

Summary of Wisconsin Workshop
Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI)
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University of Wisconsin-Madison

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Summary of Breakout Sessions

I. Long-Term Hydrologic Observatories

1) We need a concept that the diverse community of hydrology can support. This means a plan

to distribute resources that provides accessibility to a wide segment of the community for a long time.

2) How can we be different from the other observing networks that exist now?

3) A dynamic observatory, which is not fixed in given geographic locations but distributed among various types of geologic and hydrologic regimes, would embody the dynamic nature of flow of water so central to hydrology. These observatories could be funded competitively for durations of 5 to 10 years, and if appropriate moved within a region or among regions. Such a dynamic observatory, designed to maximally exploit existing monitoring programs, could be accessible to a wide segment of the hydrological community for a long time.

4) Many of the measurement requirements of these dynamic observatories could be met with an instrumentation or technology pool that provided expensive equipment with technical support to use it wisely. In addition, a competitive proposal process could be available to foster technological advances in hydrological instrumentation that would continuously strengthen this pool.

5) The selection process for a dynamic observatory could be driven by science and by specific applications, such as assessing the role of ecosystem services in meeting human needs. The dynamic hydrological observatory would bring advances in hydrological sciences to issues that touch people's lives - clean water, aesthetics, good food, transportation, etc. Essentially "connecting science to society through a dynamic hydrological observatory."

6) Clearly any objective that was appropriate for a dynamic hydrological observatory would have major involvement of existing stationary monitoring systems such as USGS, counties, states, cities, universities or cooperative observers.

7) A good name might be beneficial to selling the idea to NSF and congress.

II. Public Sector Issues

A common thread throughout the discussion was education, education of the public to the importance of hydrology and education of hydrologists to public issues.

1) Understand the issues that concern and are of interest to the public. The public may already be aware of some of these issues such as flooding or smelly lakes. Some issues might be important but are not well understood by the public, for example, zoning for development in recharge zones.

2) Show the public the importance of the ecosystems resources and how those resources depend on hydrology. An understanding of hydrology will enable better stewardship and more returns from our ecosystems. The public has shown interest in ecosystems and hydrology as demonstrated by local groups, the Pheasant Branch Conservatory and the Upper Rock River Group. These groups have a great deal of energy but don't always know where to best place that energy.

3) Incorporate natural resource information, this includes hydrology, with land use plans. Often the county and town boards that are called upon to make zoning decisions are forced to make those decisions without adequate resources. There should be a way that these local boards are given access to and are encouraged to use the most up-to-date information on hydrology.

4) The hydrologists need to agree on their message so that the public hears a consistent message. This could take the form of protocols for decision-making when hydrologic issues are involved.

III. Vision for an LTHO in the Upper Mississippi River Basin

A. Why would this be a good setting for an LTHO?

- Variety of geomorphic and hydrogeologic (driftless area with significant relief and shallow bedrock, broad alluvial valleys with unconsolidated sediment)
- Mosaic of land use including agriculture, urban, and natural areas
- Variety of resource use and management issues
- Sensitivity, particularly of agricultural lands, to climate change
- Importance of nutrient, sediment, and water export to other areas (particularly the Gulf of Mexico)
- Good existing data and background studies by university researchers, state and federal agencies
- Ongoing restoration initiatives provide opportunities for collaboration

B. Possible research topics (assuming a nested set of field sites at different scales)

- Characterization of water pathways at many scales
- Quantification of fluxes (water, sediment and nutrient) at many scales
- Understanding and predicting hydrologic, and associated ecologic, responses to changing stressors (climate, landuse, construction and operation of structures, restoration activities)
 - i. Responses of interest include changes in magnitudes and frequencies of fluxes
 - ii. Identification of thresholds is another important aspect of understanding and predicting responses
 - iii. Research could take advantage of changes that result from natural processes or human activities that are ongoing in the region
 - iv. Research could also involve active experiments in which stressors intentionally altered

C. What would an LTHO infrastructure provide?

- Compilation of existing data and coordinated management of existing and new data
- Identification of critical data gaps
- Enhanced long term monitoring of critical regional features
- Synoptic sampling campaigns to enhance the regional data
- Housing of shared equipment for installation of monitoring instrumentation
- Pool of field instruments for use in multiple projects
- Facilities for calibration and maintenance of instruments
- Coordination of permitting and other activities required for access to monitoring and experimental sites