

United States Environmental Protection Agency

- Office of Research and Development
- National Health and Environmental Effects Research Laboratory
- Mid-Continent Ecology Division, Duluth, Minnesota

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MED in Review Editor

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MED in Review Design

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From the Director, Carl Richards

Welcome to *MED in Review*. This is the first edition of a new publication designed to highlight recent and ongoing research activities at the Mid-Continent Ecology Division of the National Health and Environmental Effects Research Laboratory of ORD. Our aim is to provide a snapshot of interesting developments in MED's research portfolio in a friendly format that both informs on the scope of our activities and encourages more in-depth communications with our staff. We believe that you will find these editions useful over time and hope you will give us any thoughtful suggestions on how we might improve the functionality of this newsletter for your needs. Please feel free to contact us at any time; that's why we're here.

Research Events

PEER REVIEW OF THE MID-CONTINENT ECOLOGY DIVISION

On April 17–20, EPA's National Health and Environmental Effects Research Laboratory held a peer review of the Division's research program. A panel of senior scientists was convened to review the Division's research programs and accomplishments for the period 2002–2007. Panel members included Dr. Tom Burton (Michigan State University), Dr. Patricia Chow-Fraser (McMaster University), Dr. Joel Coats (Iowa State University), Dr. Alan Covich (University of Georgia), Dr. Peter Hodson (Queen's University), Dr. Barry Lesht (Argonne National Laboratory), and Dr. Charles Pittinger (ARCADIS US, Inc). During the review week, Division Branch Chiefs and Senior Scientists provided overviews of the research conducted under ORD's multi-year plans. Each briefing also included a poster session that involved most of the Division's science staff; over 50 posters were presented. The panel returned a very helpful and constructive report. The Division is in the process of providing a response and series of action items.

Contact: Janet Keough (218) 529-5025.

UNIVERSITY OF MINNESOTA DULUTH COOPERATIVE TRAINING AGREEMENT

In February, the Division formalized a cooperative training agreement with the University of Minnesota after a competitive proposal process involving several other large universities. Through this agreement, EPA will provide funds to the University to recruit and train both undergraduate and graduate students as well as postdoctoral scientists in environmental sciences. The opportunity to work with senior scientists at one of EPA's premier environmental laboratories will enhance the educational experience of students as they strive to become leaders within the scientific community.



The University of Minnesota Duluth campus

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COOPERATIVE TRAINING AGREEMENT – CONTINUED

While EPA provides funding and the University administers the actual recruitment, use of the funds, and the program overall, EPA scientists will have a direct involvement with U of M faculty in selecting successful candidates and providing mentoring both on and off MED's facilities. Much of the students' work will take place at MED. This is yet another tool, like the Student Services Contract program and summer internships, to train and mentor future scientists for their careers – perhaps even in the public service field. MED scientists are urged to investigate this opportunity whenever they have the potential to provide funds toward student training and assistance.

This effort was the brainchild of Dr. Janet Keough who served as the project writer and coordinator until proposals were received. At that point, the Project Officer responsibilities were turned over to Roger Parsons, who will remain in that capacity, and can be contacted at (218) 529-5030.

NORTHLAND CHAPTER OF THE SOT, SPRING MEETING



The spring meeting of the Northland Chapter of the Society of Toxicology was held May 3 in MED's conference center. Titled "Down the Drain and Out of Our Minds," the meeting focused on contemporary issues in wastewater management, with an emphasis on pharmaceuticals and "personal care" products. Invited speakers gave four presentations:

Medaka: A good fish model for assessing hazards associated with waterborne contaminants: **Dr. Rodney Johnson, EPA/MED;**

The evolving landscape of wastewater regulation over the last 35 years: Tim Scherckenbach, Minnesota Pollution Control Agency;

Photochemical cycling of triclosan: Degradation and the formation of toxic products: Dr. Doug Latch, Seattle University;

Exposures, effects, and risks of agricultural pharmaceuticals in surface waters and soil: Dr. Keith Solomon, University of Guelph.

Contact: John Nichols (218) 529-5160.

INTERNATIONAL SCIENCE FORUM ON COMPUTATIONAL TOXICOLOGY



Two MED researchers participated in the Forum, held at EPA's Main Campus in Research Triangle Park, North Carolina, on May 21–23. Designed for public, private sector, and academic researchers active in the field as well as risk assessors and risk managers, the Forum highlighted progress in the use of modern molecular, biological, and chemical based tools on the assessment of exposure, hazard, and risk of environmental chemicals. Approximately 50 invited speakers from around the world presented the latest advances in computational toxicology. Plenary sessions led by prominent keynote speakers examined development of virtual tissues and organs, models of ecosystem function, and gene-environment interactions. Dan Villeneuve of

MED's Toxic Effects Characterization Research Branch co-chaired the plenary session "Computational Tools for Ecological Risk Assessment." He also presented *Mining minnows and building models: An integrated systems biology approach to link mechanism of action to ecologically-relevant outcomes*. Matthew Etterson, National Research Council Post-Doc at MED, presented *Toxicology versus ecology in population-level risk assessment for wildlife: What data does your modeler really need?* Concurrent sessions covering related topics followed two tracks – computational models, and tools for hazard prediction. An evening poster session featured contributed research focused on similar themes. **Contacts:** Matt Etterson (218) 529-5158 and Dan Villeneuve (218) 529-5217.

ORD SCIENTISTS PARTICIPATE IN FISH TOXICOGENOMICS WORKSHOP

The UK National Environment Research Council (NERC), through the University of Birmingham, sponsored a workshop entitled "Fish Toxicogenomics: Advancing Practical Implementation" May 24-26 in Aveiro, Portugal. Invited scientists from around the world met to identify needs and develop experimental projects to focus NERC funding to support the application of genomics to ecological risk assessment. Specific topical areas included bioinformatics, transcriptomics, metabolomics, and data interpretation (toxic vs. compensatory responses). Three ORD scientists, Drs. Gerald Ankley (NHEERL/MED), Tim Collette (NERL/ERD) and William H. Benson (NHEERL/GED and Office of the Science Advisor) were among the approximately 40 invitees, as were two scientists receiving funding from EPA, via the STAR program – Dr. Nancy Denslow (University of Florida) and via an interagency agreement – Dr. Ann Miracle (Pacific Northwest Laboratories, DOE). **Contacts:** Gerald Ankley (218) 529-5147, Tim Collette (706) 355-8211, or William Benson (850) 934-9208.

VISITING EXPERT FROM UNIVERSITY OF UTRECHT

For three months this summer, Division researchers learned a Solid Phase Microextraction (SPME) technique from Dr. Thomas ter Laak, a scientist from the University of Utrecht, the Netherlands. SPME measures the free concentration of a compound in an experimental system, and can be applied to solutions, tissues, sediments, and other matrices. The resulting information can be used to estimate sorption coefficients and may contribute to the interpretation of in vitro and in vivo test data. Specific applications of the SPME method that are being pursued include the effect of chemical binding on hepatic metabolism in an isolated perfused fish liver preparation and determination of free chemical concentrations in an in vitro estrogen receptor binding assay.

Contact: John Nichols (218) 529-5160.

PELLSTON WORKSHOP

EPA scientists from NHEERL (Russ Erickson and Dave Mount, MED and Mace Barron, GED) and OPP (Keith Sappington, EFED) participated in a Pellston Workshop of the Society of Environmental Toxicology on the "Tissue Residue Approach to Ecotoxicity Assessment." The workshop, held June 7–12 in Leavenworth, Washington, included invited experts in ecotoxicology and environmental chemistry from North America, Europe, and Asia. Participants examined the theory and practice of using organism-based dose metrics (e.g., whole-body, organ, tissues) to assess ecological risks, and to conceptualize methods to translate residue-response data into regulatory guidelines for tissue, sediment, and water quality. Individual working groups focused on scientific underpinnings of the approach, mixtures/mechanisms, metals and metal compounds, organic compounds, and application to risk assessment. **Contacts:** Russ Erickson (218) 529-5157 and Dave Mount (218) 529-5169.



Rod Booth (MED Facilities Mgr.), Carl Richards (MED Director), & Hal Zenick

NHEERL DIRECTOR, DR. HAL ZENICK, VISITS THE DIVISION

This August 27 – 28 visit proved to be an excellent opportunity to brief Dr. Zenick on MED's research programs, since he had been unable to attend our peer review in April. We always appreciate visits from the NHEERL "Mother Ship," and Hal shared his perspectives on programmatic futures within the Laboratory and ORD. The Division held a "potluck and brats" luncheon, followed by an all-hands briefing by Dr. Zenick and discussion with the staff. Several awards were presented.

2007 MCKIM CONFERENCE ON PREDICTIVE TOXICOLOGY

The Division participated in the "McKim Conference on Predictive Toxicology" held in Duluth on September 25–27. The Conference was organized by the International QSAR Foundation and convened about 80 scientists to develop the science needed for hypothesis-driven testing strategies. The Conference was inspired by and named in honor of the late James M. McKim III, long-time MED employee, whose pioneering contributions in the field of aquatic toxicology

MED HOSTS DISCUSSIONS ON WATER QUALITY CRITERIA FOR EDCs



On July 23–26, MED hosted meetings with managers and staff from the Office of Water's Office of Science

and Technology (OW/OST). On July 23, senior managers from OW/OST met with MED senior staff to discuss research across all GPRA goals with relevance to OW science priorities, including endocrine disruption, pharmaceuticals and other emerging contaminants, techniques for toxicological extrapolation across species and chemicals, "omics" techniques, biological condition assessment and diagnosis, and nutrient and habitat effects on ecological condition. On July 24–26, there were technical meetings of OW/OST and ORD scientists which focused on developing supplemental methods and guidance for deriving water quality criteria (WQC) for endocrine-disrupting compounds (EDCs) and other chemicals with properties that are more difficult to properly assess using existing WQC derivation approaches. This meeting is a step in a larger ongoing technical assistance effort. Scientists from NERL-Cincinnati specializing in detection and analysis of EDC chemicals are also part of the workgroup and attended this meeting. Division attendees were Gary Ankley, Rick Bennett, Russ Erickson, Dale Hoff, Dave Mount, Chris Russom, Chuck Stephan, and Joe Tietge. **Contact:** Dale Hoff (218) 529-5386.



provided the science necessary to develop sound ecological risk assessment principles. The McKim Conference is not a forum for the presentation of individual scientific research, but rather a forum for discussion of specific issues which are framed by invited speakers.

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McKIM CONFERENCE – CONTINUED

Last year, the McKim Conference discussed the paradigm shift occurring in numerous regulatory agencies, and outlined three major areas where science currently limits a more strategic paradigm in safety assessment. The 2006 conferees urged that future meetings be focused on specific gaps in predictive toxicology and chemistry that limited extrapolation of existing data across chemicals, species, and test endpoints. Important gaps included the models and dose metrics used for chronic non-cancer endpoints including reproductive and developmental impairment. Accordingly, the organizers of the 2007 Conference invited speakers who gave thought-starter papers in systems biology for the brain-pituitary-gonad axis and illustrated how these studies guide the development of specific reproductive models for different toxicity pathways. The conferees discussed methods of incorporating these models into different chemical categories to fill data gaps within specific regulatory domains.

Conference topics:

- Chemical Categories and Predictive Toxicology
- New Reference Points for Hazard Identification
- Using Systems Approaches to Strategic Testing

- Special QSAR Toolbox Training Session
The QSAR Application Toolbox was developed by OECD and the Laboratory of Mathematical Chemistry to facilitate the use of chemical categories and QSAR in the international hazard assessment of chemicals.

ORD presentations made at the conference:

- Bioinformatics and systems biology – Imran Shah/ NCCT
- Predicting estrogen receptor binding within categories – Rick Kolanczyk/MED
- Dose-response for neurological effects in narcosis – Phil Bushnell/NTD
- Dose-response for reproductive effects of ER binders – Pat Schmieder/MED
- Systems biology in small fish models – Dan Villeneuve/MED
- Bridging from individuals to populations – Matt Etersson/MED
- Systems biology in amphibian models – John Nichols/MED
- Opportunities for strategic planning using systems models – Gary Ankley/MED
- Defining reproductive or neurological hazards – Pat Schmieder/MED, Phil Bushnell/NTD

Contact: Pat Schmieder (218) 529-5161.

MED SCIENTIST WORKING WITH NHEERL/ETD, REGION 8, AND OSWER TO SUPPORT EPA'S LIBBY ACTION PLAN



NHEERL and OSWER representatives were invited to Libby, Montana, for meetings on September 26-27, to discuss research addressing the health effects of asbestos contamination in that community. Vermiculite ore mined for 70 years near the town contained substantial amounts of amphibole asbestos and related mineral fibers. A research plan written by NHEERL with the assistance of EPA Region 8, ORD NCEA, and OSWER was developed to improve the scientific basis for the risk assessment in Libby, and is available on the Region 8 website at <http://www.epa.gov/region8/superfund/libby/amphibole.html>.

At the meeting in Libby, Doug Ammon (Chief, Science Policy Branch, Office of Superfund Remediation and Technology Innovation, OSWER) described the role of OSWER. Dr. Linda Birnbaum (Experimental Toxicology Division Director) provided an overview of NHEERL and its capabilities. Dr. Phil Cook/MED described the NHEERL historical asbestos research database and plans for in vitro fiber dissolution studies. Dr. Stephen Gavett/ETD discussed plans for in vitro toxicity studies and subchronic inhalation exposure studies in rats. Dr. Urmila Kodavanti/ETD discussed plans for comparative toxicity and intratracheal instillation studies in rodents. Annie Jarabek (ORD/NCEA, on detail to NHEERL/ETD) described plans for developing a dosimetry model and its relevance for risk assessment methodology. Participants also toured the remediation sites, had discussions on future research plans, and attended a public session to discuss how the science will benefit the public. **Contact:** Dr. Stephen Gavett (919) 541-2555.

Featured Research

MED AND EPA REGION 5 PARTNERSHIP IN RESEARCH AND REMEDIATION CULMINATES IN TRENTON, MICHIGAN

On June 18, the first Great Lakes Legacy Act remediation site, the Black Lagoon in Trenton, Michigan, was re-dedicated as Ellias Cove, named after the donor of the adjacent land known as Meyer-Ellias Park. At the ribbon-cutting on the restored shoreline, an announcement was made that a long-awaited marina would be developed at the site. The City of Trenton hosted the event with numerous partners: participating were high-level officials from EPA, represented by Dr. Carl Richards, MED Director; US Fish and Wildlife Service (USFWS); US Army Corps of Engineers (Corps); the Michigan Departments of Environmental Quality (MDEQ) and Natural Resources; and many political dignitaries.



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ELLIAS COVE, TRENTON, MICHIGAN – CONTINUED

Other key project partners are: Metropolitan Affairs Coalition's Greater Detroit American Heritage River Initiative, Michigan Sea Grant, Detroit River Remedial Action Plan, JJR, the Ellias family, and the Great Lakes Basin Program for Soil Erosion and Sediment Control.



The two-acre Black Lagoon lies within the USFWS Detroit River International Wildlife Refuge, the first of its kind in North America. MED, Region 5, and their partners have had a long history at this site. In the mid 1980s, EPA's ORD staff in Grosse Ile, Michigan (now part of MED) conducted the primary assessment of the site under the Upper Great Lakes Connecting Channels Study and the Detroit River In-Place Pollutants Study. A series of toxicity and mutagenicity tests, benthic invertebrate investigations, chemical analyses, and mathematical modeling were conducted. The lagoon was characterized as one of the most

severely contaminated (by PCBs, mercury, oil, grease, lead, and zinc) and impacted sites in the Detroit River and for all of the Great Lakes. (The name "Black Lagoon" was coined because extremely contaminated black sediments were trapped in this backwater embayment as they moved downstream from Detroit-area industries.) Subsequently, a series of other characterizations were completed.

In 2004-2005, Region 5's Great Lakes National Program Office (GLNPO), the EPA Office of Solid Waste and Emergency Response, MDEQ, and the Corps completed dredging at the site under the Great Lakes Legacy Act. In total, \$9.3 million – EPA 65%, MDEQ 35% – was spent to remove 115,000 cubic yards of sediment and dispose of it in a special containment cell at the Pointe Mouillee Confined Disposal Facility. Since that time, the City of Trenton and USFWS, in cooperation with the Detroit River International Wildlife Refuge, have completed the shoreline restoration project. The USFWS awarded funds through the Boating Infrastructure Grant to the City of Trenton with an appropriate match, to begin construction of a much-needed marina to stimulate the local economy.

Shoreline changes at the cove include new depth where the sediment was removed, and boulder and native plant installation to provide three types of new habitat for various returning wildlife. At

least seven pairs of bald eagles nest near the wildlife refuge. Ospreys and peregrine falcons also enjoy the area, as in the days before contamination. Fish expected to return and thrive are whitefish, sturgeon, salmon, yellowbelly perch, and walleye.

This project is an excellent example of research, modeling, and remediation coming together to help restore a portion of the Detroit River, a region that is becoming internationally known for its public-private partnerships for outdoor recreation, conservation, and quality of life. The river is one of only 14 in the US to be honored with an American Heritage River designation. In 2001, it also received a Canadian Heritage River designation, making it the first international heritage river system in North America.

This landmark restoration marks a significant demonstration of the way a sound science and research foundation can lead to restoration of ecological services and economic vitality.

Contact: Russell G. Kreis Jr. (734) 692-7615.



Current Events

MAKING A GREAT LAKE SUPERIOR, OCT. 29–31



Organized by the Lake Superior Binational Program and a large number of federal, state, tribal, educational, and other organizations within the Lake Superior Basin, "Making a Great Lake Superior" is a conference on Lake Superior science, management, and education. The conference is being held at the Duluth Entertainment and Convention Center, and features presentations on the science, management, and education of topics such as invasive species, human health, Areas of Concern, sources and types of pollution, economic and environmental sustainability, climate change, water level change, watershed stewardship, and fisheries and aquatic ecology. The conference features many "green" practices, such as mass transportation, use of recycled materials, energy conservation, and volunteer activities.

Dr. Carl Richards, MED Director, is giving one of the keynote addresses in a session on "Past and Future States of Lake Superior." Several MED scientists are making oral and poster presentations. For more information, go to: <http://www.seagrant.umn.edu/superior2007/>.

New Publications since 3/13/2007

- Albers, P.H., M.T. Koterba, R. Rossmann, W.A. Link, J.B. French, R.S. Bennett, and W.C. Bauer. 2007. Effects of methyl mercury on reproduction in American kestrels. *Environmental Toxicology and Chemistry* 26:1856–1866.
- Ankley, G.T., K.M. Jensen, M.D. Kahl, E.A. Makynen, L.S. Blake, K.J. Greene, R.D. Johnson, and D.L. Villeneuve. 2007. Ketoconazole in the fathead minnow (*Pimephales promelas*): Reproductive toxicity and biological compensation. *Environmental Toxicology and Chemistry* 26:1214–1223.
- Blystone, C.R., C.S. Lambright, K.L. Howdeshell, J. Furr, R.M. Sternberg, B.C. Butterworth, E.J. Durhan, E.A. Makynen, G.T. Ankley, V.S. Wilson, G.A. LeBlanc, and J.L.E. Gray. 2007. Sensitivity of fetal rat testicular steroidogenesis to maternal prochloraz exposure and the underlying mechanism of inhibition. *Toxicological Sciences* 97:512–519.
- Brazner, J.C., N. Danz, G.J. Niemi, R.R. Regal, A. Trebitz, R. Howe, J. Hanowski, L. Johnson, J. Ciborowski, C. Johnson, E. Reavie, V.J. Brady, and G. Sgro. 2007. Evaluation of geographic, geomorphic and human influences on Great Lakes wetland indicators: A multi-assembly approach. *Ecological Indicators* 7:610–635.
- Breen, M.S., D.L. Villeneuve, M. Breen, G.T. Ankley, and R.B. Conolly. 2007. Mechanistic computational model of ovarian steroidogenesis to predict biochemical responses to endocrine active compounds. *Annals of Biomedical Engineering* 35:970–981.
- Danz, N., G.J. Niemi, R.R. Regal, T. Hollenhorst, L. Johnson, J. Hanowski, R.P. Axler, J. Ciborowski, T. Hrabik, V.J. Brady, J.R. Kelly, J.A. Morrice, J.C. Brazner, R. Howe, C.A. Johnson, and G.E. Host. 2007. Integrated measures of anthropogenic stress in the U.S. Great Lakes Basin. *Environmental Management* 39:631–647.
- Ekman, D., Q. Teng, K. Jensen, D. Martinovic, D. Villeneuve, G. Ankley, and T. Collette. 2007. NMR analysis of male fathead minnow urinary metabolites: A potential approach for studying impacts of chemical exposures. *Aquatic Toxicology* 85:104–112.
- Erickson, R.J. 2007. Quantification of toxic effects for water concentration-based aquatic life criteria – Part A. *U.S. Environmental Protection Agency, EPA/600/R-07/065*.
- Etterson, M.A., J.R. Etterson, and F.J. Cuthbert. 2007. A robust new method for analyzing community change and an example using 83 years of avian response to forest succession. *Biological Conservation* 138:381–389.
- Etterson, M.A., L.R. Nagy, and T.R. Robinson. 2007. Partitioning risk among different causes of nest failure. *The Auk* 124:432–443.
- Etterson, M.A., B. Olsen, and R. Greenberg. 2007. The analysis of covariates in multi-fate Markov chain nest failure models. *Studies in Avian Biology* 34:55–64.
- Fitzsimmons, P.N., G.J. Lien, and J.W. Nichols. 2007. A compilation of *in vitro* rate and affinity values for xenobiotic biotransformation in fish, measured under physiological conditions. *Comparative Biochemistry and Physiology Part C* 145:485–506.
- Helbing, C.C., C.M. Bailey, L. Ji, M. Gunderson, F. Zhang, N. Veldhoen, R.C. Skirrow, R. Mu, M. Lesperance, G.W. Holcombe, P.A. Kosian, J.E. Tietge, J.J. Korte, and S.J. Degitz. 2007. Identification of gene expression indicators for thyroid axis disruption in a *Xenopus laevis* metamorphosis screening assay. Part 1. Effects on the brain. *Aquatic Toxicology* 82:227–241.
- Helbing, C.C., L. Ji, C.M. Bailey, N. Veldhoen, F. Zhang, G.W. Holcombe, P.A. Kosian, J.E. Tietge, J.J. Korte, and S.J. Degitz. 2007. Identification of gene expression indicators for thyroid axis disruption in a *Xenopus laevis* metamorphosis screening assay. Part 2. Effects on the tail and hindlimb. *Aquatic Toxicology* 82:215–226.
- Hoffman, J.C., D.A. Bronk, and J.E. Olney. 2007. Tracking nursery habitat use in the York River estuary, Virginia by young American shad using stable isotopes. *Transactions of the American Fisheries Society* 136:1285–1297.
- Larkin, P., D.L. Villeneuve, I. Knoebl, A.L. Miracle, B.J. Carter, L. Liu, N.D. Denslow, and G.T. Ankley. 2007. Development and validation of a 2,000 gene microarray in the fathead minnow (*Pimephales promelas*). *Environmental Toxicology and Chemistry* 26:1497–1506.
- Nichols, J.W., P.N. Fitzsimmons, and L.P. Burkhard. 2007. In vitro-in vivo extrapolation of quantitative hepatic biotransformation data for fish. II. Modeled effects on chemical bioaccumulation. *Environmental Toxicology and Chemistry* 26:1304–1319.
- Smith, P.N., G.P. Cobb, C. Godard-Codding, D. Hoff, S.T. McMurry, T.R. Rainwater, and K.D. Reynolds. 2007. Contaminant exposure in terrestrial vertebrates. 2007. *Environmental Pollution* doi:10.1016/j.envpol.2007.06.009.
- Trebitz, A.S., J.C. Brazner, V.J. Brady, R.P. Axler, and D.K. Tanner. 2007. Turbidity tolerances of Great Lakes coastal wetland fishes. *North American Journal of Fisheries Management* 27:619–633.
- Villeneuve, D.L., G.T. Ankley, E.A. Makynen, L.S. Blake, K.J. Greene, E.B. Higley, J.L. Newsted, J.P. Giesy, and M. Hecker. 2007. Comparison of fathead minnow ovary explant and H295R cell-based steroidogenesis assays for identifying endocrine-active chemicals. *Ecotoxicology and Environmental Safety* 68:20–32.
- Villeneuve, D.L., L.S. Blake, J.D. Brodin, K.J. Greene, I. Knoebl, A.L. Miracle, D. Martinovic, and G.T. Ankley. 2007. Transcription of key genes regulating gonadal steroidogenesis in control and ketoconazole- or vinclozolin-exposed fathead minnows. *Toxicological Sciences* 98:395–407.
- Watanabe, K.H., K.M. Jensen, E.F. Orlando, and G.T. Ankley. 2007. What is normal? A characterization of the values and variability in reproductive endpoints of the fathead minnow, *Pimephales promelas*. *Comparative Biochemistry and Physiology Part C* 146:348–356.

MED Seminars

RECENT AND UPCOMING SEMINARS

Aug. 27

Ross Lunetta, EPA/National Exposure Research Lab Landscape Branch

- Landscape change detection and characterization project for the Great Lakes basin

Sept. 4

Stephen Edwards, EPA National Health and Environmental Effects Research Lab

- Causal gene networks and systems biology at the EPA

Sept. 12

Marinus L. Otte, North Dakota State University

- Biogeochemistry and metal tolerance in wetland plants - Implications for the evolution of metal tolerance in all plants

Oct. 3

Dr. Jay Austin, UMD Large Lakes Observatory

- Climate change signals from Lake Superior

Oct. 17

Allen Olmstead, MED

- *Xenopus Tropicalis* reproductive toxicology

Dec. 12

- MED Division-wide poster event

Feb. 6

David Miller, MED

- Lower food web ecosystem productivity modeling applied to Lake Michigan

Awards

EPA NATIONAL HONOR AWARD

Sulfate Criteria Team, Region 5 – Charles E. Stephan (and Region 5/OW recipients)

For protecting aquatic life by exemplary application of sound science and effective multi-party collaboration to develop and apply sulfate water quality criteria for Illinois.

ORD 2006 BRONZE MEDALS

Christine L. Russom

For innovation within the ECOTOX Knowledge System to improve access and utility of high quality chemical toxicity information for risk assessment and research.

Richard S. Bennett

Recognizing exceptional efforts to provide consultation and guidance to EPA Program and Regional Offices in the area of wildlife risk assessment and population modeling techniques.

Anne M. Cotter, Colleen M. Elonen, Brian H. Hill, Terri M. Jicha, John R. Kelly, Michael L. Knuth, John A. Morrice, Gregory S. Peterson, Michael E. Sierszen, Debra L. Taylor, Jo A. Thompson, Anett S. Trebitz, and Corlis W. West (and other members of the Nutrients Research Team)

For scientific leadership in research to improve technical guidance for establishing nutrient criteria for estuarine, coastal, and Great Lakes waters.

Teresa J. Norberg-King (and other members of the ORD Microtox Team)

For exceptional technical assistance efforts by the Microtox Team to ensure that EPA's whole effluent toxicity test methods are appropriately validated.

EPA'S SUSTAINABLE FACILITIES PRACTICES BRANCH AWARDS

BTU Buster Award – Rodney H. Booth, MED Facilities Manager

In recognition of reduction in energy use by more than 12.5 % in FY 2006, through diligent management of laboratory operations, including manually resetting cooling and heating set points on the facility's building automation system, as well as completing a variable air volume system installation.

First Annual Green Thumb Award – Landscaping Team: Rodney H. Booth, Alex D. Hoffman, Janet R. Keough, Patricia A. Kosian, Elizabeth A. Makynen, Christine L. Russom, Mary Ann Starus, Debra L. Taylor, and Corlis W. West

For the implementation of onsite sustainable landscaping, by planting native grasses, wildflowers, and shrubs, reducing mowing and water runoff. Team members also started a public education campaign, creating an insert for the visitor brochure and a poster in the building lobby that explain the landscaping project.



NHEERL QUALITY ASSURANCE AWARD

Anne M. Cotter

In recognition of the implementation of software for sample tracking using bar codes.

NHEERL GOAL 1 AWARD: SUPPORT THE AGENCY'S MISSION

Brian H. Hill, Mary F. Moffett (and other recipients in GED/AED/WED)

In recognition of outstanding efforts in the research and operational support for aquatic monitoring programs.

REGIONAL SETAC BEST POSTER AWARD

Lindsey Blake

Blake, L.S., D.L. Villeneuve, K.M. Jensen, D. Martinovic, M.D. Kahl, J.D. Brodin, E.A. Makynen, E.J. Durhan, and G.T. Ankley. Effects of trilostane on the fathead minnow (*Pimephales promelas*).

Lindsey Blake, former MED Student Contractor Services (SSC), won the best student poster award at the Midwest regional SETAC meeting, March 14–16, at Argonne National Laboratory in Chicago. She presented some of the gene expression work she has done on the Small Fish CT project. This was a joint meeting with the Chicago Chapter of the Society for Risk Analysis, so there was added competition. The award covers the student's travel costs to the national SETAC meeting in Milwaukee in November. Lindsey is now enrolled in graduate studies at the University of Minnesota Duluth, and Gary Ankley/MED is her advisor.

People

WELCOME PAULINE!



In June, Pauline Davies joined us as a Senior Environmental Employee (SEE) receptionist. She is a Duluth native, and her family includes two daughters and two Bichons. Pauline has experience in publishing, and owns a small manufacturing business. She plays the violin, cross country skis at her cabin, and is a fan of UMD men's hockey.

FRANK MOVES TO HEALTH AND SAFETY



Frank Puglisi, retired MED Analytical/Research Chemist, is the new SEE Occupational Safety and Health technician. Frank will also work with MED researchers on pesticide metabolism, and will become another expert on our chemical inventory database, with monitor Eric Mead, SHEM Program Manager.

GREG LIEN AND RITA MARROW RETIRE



After a long and illustrious career, starting in 1978, Aquatic Biologist Greg Lien retired on April 30.



After about 20 years in the Air Force, Rita worked at MED as General Supply Specialist since 1998, and retired July 21.

CRAIG JOHNSON AND MARIE NICHOLS-JOHNSON MOVE TO NCEA/CINCINNATI



Craig Johnson was our Acquisition Manager since 1994. He has taken a position at the EPA/ORD National Center for Environmental Assessment (NCEA), as a Senior Program Analyst and Quality Assurance Coordinator.



Marie Nichols-Johnson came to MED in 2001, and served as Program Analyst. She is now a Contract Support Specialist at NCEA.