

American Water Resources Association
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GIS & Water Resources VI
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Wednesday, March 31
1:30 PM – 3:00 PM
SESSION 34: User Interface

The User Experience in Water Resources GIS Software - Stephen Bourne, PBSJ, Smyrna, GA

Over the past few years, much focus has been placed on user experience in the software development world - particularly with regard to commercial software such as Apple's I-Phone operating system. With ease of use as a driving design goal, designs have become simultaneously easier to use and more powerful. Similar focus has been placed on development of GIS-based tools. Examples include the growth of web-based GIS portals and virtual globe systems (eg. Google Earth, Google Maps, MS Virtual Earth, ArcGIS Explorer, etc.). The next step is to focus on the user experience for more complex water resources analysis tools. Tools for 3D estuary water quality modeling or regional stormwater master planning require many more input data and modeling parameters than, say, searching for an address in Google Maps. These tools also have volumes of result data that must be displayed in a meaningful way. Through a user interface design approach that focuses on user expertise and a commonly understood conceptual model, the water resources technology group at PBS&J has developed several GIS-based water resources tools. The tools use windows-explorer like trees that guide the user through setting up complex analyses - providing options for each item in the tree in a context-specific panel. The tools make use of powerful charting tools and a map display to visualize inputs and results. In this presentation, several of example tools will be presented along with the design philosophy employed in tool development. Future directions for user experience-focused design will also be discussed.

A Pen-Based Approach for Water Resources Model User Interfacing - Joshua Peschel, Texas A&M University, College Station, TX (co-author: Tracy Hammond)

Water resources model interfaces have evolved over the years from simple command line inputs to complex interactions with multi-source geographical information system (GIS) data sets. Not surprisingly, the complexity of user interaction has also increased. The modern user of water resources models today must often be familiar with not only the model itself, but also an array of external software, such as GIS programs. The current paradigm for working with these types of programs and data is a tool palette-driven approach, specific to each program, which requires additional learning. Pen-based computing and, in particular, newly emerging technologies such as sketch recognition, provide a shift in the user interface paradigm to more natural modes of human interactions. In this work, we present a framework of a pen-based approach for water resources model user interfaces, specifically addressing some contemporary GIS-based models including: HEC-HMS, HEC-RAS, EPANet, and ArcSWAT.

Use of the National Hydrography Dataset in the USGS StreamStats Web - Alan Rea, U.S. Geological Survey, Boise, ID

StreamStats (<http://streamstats.usgs.gov>) is a U.S. Geological Survey Web-based geographic information systems application developed as a tool for water-resources planning and management, engineering design, and numerous other applications. StreamStats is using the National Hydrography Dataset (NHD) in several ways. StreamStats allows users to navigate the stream network to locate upstream or downstream streamgaging stations, dams, point discharges and other water-related features and get information about those features. Both the high-resolution NHD and the medium-resolution NHD (used in the NHDPlus,) may be selected by the user for navigation. A tool uses the network to search upstream and downstream for stream gages and can provide streamflow estimates for an ungaged site based on flow records for similar gages. A "raindrop" trace to the network tool will trace the overland flow path from any user-selected point and identify the point where the water would enter the stream network. Another tool allows the user to specify two points on the stream network and receive a three-dimensional profile of the stream segment in graphical and tabular format.

Most StreamStats functionality is available through Web services, and can be called from either the StreamStats interactive map interface, or from a program. These tools illustrate some of the ways StreamStats is integrating the NHD into its basic operation.

EMAPS: Environmental Monitoring and Planning System - Kurt Saari, South Florida Water Management District, West Palm Beach, FL (co-author: Rick Householder)

EMAPS: Environmental Monitoring and Planning System The District's monitoring and sampling site registration process requires information to be planned, accurately gathered in the field and uploaded into the District enterprise database in a timely fashion. Issues such as site redundancy, incorrect locations and lack of project planning can introduce numerous errors into the environmental database. The EMAPS Explorer application is designed to support staff and reduce these common errors. The application also allows project managers the ability to review, analyze, plan, and optimize their monitoring and sampling locations along with current density and distribution. EMAPS Explorer is a web-based interactive mapping application based on ESRI ArcGIS Server and developed on the Web.ADF. The application provides common GIS functions including visualization, query, spatial analysis, and basic mapping. In addition, EMAPS Explorer provides custom tools to facilitate monitoring location planning, registration, verification and editing workflows. Application performance is enhanced by the use of enterprise map caches for imagery and transportation. This presentation will discuss management of the monitoring and sampling locations, EMAPS Explorer workflows as well as the underlying technologies.