

## Regional

# Brunkow studies health of Midwest freshwaters

Among the many environmental problems we face these days, the quality and ecological health of freshwater sources is one that is being faced worldwide – including right here in the Midwest. One of the scientists monitoring the situation and providing clues as to what can be done is Paul Brunkow.

Born in Portland, Ore., Brunkow received his bachelor's degree in zoology from the University of Washington, and his doctorate also in zoology from Arizona State University. Today he is an associate professor and chair of the department of biological sciences at Southern Illinois University Edwardsville. After a summer experience as a teenager at the Portland Zoo, he decided to become a biologist instead of his original idea of becoming a surgeon. Today he works doing ecological studies of the freshwaters of North America.

"A lot of fresh waters in North America have come under a lot of human control in terms of draining fields, for example to reduce flooding in fields," Brunkow explained. "This results in a lot of sediment runoff into streams and rivers, which then gets carried down stream and away from the terrestrial habitat."

Ecologists like Brunkow can look at just a few organisms to help better understand the health of our rivers and lakes. Some of the most commonly used organisms for this

## Aldemaro Romero College Talk

purpose are the amphibians, including frogs, toads and salamanders.

"Amphibians are sort of interesting because they integrate environmental challenges both in the aquatic habitat and in the terrestrial habitat," Brunkow said. "That is why they have become such good indicators of ecosystem health. And I believe the problem is getting worse because of pollution and diversion of water." To Brunkow, it is the combination of pollution and deviation of water sources that is putting our freshwaters in peril.

"More recently there has been a lot of emphasis paid to the distribution of novel pathogens, fungal pathogens for example, getting into populations and their pathogenicity being increased by the environmental stress that the organisms are feeling," he said. "So they really integrate a lot of different challenges."

In addition to his current work in the Midwest, Brunkow has done fieldwork in Costa Rica and in U.S National Parks, such as Grand Teton in Wyoming. "We did a very large scale project on small mammals

in the park," he said. "I was working with a graduate student from the University of Michigan at that time who would drive all the way out to the Grand Teton and execute this enormous project. It was an amazing amount of work."

Unlike other biologists who specialize in a particular organism or group of organisms, Brunkow studies a variety to better assess the ecological health of our waters. "One of the things that my doctoral adviser drove into me at Arizona State University was to be question-driven and not organism-driven," Brunkow said. "And a lot of the projects that we have going on in the lab currently and in the past, while they encompass a wide variety of organisms, the questions uniting those studies fall along certain intellectual lines, for example looking at the influence of water on shaping animal form and function." In addition to amphibians he also uses fish, snails, and even crustaceans for his ecological studies.

"Just recently I started studying amphipods, which are little stream invertebrates that live for example in the streams above Grafton in Pere Marquette State Park. Little crustaceans, fabulous little animals, they have been an absolute joy to work with," Brunkow said. "I have tried very hard to find what students are interested in terms of what kinds of animals they would like

to work with, what kinds of habitats they would like to work with, but the questions uniting those studies are actually a fairly limited subset of what we could be looking at." And these students ultimately find jobs in diverse fields.

"The kinds of jobs for students who are doing this kind of work would be with, for example, the Illinois Department of Natural Resources, the Missouri Department of Conservation. We have a number of federal agencies around here, U.S. Fish and Wildlife Service and the U.S. Army Corp of Engineers, which hire biologists who do this kind of work," he said.

There are also possibilities for these students in the private sector, Brunkow added. "There are a lot of environmental consulting firms in the St. Louis area," he said. "It is challenged with a lot of pollution issues in terms of having a lot of oil refining in the area and a lot of heavy industry and they will hire some students who have this kind of experience working in aquatic biology."

*Aldemaro Romero is the Dean of the College of Arts and Sciences at Southern Illinois University Edwardsville. His show, "Segue," can be heard every Sunday morning at 9 a.m. on WSIE, 88.7 FM. He can be reached at College\_Arts\_Sciences@siue.edu.*



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