

## 15 NOVEMBER 2000 : AN OPEN DISCUSSION MEETING - OPERATIONAL OCEANOGRAPHY

A joint meeting with the Challenger Society

**T Guymer, Southampton Oceanography Centre** - Introduction: the new challenge for oceanography ([thg@soc.soton.ac.uk](mailto:thg@soc.soton.ac.uk))

This meeting provides an opportunity to review, from a number of perspectives, the developments taking place in operational oceanography and also to obtain a clearer picture of the challenges yet to be overcome.

The development and implementation of routine ocean observing systems is a key requirement addressed by two of the talks: the international Argo profiling float programme will provide, for the first time, a synoptic, global view of the ocean interior in near real-time as a complement to the unique view of the ocean surface obtained from remote sensing satellites. However, lack of assured continuity of operation remains a problem.

The increased computing power now available has made the prospect of forecasting the ocean on various time scales more attainable. Two of the papers will consider model predictions, one on the particular issues involved in the predictability of shelf seas, the other using different versions of a coupled ocean-atmosphere model to provide operational short-term forecasts and with application to seasonal to decadal time scales. Finally, there is a need to implement the necessary infrastructure in European and international frameworks as discussed in the final presentation.

**S Bacon, Southampton Oceanography Centre** - Plumbing the depths with argo floats ([shb@soc.soton.ac.uk](mailto:shb@soc.soton.ac.uk))

Since oceanography effectively began with the research cruise by the Challenger in 1873, oceanographers have been severely restricted in their ability to gather data by seawater's near-total opacity to electromagnetic radiation. This means that sub-surface measurements must rely on contact to the surface by either mechanical or acoustic means. The former (ultimately) requires ships or moorings; the latter, to be widely useful, requires a satellite data collection service combined with a sub-surface vehicle which can reach the surface to transmit its data.

The Argo Programme, which will infest the oceans with thousands of autonomous profiling floats, will advance the study of the oceans by an order of magnitude, providing real-time and frequent (weekly-monthly) measurements of circulation and density over the upper half of the whole of the world ocean.

In this talk, we provide overviews of the development of neutrally buoyant floats, the application of float technology to the Argo programme, and some examples of our experience with this technology.

**P Challenger, Southampton Oceanography Centre** - Routine monitoring of the ocean from space ([pc@soc.soton.ac.uk](mailto:pc@soc.soton.ac.uk))

Operational oceanography is concerned with delivering information about the oceans to decision makers in a timely and relevant way. In many ways satellites are the ideal instruments for such purposes. They deliver data routinely and often have data systems designed to produce information quickly. However there are drawbacks as well. While for some, broad swath, instruments you can rely on one or two observations a day, for others, either because of narrow swaths or problems with cloud, we can only get one or two observations a month.

**H Cattle, The Met. Office** - Predicting the global ocean: FOAM ([hcattle@meto.gov.uk](mailto:hcattle@meto.gov.uk))

The Met. Office's Forecast Ocean Atmosphere Model (FOAM) system produces real-time analyses and forecasts of the temperature, salinity and currents of the ocean in depth for up to five days ahead. FOAM is built around a physically based ocean model and, in its global version with one-degree horizontal resolution and 20 levels in the vertical, has been run every day since October 1997.

High-resolution, limited-area versions of the FOAM system are also being developed, nested within coarser, larger-area models. These are a 1/3 degree resolution model covering the Atlantic and a 1/9 degree resolution model covering the Caribbean and the Gulf of Mexico.

This paper will cover these developments and give examples of FOAM output and verification. FOAM also has applications to Seasonal Forecasting and experimental decadal timescale prediction. The international Argo programme and satellite altimetry will provide an important source of data for FOAM analyses and forecasts for the future, both for operations and in the context of the Global Data Assimilation Experiment (2003-2005).

**N Flemming, EuroGOOS** - Developing a global ocean observing system ([nf@soc.soton.ac.uk](mailto:nf@soc.soton.ac.uk))

The first plans for a Global Ocean Observing System were outlined in the late 1980s during the preparation for the Second World Climate Conference in 1990, and then the Rio Convention on Environment and Development in 1992. During the last decade many aspects of infrastructure, science base, technology, and implementation have been analysed and put into practice. The progress achieved and the challenges remaining will be reviewed with an emphasis on the relationship between metocean research activities and the broader operational requirements of the marine sector.

**D Prandle, Proudman Oceanographic Laboratory** - Limits to predictability in shelf seas ([dp@pol.ac.uk](mailto:dp@pol.ac.uk))