Session H3: Information Systems for Accessing and Assessing Data

Room B117-119
8:00 – 9:30 am

0020
H3-1

Water Quality Data Assessment Using Principle Component Analysis, Case Study: Qazvin, Iran

Saeid Ashraf Vaghefi[1,2], Jamshid Mousavi[1] and Majid Ehtiat[1]

[1]Amirkabir Univ. of Technology, Tehran, Iran, [2]Eawag: Swiss Federal Institute of Aquatic Science and Technology, Dubendorf, Switzerland

Utilization of groundwater resources for drinking and agriculture purposes has made the quality assessment of these resources a vital issue for local and regional water managers as well as those stakeholders who are affected. The variety of water quality parameters is also an important feature making the assessment procedure of the quality of these resources difficult due to the need for considering multi attribute nature of the problem. Principal component analysis (PCA) is a mathematical approach to reduce the dimensionality of the data while keeping the most important information embodied in the data. In this study, a large data base including 16 water quality parameters of 218 wells in Qazvin Province in Iran has been statistically analyzed using Principal Component Analysis. The results obtained by PCA technique identifies three significant components by which more than 80% of the information regarding (spatial) variation of water quality parameters can be represented. This is important for how to monitor the quality of ground water resources in the study area more efficiently.

0361
H3-2

Recovery Potential Screening: Online Tools for Assessing Watershed Restorability

Tatyana DiMascio[1], Douglas J. Norton[2], Julie Scarangella[3] and David Di[3]

[1]US Environmental Protection Agency ORISE, Washington D.C., USA, [2]US Environmental Protection Agency Office of Water, Washington D.C., USA, [3]Tetra Tech, Fairfax, Va., USA

Recovery potential screening is a flexible, screening-level assessment methodology for comparing large numbers of waters or watersheds based on their relative restorability. This method originated as a technical tool to help states set restoration priorities among the impaired waters on their Clean Water Act 303(d) lists, but is also widely applicable for comparative assessment of impaired or healthy waters at watershed, statewide, or regional scales. For example, the method can help in prioritizing TMDLs for implementation, developing nonpoint source program strategies, and identifying ways to integrate protection and restoration priorities. The EPA Office of Water has developed a website to serve as a central source for everything related to the methodology. Practitioners have been successful in learning the methodology and applying it to their needs solely based on the information presented in the website. Found at http://www.epa.gov/recoverypotential/, the website provides a step by step methodology, related technical tools, summary information on over 120 recovery potential indicators, and several demonstration projects and papers. The tools include a 1600+ citation database on driving factors that affect restorability; a downloadable scoring spreadsheet that organizes, weights and normalizes indicator data and auto-calculates recovery potential summary scores; documentation from the literature on each indicator, its data sources and measurement options; and a downloadable 3D bubble-plotting script for viewing ecological, stressor and social indicator summary scores separately but simultaneously.

0516
H3-3

Tackling Data Comparability for Multiple Uses

Cristina Grosso[1], Shira Bezalel[1], Victoria Bowles[4], Todd Featherston[1], Amy Franz[1], Thomas Jabusch[1], Karl Jacobs[5], Michael Johnson[4], Sarah Lowe[1], Michael May[1], Marlene Merchain[2], Shelly Moore[2], Mark Pranger[3], John Ross[1], Steven Steinberg[2], Stacey Swenson[3], Melissa Turner[4], Meredith Williams[1], Adam Wong[1] and Donald Yee[1]

[1]San Francisco Estuary Institute, Oakland, Calif., USA, [2]Southern California Coastal Water Research Project, Costa Mesa, Calif., USA, [3]Marine Pollution Studies Laboratory at Moss Landing Marine Laboratories, Moss Landing, Calif., USA, [4]MLJ-

LLC, Davis, Calif., USA,[5]California State Water Resources Control Board, Sacramento, Calif., USA

Since 2002 California has worked to compile and standardize the State's water quality data and provide access to multiple audiences. Visualization tools allow users to view results and sampling sites, define queries for data retrieval, and download data for analysis purposes. The California Environmental Data Exchange Network (CEDEN) is based on Regional Data Centers (RDCs) to provide data management services within their region. Since RDCs use common database structures and procedures, partners can leverage resources and develop and share tools. Weekly replication of RDC databases are made to the CEDEN database managed by the State Water Resources Control Board. Data views are constructed to retrieve data for various applications, including the California Water Quality Monitoring Council's theme-based, question-driven *My Water Quality* portals. Automatic scripts alert staff when new datasets have been uploaded so they can be reviewed and integrated into the data display.

A major challenge partners have struggled with is data comparability, including the time required to standardize codes across the State and from numerous data providers. While this is a necessary and important step for regulatory use of the data, such as California's 303(b)/305(d) Integrated Report, this time-consuming process impedes the timely display of new datasets. Smaller scale projects using different data formats or with limited funding for data management cannot be easily integrated into this system. RDC partners must balance data comparability and data utilization to realize CEDEN's goals of integrating numerous datasets and providing comprehensive access to California's data. We present case studies which illustrate some options ranging in levels of comparability and effort required by the end-user. These include a file upload feature that accepts multiple file formats, a monitoring directory that directs users to available datasets, and download tools for regulatory use requiring highly standardized data.

0114
H3-4

StreamChemDB: Development of a Web-Accessible Database of Stream Chemistry for US Forest Service Experimental Forests and National Science Foundation Long-Term Ecological Research Sites

Effie Greathouse[1], Sherri Johnson[1,2], Don Henshaw[1,2], Stephen Sebestyen[3], Charles Rhoades[4], William McDowell[5], Jeremy Jones[6], George Ice[7] and Alba Argerich[1]

[1]Oregon State Univ., Corvallis, Oreg., USA,[2]US Forest Service Pacific Northwest Research Station, Corvallis, Oreg., USA,[3]US Forest Service Northern Research Station, Grand Rapids, Minn., USA,[4]US Forest Service Rocky Mountain Research Station, Fort Collin, Colo., USA,[5]Univ. of New Hampshire, Durham, N.H., USA,[6]Univ. of Fairbanks, Fairbanks, Alas., USA,[7]National Council for Air and Stream Improvement, Corvallis, Oreg., USA

StreamChemDB aims to provide one-stop access to long-term stream chemistry data records and associated metadata for two national networks: the US Forest Service Experimental Forests and Range (EFR) system and the National Science Foundation's Long-term Ecological Research (LTER) sites. This proposed database builds on former LTER-EFR cyberinfrastructure projects ClimDB and HydroDB (http://www.fsl.orst.edu/climhy/), which similarly provide one-stop access to climate and hydrology data across 45 EFRs and LTERs. The project combines data sets that are currently unavailable on the web or are only accessible on disparate web sites in a variety of formats. Here we present the status of our prototype, which allows dynamic downloads of data from a relational database. The prototype contains nitrate data from four sites (Bonanza Creek Experimental Forest and LTER/Caribou-Poker Creeks Research Watershed in Alaska, H. J. Andrews Experimental Forest/LTER in Oregon, Luquillo Experimental Forest/LTER in Puerto Rico, Marcell Experimental Forest in Minnesota). Controlled vocabularies have been implemented in the database to standardize analytical and sampling methods, detection limits, analytes and units. Once completed, StreamChemDB will facilitate cross-site studies and long-term archival of EFR/LTER stream chemistry data and will be available through the LTER Network Information System in a format compatible with existing and emerging environmental observatories and related water quality databases, such as LTER's Network Information System, the National Environmental Methods Index, WQX/STORET, NEON, Critical Zone Observatories (CZO program), the National Network of Reference Watersheds and the CUAHSI Hydrologic Information System.