

## **Indian Ocean Observing System (IndOOS) Resources Forum - update**

**Following the recommendation to establish an Indian Ocean Resources Forum (IRF) at the 5<sup>th</sup> meeting of the Indian Ocean GOOS (Global Ocean Observing System) in December 2008, the CLIVAR/GOOS Indian Ocean Panel (IOP), was tasked to draw up a business plan for an IRF. This was addressed at the recent IOP panel meeting in June 2009 in La Reunion.**

Stimulated by the need for an ocean observing system to meet the demands for regional monsoon prediction and in response to data requirements expressed by the science and social communities, CLIVAR and GOOS instituted a joint Indian Ocean Panel to develop an Implementation Plan for and coordinate the deployment of the Indian Ocean Observing System (IndOOS).

A key achievement in developing a sustained ocean observation system for the Indian Ocean (IndOOS) has been the installation of a tropical basin-wide mooring array. The mooring array, called RAMA (Research moored Array for African-Asian-Australian Monsoon Analysis and prediction) is planned to consist of 46 moorings. As of March 2009, 22 of these (47%) are already occupied, with equipment and/or ship time contributions from the US, Japan, India, China, Indonesia, France as well as from regional programs such as the Agulhas and Somali Current Large Marine Ecosystems project. The first scientific results from RAMA were reported in a recent paper (McPhaden et al., 2009).

IndOOS includes a variety of other observing platforms including expendable bathythermographs on merchant vessels, Argo floats, surface drifters and tide gauges. The main challenge at this time is to find and focus the resources of individual nations to achieve a coherent completion of IndOOS and sustain the system into the future.

A review of the activity of the Indian Ocean Panel (IOP) during the 5<sup>th</sup> Annual Meeting of the Indian Ocean GOOS Regional Alliance, IOGOOS-V, (Phuket, 2007) prompted an investigation of the feasibility of establishing an IndOOS Resources Forum (IRF). The terms of reference for the IRF were agreed at IOGOOS-VI (Hyderabad, 2008) and the IOP was asked to prepare a business plan for the IRF and to nominate national representatives from nations that are contributing to IndOOS. A draft of the business plan has recently been released for comment from the IOP members. The main elements from the plan are summarised as follows:

The IRF will biannually monitor and critique the rationale for implementation of the IndOOS Plan, as it is articulated by the CLIVAR/GOOS Indian Ocean Panel and other relevant expert-bodies. Based on its deliberations at biannual face-to-face meetings, the IRF will work out of session to facilitate and coordinate the provision of the resources required for the implementation of IndOOS. The IRF activity will promote contributions from institutions in the participating countries, with a view toward completing the IndOOS plan by 2015.

The most urgent needs at this time are ship-time for the RAMA (McPhaden et al. 2009), and the large investment in mooring equipment required to complete the array primarily in the western Indian Ocean.

In addition, resources are required:

- To provide and distribute Argo floats in remote regions that are difficult to reach,
- To complete the ship of opportunity expendable bathythermograph network and enhance biogeochemical observations, after a review at the international OceanObs'09 conference in September 2009,
- To enhance the Argo array with biogeochemical sensors if recommended at the OceanObs'09 conference,

- To maintain an array of surface drifters, with a capability to measure the surface current in addition to sea surface temperature (a critical need for validation of the products of operational models),

Sustaining IndOOS into the future is the biggest challenge that the Forum needs to address. The IRF as a body will explore the possibility of international resources from aid and development agencies to develop IndOOS. The outcome of the IRF's activity should be stable and adequate resources to develop and sustain IndOOS.

Reference:

McPhaden, M.J., G. Meyers, K. Ando, Y. Masumoto, V.S.N. Murty, M. Ravichandran, F. Syamsudin, J. Vialard, L. Yu, and W. Yu, 2009: RAMA: The Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction. Bull. Am. Meteorol. Soc., 90, 459-480.