

CUAHSI HIS Service Oriented Architecture: Transitioning Main Components to OGC Standards Compliance.

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ABSTRACT: The CUAHSI Hydrologic Information System Project has developed a services-based infrastructure for publishing, cataloguing, discovering and accessing hydrologic observations from multiple distributed repositories. The backbone of the HIS service-oriented architecture design is a set of standard web service application programming interfaces that define interactions between hydrologic data publication platform (HydroServer), the data cataloguing and discovery system (HydroCatalog) and client applications, such as HydroDesktop. The key standards used in the current operational version of HIS are WaterML 1 and WaterOneFlow services. These specifications have been designed to unify hydrologic data discovery and access for academic data sources that store data in CUAHSI Observations Data Model (ODM) and large federal and state repositories (e.g. maintained by USGS, EPA, NCDC) that follow their own storage, metadata and access conventions.

To establish a higher level of compatibility between a wider group of water data sources, at the national and international scales, and to take advantage of multiple third-party software applications, the CUAHSI HIS services oriented architecture is now transforming the key interfaces to be compatible with Open Geospatial Consortium (OGC) standards and utilizing OGC services to deliver hydrologic observation sites, series and data. Hydrocatalog servers will utilize OGC Catalog Services for the Web (CSW) servers to expose listings of hydrologic data available as OGC services. Hydroservers will deliver “Water Observational Catalogs” and site locations using Web Feature Services (WFS), and deliver data using OGC WaterML 2 over Sensor Observation Services (SOS). This software stack can be implemented using commercial software, like ESRI ArcGIS and Kisters Wiski, or open source components like Geoserver WFS, GI-Cat CSW, and 52North SOS.

Another key advantage of this transition is that Open Geospatial Consortium provides transparent and community-accepted procedures and protocols for governing standards development. In particular, OGC has assembled an international group of experts in standards for water data and related fields (as the OGC/WMO Hydrology Domain Working Group (HDWG)) from participation from government, corporate and research organizations. The HDWG’s mission to examine existing standards, develop standardization priorities, coordinate development of specifications, organize their testing in a series of interoperability experiments, and lead the standards to community adoption.

KEY TERMS: Hydrologic Information System; Information Exchange; Open Geospatial Consortium standards; web services; cyberinfrastructure;

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