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

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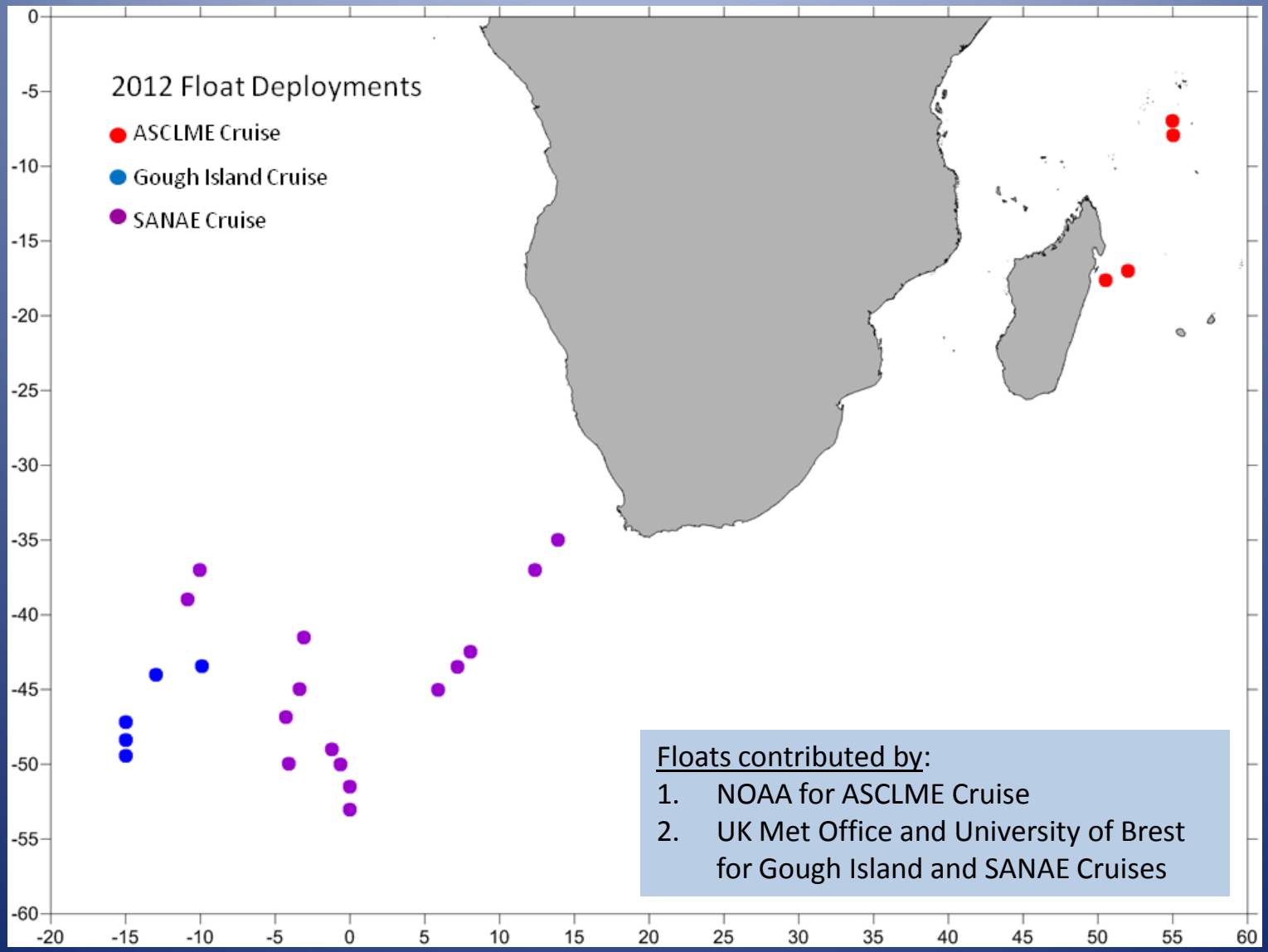
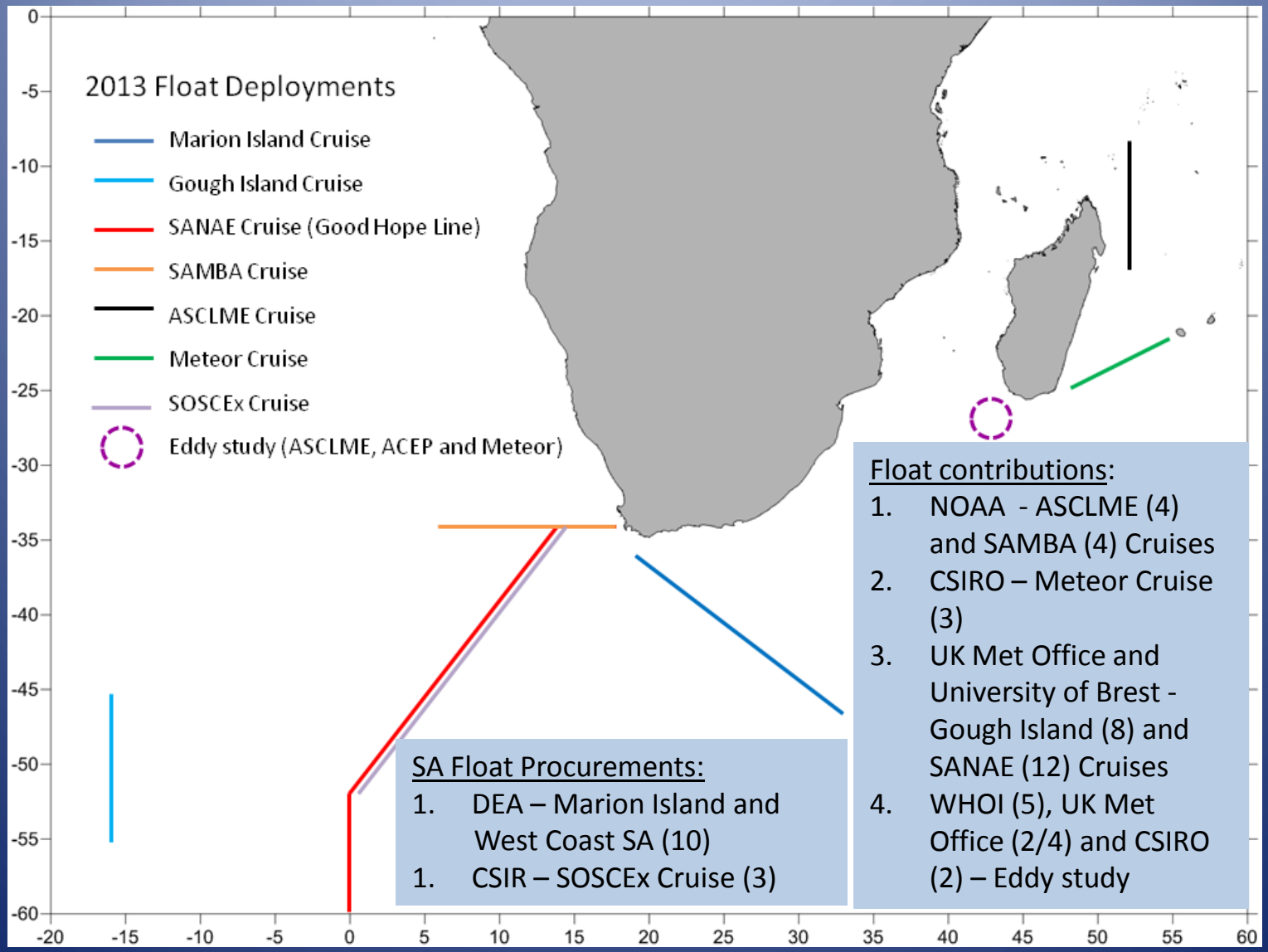
2012 Deployments



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)
1. 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

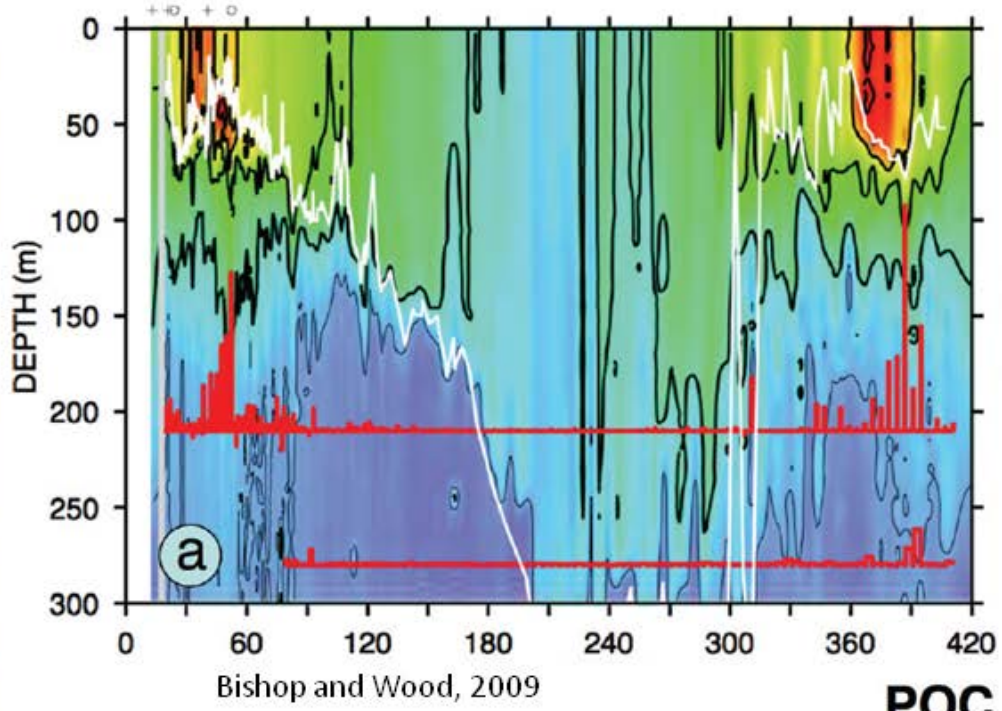
SOBOM – Biogeochemical floats

Dr. Ansorge – UCT International Collaborations Committee

Float deployments opportunities on Southern Ocean cruises

Carbon explorer float

Bishop, 2009



Bishop and Wood, 2009

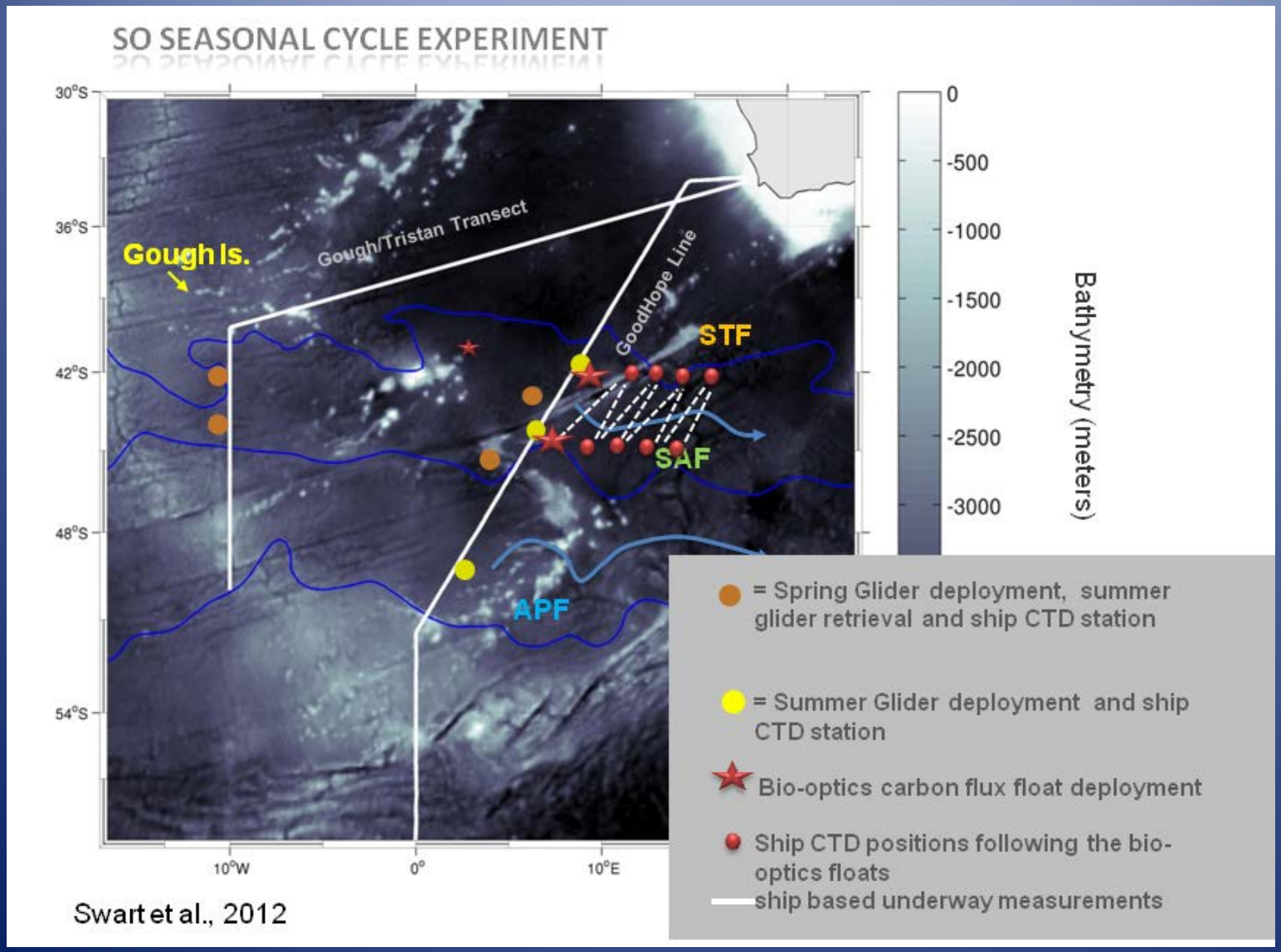
POC (μM)

- 8
- 4
- 2
- 1
- 0.5

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

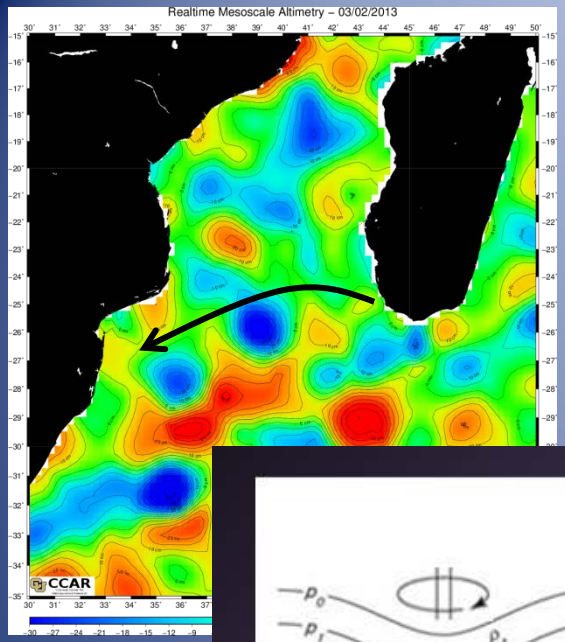
SOSCEx 2012 Experiment



Swart et al., 2012

Dr Thomalla – CSIR

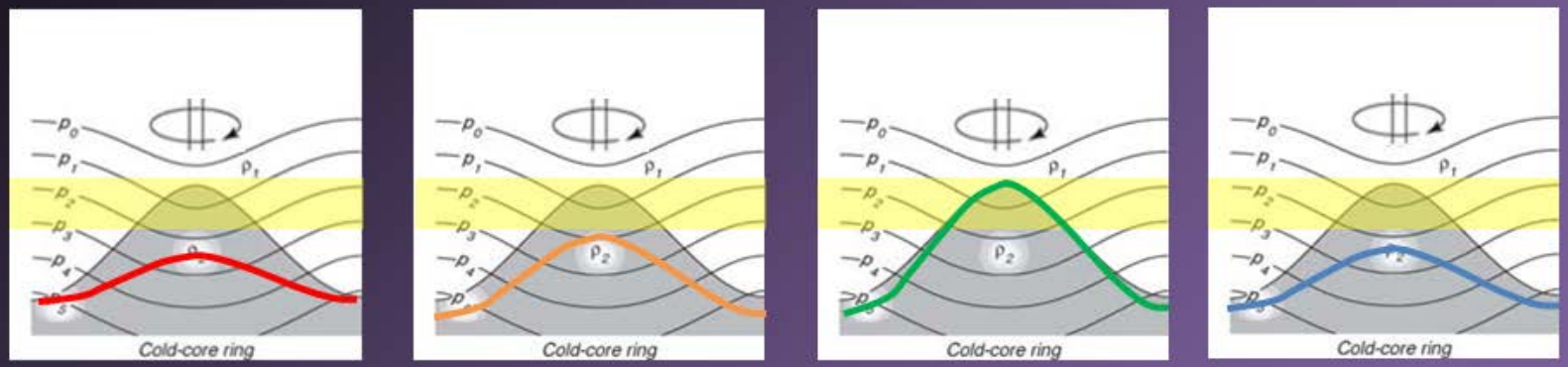
Modified PROVOR float with CTD, DO, backscatter, fluoro, transmissometer and CFI system

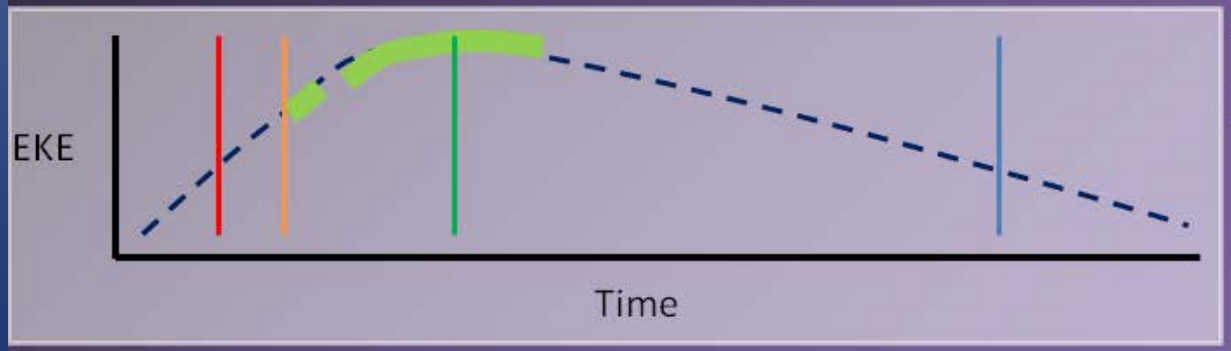


Eddy Study

Bayworld Centre for Research and Education (BCRE)

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



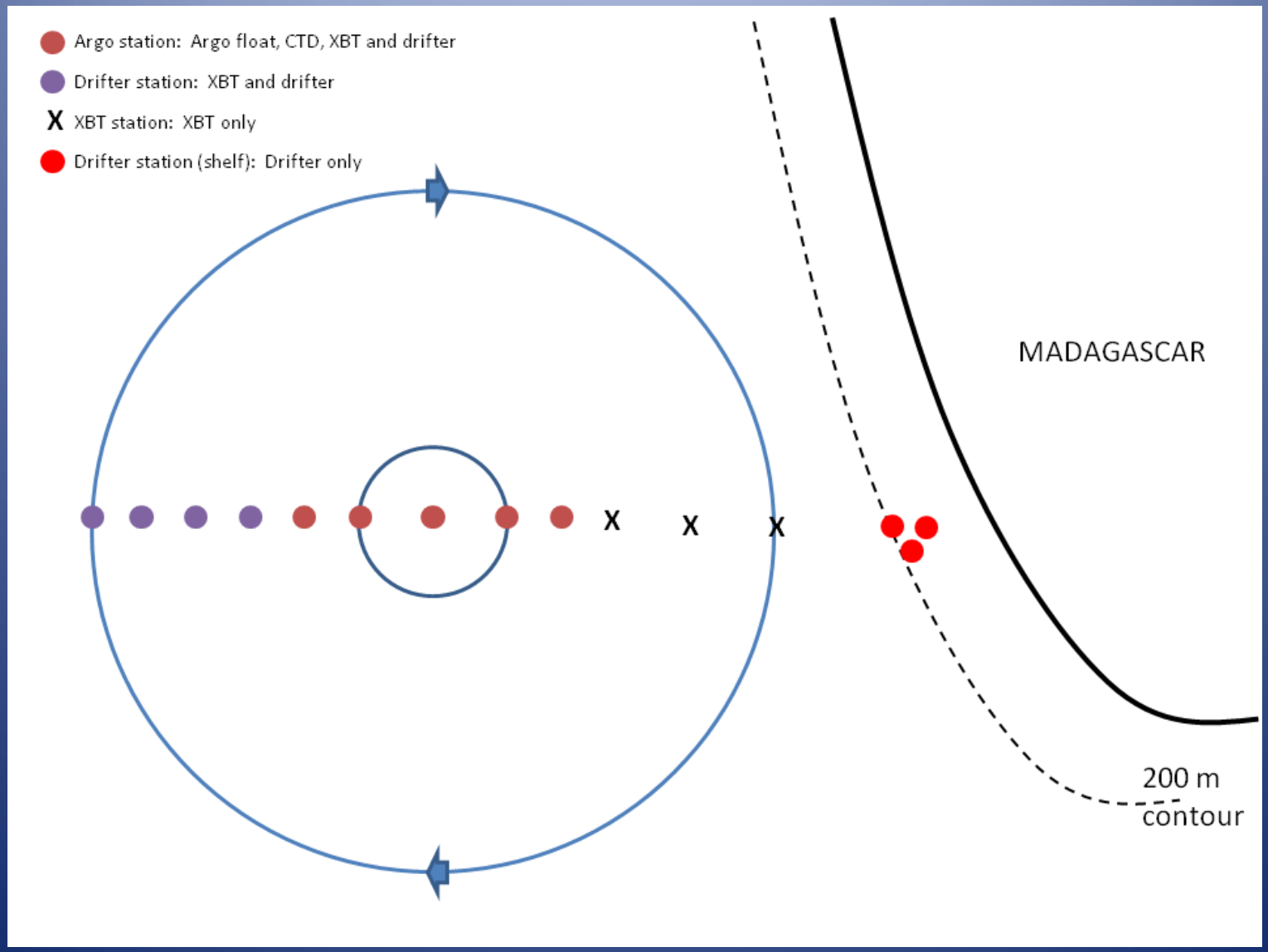


"Argo Dance"

- 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 sustainablility

4th Argo Science Workshop: Venice, Italy
24-29 September 2012

Eddy Study


Argo station: Argo float, CTD, XBT and drifter
Drifter station: XBT and drifter
X XBT station: XBT only
Drifter station (shelf): Drifter only
MADAGASCAR
200 m
contour

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

Getting an Argo float into the water – quick and easy! Image: SAEON

Robots in the ocean

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

The Argo float in the water. Image: SAEON

In the past three decades, discussions of global warming have been restricted mainly to academic debates. Now, however, the same topics provide fuel for public debate and mounting pressure for increasing government action as substantial indicators suggest that climate is undergoing significant variability and change. The flurry of new studies into the climate system have worrying conclusions. However, although the changes seen may 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 3 mm/year, while August 2012 has seen the Arctic sea ice cover shrink to its lowest level ever. Extreme weather events such as droughts in Africa, intense hurricanes off Florida, unprecedented warm spells in the European winter, dust storms in the Sahara 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 1860. An understanding of the changes in both the atmosphere and ocean are crucial in order to guide international action and policy. However, a lack of sustained earth observations has hindered the development and validation of the climate models that we need to accurately forecast these changes. In 1998 a plan was put forward to develop a global array of profiling floats throughout the ice-free areas of the deep ocean. This array would, for the first time, provide a systematic robotic monitoring system of the global oceans. That initiative was ARGO.

How does ARGO work?

ARGO is a multi-national network of 3 000 profiling floats. ARGO floats are approximately 1.1 m tall and

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

Mtsonti, T. and Ansorge, I. 2013. Robots in the Ocean. ***Quest*** 9 (1). 50-53.

Request to any groups who have old or broken Argo floats or scale models that can be used for educational displays and for teaching purposes.