



## **A Testbed for Integrated Water Cycle Observations: A Grand Challenge for the Community**

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As more space-borne sensors for components of the water cycle are launched by NASA, ESA and JAXA, there is a critical need by the community to integrate the measurements into coherent data sets useful for global water cycle analyses. The hydrology community must recognize the potential of these measurements to address basic research and application questions related to the global water cycle. These include understanding the distribution of fresh water over and through the land surface, and how will this change over the next century; how water management can best adapt to changes in global hydrology from climate change; understanding the effects of a changing landscape and changes in water management on hydrologic processes; and whether remote sensing can be used to test hydrologic theory on spatial hydrologic processes. This leads to a Grand challenge for hydrology: can the storage, movement and quality of water at every point on the landscape be observed and modeled? This challenge requires integrated global remote sensing of the water cycle with these observations assimilated with in-situ observations and global land surface models. The presentation will discuss this challenge and its importance to hydrology, and offer a path-way for its realization through the development of a hydrologic testbed for integrated water cycle observations. Specifically the presentation will identify the elements of a water cycle testbed platform, and what initial activities are being developed, the potential for current space-borne observations to test the system, and how basic hydrologic science questions and global water sustainability questions can be addressed with the system.