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10th International Congress on Environmental  
Modelling and Software - Brussels, Belgium -  
June 2020

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## Automated Watershed Characterization and Prioritization for Protection and Restoration

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Wible, Tyler, "Automated Watershed Characterization and Prioritization for Protection and Restoration" (2020). *International Congress on Environmental Modelling and Software*. 14.  
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## Automated Watershed Characterization and Prioritization for Protection and Restoration

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**Abstract:** Watershed prioritization is necessary to target restoration efforts, protection status, and other priorities. The EPA Healthy Watersheds Assessment provides a framework for outlining and quantifying numerous indicators of watershed health and vulnerability across landscape condition, habitat, hydrology, geomorphology, water quality, land use change, water use, and wildfire risk categories, among others. However, these assessments require extensive effort to consolidate datasets from multiple sources across spatial and temporal scales. Combining the EPA Healthy Watersheds Assessment framework with an automated data extraction and summary tool can streamline this process and quickly quantify watershed characteristics for evaluation. Further, the volume of data compiled impedes efficient prioritization and decision-making, motivating the need for a process to rank watersheds based on their properties, flexible enough to weight the importance of categories of data and individual indicators. A Multi-Criteria Decision Analysis (MCDA) can provide composite watershed scores based on criteria and sub-criteria, ideal for identifying watershed rankings. The Watershed Prioritization Dashboard (WPD) contains these features and fills a need for public access and transparency to state and federal watershed prioritization efforts. The WPD contains a summary of over 200 automatically calculated watershed properties, health and vulnerability indicators. It also includes multiple visualization methods of the data from tables to charts, to maps. Additionally, the WPD includes a flexible multi-criteria decision analysis framework on top of the watershed characteristics to provide defensible watershed priorities based on protection or restoration as well as custom rankings based on user interests. Funding was provided through the Nonpoint Source Program in the WQCD at CDPHE in partnership with the U.S. EPA.

**Keywords:** MCDA; watershed; prioritization; indicators