2007 Fall Meeting
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HR: 09:30h
AN: **GC51B-07**
TI: Analysis of Global Atmospheric and Terrestrial Hydrological Budget Using Merged Satellite Data Sets
AU: ***Gao, X**
EM: *xgao304@mit.edu*
AF: *Massachusetts Institute of Technology, Bldg. E40-414 1 Amherst St., Cambridge, MA 02139, United States*
AU: **Schlosser, A C**
EM: *casch@mit.edu*
AF: *Massachusetts Institute of Technology, Bldg. E40-414 1 Amherst St., Cambridge, MA 02139, United States*
AU: **Houser, P R**
EM: *mouser@iges.org*
AF: *Center for Research on Environment and Water (CREW), 4041 Powder Mill road, suite 302, Calverton, MD 20705, United States*
AU: **Entin, J K**
EM: *jared.k.entin@nasa.gov*
AF: *National Aeronautics and Space Administration, Code YS, NASA Headquarters, Washington, DC 20546, United States*
AB: One of the main objectives in NASA Energy and Water Cycle Study (NEWS) is to assess our water cycle observational capabilities and promote the development of an experimental global observation system. As part of the integrating auspice of NEWS, efforts have been made to compile the state-of-the-art satellite-based data sets for the global atmospheric and terrestrial hydrological budget analyses. The NEWS Water-cycle integration and Analysis (WIA) has focused its initial efforts on combining precipitation, evaporation, total precipitable water change, and terrestrial water storage changes to evaluate their consistency in global scale water budgets, assess their spatial and temporal variations, and develop research and analysis toward improved observational capabilities. In this study, our global scale water budget analyses consider the more recently developed satellite-based products, which are limited in time (i.e. span less than a decade) and space (most cover from 50S to 50N). Wherever possible, rigorous estimates of sampling error/uncertainty for all water-cycle variables are provided for a more robust quantification of the consistency in these budget terms. The preliminary results indicate that there exist notable systematic differences in the monthly water export time series, which is mainly attributed to the use of various precipitation data sets. Nevertheless, all precipitation data sets convey a consistent depiction of overall evaporation excess for the 50S to 50N region, implying a net export of water vapor to higher latitudes. As far as global annual mean precipitation rates are concerned, most of the discrepancy stems from differences over the ocean. We also compare these budget and residual estimates to reanalyses products

(e.g. NCEP-NCAR, NASA, and ECMWF) and coupled GCM simulations from the IPCC AR4 archive. Through such cross-comparison exercises, we highlight consistencies and discrepancies between model estimates and satellite observations to not only increase confidence in these products, but also to provide insights on the regions where the continued evaluation, future model improvement, in-situ networks, field campaigns, and (potential) experimental satellite missions should emphasize.
DE: 1836 Hydrological cycles and budgets (1218, 1655)
DE: 1855 Remote sensing (1640)
SC: Global Environmental Change [GC]
MN: 2007 Fall Meeting

New Search