

ERLN Activates for the First Time

By Schatzi Fitz James, EPA Office of Emergency Management; John Griggs, PhD, EPA National Air and Radiation Environmental Laboratory

Spring 2011 marked a milestone for EPA's Environmental Response Laboratory Network (ERLN) when the network activated to support the Japan Fukushima Nuclear Incident.

EPA's Office of Radiation and Indoor Air (ORIA) used RadNet to monitor potential environmental impacts resulting from the Japan nuclear fallout. RadNet is a national network of monitoring stations that regularly collects air filters, drinking water, precipitation, and milk samples for analysis of radioactivity. The RadNet air monitors also have the capability of measuring radioactivity in real-time.

ORIA's National Air and Radiation Environmental Laboratory (NAREL) analyzed RadNet samples and communicated results to the public. To supplement its capacity and to assist with the gamma analysis of drinking water samples, NAREL (in conjunction with EPA's Office of Water) requested ERLN activation. Within 48 hours, EPA's Office of Emergency Management (OEM) and Office of Acquisition Management (OAM) used the ERLN's Compendium of environmental laboratories to identify laboratories with qualifications that met NAREL's need. OAM, with input from ORIA and OEM, issued an incident-specific statement of work and funding, via a Basic Ordering Agreement, or BOA.

The ERLN activation fortuitously complemented other radioanalytical preparedness endeavors. Proficiency in the analysis of samples containing mixed fission products¹ has declined among the radioanalytical community in the United States because of decreasing amounts of nuclear weapons testing as well as the lapse or demise of federal programs responsible for administering proficiency testing programs for radionuclides. ORIA and OEM have addressed this gap by developing and implementing a mixed fission products proficiency testing program with federal, state, and private laboratories—with the goal of enhancing the capabilities of radiological laboratories to analyze samples containing these products.

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¹ Mixed fission products refer to a larger array of radionuclides that would be released into the environment in the event of a nuclear weapon detonation or a major accident at a nuclear power plant.

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2011 APHL Annual Meeting and Fifth State Environmental Laboratory Conference: Laboratories at the Crossroads

By Erinna Kinney, MPH, Environmental Laboratories Specialist, APHL



Michael Wichman, Associate Director, Environmental Health, IA, discusses challenges and solutions of meeting laboratory accreditation requirements, 2011 APHL Annual Meeting.

Breaking records across the board, the 2011 APHL Annual Meeting & Fifth State Environmental Laboratory Conference, titled “Laboratories at the Crossroads,” exceeded expectations of attendees and proved to be an overwhelming success for APHL.

Held in Omaha, Nebraska, June 5-8, this year’s conference drew over 450 participants with more than 50 public health and environmental laboratories from the state, local, and international arenas. Featuring over 100 presenters, 20 sessions, corporate industry events, and a variety of pre/post meetings, the conference provided participants with an extraordinary venue to explore critical issues within public health and environmental laboratory practice.

Interdisciplinary in focus, this year’s meeting encompassed a transect of agriculture, environmental health and public health within a single breakout session. Specific to the environmental laboratory sector, topics spanned biomonitoring, radiochemistry, electronic data sharing, emerging environmental testing, accreditation, and national laboratory network systems.

Highlights included:

Emerging Environmental Contaminants of Concern (Breakout Session)

This session discussed EPA’s Candidate Contaminant List and Unregulated Contaminant Monitoring Regulation. Attendees learned about recent work done by USGS and the EPA on emerging chemical and microbial contaminants, their fate, effects in the watershed and analytical techniques.

Hot Topics in Public Health Informatics (Plenary Session)

Providing an overview of current laboratory data exchange activities, this session featured updates on electronic data sharing for public health and environmental laboratories including APHL’s whitepaper on Environmental Data Sharing, strategic planning and steps toward environmental laboratory interoperability.

Radiological Response at the Crossroads — A Multi-Agency Perspective (Breakout Session)

Highlighting the progress of EPA and FDA in the arena of radiological response, this session included lessons learned in implementing enhanced radioanalytical preparedness activities.

Meeting Monitoring and Measurements Needs through Technology Innovation and Collaboration (Breakout Session)

Lead by EPA’s Office of the Science Advisor’s Lara Autry and Anand Mudambi, this breakout session presented innovative opportunities and creative solutions to meet monitoring needs and/or gaps. Notable themes were method development, data management, data analysis, and assessment.



Where is Biomonitoring Headed? (Breakout Session)

This session focused on the vision and future of biomonitoring. It detailed plans for a national biomonitoring system, examples of biomonitoring activities in CDC-funded states, and a discussion of CDC's biomonitoring efforts at the national level.

Laboratory Accreditation: Do You Have All the Details? (Plenary Session)

This session emphasized progress toward, and issues associated with, environmental laboratory accreditation. Michael Wichman, PhD, (IA) presented on challenges, obstacles, and solutions that principal state environmental laboratories face to meet accreditation/certification requirements.

Not Just White Powders - Perspectives from the Field and the Lab

This session described areas in which Civil Support Teams (CSTs) and laboratories can collaborate to provide additional analytical specificity and assistance. Tara Lydick (DE) presented an overview of integration of the CST into the Delaware Public Health Laboratory. APHL Public Health Preparedness and Response Committee Chair Maureen Sullivan (MN) debuted the draft "APHL Unknown Sample Algorithm" for first responders and partners.

All-Hazards Receipt Facility Lessons Learned (Roundtable)

Participants presented multiple all-hazards receipt facility approaches (e.g., modular, free-standing, existing lab space), benefits and challenges of each approach, and lessons learned from working in all-hazards receipt facilities.

Trial by Fire - Moot Court (Breakout Session)

This interactive session illustrated some of the pitfalls associated with testifying during a trial involving significant laboratory evidence and testing. This session mimicked a real court scenario with attendees and APHL staff serving as witnesses, lawyers, and members of the jury. Attendees learned areas to strengthen with regard to chain of custody and evidentiary procedures.

Corporate Industry Events

New this year, APHL showcased the varied technologies and innovations of corporate partners via Industry Workshops. Partners included: Abbott Molecular, PerkinElmer, LifeTechnologies, and ThermoFisher Scientific.

To download presentations or for additional highlights from the 2011 APHL Annual Meeting and other past APHL annual meetings, please visit:
<http://www.aphl.org/conferences/proceedings/pages/default.aspx>.



MARK YOUR CALENDAR

The 2012 APHL Annual Meeting and Sixth Environmental Laboratory Conference will be held **May 20-23, 2012**, in Seattle, Washington!

EPA Water Laboratory Alliance Forum Makes a Splash at the APHL Annual Meeting

By Erinna Kinney, MPH, Environmental Laboratories Specialist, APHL



Conference participants at the 2011 APHL Annual Meeting

Water utilities and environmental laboratories from across the country convened in Omaha, Nebraska, for a half-day Water Laboratory Alliance (WLA) workshop hosted by US EPA Water Security Division. In conjunction with the 2011 APHL Annual Meeting and 5th State Environmental Laboratory Conference, the forum provided attendees representing local, state and federal agencies from across the water sector with knowledge regarding the WLA, an integrated nationwide network of laboratories with the analytical capabilities to support monitoring surveillance, response and remediation in response to an intentional or natural water contamination event. Providing an overview of the WLA, Latisha Mapp from EPA's Water Security Division led the forum, and Prisca Takundwa facilitated forum activities. Terry Smith (EPA-OEM) presented an update of the Environmental Response Laboratory Network (ERLN), and Adrian Hanley (EPA-WSD) highlighted the past and upcoming EPA functional WLA/ERLN exercises.

Tarulatta Upadhyay (Pennsylvania Department of Environment Protection Laboratory) presented on "Public Environmental Laboratories and the WLA: An Insiders' View," which focused on PA's strategic and effective process of applying to the ERLN/WLA. Her presentation outlined valuable steps and lessons learned, and included a comprehensive crosswalk that simplified the ERLN/WLA application elements. In addition, the presentation provided current examples of PA's experience with the WLA. Moreover, the interactive forum offered the opportunity for participants to dialogue and engage with EPA staff on questions, benefits and challenges to the WLA application process.

Overall, participants received an informative overview of the WLA and the Environmental Response Laboratory Network, summarizing their respective programs' scope, significance, reimbursement mechanisms, and membership benefit to laboratories.

To view the presentations from the forum, visit the APHL Member Resource Center (<http://www.aphl.org/memberresources/Pages/default.aspx>). For more program information on the WLA, application materials and resources, visit <http://water.epa.gov/infrastructure/watersecurity/wla/>.

Congratulations to APHL's 2011 Annual Meeting Awardees

APHL congratulates the 2011 Annual Meeting Awardees. In *Bridges*, we focus on those connected to the environmental health community.



The 2011 recipient of the APHL Gold Standard Award for Public Health Laboratory Excellence is **Stephen W. Jenniss**, MS, the retired director of the Environmental and Chemical Laboratory Services (ECLS) within the New Jersey State Department of Health and Senior Services (DHSS).

This award recognizes an APHL member who makes or has made significant contributions to the technical advancement of public health laboratory science and/or practice. Although recently retired, Steve served as laboratory director of the ECLS since 1988 and within the environmental public health sector since 1976. Mr. Jenniss assisted in establishing the chemical threat and biomonitoring testing programs in NJ and played an integral role in the successful consolidation of the Department of Environmental Protection laboratory with that of DHSS.



The 2011 recipient of the APHL Emerging Leader Award is **Jack Bennett**, BS, environmental chemistry section chief at the Connecticut Department of Public Health. This award recognizes a laboratorian whose leadership has been instrumental in one or more advances in laboratory

science, practice, management, policy or education of public health significance. Relocating to the public sector in 2004, Mr. Bennett has exhibited leadership skills of national, state and APHL significance. At the state level, Mr. Bennett has served on agency-wide task forces and

committees to address ethics policies and workforce development. He is currently serving as chair of the Environmental Laboratory Subcommittee and is a valuable participant with the Environmental Health Committee.



The 2011 recipient of the APHL On the Front Line Award is **John Griggs**, PhD, director of the Center for Environmental Radioanalytical Laboratory Science and EPA's National Air and Radiation Environmental Laboratory. This award recognizes an individual or organization

outside of the association's membership who makes significant contributions to APHL, its membership and mission. Dr. Griggs was nominated for his efforts in providing technical consultation, assistance and training on environmental radiological laboratory issues to state and local environmental public health laboratories.



The 2011 recipient of the APHL Healthiest Laboratory Award is the **Arkansas Public Health Laboratory** (accepted by **Dr. Jeffery Moran**). This award celebrates excellence in environmental stewardship and health promotion in both practice and policy. It recognizes APHL member

laboratories demonstrating outstanding efforts to reduce their collective environmental impact and to promote health & wellness programs. The Healthiest Laboratory Award is generously sponsored by APHL Diamond Level Sustaining Member HDR, Inc (<http://www.hdrinc.com/>). To learn more about the Healthiest Laboratory Award and the winners, please visit APHL's Membership Page, <http://www.aphl.org/member/Pages/default.aspx>.

Spotlight on Member Research

Milwaukee Lab Investigates Beach Water:

Same-Day Direct Detection and Quantification of *Escherichia coli* from Recreational Water by Rapid Quantitative Polymerase Chain Reaction Assay at the City of Milwaukee Health Department Laboratory

By Sanjib Bhattacharyya, PhD, Chief Molecular Scientist; Manjeet Khubbar, MS, Microbiologist III; Valdis Kalve, MS, Microbiologist II; Steve Gradus, PhD, D(ABMM), Laboratory Director, City of Milwaukee Health Department Laboratory



MHDL staff Valdis Kalve filtering beach water samples.

Studies of beaches document direct relationships between the density of Enterococci and *E. coli* in water and the occurrence of swimming-associated gastroenteritis. Recognition of the public health implications of this relationship led to the development of EPA's "Ambient Water Quality Criteria for Bacteria," used to establish recreational water standards.¹ Public health laboratories monitor recreational water quality for human indicators² by using:

- commercially-available culture-based methods (i.e., Colilert for *E. coli* or Enterolert for Enterococci);
- membrane filtration techniques (EPA-approved method 1600 for Enterococci and 1603 for *E. coli*); or
- quantification by most probable number using serial dilution in multiple-tube fermentation.

Culture-based methods are easy to perform and cost-effective and allow detection in 24 to 48 hours. The Milwaukee Health Department (MHD) did comparison studies to see if the faster quantitative

polymerase chain reaction (qPCR) assays might allow faster public health actions. This article highlights the results.

As per the Beaches Environmental Assessment and Coastal Health Act of 2000 and Section 303(a) of the Clean Water Act, MHD adopted EPA water quality criteria and standards to issue public notifications on recreational water quality within 24 hours of water sampling using Colilert.³ The Beach Protection Act of 2008 now allows EPA-approved labs to use a rapid-testing method.

In the past, several real-time quantitative polymerase chain reaction assays were developed for detecting and quantifying *E. coli* in water samples from recreational water sites in less than 4 hours. By definition, qPCR amplifies and simultaneously quantifies a targeted DNA molecule. The EPA expects to define qPCR recommendations for beach-testing laboratories by 2012.

MHD LABORATORY qPCR INITIATIVES

The MHD Laboratory participated in the multi-site EPA qPCR study in 2006 and continued pilot studies for three consecutive years on local beach water samples for *E. coli* using EPA Method 1603, Colilert-18 and qPCR.

For qPCR, 100 mL beach water samples are filtered onto 0.45- μ m pore-size polycarbonate filters, and DNA is extracted from the membrane filters. For qPCR assay set up on SmartCycler instruments (Cepheid, Sunnyvale, California), proprietary lyophilized beads containing all reagents are used (BioGX, Inc., Birmingham, Alabama), followed by Cycle threshold (Ct) from system software and interpretation of results based on calculation of Cell Equivalent (CE)/100 mL, compared to EPA-recommended MPN/100 mL numbers.

1 http://water.epa.gov/type/oceb/beaches/upload/2006_06_19_beaches_rvsdman.pdf

2 A group of organisms that indicate the presence of fecal contamination of human origins

3 IDEXX Laboratories, Westbrook, Maine

Based on the Beach Management decisions, the agreement between culture-based methods, Colilert and EPA method 1603 was ~100 percent. Based on findings from a multi-year study, the beach management decision agreement between culture-based methods (Colilert, colony count on agar plates) and qPCR was >83 percent.



MHDL staff Manjeet Khubbar setting up qPCR from beach samples.

Out of 17 percent disagreement, 12 percent was due to false negatives, where qPCR was unable to detect the presence of *E. coli*, and, therefore, missed a warning that was identifiable with a less-sensitive culture method. The inhibition of DNA amplification during qPCR could be attributed to specificity of the primer/probe design, excess DNA, loss of target organism or nucleic acid during sample processing and sample collection process.

FUTURE DIRECTIONS FOR ENHANCED BEACH MONITORING

Same-day reporting of the presence of human indicator(s) from recreational waters would be a tremendous advancement in beach quality assurance. The MHD laboratory is currently reporting qPCR results (presumptive ID for *E. coli*) within 4 hours of receiving water samples from three of the local beaches, followed by next-morning (18 to 24 hours) confirmation using the Colilert method.

Our study indicates that further improvement in sample collection, DNA extraction processes and standardization of qPCR data interpretation will narrow the gap between conventional and qPCR-based identification of human indicators in recreational waters.

This will allow more scientific and knowledge-based calls for action in beach closure decision making.

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DISCLAIMER

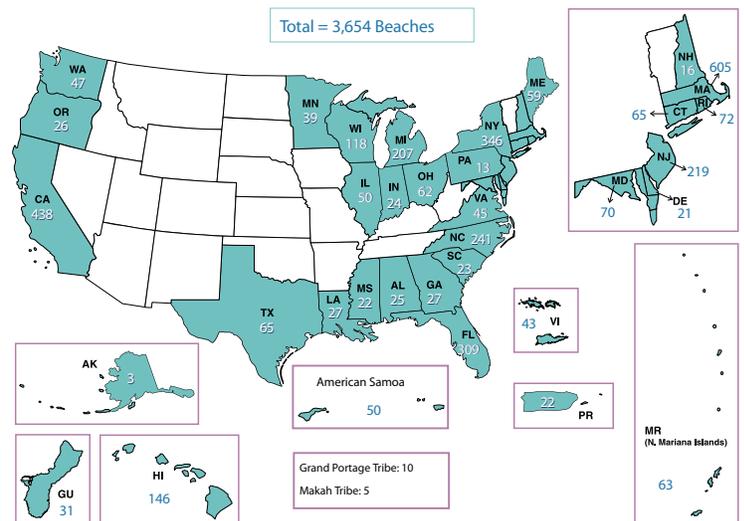
APHL does not endorse the methods or products presented in this article.

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For the full version of this article, visit APHL Environmental Health Website, <http://www.aphl.org/aphlprograms/eh/Pages/default.aspx>

In 2010, 37% of the 3,654 monitored beaches had at least one advisory or beach closure.

COASTAL STATES WITH 2010 MONITORED BEACH DATA



Source: US Environmental Protection Agency, Accessed August 2011, http://water.epa.gov/type/oceb/beaches/seasons_2010_national.cfm

Contribute Today: APHL Member Resources Center

APHL's Member Resources Center (MRC) provides an extensive range of resource materials designed to share knowledge, lessons learned, and technical assistance within the public health and environmental laboratory sector. Created by and for the APHL member community, the MRC provides a virtual clearinghouse of documents designed to exchange practices, communications, protocols, state newsletters and more. The MRC assists APHL members in accessing timely, peer-contributed public and environmental health information—rapidly and easily. The resources are neither reviewed nor necessarily endorsed by APHL.

Examples include:

- promising and best laboratory practices
- media relations procedures
- laboratory newsletters
- human relations processes
- laboratory testing protocols and guidelines
- local fact sheets
- energy management practices and more!

Join APHL: An Association for Environmental Laboratorians

APHL serves as a focal point for environmental laboratory communication, training, policy, and interactions with the federal government.

An Associate Institutional membership with APHL offers environmental laboratory directors and their staff opportunities to connect with their counterparts from across the country to address shared issues and to strengthen relationships with other health decision makers at the local, state and federal level.

Membership benefits include:

- networking and laboratory linkages
- professional development and training
- policy and regulatory updates
- technical assistance
- exclusive access to the APHL Member Resources Center
- members-only resources and communication

To submit a resource, please visit <http://www.aphl.org/memberresources/Pages/submit.aspx>.

For further information, please visit the APHL Member Resources Center page, <http://www.aphl.org/memberresources>, and send questions/feedback to memberresources@aphl.org.

For an application, visit www.aphl.org/becomemember.

New Associate Institutional members receive a 50% discount their first year of membership. Questions? Contact Tiffany Adams, APHL membership and governance manager, at 240.485.2721 or tiffany.adams@aphl.org.

Bridges

Connecting the Nation's
Environmental Laboratories

Funders

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The Association of Public Health Laboratories is a national non-profit located in Silver Spring, MD, that is dedicated to working with members to strengthen governmental laboratories with a public health mandate. By promoting effective programs and public policy, APHL strives to provide public health laboratories with the resources and infrastructure needed to protect the health of US residents and to prevent and control disease globally.

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