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NBC News visits Lab to shoot NAWQA study

NBC producer Niki Stamos and photographer Ray Farmer visited the National Water Quality Laboratory March 23 to photograph and gather information on the Colorado District finding of methyl t-butyl ether (MTBE) in ground water in the Denver area. The program was broadcast during NBC's 6 p.m. national news March 28.

The finding was part of Kevin Dennehy's National Water-Quality Assessment (NAWQA) program study of Denver's urban ground water. The study assesses water-quality conditions in an alluvial aquifer that drains the South Platte River.

One volatile organic compound (VOC) determined was MTBE, a gasoline additive designed to reduce air pollution in the wintertime. It was detected in nearly 80 percent of 30 wells distributed in residential, commercial, and industrial land-use settings. The wells were sampled once in 1993 for a broad range of compounds. The widespread detections suggest a possible nonpoint source of MTBE to Denver's ground water.

Dennehy's water samples were analyzed in the volatiles laboratory at NWQL by Donna Rose and Mary Noriega.

Dennehy said no other petroleum-based product was found as frequently in the sampled wells. MTBE seems to accumulate, said Dennehy, who hopes to work out a study plan with the Colorado Department of Public Health and the U.S. Environmental Protection Agency.



Donna Rose, chemist in the Organic Chemistry Program, shows NBC photographer Ray Farmer how analytical data are stored and retrieved for the NAWQA study of Denver's urban ground water. Rose and Mary Noriega identified methyl t-butyl ether in ground-water samples.



NBC Producer, Niki Stamos makes a point during filming in the volatiles laboratory. Merle Shockey (center), Acting Chief, Organic Chemistry Program, and Pete Rogerson, Chief, NWQL, provided background information.

Williams accepts new job

Bob Williams, assistant chief, NWQL, for the past 2-1/2 years, plans to leave the Laboratory April 14 to become chief of the Earth Science Investigation Program for the Yucca Mountain Project Branch in Denver. In making the announcement March 27, Pete Rogerson, Laboratory chief, recognized Williams' focus and expertise in helping to bring NWQL "along our road to efficiency and relevance within the Survey."

Midyear estimates needed

Analytical workload estimates are requested by April 17, 1995. Totals should be provided to the NWQL for the entire fiscal year, not just from April through September.

BioQA hires algal taxonomist

Dr. John Kingston is joining the Biological Quality Assurance Unit at the NWQL as its algal taxonomist in April 1995, leaving at least 12 feet of accumulated snow behind in Newfoundland, Canada! Since 1991, Kingston has been the water-quality manager for the Water Resources Management Division, Department of Environment, where he coordinated water-quality monitoring programs (for algae, invertebrates, fish, and water chemistry) and held an adjunct professorship at Memorial University in St. Johns.

Kingston has over 22 years experience in the systematics, taxonomy, and ecology of freshwater algae and the monitoring of environmental quality, and has been a source of quality assurance and ecological innovation for major aquatic ecology projects in the United States, Canada, and Europe. He is respected internationally, and has visited and worked in most of the major diatom herbaria in the world.

Kingston's expertise and experience in algal systematics, taxonomy, ecology, and quality assurance, combined with his broad knowledge of water quality, aquatic organisms, statistics, and computer skills (including GIS) will be put to immediate use. He will monitor the performance of the contractors processing the periphyton samples collected as part of the National Water-Quality Assessment program and assist biologists as the first round of study units begins to analyze and interpret data.

Kingston was a pioneer in the North American phycological community, introducing and promoting innovative multivariate statistical methods for analyzing and interpreting algal data in relation to past and present water-quality conditions. He has authored over 50 publications in the field of algal systematics and ecology, and has published four papers and report sections specifically on quality-assurance issues pertaining to algae.



by Allison Brigham

Radchem enhances in-house capabilities

The Radiochemistry Unit (Radchem) of the National Water Quality Laboratory has increased its in-house capabilities to include determination of gross alpha, gross beta, laser uranium, and radon. In addition, plans are being developed to add radium-226 and radium-228 as in-house methods. The unit participates in proficiency programs--similar to accreditation--offered by the U.S. Environmental Protection Agency (USEPA) and by the U.S. Department of Energy.

The unit also handles contracts for analytical services. At present, Radchem contracts with four commercial laboratories (Quanterra, for radiochemical analyses; University of Miami, for low-level tritium; Global Geochemistry, for N-15/N-14; and University of Waterloo, for carbon-14). The unit also has "agreements" with USGS Branch of Regional Research laboratories in Reston (for oxygen, deuterium, and S-34/S-32) and in Menlo Park (for tritium). An extensive quality assurance/ quality-control program is maintained for all of these laboratories, ranging from the submission of double-blind samples with each batch of routine samples, to monitoring their results on national proficiency programs, to on-site audits.



Mark Cree analyzes water samples for radon by liquid scintillation in the Radiochemical Unit laboratory.

Members of Radchem work closely with USEPA personnel in Region 8 as well as with representatives from USEPA laboratories in Las Vegas, Nev., and Montgomery, Ala. Joint efforts are now directed toward getting the USEPA to grant approval for the laser uranium method. This approval would pave the way for NWQL to receive USEPA certification for uranium. The NWQL already is fully certified by USEPA for gross alpha and gross beta.



by Ann Mullin

Short takes

Larry Tilley recently completed a 6-week detail from Menlo Park to work with Allison Brigham in the Biological Quality Assurance Unit. . . Tom Kashuba has accepted a position with the Wyoming District Office in Cheyenne to work on the Air Force project for the superfund cleanup. . . Kailin Terry has resigned from the Quality Management Program to take a position as chemist with Cobe Laboratories in Arvada, Colo.

Collaboration with our friends in Canada

Over the past several years, the U.S. Geological Survey has been investigating the impacts of filtration artifacts on trace-element concentrations with the Geological Survey of Canada and Environment Canada. The project is directed by Art Horowitz (USGS, Sediment Partitioning Research Project, Atlanta, Ga.). As part of this investigation, the latest series of experiments were conducted at the National Water Quality Laboratory by John Garbarino (NWQL), Claire Lemieux (a scientist from Environment Canada, Centre Saint-Laurent in Montreal), and Debbie Vaught (NWQL).

The focus of the study was to identify possible sources of bias in dissolved trace-element concentrations arising from various methods of filtration. Currently, dissolved trace-element concentrations are defined as those measured in the filtrate obtained from filtering a whole-water sample through a 0.45- μm (micrometer) pore-size membrane. The objective was to test the hypothesis that the currently used operational definition for dissolved trace-element concentrations in samples of natural water is potentially inaccurate. The concentrations might be influenced by physical and chemical composition of the natural water being filtered and the filtration process itself.

The Mississippi and Tangipahoa Rivers were chosen as sources for the natural-water samples used in the experiment because of distinctly different pH, conductivity, dissolved organic-carbon concentration, and suspended sediment concentration. Over 120 L (liters) of each natural-water sample was filtered using four different filter media.

Over 250 samples were analyzed using inductively coupled plasma-emission spectrometry and inductively coupled plasma-mass spectrometry at the NWQL. Preliminary results indicate that several factors influenced dissolved trace-element concentrations in samples from the Mississippi and Tangipahoa Rivers: (1) the surface area of the filter medium used, (2) the type of filter medium used, and (3) the filtrate aliquot analyzed. Treatment of the whole-water samples by centrifugation prior to filtration substantially reduced the differences in the trace-metal concentrations obtained for different filter media. Study findings will be published in a journal article within the next year.



by John Garbarino

New reports published

New titles published by the National Water Quality Laboratory (NWQL) are as follows:

Leiker, T.J., Madsen, J.E., Deacon, J.R., and Foreman, W.T., 1995, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory-Determination of chlorinated pesticides in aquatic tissue by capillary-column gas chromatography with electron-capture detection: U.S. Geological Survey Open-File Report 94-710, 42 p.

Rose, D.L., and Schroeder, M.P., 1995, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory-Determination of volatile organic compounds in water by purge and trap capillary gas chromatography/mass spectrometry: U.S. Geological Survey Open-File Report 94-708, 26 p.

Raese, J.W., 1994, National Water Quality Laboratory profile: U.S. Geological Survey Open-File Report 94-366, 4 p.

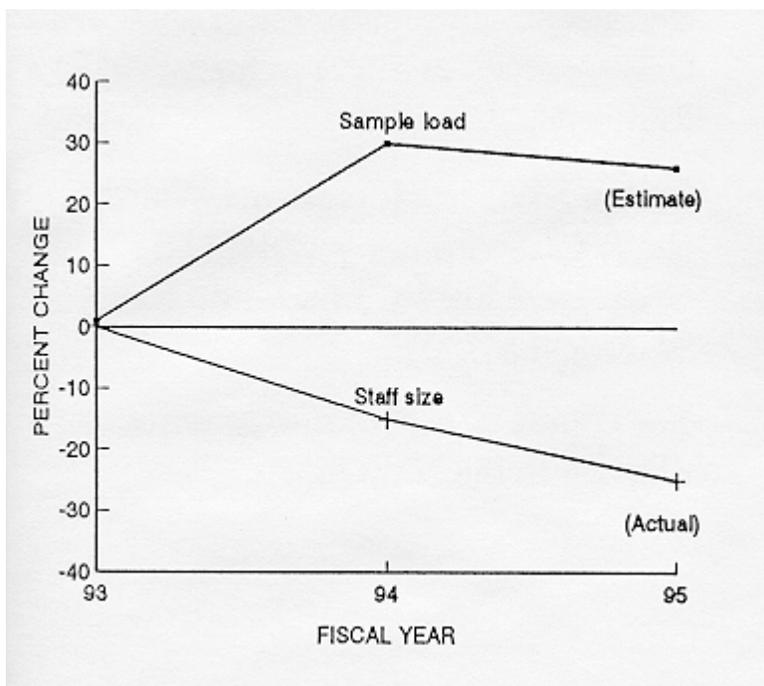
For copies of these reports, write directly to the NWQL.

Analyses up, staff size down in Organics in FY 1994-95

Substantial changes have taken place in the last 18 months in the NWQL Organic Chemistry Program.

- The program analyzed over 39,900 schedule and lab-code requests in fiscal year (FY) 1994 (a 30-percent increase over 1993) and expects to analyze almost that many in fiscal year 1995 (see graph).
- Since fiscal year 1993, the number of program staff dropped from 66 to 50, a 24-percent decrease (see graph).
- As of March 9, 1995, the program backlog was 15 percent lower than for the same period in fiscal year 1994.
- In fiscal year 1994, the program introduced changes in quality assurance/quality control (QA/QC) protocols. As part of the continuing effort to improve QC practices, the program developed more uniform QC and increased the number and types of QC samples for some analyses.

Merle Shockey, acting program chief, attributes the increased number of analyzed samples and lower backlog, while the program size has decreased, to a "top-quality well-trained staff, improved instrumentation and methodologies, and a more stable work force."



TQM teams created

The NWQL has five Total Quality Management (TQM) teams in operation. The Sample Flow Team has been meeting to chart the flow of samples, from reception to getting the data to customers. The team will be making recommendations to tackle specific problems.

The Analytical Parameters Team--an effort to evaluate analyses and target those that either should be replaced, contracted, or deleted--has passed its recommendations through the supervisory level to senior staff. Senior staff, in turn, is sending the results to the Office of Water Quality in Reston.

Three *ad hoc* teams have been formed in the last month. Inorganic Program staffers have formed a team to evaluate ways to eliminate pH spikes in laboratory wastewater. The team expects to fix the problem by mid-April 1995. A team also was formed to design a pH control system for the effluent of the entire NWQL. The Organic Program formed a team to deal with completing sample-preparation work with decreased staffing and forwarded a plan to the program chief.

Community outreach part of laboratory culture

Community outreach and public service play an increasingly important part in the lives of NWQL employees. Eleven staffers have represented the U.S. Geological Survey at 15 schools in the Denver metropolitan area since last fall.

An incomplete listing of community outreach follows: Glenda Brown, Jan. 5, 1995, Alexander Dawson School, Lafayette, and Feb. 24, science fair judge at Whittier Elementary School, Boulder; Gary Cottrell, Feb. and Mar. 1995, Mentoring Program, Gale Elementary School, Denver.

Steve Glodt, Sept. 1994, Campus Middle School, Cherry Creek; Glodt, Feb. 22, 1995, Campbell Elementary School, Arvada, and tour of NWQL; Glodt, May 1995, Mandalay Middle School, Westminster, and field trip with USGS Lakewood Subdistrict equipment; Glodt and Kim Pirkey, Feb. 10, Martin Park Elementary School, Boulder; Glodt and Pat Alex, Feb. 15, Campbell Elementary School, Arvada; Glodt and Jaye Lunsford (Colo. District), Mar. 16, Mandalay Middle School, Westminster.

Jeff Pritt, Feb. 17, 1995, Prospect Valley Elementary School, Wheat Ridge; Ted Struzeski, Mar. and Apr. 1995, Mentoring Program, Denver School System; Juan Vasquez, Nov. 1, 1994, Career Fair, John F. Kennedy High School, Denver; Vasquez, Nov. 30, Place Middle School, Denver; Vasquez, Mar. 17, 1995, science demonstration for three grades at Johnson Elementary School, Denver; Ralph White, Sept. 20, 1994, Career Week, University of Colorado at Boulder, and Feb. 23, 1995, Drake Middle School, Arvada, along with tour of NWQL; and Tom White, Mar. 14, 1995, Fairmount Elementary School, Denver.



Ralph White

Motoring down the information highway

The "Information Highway" has made a profound change in the way we share and discover information. The U.S. Geological Survey has distributed MOSAIC, a sophisticated browser of the World Wide Web that allows sharing information with graphics and photographs.

Selected National Water Quality Laboratory documents are now available through the NWQL Mosaic Home Page. Bill Sockriter, the Data General system administrator, recently installed the webserver software at the NWQL with the following uniform resource locator (URL): <http://wwwnwql.cr.usgs.gov/>

Initially, the NWQL Profile publication (also called the Fact Sheet) and a contact list will be made available through the NWQL Home Page. Plans are underway to add the Services Catalog, Analytical Services Prices, NWQL Technical Memos, and NWQL Field Instructions to the Home Page. Chris Lindley of the Organics Program has developed a prototype page to share details on parameter codes and methods with the associated graphs. Many employees have participated in the effort to produce a product useful to USGS.

The Home Page is being developed by Sandy Turner under the direction of Jon Raese. If you have any comments or suggestions as to what should be included, please send them to Jon (jwraese@prodlcoarv.cr.usgs.gov).



by Sandy Turner

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Jon Raese, Editor

The National Water Quality Laboratory Newsletter, is published quarterly by the National Water Quality Laboratory, U.S. Geological Survey, Box 25046, MS-407, Denver Federal Center, Denver, CO 80225-0046. For copies, call Jon W. Raese (303) 236-3464.

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