YOTC MJO Task Force –14th Telecon

Meeting time: 21:00 GMT, 28th November 2012.

Participants:
Task Force: Matthew Wheeler, Eric Maloney, Chidong Zhang, Duane Waliser, Daehyun Kim, Hai Lin, Jun-Yi Lee, Joshua Fu

Others: Xianan Jiang

Agenda
1. Matt/Eric writing 3 articles on MJO-TF activities (including summary and forward plan for WCRP/WWRP) - 6 min
2. A rotation of 5 members at end of year - 4 min
3. Future meeting with IWM-V in Macao, Oct 2013 - 10 min
4. Introduce Min-Seop Ahn, In-Sik Kang student - 5 min
5. Update on DYNAMO case for diabatic heating project - 10 min
6. Contacting APCC to ask them to host BSISO index forecasts (with WGNE) - 5 min
7. Process-oriented diagnostic; Daehyun's RCP applied to CMIP3/5 - 30 min
8. ISVHE update from June-Yi - 10 min

Meeting Minutes (by Matt and Eric)

1. Matt/Eric writing 3 articles on MJO-TF activities Matt updated the task force on the three summary articles that Matt and Eric are slated to contribute to, with assistance from the task force. One is a GRL Frontiers article led by Chidong that includes section on the MJOTF, YOTC, the diabatic heating project, and DYNAMO. Matt and Eric have already submitted a draft to Chidong of their contribution. The head of International CLIVAR asked the task force to write an article for CLIVAR exchanges on MJOTF activities and future plans. Matt noted that we have agreed to include 2 figures in the paper (Jun-Yi's figure on the boreal summer ISO and Jim Benedict's figure detailing how the moist static energy budget can be used in process-oriented diagnostic development). A third document to be submitted to WCRP and WWRP will include a summary of task force accomplishments and plans for next three years as part of the task force renewal. Eric asked why in a recent email exchange with Nakazawa's he indicated only a 2-year renewal period for the task force. Duane indicated there is some fuzziness here, and that the task force was slated to sunset with YOTC in 2 years, although we should shoot for a 3 year extension in the proposal as it makes sense to continue task force activities beyond the YOTC period given connections to S2S, AAMP, etc.

Action Items: Eric and Matt will complete all three documents by the end of December.

2. Rotation of 5 TF members for the next term. Matt discussed the plans for the rotation of five MJOTF members for the renewal of the task force. Chidong has already rotated off of the task force voluntarily. Matt and Eric will contact 4 others in the next couple of weeks. A new focus on air-sea interaction and gender equity helped motivate part of the decision for rotation of the task force membership. Matt and Eric will also contact new TF members to secure their participation.

Action Items: Matt and Eric will contact task force member rotating off in the next couple of weeks to thank them for their service. Matt and Eric will contact new task force members to secure their participation.

3. Future meeting with IWM-V in Macao, Oct 2013. Discussion ensued of the IWM-V meeting in Macao and potential task force participation in this meeting. Duane noted that the potential for an AAMP component at this meeting would be make it a very attractive venue for our next task force meeting. Regarding possible participation and support of the GASS/diabatic heating project folks, we had not heard from Steve Woolnough and Jon Petch as of yet, but we will ping them again (Update: Jon Petch and Prince Xavier provided general support for the idea of meeting in Macao, with discussion of a possible separate diabatic heating meeting afterward in Macao or Singapore). Dick Johnson and CP Chang will coordinate a DYNAMO session. Eric thought it a good idea to coordinate with Dick to involve the MJOTF in the session planning to incorporate MJOTF science into the meeting agenda. The task force generally looked favourably on task force participation at the Macao meeting.

Action Items: Matt and Eric will coordinate with CP Chang and Dick Johnson to integrate the MJOTF into the Macao workshop, including joint session planning. Duane will follow up with Jon Petch and Steve Woolnough regarding planning for a diabatic heating/vertical structure project component to the workshop, or participation in a separate meeting the week after.

4. Introduce Min-Seop Ahn, In-Sik Kang student. We discussed the integration of Min-Seop Ahn into the TF activitites. Min-Seop is a new Korean student working with In-Sik Kang to help the task force do an analysis of the MJO in CMIP5 models using the MJOWG diagnostics package. He has already started working with the CMIP5 data. The rate of data download of all fields is 1 week per CMIP5 model. Daehyun indicated that he first downloaded daily precipitation data for 17 models, and has some initial plots showing precipitation variance and spectra. The same website that Daehyun developed for diagnostic development during the MJO Working group days is being populated with CMIP5 results (http://climate.snu.ac.kr/mjo_diagnostics/index.htm). The task force noted that it might be timely for a comprehensive presentation of these results in Macao. If so, Min-Seop's participation in this meeting should be given a high priority for travel funding.

Action Items: The MJO task force will help Min-Seop as much as possible with science and technical issues related to the application of the MJOWG diagnostics package to CMIP5 models.

5. Update on DYNAMO case for diabatic heating project Duane first provided a brief update on progress relating to the diabatic heating project, including hindcasts for the YOTC period. About 25 modeling groups have so far contributed for the initial experiments, with preliminary analysis underway. The timeline for the project including initial publications and meetings was reiterated, and generally that follows that presented during the September task force meeting in Boulder (see the notes from that meeting). A workshop is planned for the Fall (as mentioned above, possibly in conjunction with the Macao monsoon workshop) at which a comprehensive analysis of the simulations will be presented that might set stage for identification of high priority process modelling needs.

Then, Chidong discussed an extension of this project to a DYNAMO case, with a tentative experimental framework commensurate with that discussed at the GASS meeting. The idea is to start from the experimental framework prescribed for the YOTC period, but with a bit more flexibility included in this plan, so that simulations from modelling groups with fewer resources will still be accepted for project participation (e.g. that due to space and computing limitations cannot conform to the exacting data requirements), as long as other requirements such as common initialization times are met. Chidong will need to submit a formal proposal to GASS to formalize the DYNAMO case study plan, which will likely focus on the second November MJO event during DYNAMO when data coverage was at its peak. Chidong asked Duane what kind of proposal needs to be sent to GASS? Duane said that a one page document may be enough. This proposal is due in early December. Duane asked whether it might make sense to get a postdoc and also some storage space to aid with the extension to the DYNAMO case. EOL and Tim Li have committed to provide storage already, and Tim also may have a potential postdoc to contribute to the project, as long as a proposal gets funded. Daehyun says that he has the ECMWF data and has created initial condition datasets for use with the GISS model to help with hindcasts. Eric also indicated that Jerry Olson and Rich Neale at NCAR have created ECMWF initial conditions for CAM that can be used to run hindcasts.

Action Items: Chidong will submit a proposal to GASS formalizing extension of the diabatic heating project to a DYNAMO case. Duane will work with others to plan participation of the vertical structure/diabatic heating project in the Macao meeting.

6. Contacting APCC to ask them to host BSISO index forecasts (with WGNE) Matt reported a very positive response from the director of APCC (Chin-seung Chung) to host the task force's boreal summer forecasting activity. Dr.

Chung has forwarded this request to researchers within APCC who will work out the details of the implementation and get back to the task force within a week.

Matt also reported on the number of hits to the NCEP CPC site that hosts the task force's MJO forecasting activity. According to Jon Gottschalk, the number of hits in March 2012 was 283,000 during the month and it had a rank of the 22nd most popular CPC product. CPC has literally hundreds of thousands of individual products. Some other interesting facts: 1.) The hits were highest during the strong MJO in spring 2012 2.) Hits appear to be much lower during boreal summer, but still are on the order of 20-30,000 per month and rank within the top 150 CPC products 3.) Hits have started ramping up again for the boreal winter season and Jon thinks this winter hits will continue to increase as November 2012 numbers are not yet complete.

7. Process-oriented diagnostics; Daehyun's RCP applied to CMIP3/5

Daehyun discussed his continued travails with the development of process oriented diagnostics. He initially gave an update on ongoing development of the diagnostic featuring pattern correlations of the RH profile vs. precipitation rate. Prince was thanked for making a large effort to download vertical profiles of RH data from 13 CMIP3 models and 14 CMIP5 models. A revised method of weighting by mass of the layer before calculating the diagnostic causes performance of the diagnostic to substantially decrease (to near zero correlation on the MJO skill versus diagnostic scatterplot!). This is interesting, and led Daehyun to explore new avenues. A new diagnostic was developed that plots RH (averaged between between 500 and 850 hPa) in the top 1% of precipitation bins versus MJO skill. The physical idea behind this diagnostic is that it tests the requirement for the column to be near saturation before heavy precipitation can occur. The scatterplot of MJO skill versus diagnostic produces high correlations of 0.7 or so when all models are used, indicating some success for this diagnostic. Performance gets a bit better when removing CNRM. Chidong asked whether this diagnostic artificially builds in the hypothesis that only heavy rainfall is important to the MJO? Chidong suggested that one could plot frequency of heavy precipitation as function of MJO phase to see how many points on right of the plot (high average precipitation bins) occur in the enhanced phase of MJO. Daehyun also tried using boxes in the lower 1% of precipitation bins and also the difference between upper and lower 1%, although this didn't do as good versus just looking at the high end. Xianan asked if the ratio of eastward to westward power used to assess MJO skill would be sensitive to latitude band used? Daehyun said he would explore the sensitivity. Matt asked why RH is over 100% for the higher precipitation bins for some models, and whether this is real, and Daehyun indicated that some models produce this behaviour. Duane asked whether the RH is calculated before the physics step when outputting the RH, which might explain the supersaturation? Daehyun indicated that this may be the case. Tony Del Genio said calculation of RH is not standard between models, especially in the presence of Ice, and so care should be used when interpreting RH differences from model to model. Daehyun indicated that a similar analysis

that used upper troposphere RH was not robust. Chidong asked whether when the averaging box was moved left from the upper 1%, whether the correlation of MJO skill versus average was decreased? Daehyun has not tried this yet. Chidong said should put more work into understanding why the correlation analysis for method 1 does not work with inclusion of mass weighting.

Action Items: Daehyun will continue to explore development of process-oriented diagnostics based on RH, keeping the comments of the task force in mind.

8. ISVHE update from June-Yi. June-Yi had 7 slides to show, covering the topics of the ISVHE and the BSISO real-time monitoring project.

For the ISVHE, June-Yi has made many improvements to the web pages at http://iprc.soest.hawaii.edu/users/jylee/clipas/ to help gain greater interest from the research community. (As an aside, June-Yi has created a logo for the MJO-TF to illustrate the support of the ISVHE project - blue lettering with an earth for the "O", and we agreed that it looked like a good one to use if the need arises in the future). The full data from 12 models has been collected, 10 of which are one-tier (coupled) systems, and 2 of which are two-tier systems employing atmosphere-only models. Six on-going ISVHE research projects have been defined with different leads. They are:
1. Overview of MJO and BSISO prediction in ISVHE (June-Yi Lee and Bin Wang lead)
2. Intrinsic modes of MJO and BSISO in ISVHE coupled models (June-Yi Lee and Bin Wang lead)
3. MJO predictability (Duane E. Waliser and Neena Joseph lead)
4. ISO prediction over the eastern Pacific (Duane E. Waliser and Neena Joseph lead)
5. Prediction of MJO teleconnection (Net Johnson leads)
6. Prediction of BSISO teleconnection (Ja-Yeon Moon leads)

June-Yi then showed some results that will be included as part of their overview paper on the MJO/BSISO prediction. For the BSISO, the mode that we define as BSISO1 (using EOFs 1 and 2) is well predicted out to about 15-20 days by the multi-model ensemble (MME), whereas for BSISO2 (EOFs 3 and 4) the prediction skill extends only out to 10-15 days, consistent with its shorter time-scale. For the MJO (defined by RMM1 and RMM2) the prediction skill in the MME extends out to 20-25 days. Hai Lin suggested using the bi-variate correlation measure for these skill plots rather than having them displayed separately for each EOF component. June-Yi agreed.

For the BSISO real-time monitoring, June-Yi had one slide to advertise her web page that shows the indices in real time.