A Long-Term Land Surface Hydrologic Fluxes and States Dataset for China

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A long-term consistent and comprehensive dataset of land surface hydrologic fluxes and states will greatly benefit the analyses of the changes and interactions for land surface variables, as well as the assessment of land-atmosphere parameterizations for climate models. While some offline model studies can provide balanced water and energy budgets at land surface, few of them have presented an evaluation of the long-term interaction of the water balance components over China. In the paper, we develop a 3-hourly, $0.25°$ retrospective dataset of land surface hydrologic fluxes/states for 1952-2012 over China using the Variable Infiltration Capacity (VIC) hydrologic model driven by long-term gridded observation-based meteorological forcings. In the newly developed dataset, the estimated streamflow matches quite well with the observed monthly streamflow at the large river basins in China. The simulated soil moisture reasonably reproduces the seasonal variation of the observed soil moisture at the monitoring sites with available long-term observations. As compared to the similar global product, the dataset can provide a more reliable estimate of land surface variables over China. The data product, which will be publicly available via internet, may be useful for the hydroclimatological studies in China.