Scale-Dependent Effects of Spatially Detailed Soil Information on Hydro-Ecological Modeling. (S05-quinn141538-Oral)

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Abstract:

One of the emergent stumbling blocks in GIS parameterization for hydrological models is the problem of integrating data sets of varying spatial resolution. Hydrological models involve multiple sub-processes, each of which may operate at a different scale. If a model input data layer for one of these sub-processes is too generalized for an accurate depiction of the process, the uncertainty resulting from overgeneralization is propagated to the model output. This is particularly a problem when the model is purported to describe the world at a more detailed level of resolution than its input data can match. This research evaluates the effects of input layer scale incompatibility by comparing the responses of the Regional Hydro-Ecological Simulation System (RHESSys) at multiple scales using soil information from two sources: low-resolution digitized soil survey maps and high-resolution data derived from the Soil-Land Inference Model (SoLIM). Appropriate scales at which to operate the model are determined by finding operation resolutions that minimize the difference between model output using the low-resolution soil data and model output using high-resolution soil data.

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