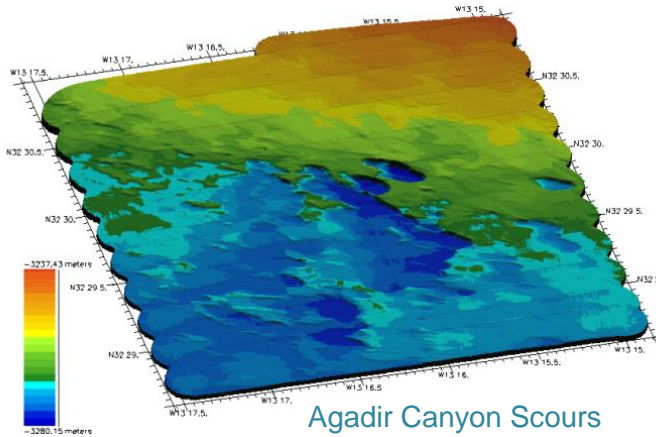


Damien Guihen  
British Antarctic Survey



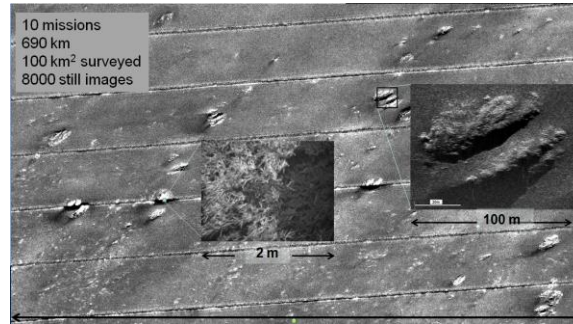
# High Powered AUV's Missions

## Bathymetric Surveys



Agadir Canyon Scours  
Cruise JC027 [2008]  
Altitude 50 – 100m

## Sidescan Surveys

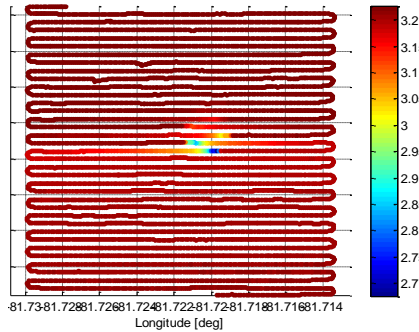


Darwin Mounds (Rockall)  
Cruise JC060 [2011]  
Altitude 15 – 50 m

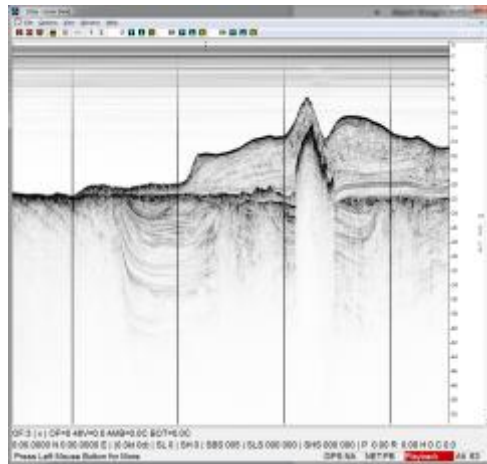
## Photographic Surveys



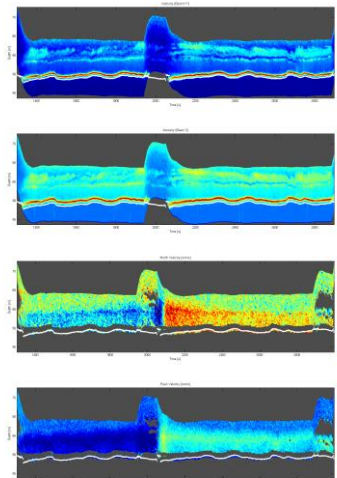
Celtic Sea  
Cruise DY008 [2014]  
Altitude 2.2m



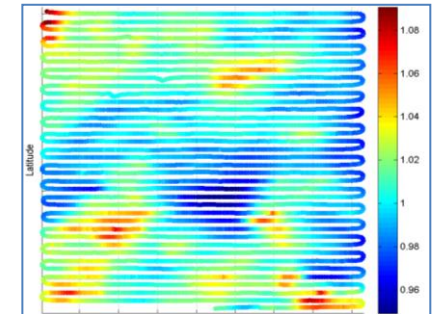
EH signal from JC44



Sub bottom profiler data  
Pelagia 2013

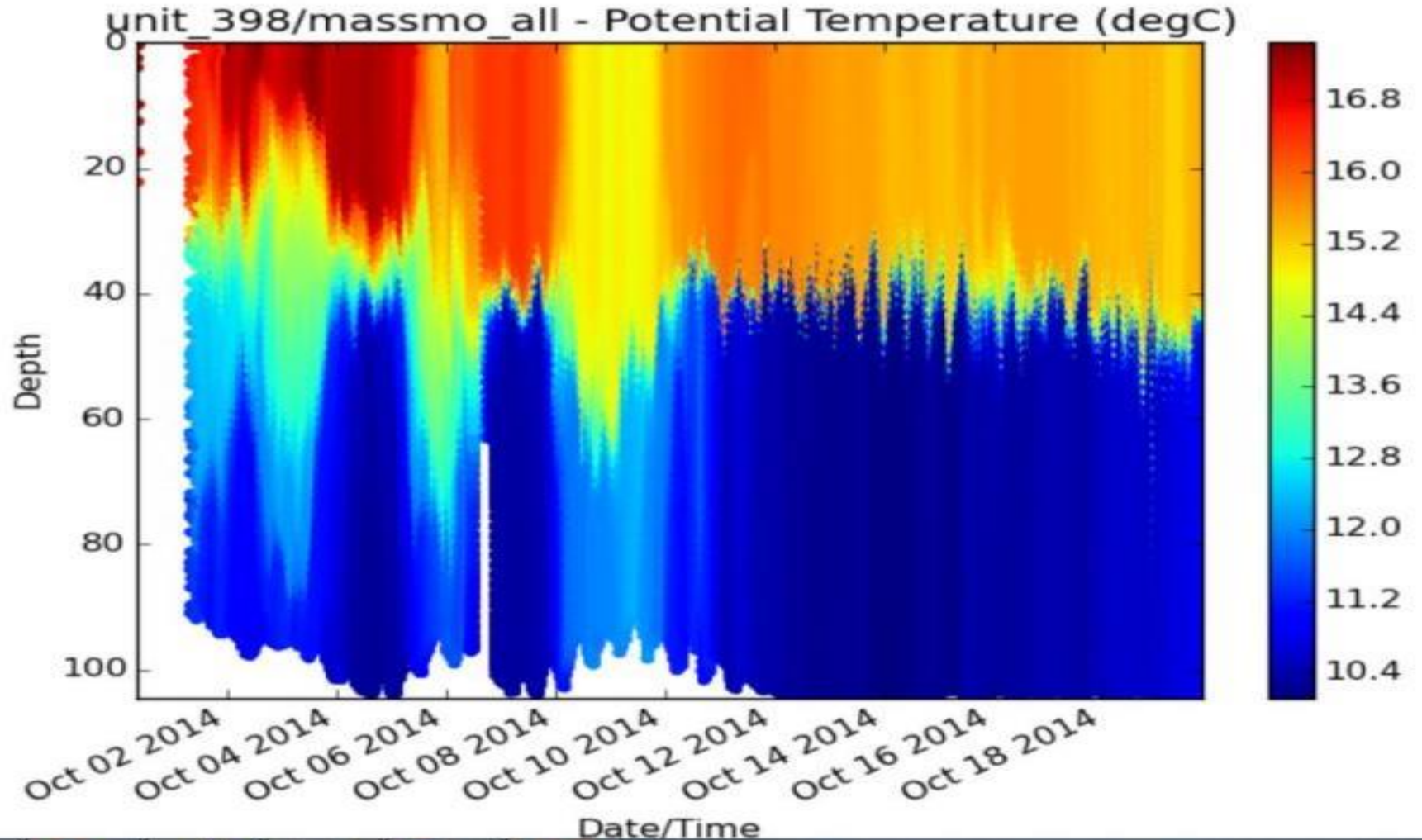


ADCP data  
Pelagia 2013



Magnetometer total field  
(normalised).

# Glider Missions



# Innovate UK Marine Autonomous Systems Funding

## Project 1 – *Microsub*

### Partners:

*Planet Ocean (lead)*  
*ASV Global*  
*University of Southampton*



## Project 2 – *Autonomous Surface/ sub-surface survey system*

### Partners:

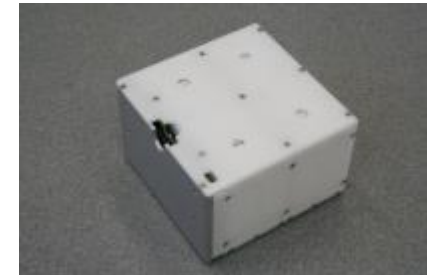
*ASV Global (lead)*  
*Sonardyne Ltd*  
*Seebyte Ltd*



## Project 3 – *Pressure Tolerant Li-S batteries for MAS*

### Partners:

*Steatite Ltd (lead)*  
*Oxis Energy*  
*Msubs Ltd*



# MARS Innovation Centre (MARSIC)

- New centre opening in NOC within the next month or two.
- An innovation Centre to foster SME engagement and collaboration with MARS, Sea Systems & NOC
- create a bespoke glider servicing and storage facility to deal with the increased glider fleet
- host the £1M University of Southampton's autonomous systems reliability lab



Render of possible innovation centre layout