

A Strategy for Accelerating the Development of Hydrological Models: Societal Needs, Observational Requirements and Public Communication

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While the development of hydrological and land surface models has progressed rapidly over the last few decades, a significant acceleration in model development is required in order to address critical societal issues of water, energy and food availability and security. In particular, major advances are needed in the areas of observations (e.g. of water cycle variability and change, of subsurface soils and hydrogeology, and of streamflow and groundwater levels), model development (e.g. of models that integrate the major components of the human and managed water cycles), data assimilation (e.g. of algorithms that can readily incorporate *in situ* and remote observations of asynchronous space-time frequency) and of a framework for integrating models and data (e.g. for access to data and simulation results, for running models, and for performing analyses). In this presentation we discuss these needs in detail, and highlight recent efforts in California and at the national scale (i.e. with the Community Hydrologic Modeling Platform [CHyMP]) to develop a modeling and data integration framework that can be applied across scales up to continental and global scales. Finally, the responsibility of the hydrologic research community to convey such important observational and simulation needs to resource managers, environmental decision and policy makers, and the general public, is underscored.