Geophysical Research Abstracts
Vol. 21, EGU2019-3578, 2019
EGU General Assembly 2019

Requirements for Successful Model Coupling in Interdisciplinary Research

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There is an increasing level of activity in the sciences in which researchers are exploring societally relevant questions involving disciplines well outside of any one individual's usual and comfortable research domain. These questions frequently deal with issues related to impacts, feedbacks and/or trade-offs in many fields linked to hydrology including climate change, energy, resources, development, health, sociology, engineering and economics in all or part of the earth system. Many of these efforts involve a strong computer modeling component and often this research involves linking or coupling disparate models to test and evaluate an interconnected system that is complex and not fully understood. Here, we find that often the most challenging unforeseen or unanticipated hurdles of successfully working on inter- and transdisciplinary problems are not technical in nature, but rather stem from the social aspect of collaborative research.

We are a group of researchers who address scientific questions that focus on water resources issues ranging in scale from local to global and daily to century. Much of our recent work has been transdisciplinary in nature and has typically addressed questions of relevance to stakeholders. We have developed and used hydrological models for over 20 years and more recently our research questions have been centered on resilience, vulnerability, and sustainability. This work has been both conceptually challenging and intellectually rewarding. To address these issues, we have been called upon to link our hydrological models with models from other disciplines. Some of those projects have advanced smoothly while others felt more like a struggle.

With this presentation we will explore some of the factors we have encountered in our model coupling efforts that have led to successful and fulfilling collaborations. We look at both the technical and social aspects of transdisciplinary research with a focus on factors related to the researchers themselves, their level of understanding of the entire system, and their willingness and openness to learning outside of their core discipline.