

# Waterworks

Kentucky Water Resources Research Institute at the University of Kentucky

Vol. 7, No. 4, 2001



*Howard H. Whiteman, Ph.D., associate professor of biology at Murray State University, observes amphibian development as a way to monitor the health of ecosystems. (See page 2)*

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## Environmental Scholarships

by Jack Stivers

**T**he deadline for environmental scholarships is approaching. February 15, 2002 is the final day to apply for the Kentucky Natural Resources and Environmental Protection Cabinet environmental scholarships.

Since 1991, the Cabinet has offered environmental scholarships to college juniors and seniors and graduate students. The scholarships are awarded to Kentucky university students majoring in areas that are considered critical to the Cabinet. In the past this

has included engineering, geology, and environmental toxicology. However, this time, the emphasis is on engineering. The Cabinet sponsors this program through the KWRRI.

The environmental scholarships pay for tuition, books, fees, room and board for each recipient, which former recipients have characterized as a pretty good deal.

Scholarship students work for the Cabinet prior to graduation whenever they are not in school upon graduating, scholarship recipients have a job waiting for them. They are required to work one year for the Cabinet for every year

of financial support they receive. Many scholarship recipients spend their entire careers working for the Cabinet.

Wesley Turner, a geologist with the Division of Waste Management's Underground Storage Tank program, is a former environmental scholarship recipient. He has been with the Cabinet since September 1997.

"Receiving the scholarship gave me a tremendous sense of relief. I could concentrate on

*(Continued on page 5)*

# Meet the Researcher

**Howard H. Whiteman, Ph.D.**

Associate Professor  
Department of Biological Sciences  
Murray State University

**Education:**

Ph.D. in Biological Sciences, Purdue University, 1994  
B.S. in Biology and Psychology, Allegheny College, 1988

**Teaching:**

Introduction to Ecology (BIO 330), Conservation Biology (BIO 578) and Animal Ecology (BIO 630).

**Current Research:**

Much of Dr. Whiteman's research, including the KWRRI project (*Developmental Stability as an Indicator of Amphibian Population Health and Environmental Degradation*), is



*Amy Benson, Murray State University graduate student working with Dr. Howard Whiteman, analyzes digital images of bullfrog (*Rana catesbeiana*) tadpoles using morphometric software.*

centered in conservation biology, with a particular focus on amphibians. Amphibians are important indicators of ecosystem health, because they often spend part of their life in water, and part on land, and thus are exposed to contaminants and habitat loss in both environments. Dr. Whiteman's research is directed at using developmental stability as a biological indicator of stressed populations. The results of this research may eventually allow biologists to quickly and easily assess populations of amphibians and other wildlife before such populations decline or become extinct.

An increase in incidence of malformed frogs has been observed throughout parts of North America. Deformed frogs may be indicators of developmental problems associated with human-induced stress, such as pesticide and herbicide accumulation in wetlands. Although these disfigured frogs serve as a warning for the management of nearby amphibians as well as human health concerns, they may appear too late to reduce anthropogenic stress to nearby ecosystems. Proper screening of

individuals with a stress indicator may have warned biologists about environmental problems and led to changes in human behavior before the stressor dramatically affected sensitive biota.

Amphibian biologists thus need an early-warning system that could identify stressed animals before the stressor causes population or regional harm. One such indicator is obtained by measuring developmental stability, one component of the ability of an organism to withstand environmental and genetic disturbances during development to produce a genetically predetermined phenotype. Under normal conditions, development follows a genetically determined pathway, and minor perturbations are controlled by developmental stability mechanisms. Under stressful conditions (e.g., increased pollutants), the performance of the stability mechanism may be reduced such that development cannot be restored to the original pathway, resulting in the production of abnormal phenotypes.

Because measures of

*(Continued on the next page)*

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<http://www.uky.edu/WaterResources/>

## Researcher, from page 2

developmental stability, such as asymmetry, can be used to identify stressed populations before significant deleterious effects are observed, and because such measures may also be used to estimate future changes in fitness, developmental stability has the potential to be an important tool for biological conservation. Surprisingly, although development has been studied extensively in amphibians, developmental stability is only recently being applied to amphibian conservation.

Over the past few years, Dr. Whiteman and his students have been correlating amphibian developmental stability with: 1. water chemistry parameters known to cause deformities and mortality in amphibians; 2. land use practices, i.e., undisturbed forested sites, moderately disturbed agricultural sites and highly disturbed industrial sites; 3. density of amphibians, which at high levels can induce stress; and 4. population size of adults, which may affect developmental stability via inbreeding depression in small populations. Population estimates will thus allow separation of natural stress levels from those that may be human induced (via water chemistry).

Dr. Whiteman's group has found that amphibian developmental stability was lower in agricultural ponds with poor water quality when compared to forested ponds with moderate or excellent water quality. They are confirming these results using digital imaging to increase the accuracy of their estimates. They also are conducting experiments to determine how asymmetry affects traits related to fitness, such as foraging behavior and growth rate. They plan to conduct microcosm and mesocosm experiments to determine how various environmental stressors affects asymmetry, and how asymmetry affects amphibian ecology under semi-natural conditions.



*Edwin Ebrahimi (right), KWRRI's budget officer, is assisted by KWRRI's administrative assistant, Charlie Mynhier, on human resources responsibilities.*

# Ebrahimi keeps track of the money

by Jack Stivers

**A**s the Administrative Staff Officer at KWRRI, it is Edwin Ebrahimi's responsibility to watch over the Institute's financial and human resources. As the new guy on the block (he started in July), Ebrahimi, is still learning the ropes. But then, he's used to adjusting to changes in his life.

Ebrahimi was born in Iran, and earned his bachelor's degree in Political Science at University of Tehran. He came the U.S. in 1977 to attend graduate school at The University of Kansas in Lawrence, Kansas. When the revolution started back home in Iran, Ebrahimi decided to stay in the U.S. He changed majors and ultimately received his Masters in Business Administration

*(Continued on page 5)*



# The University of Kentucky presents...

A two-semester seminar series by the University of Kentucky

Tracy Farmer Center for the Environment and the

Environmental Systems Certificate Program of the Graduate School



## Fall Semester

### 1. The Kentucky River: Its important role in our lives – yesterday, today, and tomorrow

Aug. 28 The Kentucky River Basin: A river flows through it  
*Eric Christianson, UK History Dept.*

Sept. 4 Physical landscapes of the Kentucky River Basin: Our geologic inheritance  
*James Dinger, Kentucky Geological Survey*

Sept. 11 Aquatic organisms in the Kentucky River Basin: Habitats, ecology, and indicator species  
*Greg Pond, Kentucky Division Water*

Sept. 18 Man-made impacts in the Kentucky River Basin: Our management responsibility  
*Lindell Ormsbee, UK Civil Engineering*

Sept. 25 Public Discussion

### 2. Water quality policy

Oct. 2 The Clean Water Act: How it's supposed to work  
*Hank Graddy, Kentucky Watershed Watch*

Oct. 9 TMDLs: An agricultural perspective  
*Rebeckah Freeman, Director of Natural Resources, Kentucky Farm Bureau*

Oct. 16 TMDLs: A scientific perspective  
*Ken Reckhow, Water Resources Research Institute of the University of North Carolina*

Oct. 23 The Clean Water Act: The role of the state government  
*Bob Ware, Kentucky Div. of Water*

Oct. 30 Public Discussion

### 3. Water quality management

Nov. 6 The impact of water quality on regional water supply: The central Kentucky experience  
*Lindell Ormsbee, Tracy Farmer Center for the Environment*

Nov. 13 Urban water quality: The Lexington experience  
*David Gabbard, Lexington-Fayette Urban County Government*

Nov. 20 Tour of the Kentucky-American water treatment plants  
*Rick Buchanan, Kentucky-American Water Company*

Nov. 27 Rural water quality  
*Dave Harmon, Kentucky Division of Water*

Dec. 4 Public Discussion

## Spring Semester

### 4. Know your water

Jan. 15 Making sense of weather data  
*Tom Priddy, UK Agricultural Weather Center*

Jan. 22 Public health and the environment: Real life examples  
*Rice Leach, Commissioner for Public Health in Kentucky*

Jan. 29 The role of the press in water issues

Feb. 5 New tools for the 21<sup>st</sup> century  
*Sylvia Daunert, UK Dept. Chemistry*

Feb. 12 Public Discussion

### 5. Community actions: Local ways to get involved

Feb. 19 Watershed action!  
*Greg Epp, KWRRI and Ken Cooke, Kentucky Division of Water*

Feb. 26 Eastern Kentucky PRIDE  
*Karen Engle, Executive Director*

Mar. 5 Town Branch: The forgotten heart of Lexington  
*Zina Merkin, Town Branch Trail*

Mar. 12 Spring Break

Mar. 19 Public Discussion

### 6. Kentucky's water future

Mar. 26 Go Seafood: Aqua-farming in Kentucky  
*J. Tidwell, President of the World Aquaculture Society*

Apr. 2 Open House at the Aquaculture Facilities at Kentucky State University

Apr. 9 Water Works Wonders: Recreational Fisheries in Kentucky  
*Benjy Kinman, Kentucky Dept. of Fish & Wildlife Resources*

Apr. 16 Public discussion

### Summary

Apr. 23 Water in Kentucky: Challenges and solutions for the future  
A round-table discussion

**The seminars will be on Tuesdays 4:30 p.m. - 5:30 p.m. in Rm. 102 of the Mining & Mineral Resources Bldg.**

## Wanted from page 1

school and not worry about how I was going to pay for tuition, books and everything else." said Turner. "Also, I knew that I had a job waiting for me after graduation. So there was a double benefit for me."



Wesley Turner

Turner found that there were other benefits that came along with being a scholarship.

"Receiving the scholarship gave my confidence in myself a big boost," Turner said. "And when I started working, I had more confidence to deal with the job, too."

In terms of career advancement, Turner thinks that there is an advantage to being a scholarship recipient.

"The management knows who the scholarship recipients are and keeps an eye on them. I definitely think that has been good for my career with the Cabinet," he said.

Turners' fellow employees think a lot of him, too. They nominated him for the Cabinet's Outstanding Employee award, which he recently received.

"It really makes me feel good that the people I work with think I'm doing a good job," said Turner.

For more information visit: [www.uky.edu/WaterResources/](http://www.uky.edu/WaterResources/)

## Edwin from page 3

from Morehead State University in Morehead, Ky.

After working 14 years managing a restaurant in Lexington, Ky., Ebrahimi began working for Research and Graduate Studies at the University of Kentucky. In the six years he has been at UK, Ebrahimi has also worked for the Survey Research Center, and the Singletary Center for the Arts.

At the Water Institute, Ebrahimi watches over the money in new and existing grants. He tracks expenditures and lets researchers know when they are out of money. He also processes employee assignments and maintains other

employee records. Ebrahimi is assisted by KWRI administrative assistant, Charlie Mynhier, with travel and leave records.

Recently, Ebrahimi spent a long weekend visiting relatives in New York City. He had the misfortune of trying to fly home on the morning of September 11. His call from LaGuardia Airport in New York alerted other KWRI staff members to the tragic events that were occurring that day.

From his relatives' house, Ebrahimi spent the rest of the week watching the smoke rise from destroyed World Trade Center. Fortunately, no one in his family was among the casualties, and he ultimately arrived home safely.

## Ch-Ch-Changes

We are remaking our mail list (and checking it twice). If you have changes (e.g., address, title, name, gender, etc.) or would like to be added to or removed from the *Waterworks* mailing list, please let us know. Also, if you know folks who would be interested in receiving our publications, please send us their names (and email addresses), so we can add them to our mailing list.

Change my address

Add me to your list

Delete me from your list

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State & Zip: \_\_\_\_\_

Email: \_\_\_\_\_

Send changes to: *Waterworks*, KWRI, 233 MMR Bldg., University of Kentucky, Lexington, KY 40506-0107

Fax: (859) 323-1049 or email: [stivers@uky.edu](mailto:stivers@uky.edu)

## Journal Articles

We want to announce recently published journal articles *Waterworks*. If you have recently published an article, tell us the publication, title, authors, page numbers, etc. and we'll publish that information in *Waterworks*. Email your information to: [stivers@uky.edu](mailto:stivers@uky.edu).



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Lexington, KY 40506-0107

## *Call for Abstracts*

# Kentucky Water Resources Annual Symposium

Wednesday, February 20, 2002  
Holiday Inn North, Lexington, Kentucky

**T**he Kentucky Water Resources Research Institute is co-sponsoring an annual symposium for water resource professionals in the Commonwealth of Kentucky. This symposium is designed to encourage the transfer of water resources information and provides an opportunity for everyone conducting water-related work in the state to meet to discuss their findings, preliminary or final. Symposium organizers are now accepting abstracts for papers to be presented at the 2002 meeting. The deadline for receipt of abstracts is January 4, 2002. **NOTE: The scope of the meeting this year has been expanded to include any subject related to water or the environment.**

Contact: Jim Kipp at (859)-257-1299 or [kipp@uky.edu](mailto:kipp@uky.edu)