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# Web Based Analysis of Hydrological Time Series in R using Web Processing Services

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**Abstract:** An increasing quantity of observed and modeled hydrological time series data are becoming available through web based catalogs and data servers. The Consortium of Universities for the Advancement of Hydrologic Sciences, Inc. (CUAHSI) Water Data Center makes much of this data available globally via its new <http://data.cuahsi.org> web portal. A computationally distributed system was needed to facilitate web based visualization and analysis of data discovered via this portal. This presentation will introduce the design and development of a web-based software framework including an application programmer interface and architecture to share time series analysis R scripts online. Using the CUAHSI data client, a web processing service (WPS) built using 52 North, and the Tethys Platform for Python based environmental web apps, we generate a graphical user interface (GUI) for running each R script. We demonstrate the GUI design for the use cases of correlation analysis and time series gap filling. The performance overhead of communicating with the web processing service is discussed. The presented software architecture can be used as a model for publishing other time series analysis R scripts online.

**Keywords:** Water Data, R, Web Processing Services (WPS), Time Series Analysis