

Waterworks

Kentucky Water Resources Research Institute at the University of Kentucky

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Water Pioneers Designated Commonwealth Collaborative

University of Kentucky President Lee T. Todd, Jr. has designated the Water Pioneers project as a Commonwealth Collaborative. The Commonwealth Collaborative program supports projects that strengthen the University's goal of "applying research-based intellectual resources, knowledge, and innovation to address the priority needs of the Commonwealth."

A partnership among KWRRI, UK's Robinson Scholars Program**, Eastern Kentucky PRIDE, and the UK Cooperative Extension Service, Water Pioneers provides Robinson Scholar high school students with experiences and curriculum for in-depth study of an Appalachian watershed. Under the coordination of KWRRI's Stephanie Jenkins and Robinson Scholars' Brad Goan and Steve Jones, the program allows students to partner with educators, volunteers, and other interested local groups to increase awareness of Best Management Practices for water quality in their respective counties.

During the learning process, the Robinson Scholars will develop ideas, communicate their knowledge, and compare/contrast experiences with students from watersheds in partnering states and regions. Through this information exchange, students can investigate similarities and differences in regional water quality while learning from peers studying different watersheds and areas of the country. The project culminates annually in an actual physical



exchange program and/or a centralized "Summit" with students from all participating regions. The exchange will allow youth across the United States to communicate and educate others about the importance of water quality.

In addition to its educational impact, Water Pioneers increases awareness of pollution in small Appalachian communities, encourages partnerships among government, non-profit, and local groups to increase awareness of water quality issues, and, subsequently, provides opportunities for improving Kentucky's water quality.

***The Robinson Scholars Program serves first generation college-bound and college students who have demonstrated the potential to succeed but who might encounter economic, cultural, or institutional impediments to completion of four-year college degrees. The Program provides these students with support services and scholarship resources that empower them to complete a baccalaureate degree at the University of Kentucky and thereby to increase the educational capital of their communities. The Robinson Scholars represent 29 counties within Eastern Kentucky.*

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Kentucky River Watershed Watch Celebration

All Kentucky River Watershed Watch volunteers were invited to an annual celebration on December 2nd at Hall's on the River in Clark County. The event both recognized volunteer efforts in monitoring and improving waterways within the Kentucky River Basin and presented a summary of 2005 water quality sampling results. KWRRRI Director and KRWW Scientific Advisor Lindell Ormsbee presented the results to approximately 50 people in attendance.

During 2005, volunteers conducted water quality sampling at 190 separate sites throughout the basin, the majority of which (72%) are located within the central and lower portions of the basin. The annual data analysis addressed the results of four separate sampling events held during the past year: herbicides in the spring, pathogens in the summer (synoptic and follow-up testing), and chemicals, nutrients, and metals in the fall.

Herbicide detections were all below the concentrations specified in the state's water quality standards. The first round of pathogen sampling showed 41% of sites exceeding the state's safe swimming standard of 400 cfu/100 ml. Slightly fewer sites (37%) were found to exceed the swimming standard during the follow-up pathogen sampling event, when sampling was repeated at sites previously found to have concentrations greater than the standard. Overall, average pathogen concentrations were below those of previous, wetter years of sampling.

Focused pathogen sampling also was conducted at sites in the upper North Fork of the Kentucky River (Leslie, Letcher and Perry Counties), Eagle Creek (Grant County), and Wolf Run (Fayette County). Although many North Fork sites produced fecal sampling results above the swimming standard, it appeared that projects intended to reduce sewage

inputs to these streams were beginning to have a positive impact. Likewise, several rounds of sampling in the Eagle Creek watershed produced averaged results that were acceptable for swimming and wading activities. Most Wolf Run sites exhibited pathogen results that exceeded the safe swimming standard.

Nutrient sampling in the fall indicated six sampling sites had nitrate levels greater than the state's drinking water supply standard of 10 mg/L. These sites were concentrated in the central region of the basin (Boyle, Madison and Fayette Counties). Fourteen sites in the central and lower regions of the basin showed high phosphorus levels, according to an unofficial KRWW water quality standard of 0.5 mg/L. Additionally, 23 sites, primarily located in the coal mining regions of southeastern Kentucky, produced high sulfate results that were greater than Kentucky's drinking water supply standard of 250 mg/L.

Of the 30 metals assessed in the fall, water quality standards are available for only thirteen. Three KRWW sites were found to violate standards associated with four of these 13 metals—copper, iron, manganese and selenium.

Each year, KWRRRI staff create a list of the ten sampling sites of greatest concern, based on an analysis of that year's sampling results. This year's list included sites in the following streams: Clark's Run and North Rolling Fork (Boyle), Town Branch (Fayette), Glenn's Creek (Woodford), Otter Creek and Tates Creek (Madison), Lost Creek (Breathitt), and Scuddy Branch (Perry).

More information on Kentucky River Watershed Watch and the sampling results can be found on the internet at www.uky.edu/otherorgs/krww.

KWRRRI & Kentucky Division of Water Host Upper Cumberland Pathogen Summit

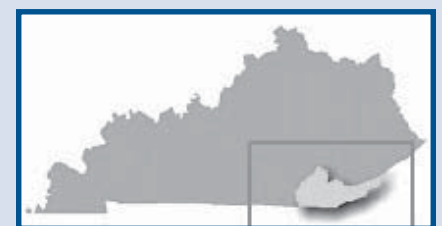
On November 15, KWRRRI and the Kentucky Division of Water jointly hosted the Upper Cumberland Pathogen Summit at Pine Mountain State Park in Pineville.

The Summit brought together representatives of state and local governments, volunteer groups, and educational entities to discuss water quality progress in the region. During the meeting, KWRRRI presented the results of multi-year pathogen sampling in the Upper Cumberland Basin.

Other Summit highlights included comments from Kentucky Division of Water's Peter Goodman and Eastern Kentucky PRIDE's Richard Thomas, a discussion of innovative technologies by National Onsite Demonstration Program representative Clement Solomon, a summary of available programs and funding, and an overview of regional success stories.

The meeting closed with a panel discussion that addressed future steps for continued progress.

For an electronic copy of the KWRRRI presentation, please contact Dr. Ramesh Teegavarapu at ramesh.teegavarapu@uky.edu.



Nutrition and Superfund Chemical Toxicity Workshop a Success

KWRRI administration and staff members involved in UK's Superfund Basic Research Program (SBRP) Research Translation Core organized the Nutrition and Superfund Chemical Toxicity Workshop on November 18th. Experts in the fields of nutritional sciences, medicine and environmental toxicology visited the University of Kentucky and presented exciting evidence indicating that nutrition or diets can modulate toxicological insults and associated disease states. As Dr. Bernhard Hennig, Director of the UK SBRP, stated, "nutrition may be the most sensible means to develop intervention and prevention strategies of diseases associated with many environmental toxic insults."

Featured workshop speakers and their topics included:

- Ronald J. Jandacek (University of Cincinnati): *Enterohepatic circulation of organochlorine compounds: a site for nutritional intervention*
- Sung Koo (University of Connecticut): *Flavonoids (green tea catechins) modulate absorption of lipids and lipid-soluble compounds*
- Craig McClain (Ohio State University): *Non-alcoholic steatohepatitis (NASH): toxic interaction and nutrition intervention*
- Harold Seifried (National Cancer Institute, NIH): *Oxidative stress and antioxidants: a link to disease promotion and prevention*
- Adrienne S. Ettinger (Harvard School of Public Health): *Dietary calcium supplementation lowers*

blood lead levels during pregnancy and lactation

- Allen Silverstone (SUNY Upstate Medical University): *Targeting AhR activation: the good, the bad, and the ugly*
- Bruce Watkins (Purdue University): *Food and inflammation*

Following the presentations, the invited speakers met with University of Kentucky SBRP faculty in an extended discussion session. The group concluded that need exists for continued exploration into the nutritional paradigm in environmental toxicology to further understanding of relationships among nutrition or diet practices, exposure to environmental toxins and the pathology of associated chronic diseases.

The Superfund Basic Research Program at the University of Kentucky

focuses on the environmental health impacts of chlorinated organics, with and a more specific focus on polychlorinated biphenyls and 99-Tc. The program includes five research projects that seek a better understanding of the biochemical and cellular mechanisms associated with exposure to such chemicals, as well as the associated impacts on such diseases as cancer, diabetes, hypertension, and cardiovascular diseases.

Sponsors: *The Nutrition and Superfund Chemical Toxicity Workshop was supported in part by funds from NIEHS/NIH (UK SBRP), UK Office of Executive Vice President for Research, College of Agriculture Office of the Associate Dean for Research, Department of Animal & Food Sciences, UK Department of Public Health, and the Kentucky Water Resources Research Institute.*

KWRRI Annual Symposium Date Set

Mark your calendars! The Kentucky Water Resources Research Institute's Annual Symposium is slated to take place on Thursday, March 2, 2006, at Lexington's Marriott Griffin Gate Resort. The event will include a variety of presentations about water-quality work in the Commonwealth, ranging from research to management to education.

Individuals are encouraged to submit abstracts for presentations and/or posters as soon as possible. For complete abstract submission information, see Page 4.

In addition to KWRRI, the Annual Symposium is sponsored by the Kentucky Geological Survey, the U.S. Geological Survey, the Kentucky Division of Water, Kentucky Waterways Alliance, and the Ohio River Basin Commission.

Registration fees and the conference program schedule will be available in late January.

For additional information about the Symposium, contact:

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Call for Abstracts

Kentucky Water Resources Research Institute Annual Symposium

The Kentucky Water Resources Research Institute's Annual Symposium encourages information transfer by providing opportunities for individuals conducting water-related work (e.g., research, management, education) to discuss their findings, preliminary or final, with others interested in the waters of the Commonwealth. The 2006 Symposium will take place on Thursday, March 2, 2006, at the Marriott's Griffin Gate Resort (1800 Newtown Pike, Lexington).

KWRRI invites abstract submissions for presentations describing recent or ongoing water projects or other related environmental activities. Special nonpoint source sessions are planned, but any water-related topic is appropriate for other sessions of the program. Authors should limit abstracts to two (2) pages, including illustrations, utilizing the following format:

ABSTRACT TITLE CENTERED AND IN CAPS

Principal Investigator(s)
Mailing Address
Phone Number
Email Address

The abstract's text should be single-spaced, 12-point Times New Roman (similar to this typeface), with double-spacing between paragraphs. One-inch margin at the top and 1.25-inch margins on the right, left, and bottom are required in order to facilitate binding and page numbering needs. Illustrations, including figures, maps, diagrams, and graphs, should be clear, legible, and suitable for black and white duplication. Do not include photographs in your abstract.

The following methods of submission are acceptable:

1. email attachments (Word or Word Perfect format) sent to kipp@uky.edu;
2. text as email body sent to kipp@uky.edu;
3. Word or WordPerfect file on diskette or CD submitted to the KWRRI address below; or
4. original paper copies if electronic transmission is not possible. *Paper copies must be camera ready.*

The deadline for receipt of abstracts is January 16, 2006. Authors should clearly indicate the preferred format for their presentation (platform or poster) and the anticipated presenting author at the time of abstract submission. Increased space for poster presentations has been arranged and a separate poster session is planned this year.

Authors will be notified of acceptance in early February and will be expected to present on March 2. A single presenter for each abstract will be allowed a discounted registration rate. Abstracts will appear in the printed proceedings, which will be distributed at the Symposium. It is anticipated that the platform presentations will be 20 minutes in length.

Proposals for theme sessions may also be submitted. Volunteers for organizing/moderating such sessions should indicate their interest(s). If you are interested in organizing a theme session or placing an exhibit at the Symposium, or if you have any questions about the program or abstracts, please contact Jim Kipp.

Symposium Inquiries

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U.S. Geological Survey
Kentucky Division of Water
Ohio River Basin Commission
Kentucky Waterways Alliance

New Water Science Website from the U.S. National Academies

The U.S. National Academies* has announced the launch of its Water Information Center, a portal of more than 100 peer-reviewed reports from the National Academies on water-related issues. The website, <http://water.nationalacademies.org>, aims to assist the work of water scientists, engineers, managers, policy-makers, and students throughout the world. These reports represent independent and objective consensus among experts from academia, industry, and other entities.

The website features the following major topics:

- Water Supply & Sanitation
- Water & Soil Remediation
- Hydrologic Hazards
- Water Quality in the Natural Environment
- River Basin Systems Management
- Environmental Assessment, Management, & Restoration
- Water Science & Research

**The U.S. National Academies of Sciences is a non-profit organization that brings together committees of experts in all areas of scientific and technological endeavor. These experts serve pro bono to address critical national issues and give advice to the federal government and the public. The organization is composed of the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council.*

Water Resources Research National Competitive Grants Program Request for Proposals

The U.S. Geological Survey, in cooperation with the National Institutes for Water Resources, has requested proposals for matching grants to support research on the topics of water supply and water availability. Proposals are sought in not only the physical dimensions of supply and demand, but also quality trends in raw water supplies, the role of economics and institutions in water supply and demand, institutional arrangements for tracking and reporting water supply and availability, and institutional arrangements for coping with extreme hydrologic conditions. The amount available for research under this program is estimated to be \$920,000 in federal funds.

Any investigator at an institution of higher learning in the United States is eligible to apply for a grant through a Water Research Institute or Center established under the provisions of the Water Resources Research Act of 1984, as amended. Proposals involving substantial collaboration between the USGS and university scientists are encouraged. Proposals may be for projects of 1 to 3 years in duration and may request up to \$250,000 in federal funds. Successful applicants must match each dollar of the federal grant with one dollar from non-federal sources.

Proposals must be filed on the Internet at <https://niwr.org/> by 5:00 PM, Eastern Standard Time, February 10, 2006 and must be approved for submission to the National Competitive Grants Program not later than 5:00 PM, Eastern Standard Time, February 24, 2006 by the Institute or Center through which they were submitted. Proposals may be filed on the website beginning November 1, 2005.

The Government's obligation under this program is contingent upon the availability of funds.

Waterworks

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Previous issues of Waterworks can be viewed on the KWRRRI web site at <http://www.uky.edu/WaterResources>



From Director Lindell Ormsbee

Greetings from UK. We humans constantly gain new knowledge about and insight into our environment and our limitations. As hurricanes Katrina and Rita and the recent Taum Sauk Plant Reservoir tragedy in Missouri remind us, water can be an incredible resource and, if not properly respected and managed, a source of disaster. The KWRRRI at the University of Kentucky continues working to increase our knowledge of water resources, as well as ways to communicate such knowledge in an effective and meaningful way. This quarter's newsletter highlights several examples of our four-fold mission of research, research translation, education, and service.

The KWRRRI advisory board recently reviewed this year's research proposal submittals. In lieu of the normal faculty-directed research grant program, this year we are funding an expanded student research program (with an upper limit of \$5000 per grant). We expect to fund around 12 proposals this year, which should allow us to leverage a greater impact around the Commonwealth. The RFP for next year's program should be issued sometime in September 2006.

Included in this quarter's newsletter is an announcement of the 2006 Water Resources Research National Competitive Grants Program (page 5). Proposals may be for projects of 1 to 3 years in duration and may request up to \$250,000 in federal funds with a required 1:1 match.

This November, the KWRRRI administration and staff helped organize and sponsor the Nutrition and Superfund Chemical Toxicity Workshop here at UK (page 3). The day-long workshop involved UK faculty and students, as well as guest speakers from around the nation. The workshop represents one of many activities of the KWRRRI through its position as Research Translation Core program administrator with the UK Superfund Basic Research Program.

The KWRRRI remains engaged in many educational activities related to water resources and the environment (page 1). This fall, the Water Pioneers Water Quality Initiative was selected as one of 24 new UK Commonwealth Collaborative projects. Coordinated by KWRRRI's Stephanie Jenkins, Water Pioneers represents a collaborative effort with the UK

Robinson Scholars Program, Eastern Kentucky PRIDE, and UK Cooperative Extension Service.

This fall also saw the KWRRRI and Kentucky Division of Water host an Upper Cumberland Pathogen Summit at Pine Mountain State Park in Pineville, Kentucky (page 2). The Summit brought together representatives from local government to discuss the current status of regional pathogen problems and to examine ways to further reduce the impacts of such problems.

In December, the KWRRRI presented preliminary results of this year's volunteer sampling effort at the annual Kentucky River Watershed Watch celebration on December 2nd (page 2). The final results will be presented at the KRWW annual meeting on January 28th in Midway, Kentucky.

Finally, I would like to encourage everyone to mark their calendars for the KWRRRI annual symposium set for on Thursday, March 2, 2006 (page 3). This year's program promises to be the largest yet. We encourage everyone to consider submission of an abstract for either an oral or poster session, or at the very least, to plan to attend.