

2. The Argo project (Key collaborators, SANAP and UCT)

Argo is part of the integrated global observation strategy. It consists of a global array of 3,000 free-drifting profiling floats (Figure 1) that measures the temperature and salinity of the upper 2 km of the ocean (<http://www.argo.ucsd.edu/>). The floats ascend approximately every 10 days collecting profiles which are then transmitted via satellite to data centres. The floats are designed to be deployed from voluntary observing ships, at a minimum cost.

Argo plays a crucial role in monitoring climate change signals in the oceans and also in long range climate prediction (30 days to 2 years). Argo is capable of monitoring signals on intraseasonal and longer scales.

Argo floats allow continuous monitoring of the temperature, salinity, and velocity of the upper ocean, with all data being relayed and made publicly available within hours after collection. Unlike satellites, Argo floats are able to measure subsurface ocean variables. These measurements are essential because the ocean's upper layers can store 1,000 times more heat than the atmosphere does. Changes in subsurface currents, temperature, and salinity eventually change conditions at the surface, where the ocean interfaces with the atmosphere. Such data is necessary to improve our understanding of both long term anthropogenic climate change and natural modes of variability in the oceans. This will benefit not just researchers but also governments, policy makers and industries. Argo data provides a vital input for ocean models which will lead to a more accurate prediction of the ocean state and how it will change over time and with different forcing. Recent work has shown the importance of Argo float data for realistic model assimilations (Oke and Schiller*).

Obtaining South African owned Argo floats is of importance primarily because the oceans surrounding South Africa are sparse of observations and floats. Another important reason behind funding an Argo float is to enable South Africa (SAEON and SANAP) to be more involved in the Argo project by being recognized on the Argo website, increasing South Africa's scientific capabilities internationally.

SAEON/SANAP collaboration

The importance of the Southern Ocean with regards to our weather and climate, as well as global change, has recently been identified, yet observations in this region (especially south of South Africa) are sparse. The Southern Annular Mode is becoming increasingly topical and measurements from programs such as Argo will prove invaluable to its understanding. This forms part of both SAEON and SANAP's mandate, which has led to the combination of purchasing two floats, in order to make the most of this opportunity.

What has happened

Two Argo floats were purchased by SAEON and SANAP and deployed in the Southern Ocean, facilitated through the Department of Environmental Affairs and Tourism's bi-annual cruises with the R.V. Agulhas. As yet the measurements are not scientifically valuable, as the floats have not been in the water for a long period. However, the data collected by these Argo floats feed into a network of floats around the world and add to the data being used to research the world's ocean systems. South African and international research being conducted south of South Africa and in the Southern Ocean region will benefit from the deployment of these floats as they provide more observations in a data poor area.

Argo floats assist in the development of the understanding of the importance of long term monitoring of the oceans, specifically with the public and learners. Argo floats generate excitement and curiosity and thus aid in bringing the public and learners closer to scientific research. The entire project has become a key aspect of the education program (see later). Furthermore, the involvement of South Africa in the Argo programme also brings exposure and recognition for our local scientists to the international scientific community.

* P. R. Oke and A Schiller, 2007: Impact of Argo, SST, and altimeter data on an eddy-resolving ocean reanalysis. *Geophysical Research Letters*, 34, L19601, doi:10.1029/2007GL031549.



Fig 2.1: Argo float being deployed from the Agulhas

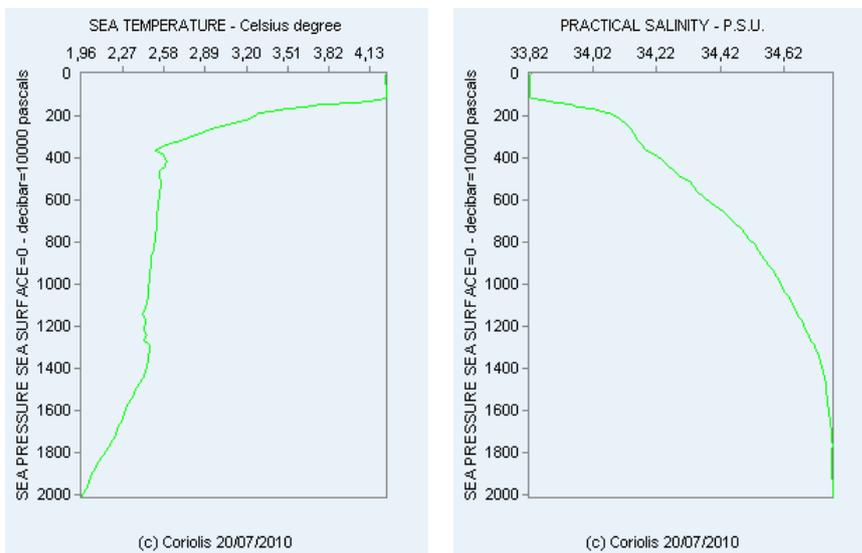


Figure 2.2: Float 1901469, 16/07/2010 04:41:00, Ascending profiles

As a result of this project, South Africa was asked to sit on the Argo Steering Committee, SAEON felt it would be most appropriate if someone from the South African Weather Service attended and they were fully funded by Argo to attend the last meeting in California. The South African Argo floats were also a feature on the JCOMM float of the month web page as well as in the NRF research nugget and SAEON newsletter. We are also working on writing an article for the Mail and Guardian, using the floats to highlight long term monitoring and the importance of the oceans surrounding South Africa.