



Hydrologic Observatories: An integrated research platform for watershed science

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Through a series of workshops, prototype studies, and committee reports, the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI), has designed HydroView, a multi-component research platform consisting of four integrated components:

- *Hydrologic Observatories* are envisioned to be instrumented river basins with areas on the order of 10,000 square kilometers, 2 to 3 orders of magnitude than instrumented watersheds today. This size will enable interdisciplinary research into climate-hydrology interactions, regional groundwater-river systems, and human influences on the terrestrial hydrologic cycle that are not possible today. The core data, which will be freely available to all scientists, will characterize the stores, fluxes, flowpaths and residence time distributions of water, sediment, nutrients and contaminants across a range of scales, including the entire basin. Achieving this characterization is a research topic in itself and will be done with a combination of direct measurement, remote sensing, and inference from computer models. Each observatory will be free to design a data collection program that is appropriate to the local conditions of the basin and is coordinated with on-going data collection efforts by Federal, State and Local agencies. However, the core data must be placed in the context of these four basic characteristics. A network-level review panel will review data collection protocols and set meta-data standards to assure data comparability across the network.
- The *Hydrologic Information System* will be a data system to ensure a common web-based portal to access the data from all Hydrologic Observatories, including both the data collected by the Observatories and the extensive data collected by agencies such as the National Weather Service, U.S. Geological Survey and

others. Technological advances now make it feasible to provide massive data sets, such as NEXRAD space-time grids and remote sensing data, as well as traditional time-series data to researchers on a routine basis. Integrating such data sources will speed research and enable new insights to be gained that would otherwise be impossible.

- The *Hydrologic Measurement Facility* will ensure consistent, state-of-the-art instruments across Observatories. Its primary missions are to diffuse knowledge of instruments across the broad range of hydrologic sciences, to increase the utilization efficiency of instruments through loan and barter arrangements, and to develop new instruments required for hydrologic science
- The *National Center for Hydrologic Synthesis* will serve as a think-tank to bring together environmental scientists from a broad range of disciplines, and to bring together academic scientists with practitioners from government and the private sector to utilize the data from the Observatories, to exchange technologies, and to chart new directions for hydrologic research.

Pilot efforts are underway for Hydrologic Information Systems and Hydrologic Measurement Facility. The University of California, Berkeley has been chosen as the partner institution and host for NCHS; a proposal is under consideration for operation of this facility by the US National Science Foundation. The first two Hydrologic Observatories will be selected in the fall of 2005 and should be operational by late 2006.

These facilities will be available for use by scientists from around the world. Collaboration with international organizations with interest in hydrologic science and watershed science is actively sought to coordinate design and operation of HydroView. Further information is available at <http://www.cuahsi.org>.