SSEC/CIMSS
Seminar

MARZIEH AZARDERAKHSH
The City College, CUNY, NOAA - CREST

Dynamics of terrestrial water budget over large scale basins using satellite data

The components of the Amazon water budget and their spatio-temporal variability are diagnosed using monthly-averaged remote-sensing based data products for the period September 2002-December 2006. The large Amazon basin is divided into 15 smaller watersheds, and for each of these sub-basins (SBs), fresh water discharge is estimated from the water balance equation using satellite data products. We use several combinations of remote sensing (RS) estimates including total water storage changes, precipitation and evapotranspiration. The results are compared to gauge-based measurements and the best spatio-temporal agreement between estimated and observed runoff is selected for each SB. Using the most consistent data combination, the seasonal dynamics of the water budget within the Amazon system is examined. Agreement between satellite based and in-situ runoff is improved when lag-times between SBs are accounted. We estimate these lag times based on satellite inferred inundation extent verifications. The results reveal not only variations of the basin forcing but also the complex response of the inter-connected SB water budgets.

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Generating an Effective Temperature for Estimation of Microwave Land Surface Emissivity

Microwave remote sensing has a great potential in understanding the geophysical and atmospheric phenomena. Microwave radiation is emitted from atmosphere and the surface of the earth. Atmosphere contribution comes from column water vapor, clouds, and precipitating particles. To understand the atmospheric phenomena such as rain rate, cloud liquid water, and total precipitable water the contribution of the surface should be accounted and be removed from the microwave signal. This research aims to improve land surface emissivity estimates from the Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E) and investigating the effect of penetration depth. The difference in depth of originations causes an inconsistency between diurnal variation of infrared and microwave brightness temperatures, which can cause more than 10% difference between day and night determined land emissivity. A lookup table of effective physical temperature representative of the contributing layers of the microwave signal at each channel and month is adopted based on the diurnal cycle of brightness temperature. The implementation of the proposed effective temperature diurnal cycle lookup table showed that it can mitigate the differences between day and night retrieved emissivities significantly from AMSR-E observations.

Tuesday, 2 August 2011
2:00 p.m.
Room AOSS 351