

Center for Applied Hydrologic Solutions

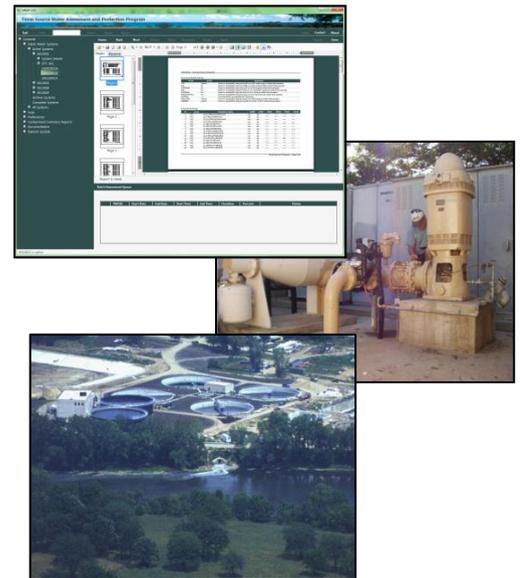
The Center for Applied Hydrologic Solutions (CAHS) is located jointly within the USGS Kentucky and Indiana Water Science Centers in Louisville, Kentucky and Indianapolis, Indiana respectively. CAHS is dedicated to developing high-end spatial and information-technology applications that leverage defensible USGS science to create partner-driven applications that pair with modern technologies. Example applications include:



SWAP-DSS

Source-Water Assessment Program - Decision Support System

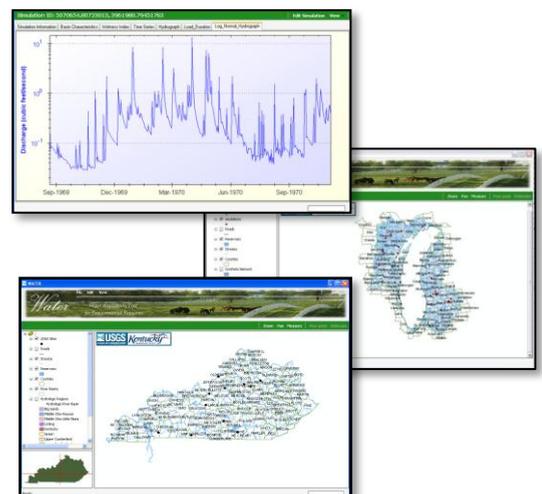
SWAP-DSS relies on comprehensive geospatial, water-quality, and other data that includes more than 2-million potential contaminant sources, more than 20 different land-use classifications, more than 4-million water-quality samples, and numerous other hydrological and hydrogeological data sets. The result of the assessments processed by SWAP-DSS is a tailored summary for each of approximately 6,000 public drinking-water systems, with approximately 18,000 drinking-water sources among them, that details each source and system's susceptibility to over 200 drinking-water contaminants. Water-resource managers may use these assessments to effectively target potential contaminant sources, allocate personnel and other limited resources to address specific targets and issues, and improve planning and management practices based on informed decisions.



WATER

Water Availability Tool for Environmental Resources

The concept of the WATER application was born from the need in Kentucky to quantify water availability in areas of the Commonwealth with limited long-term monitoring data. The program was later expanded to include the capability for creation of load-duration curves (for TMDL development) and additional models, or "extensions", for water-quality (PHREEQC - Beta version) and parameter estimation (PEST) were also added. WATER enabled USGS scientists to take well-known streamflow generation and modeling concepts, develop innovative data-processing methods, and apply the concept across all regions of Kentucky with much greater accuracy and precision than had been previously possible; WATER is currently being expanded to include the Great Lakes and other regions. WATER was created with the goal of making complex science available to the resource managers that need it; given that, WATER utilizes a simple "point-and-click" interface that allows the user to access the expertise of many USGS scientists with the click of a mouse.

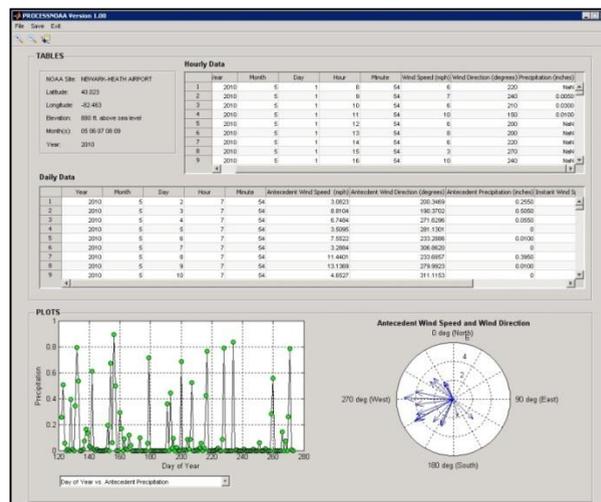


CAHS - Bringing over 130 years of USGS science into the 21st century



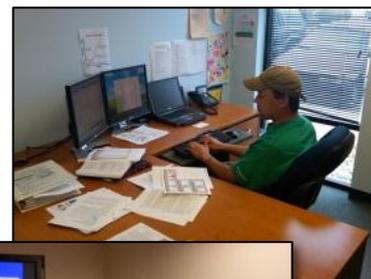
Custom Applications and Visualization

CAHS staff are capable of building custom applications and presenting data in a relevant format for virtually any need; for example, CAHS staff recently programmed a climate-data pre-processor (in MATLAB) for a pathogen-based beach-health algorithm being developed by the USGS Ohio Water Science Center. Applications can be built for local use (desktop applications or servers) and/or for use over the internet. Graphical User Interfaces or GUIs can be customized to fit virtually any need as well; GUIs recently programmed by CAHS include a wide variety of styles including map-based (used for WATER), data-driven (used for SWAP-DSS), and Graphical (used for the climate-data preprocessor).



About our staff

The Center for Applied Hydrologic Solutions (CAHS) is staffed by a group of specialized USGS scientists with backgrounds in computer and geospatial science, engineering, hydrology, and other earth sciences. The CAHS staff, as with all USGS personnel, are able to draw upon the resources of the larger U.S. Geological Survey when required; this ability enables the CAHS staff to bring to bear the expertise of over 9,000 scientists from across the Nation. The CAHS staff can create applications utilizing ArcScripts, Fortran, Java, Visual Basic, .NET, MATLAB, C/C++, Python, and other frameworks and languages. Utilizing the various languages and techniques, USGS scientists within CAHS can readily apply many USGS or outside models and techniques to address specific science questions via graphical user interfaces; CAHS staff can, therefore, make complex science relevant to site-specific characteristics and issues. Some of the models available for application are: PHREEQC, PEST, TOPMODEL, HEC-RAS, FaSTMECH, HSPF, PRMS, MODFLOW, and others. Training and support are readily available through existing CAHS partnerships with local universities such as Kentucky State University (KSU).



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