

# National Oceanography Centre

from coast to deep ocean



Waterfront Campus, Southampton



Joseph Proudman Building, Liverpool

**Vision:** The National Oceanography Centre will, by 2015, be recognised as the world-leading Centre for integrated ocean sciences and technology".



**National  
Oceanography Centre**

NATURAL ENVIRONMENT RESEARCH COUNCIL



**NATURAL  
ENVIRONMENT  
RESEARCH COUNCIL**



Liverpool

London

Southampton

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Image © 2011 IGN-France

Image © 2011 GeoBasis-DE/BKG

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

51°55'48.41" N 2°14'56.52" W elev 276 ft

©2010 **Go**

Eye alt 506 ft

# The six NERC “Sector Centres”



# Some key facts

## **NOC is owned by the Natural Environment Research Council (NERC)**

- Coast to deep sea
- Based in two sites at Southampton (headquarters) and Liverpool since April 2010
- Hosting Partners - University of Southampton, University of Liverpool
- 560 NERC staff (>200 scientists and technologists)
- £52 million annual budget (including capital)
- Funded by NERC, EU, Industry, Government Departments and Agencies
- Delivery Partners in Plymouth, Scotland
- Building a wider association of Universities and Research Centres

## **Facilities directly managed by NOC for NERC**

- Royal Research Ships, *James Cook* and *Discovery*
- National Marine Equipment Pool
- British Oceanographic Data Centre
- Permanent Service for Mean Sea-level
- British Ocean Sediment Core Research Facility

# Facilities



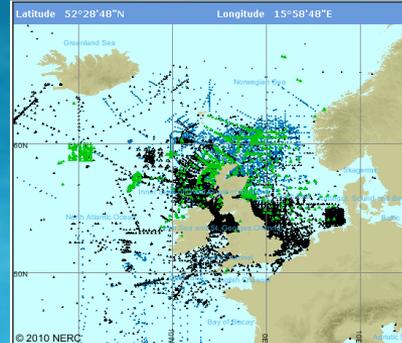
Global-class Research Vessels



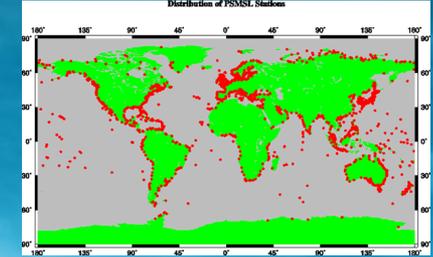
National Marine Equipment Pool and seagoing technical support



British Ocean Sediment Core Research Facility



British Oceanographic Centre



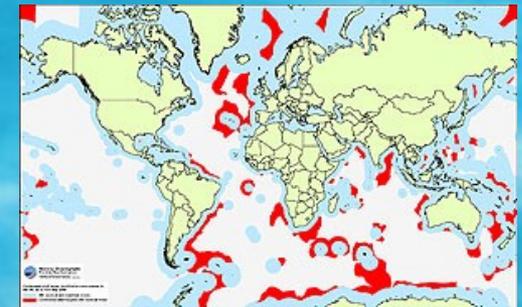
Permanent Service for Mean Sea Level



National Oceanographic Library



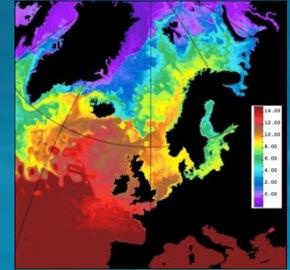
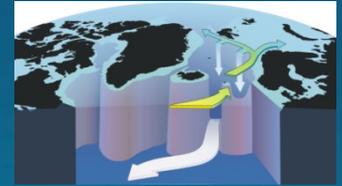
National Tidal and Sea-level Facility



Independent scientific advice

# Research Expertise

- Marine Physics & Marine Climate
- Marine Systems Modelling
- Marine Biosciences
- Marine Geo-sciences
- Technology development



# Some key facts

## NOC research can be divided into two parts

### National Capability

- Research linked to activities which are considered to be of fundamental (and probably long term) national and international importance

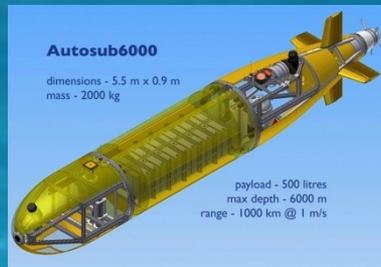
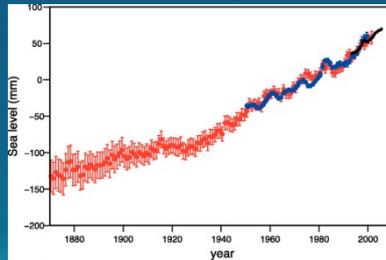
### Blue Skies

- Research funded by means of science proposals to research council committees
- In principle this research can be on any topic

### PhD Research

- Can be undertaken in either NC (block allocations) or BS (with studentships written into proposals) – for UK students.

# National Capability Programmes



## Long-term ocean observing

for decadal and rapid change

## Technology development

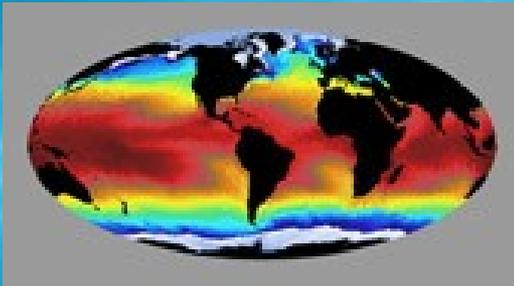
to measure the ocean in new ways

## Modelling

to simulate the oceans in the earth system

## Mapping

to chart the oceans, sea floor and habitats for science and users



# National Oceanography Centre

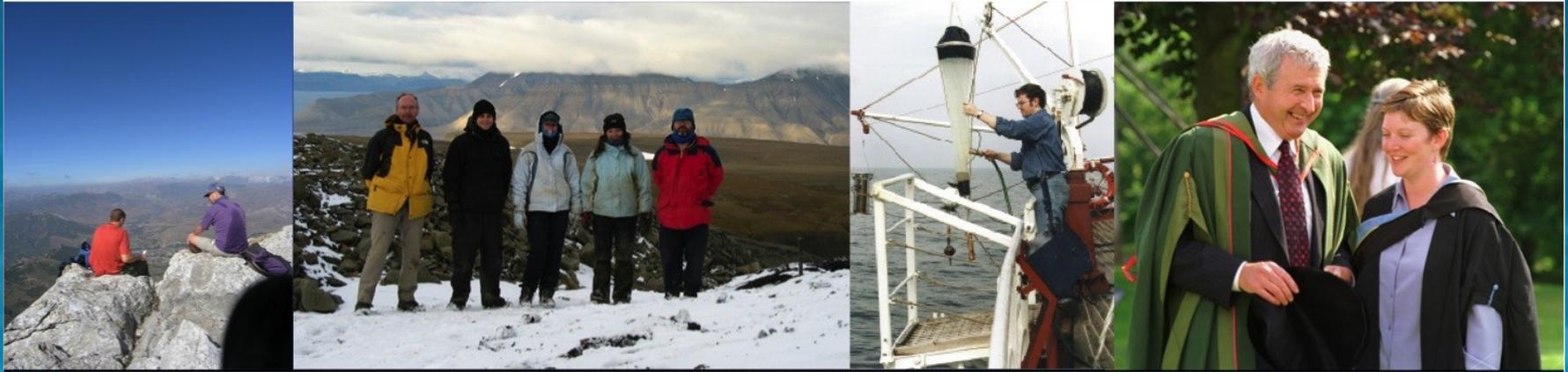
## **Liverpool (former Proudman Oceanographic Laboratory)**

- Located alongside the Liverpool University School of Environmental Sciences which includes Oceanography, Geology, Geophysics, Geography and Marine Biology.
- Prof. George Wolff will explain more about Liverpool University School of Environmental Sciences.

## **Southampton (former National Oceanography Centre Southampton)**

- Located alongside the University of Southampton School of Ocean and Earth Science.
- More information from its web site.

# School of Ocean and Earth Science, University of Southampton



# NOC Liverpool

## Marine Physics and Ocean Climate

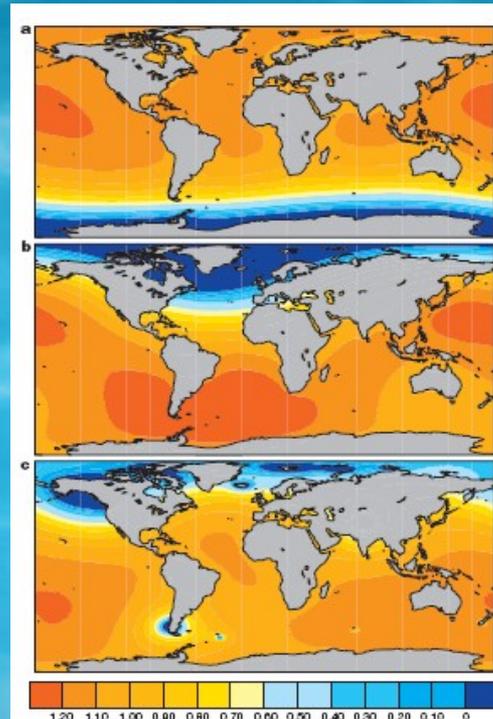
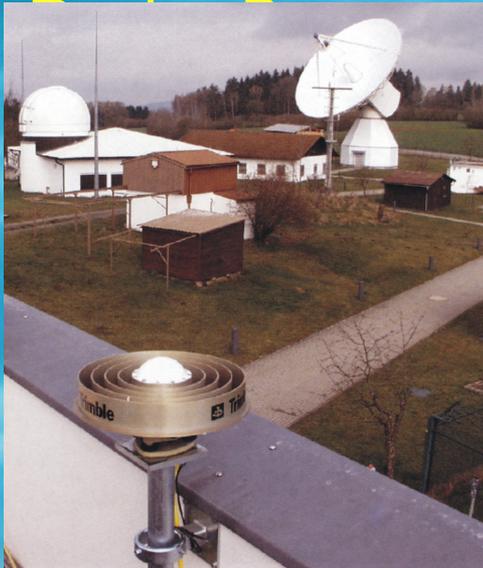
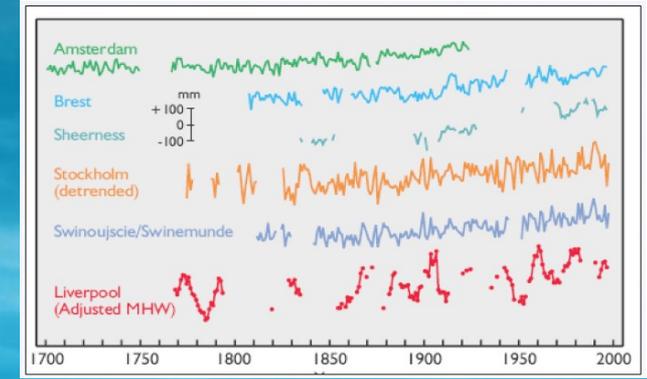
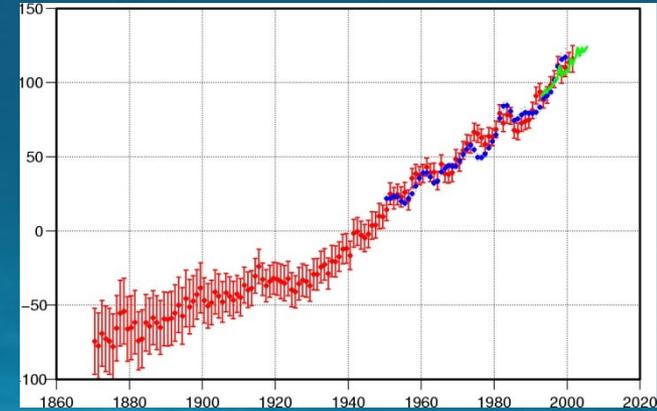
- About 120 staff
- Most research is in **Physical Oceanography, Sea Level Science, Geodesy/Geophysics, Coastal Processes, Climate Change** etc.
- A large modelling group involved in various kinds of physical oceanographic modelling and coupling to ecosystem modelling.
- PhD students could be 'visitors' i.e. registered at USP in which case financial arrangements would have to be formalised with NOC Director. (This may change in the future, see below).
- Or registered at the University of Liverpool, or both L'pool and USP jointly. The student may then have 3 co-supervisors: one at NOC, one at LU and one at USP.

## Marine Biology, Chemistry and Geophysics

- Can be undertaken at Liverpool University itself – the student would then have to be registered as above. Professor Wolff can provide more details.

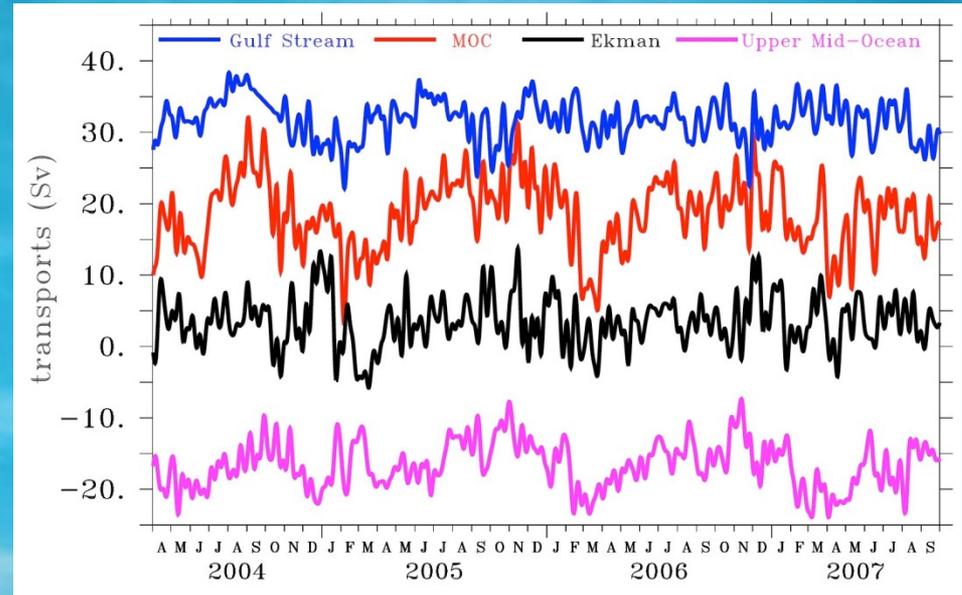
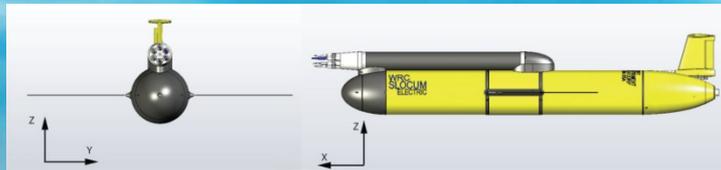
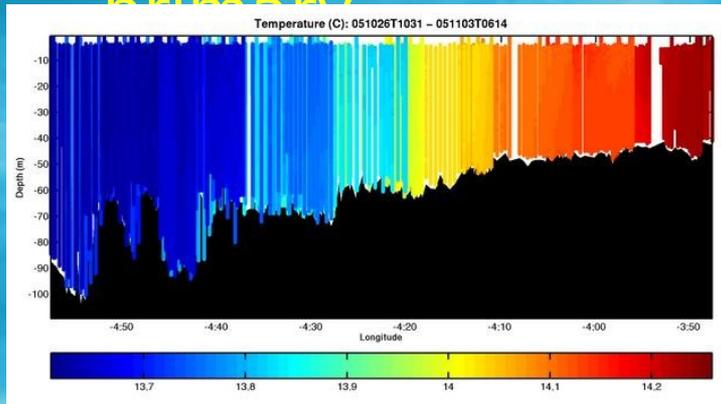
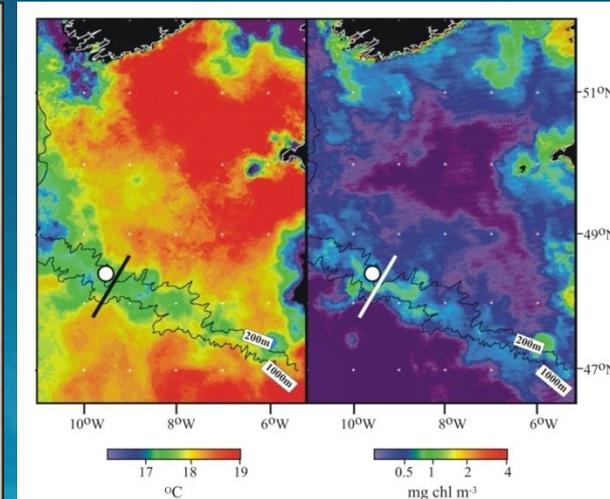
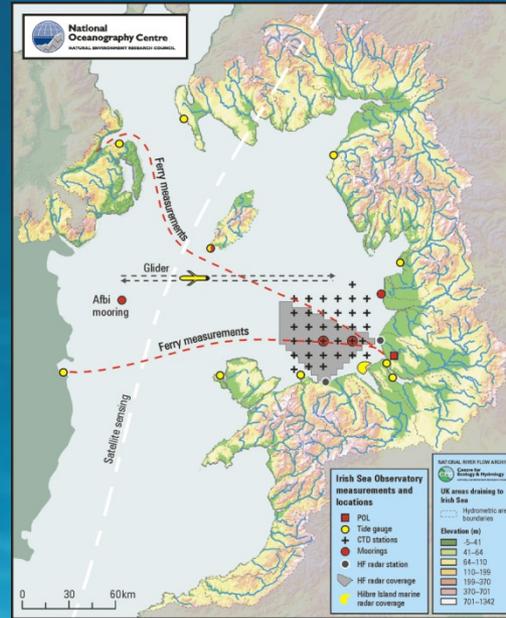
# Sea and Land Level Science

- Global and regional mean sea level;
- GPS, land movements and geodesy;
- Geophysics (GIA) studies;



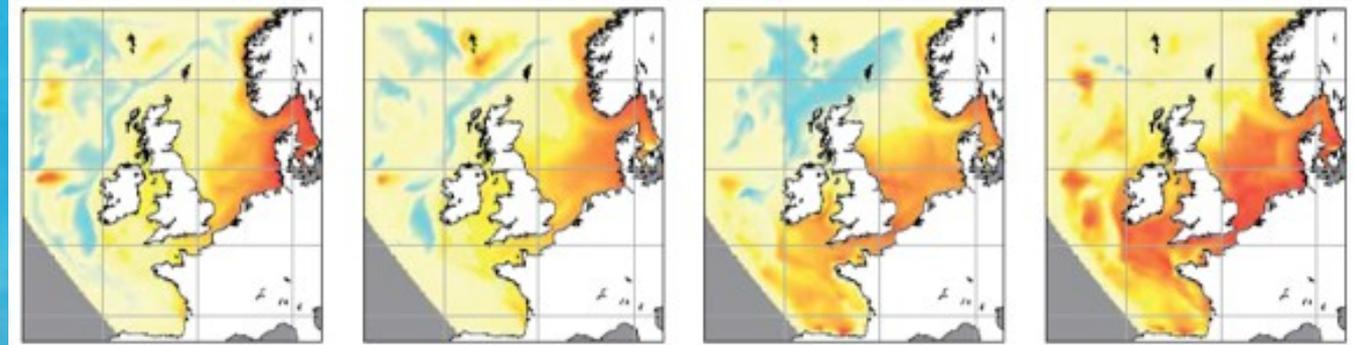
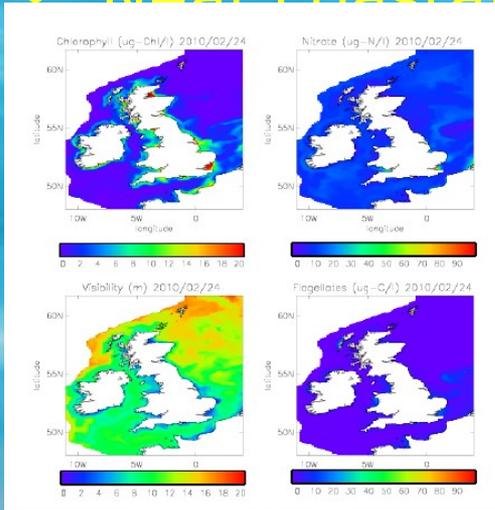
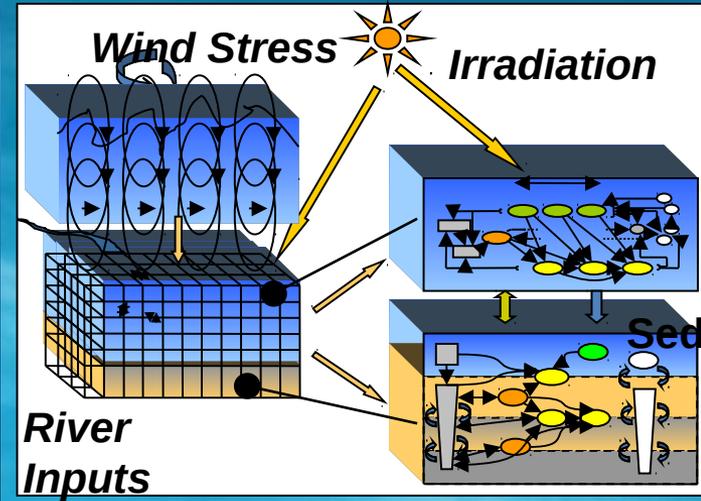
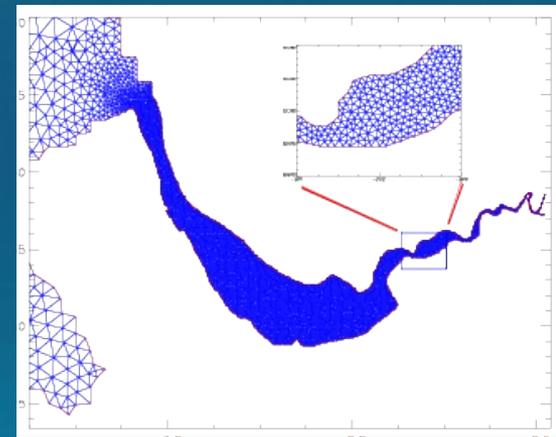
# Ocean and Shelf Sea Science

- RAPID programme at 26°N observing;
- RAPID wave monitoring off the US coast;
- Shelf-edge mixing - effects on



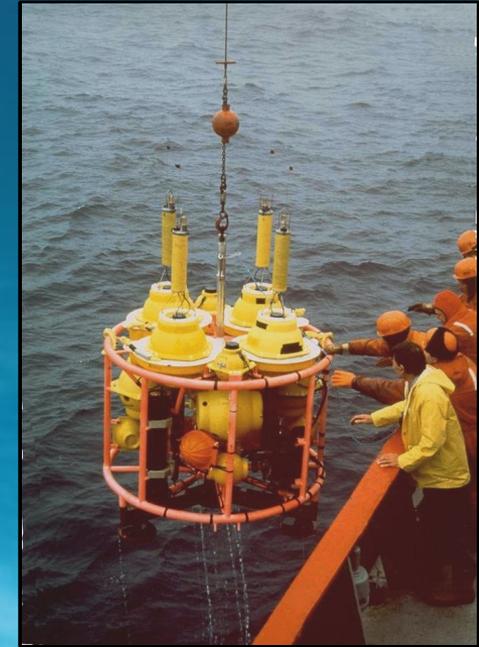
# Ocean Modelling

- Shelf and coastal modelling - shelf seas & processes;
- Integrated physical and ecosystem modelling;
- Advanced model development;
- Near coastal



# Technology at NOC Liverpool

- Tide Gauges
- Telemetry
- Bottom pressure - Drake Passage and Atlantic Wave (20 and 5 years)
- Gliders
- Coastal radars and other shelf



## Sea Level Monitoring at NOC Liverpool:

- Around the UK
- South Atlantic and Antarctica
- Gibraltar
- Contributions to African and Indian Ocean networks



# NOC (UK) Sea Level Stations in the South Atlantic, Antarctica and Gibraltar

9 Sea Level Stations

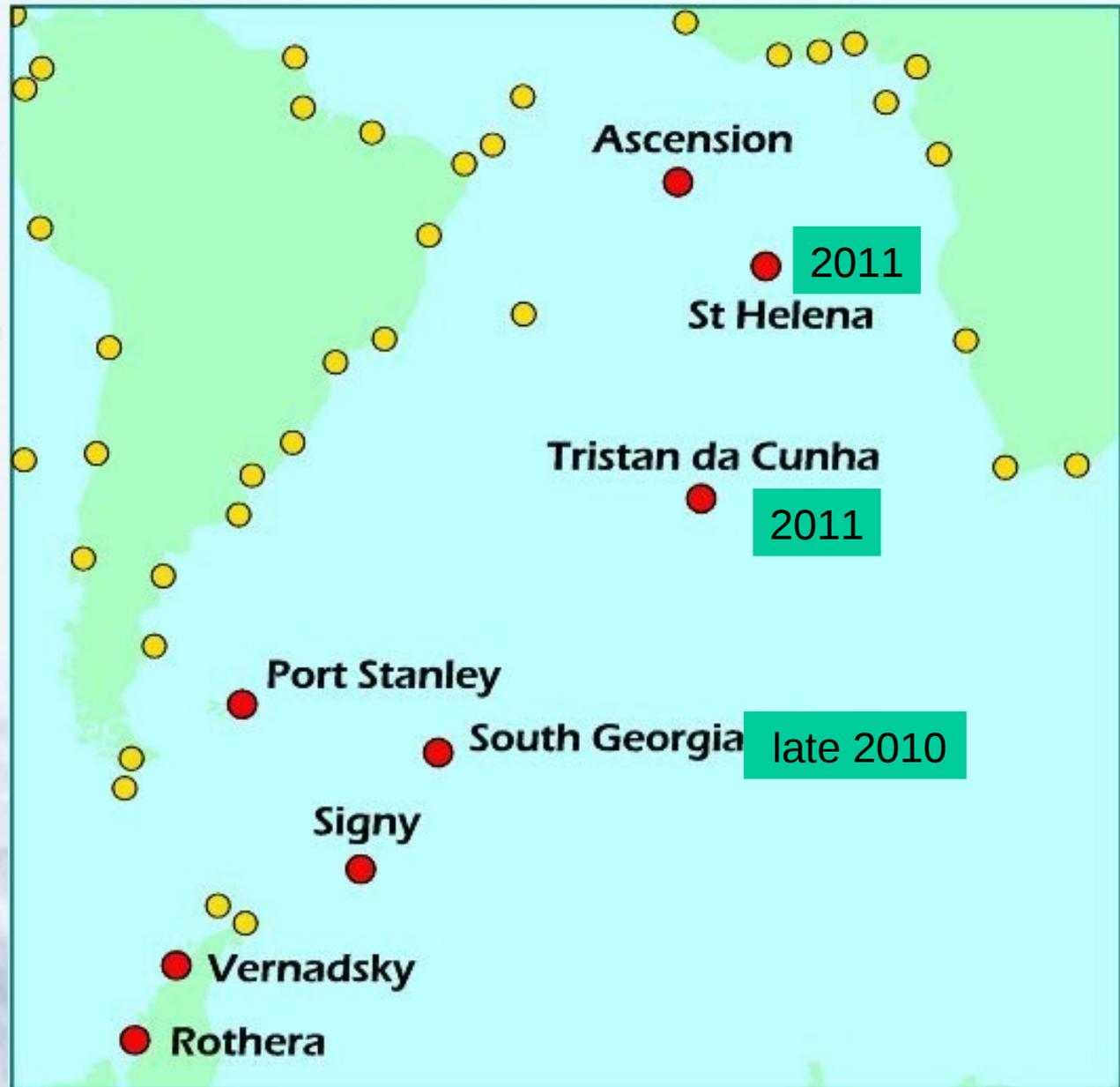
Real time telemetry:

Ascension Island  
Saint Helena  
Port Stanley  
Tristan  
Vernadsky (Faraday)  
Rothera  
Gibraltar

Delayed mode data:

Signy

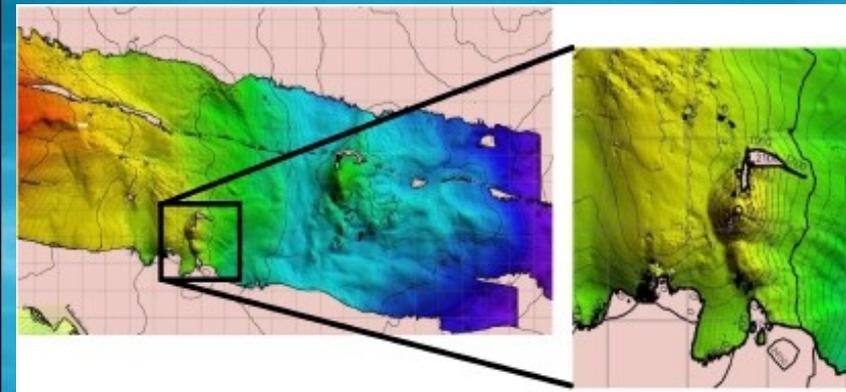
St.Helena and Tristan  
recently re-built  
after storm damage



# Autosub6000



# Autosub Long Range



6000m depth  
6000km range  
January 2011 trials

First science use: pin-pointing world's deepest hydrothermal vent sites known to date, mid-Cayman Rise, April 2010

# Data Management at NOC Liverpool

- Permanent Service for Mean Sea Level
- British Oceanographic Data Centre

Permanent Service for Mean Sea Level (PSMSL) - Windows Internet Explorer

http://www.psmsl.org/

PSMSL Permanent Service for Mean Sea Level

About Us Data Products Training & Information Links

You are here: home >

News

- French Station Records Updated for 2010
- Fonta Delgadada's RLR Factor Revised
- Change to Belgian Stations' RLR Factors
- Rickards Appointed IAG Fellow
- Two PSMSL Members Receive IOC Award
- New Sea Level Trend Explorer
- RLR Data from Greek Stations
- Netherlands Stations Switched to RLR
- More News ...

Explore the Dataset

Welcome to the Permanent Service for Mean Sea Level (PSMSL)

PSMSL is the global data bank for long term sea level change information from tide gauges and bottom pressure recorders.

About Us:  
Learn about PSMSL, contact us, read news items and annual reports.

Data:  
Obtain and submit tide gauge and bottom pressure data.

Products:  
Browse the data set via GoogleEarth or obtain derived products, view regional commentaries and author

Tide gauge records updated in the 30 days prior to 12 Oct 2011

Training & Information:  
A variety of FAQs, training and software documentation, information on non-oceanographic signals in tide gauge (e.g. glacial isostatic adjustment, atmospheric pressure, etc.)

British Oceanographic Data Centre (BODC) — oceanographic and marine data - Windows Internet Explorer

http://www.bodc.ac.uk/

British Oceanographic Data Centre  
NATURAL ENVIRONMENT RESEARCH COUNCIL

Home Contact us Glossary Site map Site styles My account Register Log in

About us Data Projects Partners Products Help and hints

The ANDRO Atlas  
BODC contribute more than 30,000 Argo data profiles [more]

IOC 50th Anniversary Commemorative Medals  
Prestigious medals awarded to BODC staff [more]

The long way round  
Working the Extended Eilat Line [more]

More news and events

Welcome to the British Oceanographic Data Centre  
a national facility for preserving and distributing marine data

We hope you enjoy our web site and would appreciate your [comments](#). If you experience any difficulties, please contact our [Web Master](#).

About us	Data	Projects
What do we do? Do you want to contact us? Learn about our history and the information technology we rely on. <a href="#">[more]</a>	We process, archive and distribute biological, chemical, physical and geophysical marine data. Find out how to download and request data, search our inventories and submit data to us. <a href="#">[more]</a>	Explore the data management services we provide to our scientific colleagues during marine research projects. <a href="#">[more]</a>
Partners	Products	Help and hints
Find out about the data management partnerships we have forged with our scientific colleagues at marine research centres. <a href="#">[more]</a>	Learn about our Web Services and software products. Find out how to order our digital atlases and the data sets available on CDROM. <a href="#">[more]</a>	Learn how to use our web site. Read our content, copyright and privacy policies. Access errata information and software updates. <a href="#">[more]</a>

We also host various data portals and project web sites

www.psmsl.org

www.bodc.ac.uk

# NOC Liverpool

## Survey of Interest in Cooperation with USP

- There have been many years of collaboration between Liverpool and USP (especially Profs. Mesquita and Harari), primarily on topics such as tides, sea level change etc.
- The problem is that there is now a completely new generation of scientists in Liverpool with a much wider range of research interests.
- Therefore NOC Liverpool science staff were surveyed as to their interest in collaboration with IOUSP and their responses are included in a report which is available.
- This report consists primarily in ideas for possible PhD projects.
- We were very pleased with the level of response.

**Nevertheless knowledge by NOCL staff of staff at IOUSP (and vice versa) is limited and it will take more work to spin up many of these ideas.**

- Perhaps the findings of the report can be discussed and further discussions can take place with video conferences?

## **Potential Science Cooperation between the National Oceanography Centre Liverpool, the School of Environmental Sciences of Liverpool University and the Instituto Oceanográfico of the University of São Paulo**

### 1. Background

In 2009, the Proudman Oceanographic Laboratory (POL, now the Liverpool component of the National Oceanography Centre, NOCL), the Department of Earth and Ocean Sciences of Liverpool University (DEOS, now a component of the School of Environmental Sciences of Liverpool University, SoES-LU) and the Instituto Oceanográfico of the University of São Paulo (IO-USP) signed a Cooperation Agreement on science areas of common interest. Three of the stated objectives included (paraphrased):

- To identify specific projects in which the Institutions concerned might collaborate.
- To disseminate on their respective campuses all information concerning the resources and interests of the three Institutions.
- To help students and staff from each Institution to take part in collaborative research and exchange visits.

## Appendix: Replies to Survey of July 2011

### NOCL Science Staff

Dr. Simon Holgate (Atlantic Sea Level Change and the AMO)

Prof. Chris Hughes (Ocean Bottom Pressure in the Tropical Atlantic)

Prof. John Huthnance (Shelf Slope Modelling)

Prof. Jonathan Sharples, Dr. Matthew Palmer (NOCL) and Dr. Claire Mahaffey (SoES)  
(Phytoplankton Studies using Ocean Gliders)

Drs. Mark Tamisiea and Simon Williams (Solid Earth response to Changing Loads)

Prof. Peter Thorne (Sediments in Estuaries)

Dr. Judith Wolf (Air-Sea Interactions etc.)

Prof. Philip Woodworth and Others (South Atlantic Sea Level Studies)

And short inputs were received from:

Dr. Richard Cooke (Technology Projects)

Drs. Alan Davies and Jiuxing Xing (Ocean Modelling)

Dr. Kevin Horsburgh (Meteotsunamis at Mid-latitudes)

Dr. Svetlana Jevrejeva (Sea Level Change)

Drs. Jeff Polton and Matthew Palmer (Modelling and Glider Measurements of the Fate of Fresh Water in Coastal Waters)

Dr. Alejandro Souza (Estuarine and Sediment Research)

Dr. Chris Wilson (Diagnosing Ocean Circulation)

Input was also received from Dr. Lesley Rickards (British Oceanographic Data Centre)

### **SoES Science Staff**

Dr. Harry Leach (Eddies in the ACC)

Prof. Andy Plater (Three Proposals to do with Coastal Evolution and Sea Level)

Prof. Andy Plater (SoES), Drs. Judith Wolf and Kevin Horsburgh (NOCL) and others (Security of Coastal Energy Infrastructure under Climate Change)

Dr. Leonie Robinson and Prof. Chris Frid (Marine Biology and Ecosystems)

Prof. Stan van den Berg (Chemical Oceanography)

Prof. Ric Williams (South Atlantic Heat Content and Sea Level on Decadal Timescales)

Prof. George Wolff (Organic Biogeochemistry)

# NOC Southampton

## Southampton Responses to the Survey

- NOC scientists at Southampton were also asked to contribute to the survey but responses were far fewer and they have not been included in the report.
- However I can pass on to anyone interested in the identified areas (e.g. sea bed mapping).

## Research at Southampton

- So far as I know, Southampton does not have the 'visitor' option (except for short collaborative visits) but all students must be registered with the University of Southampton. Because of the formation of NOC, it is possible that NOCL may adopt this NOCS practice at some point.

# National Oceanography Centre

If you are interested in studying at Liverpool (either NOC or LU):

- Talk to George and me while we are here, you can email us afterwards
- Check out the NOC-USP survey (although that is not exclusive)
- Check out the NOC and LU web sites
- We would be happy to put you in touch with possible supervisors

[www.noc.ac.uk](http://www.noc.ac.uk)