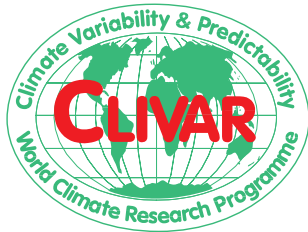


WCRP REPORT

World Climate Research Programme



Project Report

8th Session of the Asian-Australian Monsoon Panel

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19-21 February 2007

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Executive Summary

The 8th Session of the CLIVAR's Asian-Australian Monsoon Panel (AMMP8) was held at the International Pacific Research Center (IPRC), Honolulu, Hawaii, US, 19-21 February 2007. Professor Bin Wang acted as local host for the meeting. The panel reviewed the current status of development in Monsoon modelling and prediction, the Intraseasonal Variability, developments in the Ocean Observing Systems and the role of the oceans in AA Monsoon. AAMP8 considered some initiatives of AAMP interest, in particular WCRP/THORPEX Tropical Convection, collaboration with the Monsoon Asia Integrated Regional Study (MAIRS) implemented by START to elaborate a proposal to the Asia Pacific Network for Global Change Research (APN), and the Monsoon Asian Hydro-Atmosphere Scientific Research and Prediction Initiative (MAHASRI). The panel also agreed to organize a monsoon session in conjunction with WGSIP at the JSC TFSP workshop in Barcelona June'07. Other topics considered during the meeting were the role of AAMP in the Asian Monsoon Year and the Pan-WCRP monsoon activity. Links of AAMP to the CLIVAR Pacific Panel and the Indian Ocean Panel were also considered.

Further information about the meeting and AAMP activities can be found at:

<http://www.clivar.org/organization/aamp/Meetings/8thmeeting.htm>

List of actions and statements

Developments in A-A monsoon modeling and prediction

- The panel agrees to organize analysis of existing hindcasts and propose new hindcast experiments on the impact of land surface (experiment) initialization. This is a project in collaboration with WGSIP and TFSP, which aims at studying how land surface initialization and land-atmosphere interaction affect the monsoon predictability. (Action: Bin Wang will take a lead but also Ben Kirtman).
- The panel agrees to organize analysis of existing hindcasts of the role of the MJO in the onset of the 1997 El Niño. . This is a project in collaboration with WGSIP, TFSP and the Pacific Ocean Panel, which aims at studying the ability of current models to simulate and predict the interaction of the MJO with a developing El Niño event (Action: Harry Hendon will take lead in collaboration with A Timmerman POP).
- The panel agrees to organize analysis of existing hindcasts of predictability of Indian Ocean Dipole. This is a project in collaboration with WGSIP, TFSP and Indian Ocean Panel, which aims at studying the ability of current models to predict the IOD. Additional experiments will be proposed aimed at assessing the impact of an imperfect observing system in the Indian Ocean (Action: Harry Hendon will take lead in collaboration with S. Behera with input from the IOP).
- The panel endorses Schubert's proposal on High resolution modeling of MJO and TC (Action: In-Sik Kang will provide some wording for endorsement so that the relevance to AAMP is made clear)

Intra-seasonal variability

- Panel was asked to consider whether new observing/modelling initiatives need to be spun up to help address continuing problems in simulation and prediction of ISV with current generation forecast and climate models. (Action: Harry Hendon and Ken Sperberg will take lead)

Developments in ocean observing systems and the ocean's role in the A-A monsoon

- Panel was asked to consider developing a process study in conjunction with the IOP to address outstanding issues of ocean-atmosphere coupling in the Indian Ocean. Panel's opinion was that activities that leveraged on the improved IO observing system would be appropriate. (Action: Hendon to convey opinion to IOP via G Meyers).

Discussion – linking AAMP, IOP and Pacific Panel efforts in monsoon studies. In particular what is the role of the Indian & Pacific Oceans for the monsoons and is there a need for coordinated numerical experiments to help understanding and improve predictions?

Opportunities mentioned in this context were:

- 1) AAMP supports joint analysis with IOP of MISMO and CIRENE experiments
- 2) AAMP supports joint science meeting with IOP in 2008
- 3) AAMP supports joint study with IOP of impact of existing and future obs on seasonal predictability

AAMP did not show enthusiasm for a large-scale process study. The majority view of the AAMP was that the panel first would like to see the impact of the Indian Ocean observing system on, e.g., seasonal and longer-term predictability before planning any (follow-on) process studies. (Action: panel co-chairs will keep contact with the CLIVAR PIP and IOP to track on activities of AAMP interest)

Developing Initiatives of interest to AAMP

- The panel suggests that an endorsement of the WCRP/THORPEX Tropical Convection be forwarded to CLIVAR co-chairs, which they can then take to JSC. It should emphasize the importance of the experiment to the mission of AAMP (Action: Duane Waliser will keep AAMP informed of its endorsement process via Harry Hendon and Bin Wang)
- Collaboration with MAIRS: workshop in Honolulu to elaborate a proposal to APN, some panel members will be invited (Action: panel members have to be prepared)
- Collaboration with MAHASRI: a regional modeling activity, the panel will have to name some people. (Action: Takeiko Satomura organizes a subcommittee to plan this activity)
- AAM session at JSC TFSP workshop in Barcelona June'07 (Action: Bin Wang will organize a monsoon session in conjunction with Ben Kirtman)

The role of AAMP in the Asian Monsoon Year and the Pan-WCRP monsoon activity

- For AMY'08 a coordinated body with representations from different panels or groups with science interest, like AAMP, should play active role in the international committee to help clarify key science issues, drafting plan etc (Action: Wang and possibly Hendon to attend AMY08 planning meeting in Beijing April 21-23 2007).
- The panel agreed AMY would benefit international coordination. Good opportunity to integrate GEWEX activities. WCRP/WMO Directors ask for support of the tropical countries (Action: panel co-chairs)
- Coordination of AMY'08 and the Joint WCRP/THORPEX Year of tropical convection (Action: Jianping Li will send info to Carlos to distribute as appropriate)
- The panel discussed the proposal of organizing an International Monsoon Year (IMY) with broader objectives than AMY. IMY will concern all the monsoon panels. Negative: too wide for coordination; Positive: maximizes benefits from having a common data set (Action: panel co-chairs)
- The panel considered the idea of an International Year of the Tropics (IYT) as an alternative of a Monsoon Year. It would be an overarching program, which would have to include also the ocean panels, and a good opportunity to integrate GEWEX activities (Action: panel co-chairs)

AAMP links to the CLIVAR Pacific Panel

- The panel proposes MJO- ENSO interaction experiments together with the Pacific Panel as a collaborative activity between AAMP and POP (Action: Harry Hendon (AAMP) and Axel Timmerman (POP) will draft a proposal for joint analysis of TFSP hindcasts)

Links to the Indian Ocean Panel

- The panel discussed the possibility to make a joint process study on IOD predictability with IOP. Organize scientific workshop / sessions together it was also suggested, recognising the benefit of the ocean observing system for AAMP to develop impacts studies in terms of observations (Action: Harry Hendon and Swadhin Behera will draft a proposal for joint analysis of TFSP hindcasts)

Anthropogenic impact on Asian-Australian Monsoon

- The panel was informed that MAIRS is involved in the preparation of a workshop on Anthropogenic Impact on Asian Monsoon in early 2008. This was considered an excellent opportunity for promoting collaboration between MAIRS and AAMP, and it would be of great benefit if AAMP could join MAIRS in co-organizing this meeting. (Action: panel co-chairs)

Implementation of AAMP science/implementation plan

- AAMP prospectus has to be updated. Recommend that web-links to endorsed activities be included on AAMP web page and kept up to date (Action: Carlos Ereno will ask input from panel members and will update the AAMP website)
- AAMP Focus newsletter, two main themes on science and applications (Action: Harry Hendon will solicit material from Holger Meinke and Peter Webster on applications)
- AAMP webpage update: there are a number of important links related to AAMP (Action: Carlos Ereno will receive info on the links from panel members)

Next panel meeting

- The panel suggests planning a 9th panel meeting in September 2008, if possible organize a joint international monsoon symposium, or consider a joint session with WMO IMS4. Panel members are encouraged to find a host institution (Action: Bill Wang will contact Chinese institutes to find a generous host for the next Panel meeting and monsoon symposium. India is another possibility)

Annex A:

AAMP Endorsement of the YOTC Proposal

March 2007

Prepared with contribution from Duane Waliser

Progress in monsoon science and prediction has been hindered by pervasive shortcomings in our understanding and model representations of tropical convection. These shortcomings have bearing on all time scales relevant to monsoon dynamics and evolution (e.g., diurnal to seasonal). In the past, efforts at overcoming these challenges have been stymied by the lack of adequate observational data and model capabilities and resources. However, the last two decades has seen incredible growth of observational infrastructure of the tropical ocean-atmosphere-land system, mostly notably in terms of tropical convection, clouds, circulation, air-sea interaction, microphysics, etc. This has stemmed from a vast investment in satellite observing capabilities (e.g., EOS), a robust network of enhanced in-situ reference observation sites (e.g., ARM, CEOP) and dramatic developments in our ocean observing system (e.g., TAO, Indian Ocean Array, drifters). In addition, in recent years there have also been significant advances in computational capabilities that provide for altogether new opportunities in modeling finer scale and more comprehensive aspects of convection, clouds the boundary layer, and topography, all of which are crucial to better monsoon representation.

To take advantage of these new in-situ and satellite observational resources, computational capabilities and high-resolution/alternative modeling frameworks, as well as exploit the strengths of past activities addressing the tropical convection problem, WCRP and THORPEX propose a Year of Coordinated Observations, Modeling and Forecasting of Tropical Convection (aka Year of Tropical Convection – YOTC). This activity is meant to blend the strengths of the global, focus-year approach of FGGE with the Intensive Observation Period approach of GATE/COARE, where in this case, the "intensive observations" come from the vast new resources discussed above. The time frame for this focused year is 2008-9. The fundamental science questions to be addressed by YOTC are:

1. What are the most crucial elements of the large-scale circulation that influence the development, organization and maintenance of tropical convection?
2. Under what circumstances and with what mechanisms is energy and momentum transferred from the convective scale to the mesoscale, from the mesoscale to the synoptic scale, and from the synoptic scale to the large/planetary scale?
3. How does organized tropical convection interact with the extra-tropics?

The overarching goals of the program are to achieve significant gains in forecast skill by 2010 in the following areas: 1) Short-to-medium-range tropical weather forecasts; 2) extended-range/subseasonal (i.e. 1-3 week) forecasts of the MJO, and 3) medium-to-extended range extra-tropical forecast derived from improved representation of tropical weather/climate and tropical-extratropical interactions. Addressing the above science questions and meeting the goals of YOTC are at the heart of advancing monsoon science and thus CLIVAR AAMP fully endorses the proposed YOTC activity. Moreover, the AAMP is envisioned as playing an important role within the proposed YOTC science and implementation plan. Within these plans is an identified set of "targeted phenomena" for which the Intensive Observation and case study framework of YOTC will focus on. These include the diurnal cycle, easterly waves, convectively coupled waves and the Madden-Julian Oscillation. In addition, the monsoon is singled out as a challenging, multi-scale and integrating phenomena for focused attention. As presently envisioned, each of the targeted phenomena will have an associated working group that will design and coordinate the pertinent observational, modeling, forecasting and analysis issues – given the events of the 2008-9 monsoon(s) - across the community. The AAMP is envisioned to act as the working group for the YOTC monsoon target. The AAMP is not only well suited to provide this guidance but also in a good position to coordinate efforts between YOTC and the proposed Asian Monsoon Year so that these two programs can be optimally integrated. Further, AAMP is

well connected to the user community of such an improved predictability of monsoonal systems, particularly the MJO. This will ensure a dialogue with managers of climate sensitive systems, a process that will facilitate the setting of future research priorities. This will make the proposed work more relevant with the possibility of attracting industry support for specifically targeted R&D actions. Finally, at the Trieste WCRP/THORPEX workshop on tropical convection/MJO - where the YOTC activity was initially developed – there was a strong sentiment that a future field program be developed in the Indian Ocean in order to sample tropical convection more thoroughly in this basin – including the initiation stage of the MJO and take advantage of the recent/ongoing investments in the Indian Ocean Array. The AAMP, possibly in conjunction with the Indian Ocean Panel, can build on the framework and findings of the YOTC program to develop a science plan for such a field activity.

Annex B: List of Participants

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Annex C: Eighth Annual Meeting of the Asian-Australian Monsoon Panel (AAMP8)

Honolulu, Hawaii, US, 19-21 February 2007
Hosted by the International Pacific Research Center (IPRC)
Location: Asian Room, East-West Center, University of Hawaii.

Monday, February 19, 2007

- 08:30-09:00: Registration, (refreshment)
09:00-09:15 Introduction and welcome remarks
Opening of AAMP8 and introduction of panel members and experts – B. Wang and H. Hendon
Welcome, J. McCreary (IPRC)
09:15-09:40 Co-Chair's Report - Aims of meeting, main issues panel needs to address – H. Hendon
CLIVAR AAMP Activity (2005-2006) – B. Wang
09:40-10:00 Overview of relevant CLIVAR/ICPO issues and activities – C Ereno
10:00-10:30 *Break*

1. Developments in A-A monsoon modeling and prediction – Chair: K. Sperber/T. Satomura

- 10:30-12:30 1.1 Challenge and directions for improving GCM modeling of monsoon – J. Slingo/A. Turner
1.2 Current status and challenges of dynamic seasonal prediction of AAM – B. Wang/In-Sik Kang
1.3 WGSIP-TFSP-AAMP Interactions – B Kirtman/ H. Hendon
1.4 Effects of Complex Orography on Summer Monsoon Rainfall in South Asia - R Lueng
1.5 Regional climate modeling and predictability study- T. Satomura
1.6 COSMIC/FORMOSAT-3 Mission and Nested Regional Climate Simulations – B Kuo
1.7 Simulation and analysis of SE Asian high-resolution typhoon – H. von Storch
12:30-13:40 *Lunch*
13:40-15:30 1.8 High Resolution Climate Modeling – I. Kang
1.9 Current Status and Challenges in MME Seasonal Prediction and RCM hydrological issues and a proposed coordinated study – B. Wang
1.10 Discussion on potential for an AAMP-coordinated analysis of the TFSP datasets
15:30-16:00 *Break*

2. Intraseasonal variability – Chair: P. Webster

- 16:00-18:00 2.1 Diagnosis and empirical, numerical forecasting of MISO – P Webster

- 2.2 US CLIVAR MJO Working Group, MJO Simulation Metrics - Sperber/Hendon
- 2.3 Issues on ISO scale interaction and re-initiation – T. Li
- 2.4 Update/status of efforts to improve model representation of diurnal convection - K Sperber
- 2.5 Discussion – is there a key activity AAMP needs to spin up in the area of convective representation and the multi-scale interaction in ISOs

18:00 pm *Adjourn*

Tuesday, February 20, 2007

3. Developments in ocean observing systems and the ocean’s role in the A-A monsoon –

Chair: A. Schiller/J. McCreary

- 8:30-10:00 3.1 Progress on Role of the Indian Ocean in the Climate System – J McCreary/A. Schiller
- 3.2 The Role of IOD in Monsoon Variability and the IOD Predictability Experiment – S. Behera
- 3.3 Future directions for joint AAMP, Pacific Panel activities – A Timmermann
- Other contributions- attendees to input titles for further contributions
- 10:00-10:30 *Break*
- 10:30-11:00 Discussion – linking AAMP, IOP and Pacific Panel efforts in monsoon studies. In particular what is the role of the Indian & Pacific Oceans for the monsoons and is there a need for coordinated numerical experiments to help understanding and improve predictions?

4. Decadal variability and ACC – Chair: I. Kang

- 11:00-12:30 4.1 The role of black carbon aerosols on the AA monsoon – G Meehl
- 4.2 Changing ENSO regimes and the A-A Monsoon system in a future climate scenario – A Turner
- 4.3 Response of the Asian Summer Monsoon to Global Warming – H. Annamalai
- 4.4 Expanding warm pools and changes in the Asian-Australian monsoon systems – P. Webster
- 4.5 Discussion - Plan/response for a CLIVAR view of ACC

12:30-14:00 *Lunch*

5. Application studies – Chair: H. Meinke

- 14:00-15:30 5.1 ESSP Monsoon Asia Integrated Regional Study (MAIRS) – J Matsumoto/C Fu
- 5.2 Climate Forecast Applications in Bangladesh – P. Webster
- 5.3 Applications studies – J Slingo
- 5.4 Bridging the science relevance gap – H Meinke
- 5.5 Discussion – How should WCRP provide overall coordination of AA-monsoon studies? What is AAMP’s role, and should activities merge to form

an overall WCRP effort on A-A monsoons. If so what should the management structure be? What input can AAMP give to the JSC Monsoon coordination group?

15:30-16:00 *Break*

6. Future AAMP activity – Chair: H. Hendon

16:00-18:00 6.1 Discussion on Schubert's proposal for a coordinated high resolution modeling study of MJO, Typhoon – I. Kang

6.2 Discussion on AAMP modeling activities – H Hendon

18:00 pm *Adjourn*

18:30 pm *Reception*

Wednesday, February 21, 2007

7. Developing initiatives and AAMP's role in Asian Monsoon Year and Pan-WCRP monsoon activity – Chair: B. Wang

08:30-10:00 7.1 GEWEX MAHASRI and AMY'08 – J Matsumoto

7.2 Observational plan of PALAU2008 – H. Kubota

7.3 Chinese AIPO project and AMY'08—Jianping Li

7.4 Drafting of Strategic Plan for WWRP – CP Chang

10:00-10:30 *Break*

10:30-12:30 7.5 Ongoing/Planned Science Programs in India – M N Rajeevan

7.6 TWP ICE progress and plans – H Hendon

7.7 WCRP/THORPEX Year of tropical convection – D Waliser

7.8 Asian Pacific Economic (APEC) Climate Center - Chung-Kyue Park

7.9 CEOP Integrated Monsoon Studies – T Koike

7.10 Input from JSC global monsoon coordination activity and plans – Shukla/Yasunari/G. Wu

7.11 Discussion: Pan-WCRP monsoon activity

12:30 *Adjourn*

12:30-14:00 Lunch

14:00-15:00 AAM Panel Session

End

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