

Session K5: Using Diverse Data Sources for Assessment

Room C123
3:30 – 5:00 pm

0098
K5-1

Lessons Learned from Creating Multi-Agency Nutrient Datasets to Estimate Loads and Calibrate Regional Nutrient SPARROW Models

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Water-quality data were compiled from federal, state, and local agencies, and selected universities as part of an effort to develop regional SPARROW (SPATIally Referenced Regressions On Watershed attributes) models to help describe the distribution, sources, and transport of nutrient loads in streams throughout much of the United States. The initial compilation consisted of data from approximately 125,000 stream sites, collected by 186 sampling agencies in 44 states. After screening, 2,739 sites, sampled by 73 agencies, were identified as having suitable data for calculating long-term mean annual nutrient loads required for SPARROW model calibration. Based on this compiled dataset, all areas of the country experienced recent declines in the number of sites with sufficient water-quality data to compute annual loads and support regional modeling analyses. These declines were caused by decreases in the number of sites being sampled and data not being included in readily accessible databases. If the recent trends continue, data from fewer sites will be available to calculate loads using regression approaches and to support further development of regional load models. Sampling agencies that have an interest in estimating loads and would like their data to be considered for use in regional water-quality modeling (and in the management decisions informed by those models) can consider the following points to help meet the need for continued monitoring: 1) Implement sampling strategies (possibly coordinated with other sampling agencies) that meet the needs of the agency while providing water-quality and flow data suitable for accurate load estimation. The latter goal could be met by collecting more samples, particularly during high-flow events, and associating the sampling site with a nearby streamgage; 2) Provide detailed and accurate site location information to facilitate the use of the data by others. Indexing sites to a national stream network (such as the National Hydrography Network) would provide useful and consistent location information; 3) Incorporate monitoring data into national databases to potentially increase the utility of these data beyond their original objectives and ensure that the data can be discovered easily. New tools such as the Water Quality Exchange (WQX) can help facilitate this process.

0257
K5-2

Applied Open Standards in Integrated Water Information Management. Enabling the “World Water Online” Vision

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Global and local data centers, such as the Global Runoff Data Centre (GRDC) in Germany, the Capital Area Council of Governments (CAPCOG) in Texas, and the Center for Urban Environmental Research and Education (CUERE) at the University of Maryland, Baltimore County are benefiting from the advances in open standards for the acquisition and dissemination of hydrological data and information. To date hydrological data are provided in a multitude of formats necessitating the development of complex import tools and converters. With the advent of open standards the transfer and exchange of hydrological data amongst users can be streamlined or even automated. The provision of the data and data products utilizing open standards is needed by the hydrological community. The combination of domain specific software with open standards is welcomed by the GRDC, CAPCOG, and CUERE as it ultimately contributes to a more efficient operation of the data centers.

The KISTERS Web Interoperability Solution “KiWIS” has been developed as a contribution to both OGC interoperability experiments. KiWIS offers combined services such as SOS, WOF, WMS and WFS for different data sources in one instance. This solution is contributing to the surface water interoperability experiment 1 and KISTERS is leading the interoperability experiment 3.

Additionally, with the KISTERS OpenMI wrapper, local and/or remote modeling users can establish the communication to a KISTERS time series server, search and identify the appropriate input time series, and retrieve data through the internet directly into a chain of integrated modeling applications.

As the technology and quality of open standards is steadily enhanced, this paper outlines the experience made during the harmonization and implementation process and discusses the potential of applied open standards in integrated water information management at the regional and global scale.

0321
K5-3

Management and Sharing of Water Resources Data as a Basis for Rapid TMDL Estimating

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A data management system (DMS) for georeferenced discrete and real-time data is being developed within EPA- ORD. The goal is to develop a scalable data architecture that accommodates storage and management of data generated by ongoing and newly initiated watershed management research activities, enables targeted users to access, exchange and integrate water quality and quantity (WQ2) information, and conduct relatively simple calculations as the basis for better water management decisions at various watershed scales. EPA plans to use Consortium of Universities for the Advancement of Hydrologic Sciences Inc. (CUAHSI)'s Hydrologic Information System (HIS) and other tools to integrate data generated within its' local and regional watershed-related projects with data collected by EPA's collaborators, and to share these data with other interested parties. The *significance* of this effort is that the standardization and integration of data are expected to greatly facilitate collaboration and environmental modeling activities within EPA/ORD, EPA, and between EPA and other organizations. A prototype- DMS has been developed in the first phase of this project around WQ2 monitoring data collected by EPA- ORD/NRMRL in the Little Miami East Fork (EF) watershed near Cincinnati, OH. EF is a 1300 km² mixed-use watershed, and a major contributing river to the Little Miami River, a National Scenic River draining lands in the Ohio Corn Belt identified as a significant source of nitrogen transported to the Gulf of Mexico. The functionality programmed into this prototype DMS is demonstrated by conducting a nitrogen-based duration analysis for the EF watershed. For this analysis data stored into the DMS were accessed and retrieved, and combined with other WQ2 data from the HIS system using CUAHSI's Hydrodesktop. The results of this analysis can serve as the basis for a screening-level modeling approach to nitrogen Total Maximum Daily Load (TMDL) estimation. Screening-level TMDL estimation is expected to greatly facilitate TMDL development requested for regulatory proposes.

0442
K5-4

Managing and Sharing BP Oil Spill Data from the Gulf of Mexico

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Tetra Tech assisted EPA in compiling and evaluating water quality data collected by EPA and other organizations (*e.g.*, NOAA, several Gulf states) on a daily basis to provide real-time condition status during the BP oil spill in the Gulf of Mexico. Data were received from EPA's SCRIBE database by web service to help insure timely data reporting. Using automated screening techniques, oil spill data were validated to ensure data quality standards were met and then imported to WQX\STORET and Tetra Tech's Environmental Data Analysis System (EDAS2) database for screening and analysis.

EDAS2 was developed to support data sharing with WQX\STORET and includes data validation tools to support import and export of data to WQX. The database and associated dynamic data analysis tools are available on-line by connecting through a web browser making the application ideal for multiple users or multiple monitoring organizations. Data are organized by organization, project, sampling events, and associated results. The database may be queried using geospatial tools with the map interface to provide data visualization or by a text based search. Queried data may be retrieved and downloaded at varying levels from the project to specific compound or taxonomic names. The data management and analysis tools that are part of EDAS2 are based on 16 years of experience working with tribal, state, and federal agencies engaged in managing and analyzing water quality data. Included in the database are standardized biological, chemical, and toxicological data elements for reporting water quality results as recommended and defined by the National Water Quality Monitoring Council (NWQMC) and Environmental Data Standards Council (EDSC). The data elements and metadata in EDAS2 provide who, what, when, where, why, and how required for complete and known quality data.