Development of the Middle Eastern and North African Land Data Assimilation System

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The Arab region of the Middle East and North Africa (MENA) suffers from arid conditions, dense population, and inefficient use of fresh water resources. In addition, the lack of data sharing between nations has made accurate monitoring of the water cycle in the MENA difficult. These factors have nearly exhausted the existing fresh water resources in the region and have led to a re-evaluation of water management plans and budgeting schemes between nations. In order to utilize the existing resources more efficiently, it is necessary that all nations within the MENA have access to optimal estimates of hydrological states and fluxes relevant to water resources. This presentation will introduce a methodology and implementation strategy designed to provide frequent regional estimates of the water budget through the development of a Land Data Assimilation System designed specifically for the Middle Eastern and North African (MENA LDAS) region. The MENA LDAS optimally merges available in situ data with satellite-based estimates of meteorological variables including data from the Gravity Recovery and Climate Experiment (GRACE), the Moderate Resolution Imaging Spectroradiometer (MODIS), and the Tropical Rainfall Measuring Mission (TRMM) within a land surface modeling framework. As a result of this effort, a platform for data sharing among MENA nations is being developed to provide timely regional estimates of hydrological states and fluxes at 1/8th degree resolution. To be discussed will be the development and status of the system, and preliminary results from land surface model simulations over the region.