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National Water Quality Laboratory Newsletter

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U.S. Geological Survey

Collaborative response to hurricane provides unprecedented challenge

The National Water Quality Laboratory has had a substantial role in the U.S. Geological Survey's response to the overwhelming water-quality problems that have resulted from Hurricane Katrina when it made landfall as a category 4 storm in Plaquemines Parish, La., August 29.

The NWQL collaborated with USGS scientists from the Geologic Discipline and the Louisiana Water Science Center to evaluate organic contaminant concentrations in solid samples collected in New Orleans. The purpose of this sampling was to establish baseline solids concentrations of potentially harmful contaminants, thus providing the data necessary for beginning long-term exposure assessments.

The NWQL also has been the primary analytical laboratory for the Louisiana and Mississippi Water Science Centers' comprehensive water-quality assessments following Hurricane Katrina landfall. These assessments

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KATRINA SOIL SAMPLES—Todd Hoefen, Geologic Discipline scientist, is shown collecting infrared properties of soil and sediment samples from New Orleans in a NWQL analytical laboratory. The infrared data were used to calibrate instruments for remote-sensing flights over areas affected by Hurricane Katrina.

have included analysis of pesticides, trace elements, nutrients, organic carbon, and major ions.

In addition, the NWQL provided analytical support to the Reconstructed Trends Project of the National Water-Quality Assessment Program, which has conducted extensive sampling in Lake Pontchartrain to assess the current distribution of contaminants in sediments and to determine the concentrations of contaminants in the suspended sediment pumped back into Lake Pontchartrain as part of the effort to empty New Orleans of floodwater.

A unique aspect of these samples was the very real concern that samples and sample containers could be contaminated with pathogenic microorganisms because of the flooding of wastewater-treatment plants and animal agriculture operations. Because samples are distributed between many analysts at the NWQL, the possibility of spreading pathogens through sample distribution was recognized as a safety concern.

As a result, the NWQL briefed the Geologic Discipline and NWQL scientists on the potential hazards associated with handling these samples and developed procedures for disinfecting all samples received prior to distribution and analysis. Because of their prior experience with potentially pathogen-contaminated samples, Steve Werner and Ed Furlong, Methods Research and Development Program, established a designated sample decontamination area within the laboratory. Working together with Pat Alex and Phil Grano of Login, the two groups decontaminated every cooler and sample container used for Katrina response samples delivered to the NWQL.

The NWQL made rapid turnaround of the analyses of these and other samples associated with the USGS Hurricane Katrina response its highest priority to provide the timeliest results possible. Many of the results have been distributed to USGS Water Science Centers and the Geologic Discipline Katrina Response Team. Publications documenting the concentrations, composition, and distribution of contaminants in the Katrina-affected area are in preparation.

Because of the range and sensitivity of USGS official and research methods, the NWQL is providing researchers, managers, and policymakers with the objective ambient environmental data necessary for decision making and understanding of the long-term effects that a catastrophe like Hurricane Katrina may have on human and ecosystem health.

All sections in the NWQL were involved in the response to the analytical challenge presented by Hurricane Katrina. The ability of the NWQL to respond rapidly to this unprecedented challenge in supporting USGS programs is a reflection of the talent, dedication, abilities, and professionalism of all NWQL staff.

One outcome of this combined USGS response has been a successful Director's Venture Capital Fund proposal that will establish a USGS rapid-response capability for describing catastrophic natural or anthropogenic events. See article entitled, "NWQL will participate in 2006 Venture Capital Fund proposals," page 9, in this issue of ***Water Logs***.

• Ed Furlong

USGS responds to Hurricanes Katrina and Rita devastation with willing volunteers

By Jon Campbell, USGS

Moving from the world of natural science to humanitarian relief, USGS volunteers responded quickly in recent months to help victims of Hurricanes Katrina and Rita by assisting in basic recovery operations crucial to rebuilding storm-ravaged communities.

The widespread destruction wrought by the two closely timed hurricanes posed an extraordinary national challenge. Although USGS is not normally charged with responsibility for emergency support functions, the USGS Office of Human Resources, on learning the scope of the damage caused by Hurricane Katrina, offered USGS volunteers through U.S. Department of the Interior (DOI) channels to assist other Federal agencies with response and recovery efforts.

On September 8th, Acting USGS Director Pat Leahy sent out a call for hurricane relief volunteers. The memorandum indicated that respondents should be "physically able to work outdoors all day in a disaster area" and "willing to work long hours under arduous conditions." Informed that they would sleep in tents but not knowing the specific nature of the work or a definite destination for a demanding, month-long assignment, the first wave of 21 USGS volunteers responded within days, committing to the effort in spite of the lack of more detailed information. Unfortunately, before they could report to the U.S. Army Corps of Engineers recovery operations center in Baton Rouge, Hurricane Rita hit the Gulf Coast with yet another blow, delaying their deployment but underscoring the need for additional hurricane relief workers.

USGS volunteers began to arrive in Baton Rouge on September 26th. By November 7th, 59 USGS volunteers had been engaged in hurricane recovery work in Louisiana and Texas, primarily in areas in the path of Hurricane Rita. The volunteers included three from Building 95: Scott Grotheer, NWQL; and Natalie Latysh and Greg Wetherbee, Branch of Quality Systems.

Shortly before departure, the first group of USGS volunteers learned

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BLUE ROOF MISSION—Volunteers from the U.S. Geological Survey take part in the Blue Roof Mission for the U.S. Army Corps of Engineers (USACE) in Nederland, Texas. Members of the USGS team evaluated damaged roofs to see if they were qualified for a temporary Blue Roof, and measured the roof to determine how much material was needed temporarily to fix it until homeowners could get the structures permanently repaired. In this photo, team members, including Scott Grotheer (not shown), NWQL biologist, actually repaired a damaged roof to make sure the homeowners qualified for a temporary Blue Roof (tarp), charitable work that was outside their normal duties. With free donations of lumber and borrowed tools, the USGS employees made a lasting impression on the homeowners and their neighbors. The repairs were made on the team's off days; they were already working 6.5-day weeks! Col. Steve Haustein, Disaster Relief Commander for the Beaumont unit, from the USACE Galveston District, said this act of selflessness on the part of the USGS team was one of the most positive events to date during the relief effort.

more of their assignment. The Federal Emergency Management Agency (FEMA) funds a program commonly conducted in the wake of natural disasters, called Operation Blue Roof, which provides temporary roofing for qualifying homes with storm-related damages. The goal is to prevent further damage to homes during long delays that typically occur until insurance-related issues are settled and permanent roofs can be repaired or replaced by a roofing contractor. Because of the extensive property damage that results from large hurricanes, it can take a year or more for even well-insured properties to be repaired because of the overwhelming demand in devastated areas for roofing work. A blue roof—named after the tough blue plastic tarps that form the temporary roofs—protects the home and its contents and furnishes a livable space during this transitional time.

Although the U.S. Army Corps of Engineers provides overall direction of the Blue Roof program for FEMA, blue roofs are actually installed by contractors from the private sector. However, Federal employees from the corps—and in this case employees from every DOI bureau—perform three critical program management tasks. They first assess the damaged home to confirm that it qualifies for the Blue Roof program. Secondly, they determine where the blue tarp should be placed and estimate the square footage of material needed. The contractors are paid by the square foot of roofing installed; so this is an important consideration. The third and final task for government employees is a quality-assurance check for each installation. This involves ensuring that the finished job meets program standards and comparing the square footage installed against the initial estimate to protect against potential abuse of program funds.

Other USGS volunteers assisted the corps in overseeing another vital task in rebuilding communities—debris removal. The massive amount of debris that accumulates along city streets after a disaster of this scale includes fallen trees; materials from destroyed buildings; discarded household goods of all kinds; rugs, furniture, and appliances (most notably, refrigerators). A November 2nd corps press release stated that the estimate of the total quantity of debris generated by both hurricanes in Louisiana was more than 17.5 million cubic yards.

Working 12 hours a day and 7 days a week—typically with no time off for at least 30 days—USGS and other DOI volunteers indeed worked the arduous hours promised in the recruiting call. During those long days, they tackled radically different responsibilities with little training: they safely navigated to damaged homes on unsigned streets through downed trees and power lines; slept in tents; braved mosquitoes, bad dogs, and camp food; and perhaps most importantly, listened with their hearts to hundreds of disaster stories, offering hope, reassurance, and confidence to many residents.

As their assignments ended, the volunteers often had the unusual privilege of seeing how their work had actually changed the community landscape. In neighborhoods that had looked totally devastated a few weeks before, they saw a sea of blue roofs and long stretches of cleared streets.

"After replacing the roof on my own home in Wheat Ridge, Colorado, I thought I was done with roofing, but soon I was visiting 20 to 40 homes a day either to assess roof damage or inspect completed roof work in southeast Texas. Although I'm employed as an entomologist at the NWQL, my hobby is carpentry and woodworking, and for 30 days, 12 hours a day, 7 days

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a week, those roles were reversed. The closest I came to entomology was to casually observe that the mosquitoes I was swatting were truly bigger in Texas. I'm glad that my hobby and employment with the USGS provided me with the skills and opportunity to help so many in their time of need," said Scott Grotheer, who spent his time working in and nearby Port Arthur, Texas.

Acting Director Leahy wrote in a congratulatory letter to the USGS volunteers, "As we continue to mobilize our Bureau's resources to assist citizens, emergency managers, and policy makers with our scientific research and analysis, your personal commitment to the relief and recovery efforts stands out as an inspiration to us all. You have given an extraordinary gift to those in need, and I am sincerely grateful for your service to the citizens of the Gulf Coast."

Patricia Johnson

Patricia Johnson appointed administrative officer

The U.S. Geological Survey National Water Quality Laboratory appointed Patricia Johnson as the administrative officer to replace Merilee Bennett, who retired Jan. 3, 2006.

Pat was born and raised in California. She moved to Colorado in early 1984. She graduated from Allan Hancock College with a degree in business administration in 1979.

Prior to joining the USGS, Pat worked for the General Services Administration under a fee-for-service operation. She has worked in government for 31 years, 18 years with the U.S. Fish and Wildlife Service. Her government career has included work in various administrative disciplines with emphasis in budget and finance.

Pat and Randy (husband for 23 years) have two children attending Metro State College of Denver.

Administrative Officer Merilee Bennett retires; spent 34 years with USGS

Merilee Bennett

The U.S. Geological Survey hired Merilee Bennett as a clerk typist in the Personnel Office in 1971 in Menlo Park, California. On January 3, after more than 34 years with the Survey, the administrative officer for the National Water Quality Laboratory retires to a life of ease without deadlines.

"It has been a long, fulfilling career. I have worked in three disciplines (Administration, Geology, and Water) in all three regions (Western, Central, and Eastern) of the country," said Merilee.

Merilee was promoted to the administrative officer position in January 2001. In that time, she cited the achievement of three goals that gave her a sense of accomplishment:

1. Development of policy for the Working Capital Fund and the fee-for-service component;
2. The ongoing financial health of the NWQL (budgets finishing with investment funds every year during her tenure);
3. Setting up investment plans for purchasing laboratory equipment, a disciplined process for planning and tracking the purchase of instruments and equipment for laboratories and for Information Technology.

Merilee's retirement plans include travel (with husband Jim, a retired geologist from the USGS), painting, and reading ("but I won't be writing and reading budget reports!").

Merilee takes with her a vast corporate knowledge accumulated in various positions over the years, including financial analyst, program analyst, and management services specialist. And of course there was that clerk typist job back in 1971, which proved to be a good way to learn how to become an administrative officer from an entry-level position.

Taking Merilee's place as the new administrative officer is Patricia Johnson, whose position is effective January 4.

Cary Chiou, research hydrologist, retires after 22 years with Survey

Cary T. Chiou, research hydrologist in ground water chemistry, Central Region Branch of Regional Research, retires this month after 22 years with the U.S. Geological Survey. He published a number of papers and reports on sorption and partition phenomena.

Cary received his Ph.D. from Kent State University in 1973. He was a

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Senior chemist Pete Rogerson retires from USGS

Pete Rogerson, senior chemist for the Office of Water Quality, retired January 3, 2006, following a 34-year career with the Federal Government.

Pete received a B.S. degree from the University of Vermont in 1966 and a Ph.D. in analytical chemistry under the direction of Prof. Maurice Bursey at the University of North Carolina, Chapel Hill, in 1970. His doctoral dissertation was entitled, "Ionization Potentials of Silicon Compounds and Substituted Transition Metal Acetylacetonates." After a postdoctoral fellowship at Cornell University with the renowned mass spectroscopist Fred McLafferty, Pete joined the Federal Water Quality Administration in July 1971 as a research chemist at the Northeast Region National Marine Water Quality Laboratory, in Narragansett, Rhode Island. That agency evolved shortly afterwards into the U.S. Environmental Protection Agency.

In 1976, Pete was promoted to supervisory research chemist. He transferred to the U.S. Geological Survey Water Resources Discipline in 1986, and worked for the Branch of Analytical Services in Lakewood, Colorado, where he established the Methods Research and Development Program at the National Water Quality Laboratory in 1987.

Pete was the first chemist in the new Methods Program and soon assumed duties as its chief. "I coordinated and developed the program; it was challenging work, but it was fun, too, and I enjoyed it," added Pete. All but three of the research chemists he hired are still with the program.

Within a couple years, he became a supervisory hydrologist, and in 1991, he was reassigned as a supervisory chemist and became assistant chief and then chief of the National Water Quality Laboratory.

Pete Rogerson

In 1997, Pete was reassigned as senior chemist in the Office of Water Quality, in Lakewood, Colo. His accomplishments in the Office of Water Quality include the development of a new system for methods approval and in situ nutrient analyzer research in Baton Rouge, La., Raleigh, N.C., Indianapolis, Ind., and Klamath Falls, Ore. One of the greatest achievements of his career was lobbying for the construction of a new environmental laboratory. He worked tirelessly to promote a state-of-the-art building for analytical work. That dream was realized in spring 1999 when the NWQL moved into its new facility at the Denver Federal Center.

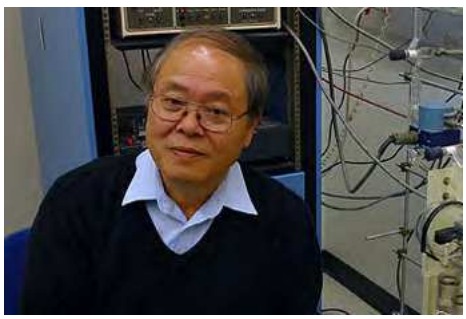
Pete plans to stay busy after retirement. He loves to spend his summers at the family cabin in Canada, and plans to indulge his passion for skiing. Dog training is another passion; he trains his border collie in agility and has won numerous ribbons at the Front Range Agility Club and Colorado Australian Shepherd Association.

An interview with Pete in 1993 is available on the NWQL Newsletter archive at *http://nwql.usgs.gov/Public/news/Jul93/pete.html#pete*

professor at Oregon State University prior to joining the USGS in 1983.

His research on partitioning of organic contaminants included sediment sorption of contaminants from water in relation to soil organic and mineral matter; contaminant partitioning and bioconcentration into fish and plants; and interactions of contaminants with dissolved natural and anthropogenic organic matter.

Cary's 1979 research paper in *Science*, on partitioning organic contaminants with soil organic matter, received the 1999 AEESP Outstanding Publication Award. His 1977 paper in *Environmental Science & Technology* on the relations of fish bioconcentration factor and octanol-water partition coefficient with contaminant water solubility was selected among the 10 high-impact papers in ES&T. He also published a book—*Partition and Adsorption of Organic Contaminants in Environmental Systems*. He received the USGS Special Achievement Award in 1985, and he is an adjunct professor at several Chinese universities.



Cary T. Chiou *(photo by Chris Lindley)*

MARLAP training

The NWQL hosted a 2-day training session for the use of the Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) manual. Subjects covered included developing data-quality objectives and measurement-quality objectives, method evaluation, data verification and validation, measurement uncertainty, obtaining laboratory services, and evaluating laboratories.

The training, sponsored by the U.S. Environmental Protection Agency (USEPA) and held the second week of November, attracted participants from the USGS, Department of Energy, Department of Defense, USEPA, California and Colorado, national laboratories (Los Alamos National Laboratory and Lawrence Livermore National Laboratory), and several commercial laboratories.

Instructors for the training were Carl Gogolak, Department of Homeland Security; Keith McCroan, USEPA; David McCurdy and Robert Litman, contractors for USEPA. Another training session is expected to be held in spring 2006, in Atlanta, Georgia.

Lindley takes Best of Show in 31st annual USGS national photo competition

Photographs from the U.S. Geological Survey National Water Quality Laboratory were well received in the 31st annual USGS National Photographic Competition for 2005, including 1st place and "Best of Show" for Chris Lindley's photo titled "Curecanti Creek Aspen," in the advanced amateur, color, still life, and close-up category.

Other winners included Jon Raese, 1st place, "Architectural Study, Colorado Convention Center" (amateur, black and white, man-made structures); Scott Oppenheimer, 1st place, "*Coprinus comatus*" (amateur, black and white, nature); Linda Oasheim, 2nd place (amateur, black and white, nature); Jon Raese, 1st place, "Willow Rootlets, Bright Angel Creek, Grand Canyon National Park" (amateur, color, nature); Mark Cree, 2nd and 3rd places, and honorable mention, "Brainard Lake," "Dream Lake," and "Mountain Aspen," respectively (amateur, color, nature); Jon Raese, 2nd place, "Little Girl with the Blues" (amateur, color, people and animals);

Off the trail at Fourth of July mine, Indian Peaks Wilderness, west of Nederland, Colorado.
Photo by Chris Lindley

Chris Lindley, 2nd and 3rd places, "Alpine Pool Near Island Lake" and "Mt. Sopris," respectively (advanced amateur, color, nature).

Jerry A. Leenheer retires this month after 35 years

Jerry Leenheer, hydrologist in the Branch of Regional Research, Central Region, retires this month after 35 years with the U.S. Geological Survey.

Jerry received his Ph.D. in agronomy/soil chemistry from Purdue University in August 1970, and joined the National Research Program of the USGS in 1970. He conducted research on organic solute migration in ground water on the Subsurface Waste Injection Project from 1970 to 1975, and was project chief of Oil-Shale Wastewater and Water Quality Project from 1975 to 1983.

He began the Comprehensive Organic Analysis of Water Project in 1984. The major emphasis of this project since 1987 has been natural organic geochemical investigations of water and sediment ranging from the Arctic to the Amazon.

During the Mississippi River Research Project, he arranged a cooperative study between the USGS and the U.S. Fish and Wildlife Service to study PCB contamination in water, sediment, and fish in the upper Mississippi River. From 1993 to the present, he has published fundamental and applied research on numerous projects concerning the nature and reactivity of dissolved organic matter in surface water, ground water, drinking water, and wastewater.

Jerry A. Leenheer

Currently Leenheer's research involves studying the transport and fate of dissolved organic matter during stormflow and infiltration of Santa Ana river water into ground water in Orange County, California.

He has received the Certificate of Appreciation from the American Chemical Society and many awards from the USGS.

• COLLEEN ROSTAD

NWQL to implement hormone method for whole-water samples

Larry Barber, USGS National Research Program-Boulder, and colleagues developed a method for selected sex hormones and other sterols in whole water that uses solid-phase extraction, analyte derivatization, and analysis by gas chromatography/mass spectrometry (GC/MS) with selected-ion monitoring.

This method was used extensively in the Toxic Substances Hydrology Program's Emerging Contaminants reconnaissance (Kolpin and others, 2002) and follow-on studies (Barnes and others, 2004; Cordy and others, 2004), and by other USGS collaborators.

More recently, Barber and National Research Council postdoctoral research associate James Gray have developed a GC/MS/MS (ion trap) analysis that provides lower detection limits and improved analyte identification reliability compared to analysis by selected-ion monitoring. Although a solid-phase extraction method, it is designed for application to whole-water methods.

The demand for the hormone method has increased dramatically since its development, with current (2005) requests exceeding capacity within Barber's laboratory in Boulder, Colo. Because estimates suggested that predicted sample loads will be comparable to the NWQL wastewater methods, it is timely to transfer Barber's hormone method to the NWQL.

This transfer will increase method capacity and make it available throughout the Water Resources Discipline. The process to validate, document, and implement an official method for selected hormones and sterols in water by solid-phase extraction, derivatization, and GC/MS/MS is underway at the NWQL and is being led by Bill Foreman, Methods Research and Development Program.

The first phase is to acquire a GC/MS/MS, including the screening of instruments, submitting samples to vendors, and evaluating results. This phase should be completed early in 2006. Gray has been employed in a term position to facilitate the method transfer. He was hired October 1.

Initially the custom analysis will be launched to support continuing studies in the Toxics Program and the Water Science Centers. Once approved, the method will be offered at first on a limited basis and then expanded to a larger customer base when confidence in method operation and experience warrants. The implementation process is expected to be completed in fiscal year 2007.

• BOB GREEN AND BILL FOREMAN

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New publications

(NWQL authors in **boldface**)

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Lab wins grant to evaluate and study estrogens in biosolids

The National Water Quality Laboratory (NWQL) will participate in a study to evaluate pharmaceuticals, endocrine-disrupting compounds, and other contaminants during wastewater treatment, as part of a project, supported by the Water Environment Research Foundation (WERF), to evaluate and reduce estrogenicity in biosolids produced during wastewater treatment.

Ed Furlong, NWQL Methods Research and Development Program, coauthored and is coprincipal investigator, with Beverly Stinson, Ph.D. (Metcalfe and Eddy–AECOM) and David Quanrud (University of Arizona) of the successful proposal "Fate of Estrogenic Compounds During Municipal Sludge Stabilization and Dewatering" submitted to WERF as part of a competitive request for proposals. James Gray, a former National Research Council postdoctoral associate now with the Methods Research and Development Program, also will take part in the project, as will Dana Kolpin of the USGS Iowa Water Science Center, and Patrick Phillips of the New York Water Science Center.

Metcalfe and Eddy will provide project design, logistical management, and access to full-scale and pilot wastewater-treatment plants for sampling of current treatment processes and testing of advanced treatment technologies. The University of Arizona will determine estrogenicity in wastewater liquids and solids using cell-based in vitro bioassays that quantify estrogenic effects from mixtures of estrogenic compounds.

This project combines the unique capabilities of the U.S. Geological Survey (USGS), academic, and industry experts in the fields of environmental engineering, hydrogeology, and toxicology to evaluate the presence, fate, and transport of estrogens in biosolids resulting from wastewater treatment, the primary source of emerging contaminants to the environment. They plan to tackle this complex environmental problem with potentially far-reaching implications for human and environmental health.

In Phase I of this study, four full-scale wastewater-treatment plants will be examined to evaluate known estrogenic compounds and the total estrogenic activity of samples collected. Commonly used treatment processes will be tested and samples collected throughout the solids-treatment train, and liquid samples will be taken from key locations in the plants (influent, effluent, and recycle streams), every 4 to 6 months to account for seasonal variability in the influent stream. In Phase II, the second year of this 2-year study, the evaluation of controlled bench or pilot scale biosolids treatment processes, particularly advanced treatment processes, will be studied in detail.

Liquid and solids samples will be analyzed at the NWQL for a suite of compounds, including pharmaceuticals, personal-care products, and nonprescription drugs, in addition to the hormones that are of primary interest to the study. Collection of these data will result in a comprehensive evaluation of the effects of biosolids processing on emerging contaminants. This research will provide key baseline information concerning the identity, concentration, characteristics, temporal/seasonal variations, and potency of estrogenic compounds that are believed to partition preferentially onto biosolids during common wastewater-treatment processes.

This information will expand the scientific basis from which regulators, engineers, and environmentalists can begin to understand the risks associated with biosolids land application, develop a list of priority pollutants and estrogenic compounds, identify suitable treatment technologies, and develop Best Management Practices for effective and safe biosolids management.

This is not the first collaboration between the USGS/NWQL and the University of Arizona or Metcalfe and Eddy. As part of a State Water Resources Research Institute—2004 National Competitive Grant entitled, "Pharmaceutically Active Compounds: Fate in Sludges and Biosolids Derived from Wastewater Treatment," several University of Arizona students have worked in the Methods Research and Development Program laboratories, learning about the analytical techniques used to determine pharmaceuticals and other trace organic wastewater contaminants.

The USGS, through Patrick Phillips of the New York Water Science Center, has partnered with Metcalfe and Eddy to assess the seasonal presence and concentration of organic wastewater compounds in effluents from five wastewater-treatment plants, to determine the typical impact of these discharges on receiving streams and the Croton Reservoir receiving water supply system.

As noted in *People, Land & Water* (U.S. Department of the Interior, October 2005, p. 46), this joint USGS–Metcalfe and Eddy project recently received the Platinum Award for Engineering Excellence by the American Council of Engineering Companies of New York, in recognition of the collaborative research on the fate of wastewater contaminants. The NWQL provided the chemical analyses for this project and received one of the two award plaques given to the USGS in recognition of the Laboratory's contributions to the success of the project.

• ED FURLONG

NWQL will participate in 2006 Venture Capital Fund proposals to mitigate risks

P. Patrick Leahy, Acting Director of the U.S. Geological Survey, recently announced 12 winning proposals for funding in 2006 under the Venture Capital Fund. Three of these multidisciplinary proposals will involve personnel from the U.S. Geological Survey National Water Quality Laboratory (NWQL).

All the proposals will help the USGS develop new methods to anticipate natural hazards and mitigate risk, and to become more responsive to communities and decision makers after natural hazards. The three proposals follow:

1. Elucidation of the Biogeochemistry of Soils and Sediments through Metal Speciation using high-performance liquid chromatography, high resolution, single focusing, inductively coupled plasma–mass spectrometry, and liquid chromatography/mass spectrometry. The lead principal investigator (PI) is Ruth Wolf (Central Region, Geology, Mineral Resources Team) and CoPIs are Jean Morrison (Central Region, Geology, Mineral Resources Team); William Brumbaugh (Central Region, Biology); Edward Furlong and John Garbarino (NWQL). The objective is to develop and validate speciation methods that would be readily available to assess potential chemical risk to human health and the environment resulting from a catastrophic event, such as a terrorist threat or natural disaster. These methods also would be available to study immediate and long-term effects of toxic metal species on ecosystem dynamics.

2. Rapid Response Environmental and Health Hazard Characterization of Solids Generated by Extreme Events. The PI is Geoffrey Plumlee (Central Region, Geology, Mineral Resources Team) and CoPIs are Gregory Meeker (Central Region, Geology, Mineral Resources Team); Dale Griffin (Eastern Region, Center for Coastal and Watershed Studies); Roger Clark, Todd Hoefen, and Paul Lamothe (Central Region, Crustal Imaging and Characterization Team); Bob Eganhouse (Eastern Region, Regional Research); Robert Rosenbauer (Western Region, Coastal and Marine Geology Team); Carl Orazio and Chris Ingersoll (Central Region, Biology); and Edward Furlong (NWQL). The objective is to establish a USGS rapid-response analytical methodology for describing the mineralogy, geochemistry, microbiology, and ecological and human toxicological properties of dust, other airborne constituents, and sediments produced by catastrophic natural or anthropogenic events, such as earthquakes, floods, forest fires, and building collapse.

3. Assessing the Risk of Contaminated Floodwater Sediment to Human and Ecosystem Health. The PI is Elena Nilsen (Mendenhall Postdoctoral Research Program, Western Region, Geology) and CoPIs are Kathryn Kuivila (Western Region, Water); Robert Rosenbauer (Western Region, Coastal and Marine Geology Team); and Edward Furlong (NWQL). The objective is to develop methods for the determination of pharmaceuticals and personal-care products in contaminated floodwater sediments to assess the impact on human exposure and on the ecosystem.

• JOHN GARBARINO

Lab news briefs

Inspectors from Colorado gave the NWQL a clean bill of health September 28 after examining the facility for hazardous materials and hazardous waste. The inspection was in compliance with the Resource Conservation and Recovery Act. No violations were found, although some minor issues were noted for correction. Lab Chief Greg Mohrman complimented the staff, and added, "It would be unacceptable for a premier water-quality laboratory within the U.S. Department of the Interior to be anything less than the absolute best we can be with regard to environmental stewardship."

* * *

Melissa Schultz, National Research Council postdoctoral research associate at the NWQL, presented a seminar at the Laboratory September 28, entitled "Determination of Antidepressants, Pharmaceuticals, and Degradates in Environmental Materials."

* * *

Merle Shockey, assistant lab chief, recently announced that all USGS NWQL methods are now listed in the National Environmental Methods Index (NEMI) at URL *http://www.nemi.gov*. NEMI is useful for comparing and contrasting the performance and relative cost of analytical, test, and sampling methods for environmental monitoring. NEMI is a free searchable clearinghouse of methods and procedures for regulatory and nonregulatory monitoring purposes. NEMI is being developed under the direction of the Methods and Data Comparability Board, a partner-

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ship of water-quality experts from Federal agencies, States, Tribes, municipalities, industry, and private organizations.

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Jon Raese won first and third places in the hydrology category of the USGS Employees at Work photo contest.

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The anticipated soil remediation project to the west of Building 95 on the Denver Federal Center started in earnest December 2. The site is being developed for a new mass transit center and a hospital.

Calendar, 2006

April 24–28, USGS Biennial Geographic Information Science Workshop, Federal Center, Denver, Colorado. See *http://gio.usgs.gov/egis/training/usgs_gis_2006/*

May 7-11, 5th National Monitoring Conference of the National Water Quality Monitoring Council. Monitoring Networks: Connecting for Clean Water, San Jose, California. See *http://www.nwqmc.org*

Emerging contaminant science presented at the CREEC South Platte Forum

Several NWQL personnel attended the Consortium for Research and Education on Emerging Contaminants (CREEC) 16th Annual South Platte Forum, October 25 and 26, in Longmont, Colorado. The forum seeks to understand the sources of these emerging contaminants (ECs), the effectiveness of removal by water-treatment processes, their transport and fate in the environment, and potential risks on humans and wildlife.

New analytical capabilities allow identification and quantification of EC constituents, such as prescription and nonprescription drugs, detergents, fragrances, and disinfectants, downstream of urban wastewater effluent.

One class of contaminant being studied, for example, shows potential for modulating the endocrine systems of water-borne organisms. These endocrine-disrupting compounds (EDCs) can be natural or manufactured, and are suspected to play a role in the observation of intersex characteristics in the indigenous white sucker fish population in Boulder Creek, Colorado, downstream from a wastewater-treatment plant effluent.

In addition to hormones naturally present in surface water, studies show that synthetic hormones, plastics, pesticides, detergents and surfactants, and other industrial products can have hormonal activity. Although the activity of detergents and other chemical contaminants may be substantially lower than that of naturally occurring and synthetic hormones, their concentrations in wastewater are substantially higher, and thus their potential to modulate hormonal function is a concern. Additional research is needed to determine whether the total endocrine-disrupting activities of these complex suites of contaminants reflect additive, synergistic, or antagonistic contributions.

The Rocky Mountain region is an ideal area to study ECs. Water from pristine, snowmelt-fed streams flows into urban corridors within a short distance. As the water is used, streamflow gradually becomes dependent on treated wastewater and other urban sources, resulting in minimal dilution of ECs. In many watersheds, agricultural practices, including the operation of confined animal-feeding operations, further impact water quality.

Within the Front Range, a world-class network of academic, State, and Federal scientists is actively pursuing EC research at local, regional, and national scales, applying their expertise in chemistry, hydrology, biology, water-treatment technology, and wildlife toxicology. By collaborating with other stakeholders, such as regulators, policy makers, municipalities, and water-treatment owners and operators in the area, CREEC provides a unique opportunity to conduct cutting-edge research and communicate EC issues to the public.

NWQL scientists participate in this research through the Toxic Substances Hydrology Program's Emerging Contaminants Project, the development of new methods to determine pharmaceuticals and other organic waste-water contaminants, and continued use of established analytical methods to evaluate ground and surface-water samples for the presence of these compounds. Much of the data in USGS publications are based on data produced using these NWQL methods for wastewater and pharmaceuticals.

• Chris Lindley and Ed Furlong

VISITING CHEMISTS—Donna Damrau, supervisor of the Business Development Team, explains an automated colorimetric analytical system for two visiting chemists from Thailand as Gary Cottrell looks on. The Thai chemists, Saowanee Nukhao (front) and Malee Kitporka (rear), were trained on USGS operations for 8 weeks before returning to their homeland. During their training, they observed analysis techniques for organic and inorganic constituents and took part in surface and groundwater-sampling trips.

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