

## IISG Fosters Community Stewardship through University Students

By Jason Peterson

Robert Nagel listened proudly as a local elementary student confidently described the problems of aquatic invasive species, a special topic his class had been studying. "I just thought, 'wow!' I realized at that moment how much he had learned," Nagel said.



U of I students gathered at a Community Stewardship Fair to present their projects. Michael Kudia shows off a monster-sized sea lamprey created by grade school students.

Nagel is not a teacher, an education major, or even a close relative of the knowledgeable student. Rather, he is a Germanic languages and literature major at the University of Illinois who happened to stumble upon a flyer for a new service-learning course entitled *Community Stewardship through Environmental Education*. Four months later, Nagel found himself directly impacting the environment, the community, and a group of kids he had never met before this year.

Throughout the course Nagel experienced two unique styles of learning that university classes do not typically offer. "In addition to academics, the class is focused on meaningful service with the community and purposeful civic learning," he said.

"Service-learning is a form of experiential education in which learning occurs through a cycle of action and reflection," said Valeri Werpetsinski, education specialist at the U of I Center for Teaching Excellence. "In this process, students work with others to apply what they learn to address community problems, and, at the same time, reflect on their experience."

Nagel and other students in the course brought the issue of aquatic invasive species to local schools, spending two hours each week in the classroom teaching 4th, 5th, and 7th grade students from four Champaign and Urbana schools. These student leaders used a science-based web

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## Sea Grant AIS Website Selected for Smithsonian Kiosk

Beginning this summer, *Nab the Aquatic Invader!*, an educational web site about aquatic invasive species (AIS), will be featured at the Smithsonian National Museum of Natural History as part of the Ocean Today Kiosk in the Sant Ocean Hall.

The web site was created by IISG along with Sea Grant programs in New York, Louisiana, Connecticut, and Oregon to be an educational resource about AIS using colorful characters and a crime-solving theme. "The site is rich with curriculum for teachers, ideas for stewardship projects, and creative educational activities for students and other online audiences," said Robin Goettel, IISG associate director for education.

The Ocean Today Kiosk, developed by NOAA in partnership with the Smithsonian Institution, presents news, video stories and in this case, interactive pages that highlight some of the most interesting, surprising, and pressing issues facing our ocean today. Through a large touch-screen interface, visitors can find a variety of information about ocean life, current science and technology, and recent discoveries.

"We are excited to partner with the Sea Grant program to turn content from the *Nab the Aquatic Invader!* web site into an interactive feature," said Katie Snider, kiosk executive producer at NOAA's National Ocean Service. "The kiosk was designed to educate the public on fundamental ocean literacy concepts. There's no better way to teach kids (and big kids!) about invasive species than by letting them 'touch screen' their way through the crimes and profiles of invasive 'suspects' around the country."

Ocean Today Kiosks will be also located at a growing network of aquariums across the nation through the Coastal America Ecosystem Learning Centers, including the John G. Shedd Aquarium in Chicago. This partnership will provide opportunities for 20 to 30 million people to engage with *Nab the Aquatic Invader!* and many other ocean resources.

### *The* **HELM**

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# Would you please pass the Asian carp?

Bighead and silver carp, two populous invasive species in Midwestern rivers, might soon find themselves in fewer rivers and on more dinner tables.

"Worldwide, silver carp is the most consumed freshwater fish—it is considered the hamburger of Asia," said U.S. Geological Survey fish biologist Duane Chapman, who is researching food market possibilities as a way to reduce Asian carp populations.

Asian carp are taking a toll on food chains in the Mississippi River and its tributaries, including the Illinois River; and separated from Lake Michigan by an experimental electric barrier, the carp now pose a threat to the Great Lakes.

"Asian carp could have a dramatic impact on Great Lakes fish populations," said Pat Charlebois, IISG aquatic invasives specialist. "Because they can grow very large, they are able to consume lots of food—both phytoplankton and zooplankton, which form the base of the food chain. If they get into the Great Lakes, they could take food away from our already-beleaguered native fish."

Lisa McKee, CEO of Big River Fish, has been selling Asian carp for human consumption for the past five years. "In a competitive market, you have to come up with new ideas to survive," said McKee, whose company is now the largest purchaser of bighead carp in the U.S. "With more and more popping up in our rivers, we had to start selling Asian carp to keep our fishermen in business," McKee said.

Although marketing is expensive and slow, McKee said Asian carp are now starting to pay off. In the last year, she sold over two million pounds of Asian carp. "Next year will be even better," she said.

Last year IISG took part in an event at Bass Pro Shop in Bolingbrook, Illinois to demonstrate to fishermen

how best to filet these fish. Shoppers were also able to sample cooked carp. "While I advocate the creation of markets for bighead and silver carp to reduce their populations, I am concerned that we might turn them into 'desirable fish,'" said Charlebois. "If that happens, they might be deliberately spread to other areas to create new fisheries."

"I'm also concerned that if their populations become depleted through these new markets, then those who have come to rely on Asian carp for their livelihood will lobby for enhancement of the fishery," she said.

Steve Shults, manager with the Illinois Department of Natural Resources Aquatic Nuisance Species Program is equally cautious about integrating Asian carp into the food market. "Any kind of market is going to have to move an abundance of product to have any effect on the population," Shults said.

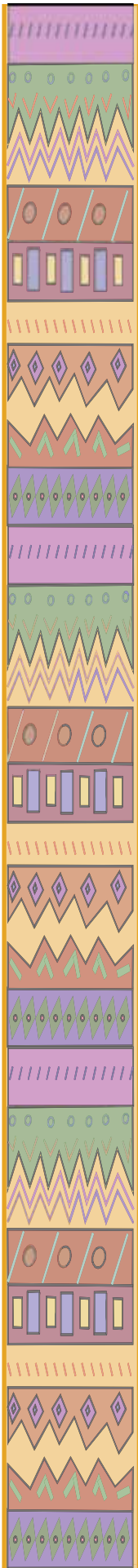
He noted that a company will have success until the raw materials are depleted. "Once the product has run out," he said, "the company would have to shut down and wait until the fish repopulate to open again. Balancing that cycle is a difficult thing to do."

McKee said she did not think the depletion of Asian carp as a resource is a realistic concern. "If they do run out," she added "our catfish and buffalo fish markets will be able to pick up again." Her main concern has been convincing reluctant consumers to purchase the fish. "Unfortunately, it's got that carp name on it," she said.

On the IISG web site at [www.iiseagrant.org/asiancarp](http://www.iiseagrant.org/asiancarp) you can learn how to identify, catch, clean, and cook Asian carp.



Vera Gelder, working with Bass Pro Shops, serves up hot and delicious silver carp. The fish are cut leaving several 'y-bones' in each slice. The bones are easy to remove, and the meat is white and flaky. (Photo courtesy of Duane Chapman)



# Sea Grant Fosters New Aquaculture Markets in Ghana, Kenya

Illinois-Indiana Sea Grant aquaculture marketing specialist Kwamena Quagraine's latest studies hit close to home. Quagraine, who was born and raised in Ghana, is currently leading research efforts to build successful aquaculture industries there and in Kenya.

"Fish has always been an important part of the diet of most Africans," he said. "Because of over exploitation of the natural fishery resources, aquaculture can become a profitable alternative agriculture enterprise to help alleviate poverty on the continent," said Quagraine, an Extension specialist at Purdue University.

As lead coordinator of the Development Theme Advisory Panel on Income Generation for Small-Scale Fishers and Farmers, which is part of the USAID Aquaculture & Fisheries Collaborative Research Support Program (AquaFish CRSP), Quagraine is currently overseeing five international study projects. He is the lead researcher on two of the projects, which focus on marketing of aquaculture products in Kenya and Ghana.

"Because of their adequate water resources, good mix of clay soils for pond construction, and warm weather," said Quagraine, "Kenya and Ghana are ideal for fish growth and technology transfer."

Quagraine and others have completed research on the development of material needs in Kenya and Ghana for a successful aquaculture industry. Now, he said, the focus has shifted to marketing and economics. With the help of Moi University in Kenya and Kwame Nkrumah University of Science and Technology in Ghana, Quagraine's team aims to develop supply chains from fish farms to retailers in these countries.

Their objective is to analyze multiple aspects of the countries' fish markets, including the cost of alternative outlets for marketing farmed fish. They are also trying to optimize spatial organization of fish assembly centers. And, the researchers are looking at the effect of public policy investment options on the aquaculture industry as well as the effects of private investment in the form of



better access to telecommunication, cold storage facilities, and transportation on marketable fish supply and farmers' welfare.

"The goal is to support the emerging small-scale commercial aquaculture sector in these countries, and also enable fish farmers to realize significant profitability and potential to obtain credit for fish production," Quagraine said. The bulk of the data will come from surveys sent out to fish farmers and fish traders.



The researchers are also focused on increasing production of catfish fingerlings as bait for Kenya's Lake Victoria fisheries. Traditionally, Kenyan fishermen rely on beach seining to catch catfish. Quagraine aims to reduce that, because it destroys habitats of native cichlids and, moreover, is illegal.

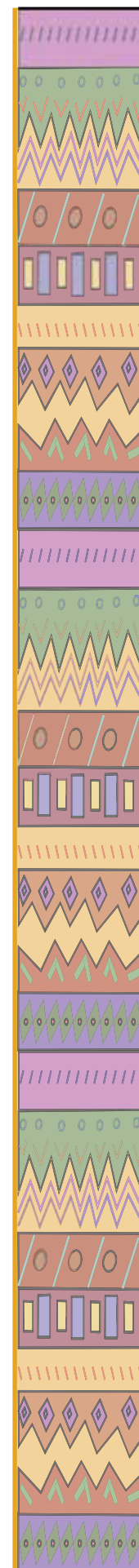
They also hope to increase profitability for fish farmers. Because it takes time for catfish to grow to food size, it's more profitable to sell them as baitfish when they are fingerlings. One challenge, Quagraine said, is that the market is not fully developed, which he noted is the essence of the study. Also, many fish farmers are reluctant to sell their fish as bait, because they are used to raising fish to food size.



Quagraine's team has been in contact with large groups of Kenyan fish farmers. "We are arranging farm visits with baitfish dealers to improve their perceptions of farmed catfish as bait," he explained. "From the work done so far, many fish farmers have learned the benefits of improved management and collective marketing."

Quagraine said it is important to him to help support the growth of aquaculture in Africa. "These projects are a wonderful opportunity," he said.

Photos from left to right: Aquaculture workshops are held at the Moi University Farm in Kenya. In Tanzania, from left to right, Quagraine, a local fish farmer, Nazael Madalla of Sokoine University of Agriculture in Tanzania, Aloyce Kaliba of Southern University, Louisiana, and two more fish farmers. Fish farming ponds in Kenya.



## Knauss Fellows Find their Future in Washington

To say that University of Illinois graduate Mark Carter worked an office job during his Knauss Marine Policy Fellowship simply means that he had an office. In reality, Carter's fellowship took him across the country, visiting aquaculture production facilities, attending conferences and stakeholder meetings and studying coastal land use issues.

Carter was assigned to work for the NOAA Aquaculture Program where he helped identify knowledge gaps and federal research priorities for an initiative to identify alternative aquaculture feeds.

Carter drafted briefing materials for NOAA and Department of Commerce leadership as well as members of Congress, held outreach meetings with various stakeholders, formulated requests for an increased aquaculture budget, and maintained the program web site.

After being offered a job as an environmental biologist in the Federal Regulatory Commission (FERC), Carter reluctantly ended his fellowship a few months early. With the help of an extensive network of Knauss Fellowship alumni, Carter said he was "in the right place at the right time" to receive the offer.

"I would have loved to remain working for the NOAA Aquaculture Program," Carter said. "But the employment opportunity with FERC was too good to pass up.

"I cannot speak more highly of my experience with the fellowship, other fellows, the Aquaculture Program, and the interaction with Illinois-Indiana Sea Grant and other state Sea Grant representatives along the way," he said.

The first thing University of Notre Dame graduate student Angela Deen, IISG's second fellow, had to do during her year-long experience at NOAA was to learn the whole gamut of issues covered by the agency, and as fast as possible. "The joke here is

that you go from having a knowledge base in graduate school that is 'an inch wide and a mile deep' to where you are expected to have an understanding of issues 'a mile wide and an inch deep.'"

Deen spent her fellowship in the NOAA Office of Oceanic and Atmospheric Research (OAR) where she worked as a program analyst for the Congressional Analysis and Relations Division. Deen's primary duties were to inform senior administrators

and scientists on legislative issues and prepare them for Congressional briefings. When OAR scientists or administrators were called to testify before House or Senate committees, she prepared background information.

Deen also applied her background in aquatic ecology and invasion biology to lead responses to Congressional inquiries and legislation related to invasive species and the

Great Lakes. "One of my biggest goals this year was to learn how to effectively translate the results of scientific research to the policy arena."

It was an interesting year to work on legislative issues, according to Deen, due to the election. She started out working mostly on bill reviews and legislative analysis, but ended it dealing with transition documents required by the incoming administration.

Like Carter, Deen's fellowship led to a permanent position. She will be staying on board with NOAA in the Office of Oceanic and Atmospheric Research.



Angela Deen with NOAA Administrator, Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.)

## Staff Update

### IISG Welcomes New Research Coordinator

John Epifanio, IISG's new research coordinator, is no stranger to the program. Early in his career, he was IISG's very first Knauss fellow. Since 2001, he has been a molecular ecologist at the Illinois Natural History Survey (INHS). There, Epifanio has served in a number of administrative roles, including director of the Center for Aquatic Ecology.

Epifanio splits his time between IISG and INHS. As research coordinator, he helps identify areas of science and research that address key coastal issues, oversees allocation of IISG research dollars, and works with researchers to connect their research to impact. Epifanio earned his doctorate from the University of Illinois.



### IISG Fosters Community Stewardship

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site—Nab the Aquatic Invader! ([www.sgnis.org/kids](http://www.sgnis.org/kids))—to effectively introduce and instill in the children the importance of this topic.

"The web site provides a creative way to learn about invasive species," said Robin Goettel, Illinois-Indiana Sea Grant (IISG) associate director for education. "Through colorful cartoon characters and a crime-fighting theme the site conveys how invasive species are transported to local waters, their adaptations, impacts and how they can be controlled."

At the end of the course, the student leaders helped the children compile their work into community stewardship projects. The children presented their topics through different mediums such as display boards, activity books, calendars, and skits, according to Werpetski.

To accomplish this, students met with representatives from libraries, park districts, nature centers, and other organizations to form community partnerships. The community partners provided resources for the children to put their projects together, and in return, they will use the projects in future teaching efforts.

"I've never taken a class before that necessitates reaching out to the community as one of the project requirements," said Nagel. "This helped me learn more about how to network. I also learned more about what the community has to offer."

Nineteen students participated in the class last spring and 25 this year. According to Goettel, about half of the students have been natural resource majors, while the other half represented other majors such as history, engineering, and literature. "But they all have a strong interest in environmental stewardship," she said. "And some had previous experience working with kids."

"This year we went beyond just using the 'Nab' web site, and provided an active learning component that incorporated more interactive, science-based activities," said Terri Hallesy, IISG education specialist. "By providing concrete learning experiences that are hands-on and engaging, students were able to teach school children about the serious issue of aquatic invasive species in a more meaningful and enriching manner."

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## New Brazilian elodea and Hydrilla WATCH Card

Outdoor enthusiasts can add two more species to their list of invasive plants to watch for: Brazilian elodea and hydrilla. These non-native aquatic plants have been invading and causing harm in our lakes, ponds, and streams. However, anglers and boaters can help prevent the spread of these plants by cleaning and inspecting their boats. Likewise, water gardeners and aquarium owners can refrain from releasing these plants (or any others!) into the wild. IISG's latest wallet-sized card is chock full of information on Brazilian elodea and hydrilla, including species characteristics, problems posed, methods to slow their spread, and contact information to report a sighting.

To order the new WATCH card, go to [www.iiseagrant.org](http://www.iiseagrant.org) and visit the AIS page in our products section.

