

Session J2: Innovations in Data Capture and Tracking

Room A106
1:00 – 2:30 pm

0373
J2-1

Illuminating the NARS Data Entry Black Box: What Happens Between Sample Collection and Data Availability for Use in Assessments?

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The steps between field collection of data and samples and availability of the resulting data from National Aquatic Resource Surveys (NARS) can appear to be a black box. This presentation is intended to shed some light on that process. The pathway for data depends on their source and type. Certain pieces of information about samples come directly from field forms, and the process of scanning these forms and extracting data from them involves a great deal of error checking to ensure the integrity of the data. In addition, biological assemblage data (*i.e.* fish or plants) recorded directly on field forms undergo extensive reconciliation of names before any statistical analysis can occur. However, data from samples which are sent to laboratories for analysis, including water chemistry and chlorophyll, for example, require additional processing. These sample data are first matched back to the sampling visit ID in the database, then checked for holding time and detection limit issues. For water chemistry data in particular, a series of calculations and plots are then used to identify potential outliers. By the time the data are made available for use in analyses, they have been through a thorough quality assurance (QA) process. To help ensure the transparency of the process, the database is designed to accommodate the tracking of all changes to data made during all QA evaluation steps. For many study components, including but not limited to physical habitat, benthos, fish, and periphyton, a series of metrics is then calculated for use in statistical analysis. Once various condition indicators have been developed and various thresholds determined, they are applied to sample data to assess site condition. This entire process is formalized into R scripts, from the initial error-checking stages to metric calculation to determining condition based on thresholds. Eventually, we hope to compile all of these scripts into an R package for distribution and use by states and other entities engaged in biological assessment.

0407
J2-2

Developing Electronic Field Forms for Use in the National Aquatic Resource Surveys

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The US Environmental Protection Agency, states, and tribes are conducting a series of surveys of the nation's aquatic resources. Often referred to as probability-based surveys, these studies provide nationally consistent and scientifically-defensible assessments of our nation's waters and can be used to track changes in condition over time. Each survey uses standardized field and lab methods and is designed to yield unbiased estimates of the condition of the whole water resource being studied (*i.e.*, rivers and streams, lakes and reservoirs, wetlands, or coastal waters).

Due to the large nature of these surveys, accurate data management and tracking are a primary concern during field season. Sampling occurs in 50 states concurrently and completed field forms are shipped daily, scanned, and put into databases. In an effort to improve data submission for the 2012 National Lakes Assessment, current popular technologies have been incorporated into the survey in the form of electronic field forms. Hear about the history of NARS field form collection, the development of these electronic forms, and see the results of this work in a demo of the forms beginning to be used in the 2012 National Lakes Assessment.

0140
J2-3

Lessons Learned from the National Aquatic Resource Surveys (NARS)

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Beginning in 2007, EPA initiated a series of surveys and assessments of randomly selected lakes, rivers and streams, coastal sites and wetlands throughout the conterminous US to address the need for improved water quality monitoring at a national scale. These surveys established a national baseline and will be used to track statistically- valid trends in water condition in each water body type. The surveys identified key stressors to these systems and explored the relative importance of each in restoring or maintaining ecosystem health. Randomized design, and standardized field and laboratory protocols, allowed EPA to analyze data that are nationally consistent and regionally relevant. Probability-based surveys offer a scientifically-valid approach to fulfill statutory requirements, complement traditional monitoring programs, and support management decisions.

Results from the National Lakes Assessment (2007), National Rivers and Streams Assessment (2008/2009), National Coastal Condition Assessment (2010) and the National Wetland Condition Assessment (2011) summarize the first-ever assessment of these water bodies across the contiguous US using consistent protocols and a scientifically-defensible, probability-based approach. Each NARS assessment was completed after careful consideration of pre-survey planning, field training, field sampling, sampling logistics, laboratory analysis, data analysis, and reporting. Approximately 60 state and regional crews, 20 contractor crews and numerous tribal crews were deployed and supported across the country for each assessment each year; sampling and sample analysis was tracked from initiation; laboratory analysis was completed at EPA, state, regional, and contract laboratories; and the data analysis and reporting was completed by EPA-lead workgroups consisting of states, contractors and EPA. Approximately 1,300 lakes, 2,030 rivers and streams, 1,200 coastal sites and 1,300 wetlands were sampled across the country, including several state enhancement studies and other special studies. The complex and difficult logistics of each assessment offered unique challenges and opportunities and provided lessons learned for each successive NARS assessment, and for other upcoming NARS assessments. The logistical lessons learned are discussed in this presentation.

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J2-4

Using Electronic Field Forms for State Monitoring Programs

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The Idaho Department of Environmental Quality (DEQ) Beneficial Use Reconnaissance Program has replaced paper field forms with electronic field forms. Ambient surface water monitoring data are collected directly on rugged tablet computers using Microsoft Access. Use of electronic field forms for stream monitoring was successfully piloted in the 2010 field season, and fully implemented for the 2011 field season. Use of electronic field forms has decreased waste, decreased the time lag for data availability, improved data accuracy and completeness of data, and significantly decreased the annual cost for data collection and entry into the central database. The presentation will include a discussion of hardware and software considerations and lessons learned from Idaho DEQ's experience.