

CLIVAR REPORT

Climate and Ocean: Variability, Predictability, and Change



Report on the Fourth Session of CLIVAR/GEWEX Monsoons Panel

Meeting Report

14th December, 2019 San Francisco, CA, USA

(11th December, 2019: Pre-meeting)

January 2020

CLIVAR Report No. 02/2020

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List of Actions

Action 1: Co-Chairs to write email to all panel members stating the importance of participating in the face-to-face meeting. This is the one where attendance counts!

Action 2: Jose will ask Kumar for an update of the proposal that He is preparing for the ICMPO going forwards and will inform the co-chairs.

Action 3: Aurel to start a table with ToR's in one column and text on the research activities from MP in the second column. Send around to panel to be completed. Future material to be published on CLIVAR website.

Action 4: Regarding Francina's GEWEX HydroClimate presentation: We need to send her presentation from Wednesday around the MP, including some summary points on what we discussed. Especially around AsiaPEX.

Action 5: Remind Mike Patterson to send around information on US CLIVAR's Large Ensembles Working Group to the MP

Action 6: Copy the list of "Future Work" from their book of abstracts from the SA monsoon workshop and try to turn it into a guidance document for SAM-WG? (Aurel?)

Action 7: Aurel to send around draft proposal and ask MP to give feedback.

Action 8: Aurel to communicate with CP Chang about his plans for 2021 IMW-7.

Action 9: Jose to find out about the GEWEX panel membership duration.

Action 10: Francoise to send a name from list of people who applied to MP to Aurel to be inserted into the letter; then send the letter to KUMAR.

Action 11: Aurel to ask Andy Turner about previously used justification points for membership and use those for the SSG presentation as well.

Action 12: Panel members encouraged to attend the meeting in numbers.

Action 13: Francoise and Aurel to talk to ROXY ASAP and start discussing on the Conference on "Indian Ocean – ENSO – Monsoon Interactions in Changing Climate".

Action 14: Jose to share more information on TBI.

Action 15: Invite co-chairs of TBI to present at the next MP telecon (Francoise and Aurel) after the SSGs.

Action 16: Jose to send around more information on WCRP Task Team on Regional Activities.

Action 17: Missing in the presentation is an update on PLANNED activities in 2020. Co-chairs to work on this.

Action 18: Aurel to prepare first draft of planned activities ASAP and send to Francoise, Jose and Kumar.

Action 19: Send GABY a 2-paragraph summary and advertisement on MP to collaborate for their YESS Newsletter.

Action 20: Send the link to Alice and colleagues about the Summer School on the American Monsoons webpage (which includes a lot of information, contacts, scientific results/topics...).

Action 21: Organise a telecon with SPARC activity leads.

Action 22: Take Andy Turner's strawman proposal as a base: ENSO teleconnections to Asian Monsoon/stratosphere link.

Action 23: Françoise to invite Vincent Moron to join the discussion on MP's interaction with SPARC.

Action 24: Francina will send contacts to start connection with AsiaPEX (remind her).

Action 25: Ask Andy to send info on how much data there is for Tier-2 and Tier-3

Action 26: Send the paper on WMO/WWRP Workshop around to Panel once submitted to BAMS.

Action 27: Ask for terms of references (TOR) for CORA.

Action 28: Prepare a MP-wide letter to be sent to CLIVAR and GEWEX Co-Chairs to request more information, especially on the consultation process and reasoning behind the decision.

1. Background

The Fourth Session of CLIVAR/GEWEX Monsoon Panel was held on 14th December 2019, at San Francisco, Ca (USA), at the Parc 55 Hotel. Six MP members and two invited participants attended the MP-4 (see Annex 1 for List of Participants). The meeting was focused on discussing the achievements of the panel during 2019, and planning the future activities for 2020 (see Annex 2 for Agenda). A pre-meeting was held on 11th December at Hotel Zelos, with the participation of four panel members and six invited participants (See Annex 3).

2. Topics Discussed

The MP co-chairs opened the meeting, welcoming everybody, and noting that several members are not present.

ACTION 1: Co-chairs to write email to all panel members stating the importance of participating in the face-to-face meeting. This is the one where attendance counts!

(1) Introduction around the table

- Mainly to introduce us to Mike Patterson and vice versa
- US CLIVAR booked the room/breakfast/etc... THANKS!
- They are keen for us to continue meeting in the US

(2) ICPO update from Jose

- The International CLIVAR Monsoons Project Office (ICMPO) sits under the ICPO and the new director since October 2019 is now Rupa Kumar Kolli.
- The agreement with the Indian Institute of Tropical Meteorology (IITM) for hosting the ICMPO will end in FEB-2020 and currently negotiations with WCRP are ongoing, they are being handled by Kumar directly.
- **ACTION 2:** Jose will ask Kumar for an update of the proposal that He is preparing for the ICMPO going forwards and will inform the co-chairs.

(3) Highlights from 2019 and TOR discussion and future work

- Major highlight was the recent SA Monsoon Workshop (Alice Grimm et al.).
- Mike Patterson mentioned that US CLIVAR would have also sponsored some travel to this one – this was not known by the co-chairs. Thus, in the in future, communicate US CLIVAR of activities that could be of interest to them and that US CLIVAR might be able to support.
- GMMIP: Andy gave a quick overview of the Monsoon MIP and data availability on the ESG (more on this later on).
- The main obstacle remains, that the combination of small funding and diversity (of scientific interests) presents a philosophical problem over choice of Panel meeting location. Regional meetings pertaining to the monsoon (or a monsoon) are not necessarily attractive to the full range of membership. Also, pressures on membership diversity: CLIVAR/GEWEX; regional monsoon balance; topic balance; gender balance; etc.
- Terms of Reference (ToR) for MP: listed in slides; all are fairly focused objectives, but it is difficult to ascertain which ones we actually can show ongoing work against. **ACTION 3:** Aurel to start a table with ToR's in one column and text on the research activities from MP in the second column. Send around to panel to be completed. Future material to be published on CLIVAR website.

- Future work: see slides showing each WG's plans, also mentioned in our 2019 Annual Report. This also needs to feed into the table mentioned before.
- **ACTION** 4: Regarding Francina's GEWEX HydroClimate presentation: We need to send her presentation from Wednesday around the MP, including some summary points on what we discussed. Especially around AsiaPEX.
- Additional source for ensemble analysis: Large Ensemble (US CLIVAR). **ACTION** 5: remind Mike Patterson to send around information on US CLIVAR's Large Ensembles Working Group to the MP.
- Possible new members for the America Monsoon WG were mentioned:
 - o Christopher Castro
 - o Salvatore Pascale

(4) SA Monsoon WG presentation (Alice Grimm)

- The outline of the presentation was:
 1. Advanced School & Workshop on American Monsoons
 2. Some topics discussed, needs for future work
 3. Example of ongoing collaboration
 4. Review on the ENSO Impact on South America
 5. Monsoons climate change
 6. Other articles & future plans
 7. The American Monsoons review chapter: in press
- **ACTION** 6: Copy the list of "Future Work" from their book of abstracts from the SA monsoon workshop and try to turn it into a guidance document for SAM-WG? (Aurel?).
- Interesting result on the correlation of seasonal cycle changes in the SASM to decadal changes. Is this also the case elsewhere?

(5) A-A Monsoon WG presentation (Annamalai)

- IITM work on CFSR model
- Randy Wu: works on East Asia Monsoon transition phases
- Gill Martin: works on seasonal prediction of EASM rainfall at UK Met Office; also on South China Sea summer monsoon onset prediction
- Surya Rao: works on rainfall predictions at IITM
- Work in Abu Dhabi on the "Atlantic Zonal Mode" and its correlation to ISMR variability
- Krishnamurti and Shukla: Monsoon research at COLA; S2S analysis; extremes; ISO
- Takayabu: EASM (from satellite obs), extremes: rainfall extremes are connected to MSC systems while convective extremes are not
- Akio Kitoh: precipitation extremes; SST v CO2 influence
- Sandeep et al: SA Monsoon: less extremes under climate change; shorter monsoon season (Sabeerali et al); Bill Boos is co-author on this work
- Achuta Rao: works rainfall uncertainty in projections in SA Monsoon
- Krishna et al: cyclogenesis in SA Monsoon (→ same talk as on Wednesday)
- Bill Boos: works on monsoon depressions in SA Monsoon
- Gill Martin: also works on spin up biases in EASM
- Annamalai and Sperber: systematic biases in CMIP.x; found that BL processes errors drive the overall errors in rainfall in GCMs more than SST errors.
- Sri (RIMES): work within RCOFs
- Andy Turner: QJRMS special issue on INCOMPASS is coming out soon; also working on seasonal prediction using ECMWF system; also works on aerosol forcing and effective radiative forcing

(6) African Monsoon presentation (Francoise)

Provided a brief summary of:

- the current membership of the WG,
- some major projects which just ended (EU DACCIWA, AMMA-2050 and other FCFA projects) or are still on-going, e.g. AEROCLO-SA (Aerosol Radiation and Clouds in Southern Africa) in South Africa or AMMA-CATCH which mainly focuses on hydrology (precipitation, water bodies, Sahelian paradoxical evolution of water bodies, observed tipping points...),
- new forecast projects (e.g. GCRF African-SWIFT led by UK or CREWS Burkina, both involving numerous African national weather forecast centres), mainly from synoptic to seasonal scales.

Presented a few examples of new results, in particular regarding extreme events: strong positive trend of extreme precipitation events in the Sahel since the early 80's, influence of tropical wave activities on such events, heat wave properties and trends.

Provided an update of the involvement in IPCC, especially via CORDEX.

(7) Discussion on the proposed Monsoons Panel-led Monsoons Conference/Workshop (A. Moise)

- Aurel presented ideas from the brief in the slides
- Gathering thoughts from around the table:
 - o Maybe focus on less monsoon domains
 - o Maybe focus on less topics; include extremes
 - o No parallel session
 - o No impact science session
 - o Monsoon-domain focussed sessions?
- **ACTION 7:** Aurel to send around draft proposal and ask MP to give feedback.
- **ACTION 8:** Aurel to communicate with CP Chang about his plans for 2021 IMW-7.

(8) Membership discussion

- Duration of membership:
 - o Should we adopt GASS ruling to go for 4 years?
 - o Currently 3yrs + 2yrs (is approved by the CLIVAR and GEWEX SSG) + 1yr (with justification) = max of 6 years
 - o BUT: all CLIVAR-only panels have this 3 + 2 + 1 rule; maybe just some GEWEX are different?
 - o **ACTION 9:** Jose to find out about the GEWEX panel membership duration.
- NEW membership and rotating-off members
 - o 3 current members rotating off and all agreed on the 6 Names put forward, including the recommendations made by Aurel and Francoise
 - o Andy Turner suggested to stay on for another year → agreed
 - o Francoise Guichard to stay on for another year → agreed
 - o NEW additional member of MP: currently suggested is Leila Carvalho; all agreed, but we need to provide a second name against her in the recommendation letter;
ACTION 10: Francoise to send a name from list of people who applied to MP Aurel to be inserted into the letter; then send the letter to KUMAR.
- Justification for an additional member:
 - o More energy currently awakens in the regional WG's: more interactions; more diverse work; need to be represented in the MP

- **ACTION** 11: Aurel to ask Andy Turner about previously used justification points for membership and use those for the SSG presentation as well.

(9) Cross-Panel activities and opportunities

- *CLIVAR/IOC-GOOS Indian Ocean Region Panel (IORP)*: **H. Annamalai** contributed to the IORP activities (cross CLIVAR activities). This includes the contribution to the white Paper towards "Sustained observations over the Tropical Indian Ocean": H. Annamalai, M. Nagura and K. Richards., 2019: Indian Ocean and South-Asian monsoon: upper-ocean processes relevant to the monsoon annual cycle. IndOOS (2020-40) White Paper (invited article – in press)
- *Monsoons Panel-SPARC*: **Andy Turner** led a straw-man ideas white paper on potential impacts of stratospheric variability on monsoon teleconnections. This was presented at the SPARC SSG meeting, following the SPARC General Assembly (October 2018) by **Tianjun Zhou**.
- *Engagement with WCRP CMIP Panel*: Engagement with CMIP6 MIPs, including a GMMIP workshop at IAP, Beijing in autumn 2019 (**Tianjun Zhou & Andy Turner**).
- *GASS and GLASS discussions*: Co-chairs from GASS are invited to attend the Monsoons Panel meeting at AGU2019 to discuss the collaborations and links to the activities outlined in the GASS White Papers (→ see Wednesday discussion and notes)
- Conference on “Indian Ocean – ENSO – Monsoon Interactions in Changing Climate” is all decided to be in FALL 2020 in Pune, India. Current proposal has IORP, GMP, IITM and WSU included (note that includes us already!)
 - Roxy is the main contact
 - What is the connection to our proposed conference?
 - This is a good opportunity to show GMP – Indian Ocean Panel connections
 - **ACTION** 12: Panel members encouraged to attend the meeting in numbers
 - **ACTION** 13: Françoise and Aurel to talk to ROXY ASAP and start discussing our involvement in the conference on “Indian Ocean – ENSO – Monsoon Interactions in Changing Climate”.
- NEW Research Foci (RF) for CLIVAR has been decided to be “Tropical Basin Interactions (TBI)”
 - **ACTION** 14: Jose to share more information on TBI.
 - **ACTION** 15: Invite co-chairs of TBI to present at the next MP telecon (Françoise and Aurel) after the SSGs.
- WCRP Task Team on Regional Activities
 - Input to WCRP Implementation plan
 - Relates back to our discussion with Beatriz on Wednesday
 - **ACTION** 16: Jose to send around more information on WCRP Task Team on Regional Activities.
 - When and how can we provide feedback?
- Workshop in 2021: Towards a Sustainable Global Ocean Obs System
 - To be held at ICTP, Italy
 - With the participation of five CLIVAR Region Panels and GSOP, the focus is on regional observing systems, some topics might be relevant to the MP, thus the panel can participate as observers.

(10) Sub-seasonal to Seasonal Prediction (S. Rao, A. Turner, A. Moise, F. Guichard and others: short talks and discussion)

- Aurel presented current activities at the Singapore CCRS in the space of S2S and WMO-led RCC.
- Role of MP to connect to these activities? Needs further discussion.
- *WMO regional Climate Outlook Forum*: **Suryachandra Rao** participated in the South Asian Climate Outlook Forum (14th Session), which was hosted by Nepal's Department of Hydrology and Meteorology (DHM) during 18-23 April 2019.

(11) Preparation for reporting to GEWEX SSG (27-31 January 2020) and CLIVAR SSG (15-16 February 2020) (F. Guichard)

- Outline of typical SSG Presentation:
 - o Motivation
 - o Current membership
 - o GMP construction
 - o Regional WG compositions
 - o Membership renewal (at least 2 slides)
 - o Key issues & work areas for each Regional WG (several slides, including science)
 - o Cross-regional activity: S2S
 - o Cross-regional activity: CMIP6
 - o GMP meetings: telecon and F2F
 - o Interactions with other WMO group: WWRP
 - o Interactions with SPARC
 - o IPCC AR6 activities
 - o Interactions with GEWEX activities
 - o Interactions with Ocean Groups
 - o Training and workshops
- **ACTION** 17: missing in the presentation is an update on PLANNED activities in 2020. Co-chairs to work on this
- **ACTION** 18: Aurel to prepare first draft asap and send to Francoise, Jose and Kumar.
- We will have the same presentation for both SSGs.
- Current agenda for the first SSG says 1.30pm for our talk (**Jose** to clarify).

Annex 1: List of Participants

Name	Institution	Country	Role
Francoise Guichard	CNRM-GAME	France	Co-chair
Aurel Moise	National Environment Agency	Singapore	Co-chair
Alice Grimm	Federal University of Paraná	Brazil	Member
Francina Dominguez	Department of Atmospheric Sciences, University of Illinois	USA	Member
Andy Turner (telecon)	UK Reading	UK	Member
Hariharasubramanian Annamalai	IPRC, University of Hawaii	USA	Member
Mike Patterson	US CLIVAR Project Office Director	USA	Invited
Jose Santos	International CLIVAR Project Office	China	ICPO Staff

Apologies: Rupa Kumar Kolli, Tianjun Zhou, Cathryn Birch, Aida Niang, Suryachandra Anguluri, Yukari Takayabu, Vincent Moron

Annex 2: Agenda

Session I: Overarching Issues

- 09:00** Welcome, *tour de table* and short summary of past year activities (A. Moise, F. Guichard)
- 09:10** ICPO/ICMPO updates and other cross-cutting panel topics (J. Santos)
- 09:15** Review and Update of Terms of Reference, including the associated work plan elements for 2020 (Lead: A. Moise)

Session II: Updates from Regional Working Groups

- 09:30** American Monsoons (A. Grimm)
- 10:15** Asian-Australian Monsoons (H. Annamalai)

11:00 Coffee break

- 11:15** African Monsoons (F. Guichard)
- 12:00** Discussion on WGs: organizations, exchanges, potential links

12:30 Lunch

Session III: Cross-Regional Activities

- 13:30** Discussion on the proposed Monsoons Panel-led Monsoons Conference/Workshop (A. Moise)
- 14:00** Sub-seasonal to Seasonal Prediction (S. Rao, A. Turner, A. Moise, F. Guichard and others: short talks and discussion)
- 14:30** IndOOS-2 Overview (J. Santos)
- 15:00** Discussion on membership changes (all)

15:30 Coffee break

Session IV: Panel Business

- 15:45** Interaction with other CLIVAR/GEWEX Panels
- 16:15** Preparation for reporting to GEWEX SSG (27-31 January 2020) and CLIVAR SSG (15-16 February 2020) (F. Guichard)
- 17:00** Any other business (all)
- 17:30** Close of meeting

Annex 3: MP Pre-meeting Notes

Wednesday Pre-Panel Meeting:

AGENDA:

- 14:30 Introductory Remarks (A. Moise, F. Guichard)
- 14:45 Open discussion on links to GEWEX activities
- Presentation and discussion with YESS members (Gaby Langendijk and Priyanka Yadav)
 - Discussion with GASS Co-Chair Xubin Zeng on Cross-Panel potential activities
 - SPARC updates and potential cross WCRP activity (Hans Volkert, A. Moise, A. Turner)
- 16:00 GEWEX Hydroclimate Panel activities and links to the monsoons panel (F. Dominguez)
- 16:15 Other relevant Updates
- IPCC AR6 monsoons coordination and GMMIP – report from recent workshop in China (A. Turner)
 - CLIVAR Science Plan and cross-panel opportunities (J. Santos) -> moved to SATURDAY
 - CORDEX/IITM (R. Krishnan, JSC, WCRP)
 - WCRP restructure and new regional focus activity CORA (Beatriz Balino)
- 17:00 A.O.B.
- 17:15 Close of meeting

(1) YESS Community discussion:

- Running ECR Events
- Running summer schools
- JOB portal (social media mainly)

Science connections:

- Have science working groups
- WS/Discussions which is leading into a soon to be published paper (ask GABY about it)
- Contributed comments to drafts of WCRP and SPARC Science Plans

Membership to MP:

- Should initially be part of the Regional Monsoon Working Groups
- Encourage to contact the RWG chairs; send a list

ACTION 19: Send GABY a 2-paragraph summary and advertisement of MP to collaborate for their YESS Newsletter.

ACTION 20: Send the link to Alice and colleagues about the Summer School on the American Monsoons webpage (which includes a lot of information, contacts, scientific results/topics...)

(2) GASS interaction discussion (Zubin Zeng)

- Two important meetings for collaboration: PAN-GEWEX Conference in October 2020 (Paris) and PAN-GASS in 2021 (Place TBD)
- Xubin explained several of the projects and panels in GASS, the initiative: **Improving the Simulation of Diurnal and Sub-Diurnal Precipitation over Different Climate Regimes,**

has many connections with MP. The Third Pole Environment (TPE) project as well (e.g. influence of the TP spring temperature on subsequent precipitation further South in the region)

(3) SPARC interaction discussion (Hans Volkert)

- **ACTION** 21: Organise a telecon with SPARC activity leads.
- **ACTION** 22: Take Andy Turner's strawman proposal as a base: ENSO teleconnections to Asian Monsoon/stratosphere link
- Involve Andy (and Krishnan)?
- **ACTION** 23: Françoise to invite Vincent Moron to join the discussion on MP's interaction with SPARC.
- SPARC guest from SPARC Project Office: HANS Volkert presented activities
- Find people who actually work on these topics

(4) GEWEX HydroClimate presentation (Francina Domingues)

- Regional Hydroclimate Projects (RHCPs) looking at physical processes
- Plus GHP cross-cutting projects with questions that cut across all GHP's; for example INTENSE CC = looking at subdaily precipitation, data acquisition and analysis
- NEW one is AsiaPEX: about to submit their proposal to become a RHCP, involving 10 countries in Asia
- **ACTION** 24: Francina will send contacts to start connection with AsiaPEX (remind her).

(5) Andy Turner presentation

- (a) GMMIP update, including recent meeting in China (late October 2019)
- Connection between GMMIP and HiresMIP
 - ESG has already data from GMMIP
 - **ACTION** 25: Ask Andy to send info on how much data there is for Tier-2 and Tier-3 experiments from GMMIP.
- (b) WMO/WWRP workshop, China (December 2019)
- Focus was the Monsoon Attribution Report/Book that CP Chang is leading and Bin Wang driving as Science Lead
 - WWRP monsoon group supported
 - WGTMR from WMO has requested this report
 - NEW: want to finish a quick BAMS paper on this by the end of this month for IPCC AR6 deadline
 - **ACTION** 26: Send the paper on WMO/WWRP workshop around to Panel once submitted to BAMS.
- (c) Future of WMO/WWRP
- Andy spoke to CP Chang to find out what is planned
 - WGTMR may become a single-level structure without panels as a consequence of WMO restructure; no expert teams either
 - TC's and Monsoons will remain a core focus
 - IWM-7 likely to go ahead in India in 2021, but CP will only "help" and not lead it
- (d) IPCC AR6 WGI report and monsoons
- Andy showed which chapters are likely to include sections on monsoons
 - Try to finish papers ASAP!

- Also, next Feb-Apr: all can nominate themselves as expert reviewers of the SOD.

(6) Beatriz provided an update on CORA and the development regarding WCRP strategic and implementation plans:

- The Coordination Office for WCRP Regional Activities (CORA) was launched in 2018 and it became fully operational in 2019 for a period of 3 years. CORA is hosted jointly by the Bjerknes Centre for Climate Research (BCCR) in Norway and the Climate Service Center Germany (GERICS) in Hamburg. The coordinators are Beatriz Balino at BCCR and Wiebke Schubotz at GERICS. The goals of CORA are to integrate and develop synergies among regional activities across WCRP bodies, support the Joint Scientific Committee (JSC) to develop WCRP messages on regional climate science and facilitate capacity building
- CORA is a member of the Task Team on Regional Activities (TTRA), a temporary group that the JSC put together for the purpose to brainstorm, co-develop and make recommendations on required structures and elements for the WCRP implementation plan in order to empower the WCRP to address its strategic priorities on climate information for regions. The TTRA will present its report at the JSC-41 (May 2020) and then it will disband.
- At the same time, the TTRA will consider implementing an initiative proposed by the chairs of the Core Projects during the JSC 40 (Geneva, 2019) with the goal to conduct cross-cutting, interdisciplinary regional climate research in tentatively 3 regions of the globe: (i) the Third Pole Environment, (ii) the Andes, and (iii) the Greenland ice-sheet in the Arctic.
- **ACTION 27:** Ask for terms of references (TOR) for CORA.
- They include “Regional Task Force teams” who are supposed to engage with regional stakeholder to co-develop a plan, suggest new structures and elements of the new program.
- WCRP leaders (including the Co-Chairs of all core programs CLIVAR, GEWEX, SPARC and CliC) have sat down and proposed REGIONAL PROJECTS which they see as the “flagship” projects in which the Core Projects could liaise:
 - o Greenland (sea level rise)
 - o ANDEX (Andes)
 - o TPE (Third Pole Environment), i.e. Himalayas
- The idea was about fresh water availability for the last two
- January 2020: they will send around their draft for comment/feedback

There ensued a perplexed discussion, given that this was the first time the GMP was told about this decision/path within WCRP. It is unclear if we ever received any notification/consultation from our CLIVAR or GEWEX Co-Chairs about this.

In any case, the opinion was that we don’t really understand how this decision could make sense with respect to stakeholder needs and the human population needs at large. Since Beatriz was just the messenger, there was no productive discussion or exchange possible, e.g. the MP will need to go back to the respective Chairs of CLIVAR and GEWEX to find out more.

ACTION 28: Prepare a MP-wide letter to be sent to CLIVAR and GEWEX Co-Chairs to request more information, especially on the consultation process and reasoning behind the decision. Also, we should bring forward strong arguments why we believe “our” stakeholders (e.g. connected to monsoon science outputs) would disagree with this position. We should discuss this more on Saturday.