

US CLIVAR: MJO WORKING GROUP

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These proposed objectives are designed to make tangible yet realistically-scoped contributions in a number of key areas:

- 1) physical understanding and model representation,
- 2) assessment of predictability and prediction skill,
- 3) resources and infrastructure in regards to modeling/prediction, and
- 4) organization and leveraging of the multiple threads of activity relevant to the MJO.

1. Develop and coordinate model experiments and inter-comparisons with data that are designed to at least better understand, and possibly lead to improvements in, our model representations of the MJO.

- *Develop a target set of diagnostics for MJO model evaluation.* This should include simple measures of space-time structure (e.g., EOF, EEOF, composites), wave-frequency diagrams, vertical structure components, phase relations of surface flux, rainfall, wind and SST (if available) perturbations. A preliminary discussion highlighted the potential need for several stages of detail. First, a very simple metric that the non-expert may be able to take advantage of and others that are more complex which provide an increasingly stringent characterization of the MJO. For example, we might have a simple two-dimensional structure that summarizes the spatial-temporal variability (e.g., OLR/rain). The next order of complexity might involve upper and lower level wind and rain, and finally a robust characterization involving additional components to the MJO. Another suggestion was to use such a metric to identify the “observed” events in the record so that a non-specialist or otherwise would not have to redefine events for any given study. Due to differences in the MJO/ISO propagation characteristics during boreal winter and summer there may be the need for separate metrics to discriminate between the two seasons.
- *Extend model evaluation to connect 3D dynamics and thermodynamics.* Focus on a multi-model assessment in terms of wave-frequency spectrum in conjunction with vertical structure of heating and thermodynamics (i.e., T, q). This should consist of GCM, multi-model framework (MMF), CRM if available, re-analysis, and satellite data products and could even include connections to more idealized studies (e.g., aqua planet). Based on groundwork laid already as well as available resources and ongoing activities, it is reasonable to think that model contributions for this purpose might, at a minimum, be readily attainable from GEOS5, GFDL, CSUMMF, UH. NCEP, BOM,

ECMWF, NCAR and others might also be able to make contributions if it is in line with their objectives and resources. Where possible, profile comparison can be done with observations (e.g., T, q) and in cases where observational information is not readily available (e.g., Q), even a model-model comparison is thought to have virtue.

2. Develop and coordinate model and multi-model ensemble predictions of MJO variations to estimate the expected predictability as well as model prediction skill of MJO variability.
 - *Assess prediction skill and predictability*, including to the extent possible characterizing the importance of initial conditions, boundary conditions, land surface processes (i.e., soil moisture), ocean coupling, and modulation by lower-frequency variability (e.g., ENSO). There are some programmatic elements and grant activities underway to facilitate this including CLIPAS (Wang, ..., Schubert, et al.), NASA/MAP work (Schubert, ... Waliser, et al.), NOAA/CFS analysis (Waliser, Schubert, et al.), etc. Thus the work involved here would be an effort in coordination and providing direction to these efforts in order to leverage the most possible as well as to entrain parallel and complimentary efforts into a unified effort. The CLIPAS effort in particular – which may at first focus on a case study approach for a number of events - is just emerging and could probably benefit from some direction.
 - *Develop a set of target prediction metrics relevant to the MJO (summer and winter). In order to quantitatively score models for prediction and predictability, it would be very useful to have some common prediction targets on which to gauge performance (e.g., analogous to the Nino3 SST index for ENSO).*
3. Determine a useful/optimal course of action with respect to the development, dissemination, and analysis of experimental forecasts of subseasonal variability. *Here the focus will be to facilitate the translation of MJO prediction techniques/resources that are both available and skillful into a useful venue, including its impacts on medium-range forecasting. NOTE – THESE ITEMS ARE STRICTLY SEEN TO BE A COORDINATION AND ADVISORY ACTIVITY AT THIS TIME DUE TO THE SCOPE OF OUR EFFORT.*
 - *One component of this will be to determine the utility of the so-called Experimental MJO Prediction Project hosted by CDC.* We should be able to provide support or direction to this activity, and facilitate and/or entrain other similar efforts.
 - *Another element that should be explored and cultivated is the development of connections to the user-community for subseasonal forecasts.* The main point here is that at the end of the 2 years of this working group, we should have developed some tangible connections to possible user communities and/or at least have a greater appreciation for the required end products from subseasonal predictions.
4. Help to coordinate MJO-related activities between the International CLIVAR Monsoon Panel, GEWEX, CPPA, NAME, AMIP-related activities, NOAA operational/research centers, the proposed Thorpex program, etc. Where additional modeling, analysis or observational resources are needed, provide plans for implementation to US CLIVAR, GEWEX, and the Interagency Group (IAG).
 - CLIVAR Monsoon Panel, connections presently exist via Bin, Ken, Julia, and Harry.
 - NOAA connections exist through current research and the Experimental MJO Prediction program at CDC.
 - Thorpex, CLIPAS, and others.

A. *Proposed/Tentative Timeline*

April 2006	Start Date, First Telecon (~monthly thereafter).
August 2006:	First SSWG Meeting – with CLIVAR Summit
September 2006:	Deliver Prospectus on (refined) Proposed Activities and Goals
*May 2006:	Special Session at AGU on Intraseasonal Variability
Spring 2007:	First SSWG Workshop in collaboration with International CLIVAR Monsoon Panel & Second SSWG Meeting
May 2007:	Deliver Workshop Summary Report
*May 2007:	Special Session at AGU on Intraseasonal Variability
August 2007:	Third SSWG Meeting – with CLIVAR Summit
September 2007:	Deliver Report on Accomplishments to-date and a Prospectus on (further refined) Proposed Activities and Goals
Spring 2008:	Second SSWG Workshop – in conjunction with other activity, maybe Thorpex, GEWEX, ?
August 2008:	CLIVAR Summit: Deliver Report on Accomplishments and Recommendations for Future CLIVAR Activities and Goals

* We may coordinate specific meetings with the AGU Spring Meeting. Otherwise, these meetings are just highlighted as this year's is the 2nd annual meeting of this session and it seems worthwhile noting their likely future existence. It doesn't necessarily add any additional work or need to meet, but notes activity and a potential meeting time/place.