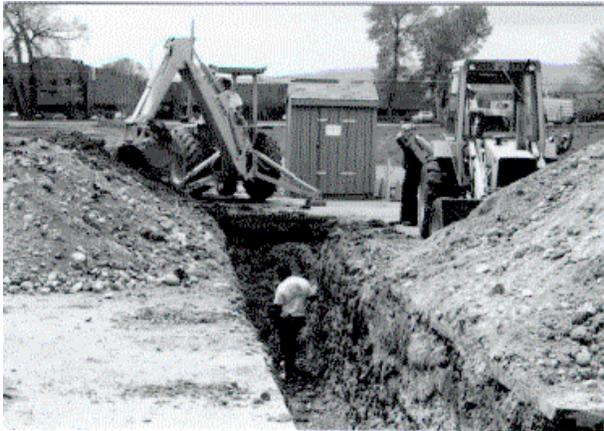


Planning Committee meets to set goals

The Water-Quality Analytical Planning Committee met June 8-9 at the NWQL to discuss subcommittee assignments and set goals. Also on the agenda was a discussion of available resources and strategic planning. The committee held its first organizational meeting May 8.

The committee is charged with reviewing laboratory financing and personnel needs, future division needs for analytical services, quality assurance of analytical activities, customer support, analytical methods development, other means for analytical services, and the composition and function of the Management Advisory Committee.

Committee members are Phillip E. Greeson, chair and acting regional hydrologist, Southeastern Region; Marvin O. Fretwell, associate regional hydrologist, Portland; Richard O. Hawkinson, district chief, Austin; Robert A. Lidwin, district chief, Little Rock; Marc A. Sylvester, assistant regional hydrologist-NAWQA, Menlo Park; David P. Krabbenhoft, research hydrologist, Madison; Jeffrey T. de Roche, section chief, Columbus; Thomas H. Chaney, quality-assurance manager, Yucca Mountain Project, Lakewood; Peter F. Rogerson, chief, NWQL; Timothy L. Miller, hydrologist, Reston; Robert P. Eganhouse, research chemist, Reston; David E. Erdmann, supervisory hydrologist, Golden; Gregory E. Schwarz, economist, Reston; and Gary L. Pederson, regional water-quality specialist, Norcross.



Treatment System for pH – Construction of a treatment system for pH is underway in the NWQL parking lot. All three waste lines from the Laboratory will be combined and brought into a vault containing a pH treatment system. The pH will be maintained between 6 and 9 to keep the Laboratory in compliance with its discharge permit.



Community Outreach – Chemist Gary Cottrell discusses an experiment in one of the NWQL labs with Thomas Rangel of Gale Elementary School, Denver, during a mentor project arranged by Community Resources, Inc., also in Denver.

Stable isotope analyses at Reston NRP Laboratory

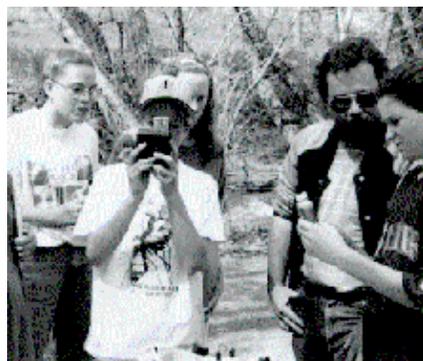
The NWQL and Reston NRP (National Research Program) Isotope Fractionation Project have agreed to decrease turnaround time and lower costs for stable isotope analyses. The two laboratories will continue to provide the division with a dependable source of high-quality analyses. NWQL Technical Memorandum 95-07 describes the new agreement, which became effective June 1, concerning analyses of oxygen (O-18/O-16), deuterium (D/H), sulfur (S-34/S-32), as well as calcite and CO₂ samples for both C-13/C-12 and O-18/O-16 analyses. Electronic copies of this memo are available on Mosaic software using the World Wide Web (see accompanying article entitled "New on the Net"). Key in the following uniform resource locator (URL): http://wwwnwql.cr.usgs.gov/Public/ref_list.html. Prices listed in the Technical Memorandum will be used through fiscal year 1996.

Significant changes have been made in the procedure for submission of samples, and prices have been reduced. In brief, samples for analysis of the isotopes listed above are now to be submitted directly to the Reston NRP Isotope Fractionation Project. NRP has taken on all responsibilities for sample receipt, login, and interactions with district personnel regarding these samples. The NWQL will continue to provide services for billing and release of data to the districts, and will maintain a quality-assurance program for this analytical work.

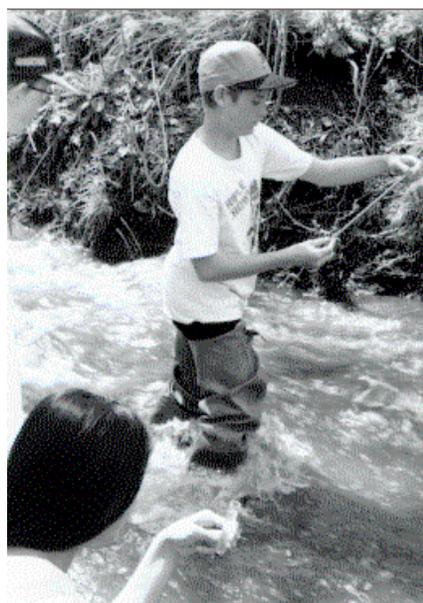
Local parks provide rich learning environment for public outreach

Steve Glodt, NWQL computer specialist, missed his calling: he should have been a teacher. Glodt takes to heart the U.S. Geological Survey's call for public outreach. In fair weather (and sometimes foul), he can often be found on the banks of a local creek instructing youngsters on the finer points of water chemistry.

Such was the case May 19 when Glodt turned up at Mt. Vernon Creek in Matthews/Winters Park west of Denver, to lead a group of 7th-grade students from Mandalay Middle School, in Westminster. Kids of all ages love to play in the water, but Steve still managed to divert their attention long enough to teach them how to measure dissolved oxygen, alkalinity, and water temperature.



Science is Fun – Steve Glodt (second from right) shows students from Mandalay Middle School how to use portable Hach kits to measure dissolved oxygen in water samples from Mt. Vernon Creek.



Tricky Footing – Students thought the water was “cool,” but they were not referring to the 10 °C temperature in Mt. Vernon Creek swollen by snowmelt runoff.

While Glodt kept one-half of the class riveted on water chemistry, the other half collected bugs for the ecology unit. Science teacher Kelly Curran helped the students collect and identify mayfly nymphs, crane fly larvae, and other assorted insects at the head of Mt. Vernon Canyon, one of the early routes to the gold fields of Central City (Gregory Diggings) and South Park.



Benthic Invertebrates – Science teacher Kelly Curran (left) of Mandalay School shows the proper technique for collecting samples. Generally the aquatic biological samples were represented by immature insects. Invertebrate communities are indicators of the quality of the aquatic environment.



Mayflies in May – Insect life was varied, and a beautiful spring day provided all the ingredients for a successful field trip to Matthews/Winters Park. Here, a student keys out the bugs.

New titles in print

New titles published by NWQL:

Burkhardt, M.R., Cinotto, P.J., Frahm, G.W., Woodworth, M.T., and Pritt, J.W., 1995, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory- Determination of methylene blue active substances by spectrophotometry: U.S. Geological Survey Open-File Report 95-189, 16 p.

Foreman, W.T., Connor, B.F., Furlong, E.T., Vaught, D.G., and Merten, L.M., 1995, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory- Determination of organochlorine pesticides and polychlorinated biphenyls in bottom sediment by dual capillary-column gas chromatography with electron-capture detection: U.S. Geological Survey Open-File Report 95-140, 78 p.

Patton, C.J., and Truitt, E.P., 1995, U.S. Geological Survey nutrient preservation experiment--Nutrient concentration data for surface-, ground-, and municipal-supply water samples and quality-assurance samples: U.S. Geological Survey Open-File Report 95-141, 140 p.

Sample handling and analysis -- More questions, answers

What happens to the bottle after you put it in the mail?

By Ed Furlong, Methods Research and Development

Editor's note: This column contains questions that originally were part of the Water Resources Division (WRD) training class "Water-Quality Principles." Through this question and answer format, Paul Capel (Minnesota District) and Ed Furlong (Methods Research and Development Program) answer some of the more common questions that WRD personnel ask the NWQL. If you have a question about the Laboratory, please send it to EFURLONG on Geomail. Selected questions and answers will be printed in future columns.

My project's cooperater is paying a lot of money for our study. I would like to do a good job on the project, including an awesome analysis of lake water. If I send you multiple containers of water, can you analyze the water for everything that is there?

As method detection limits are lowered, the probability increases that you will detect increasing numbers of analytes. Unfortunately, the cost goes up roughly with the same magnitude as the detection limit is lowered. So at some extremely high cost, we could provide a long list of detected constituents, but there would still be some undetected and unidentified compounds.

One way to think about the problem is that you could provide enough 1-liter batches of water to have the laboratory analyze all the constituents that we can determine currently. This would result in a lot of nondetects, a big bill, and an unhappy cooperater. A second way would be to try to selectively preconcentrate trace inorganic constituents by processing large volumes of water. This is a labor-intensive approach that would result in data with a lot of qualifiers, but the probability is higher that you would detect more analytes. However, once again you would spend a lot of money and would have data for only one parcel of water at one point in time. The best approach would be to contact the NWQL and work with someone in the Methods Research and Development Program (a) to define your problem more clearly, (b) help set priorities for constituent types, and (c) develop an approach that uses standard and custom analyses to provide the data you need. For example, you might use standard schedules for major ions and nutrients, a chelation extraction-inductively coupled plasma-mass spectrometric method for trace elements, and a large-volume extraction method for hydrophobic organics. Again, I cannot stress enough the need to consult (preferably in the early stage of a project) with the NWQL about your analytical needs.

Why can I measure alkalinity and dissolved oxygen better in the field with simple instruments than you can do in the lab with all your great equipment?

Alkalinity is a function primarily of carbon dioxide concentration in the water sample. Both alkalinity and dissolved oxygen are directly influenced by small changes in atmospheric partial pressures of carbon dioxide and oxygen, respectively. Also, whether filtered or not, water samples contain bacteria, whose metabolic activities can profoundly influence alkalinity and dissolved oxygen. Unfortunately, there is no practical way to seal samples in the field so that subsequent shipping and storage won't affect these results. Results from less expensive field equipment (even if less sensitive or precise, or both) can thus better approach "truth" than more expensive, precise, and accurate laboratory equipment.

A project chief told me that I can save a bundle of money (so I can drill more holes in the ground) and get faster results if I do the analyses myself with Hach-type and immunoassay kits. I think I know your answer, but what do you think?

I think that the results from Hach and immunoassay tests have to be clearly defined and delimited. My personal sense is that these kits are best used to determine whether a site should be further tested (go/no go) using more specific analytical techniques.

Immunoassay kits are being used primarily for trace organic compounds. In the case of an immunoassay test, the result is the sum of a specific class of compounds (for example, the triazines) plus all their degradation products that react to the immunoassay. The resulting value reflects unknown and varying contributions from a large group of chemically similar compounds. You also do not determine other compounds (for example, acetanilide herbicides) that may be of equal significance at your site but which are not reactive to the immunoassay. In comparison, NWQL method 1379 would provide individual determinations of atrazine, simazine, other triazine herbicides, and degradation products as well as the acetanilide herbicides, at detection levels comparable to most immunoassay kits. Even if you built a project around results from immunoassay kits, you would be well advised to submit some fraction, say 10 percent, of both your positive and negative detect samples to the laboratory for a full chemical analysis. The purpose of submitting positive hit samples is to verify immunoassay kit performance and also to determine if there are compounds of interest present that do not respond to the immuno-assay. The purpose of submitting samples with no detects by immuno-assay is to ensure that there are no false negatives because of poor response, and also to look for nontarget compounds that might be of environmental significance but that the immunoassay is not designed for.

Hach kits are most often used for inorganic constituents. The problems with Hach kits are that they are relatively insensitive and more subject to interferences than laboratory methods. Again, it is all a matter of what your data objectives and needs are.

My section chief tells me that I'm supposed to look at the data sheets as soon as I get them back from you. Seems kind of silly to me--the numbers on the page aren't going to go anywhere. What do you think about looking at the data sheets?

True. The numbers will not change, but you do want to look at the data as quickly as possible in case any values are suspect and a reanalysis might be required.

The laboratory has limited the time it holds onto inorganic samples (30 days for nutrients, 180 days for all other inorganic samples) because there is limited space for archiving materials. The sooner we know that you have a question about the data, or are interested in a reanalysis, the better the probability that we have the sample and can reanalyze it. We do not routinely archive samples submitted for organic analysis. Analyses of water for organics use the whole sample, so there is nothing left to archive. Sediment samples are held as long as there is space in the freezers, and then the oldest samples are discarded. However, we are implementing an archive for extracts produced by the National Water-Quality Assessment program. We expect to offer this service in the future. Be aware that there will be an annual cost for any extract stored in this archive because the sample extracts will be kept frozen and the extract condition monitored.

New on the Net

The NWQL Technical Memorandums have been added to the information available on our World Wide Web Home Page. Memos from 1992 to the present are available for browsing or printing. The address of the NWQL Home Page is <http://wwwnwql.cr.usgs.gov/USGS>.

This page is available for USGS access only. A Public NWQL Home Page is under development. Please send any comments or suggestions on the Home Page to Jon Raese (jwraese).



Safety Workshop – Hands-on training for the Confined Space Safety Workshop was held at the National Water Quality Laboratory March 23. About 22 USGS employees from all regions of the country were enrolled for the three-day course. Confined-space training is mandated by the Occupational Health and Safety Administration for those employees working with the National Pollution discharge and Elimination System (NPDES). Clarence Nichols (right), NWQL Safety Office, assisted with the exercise.

Seminars at NWQL listed

Anton L. Inderbitzen, office of the assistant director for research, "Open Forum on CRADA's--Cooperative Research and Development Agreements," March 6; Prof. Michael Burke, Department of Chemistry, University of Arizona, "Advances in Solid-Phase Extraction," May 18; VARIAN Instruments, "Recent Advances in Ion Trap Mass Spectrometry," June 14.

Newsletter Staff

Jon Raese, Editor

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