

SIBER

Sustained Indian Ocean Biogeochemistry and
Ecosystem Research

Report of the 6th Meeting of the SIBER Scientific Steering Committee

December 7-8, 2015

Goa, India



IMBER Report # XX



IOGOOS:PR:07:SIBER/07

SIBER Report # 07

The SIBER program 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 Biosphere Research (IMBER) 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.

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Introduction:

The sixth annual meeting of SIBER Science Steering Committee (SSC) meeting was held at Bogmallo Beach Resort, Goa, India during December 5-9, 2015. The meeting was held in conjunction with its allied projects Indian Ocean Panel (IOP), Sustained Indian Ocean Biogeochemistry and Ecosystem Research (SIBER)-5 and Indian Ocean Observing System (IndOOS) Resources Forum (IRF) meetings. These integrated meetings were held immediately after the International Symposium on Indian Ocean Dynamics held by National Institute of Oceanography (NIO) during November 30 – December 4, 2015. The first expedition of International Indian Ocean Expedition (IIOE)-2 was formerly launched on December 4, 2015 onboard India's RV Sagar Nidhi. The RV Sagar Nidhi sailed from Goa to Mauritius covering various transect similar to IIOE-1 first expedition.

The IOP, SIBER projects have met together on the Second and Third day i.e. December 7-8, 2015 where IOGOOS Members have also participated. The two days meetings have mainly focused on the review of the Observing systems in the Indian Ocean, IIOE-2 and associated initiatives by various countries, new observing initiatives, and process studies that are in place or proposed to undertake under IIOE-2. The science talks on understanding the Southern Ocean processes and ecosystem responses - Results from the Indian Expeditions, decadal sea level variations of the Indian Ocean since 1950s, Indonesian Through Flow over recent decades and its impact on the Indian Ocean biogeochemistry, Bay of Bengal salinity variability & climatic implications, spatial and temporal variability of Arabian Sea Oxygen Minimum Zone over the holocene, microbial communities and chemical processes in Arabian Sea Oxygen deficient waters, results on Indian Ocean biophysical coupling, anomalous behavior of the Wyrki jet, remote and local forcing of East Indian Ocean upwelling, prediction of ocean circulation during the DYNAMO program by a global coupled prediction system, etc. were presented. In addition to this, individual business meetings of IOP and SIBER were held in parallel to discuss on the Observing systems, next meeting, membership renewals, etc.

SIBER-SSC was held on 08 December 2015 and was attended by Raleigh Hood (Chair), Mike Roberts (Co-Chair), Jerry Wiggert, Dwi Susanto, Mike Landry, Birgit Gaye, Jenniger Hugget, Makio Honda, Gregg Cowie, Lynnath Beckley and M. Ravichandran. SIBER executive Satya Prakash could not attend the meeting as he was participating in the 1st IIOE-2 expedition. Nick D'Adamo and Louis Wicks attended the meeting from from IOC Perth office. Invited experts were ex-SIBER SSC member Wajih Naqvi, Prasanna Kumar, N. Ramaiah and Anil Kumar.

Raleigh Hood welcomes the members and invites to the SIBER SSC meeting and briefed about the agenda items and progress made during the past one year. The meeting started with overview of the last SSC meeting report. Since SIBER IPO executive Satya Prakash was not present in the meeting, this agenda item was put on hold for discussion in the executive committee meeting.

1. Update on the IPO and progress on the website, blog, etc.

SIBER SSC then took an update on the progress made so far on SIBER website and discussed on the need to make the website more informative and interactive. SSC suggested providing a link to SIBER website from the newly developed IIOE-2 web portal. They also recommended providing a link to BOBLME CO2 time series Data (BOBOA) on the SIBER portal via NOAA BOBOA website. The role of SIBER in securing the support for BOBOA CO2 time series data was much appreciated by all the members. Recently published paper by Strutton et. al., (2015) on Biogeochemical variability in the central equatorial Indian Ocean during the monsoon transition, *Biogeosciences*, (doi:10.5194/bg-12-2367-2015). The said publication examines time-series measurements of near-surface chlorophyll concentration from a mooring that was deployed at 80.5°E on the equator in the Indian Ocean in 2010 and highlights the use of time-series biogeochemical data from a mooring site. This is an important contribution of SIBER towards understanding the biogeochemical processes and variability in the Indian Ocean using modern observational tools.

The flux from the Indonesian through flow region is still poorly understood to understand its impact on the biogeochemistry of the Indian Ocean. SIBER has been advocating to enhance the capabilities and observations in this region to help quantify the fluxes and estimate their impact. Ayers et al., (2014) is a first product of SIBER efforts towards quantification of Indonesian throughflow nutrient fluxes and their potential impact on Indian Ocean productivity (*Geophysical research Letters*, doi: 10.1002/2014GL060593).

SSC appreciated these efforts and suggested to highlight it on the SIBER website. It was also suggested to provide list of SIBER endorsed project on the portal.

2. Review of IMBER and IOC Perth Office budgetary situations and ramifications for SIBER

Raleigh Hood, Chair SIBER SSC presented overview of the anticipated budget situation for year 2016. He pointed out that during the last couple of years IMBER has cut the budgets for the regional programs such as SIBER from \$15,000 USD to \$10,000 USD. It is anticipated that IMBER support will be increased to previous, pre-cut levels and that IOGOSS/IOC Perth Office support will be maintained at the current levels (\$5000 USD). SIBER had approached the IMBER IPO to help with advertising materials (e.g., a 1-page flyer) for SIBER. IMPER IPO provided flyer on SIBER and the same was distributed among the SSC members for further distribution.

3. SIBER efforts on capacity building in the Indian Ocean Region

The Indian Ocean is heavily under-sampled in Biogeochemical observations. Therefore, SIBER strongly supports any capacity building activity in the Indian Ocean Region. The recent publication of fluxes from Indonesian throughflow is an example of SIBER contribution towards strengthening observations in poorly samples area and enhance capacity building in such regions. SIBER is co-leading on the planned efforts on conducting a IIOE-2 summer school, tentatively scheduled during late 2017 / early 2018 time frame. Beyond that, we will plan to participate and leverage to the fullest possible extent IOC and SCOR-motivated capacity development activities in IIOE-2.

4. Update on progress toward strengthening the SIBER IPO and establishing Regional Project Offices in Australia and in the southwestern Indian Ocean region and potential links to SAPPHIRE and proposed IIOE-2 project offices

SIBER has been advocating on establishing regional project offices for western and eastern Indian Ocean to spread SIBER related activities in these regions. The proposed offices will be established in Australia and South Africa, respectively. It was proposed to leverage the human resources of the joint IIOE-2 project offices in Hyderabad and Perth to the fullest possible extent to cater SIBER needs and fulfil its objectives. The prospects for establishing a SIBER project office in the southwestern Indian Ocean in association with SAPPHIRE or the WIOURI do not appear to be very good at this time. Perhaps these prospects will improve with further development of WIOURI and will be explored in future.

5. Status of SIBER research initiatives in the Indian Ocean including the Eq, 80°E biogeochemical sensor data analysis, efforts to calculate ITF nutrient fluxes, analysis of CO₂ flux measurements from the Bay of Bengal mooring, and the recent bgc sensor deployment on the RAMA mooring at 26°S, 97°E.

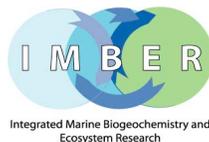
Raleigh Hood, Chair SIBER appraised SSC on the status of the analysis and publication of these mooring biogeochemical sensor data. SIBER played a major role in augmenting biogeochemical sensors on mooring at 80E and Equator. Strutton et. al., (2015, Biogeosciences, doi:10.5194/bg-12-2367-2015) analyzed the data from the said mooring and reported biogeochemical variability in the central equatorial Indian Ocean during the monsoon transition. Raleigh also highlighted efforts to estimate nutrient flux from Indonesian through flow region (Ayers et al., 2014, Geophysical research Letters, doi: 10.1002/2014GL060593). The analysis of CO₂ flux measurements from the Bay of Bengal mooring is proceeding with a poster presentation planned

for Ocean Sciences meeting in New Orleans and paper to follow (Hood et al., 2016). Data is also being analysed from a recent biogeochemical sensor deployment on the RAMA mooring at 26°S, 97°E. There are some interesting signals in the fluorometer data. Further analysis and ultimate publication is planned (Strutton et al.)

6. *Developing SIBER products related to the science plan research themes, research initiatives, planned papers and special issues.*

It was informed that the Biogeosciences Special Issue on the Northern Indian Ocean is finished. There is a consensus that we want to initiate another special issue on the Indian Ocean, perhaps revolving around the IIOE-2. Potential journals include *Frontiers of Marine Science* (they have asked us if we are interested in doing a special issue), *Progress in Oceanography*, *AGU Monograph* (Jerry will check into this), and *Journal of Marine Systems*. Note that *Deep Sea Research* has also approached R. Hood about doing a special issue on IIOE-2.

There is also a strong interest in pursuing SIBER Theme I, II, and III review papers. Manuscript of Theme I (Boundary current dynamics, interactions and impacts) is in review / revision (Hood et al., 2016). Jerry wiggert has agreed to lead the Theme II paper on Variability of the equatorial zone, southern tropics and Indonesian throughflow and their impacts on ecological processes and biogeochemical cycling. Raleigh agreed to approach Tim Rixen and Greg Cowie about doing a Theme III paper on Physical, biogeochemical and ecological contrasts between the Arabian Sea and the Bay of Bengal.



SIBER

Sustained Indian Ocean Biogeochemistry
and Ecosystem Research

**6th Scientific Steering Committee Meeting,
December 7-8, 2015, Goa, India**

Final Agenda

Planned Attendees:

SIBER SSC Members: Raleigh Hood (Chair), Mike Roberts, (co-Chair), Jerry Wiggert, Dwi Susanto, Mike Landry, Birgit Gaye, Jennifer Huggett, Greg Cowie, Makio Honda, Lynnath Beckley, M. Ravichandran, Xabier Irigoyen

Invited Experts: Wajih Naqvi, Prasanna Kumar, N. Ramaiah, M. Lengaigne, Anil Kumar

SIBER IPO Staff: Satya Prakash (will not be attending)

IOC Perth Office: Nick D'Adamo, Louis Wicks

SIBER-6 will be held in conjunction with the 12th Indian Ocean Panel (IOP) meeting and the 12th Indian Ocean GOOS (IOGOOS) meeting. **SIBER will meet in a joint session with IOP and IOGOOS on December 7 and 8 (see IOP agenda). Also note that there will be a group dinner on the 7th or 8th (for IOP, IOGOOS and SIBER delegates and guests, date and location TBA). The SIBER SSC business meeting will be convened toward the end of the day on December 8th.**

Monday 7 December



0830-1800

Joint IOP, SIBER and IOGOOS meeting (see IOP agenda)...

1900-2200

Group Dinner? (TBA)

Tuesday 8 December 0830-1630

0830-1630

Joint IOP, SIBER and IOGOOS meeting (see IOP agenda)...

Tuesday Afternoon 8 December 1630-1800 (SIBER BUSINESS MEETING)

1630-0835

CONVENE SIBER SSC BUSINESS MEETING: *Overview of agenda and SSC meeting goals, news from the Executive Committee, Steering Committee rotations, etc.* (Raleigh Hood and Mike Roberts)

1635-1645

SIBER UPDATE: *Overview of SIBER-5 meeting report* (Raleigh Hood for Satya Prakash and all SSC)

1645-1655

THE SIBER IPO: *Update on the IPO and progress on the website, blog, etc.* (Raleigh Hood for Satya Prakash)

1655-1700

SIBER UPDATE: *Review of IMBER and IOC Perth Office budgetary situations and ramifications for SIBER* (Raleigh Hood and Nick D'Adamo)

1700-1705

THE SIBER IPO: *Outcome of efforts to approach the IMBER IPO to help with advertising materials (e.g., a 1-page flyer) for SIBER. What are the next steps?* (Raleigh Hood)

1705-1715

DISCUSSION: *How can we motivate meaningful capacity development in SIBER? Can we create a link to the IMBER Capacity Building working group via Samina Kidwai? Samina has offered to assist. Or, alternatively, through IIOE-2 capacity development efforts. How do we proceed?* (Raleigh Hood, Mike Roberts and Nick D'Adamo)

1715-1720

THE SIBER IPO AND AUSTRALIA AND SWIO RPOs: *Update on progress toward strengthening the SIBER IPO and establishing Regional Project Offices in Australia and in the southwestern Indian Ocean region and potential links to SAPPHIRE and proposed IIOE-2 project offices.* (Raleigh Hood, Mike Roberts and Nick D'Adamo)

Tuesday Afternoon 8 December 1630-1800 Continued...



1720-1730

NATIONAL PERSPECTIVE: *Update on SIBER India.* (Wajih Naqvi)

1730-1740

DISCUSSION: *SIBER progress to date. Have we made significant progress on our objectives from SIBER-5? What additional work needs to be done on our website? How can additional resources for the IPO and the SSC be secured? What are the next steps that we need to take toward establishing an RPO in Australia and in the SWIO, perhaps leveraging IIOE-2 momentum? What can we do to better advertise SIBER in Indian Ocean rim nations and elsewhere?* (Leaders: Raleigh Hood, Nick D'Adamo and Mike Roberts)

1740-1750

SIBER UPDATE: *Status of SIBER research initiatives in the Indian Ocean including the Eq, 80°E biogeochemical sensor data analysis, efforts to calculate ITF nutrient fluxes, analysis of CO₂ flux measurements from the Bay of Bengal mooring, and the recent bgc sensor deployment on the RAMA mooring at 26°S, 97°E. How can we motivate/fund another deployment?* (Raleigh Hood and Dwi Susanto)

1750-1800

CLOSING DISCUSSION: *Developing SIBER products related to the science plan research themes, research initiatives, planned papers and special issues. The Biogeosciences Special Issue on the Northern Indian Ocean is finished. Do we want to start working on another special issue? What is the status of the SIBER Theme I, II and III review papers? What are the next steps? We also need to discuss plans for our next SIBER SSC meeting. Where should it be convened?* (Leaders: Raleigh Hood, Mike Roberts, Jerry Wiggert and Greg Cowie)

1900-2200

Group Dinner? (TBA)