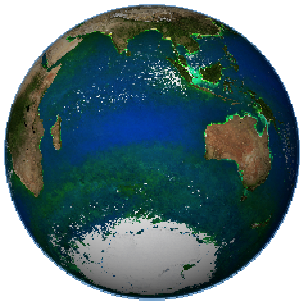

SIBER

Sustained Indian Ocean Biogeochemistry and Ecosystem Research

Report of the 4th Meeting of the SIBER Scientific Steering Committee

11-12 July, 2013

Lijiang, China

Integrated Marine Biogeochemistry and Ecosystem Research

IMBER Report # 10

IOGOOS:PR:07:SIBER/05

SIBER Report # 5

The SIBER programme reflects the importance placed on these issues by the International Geosphere-Biosphere Program (IGBP), the Scientific Committee on Oceanic Research (SCOR) and the Global Earth Observing System of Systems (GEOSS). SIBER has been developed with the approval of the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) Project and the Indian Ocean Global Ocean Observing System (IOGOOS), providing strong relevancies to the High Level Objectives of UNESCO's Intergovernmental Oceanographic Commission, which span across the generic themes of marine hazards, climate change, ecosystem protection and associated marine natural resource management.

Bibliographic Citation:

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Introduction:

The fourth annual meeting of SIBER Science Steering Committee (SSC) meeting was held during July 12, 2013 at Guangfang Hotel, Lijiang, China. SIBER-4 was held in conjunction with 10th annual meeting of CLIVAR-GOOS Indian Ocean Panel (IOP-10) on 10-11 July and 4th annual meeting of the Indian Ocean Observing System Resource Forum (IRF-4) on the afternoon of 12th July. IOP and SIBER had joint sessions starting in the afternoon of 10 July and running all day on 11 July to provide discussion opportunities with high-level officials, panel members and other relevant agency representatives.

SIBER-SSC was held in the forenoon of 12th July 2013 and was attended by Raleigh Hood (Chair), Jerry Wiggert, Dwi Susanto**,** M. Ravichandran, Somkiat Khokiattiwong, Mike Landry, Birgit Gaye and Mike Roberts along with SIBER IPO staff Satya Prakash and Nick D'Adamo from IOC Perth office. Invited experts attending included Dake Chen, Jun Sun, Lei Zhou and Meixun Zhao. Wajih Naqvi, Gregg Cowie, Lynnath Beckley, David Vousden and Dwi Susanto could not attend the meeting and expressed their regrets for the same.

Dr. Weidong Yu, Chair IOP and local host for the combined IOP, SIBER and IRF meetings gave his opening remarks and welcomed all delegates. He highlighted the importance of collaboration between IOP and SIBER, which is not only growing but has matured over the past few years. SIBER has provided a platform for cross-cutting collaborations among physical and biogeochemical oceanographic experts having interest in the Indian Ocean. This platform has also encouraged involvement of local scientists with linkage to IOP and SIBER. Dr. Yu emphasized the need to maintain joint assignments/meetings going forward. Some new proposals such as Eastern Indian Ocean Upwelling Research Initiative (EIOURI), IIOE-2 and draft resolution to IOC on IIOE-2 are some examples of our collaborative efforts. Dr. Raleigh Hood also expressed his gratitude to the local organizers and thanked all delegates of SIBER and IOP who gave their valuable time to attend this series of meetings.

Chinese plan and proposed contribution towards accomplishing IOP and SIBER objectives:

One of the major objectives for keeping this consortium of meetings at different countries is to involve local scientists. This facilitates the establishment of international collaborations that strive to realize broader goals and injects the knowledge of local experts regional-scale processes that often significantly modulates larger scale variability. In this context, and continuing our earlier adopted practice, many local scientists were invited to deliver scientific talks and present regional scientific issues/outstanding questions.

Dr. Dongxiao Wang made a presentation on " Connection between the Bay of Bengal and eastern tropical Indian Ocean before/after Summer Monsoon Onset Based on four years' in situ

observation". In his presentation, he reported on China's plan for a time-series station at the Southern Bay of Bengal (off Sri Lanka) in collaboration with a university in Sri Lanka. He also presented a plan to deploy a buoy, probably at a location close to the un-occupied RAMA mooring location. This will not only help expand observational network in the Indian Ocean but also complement RAMA where many of the planned stations are still unoccupied due to logistics issues.

Dr. Jun Sun made a presentation on "Indian Ocean Ecosystem investigation in China". He outlined ongoing activities on ecosystems in China that have close linkages with ongoing SIBER activities, stressing a need to measure ecosystem parameters in order to understand the impact of global change on regional ocean ecosystem.

Dr. Lie Zhou gave a presentation ("The Impact of Makassar Strait Throughflow on the Indian Ocean") that highlighted the importance of Makassar Strait and its impact on physical and biogeochemical processes of the Indian Ocean. He emphasized that though there have been several reports of *Trichodesmium* bloom occurences in the Southern Bay, we lack understanding on the nitrogen fixation rates and their contributions to the regional and global nitrogen budgets. It was suggested by the delegates that the 15N-tracer technique to estimated nitrogen fixation rate may be adapted and encouraged. A training programme on this technique as a capacity building exercise may be carried out in this regard.

Dr. Menhan Dai talked on "GEOTRACES research in the western Pacific marginal seas and implications for the Indian Ocean biogeochemistry", focusing on China's activities pertaining to the GEOTRACES programme and their plans to carry out sampling in the Indian Ocean.

Dr. Lin Lue presented on "Assessment of CMIP-5 IOD simulation in comparison with CMIP-3", highlighted some of recent results from his analysis. Since the wind states used for forcing the models are same in CMIP3 and CMIP5, there has no appreciable improvement. The same has been observed and reported recently by Binachi et al. (2013). Dr. Vialard suggested that analysis from an ensemble of model solutions may provide better information compared to any individual model.

IOP UPDATE FOR SIBER: Progress and activities since IOP-9

M. Ravichandran

The Indian Ocean Observing System (**IndOOS**) is a regional contribution to the Global Ocean Observing System (**GOOS**, http://www.ioc-goos.org/). Updates on India's mooring time series, Argo profiling floats and deployment opportunity of biogeochemical sensors in the Indian Ocean were presented. RAMA occupation was the same as last year but is expected to increase during Oct/Nov. Due to the piracy problem in the western Indian Ocean, deployment of RAMA moorings at unoccupied sites could not be completed. Piracy has also taken a toll on the density

of Argo floats in the Indian Ocean, which is reduced compared to previous years. The situation is likely to improve in coming months as protection has been promised for cruises in the pirated zones. Many countries continue to support RAMA and help service existing moorings. For example, this year China helped service two RAMA moorings despite bad weather conditions. The collective and collaborative effort is also reflected in an increasing number of publications from RAMA mooring data.

The RAMA Australian site has a pCO2 sensor. One year of continuous data from this site has been obtained and is now being processed. Another pCO2 sensor deployment is scheduled for later this year at 18°N 90°E in the northern Bay of Bengal. Delegates were also briefed about future plans pertaining to field measurements for understanding microstructure/mixing processes that lead to formation of barrier layers in the Bay of Bengal. It was suggested during the meeting to deploy iridium based Argo floats into the upwelling regions and include sensors such as pH and florescence based sensor for chlorophyll measurements.

IOP-SIBER joint session on 12th July:

SIBER Science Progress

Dr. Dwi Susanto made a presentation on "ITF Biogeochemical Fluxes and Related Research Efforts". Despite the fact that the ITF region is charecterized by of high marine diversity, its biogeochemical fluxes are poorly understood. The iconic pCO_2 flux map of Takahashi et al., 2009 is too coarse in the ITF to make any meaningful interpretations. It is still not understood whether the ITF is a sink or source of CO_2. Though researchers have recently focused their attention toward understanding the impact of the ITF on the Indian Ocean, these efforts are at a premature stage. Further advancement in our understanding requires focused, sustained and systematic research in this direction. For example, the nature of nutrient transport into the Indian Ocean via the ITF and its role/impact on modulation biogeochemical cycling in the Indian Ocean remains unclear. To date the only credible knowledge on BGC transfer in ITF is from Kinkade et al, (1997), where measurements pertaining to BGC fluxes have been reported. Some recent studies have made an attempt to estimate fluxes across Sunda Strait, where the water transport through different means are small, the variability is large and mixing is comparatively more. It is also reported that water mass flux is more into the Java Sea. but we lack knowledge of exchanges. The impacts of large-scale processes such as monsoon, El-Niño and IOD on ITF are also not well understood, though they are likely to have significant bearings on local, regional as well as global scales.

Dr. Somkiat Khokiattiwong provided highlights of planned activities in Thailand in his talk on "Andaman Sea-Bay of Bengal multidisciplinary cruise research based on Thai-China Joint Laboratory for Climate and Marine Ecosystem". He presented new results from his recent cruise in the Bay of Bengal, which was undertaken in collaboration with First Institute of Oceanography, China. Their analysis shows that during the new moon and full moon warm water

can be traced to up to 150 m water depth in the Andaman Sea. They also observed strong currents and corresponding phytoplankton blooming. The strong currents are likely to enhance BGC fluxes into the upper layer, which may support the bloom. Further analysis is presently underway to understand the processes that may have caused strong currents and subsequent bloom formation.

Dr. Khokiattiwong also talked about ongoing and planned capacity building activities taken by PMBC such as exchanges of young scholars, scientists and on-board trainings. He also invited participation from experts and students on a planned cruise in Bay of Bengal later this year as a part of a capacity building activity.

IOP Science Progress

Dr. Toshi Shinoda provided an update on the CINDY/DYNAMO field campaign wherein he showcased the present status and results of the project. Analysis of the data collected over a period of time suggests that an increase in SSH in the eastern Pacific is associated with high wind towards this area. Dr. Jerome Vialard talked about large-scale dynamic responses in the Eastern Indian Ocean that are modulated by wind forcing. An ADCP mooring deployed by India in the region will help in understanding the role of wind forcing in observed current variation. Dr. Weiqing Han talked about effects of solar diurnal cycle on Indian Ocean SST and its implication on MJO initiation for DYNAMO. She showed that the diurnal cycle of solar radiation plays an important role on diurnal/intraseasonal variability of SST in this basin.

***Points for Discussion*:**

1. Why does the northern Indian Ocean not have high baroclininc waves, but the southern Indian Ocean does?

2. Dr. Martin Visbeck stressed the need for collective efforts towards developing an understanding of decadal monsoon oscillations and its impact on marine ecology and on society as a whole. He also suggested that analyzing paleoclimate data using different proxies might help in understanding decadal oscillations e.g., infererces about extreme events using past data might help in understanding the oscillation and its magnitude, cause and implication in the present time scale.

3. Dr. Nick D'Adamo suggested that we translate and print our current status of knowledge on climate change into local languages, explaining it using cartoons, pictures etc. and, catering it to our policy makers. International forums such as CLIVAR and IMBER should be requested to support such awareness activity.

Regional Programs Progress

Dr. Will de Ruijter, Dr. Weidong Yu and Dr. Ming Feng presented progress on different activities that are going on in South Africa, Bay of Bengal, southeastern Indian Ocean and Australia. Dr. de Ruijter proposed an observational plan for the southwestern Indian Ocean and its time-frame which overlaps with the proposed time frame of IIOE-2. The proposed observational domain is similar to that of ASCLME and therefore, provides an opportunity for mutual and international collaborations. He stressed that ASCLME has committed to support maintenance of the proposed buoy.

Dr. Weidong Yu presented progress in the ongoing Monsoon Onset Monitoring and its Social and Ecosystem Impacts (MOMSEI) project. He called for interested scientist for collaborations and suggested that proposed cruise also provide opportunities for deployments and servicing of new and existing moorings. Dr. Dwi Susanto expressed his interest and offered to deploy an ADCP mooring in the Bay of Bengal using this opportunity.

IIOE: Developments since last meeting

Dr. Raleigh Hood and Dr. Nick D'Adamo provided an overview of the development of IIOE-2 since the last meeting. The Intergovernmental Oceanographic Commission (IOC)/UNESCO have formed, through its Perth office and in consultation with IOGOOS, an international sub-committee (referred as IIOE-2 reference group) to discuss and develop a plan to motivate collaborative international research and to prepare a science plan and implementation strategy for IIOE-2. The first meeting of the IIOE -2 reference group was held at Hyderabad during May 14-15, 2013. The reference group reviewed, in great detail, the IIOE history, scientific motivation and outcomes with a view toward identifying scientific questions that are still unanswered, and should be pursued as part of the 50^{th} Anniversary effort. Two additional meetings of IIOE-2 RG have been planned in the near future to identify the key science questions and to prepare a detailed science plan.

Discussion points:

1. Dr. Martin Visbeck outlined his views on how IIOE-2 should play a bigger role in shaping future research in the Indian Ocean. IIOE-2 should aim to accomplish better understanding on the Indian Ocean as heritage rather than piracy etc. He stressed making the Indian Ocean an example by incorporating a new state-of-the-art observational system to provide baseline information that could help Indian Ocean rim countries better plan management of coastal and open-ocean resources. IIOE-2 should also be able to provide baseline information on biodiversity assessment, which have not yet been done for the Indian Ocean. While writing the IIOE-2 science plan, the reference group should aim to project a bigger picture such as climate change and its societal impacts so that it excites the policy makers. The Indian Ocean rim nations are

most populated, with nearly 1/3 of the population living around the Indian Ocean coast, and therefore the proposed plans should look to cater their needs under changing scenarios.

Dr. Dwi Susanto suggested to incorporate issues related to fish stock assessment as they provide livelihood for large coastal populations. Studies pertaining to tsunami and its impact on the coastal population should also be included in the draft science plan.

Dr. Jerome Vialard suggested studies on decadal variability in large predictable signal

Dr. Visbeck: In 1950 we did not have enough means to observe the ocean, which now we have. Robot technology should be used to observe ocean and should be a theme in IIOE planning. We should focus on using modern instruments of ocean observation during IIOE-2. It is also important to insure the extent to which the technical committee can contribute toward planning IIOE 2.

Dr. Tony Lee suggested that food and water are future aspirations of NASA, and IIOE-2 should, therefore, have a similar aspiration. In this way NASA can complement achieving IIOE-2 goals.

Dr. Visbeck: IIOE-2 reference group should focus on using IIOE-2 as an opportunity to gather ocean information that can help solve issues such as securing food and water availability, which are major needs of mankind. The motive of IIOE-2 should be "**Explorations to Services"** and should form a pathway that may conceive another round of exploration using modern techniques and pave the way for continual service in future. We should aim to make IIOE-2 an International Indian Ocean mission, and to achieve this target IOC may endorse WMO/JCOMM to convince funding agencies to support funding.

Dr. Jerome Vailard: Another RG meeting for draft on strategic science report should focus on articulating big science questions first and should encourage using new observation systems. These new modern observation systems may reveal the issues that we cannot resolve using the present set of observations.

Dr. Birgit Gaye briefed about Germany initiatives pertaining to IIOE-2, with a particular emphasis on paleo-studies. For example, lamination based studies are capable of providing insights on past productivity changes where-in light-colored laminations suggests low PP era with more lithogenic input. It may also have enhanced aeolian input. The dark laminations suggests high productivity. Piracy was a big hindrance in bringing German scientists to the Indian Ocean, but with piracy in decline, Germany may plan for expeditions in the western Indian Ocean.

Dr. Mike McPhaden suggested making a concerted effort to understand teleconnections between the western and eastern Indian Ocean. Proper planning and focus on both these sectors at the same time and with similar scientific objectives will certainly help in understanding linkages across the basin.

Dr. Jerry Wiggert suggested incorporation of quantifying fresh water runoff from islands around ITF and associated nutrient loading. This is one area where knowledge is very limited but likely to have great impacts on eastern Indian Ocean biogeochemical cycles.

Dr. Visbeck: Give priority to citizen science and their involvement. He emphasized that considering the vastness of the Indian Ocean, it will be proper and helpful to involve citizens in enhancing means of sample collection. This opportunity should also be used to educate the common man on effects of impending climate change and its effects on common citizen. For example, nutrient kits could be provided to fisherman and train them to measure nutrients in the coastal zone. This way we will have a good number of data sets and hence understanding of coastal processes.

Dr. Jerome Vailard talked about plans to organize a summer school and impart training to students and young scientists as a capacity building in Indian Ocean RIM countries. The summer school may include training on data mining and analysis techniques. A group of participants may be divided into smaller teams consisting of one experienced and one inexperienced person and allow them to work on a smaller project. This will provide also guidance to inexperienced people.

Dr. Mike McPhaden: IIOE-2 should aim to answer how the system will function 30, 50, 70 or 100 years from now and how can we move forward with our forecast system? We certainly need to seek advice from the scientific community to plan and implement IIOE-2. Playing on each other's ability and providing opportunity to mutual collaborations will be immense help. The best example is servicing of RAMA moorings where many countries are contributing with their resources, manpower and expertise. BGC parameters should be included in RAMA for sustained measurements.

SIBER 4 SSC

SIBER Update: Review of Accomplishments and Activities since SIBER-3

Raleigh Hood

SIBER progress since the last SSC and scientific talks from invited local experts have already been reported. The meeting report of SSC-3 has already been completed and published on the SIBER website. SIBER has played a defining role in motivating international community for IIOE-2. In this context and taking a step further, it was decided during SSC-2 in Cape Town to hold the IIOE-2 reference group (RG) meeting to chart a way forward on IIOE-2 and develop science plan. The first meeting of IIOE-2 RG was held at Hyderabad India. Moving forward on this the 2nd RG meeting is scheduled late this year in Qingdao, China.

Rotation of SIBER SSC

During the formation and initiation of the SIBER international programme it was decided to have 3-year term for SIBER SSC members with a possibility of back-to-back terms. Since the 1st SSC of SIBER has completed its 1st 3-year time period, the possibility of rotating off some SSC members and inclusion of new members was discussed in detail. It was decided, after due discussion, that non-active SSC members could be rotated off the committee. This will improve the functioning of the SSC as well as provide an opportunity to include eminent scientists from other countries/regions to help expand the purview of SIBER. After detail discussion the following decisions were taken:

1) Dr. Raleigh Hood was nominated to continue as the Chair of the SIBER SSC for another 3-year term beginning July, 2013. This nomination was approved by the SIBER EC and will be put to a vote by the full SIBER SSC in the near future.

2) Dr. Wajih Naqvi has rotated off the SIBER SSC and stepped down as co-Chair, but he will remain involved in SIBER as an "emeritus" SSC member.

3) Dr. Mike Roberts (South Africa) was nominated to be the new SIBER SSC co-chair. This nomination was approved by the SIBER EC (Executive Committee) and will be put to a vote by the full SIBER SSC in the near future.

4) Dr. Adnan Al-Azri has rotated off the SIBER SSC.

5) Dr. Xavier Irigoien (KAUST, Saudi Arabia) was nominated to fill Dr. Al-Azri's position on the SIBER SSC. This nomination was approved by the SIBER EC and will be put to a vote by the full SIBER SSC in the near future. The SSC lauded Dr. Al-Azri for his contributions to SIBER and expected his support in future initiatives as a non-officiating member.

Discussion of a SIBER IPO in India in harmony with Australia and Africa regional Project offices (RPO).

We continued our efforts to establish a SIBER RPO in Australia, courtesy of Tim Moltmann (IMOS) and Nick D'Adamo (IOC Perth). Moving forward on this, the SSC prepared a draft document listing responsibilities of the proposed RPO. It was also proposed to establish a RPO in South Africa, courtesy of efforts by Mike Roberts and David Vousden, that will function in harmony with SIBER IPO and INCOIS. The RPO in Australia will be supported jointly by IMOS and the IOC Perth office, whereas the RPO in South Africa will be supported by ASCLME. It is envisaged that these offices will work in tandem with the IPO and support SIBER SSC meetings and conferences, website and newsletter development and promote SIBER in Australia and Africa. It is hoped that funds will be available to support travel of SIBER

Australia and Africa RPO staff members to attend SIBER SSC meetings and related conferences. It was also decided to tap in Dr. Mika Odido, Officer, IOC Africa to SIBER related activities in order to expand SIBER activities in Africa. SIBER SSC will also contribute, by organizing workshops and summer schools, to capacity building in Africa. SIBER will also interact with scientists in Africa involved in biogeochemistry and ecosystem research and help broaden their scope of research to meet the goals of SIBER.

Action items: 1. Define a set of tasks for personnel in proposed RPOs at Australia and Africa.

2. Preparation of Australian distribution list

3. Define objectives of Australia and Africa RPO

Comments:

Dr. Mike Landry: We have little knowledge of fisheries stocks and their larvae of southeastern African countries. How are they linked to the IOD, and what changes occur in fisheries during IOD years? We need to know connections to higher trophic levels, interannual variability, and impacts on fisheries production and catch. We need to find a focal point in southeast Africa that can take up studies pertaining to the above questions and help resolve them, in order to meet SIBER objectives. The CLIOTOP (IMBER) programme focus on top predators may be help if supportting such studies.

BOBLME has sound funding. They may be attached SIBER and requested for additional funding

IMBER is having their mid-term review in 2014 and is organizing an Open Science Conference. SIBER may put a formal request to the open science committee to have SIBER special sessions. Drs. Wajih Naqvi and Raleigh Hood will communicate with the organizing committee of the Open Science Conference (OSC) to hold a special session on SIBER in the IMBER OSC.

Review papers with pictures/cartoons etc on Biogeochemistry

SIBER is approaching its mid term and, therefore, it is imperative to showcase its achievements to the international community. This can be done by publishing review papers on SIBER themes. It is also important to promote awareness of SIBER and global change issues to the general populus. Printing leaflets with cartoons and pictures that explain the impacts of climate change on ecosystems and thus on common people should be considered. SIBER may approach IMBER IPO to help print leaflets on SIBER, BGC and climate relations.

Action Item: 1. Approach IMBER for leaflets

2. Motivate SSC to write review papers on SIBER themes.

SIBER Webpage:

The SIBER webpage is hosted on the INCOIS server. Over the last few years, it has served as a nodal point to disseminate information on SIBER. SSC members had the following suggestion for improving the SIBER website:

1. SIBER has played an instrumental role in planning IIOE-2 RG meetings. It is, therefore, important to link the IIOE-2 RG page to the SIBER website.

2. There are various data repositories that contain data of interest to the SIBER community. It was recommended to provide links to those pages on the SIBER website.

3. To make the SIBER home page more generally attractive, a cartoon reflecting SIBER objectives should be added to the SIBER home page.

Appendix A

IOP-SIBER Joint Session

10-11 July 2013, Guangfang Hotel, Lijiang, China

Afternoon, 10 July 2013		
14:00-14:10	Weidong Yu Raleigh Hood M. Ravichandran Nico Caltabiano Nick D'Adamo	Welcome and logistics, motivation and expectations
Interaction with local scientists		
14:10-14:25	Dongxiao Wang	Connection between the BOB and eastern tropical Indian Ocean before/after summer monsoon onset based on four years' in situ observation
14:25-14:40	Jun Sun	Indian Ocean Ecosystem investigation in China
14:40-14:55	Lei Zhou	The impact of Makassar Strait Throughflow on the Indian Ocean
14:55-15:10	Meixun Zhao	GEOTRACES research in the western Pacific marginal seas and implications for the Indian Ocean biogeochemistry
15:10-15:25	Lin Liu	Assessment of CMIP-5 IOD simulation in comparison with CMIP-3

15:25-15:40	Liang Xue	pCO_2 increasing trend in Southeastern Tropical Indian Ocean, a region of CO_2 source
15:40-16:00	**Coffee/Tea Break**	
IOP and SIBER Observation Progress		
16:00-16:20	M. Ravichandran Weidong Yu	Briefing IndOOS progress
16:20-16:40	Raleigh Hood	Biogeochemical Variability in the Equatorial Indian Ocean in Response to Wyrtki Jet Forcing: Preliminary results from the first RAMA biogeochemical sensor deployment
16:40-17:00	Wajih Naqvi	Recent Arabian Sea Research
17:00-17:45	Group Discussion	
18:30-20:30	**IOP-SIBER Dinner**	
Morning, 11 July 2013		
SIBER Science Progress		
09:00-09:15	Dwi Susanto	ITF biogeochemical fluxes and related research efforts
09:15-09:30	Somkiat Khokiattiwong	Andaman Sea-Bay of Bengal multidisciplinary cruise research based on Thai-China Joint Laboratory for Climate and Marine Ecosystem
IOP Science Progress		
09:30-09:45	Weiqing Han	Effects of solar diurnal cycle on Indian Ocean SST: with implication on MJO initiation for DYNAMO

09:45-10:00	Toshi Shinoda	The large-scale context for the CINDY/DYNAMO field campaign: Surface wind and upper ocean variability
10:00-10:20	Jérôme Vialard	Origins of wind-driven intra-seasonal sea-level variations in the North Indian Ocean coastal wave-guide
10:20-10:40	**Coffee/Tea Break**	
10:40-11:00	Weiqing Han Jérôme Vialard Tony Lee and others	Decadal and Inter-decadal Variability of the Indian Ocean
Regional Programs Progress		
11:00-11:20	Will de Ruijter	LOCO (around Madagascar) and ACT (Agulhas) observations
11:20-11:40	Weidong Yu	Monsoon Onset Monitoring and its Social and Ecosystem Impacts (MOMSEI)
11:40-12:00	M. Feng	Western Australia IMOS
12:00-13:30	**Lunch**	
Afternoon, 11 July 2013		
IIOE-2 Planning Reports and related activities		
13:30-14:00	Nick D'Adamo and Raleigh Hood	IIOE-2 Reference Group Meeting Report
14:00-14:15	Birgit Gaye	German plans and Initiatives potentially related to IIOE-2

14:15-14:30	Mike Roberts	Ongoing and planned research projects in the WIO and potential South African contribution to IIOE-2
14:30-14:45	Jerry Wiggert	Biogeochemical modeling and other plans as part of the IIOE-2
14:45-15:00	**Coffee/Tea Break**	
15:00-15:15	Mike Landry	Report on biogeochemical/ecosystem research ideas emerging from the EIOURI meeting
15:15-15:30	Yukio Masumoto Weidong Yu	Report from the EIO Upwelling Research Initiative meeting
16:30-17:30	Discussion and Summary	

Appendix

List of participants of IOP-SIBER Joint Session

IOP Part

1. Member Participants (13):

1.	Weidong Yu	FIO, SOA, China
2.	M. Ravichandran	INCOIS, India
3.	M. Feng	CSIRO, Australia
4.	Weiqing Han	University of Colorado, USA
5.	Raleigh Hood	Horn Point Lab. Uni. Maryland, USA
6.	Tony Lee	Jet Propulsion Laboratory, USA
7.	Charles Magori	Kenya Marine and Fisheries Research Institute, Kenya
8.	Yukio Masumoto	FORSGC, JAMSTEC, Tokyo, Japan
9.	Michael McPhaden	NOAA, PMEL, Seattle, USA
10.	W. de Ruijter	University of Utrecht, Netherlands
11.	Toshiaki Shinoda	Naval Research Lab, Stennis, USA
12.	Agus Supangat	National Council on Climate Change, Indonesia
13.	Jerome Vialard	LOCEAN, Paris, France

2. Member apology for absence (1):

1.	Gabriel Vecchi	NOAA-GFDL, Princeton, USA

3. Officials (2):

1.	Nico Caltabiano	ICPO
2.	Nick D'Adamo	IOC Perth Office

4. Invited experts (4):

1.	David Legler	NOAA, US
2.	Sidney Thurston	NOAA, US
3.	Mike Roberts	ACEP/South Africa
4	Said Mazaheri	INIO, Iran

SIBER Part

1. Member Participants (9):

1.	Raleigh Hood	University of Maryland Center for Environmental Science, USA
2.	Jerry Wiggert	Univ. of Southern Mississippi, USA
3.	Dwi Susanto	LDEO, Univ. Columbia, USA
4.	Michael Landry	Scripps Institute of Oceanography, USA
5.	Birgit Gaye	Univ. Hamburg, German
6.	Somkiat Khokiattiwong	Phuket Marine Biological Center, Thailand
7.	M. Ravichandran	INCOIS, India
8.	Michael Roberts	Department of Environment Affairs, South Africa

2. Member apology for absence (6):

1.	Adnan Al-Azri	Sultan Qaboos University, Al-Khod, Oman
2.	Lynath Beckley	Murdoch University, Australia
3.	David Vosuden	ASCLME, South Africa
4.	Greg Cowie	University of Edinburgh, UK
5.	Makio Honda	JAMSTEC, Japan
6.	Jenny Ann Huggett	Department of Environment Affairs, South Africa
7.	Zainal Arifin	LIPI, Indonesia
8.	Dr. Wajih Naqvi	NIO, India