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Design and Implementation of Hydrologic Model Sharing Capabilities within the CUAHSI HydroShare System

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Abstract: HydroShare is an online repository tailored for the hydrology community and designed to facilitate collaboration and open sharing of hydrologic data, analytical tools, and models to enable model reuse, and research reproducibility. In HydroShare data, models and their input and output files are considered as objects of collaboration, or social objects. Collectively these are referred to as "Resources" and HydroShare supports a number of resource types each designed to represent a specific hydrologic data type or model. Each resource type includes a metadata profile that describes key attributes of that resource. This research focuses on the resource types and metadata profiles for hydrologic model programs and model instances composed of the input and output files for a specific model program. The presentation will provide an overview of the steps taken to design the modeling related resource types and the resulting data model. The implementation of the design within HydroShare will be presented to illustrate how hydrologists can use the system for sharing and publishing their model resources with the broader scientific community. The resource definitions can be used by other systems to provide interoperability between systems. This will be demonstrated through a collaboration with developers of SWATShare, a system tailored for running a particular hydrologic model (SWAT). Because HydroShare and SWATShare adopt the same resource definition for SWAT models, it is possible to easily exchange SWAT models between the two systems. This demonstration illustrates the benefit of a common metadata framework for water models by allowing for interoperability across software systems.

Keywords: Hydrologic modeling; Model sharing; Metadata; HydroShare; SWATShare