Title: **Water Prediction Tools for Informing Climate Adaption Strategies as a Focus of Community Engagement**

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ABSTRACT

Evaluating the effectiveness of adaption strategies aimed at mitigating the negative consequences of anticipated climate change requires modeling approaches that are (1) functionally and structurally accurate, and (2) appropriately sensitive to changes in forcings, land use, and land cover over a range of potential future scenarios. Models of this type will most certainly rely heavily on physical process representations in a high performance computational (HPC) environment that allows explicit representation of multi-dimensional heterogeneity. That is to say, to investigate climate change impacts and test mitigation and adaption strategies, the complexity of nature demands the use of models that can describe the characteristics of large watersheds. In essence, these models should emphasize "getting the right answer for the right reason" using excellent coupled physics rather than parameter tuning of simplistic models that do not exhibit realistic sensitivities to variations. This presentation discusses recent developmental efforts in academia aimed at the development of such models. Rather than emphasize proprietary or "named" models, the author proposes creation of a suite of tools in an HPC environment that facilitates process-level testing and validation of coupled physics-based hydrological representations. Two examples are shown that provide a potential road map for engaging the research and water management communities in a productive collaboration aimed at lowering the bar for the application of supercomputers for evaluating climate change mitigation strategies in the western US in a way that fosters community involvement and advances "best-in-breed" modeling technologies.