South African deployment opportunities and feed-back on Argo related research and educational outreach

Tamaryn Morris¹

With contributions by:
Isabelle Ansorge², Juliet Hermes³, Sandy Thomalla⁴ and Thomas Mtontsi³

¹Bayworld Centre for Research and Education, Cape Town, SA
²University of Cape Town
³South African Environmental Observation Network
⁴Council for Scientific and Industrial Research
2012 Deployments

Floats contributed by:
1. NOAA for ASCLME Cruise
2. UK Met Office and University of Brest for Gough Island and SANAE Cruises
2013 Deployment Opportunities

SA Float Procurements:
1. DEA – Marion Island and West Coast SA (10)
2. CSIR – SOSCEx Cruise (3)

Float contributions:
1. NOAA - ASCLME (4) and SAMBA (4) Cruises
2. CSIRO – Meteor Cruise (3)
3. UK Met Office and University of Brest - Gough Island (8) and SANAE (12) Cruises
4. WHOI (5), UK Met Office (2/4) and CSIRO (2) – Eddy study

2013 Float Deployments
- Marion Island Cruise
- Gough Island Cruise
- SANAЕ Cruise (Good Hope Line)
- SAMBA Cruise
- ASCLME Cruise
- Meteor Cruise
- SOSCEx Cruise
- Eddy study (ASCLME, ACEP and Meteor)
SOBOM – Biogeochemical floats

Unlocking the mysteries of the Southern Ocean

Center for Southern Ocean Biogeochemical Observations and Modeling

The Center for Southern Ocean Biogeochemical Observations and Modeling is a candidate NSF Science and Technology Center focused on unlocking the mysteries of the Southern Ocean and determining its influence on climate.

Housed at Princeton University, the Center would draw on the strengths of teams of investigators across the U.S. as well as participate in international observational and simulation efforts.

Dr. Ansorge – UCT International Collaborations Committee

Float deployments opportunities on Southern Ocean cruises
The rate of particle accumulation on the upward looking transmissometer whilst drifting between profiles gives a carbon flux index.

A = Transmissometer, B = Backscatter, C = CFI
SOSCEx 2012 Experiment

Dr Thomalla – CSIR

Modified PROVOR float with CTD, DO, backscatter, fluoro, transmissometer and CFI system

Swart et al., 2012
Eddy Study
Bayworld Centre for Research and Education (BCRE)

ACEP III Project – “Suitcase Project”: Genetic linkages between Madagascar and South Africa

“Argo Dance”
- 6-8 (Bio)Argo floats
- 1 day profiles
- ~300 m depth
- Deployed in a transect across eddy
- Aim: to capture the euphotic zone pumping of a cyclonic eddy and thus its sustainability
Educational Outreach

South African Environmental Observation Network

Five secondary schools in the Western Cape identified to partake in science projects looking at data collected by two Argo floats procured by SAEON with the help of the South African Weather Services and deployed in the Southern Ocean in 2009.

Projects include:

1. The Identification of deep water masses and their movement using temperature
2. Relationships between salinity and depth
3. Descriptions of temperature, pressure and salinity parameters in the ocean
Educational Outreach

Showcased at the 2013 SciFest Africa in Grahamstown, 13-19 March 2013


**Robots in the Ocean**

*Why do we need a global ocean observing system?* by Thomas Mtsonti and Isabelle Ansorge

In the past three decades, discussions of global warming have been mentioned mainly in academic debates. Now, however, the same topics provide fuel for public debate and mounting pressure for increased government action as substantial indicators suggest that climate is undergoing significant variability and change. The flurry of early studies into the climate system have worrying conclusions. However, although the changes appear to be a response of the oceans to global warming, they could just as easily be a natural mode of oceanic variability.

Recent reports have confirmed that sea level is rising at an accelerating rate of 5 millimeters per year, while August 2012 has seen the Arctic sea ice reach its lowest level ever. Extreme weather events such as droughts in Africa, intense hurricanes off Florida, unprecedented warm spells in the Norwegian winter, and storms in the Pacific or raging bush fires in Australia are now seen regularly. In the past 10 years we have seen eight of the warmest years recorded since 1900. As understanding of the changes in both the atmosphere and oceans are crucial in order to guide international action and policy. However, a lack of improved earth observations has hindered the development and validation of the climate models that are used to accurately forecast these changes. In 1998 a plan was put forward to develop a global array of profiling floats throughout the four free areas of the deep oceans. This array would, for the first time, provide a systematic, robotic monitoring system of the global ocean. This initiative was ARGO.

**How does ARGO work?**

ARGO is a multi-national network of 5000 profiling floats. ARGO floats are approximately 1.1 m tall and...