

YOTC MJO Task Force –13th Telecon

Meeting time: 21:00 GMT, 10nd July 2012.

Participants

Task Force: Eric Maloney, Matt Wheeler, Masaki Satoh, Augustin Vintzileos, Ken Sperber, Chidong Zhang, Hai Lin, Rich Neale, Steve Woolnough, Daehyun Kim, Joshua Fu, Duane Waliser

Others:

Jim Benedict (CSU)

Proposed Agenda

- 1) The Pan GASS and add-on MJO Task Force meeting this Fall.
- 2) Updated process-oriented diagnosis of models (Jim Benedict)
- 3) Boreal Summer ISV in CMIP5 (results from an CLIVAR Asian-Australian Monsoon Panel paper: Ken)
- 4) MJO in CMIP5 (Daehyun) and Update on Jialin Lin's CMIP5 efforts (Eric and/or Chidong)
- 5) The need for broader recognition of the importance of intraseasonal variability forecasts (Chidong)
- 6) THORPEX implementation plan on subseasonal to seasonal prediction and integration with task force (Duane)

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Meeting Minutes (by Eric and Matt)

1. The Pan GASS and add-on MJO Task Force meeting

Matt provided an update on the September Pan-GASS meeting and the add-on task force meeting the following Monday. 8-9 task force members are anticipated to attend both the Pan-GASS meeting and the task force add-on meeting. Eric intends to invite some local people including Jim Benedict and Stefan Tulich to the add-on meeting to entice some broader participation and ensure a critical mass.

According to Steve W., Pan-GASS plenary talks will be decided this week. The organizing committee will then get into contact with breakout chairs to see if they want to include any abstracts that were not selected for the plenary session as oral presentations in their sessions.

The DYNAMO/CINDY breakout will take place on Wednesday of the meeting, and the GASS MJO/diabatic heating comparison breakout on Thursday afternoon. No plans exist for coordinated discussions among the different sessions, although Rich said NCAR could provide help to organize such discussions. The possibility exists for broader MJO-related talks in the breakout session for the GASS MJO project (diabatic heating intercomparison), given that 3 hours is allotted. Prince, Nic K. and Xianan will give the core talks of this session at the beginning, but then much flexibility exists. Steve will get

in contact with Duane, Matt, and Eric to discuss how we might best organize the session once the plenary talks are decided. Duane said that it would be nice to discuss the direction of the analysis for the diabatic heating project during the breakout. He also said that 30 model uploads for the climatological part of the project have already taken place. According to Steve, 8-9 uploads for 20 day hindcast experiments have been done.

Chidong will be leading the DYNAMO/CINDY session and will organize it as he sees fit. Chidong asked whether there will be reports back to the plenary sessions. Steve indicated that such reports will be done on Friday morning. Matt indicated that Friday afternoon is the GASS scientific steering committee meeting (which includes Steve), which will be some free time for the task force to conduct informal discussions and other activities.

Augustin is one of the TF members who cannot come but would like to have the opportunity to use video conferencing or something similar to participate in MJO-related talks and discussion. Rich indicated that this should be possible at NCAR.

Matt asked when the poster sessions are to take place. According to Steve poster sessions will be scheduled for Monday and Wednesday evenings, although the posters for the allotted session will stay up an extra day after these two days.

ACTION ITEMS: Steve will follow-up with Matt, Duane, and Eric on plans for the MJO Breakout session at the Pan-GASS meeting. Matt will send the travel requests to Valery Detemmerman at the end of next week for those needing travel support.

2. Update on moist static energy diagnostics applied to climate models (Jim Benedict)

Jim Benedict presented some further results on a new process-oriented climate model diagnostic based on the vertically-integrated moist static energy budget. This is a follow-up to his presentation at the last telecon.

In his presentation, Jim reviewed the concept of the moist entropy diagnostics he is using, and the three model pairs (with good and bad MJOs) on which he is doing the comparison of gross moist stability (GMS). Jim reviewed the distribution of time-mean GMS, showing that models with lower time mean GMS tend to have the stronger MJO activity.

Jim's new analysis extends to looking at variations in GMS as a function of MJO phase. In particular, Jim compared the SP-CAM with the conventional version of CAM, with GMS anomalies generated by regressing fields relative to MJO filtered precipitation at 90°E. ERA-I was used as the observational comparison. Jim showed that SP-CAM could reproduce the observed strong increase in GMS during and after the MJO convective event, with the decrease in GMS before the event. This is consistent with deeper and stratiform convection associated with the MJO convective event strongly reducing GMS when MJO convection occurs, and shallow convection in advance of the MJO convective center. CAM, on the other hand, has great difficulty simulating the strong increase in GMS during peak precipitation, suggesting that CAM cannot produce the correct evolution of vertical heating structure relative to peak precipitation.

Chidong asked whether results would be different if a west Pacific location rather than an Indian Ocean location were used as a reference point. Jim said that results were

relatively insensitive to the longitude used. Steve noted that ERA-I looks more like the CAM than SP-CAM in the mean GMS plots, which seems surprising given that SP-CAM produces better ISV. Jim said that SP-CAM does show some defined biases that we are still sorting through, and we have no definite explanation for this behaviour yet. Eric will talk to Jim offline about attending the Monday task force follow-on to the Pan GASS meeting.

ACTION ITEMS: Jim will refine this analysis, keeping the discussion on the telecon in mind. Relating these findings to model variations in diabatic heating structure will be a next step. Jim will provide an extended update of these results at the Pan-GASS meeting in September and at the follow-on MJO task force meeting the next Monday. More comparison to the process-oriented metrics of Prince and Daehyun will also be conducted.

3. Boreal Summer ISV in CMIP5 (results from an CLIVAR Asian-Australian Monsoon Panel paper: Ken)

Ken gave a first look at the ability of CMIP5 models to realistically simulate boreal summer intraseasonal variability relative to CMIP3. 16 CMIP5 models and 13 CMIP3 models were compared for June-September. For the pattern correlation of 20-100 day OLR variance in CMIP5 models with AVHRR, MPI has largest pattern correlation (0.87). MIROC has the lowest (0.55). The CMIP5 multimodel mean gives a pattern correlation of 0.90, about the same for the CMIP3 multimodel mean.

For CMIP3, only 2 models got the structure of BSISO in summer reasonably well (two versions of the ECHAM model), especially in terms of the tilted rainband structure. Some CMIP5 models show nice improvements at getting this structure, including the MIROC model. The MIROC model does very good as simulating BSISO in CMIP5, better than other models. The MRI does almost as well, except that the tilted rain band structure is not as well simulated. A non-arithmetic multimodel mean comprised of statistically significant anomalies from models (where more than half of the models show significance at a given locations) demonstrated very good performance at getting a realistic BSISO structure. In general, the best models from CMIP5 are about as those good from CMIP3, and the multimodel model mean from the two archives is about the same. Some models have improved physics and made great strides at simulating the BSISO, including the MIROC model.

Chidong asked about two bad models from CMIP3 that are outliers on one scatterplot, and whether these now moved into the range of good models in CMIP5 given improved physics. Ken said for one of these models this was indeed the case (GISS), but he did not know about the other. In general, most CMIP5 models now produce reasonably good variability, but most have trouble getting convection from the Indian Ocean into the west Pacific and hence producing a realistic tilted rainband structure. Matt noted that the best models from CMIP5 are no better than best models from CMIP3. However, Ken said it is nice that we now have new models with different physics that are now having some success, which we might learn something from.

ACTION ITEM: Ken will write a manuscript on these results for submission before the AR5 July 31 deadline.

4. Boreal winter MJO in CMIP5 models

Daehyun described a preliminary analysis of MJO behaviour in 17 CMIP5 models. It was noted that the suite of models used differs somewhat from that being used in a related analysis by Jialin Lin. Lin used 6 models that Daehyun has not, and Daehyun is using 4 additional models. 20 years of model data went into Daehyun's analysis.

Based on plots of east/west power ratio, in Daehyun's estimation, the CMIP5 models have decreased slightly in performance at simulating the MJO relative to CMIP3. This differs from Jialin's analysis that presented an opposite conclusion, in which he argued that CMIP5 model performance improved. It was speculated by the task force that this might be due to the different models used. It was noted the good performance of the Norway model at simulating the wintertime MJO, which Ken also found in a complementary analysis. Chidong asked why the datasets were different between Daehyun and Jialin's analysis. Basically, given the frantic nature of the task and the IPCC deadline, researchers tried to get their hands on as much data as they could, and sometimes led to inconsistencies among different groups.

Chidong suggested that Daehyun contact Jialin to try to make uniform the models used between the two sets of analyses. Ken suggested that we should pursue this CMIP5 comparison further as a group, and should also look at some horizontal structure to best document MJO performance in addition to first order metrics (i.e. like in the full MJO diagnostics package). Matt asked whether common successes exist for individual models in Ken's boreal summer analysis and the winter analysis of Daehyun? This still needs to be examined, but the Norway model seems to have worse performance in summer versus winter, although this needs to be diagnosed in more detail.

Ken Sperber and Jialin Lin intend to submit the results of their analysis before the 31 July deadline. Chidong thought the task force could offer Jialin some suggestions for refining his analysis in the short term, and also suggested that a later publication to summarize model ISV performance in both summer and winter may be warranted as goal of the task force. Matt agreed.

Matt asked whether Ken and Daehyun intended to apply their simple MJO metric derived earlier this year to the CMIP5 models. Ken indicated he already did, and will resend this analysis to the task force. Matt suggested that we should revisit the CMIP5 intercomparison more in September to see where we stand, either during the Pan-GASS meeting or in the follow-on task force meeting the next week. Ken and everyone else agreed.

ACTION ITEMS: Daehyun will contact Jialin to harmonize the models used in their respective analyses. The task force will provide short-term advice to Jialin in his intercomparison effort. A longer-term goal will be for the task force to develop a comprehensive paper on boreal winter and summer MJO performance in CMIP5 models, with progress to be updated in September.

5. AMS Policy Statement on the Energy Sector and Earth Observations, Science, and Service

In this AMS statement that is currently posted for comment, Chidong notes a lack of emphasis on subseasonal problems, even though many in the policy realm and private sector have noted the importance of subseasonal prediction. Chidong notes that this omission may be for a couple of reasons. First, the concepts of weather and climate are well-defined, although the intraseasonal timescale is more of a grey area. Further, many people have not realized the importance of subseasonal processes to prediction. We might need to do a better job as task force on educating people on its importance. For example, whenever we see such omission in statements such as this, we might make an effort to point it out. Chidong wonders whether we also should be doing anything else? Augustin wondered whether we need to contact the user community to garner their feedback and support. Eric sent the task force an example of how one firm (Chesapeake Energy) makes use of subseasonal forecasts for the energy sector. Matt asked whether we should all send comments to AMS on this current statement. Chidong says yes. Chidong also mentioned an upcoming AMS statement on climate service that feature daily to decadal forecasts as a priority. Subseasonal is in here, but AMS might not realize strongly enough that we can already provide subseasonal forecasts relatively successfully, but not decadal, and so subseasonal should get more emphasis. It was asked whether we should collect info from companies who use subseasonal predictions to gauge their importance. Matt said anecdotally that many companies were upset when his website that provided real time MJO monitoring went down, and called to ask on the status of the site.

ACTION ITEM: All task force members should make comments on the AMS website by July 13 about the lack of subseasonal content in the AMS energy statement.

6. THORPEX implementation plan on subseasonal to seasonal prediction

Duane gave a brief update on the THORPEX implementation plan on subseasonal to seasonal prediction, currently contained within a 10-15 page document. The fate of this plan will be discussed in July at a WWRP meeting, and so will know the outcome of this plan then (although it is likely to pass). Workshops are part of the plan, and given the topic, it would be logical for this group to coordinate with the MJO task force. Duane also noted that THORPEX is deciding its fate when its current term ends. Three possibilities were mentioned: 1) it will simply wind down, 2) it will be extended 10 years, 3) its goals will be refined to include subseasonal and polar processes. An SSC meeting will occur in September/October in Geneva at which the plan will be discussed, and Augustin also noted a US Thorpex meeting during the week of Sept 17 with possible similar discussions.

7. Other Items

Joshua asked whether the task force was aware of the upcoming science plan to come out of the U.S. CLIVAR summit, and its lack of intraseasonal emphasis. Duane said that subseasonal should be in the science plan, since it would support NOAA subseasonal research and that of other agencies. Ken said that International CLIVAR's mission does include this. Chidong can talk to Mike Patterson about this, to make US CLIVAR realize that climate forecasts should not start at seasonal timescale. Joshua will

draft a letter to send to Mike Patterson, and will garner feedback from the rest of the MJO Task Force before sending.

ACTION ITEMS: Joshua will draft a letter to Mike Patterson to stress importance of the intraseasonal timescale to the CLIVAR mission, will circulate to the task force, and then send to Mike Patterson by the July 17-20 CLIVAR summit.

Ken asked whether we can get an update of skill assessment from Jon at the September meeting? It was noted that since Jon cannot be there, maybe Matt will provide such an update, or Augustin by phone.

Ken noted that the sooner we contact Valery the better to provide information on our travel support requirements for the Pan-GASS meeting, since she will be going to Beijing for the JSC meeting shortly.