

# Minutes of teleconference on joint Indian Ocean Panel and Monsoons Panel activities, 1600UTC 16 Feb 2016

---

Note that these minutes have been edited for public display to remove reference about persons not involved in the conversation, including speculation over possible membership.

## Attendees

Paul Dirmeyer, Andy Turner, Jérôme Vialard, H Annamalai, Kunio Yoneyama  
Rokkam Rao, Ramesh Kripalani  
Apologies: Aurel Moise, Lisa Beal [comments provided offline]

## Agenda

SST-monsoon review paper  
YMC update (+S2S synergies?)  
The IndOOS and IIOE-2  
Other observing systems/programmes & observations needed to improve monsoon prediction  
Structuring cross-panel initiatives (e.g. ex-officio members in each to report)  
CLIVAR OSC arrangements (some IOP members will be present)

## Minutes

The background to the MP and IOP was discussed.

The MP is recently conceived with a global monsoons remit and cross-cutting between GEWEX and CLIVAR. Membership is roughly split between members falling under those approximate headings. The MP wants to ensure interaction with on-going GEWEX-related activities such as GASS and GLASS, particularly in cloud systems and land-atmosphere interactions. Formerly, CLIVAR operated the Asian-Australian Monsoon Panel, VAMOS, and a similar activity for Africa. To avoid losing regional expertise and connection to end users, the Monsoons Panel is establishing Regional Working Groups: the relevant group for Indian Ocean region being chaired by H Annamalai (IPRC/SOEST, Hawaii) and Aurel Moise (BOM).

The IOP had its origins in suggestions from the CLIVAR AAMP, focusing on the need to coordinate and expand an observing system in the Indian Ocean. This observational focus continues to this day. The IOP membership has largely been composed of oceanographers with little understanding of the monsoon.

### SST-monsoon review paper

Prior to the meeting Jérôme raised the following questions of interest:

- Where is the moisture source for the southwest monsoon rain over India?

- Is interannual variability of the humidity transport over the Arabian Sea dominated by variations in the wind intensity or in the water vapour content?
- What are the relative influences of land heating / deep atmospheric convection (in particular over the Bay of Bengal) in driving the monsoon flow?

Answer to these intentionally provocative questions would help clarify how the links between SST and the monsoon from an oceanographers perspective.

There are many uncertainties in the role played by Indian Ocean SSTs on monsoon rainfall variability, e.g. the impact of the IOD (or whether the IOD is a slave to the monsoon), the role played by barrier layers in the intensely stratified Bay of Bengal in maintaining monsoon convection and, in the climate change problem, the relative impact of increasing surface temperatures and consequent impact in moisture, versus changes in the meridional temperature gradient and possible feedbacks in wind and upwelling.

Indian Ocean-monsoon behaviour, when examined in models, can either be done in the forced framework (AMIP SSTs but lacking air-sea interaction processes) or coupled mode (but with large SST biases, often cold). Both modelling tools feature large biases in monsoon rainfall over India in the equatorial Indian Ocean (generally dry and wet, respectively).

The suggestion is to bring together our knowledge on processes linking the monsoon and Indian Ocean, in a review paper on the relationship between Indian Ocean SST and the monsoon. This paper would help inform oceanographers on key processes for the monsoon, and help work towards identifying what further observations may be needed to improve monsoon prediction. Such a paper would also bring useful guidance for the upcoming review of IndoOOS (the Indian Ocean Observing system) to be performed by the IOP, including which measurements and in what locations would benefit to monsoon understanding and forecasting?

### YMC update & S2S synergies

Kunio gave an overview of his slides detailing recent developments in YMC. Briefly, there has been:

1. Extension of Routine Sounding Sites  
Indonesia, Singapore and Malaysia have agreed to contribute their routine soundings to YMC.
2. Hi-res Analysis Data by ECMWF  
The YMC (as well as the Year of Polar Prediction) have formally requested that ECMWF provide YOTC-style 10km analyses for the observational period.
3. Synergy with other Projects
  - (i) TPOS has formed a dedicated Working Group for YMC and they regard it as their pilot project.
  - (ii) There is some coordination with the PISTON project over the Philippines (Propagation of Intraseasonal Tropical Convection); there may also be interest in northward propagating events.
  - (iii) Coordination with S2S and the MJO-TF, via promotion of a workshop in Singapore in April. This offers excellent parallels

with proposed S2S activities to be spun up in the various Regional WGs of the Monsoons Panel.

### **The IndoOOS and IIOE-2**

The Indian Ocean Observing System is a large collection of observing systems for the Indian Ocean, major components being the Argo network and the RAMA mooring array.

The Argo network for the Indian Ocean currently operates at a distribution rather better than the typical global standard, with more than 1 float per 3-degree grid box. Significant efforts by India have aided the deployment of floats. The RAMA mooring array is an Indian Ocean equivalent of the TAO array in the Pacific, consisting of 46 planned moorings of which 35 are currently active. Some observations over the Arabian Sea have been limited in recent years due to the risk of piracy. Lloyds of London had suspended ship insurance in the regions due to repeated pirate attacks, thus preventing ship-based research or equipment maintenance. However there was no reported piracy in 2015 or thus far in 2016, so plans are afoot to recommence research ship activity.

The main issue for completing and maintaining the RAMA moorings is ship time. However many cruises operated under the umbrella of the IIOE-2. A specific objective of IIOE-2 is to complete the IndoOOS.

Over the coming two years the IOP will be undertaking a scientific review of the IndoOOS, and IOP desire input on what further observations are needed for better understanding and prediction of the monsoon.

IIOE-2 had its official launch in November 2015 in Goa, and acts as an umbrella for many other activities (especially cruises).

IIOE-2 has an ambitious goal to coordinate and promote basin-wide observing programs that contribute to: Understanding how oceanic, atmospheric, and geological processes and their interactions affect climate, marine biogeochemical cycles, ecosystems, fisheries, and people in the Indian Ocean and around the globe.

Within IIOE-2 there are several well-developed regional programmes including EIOURI (the Eastern Indian Ocean Upwelling Research Initiatives), YMC (the Year of Maritime Continent) and ASCA (Agulhas System Climate Array).

It is unclear if INCOIS is hosting the project office of IIOE-2.

WIOURI (the western Indian Ocean analogue of EIOURI) may become an interesting programme for interaction with the Monsoons Panel, because of the potential influence of Arabian Sea upwelling on moisture transported by the monsoon jet. However WIOURI does not yet have definitive scientific objectives or PIs.

### **Other observing systems/programmes & observations needed to improve monsoon prediction**

A long-term aim of the IOP and MP collaboration will be to determine what further measurements are needed to improve monsoon understanding and prediction. This will be partly aided by construction of the review mentioned above and also through the IOP scientific review of the IndoOOS programme.

### Structuring cross-panel initiatives

In order to foster better communication between the MP and IOP, one solution is to encourage each Panel to feature an ex-officio member who is also a full member (primarily) of the other panel. These members would serve to report to the other panel on developments and encourage joint activities.

The IOP seeks to enhance the expertise of its membership beyond oceanography and is working towards bringing atmospheric nominations into the panel.

[Sentence removed.]

### CLIVAR OSC arrangements

The GEWEX/CLIVAR MP will hold its panel meeting in Qingdao, China, 17-18 September 2016 prior to the CLIVAR OSC meeting. The IOP will not be holding its regular panel meeting in Qingdao, instead preferring to meet at the second IIOE-II workshop in January 2017. However Jérôme and two other IOP members will be at the OSC, and able to split their time between the MP and Pacific Ocean Panel. This will help advance joint activities.

### Actions

- Monsoon Panel and Indian Ocean Panel to each poll internally for members interested in sitting on other panel as ex-officio members.
- Andy with Annamalai to begin drafting a half-page text on scope and topics for inclusion in the monsoon/Indian Ocean review, to iterate and circulate. This project needs to be led from the Monsoons Panel (&WG) rather than IOP, although IOP members will participate in its construction
- All (where relevant) to share literature on moisture sources for the monsoon
- IOP to update MP on progress of the IndOOS review as appropriate.
- Andy and Paul to ensure IOP are aware of and involved where necessary in developing agenda for Qingdao panel meeting.
- Rokkam Rao/ICMPO to clarify the role of INCOIS in IIOE-2 and the nature of the IIOE-2 project office and its leadership.