YOTC MJO Task Force
Ad Hoc Meeting at AMS

Meeting time: 16:30 PST, 25 January 2011.

Participants

Task Force:

Duane, Ken, Eric, Jon, Chidong, Masaki, Richard, Hai

Meeting Minutes (by Duane)

The WGCM/WGNE Metric Panel, via P. Glecker (chair), asked Ken to work with the MJO TF to develop a small number (e.g. 1-3?) metrics (i.e. single value quantities, not maps) that can be used, among other things, in the context of CMIP5 model evaluation. Three strawman metrics were proposed in an email by Ken to the group prior to the meeting (attached at end of minutes). These were discussed, along with virtues of considering OLR vs precip, precip vs low level winds etc. The group generally liked metric 1), possibly along with the same thing for the total anomalous variance and the fraction so that the overall level of variability is captured as well – with each then using the correlation and RMS as suggested. Advantages and disadvantages of 2) and 3) were discussed and there was a sentiment to try and actually capture the MJO mode. The suggestion was made to take daily (full) anomaly model output and project onto two WH modes that will give a PC1 and PC2. Their amplitude, correlation, and lag for maximum correlation give information on how well the model represents the MJO mode – spatial structure, phase speed, etc. There was some concern about the complexity of this process as the request was for very simple metrics. Jon offered to give the code in the event that would help. Ken said he might try to compute this metric along with the 3 strawman metrics mentioned above for a number of models so we could better ascertain a "final" recommendation. In writing this, I noticed that Ken already emailed Peter Gleckler to convey our discussion and suggestions, with a solicitation for his feedback.

Jon provided us some update on the MJO WG/TF forecasting metric activities. He made an excellent presentation on the BAMS paper / MJO forecast activity at AMS that was attended by Hai, Chidong, Ken and Duane. Recently, he has written to ECMWF to try and get permission to post their forecasts within the activity in real time rather than having use restrictions – he has not received a reply yet. He is preparing the forecast metric system for readiness to support DYNAMO and also working on expanding the forecast verification procedures and associated graphics for the web site. He has also performed some preliminary MME calculations, based on equal weighting of each forecast system that is participating. He will report on these in future telecons.

Richard provided some commentary and information on MJO variability in the CAM and CESM models at NCAR. CAM4 is not so different than CAM3.5 that had poor to modest MJO variability. The newest version CAM5 has not been looked at in very much detail and encouraged the TF to look at it if someone had time and he would facilitate access.

Duane gave an update on where things stand with the diabatic heating experimentation and the connections being made with YOTC and GCSS. At present, a framework is coming together to have a long-term simulation and a handful of hindcast case studies from YOTC. Jon Petch and Chris Bretherton (both co-chairs of GCSS) and Steve Woolnough (member of GCSS) are very interested in collaborative effort. They have offered Prince Xavier (UKMO) to help with the GCSS side of the collaboration. So Xianan Jiang and Prince Xavier may act to do much of the organizational work on this, with Jon, Steve, Duane and Chidong helping to shepherd and advise them in carrying out the experiment and analysis.

Masaki provided some updates on the experimentation taking place with the NICAM model which includes a couple MJO case studies, including a winter 2009/10 case which he highlighted as being a good case study. They are especially interested in the MJO-TC interactions. He also mentioned that as part of the "Athena" project, they have produced 8 boreal summer simulations. Analysis on these is being performed now and some of the results are being presented at the YOTC symposium in May.

Email from Ken to MJO TF yesterday to prepare for today's ad hoc meeting.

Duane et al.:

The WGNE/WGCM Metrics Panel is interested in a few simple scaler MJO metrics that can be used for CMIP 5 model validation. Their goal is to assemble a short list of metrics for climatologies and modes of Variability (see http://www.clivar.org/organization/wgcm/wgcm-14/talks/041010/MetricsPanel.pdf).

I suggest 3 possible MJO metrics, based on the figures etc. from the MJOWG et al. paper, though perhaps 2 will be sufficient.

1) Generate Fig. 4, the percent variance explained by 20-100 day filtered rainfall (or OLR) over the domain 30S-30N, 0-360.

Metric: pattern correlation vs. RMS difference of model with observations

2) Generate daily or 20-100 day filtered anomalies of rainfall (or OLR) over the Indian Ocean (10S-5N, 75E-100E) and the western Pacific (20S-5N, 160E-185E). These regions were given in MJOWG et al. Calculate correlation as a function of time lag.

Metric: plot maximum positive correlation vs. time lag

3) Generate Fig. 5, plot of the correlation of Indian Ocean (10S-5N, 75E-100E) rainfall (or OLR) with 10N-10S averaged filtered rainfall (or OLR) at each longitude as a function of time lag.

Metric: pattern correlation of model with observations

(2) and (3) both give propagation information, but (2) is simpler and potentially more useful since the metric gives the strength of the relationship and time scale.

The Metrics Panel would promote these simple metrics and refer the reader to more comprehensive diagnostics and metrics.

Time-permitting, we can talk about these tomorrow, and in the next telecon. Please make your own suggetions for candidate metrics.

Ken