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A land data assimilation system using the MODIS-derived land data and its applications

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The Asian region with its one third of the global population, due to rapid change in land use and large pressure for economic growth, has been undergoing significant environmental changes that are of great importance for agriculture and water resources. Therefore, better representation of land surface processes in the model can provide pivotal information in sustainability over this critical region. Currently, several Land Data Assimilation Systems have been developed to properly simulate the surface initial conditions such as soil moisture and temperature for better prediction of weather and climate and to optimally estimate hydrological states and fluxes relevant to water resources. In this study, in order to represent a realistic land-atmosphere interaction over the East Asian region we have developed the Korea Land Data Assimilation System (KLDAS) based on an uncoupled land surface modeling framework that integrates high-resolution in-situ observation, satellite data, land surface characteristics information for a mesoscale weather prediction model, and up-to-date land surface characteristics from satellite such as Moderate Resolution Imaging Spectroradiometer (MODIS). As a result of this effort, we have generated a 5-year (2004∼2008), 10km, and hourly atmospheric forcing dataset for use in KLDAS operating across East Asia and regional estimates of hydrological states and fluxes over East Asia. This presentation will introduce a methodology and implementation strategy designed to provide hydrological states and fluxes data over East Asia and preliminary results through applications using KLDAS.