

PERTH PROGRAMME OFFICE
IN SUPPORT OF UNESCO - IOC

Newsletter



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Intergovernmental
Oceanographic
Commission

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Welcome to the 8th occasional newsletter for the Perth Programme Office (PPO) in support of UNESCO's Intergovernmental Oceanographic Commission (IOC). This newsletter provides an update to stakeholders on recent PPO programs and activities.

Further information can be obtained through our website (www.iocperth.org), or please feel free to contact the PPO (nick.dadamo@bom.gov.au or j.wicks@bom.gov.au) for further details on anything contained in this newsletter.

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International Indian Ocean Expedition 2

Update on planning

The Second International Indian Ocean Expedition (IIOE-2) is a major global scientific program which has been under development since 2011 under the co-auspices of IOC, SCOR and IOGOOS. It proposes to engage the international scientific community in collaborative oceanographic and atmospheric research focused upon the Indian Ocean (from coastal environments to the deep sea) over the period 2015-2020, revealing new information on the Indian Ocean (i.e. its currents, its influence upon the climate, its marine ecosystems) which is fundamental for future sustainable development and expansion of the Indian Ocean's blue economy.

IIOE-2 follows on fifty years after the original International Indian Ocean Expedition (IIOE) of 1959-65. The original expedition was a true voyage of discovery exercise uncovering scientific data of significant societal and environmental relevance, as well as catalysing the establishment of inter-governmental scientific organisations such as the IOC within UNESCO and CSIR-National Institute of Oceanography in India.

A large number of scientists from research institutions from around the Indian Ocean and beyond have been engaged in planning for IIOE-2. Please refer to IIOE-2 pages on www.iocperth.org for background documents associated with IIOE-2 planning.

This effort culminated in the presentation of a formal resolution on IIOE-2 to the IOC's 147 Member States at the 28th IOC Assembly, 17-25 June 2015 in Paris. A [Strategic Framework](#) for the Implementation of the Second International Indian Ocean Expedition, developed through the IOC IIOE-2 Interim Planning Committee (Group of Experts) process, and the final [IIOE-2 Science Plan](#) developed by the SCOR International Science Plan Development Committee, were also presented to IOC Member States for their endorsement. The IIOE-2 agenda item received strong supportive interventions from many Member States and [Resolution XXVIII-1](#) was ultimately adopted, formally adopting IIOE-2 as a major initiative of the IOC to be undertaken jointly with SCOR and IOGOOS, initially over the next 5 years. The Resolution also creates a new project in the IOC Secretariat portfolio with an allocated initial budget for 2016/2017 of \$25K USD per year to facilitate the IOC's coordination of activities. The ongoing success of IIOE-2 will therefore be heavily reliant upon the commitments of



IIOE-2 Update cont....

Member States to self-fund research endeavours and the project sponsors will also be actively seeking support from international donors to assist in capacity development initiatives.

Focused research on the Indian Ocean has a number of benefits for all nations. The Indian Ocean is complex and drives the region's climate including extreme events (e.g. monsoons, droughts, waves and storm surges). It is the source of important socio-economic resources (e.g. fisheries, oil and gas exploration/extraction, eco-tourism) and is the background and focus of many of the region's human populations around its margins. In this context, IIOE-2 research will be guided by the following six science themes as detailed in the IIOE-2 Science Plan:

1. Anthropogenic impacts
2. Boundary current dynamics, upwelling variability and ecosystem impacts
3. Monsoon variability and ecosystem response
4. Circulation, climate variability and climate change
5. Extreme events and their impacts on ecosystems and human populations
6. Unique geological, physical biogeochemical and ecological features of the Indian Ocean

Research and observations supported through IIOE-2 will result in an improved understanding of the ocean's physical and biological oceanography, and related air-ocean climate interactions (both in the short-term and long-term). The IIOE-2's program will complement and harmonise with other regional programs underway and collectively the outcomes of IIOE-2 will be of huge benefit to individual and regional sustainable development as the new information will be a critical component of improved decision making in areas such as maritime services and safety, environmental management, climate monitoring and prediction, food and energy secu-

rity.

IIOE-2 activities will also include a significant focus on building the capacity of all nations around the Indian Ocean to understand and apply observational data or research outputs for their own socio-economic requirements and decisions. IIOE-2 capacity building programs will therefore be focused on the translation of the science and information outputs for societal benefit and training of relevant individuals from surrounding nations in these areas.

Since the adoption of IIOE-2 at the 28th IOC Assembly, the IOC IIOE-2 Interim Planning Committee (Group of Experts) process has been working hard to complete an IIOE-2 Implementation Plan in time for the launch of IIOE-2 on the 4 December 2015 in Goa, India, on the final day of the IO50 symposium on the Indian Ocean. The IPC recently met in Hyderabad, India to consolidate the contents of the Plan and when presented it will provide the overarching framework for IIOE-2 addressing issues such as how to participate in IIOE-2 research, the procedures and protocols for data and information management and the proposed approaches to linked capacity development and outreach initiatives.

The Perth Programme Office (PPO) of the IOC will continue its role in IIOE-2 and has been designated as a key node of the Joint Project Office (JPO) IIOE-2 secretariat network, with the Head of the PPO designated as the IOC's IIOE-2 Coordinator. The PPO will also work in harmony with another key JPO node, to be hosted and supported by the Government of India at INCOIS, in all aspects of IIOE-2 implementation.

For further information, contact the Head of the PPO, [Dr Nick D'Adamo](#).

International Indian Ocean Symposium

In order to celebrate the linked events of 50 years of completion of IIOE and the Golden Jubilee of NIO, an International Symposium will be held from 30th November to 4th December 2015 in Goa, India. The Symposium, co-sponsored by NIO, SCOR, and IOC, will provide a forum for marine and related scientists from all over the world to present the results of their latest research on the Indian Ocean, review the progress made in understanding the unique characteristics of the region and plan future research to address outstanding issues under IIOE-2. Registration to attend the conference is open up until 20th November, 2015 and further details can be found via the symposium <https://www.io50.incois.gov.in>.

One of the significant events associated with the symposium will be the launch of the IIOE-2, coinciding with the last day of the symposium on 4 December 2015. The launch will be symbolized by the first research cruise under IIOE-2 by the Research Vessel Sagar Nidhi, travelling between Goa and Mauritius (4-22 December, 2015).



PPO Sponsors



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Update in Bio-Argo Project

As reported in the PPO's last newsletter, the PPO has been collaborating with CSIRO and project partners, India's National Institute of Oceanography (CSIR-NIO) and the Indian National Centre for Ocean Information Services (INCOIS), on outreach and communication activities associated with a joint Australia-India Bio-Argo Project. Following initial modelling activities to identify optimal deployment parameters, deployments of BioArgo floats in June 2015 have already been relaying important data to project scientists, and further deployments are planned in January and March 2016. The project team will get together at a workshop prior to the Goa Symposium and the PPO will provide a project update to IOGOOS participants at their Goa meetings (5-9 December 2015) on behalf of the project team. The PPO and CSIRO will also shortly commence planning for the end of project workshop, to be held in the second half of 2016, which will seek to facilitate the

Principal scientist Nick Hardman-Mountford testing communications on one of the Bio-Argo floats.



translation and utilisation of the outputs from the project for future research studies and future bio-Argo deployments. For further information please contact the PPO's Program Manager, [Ms Louise Wicks](#).

The following CSIRO media release provides an update on the June 2015 deployment.

Robots to identify what makes the Indian Ocean tick – CSIRO Media Release

A fleet of floating bio-robots were deployed between Christmas Island and Madagascar the past June by CSIRO. The BioArgos were equipped with tiny sensors that can measure biological indicators within the ocean including dissolved oxygen, nitrate, chlorophyll, organic matter and particles. This is hoping to help gain an understanding of the physical and biological workings of the crucially important Indian Ocean.

It was the first time CSIRO used the new BioArgo robotic floats to measure this massively under sampled part of the world.

"These can tell us about the growth of plankton, how much carbon they take up, how much gets used up the food chain and how much gets buried," CSIRO project leader Dr Nick Hardman-Mountford said.

"Knowing about this growth is important for predicting how much food the Indian Ocean can produce and how much carbon dioxide it can capture, and will give us a better idea of what keeps the Indian Ocean healthy and productive."

"The East Indian Ocean alone brings in catches of seven million tons of fish per year. It also contains oil and gas resources, and mineral resources like copper, iron, zinc, silver and gold and it also drives the climates of its surrounding regions, which make up more than 16 per cent of the world's entire population. So it's important that we keep track of what's going on below the surface." Dr Hardman-Mountford said.

The voyage was part of a UN Food and Agriculture (UNFAO) voyage on the Norwegian research vessel Dr Fridtjof Nansen, with the project funded by the Department of Industry's Australia-India Strategic Research Fund, CSIRO Oceans & Atmosphere Flagship and Earth Observation Informatics Future Science Platform, the Indian Government's Department of Science and Technology and UNFAO. CSIRO's Dr Francois Dufois set sail from Jakarta on 26 June, with a stop at Christmas Island where the Bio Argo floats were loaded.

Reaching out the BOBLME Region and developing collaborative projects under IIOE-2



The PPO and the Bay of Bengal Large Marine Ecosystem (BOBLME) Project developed a joint initiative to better connect BOBLME countries with the finalisation of IIOE-2 planning and subsequent implementation in early 2015. The partnership included a number of activities, including running a BOBLME Focus Group meeting in Bangkok in March 2015 to engage BOBLME scientists with IIOE-2 planning activities, as well as undertaking a desk-top assessment on opportunities to introduce oceanography and climate science teaching modules into the curriculum of primary and secondary schools in BOBLME countries.

Workshop

Twenty scientists from seven BOBLME countries and SCOR, IOGOOS and IOGOOS' scientific project alliances in IOP and SIBER participated in the workshop over 17-18 March 2015. It achieved considerable engagement by the BOBLME country participants, both at a substantive level; including through detailed presentations on their institutional and/or countries' oceanographic scientific capabilities and desired outcomes, involvement and capacity development opportunities through IIOE-2; as well as at an insightful level in response to workshop presentations and resultant plenary discussions. This engagement is already translating into an improved awareness and ability to engage in IIOE-2 amongst BOBLME countries, as well as improved collegial relationships with scientists throughout the region.

Feasibility Study

The desk-top feasibility study into the development of appropriate school based ocean and climate science curriculum, centred on the SEREAD Program, confirmed that the BOBLME Region provides an ideal setting for the SEREAD teacher training program to be modified and piloted in the Indian Ocean. International scientific interest in the Indian Ocean, as focussed through IIOE-2 over the next five years, also provides an ideal timeframe for a pilot project to be commenced. This evolution of new scientific understanding through IIOE-2 will provide a vibrant background for students to understand the real-world relevancy of ocean observations and climate science studies and enable students to connect with scientists undertaking research in their region. Further work would be required to modify SEREAD content and to establish solid foundations for the initiative through Educational Ministries in the BOBLME region, but it presents itself as an exciting opportunity with the potential to substantially improve the knowledge, awareness and interaction of students, teachers and communities around the Bay of Bengal in ocean climate science.

Overall, the collaboration between the PPO and BOBLME established through this initiative offers the potential for future collaborations, which could facilitate and provide a stronger oceanographic focus during Phase 2 BOBLME, expected to start in 2016.

For further information please contact the PPO's Program Manager, [Ms Louise Wicks](#) .



Notification of IOGOOS meetings

The Indian Ocean Global Ocean Observing System (IOGOOS) Regional Alliance will be holding its 12th annual meeting during 5th – 9th December, 2015 in Goa, India. It has been planned to coincide with the end of the International Symposium on the Indian Ocean, and the launch of the IIOE-2. The IOGOOS meeting will be held in conjunction with the 6th annual meeting of the Indian Ocean Panel (IOP), the 6th of the Sustained Indian Ocean Biogeochemistry and Ecosystem Research (SIBER) and the 6th meeting of the Indian Ocean Observing System Resources Forum (IRF).

For further information, please contact [Dr Nick D'Adamo](#) .



Connecting IIOE-2 to IORA Member States

As the Apex regional body representing the Indian Ocean, the IOC has been seeking to increase its engagement and collaboration with [Indian Ocean Rim Association](#) and its Member States, particularly as a result of the IIOE-2 planning process. The work of the IIOE-2 strongly supports and is highly complementary of all six of the IORA priority areas, but in particular will directly contribute to increased regional academic, science and technology cooperation.

As part of IIOE-2 planning the IOC's PPO has actively engaged with many scientists and government officials from the IORA constituency, and has also kept the IORA Secretariat informed of progress and opportunities to facilitate the increased engagement of IORA Member States in IIOE-2 research and capacity development activities. These connections have been very positive and the PPO was delighted to present an update on IIOE-2 to the Indian Ocean Rim Academic Group (IORAG) at their recent meeting in Padang, Indonesia on 20 October 2015 as part of the 15th IORA Council of Ministers Meetings. The presentation and subsequent individual discussions provided many positive endorsements of the IIOE-2 program and the PPO will continue to actively engage with IORA throughout IIOE-2.

As a significant first step, the Australian Bureau of Meteorology, as a sponsor and host for the PPO, was awarded an Australian Aid project by the Department of Foreign Affairs and Trade (DFAT) to support the PPO running of a capacity development workshop targeted for IORA Member States to learn about the ocean observing infrastructure and research being undertaken through IIOE-2, how the data will be processed and can be acquired, and the ways in which it can be used (in ocean/weather modelling) and applied for societal usage and benefit. Planning for this workshop has commenced and it will be held in the first quarter of 2016. For further information please contact the PPO's Program Manager, [Ms Louise Wicks](#) .

