

VACS Report for AIP, August 2008 (C. Reason)

A new CO₂ Observation Programme for the South East Atlantic and Southern Ocean sector south of South Africa has been started by CSIR South Africa in collaboration with the University of Cape Town. The SOCOP is a long term initiative to observe changes in the ocean - atmosphere fluxes of CO₂ in the Southern Ocean to the South of Africa. It will comprise a gradually increasing set of underway observations starting with ocean / atmospheric pCO₂, & surface layer TA, TCO₂, Chla, O₂, T, S expanding in the coming year to include a number of other variables in the upper mixed layer and lower atmosphere. It takes advantage of both the geographic location of South Africa in a relatively under sampled zone of the Southern Ocean as well as the three annual trips that the SANAP ship SA Agulhas undertakes between Cape Town and the Antarctic bases. These cruises offer an excellent and up to now relatively under-utilised opportunity to sample this sector over three seasons.

In February-March 2008, the RV Marion Dufresne completed an extensive survey which included CTD, XBT, biogeochemistry and radiosonde observations, to mention but a few. This was the fourth CTD and twelfth XBT section completed in the GoodHope program's short history, which commenced in 2004. Additionally, the deployment of Argo floats (approx. 16 deployed during the most recent GoodHope occupation) has helped to fill the Southern Ocean gap of floats for this region of the South Atlantic.

Proxy methods applied to the CTD and XBT data can be used to infer subsurface hydrographic information from 16 years of satellite altimeter data. This includes being able to infer baroclinic transports of the ACC from altimeter SSH data alone (Swart et al. 2008, JGR). More recently, applying altimeter SSH data to the Gravest Empirical Mode in order to gain a better understanding of the subsurface thermohaline structure has proven to be a very successful method in such a data sparse region of the world's ocean.

VACS attended the PIRATA-13 meeting in Natal, Brazil in February. At the moment, the PIRATA SE extension still requires funding for a second ATLAS mooring. BCLME funded an initial mooring and ship time is available courtesy of IRD. Discussions were held with Mike McPhadden about the possibility of NOAA providing a second mooring in return for local ship-time to assist with the RAMA array in the Indian Ocean. VACS has helped organize deployment of two ATLAS moorings and several Argo floats in the western Indian Ocean through a South African-led ASCLME cruise. We will now approach PMEL to see whether a second mooring can be supplied for PIRATA SE.

VACS organised or contributed to several workshops and conferences in the last twelve months. In particular, a workshop on southern African climate variability and Atlantic influences was held in Cape Town in late 2007 with funding from the UK Royal Society and the South African NRF. The workshop led to the development of a southern African research programme and a plan for obtaining major funding to support this. An African Climate conference was

held at ITCP, Trieste in June 2008. Several members of VACS were on the organising committee and gave invited talks.

The African Centre for Climate and Earth System Science (ACCESS), headed by George Philander, is preparing a bid for large scale funding to the South African government Dept of Science and Technology to help support climate modelling, operational oceanography and other earth system science components with the Atlantic aspects playing a prominent role. VACS has assisted with the intraseasonal to interannual variability components of this bid. Of particular interest to AIP are the aspects dealing with the science underpinning the prediction of the Benguela Nino and low oxygen events in the South East Atlantic.

A proposal has also been submitted to the South African, Brazilian and Indian government agencies under the trilateral India / Brazil / South Africa research programme one component of which is oceanography. Although this funding is mainly aimed at scientific exchanges between the three countries, it should assist with holding a workshop to address climate issues of the South Atlantic that are of special interest to Brazil and South Africa.