

Highlights - August/September 2009

- ▶ The **NEWS Energy and Water Cycle Climatology (NEWCC)** project is aimed to synthesize a self-consistent climatology to describe the global energy *and* water cycles using state-of-the-art satellite information developed by NEWS scientists as well as refinements from the community-at-large. The NEWCC project maintains a Google Group site and welcomes all scientists to join in our efforts to refine our global water and energy cycle assessments:
<http://groups.google.com/group/news-energy-and-water-cycle-climatology?hl=e>
- ▶ **Version 2.1 (V2.1) fo the GPCP monthly product and Version 1.1 (V1.1) of the GPCP One-Degree Daily (1DD) product have just been released.** The new data products and documentation are available on-line at <http://precip.gsfc.nasa.gov>.
- ▶ **Landslides and Flooding in Taiwan and Japan: Real-tme Global Monitoring Using Satellite Data** including (TRMM Estimations) and Hydrological Models and Landslide Algorithms. For more information to to <http://trmm.gsfc.nasa.gov> and click on "Global Floods and Landslides".
- ▶ **MERRA new has 1979-2005 data complete and on-line.** A neural network methodology has been developed for application to passive microwave data (SSM/I) that demonstrates significant error reduction in deriving outputs needed to drive ocean turbulent flux alorithms: specific humidity, air temperature, wind speed, sea surface temperature, and precipitable water. For more information go to http://gmao.gsfc.nasa.gov/merra/data_access.php.
- ▶ **New satellite data and techniques allow scientists to solve the paradox of Sahel precipitation jump.** by combining the effect of onshore flow at the surface and offshore transport aloft, they show that the depth-integrated moisture advection across the Atlantic coast into the Sahel region is in-phase with the annual and interannual variations of Sahel rainfall, but off-phase with the transport across the northern coast of the Gulf of Guinea and the rainfall just inland from this coastline. Results will provide a new perspective and advance our understanding of the onset of West African monsoonal rainfall and the ability to predict it, which is important to survival in the marginal agriculture of the Sahel. For more information email W.T.Liu@jpl.nasa.gov.
- ▶ **A new surface roughness model developed by M. Bourassa of Florida State University has been combined with the Clayson/Curry surface renewal bulk turbulent flux model, a sea spray parameterization, and ocean wave data.** The NEWS product better represents the observed conditions shown in hurricanes. The model is providing a 10+ year data set that can be used to evaluate coupled climate model simulations and conduct diagnostic studies to improve understanding of the water and energy cycle variability on time scales from the diurnal to the decadal.
- ▶ **Adjustment of satellite-based rainfall estimation using global GPCP rainfall estimation enables the estimation to match GPCP rainfall at monthly scale, and provide bias adjusted satellite-based rainfall at sub-daily scale.** Preliminary results show effective downscaling of low spatial and temporal GPCP rainfall estimation to sub-daily rainfall from PERSIANN estimation.
- ▶ **Separate evaluations of the contributions by radiation, precipitation and surface sensible heat flux have revealed that the surface sensible heat flux is more important than might have been expected from the magnitude of the fluxes and that although radiation and precipitation act in-concert to force the mean atmospheric circulation, they act in opposition in storms.**
- ▶ **Quantifying the key reservoirs and fluxes in the atmospheric branch of the global water cycle over the ocean is now possible with the "Passive Microwave Water Cycle" (PMWC) product, developed**

within NEWS. PMWC estimates of water vapor transport are derived using estimates of the surface wind vector. PMWC uses CCMP ocean surface wind vectors, which were developed by a NASA MEaSUREs project. CCMP vectors are derived from surface wind speed satellite retrievals, which are produced by the NASA MEaSUREs DISCOVER Project.

References:

Levinson, D.H., et.al, 2009: Global precipitation, in State of the Climate 2008

Hilburn, K. A., 2009: The passive microwave water cycle product

▶ **A dataset combining temperature and water vapor observations from AIRS, AMSR-E and MLS in the A-Train constellation was delivered to the CREW data server.** These combined data include total water vapor from AMSR-E over ocean, and from AIRS globally. Height-resolved water vapor extends from the surface to the upper troposphere have shown remarkable consistency between water vapor observations from these instruments (Fetzer et.al., 2006; 2008, Read et.al, 2007). These data are being used by A. Schlosser of the NEWS team in studies of the global water budget. For more information email Eric.J.Fetzer@jpl.nasa.gov.

▶ **The first satellite-based atmospheric diabatic heating profile product now spans the region from 40N to 40S and the decade from 1998-2007.** Ongoing analysis of this product is improving our understanding of the role of atmospheric heating in the climate system that may ultimately improve our ability to represent these effects in climate prediction models.

▶ **A modeling and observational framework for diagnosing local and land-atmosphere coupling of water and energy cycles has been successfully demonstrated.** For more information email Christa.D.Peters-Lidard.

References:

Santanello et.al, 2009: A modeling and observational framework for diagnosing local land-atmosphere coupling on diurnal time scales.

▶ **Investigation of the 2006 Drought and 2007 Flood Extreme Events at the US SGP using an integrative analysis of observations.**

References:

Feng, Z., et.al, 2009: A Method to Merge WSR-88D Data with ARM SGP Millimeter Cloud Radar Data by Studying Deep Convective Systems.