

YOTC MJO Task Force – 10th Telecon

Meeting time: 21:00 GMT, 17th August 2011.

Participants

Task Force:

Matt, Duane, Ken, Harry, Frederic, Daehyun, Masaki, Augustin, Eric, Joshua, Jon, Hai

Others:

June-Yi Lee, Xianan Jiang

Proposed Agenda

I) Updates on our 4 subprojects:

- 1) Process-Oriented Diagnostics/Metrics for MJO Simulation - Leads: D. Kim, E. Maloney
- 2) Boreal Summer Forecast and Monitoring Metrics - Leads: M. Wheeler, J. Gottschalck, J.-Y. Lee
- 3) Vertical Structure and Diabatic Processes of the MJO - Leads: D. Waliser, P. Xavier, Xianan Jiang, Jon Petch
- 4) MJO Metrics for WGNE/WGCM Climate Metrics Panel - Leads: K. Sperber, H. Hendon

II) Discussion on potential focus area on MJO influence on TCs - J. Fu.

Meeting Minutes (by Matt and Duane)

I)

1) Process-oriented diagnostics/metrics for MJO simulation

Daehyun sent slides for discussion. The first 9 slides were from him, and the last 4 slides were Eric's. Harry helped with the discussion of the slides when Daehyun's phone cut out.

Slide 2 investigates the number of years of observations or model data required to have a robust estimate of the east/west power ratio. Daehyun computed this by breaking up the observational record into different length segments. His conclusion is that about 7 or 8 years of data is required. Harry pointed out that using statistical assumptions and theory this may be estimated from just a calculation of the east/west power ratio from the individual years (i.e. using power computed from different 1-year segments). He provided further details in a subsequent e-mail. He also thought that the interannual standard deviation of the power estimate was a useful diagnostic in itself. Can models reproduce this large year-to-year variability in MJO power?

Slide 5 showed how the RH metric is quite sensitive to the observational data product that is used, both for the RH estimates and precipitation estimates. The combinations

shown are AIRS/GPCP, NCEP1/GPCP, NCEP2/GPCP, ERA40/GPCP, ERAinterim/GPCP, MERRA/GPCP, AIRS/GPCP. The metric was also shown using the precipitation estimates from the model analyses. Duane pointed out that some of these model analyses are already considered obsolete (e.g. NCEP1, ERA40). Also, can this plot be used to estimate the observational uncertainty in the RH diagnostic?

Slides 6, 7, and 8 show the resulting multi-model correlation between the various “MJO metrics” (e.g. east/west power ratio) and “Process-oriented metrics” (e.g. RH-composite based on precipitation). The highest correlation is achieved using the “east power” and “rh_comp_pcor” (correlation of 0.68 when using MJOWG and CMIP3 models).

Eric discussed the column-integrate moist static energy MSE (or entropy) export binned by some measure of convective activity. This could be used as another process-oriented metric, as suggested to be important for the MJO by Raymond and Fuchs (2009). They show that in the GFS, which does not have a good MJO, MSE export due to vertical advection is positive even for periods of modest convergence, that is, convective activity tends to dry the atmospheric column. In contrast, results from Jim Benedict for the SP-CAM show that convection in that model does not dry the column. Eric has plans to extend these calculations to other models as a pilot MJO-MSE budget model intercomparison project.

Eric and Duane noted that the data needs for this intercomparison project are very similar to the MJO diabatic heating MIP. We should thus strive to have the same sets of output from both sets of model experiments. For the diabatic heating MIP, the experimental specifications are listed on the MJO-TF web page.

Eric presented this and other ideas of the process-oriented metric subgroup at a recent CMMAP meeting in Fort Collins.

2) Boreal Summer Forecast and Monitoring Metrics

Not much new to report here. June-Yi showed some updated monitoring results on her web-page. She has also added links to her combined EOF structures and fortran code for computing the projection onto these structures.

Matt said he would look more closely at June-Yi’s web page and provide comments. Jon will download the EOF structures for application with the NCEP models.

Duane mentioned that the upcoming NOAA Climate Diagnostics and Prediction Workshop (October) will be a good location for looking at this topic further. June-Yi, Duane, Jon, and Bin Wang plan to be present.

3) Vertical Structure and Diabatic Processes of the MJO

Duane reminded everyone that the proposed experimental design is available on the MJO-TF web page. Comments are welcome from the MJO and modelling communities.

4) MJO Metrics for WGNE/WGCM Climate Metrics Panel

Since the last telecom there has been a lot of offline discussion by Daehyun, Harry, Ken, and others on steps that can be done to arrive at the best metric for this activity. The results are not yet ready for reporting to the group. It is expected that our face-to-face meeting during the OSC in October will provide the means to discuss and finalize many choices for a Climate Metrics Panel metric.

II) Discussion on potential focus area on MJO influence on TCs

Joshua provided slides to discuss his proposal to have a 5th subgroup of the Task Force on the topic of the MJO influence on TCs. His presentation covered all aspects of the MJO's interaction with TCs including societal impacts and implications for climate change impacts on TCs. These ideas are nicely described by Joshua's slides.

Duane noted that the Task Force is already stretched, so any new activity will have to be well justified. For example, is the new activity something that would benefit from being tackled by the TF, or would it be better tackled by an individual?

Xianan mentioned that he is doing work on the ISO and TCs over the East Pacific. They find that the GFDL atmosphere-only model does a good job at reproducing the observed behaviour.

Harry asked whether ECMWF are the only ones making dynamical forecasts of TCs on the intraseasonal (multi-week) time scale. The answer is yes. A nice outcome of this activity would thus be to get other modelling centres to produce intraseasonal TC forecasts. The proposed review paper could be focussed on this topic (i.e. intraseasonal TC prediction).

It was mentioned that Sig Schubert at GFDL has written a proposal on the MJO influence on TCs involving very high resolution modelling. There is also a (proposed only?) hurricane working group in US-CLIVAR that would have some overlap. Suzana Camargo is the contact for this group.

Matt asked whether the ISV hindcast dataset in Hawaii would be good enough to determine the predictive capability of TCs on the intraseasonal time scale by the models. This would depend on the resolution of the models – it requires a relatively high horizontal resolution to model something that resembles a TC. Frederic thought that the TIGGE database would be better for that task, as these models are higher resolution, although they don't have forecasts beyond about 15 days.

Joshua will work on refining his proposal based on these comments.