Examination of the Spatio-Temporal Pattern of the Surface Heat Fluxes for China Based on the GSWP2 Dataset

Hongbo Su[1], Jing Tian[1], Renhua Zhang[1], Shaohui Chen[1], Paul Houser[2] and Eric Wood[3]

1 Key Laboratory of Water Cycle and Related Land Surface Processes, Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, 100101, China
2 Department of Atmospheric, Oceanic and Earth Sciences, George Mason University, Fairfax, Virginia 22030 USA
3 Department of Civil and Environmental Engineering, Princeton University, Princeton, NJ 08544 USA

Abstract: The Second Global Soil Wetness Project (GSWP2) is a land-surface modeling activity of the Global Land-Atmosphere System Study (GLASS) and the International Satellite Land-Surface Climatology Project (ISLSCP), both contributing projects of the Global Energy and Water Cycle Experiment (GEWEX). The Global Soil Wetness Project Phase 2 (GSWP2) provides global land model simulations, under a common experimental framework, at a 1°x1° resolution, spanning the years 1986-1995. GSWP2 serves as a global platform for the application of remote sensing to Land Surface Scheme (LSS) calibration, validation and assimilation. The baseline fields are a hybrid of observations and reanalyses for most surface variables. In most cases, 1° resolution is sufficient for land surface study at a global scale, however, when the study focuses on a continental or a river basin scale, a finer spatial resolution is needed. In our study, satellite derived land data products with a finer resolution (originally at 1km and resampled to 25km) are used in combination with the meteorological forcing data from GSWP2 to force a land surface mode (NOAH). The off-line simulation is conducted at 25km and 3 hourly. With the incorporation of new information (Land Cover, Vegetation, Albedo, Elevation, etc) from satellite into the land surface modeling, a more detailed spatio-temporal pattern of the land surface heat fluxes (i.e. latent and sensible, ground heat fluxes) for China mainland is examined over the period of 1985 to 1995. This study is built upon the software infrastructure of Land Information System developed by the Hydrology Science Branch of NASA Goddard Space Flight Center.

Corresponding author: Hongbo Su

Hongbo Su
E-mail: hongbo@ieee.org