NEWS FY09 July Update

NASA Model and Observation Products for the Study of Land Atmosphere Coupling and its Impact on Water and Energy Cycles

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1) Project Status & Progress:

- LoCo Diagnostics: Compiled results and statistics of various experiments and produced analysis for publication in JHM (in print January 2009). Results also presented to the AGU 2008 Fall Meeting, and keynote addresses to the GEWEX-GLASS 'LoCo' (June 08; July 09) and the GEWEX-GABLS (June 09) communities.

- LIS-WRF upgrades: The latest version of LIS(v6) is being coupled to the latest publicly released version of WRF(v3) to make available the many improvements and additional features and schemes available in each.

- Imported the ECMWF land surface model (TESSEL) into the LIS and LIS-WRF system as a result of collaboration with the Dutch Meteorological Institute (KNMI; Bart vd Hurk).

- Currently performing LIS-WRF experiments for the NEWS Integration Project #2 (2006-7 dry/wet extremes) to test and develop more robust coupling diagnostics using a more complete set of LSMs in LIS with the new PBL schemes available in WRF(v3).

- In addition, an 11-year MMF simulation from January 1998 to December 2008 has been started. It is expected that the model integrations will be finished at the end of January-February 2010. This data will be used for studying diurnal variation (over land and ocean) and cloud properties (land and ocean) during different climate regimes (ENSO).

2) Collaboration:

- Continued collaboration with GLASS-LoCo and GABLS scientists concerning the diagnostic approach. In particular their expertise in PBL physics and modeling compliment NASA/HSB's and our NEWS study's expertise in land surface modeling. This will aid in understanding and applying LoCo diagnostics in an improved manner that is more physically sound and of greater interest to the climate/atmosphere communities.

3) Publications and Presentations:

Santanello, J. A., C. Peters-Lidard, S. Kumar, C. Alonge, and W.-K. Tao, 2009: A modeling and observational framework for diagnosing local land-atmosphere coupling on diurnal time scales. *J. Hydrometeor.*, **10,** 577-599.

Santanello, J. A., C. Peters-Lidard, S. Kumar, C. Alonge, and W.-K. Tao, 2009: LoCo and LIS-WRF updates from NASA-GSFC. ***GEWEX Symposium*** on Global Evaporation, Wallingford, UK, 15 July.

Santanello, J. A., C. Peters-Lidard, S. Kumar, C. Alonge, and W.-K. Tao, 2009: Updates on the GLASS-LoCo Initiative: Results, Collaborations, and Outlook for the Future. ***GABLS Workshop***, Boulder, CO, 27 June.

Santanello, J. A., C. Peters-Lidard, S. Kumar, C. Alonge, and W.-K. Tao, 2008: A modeling and observational framework for diagnosing local land-atmosphere coupling on diurnal time scales. ***AGU 2008 Fall Meeting***, San Francisco, CA, 16 December.

Shen, B-.W., W.-K. Tao, R. Atlas, Y.-L. Lin, C. D. Peters-Lidard, and K.-S. Kuo, 2009: Forecasts of tropical cyclongenesis with a global mesoscale model: Preliminary results with twin tropical cyclones in May 2002. *J. Geophy*. *Res.,* (submitted).

Tao, W.-K., D. Anderson, J. Chern, J. Entin, A. Hou, P. Houser, R. Kakar, S. Lang, W. Lau, C. Peters-Lidard, X. Li, T. Matsui, M. Rienecker, M. R. Schoeberl, B.-W. Shen, J.-J. Shi, and X. Zeng, 2009: Goddard Multi-Scale Modeling Systems with Unified Physics, *Annals Geophysics*, (**in press**).

4) Issues:

None at this time.

5) Integration: Define your project's current and near-future contribution to integration projects (both NEWS multi- PI, as well as the 3 defined questions). Define expectations for action items (a forward looking timeline) specifically; what can you commit to and who can you connect with to make progress towards answering questions.

- Our contributions are to the #2 project '2006-2007 extremes'. In designing the LIS-WRF experiments for the NEWS Integration Project, we have collaborated with another NEWS PI (Dong) who has performed in in-depth empirical/observational analysis of the SGP during these dry and wet regimes. Their results have been valuable in pinpointing ideal regions and periods of interest for the ongoing simulations.