

## **Progress Report from the Data Standards and Data Management Workgroup of the Subcommittee on Ground Water**

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### **ABSTRACT**

The purpose of the Data Standards and Data Management Workgroup of the Subcommittee on Ground Water (SOGW) is to identify opportunities for consistent data reporting, comparability, and exchange in order to facilitate ground water data archiving and sharing on a national scale. This work is being accomplished in the context of several key questions. 1. How will data structures across programs be considered? 2. How can the data be stored so they can be easily retrieved and shared? 3. What standards for metadata are available and are the standards adequate to achieve our goals? If not, what additional metadata standards may still need to be proposed? 4. Who may use the data and interpret it? 5. Should we set up a template and encourage people to use it and how do we encourage a more uniform approach across the country? Answers to these questions will be passed on as recommendations to the full Subcommittee.

To that end the workgroup has identified and reviewed metadata standards and data management models from several national/international groups including US Environmental Protection Agency (USEPA), American Society for Testing and Materials, US Geological Survey (USGS), Consortium of Universities for the Advancement of Hydrologic Sciences and Information (CUASHI), and the European Union. The primary differences in metadata standards are the database vocabularies (e.g., multiple codes and descriptors for the exact same entity) in addition to rules describing required values and allowable values for the data. The causes for the differences are the purposes and spatial scales for which the different standards were developed. The primary differences in data management are in the methods used for data distribution and data services (e.g., text versus maps, analysis tools or no tools), and the directions of data flow. For example, USGS operates a data search and distribution application, while USEPA offers applications that will upload data to their own databases as well as to regional distribution nodes.

There are adequate standards available for common vocabulary, XML tagging, schema design, etc. for ground water data. One could argue that there already are too many standards. For example, a key issue on the federal level is the lack of consistency and integration between the STORET and National Water Information System (NWIS). This issue affects the quality and completeness of national scope ground water research done by the USGS and others, and makes it difficult for other academic, governmental, and corporate data users to acquire the data they need in an efficient and timely manner. It would make more sense to have these two systems be available through a seamless interface.

Recent developments in web based programming have led to data management and distribution models that can address a vast majority of user needs. For example, the CUAHSI initiative has developed a system of text and map based web browser tools that allow a user to retrieve, display, and analyze data simultaneously retrieved from STORET, NWIS,

and CUAHSI hydrologic observatories. STORET has recently released a web browser based map tool to augment their text based data selection tool set. These developments suggest that instead of devoting resources to developing new web tools, there should be explicit consistent direction and encouragement from the national level to the states, tribes, and local water agencies and authorities to follow the standards and resources to develop specific tools to translate their data into standardized formats.

To date, the SOGW has agreed in principle to the concept of a web portal to seamlessly access multiple databases, encouraging common data vocabularies and a list of minimum data elements that draws heavily from the USGS Ground Water Site Inventory and NWIS, and recognition of differences in tasks between the states and federal agencies that require some differences in data management and reporting. Future progress in building a well populated and widely accessible national database of ground water information appears promising considering that many states built their electronic databases using the USGS template and collect their data using USGS standard operating procedures. However, integrating the many state and local data collection efforts and databases into a national network will require solution to long-standing funding difficulties in the USGS joint-funded program and administrative/operational problems with how the USGS does not use data generated by non-USGS agencies.

**KEYWORDS**

Ground water, data, monitoring, web services, Subcommittee on Ground Water, Advisory Committee on Water Information, US Geological Survey, NWIS, STORET, CUAHSI