

# immersed

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## IN RESEARCH AND TEACHING

*From an island to landlocked DC, Dr. Doug Kane continues to study the Lake Erie watershed*

*by Kathy Punches, Director of Public Relations and Marketing*

Seeing someone who has spent much of his undergraduate and graduate education years conducting research on a small island in Lake Erie, one is quick to wonder what drew Dr. Douglas Kane to landlocked Defiance.

Surprisingly, the answer is location. Defiance lies within the Lake Erie watershed and embraces the Maumee River, which

flows into the lake. “My research has mainly been on – I could describe it as water quality, but it’s a little broader than that – biotic integrity,” says Kane, assistant professor of biology since fall of 2007. He describes biotic integrity as those practices that help or hurt the environment, and for his research, specifically water quality including chemical water quality, nutrients levels in the water, physical water quality, and water temperature. He examines organisms that

help or hurt water quality.

His research began at Stone Lab, Ohio State University’s Lake Erie campus on Gibraltar Island, and has now expanded to the watershed areas of the Sandusky and Maumee rivers. “You really have to look back at what’s coming into the lake from upstream, and now I’m upstream and that’s one of the reasons I’m here,” he says.

Kane also appreciates the small college environment where he can continue his



PHOTO BY JENNY DERRINGER

research without the pressures of a larger research institution. And, he enjoys teaching and getting students interested and involved in environmental education.

He has been fascinated by the study of water since growing up on a small, manmade lake in a suburb of Cleveland, not to mention living less than three miles from Lake Erie. "I guess my environment affected what I was interested in studying and doing, and in high school and college, biology was always my favorite class," he recalls.

Kane wasn't exactly sure which way his interests would lead him until he visited Stone Lab during his freshman year at OSU (where he would go on to earn bachelor's, master's and doctoral degrees). As the nation's oldest freshwater biological field station, Stone Lab affords endless opportunities for teaching, research, and mentoring. "Stone Lab is probably one of the best examples I can think of in environmental education, because you're on a small island separated from everything else, you've got water all around you so it makes it very convenient," he says, adding with a laugh, "And you're actually immersed in what you're doing."

Lake Erie's water quality has been declining since the mid-1990s, Kane says. He notes that biologists are observing more toxic blooms of algae as well as low-oxygen events. Algae grows then dies and falls to the bottom, and as it dies, bacteria come in and decompose it, using up oxygen. "So the oxygen at the bottom gets used up, and if you're a fish down there, you're in trouble," says Kane. "There's no oxygen so you either have to move somewhere else or die."

While there are many hypotheses as to causes of declining water quality, researchers see invasive species (zebra mussel) and events within the Lake Erie watershed and

"You really have to look back at what's coming into the lake from upstream," he says, explaining that farming practices within the watershed contribute to nutrients and sediment depositing into Lake Erie. "Obviously we're not going to take all the farms away from the Maumee River basin, but there are some things we can do to minimize the amount of nutrient loss from the farm fields and prevent them from going downstream into Lake Erie and growing toxic algae."

And, there are aesthetic reasons to improve water quality. "People don't like algae washing up on their beach and decomposing because it stinks, and it doesn't look nice. And algae cause taste and odor problems in water that cost water companies more to filter out," says Kane.

He hopes to be able to take Defiance College students to Lake Erie and to Stone Lab to become involved in field trips and research activities. Stone Lab offers a competitive program for undergraduate research experiences.

Kane's research into invasive species also includes terrestrial species. "One that we hear about now in Defiance County is the emerald ash borer," he says. His recent work has been to look at community composition of trees. "Can we make some predictions about what will take over once all the ash trees are dead?"

Kane has discovered a valuable resource for his students in nearby Thoreau Wildlife Sanctuary, a 200-acre reserve just minutes from campus. Owned by the

Diehl family, the sanctuary has been available for research and field experience to DC students for nearly 20 years. Kane credits his predecessor Dave Reed for restoring prairie and forest ecosystems at the sanctuary. "Now we are seeing long-term what is happening and comparing that to other areas around here."



## LAKE ERIE FACTS

Water flow from the Detroit River makes up 80 to 90% of the flow into the lake. The outlet for Lake Erie is the Niagara River; consequently, it is Lake Erie that feeds water to Niagara Falls.

Basin rainfall is about 34 inches per year, although the historical trend is increasing slightly. About 34 inches of water evaporates from the lake surface per year.

Heat storage by the lake tempers the fall climate and lengthens the growing season.

--Ohio Geological Survey

**"Can we make some predictions about what will take over once all the ash trees are dead?"**

**-- Doug Kane, DC professor**

upper Great Lakes as two key possibilities. Lake Erie is the shallowest, warmest, southernmost, and most productive of the Great Lakes. These characteristics allow more fish to be produced in Lake Erie than all the other Great Lakes combined, explains Kane.

Few colleges have reserves so conveniently located to campus, he says, and he hopes to be able to expand use of the sanctuary to non-science students and faculty. As a teaching tool, it provides a setting that surpasses most classroom experiences. "It's really more experiential learning rather than sitting there having someone talk to you all day," he says.

Kane's interests beyond natural science include classic rock and art. He earned a minor in art history and hopes to someday join his art faculty peers in teaching a course. "Art and science aren't really so different ... they inform one another," he says. "That's one of my side interests, and I don't think I'd even be able to think about pursuing anything like that at a bigger school."

Growing up in Cleveland, Kane became a sports fan, following the Browns, Indians and Cavaliers. He spent the past 11 years in Columbus as a Buckeye fan. "It's interesting when I'm here and I see all the Michigan stuff ... it's very hard for me to restrain myself," he laughs. "I'd say my life has been very Ohio-centered." ♦