



ILLINOIS-INDIANA SEA GRANT COLLEGE PROGRAM

*Annual Report 2003*



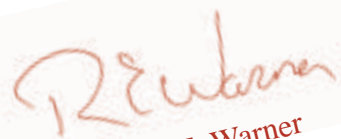
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The Illinois-Indiana Sea Grant College Program operates in a region that is highly unique. The setting comprises one of the largest population centers on the continent, sustained by the largest fresh water resource in the world. Sitting on the continental divide, water flows both to the Great Lakes and the ocean. Thus, IISG is well poised to help address issues of common interest to the Midwestern agricultural heartland and the coastal oceans population.

The program focuses on the interplay of coastal, urban, suburban, and agricultural issues. It addresses the range of coastal issues pertinent to a major coastal city, the heavily industrialized and rapidly changing portions of Indiana, protection of natural areas, recreation, and agriculture; and the smart growth issues that are at the interface of economic and environmental sustainability in the region.

Our program is responsive to regional needs and priorities, and forms effective partnerships to achieve measurable impacts. This report highlights selected accomplishments and other milestones for IISG for 2003.



Richard E. Warner  
Director

# *Illinois-Indiana Sea Grant College Program*

## *2003 Annual Report*

### INTRODUCTION

In 2003, Illinois-Indiana Sea Grant (IISG) initiated new programs, formed new partnerships, and secured new staff. And, with a strong commitment to its ongoing programs, IISG has fostered significant progress that will benefit the region as a whole. The program has helped shape policy and has informed the public on issues ranging from invasive species to water sustainability. Here are some highlights:

This year, Sea Grant partnered with the U.S. EPA Great Lakes National Program Office (GLNPO) to create a new specialist position to disseminate cutting-edge research results. IISG also developed and implemented a program through the Fisheries Leadership Institute to identify and train potential leaders in the fisheries communities to make educated choices related to fisheries management.

Asian carp and other invasive species were a hot topic in 2003 as the carp moved dangerously close to Lake Michigan. Through research, management, expert meetings, and testimony to legislators, Sea Grant has helped shape policy and has played a role in the development and implementation of barrier technology to contain invasive species.

The Wingspread Accord, initially funded by Sea Grant and signed in 2002, has led to the creation of the Tri-State Water Supply Consortium. This group will promote a regional approach to sustainable water supply planning and management in the greater Chicago metropolitan region. The *Planning with POWER* Program continues to grow and is now helping Lake and Porter Counties along Lake Michigan to incorporate water resources into land-use planning.

Addressing human health issues, IISG developed a Web site to provide up-to-date beach water quality information. With this site, people can find out throughout the summer whether their favorite beaches are closed. And, the program has developed a brochure to inform mothers and pregnant women



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about potential contaminants in seafood, which can impact development in babies and children.

These and many other accomplishments are explained below.

### LEVERAGED RESOURCES

*Fellowships and Student Involvement in Research*  
IISG funds opportunities for students directly through its fellowship program, through special projects funded via program development, and as components of competitively awarded research projects. In early 2003, IISG awarded two fellowships to students at the University of Illinois at Urbana-Champaign and at Southern Illinois University for the 2003-2005 academic years. The number of students, both at the

undergraduate and graduate level, supported by omnibus-funded research remains strong. In the last year, three PhDs, three masters, and five undergraduate students received support through omnibus research projects.

### ***Leveraged Funding***

Principal investigators report that over the past year, Sea Grant-funded projects have leveraged substantial additional funding to continue or enhance ongoing research.

In the area of aquatic nuisance species, researchers have expanded IISG-funded work on the competition for food sources between non-native carp and native filter feeding fish to include investigations into barrier methods for preventing the spread of non-native carp, and explorations of the movement and dispersion of Asian carp and round gobies. Funding sources for the complimentary projects include the National Sea Grant Office, the International Joint Commission, and U.S. EPA. A project identifying sources of entry for aquatic nuisance species found complementary funding through the National Sea Grant Office to do outreach to the pet and aquarium industry.

Water quality researchers secured additional funding from the Great Rivers Environmental Research and Education Center to continue research on mercury in waterways. And, in the area of aquaculture, researchers have leveraged IISG funding for studies on inactivation of fish aromatase genes to earn a National Institute of Health grant exploring targeted mutagenesis in zebrafish.

### **STAFF CHANGES**

Several new positions were filled in the director's office at the University of Illinois-Urbana. These include a secretary, fiscal and policy analyst, and program assistant. Stephanie Lage was appointed as the administrative secretary (.50 FTE); the balance of her time is with the Environmental Council. Rosa Townsend now serves as the program's fiscal and policy analyst (.50 FTE) through the University of Illinois. Elizabeth Anderson is the program assistant (.45 FTE) for Illinois-Indiana Sea Grant. Irene Miles (public information specialist) was elevated to a permanent .50 FTE position and is housed in the communications unit of the program; she has an

additional .25 FTE appointment with the Illinois Water Resources Center. Dr. Phil Mankin was appointed as research coordinator for the program (.75 FTE) and also shares his time with the Illinois Water Resources Center (.25 FTE) where he serves as research coordinator. Other staffing changes include:

Kate Beardsley was hired as our new Great Lakes ecosystem extension specialist through a grant from UDSA-CSREES. This position resides at U.S. EPA GLNPO in Chicago and administratively housed in the Department of Forestry and Natural Resources at Purdue University.

Charles Felkner joined IISG as the aquaculture extension specialist for the program in January 2003. This is a two-year .50 FTE position responsible for training extension educators specializing in aquaculture in Indiana and Illinois, working with the aquaculture associations in both states, and responding to producer calls and inquiries. Felkner has spent his career as an extension educator in Indiana and has maintained a specialty in aquaculture for the past 10 years. This position is physically and administratively housed in Purdue University Cooperative Extension Service.

Chad Dolan was hired as the program fisheries extension specialist through National Sea Grant fisheries extension enhancement funds. Dolan serves in the Fisheries Leadership Institute, conducting state meetings and activities for this institute. Dolan is physically and administratively housed in Illinois Natural History Survey (INHS).

### **OUTREACH**

In 1994, a specialist position existed in only one thematic area (Aquaculture), and the extension program provided no educational component. Very few outreach products were developed and few formal partnerships with academic institutional and management agencies existed. Today, one or more specialists are in place in four thematic areas (Aquaculture, Biological Resources (BR), Coastal Business and Environment (CBE) and Water Quality) and formal partnerships are in place with one or more institutions, which make each of these positions possible. Funds supplied by outside grants have led to expanded programming. Illinois-Indiana Sea Grant

leads several regional and national efforts; program staff has received regional and national awards for their individual efforts; and extension specialists are frequently invited to participate on committees that have influence on policy and management decisions. Today, the program has an established educational component and has developed three educational projects that encompass national participation.

Activities will not result in impact unless designed to do so. Therefore, IISG is guided by plans (strategic, implementation, and annual work) that are designed for impact. Formal processes for client needs assessment and evaluation are in place, and formal procedures to integrate outreach and research have been implemented. To make wise decisions concerning the use and allocation of Lake Michigan resources, citizens, community leaders, user groups, agency personnel, and industries require access to unbiased science-based information in a useable form. Through partnerships, personal day-to-day contact with clients, and educational programming, the Sea Grant outreach program provides a critical link between clients and university services, and enables clients to make informed decisions.

The outreach functional area had many notable achievements in 2002-2003. Productive, applied aquaculture programming is being provided to local producers through collaborative partnerships with aquaculture extension educators in Indiana and Illinois. *Planning with POWER* is an established statewide program in Indiana, empowering communities to proactively make land-use change decisions that protect water and environmental resources. Specialists working in the CBE thematic area have research-based information on which to design outreach products and programs for decision-makers involved in land-use change decisions. A partnership with the U.S. EPA GLNPO has resulted in the establishment of a Great Lakes ecosystem specialist position. This specialist draws upon research conducted by U.S. EPA and associated IISG partners, and transfers these Great Lakes scientific discoveries to coastal communities and resource managers. The Wingspread Tri-State Regional Accord (an agreement that brings the regional planning authorities from three states around Southern Lake Michigan to cooperate in the planning of future growth and infrastructure development in a way that

protects coastal resources while accommodating growth) is entering its third year. Illinois-Indiana Sea Grant is assisting the signatories of the accord to apply scientific findings and principles to help protect coastal resources in this broad-scale planning effort.

### ***Outreach through Web Sites and Exhibits***

In addition to the Illinois-Indiana Sea Grant College Program Web site, the program maintains two national sites, AquaNIC and SGNIS, which have won numerous regional and national awards. These sites incorporate cutting-edge technology and make Sea Grant information available to users 24 hours a day. The IISG Web site continues to be fine-tuned and improved with better navigation and a more user-friendly Web page structure. Program Web sites reach scientists, students, aquaculture producers and natural resource managers around the world—195,000 visitors came to the IISG site from over 126 countries (downloading 2,100,000 files) in the 12-month period from October 1, 2002 through September 30, 2003.

Through the Sea Grant exhibit *What's Wrong with this Picture?*, 3,100 people learned how they can play a role in the spread of exotic aquatic species. This interactive exhibit invited viewers to examine a colorful cartoon lake scene and determine what people-related activities can transport exotics to new water bodies. Also accompanying the exhibit were numerous fact sheets on invasive species and a tank of live sea lamprey, which drew people to the display. The exhibit appeared at the Chicagoland Outdoors Show, the Valparaiso Spring Fever Outdoor Show in Indiana, and the Grundy County Fair in Illinois. Another exhibit, *Arrest That Invader!* invited both youth and adults to decide which aquatic plants were invasive and which were native based on photos and descriptions of their habitat and characteristics in a plant "line up." This award-winning display appeared at the University of Illinois College of Agricultural, Consumer and Environmental Sciences (ACES) Open House, the Clean Water Celebration in Peoria, Illinois, and at the Science Spectrum in Muncie, Indiana; altogether, 550 visitors learned about invasive aquatic plants through the exhibit.



*Research on Native and Invasive Species in the Great Lakes Region—Selected Projects from the Great Lakes Sea Grant Network* was developed for the International Association of Great Lakes Research (IAGLR) Conference in Chicago. It has been seen by 800 scientists and resource managers at the IAGLR conference and at the Governor’s Conference on the Management of the Illinois River System. An outreach directory, *Making Waves*, continues to be distributed at public events and to water resource management agencies in Illinois and Indiana and to attendees of Sea Grant workshops.

### ***Specialists Provide Expertise and Leadership***

In the past year, Sea Grant outreach staff members have been invited and/or continued to serve on a number of key committees that influence policy in the two states. The water quality specialist serves on the Indiana *E. coli* Task Force, composed of 17 governmental agencies working to solve the *E. coli* problem in southern Lake Michigan, and is the chair of the Task Force outreach committee. The aquaculture extension specialist serves on Indiana Lieutenant Governor’s Livestock Promotion Grants Committee and helps guide funding decisions under this program.

The BR specialist has played critical roles in establishment of key ANS prevention tools at both the state and federal levels. With Richard Sparks, former research coordinator for IISG, she co-wrote the Illinois Aquatic Nuisance Species Comprehensive Management Plan, which was submitted, and approved for funding by the USFWS. Currently, she has a grant from the Illinois Department of Natural Resources (DNR) for the plan implementation. Components of the plan include an ANS monitoring inventory, a rapid response plan, and outreach activities. For several years, she and Sparks have served as members of the Chicago Waterways Dispersal Barrier Advisory Committee. Their work has played a significant role in the installation of an experimental electric fish barrier in Chicago waterways; their continuing efforts on this committee and the BR specialist’s involvement in planning a Dispersal Barrier Summit hosted by the City of Chicago and USFWS should result in a permanent barrier designed to impede movement of a variety of organisms between the Great Lakes and Mississippi River drainage basins.

The BR specialist also has directly impacted policy in

Illinois. Her testimony on snakehead fish before the City of Chicago’s City Council helped spur the state to develop legislation banning the fish. This legislation is the first step in the development an easily-amended prohibited species list. Her participation on a State committee examining the feasibility of regulating shippers as they enter local waters of Lake Michigan resulted in Illinois’ willingness to work with the shipping industry through education rather than regulation. (Regulation of shippers on a regional level has been determined to be preferable to individual state regulations.) The biological resources specialist has developed a ballast water brochure for the Great Lakes shipping community, which is being distributed to each ship captain entering an Illinois port.

The CBE specialist currently serves on the following agency committees and task forces so that environmental and economic concerns are considered and integrated into ongoing local and regional planning initiatives:

- The Environment and Natural Resources Work Group of the Northeastern Illinois Planning Commission’s “Common Ground” regional planning process;
- The Regional Water Supply Steering Committee overseeing the collaborative water resources management strategy developed by the Northeast Planning Commission (NIPC), the Northwestern Indiana Regional Planning Commission (NIRPC) and the Southeastern Wisconsin Regional Planning Commission (SEWRPC) under the Tri-State Wingspread Accord;
- NIRPC’s Governmental Regulations, Enhancement, and Coordination Watershed Technical Team for its Section 319 Watershed Management Plan;
- The Natural Environment Work Group of the Chicago Metropolis 2020 Project of the Chicago Commercial Club (The Chicago Metropolis 2020 Project recently published its regional smart-growth plan, “The Metropolis Plan: Choice for the Chicago Region (2003)”);
- The Sustainability Task Force of the Chicago Wilderness Biodiversity Project;
- The Lake Calumet Ecological Plan Task Force of the City of Chicago’s Department of Environment.



The CBE specialist has also been appointed a faculty scholar in University of Illinois at Chicago Institute for Environmental Science and Policy for the 2003-04 academic year, enabling him to work more closely with faculty and staff within the university to develop interdisciplinary research proposals to improve water quality and water resources management within the region.

*The following outreach accomplishments, milestones and impacts have been achieved this last year in our four thematic areas:*

### ***Aquaculture***

Fish are a great source for protein and minerals; they are also low in saturated fats and can be a source of omega-3 fatty acids—essential for good health. In fact, seafood is the number one source of protein worldwide. But recent scientific studies reveal that many fish populations around the world are notably depleted, some described as imperiled. In oceans and other water bodies, fish are being harvested at unsustainable rates. In the Great Lakes as elsewhere, many native fish populations are waning. In fact, commercial fishing in Illinois and Indiana is virtually gone.

The Chicago seafood market is the fifth largest in the U.S. and imports 99 percent of the products consumed in the Midwest. Right now, less than one percent of the farm-raised seafood consumed in the U.S. is produced in the Midwest, but with such a large consumer base, it makes sense for these numbers to increase. Illinois-Indiana Sea Grant has set a goal to increase the size and profitability of aquaculture industries in the two states.

### ***AquaNIC Leads the Way Online***

The Aquaculture Network Information Center ([aquanic.org](http://aquanic.org)) was accessed by users from over 160 countries and received 16.6 million hits and 1.5 million visitors in 2003. AquaNIC, which has been fostered by the program since 1994, was one of the first aquaculture internet sites to deliver scientific information to aquaculture users. The site was established to be the gateway to the world's electronic aquaculture resources. AquaNIC is a one-stop source of aquaculture information, available 24 hours a day, to producers, educators and scientists. A memorandum of agreement between NOAA and the

USDA libraries was signed in 1999 making AquaNIC the primary aquaculture Web site for the AgNIC network project. Formal partnership agreements have also been made with 14 institutions to provide coordinated aquaculture information to users. Illinois-Indiana Sea Grant's chief Web officer has been elected to the executive board of the national AgNIC Web project, sponsored by the USDA, and is chair of the Budget/Fundraising Committee. He led a large multi-state NSF proposal effort last year and established a cooperative agreement with USDA/NAL to catalog Purdue Extension and AquaNIC resources, in collaboration with the AgNIC project.

The growth of this site (2 million hits in 1998 to the present 16.6 million hits) and the contribution of the partners make AquaNIC useful to clients in Illinois and Indiana, as well around the world. Users may:

- Participate in threaded discussion groups;
- View publications, newsletters, multimedia files, or calendars;
- Post jobs/resumes or search for viable candidates/leads;
- Find e-mail addresses of people with similar interests or post their own;
- Search for other aquaculture web sites or post their favorites.

A major redesign of the AquaNIC Web site interface was completed, incorporating JavaScript technologies to speed up the load time for the users, The Java Applets are being phased out in favor of JavaScript on all program Web sites to increase the speed of user interfaces. A new Windows 2000 server was installed to replace the aging NT server, used for Active Server Page (ASP) technologies. Both the SGNIS and AquaNIC Web sites use ASP technologies for database searching and additions. AquaNIC recently added a photo database to be delivered via ASP.

### ***Educating the Educators***

Producers require science-based advice to guide their decisions and production efforts as they undertake new aquaculture ventures. Aquaculture Extension Specialist Charles Felkner worked closely with 10 extension aquaculture educators located throughout Indiana and Southern Illinois. These educators serve as regional resources to producers requiring aquaculture assistance and advice. The aquaculture

extension specialist held three continuing education workshops for these educators to provide the latest research results on pond management, fresh water prawn production, and conversion of existing barns to re-circulating systems. These educators are now equipped to assist producers in their region on these topics. Felkner also has worked closely with the Indiana Aquaculture Association over the past year. He has worked with the board of directors to re-energize the organization and together they identified the educational needs of association members. A one-day educational workshop was provided for association members and aquaculture producers in the state. Scientists and experts worked with producers on issues related to value-added products, marketing issues, and prawn production. Producers in Indiana and southern Illinois now have a source of up-to-date scientific information available to them from their cooperative extension service offices and have an association they can turn to for additional support.

### ***Biological Resources***

The Great Lakes basin encompasses the largest surface freshwater system in the world. One of the greatest risks to the health of this system is the invasion of non-native aquatic nuisance species (ANS); over 160 ANS have been introduced in the Great Lakes region. These species include high profile invaders such as the sea lamprey and zebra mussel. Once introduced, these species can spread and have a devastating impact on our lakes and rivers, and on the native fish and wildlife that inhabit them. They are costly not only to our environment but also to our economy. The sea lamprey drastically changed the food web of the Great Lakes and now costs more than \$12 million a year to control. Zebra mussels continue to cause ecological damage including reducing food availability for native mussel and fish populations. Control costs associated with zebra mussels in the Great Lakes basin are estimated at \$250 million.

The introduction and spread of ANS can occur through a variety of pathways and vectors including recreational water users, backyard water gardeners, aquarium hobbyists, the baitfish industry and commercial shippers. Additionally, in Illinois, there is a direct connection between Lake Michigan and the state's inland waters via the Chicago waterways—a series of canals dug to link the Great Lakes and

Mississippi River basins. Illinois-Indiana Sea Grant is working to close this conduit of ANS dispersal. We are also engaged in preventing the introduction of new species and limiting the spread of those already established by changing the behavior of people involved in each pathway of spread.

The history of exotic species in the Great Lakes is one of profound ecological change at significant financial cost. The modern Great Lakes are still threatened by new introductions as well as unrealized impacts from those species already in the basin. These threats also apply to inland waters in both Illinois and Indiana. The ecological and economical impacts of nonindigenous species can be reduced by helping water users understand the consequences of these species and teaching them to take proactive steps toward preventing their spread.

### ***Reaching Critical Audiences***

IISG clientele that require information on exotic species and Lake Michigan's fisheries is quite diverse. It includes youth educators, anglers, charter captains, lake associations, recreational boaters, and resource managers. In many cases, this clientele has no organizational affiliation, or are only loosely organized. As examples, not all anglers belong to an angling group, and not all lake associations are active members of the state lake management association. In addition, the species of concern (both exotic species and sport fish species) are numerous. To address the varying needs and types of clients, our outreach methods must be diverse.

Current educational programming is designed and delivered to recreational water users, plant hobbyist and professionals, aquarium hobbyists and professionals, baitfish suppliers, commercial shipping industry staff, and resource managers to assist them in identifying ways they might spread ANS and to help them learn

management and behavior changes that can reduce this spread. Pat Charlebois, the biological resources specialist, along with other program staff, are continuing to implement



components of the Illinois ANS Management Plan, including an inventory of monitoring activities, development/refinement of a Chicago waterways dispersal barrier, and development of a regional rapid response plan. Biological Resources staff produces a periodic Illinois ANS update for subscribers to an update listserv and is assisting Indiana DNR with the development of a state ANS comprehensive management plan.

The BR specialist has been instrumental in bringing Sea Grant information to new audiences—bait suppliers and water garden hobbyists and professionals. Charlebois has participated in the development of a series of outreach tools aimed at the bait industry including a HACCP-like plan for bait



wholesalers, a poster for retail outlets, and HACCP workshops for federal fish hatcheries. She also developed a sticker for bait users (i.e., a bait bucket or

tackle box sticker); over 550,000 copies of this sticker are currently being distributed by bait shops and resource managers throughout the Great Lakes. As a result of these projects, we expect that fewer non-bait species will appear in bait, and bait dumping by anglers will occur less frequently.

Charlebois also participated in a national outreach initiative on invasive aquatic plants—invasive plants are a new area of involvement for Sea Grant. As part of this initiative, she collaborated with the industry to develop a brochure for water garden hobbyists to educate them about how backyard water gardens can play a role in the spread of ANS. Over 35,000 of these brochures have been distributed nationally. We expect that many of these water gardeners will take steps to reduce the risk of introduction and spread of ANS.

Our objective is also to empower users and managers of Lake Michigan and the inland waters of Illinois and Indiana to reduce the introduction of new nonindigenous aquatic nuisance species, and to cope with problems caused by existing species. Through this approach, a higher number of recreational boaters and anglers are consciously practicing behaviors to avoid spreading ANS and a comprehensive education and monitoring program is routinely used at some

inland lakes throughout both states to reduce the introduction and impacts of ANS. Outreach projects are in place to ensure that:

- The number of recreational boaters and anglers who consciously avoid spreading ANS will increase.
- A comprehensive education and monitoring program will be routinely used at inland lakes throughout both states to reduce the introduction and impacts of ANS.
- Zebra mussels will not spread as widely or as quickly as modeling predicts.
- Round gobies will not spread as widely as environmental conditions allow.
- Barriers to the dispersal of ANS will be installed and tested.
- The rate of exotic introductions into Illinois and Indiana waters will decline.

Outreach efforts in the Biological Resources thematic area have resulted in the following impacts:

- Actions taken by boaters have delayed zebra mussel infestation of inland lakes by several decades, according to a model. This buys time to develop control methods and may save native mussels in hundreds of miles of streams and rivers.
- Economic impacts of exotic species on industry and recreational water users have been reduced because a) industries have changed their zebra mussel control practices to be more effective and cost efficient, and b) 25,000 boaters have obtained information on how to protect their boats and boat engines from zebra mussels.
- In the Chicago metropolitan area, 64 percent of anglers can identify the round goby; more than 70 percent of recreational boaters and anglers reportedly take steps to prevent the spread of aquatic nuisance species.
- Youth in Indiana and Illinois are more informed about the issues surrounding aquatic nuisance species (purple loosestrife, in particular) and are more involved as environmental stewards working on solutions.

### *SGNIS—A Web Presence*

Congressional action in response to the invasion of zebra mussels in the Great Lakes led to the passage of the Nonindigenous Species Control Act of 1990 and millions of dollars spent by Sea Grant on research and outreach projects. As ANS continue to spread throughout the country, the growing wealth of information resulting from these projects is critical. The work of Sea Grant Programs can help others to respond rapidly to ANS problems by applying research findings to control strategies, and by using the richness of educational materials to teach industry and resource management agencies.

The goal for the SGNIS Web site was to create instant access to research and outreach results developed by Sea Grant and other agencies on aquatic nuisance



plant and animal species. To date, the SGNIS database contains over 1,380 research reports and educational items on 17 species. Currently housed at the site are over 789 completed research findings, 369 research and outreach papers in six conference proceedings, 89 issues of newsletters, an 86 slide graphic library, six distribution maps, 62 Sea Grant outreach and education products, and 961 general publications. Contributions to SGNIS have been made by over 100 organizations (20 of which are Sea Grant Programs) and 125 peer-reviewed journals. In 2003, SGNIS had over 1,738,000 file transfers. Over 29 percent of the file transfers were conducted by international users from 109 countries.

The SGNIS Web site has been the Web presence for the National Sea Grant College Program on non-indigenous issues since 1996. Great care has been taken to ensure that all materials are of the highest quality and to make sure that all information is searchable and easily accessible to the end user. It is one of the few Web sites where all documents, both research and outreach, have been subjected to peer

review. We believe that making Sea Grant and other NOAA research and outreach accessible via the Internet, while maintaining high scientific standards, will directly enhance management, control and prevention of aquatic non-indigenous species throughout the continent.

This site also exemplifies how technology will be transferred in the future. Researchers and other users can conduct a literature search (as is done on searchable library databases) or they can download the entire document or product. This moves the transfer of scientific technology one step further and Sea Grant can be proud to be a leader in this trend.

### *Fisheries Institute Trains New Leaders*

Recreational fishing opportunities comprise an important social and economic component of the Lake Michigan shoreline in Indiana and Illinois. In 2003, the Illinois-Indiana Sea Grant College Program secured a 50 FTE fisheries outreach specialist to define and implement an outreach strategy and implement a program for southern Lake Michigan fisheries and stakeholders. The program addresses needs for the diverse recreational, charter, and commercial interests in Lake Michigan and Chicago urban fisheries. Chad Dolan, IISG fisheries extension specialist is part of a broader effort through the Sea Grant Great Lakes Network Great Lakes Fisheries Leadership Institute and serves as the key contact for Illinois and Indiana. Dolan works directly with the Lake Michigan Committee of the Great Lakes Fishery Commission in identifying outreach needs. He also is in close contact with Lake Michigan fish managers from Illinois and Indiana DNRs and researchers at INHS. A longer-term goal for this specialist is to institutionalize a value-added outreach program serving the Lake Michigan fishery community with an additional emphasis on connecting waterways and the Illinois River system.

The Illinois-Indiana Lake Michigan fisheries extension specialist reports to Illinois-Indiana Sea Grant through INHS, Center for Aquatic Ecology (PI is director of the Center for Aquatic Ecology). Direction for this program is determined by a coordinating council composed of representatives of Illinois and Indiana DNRs, INHS, Purdue University, and Illinois-Indiana Sea Grant.

In 2003, Dolan identified client needs and developed products and delivered programs for the Lake Michigan fisheries communities in Illinois and Indiana. New prospective leaders of fisheries organizations in both states were identified and assembled for a formal, long-term training program as part the Great Lakes Fisheries Leadership Institute. Thirty participants came together for the first time to embark on an interactive learning opportunity in July of 2003. They learned the basics of fisheries management structures currently in place in Lake Michigan, became familiar with basic biological principles associated with management decisions that must be made, and were led through a facilitated session to identify their needs for future training sessions.

Participants will also be invited to join future leaders from other states surrounding Lake Michigan in a training program focused on more detailed ecological issues influencing fisheries management in Lake Michigan; there they will begin to build a working relationship with leaders from other states. The Great Lakes Fisheries Leadership Institute is intended to be a long-term program designed to work regularly with this new group of emerging fisheries leaders in Indiana and Illinois to prepare and empower them to be effective leaders in southern Lake Michigan fisheries issues.

### ***Coastal Business and Environment***

The Illinois-Indiana urban corridor along southern Lake Michigan continues to grow in population and rely heavily on the tremendous diversity of natural resources that Lake Michigan provides. Within the Chicago metropolitan region alone, the population is projected to grow by 1.5 million by 2020, with 800,000 new newly created jobs. Additionally, each year more than six million visitors use the region's coastal lake

resources for recreation, including an area of nationally significant dune and swale wetland ecosystem fragments of extraordinary biodiversity. Accommodating the region's projected growth while protecting its fragile natural resources comprises a critical management challenge for government planners and decision makers.

According to NIPC's *Strategic Plan for Water Resources Management* (2002), the metropolitan region's projected growth will stress water supply resources. Illinois is constrained by a U.S. Supreme Court decree from diverting more than 3,200 cfs from Lake Michigan. Illinois has also entered into a memorandum of understanding with other Great Lakes states to not only maintain this diversion limit, but to reduce Great Lakes water use over the next decade, to make up for historically violating the limit. At the same time, communities within the Chicago metro region continue to mine their deep aquifer



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system at unsustainable pumpage rates; some are already within 80 percent of the estimated sustainable yield of their localized shallow aquifers. These factors make water supply planning a priority issue in the region.

Better water supply management strategies must be considered and promoted if the region is to use its water resources in a responsible and sustainable manner.

As a result of the region's projected growth, considerable planning is underway. NIPC is in the process of developing enhanced water resource policies and updating its comprehensive plan. The private sector, through the Chicago Metropolis 2020 planning process initiated by the Commercial Club of Chicago, is placing increased emphasis on economic development and manpower planning to capture the

economic opportunities that new development brings. NIRPC is engaged in a new regional planning process to protect the water quality of streams, rivers and lakes within the Lake Michigan basin from threats posed by new development, as part its Section 319 watershed planning process. SEWRPC has also begun working with NIPC and NIRPC to formulate coordinated water resource management strategies for the southern Lake Michigan basin.

It is important that the Illinois-Indiana Sea Grant College Program work with these public and private-sector groups to ensure that critical environmental and natural resources management issues are not ignored in these new interstate planning initiatives, and to continue to work with non-profit environmental organizations to build a stronger constituency for these issues within these planning processes.

Through an institutional partnership arrangement between IISG and the UIC Great Cities Institute (GCI), Martin Jaffe, the CBE specialist is housed at GCI. Dr. Jaffe assists state and local officials, water supply managers, and the general public in improving public water supply planning and intergovernmental water transfers, so that water resources are used more efficiently and sustainably in the Chicago metropolitan region. He researches and educates local officials about the use of economic incentives (including the incorporation of water resource sustainability criteria in municipal and corporate bond rating and underwriting procedures), regulatory modifications, and increased intergovernmental cooperation to encourage more sustainable water use within the region by municipalities, joint action water agencies, and private-sector water utilities.

Jaffe is assisted in his research by two students: Rebecca Retzlaff, a doctoral student in the University of Illinois at Chicago College of Urban Planning & Public Affairs (CUPPA), and Jesse Elam, a graduate student in the CUPPA Urban Planning and Policy Program. Retzlaff is assisting Jaffe in his research, examining how enhanced regional-scale intergovernmental cooperation in water supply provision affects water supply sustainability. Retzlaff's IISG-funded research assistantship in GCI will help her define her dissertation research interests and will provide valuable graduate research and public outreach training. Elam, who previously

worked with the Spokane, Washington, Department of Public Works, will also be helping Dr. Jaffe in assisting NIPC, NIRPC, and SEWRPC in the development of their coordinated regional water supply management policies as part of his IISG-funded research assistantship.

#### *Water Resource Decision Making*

The land surrounding southern Lake Michigan is highly developed and continues to be a very fast-growing area. This region includes three counties in northwest Indiana, six counties in northeastern Illinois, and seven counties in southeastern Wisconsin, with an estimated 2000 U.S. Census population of 11 million people. Existing development and future growth in this area does and will impact Great Lakes environmental and coastal resources. For coastal resources to be managed sustainably in this region, they should be considered in developing regional growth plans. Planning for this multi-state area is conducted by four regional planning organizations serving the Gary-Chicago-Milwaukee corridor: the Chicago Area Transportation Study, NIPC, NIRPC, and SEWRPC. Prior to this project, these four organizations operated independently. They did not plan for the region as a whole, and made few provisions for natural resources in future growth plans.

Funding has been provided by Illinois-Indiana Sea Grant to NIPC for the past three years to improve communication and coordination of planning activities among the four regional planning agencies serving the lower Lake Michigan basin area. Initial meetings were held with the executive directors of the organizations to plan a course of action—this was the first dialog established between these agencies. Leaders of the four major planning bodies reached an “accord,” in which the organizations commit to regional coordination of planning efforts on topics of common concern including sustainability of water and other coastal resources, economic development, and transportation planning.

A tri-state economic growth plan is under development, preliminary activities in transportation infrastructure are underway, and proposals have been developed to work on coordinated watershed and water quality planning. Current activities are focused on bringing together policy and management officials that control surface and ground water supplies, to work toward sustainable water use and planning in this tri-state region.

A Water Supply Consortium has been formed that is composed of agency officials responsible for surface and ground water supplies in southeast Wisconsin, northwest Indiana, and northeastern Illinois. This consortium has formed and matured over the past year. Three day-long meetings have been held to identify the group's purpose and future direction. The vision and mission statement of the Water Supply Consortium are:

#### VISION

Recognizing that water resources have no political boundaries, the vision of the Tri-State Water Consortium is to ensure sustainable, a high-quality water supply for future generations throughout the metropolitan region of northeast Illinois, southeast Wisconsin, and northwest Indiana

#### MISSION

The Tri-State Water Consortium mission is to promote a comprehensive regional approach to sustainable water supply planning and management in the greater Chicago metropolitan region, including southeast Wisconsin and northwest Indiana. We recognize that comprehensive planning and management must include all water resources, from Lake Michigan to inland surface waters to groundwater. Our mission will address the tri-state region water supply issues by pursuing the following goals:

- Acquire funding to support the mission of the consortium;
- Promote water supply data gathering, research, and data analysis;
- Promote legislation at federal, state, and local levels for water supply planning and management;
- Advocate increased water supply education among all stakeholders;
- Create a regional water supply plan and provide support to implement that plan.

The Water Supply Consortium has formed three work groups that are meeting more intensively to: address future funding needs; identify a strategy for developing a sustainable tri-state water use plan; and identify and implement a management structure that allows the sustainable water use plan to be enacted.

#### *Balancing Land Use Change and Natural Resources*

The newly released 2000 U.S. Census shows that the population of Indiana increased 9.7 percent from 1990 to 2000; however, this growth was not uniform. The fastest-growing areas increased by as much as 67 percent, with most of the growth occurring through sprawl on agricultural lands. Indiana ranks 38th in the nation in land area, but ranks 2nd in prime farm land. The increased development and resulting land use changes have a significant impact on water quality and water quantity. Sediment, nutrient loading, biological contamination (e.g. *E. coli*), toxins (including metals and oils from automobiles), and increased runoff can all result from development. As communities grow, local officials generally focus on the economic implications of growth (i.e. tax base, number of jobs, new housing starts, etc.) and pay little attention to the water quality implications of growth.

The *Planning with POWER* Project is a statewide education program in Indiana linking local land use decision-making to natural resource based or watershed planning. *Planning with POWER* helps communities

guide growth and development while still protecting water and other vital natural resources.

This project, coordinated by the Illinois-Indiana

Sea Grant College Program and the Purdue University Cooperative Extension Service, provides a mechanism by which communities can seek education and technical assistance in developing watershed plans in concert with land use plans.

Education programs are delivered at the local level to planning and zoning officials (planning commission members, planning staff, county commissioners, city officials, local health departments, county surveyors, city and county engineers, local Natural Resource Conservation Services, Soil and Water Conservation Districts, IDNR staff, extension educators) and to citizen groups (including watershed coordinators, environmental groups and organizations, agricultural representatives, and other interested citizens). Programs are designed to identify natural resource



problems that can result from current and future land use practices in growing communities, and to encourage participants to take action to prevent further impacts to their watershed.

*Planning with POWER* encourages communities to determine local interest in land use and watershed planning activities, and to proceed at a pace compatible with the local political climate and the available infrastructural support. Robert McCormick, the project coordinator, along with work team members, provide the mechanism by which this progress becomes possible. Also, the statewide network of natural resource and extension professionals available through *Planning with POWER* provides technical support and assistance to communities. The project coordinator works closely with communities that wish to move forward, and encourages and facilitates needed training, educational resources, and appropriate levels of interaction between local officials, local citizen groups, and technical resources from agencies.

Over the past two years, the *Planning with POWER* Project has developed a program brochure, six peer-reviewed extension publications, a Web site, a 25-minute PowerPoint presentation, and delivered over 50 presentations in thirty-five counties in the state, as well as presentations to over 60 professional groups and agencies in Indiana and in surrounding states.

The *POWER* project has begun working closely with five communities on *POWER* goals and objectives:

- In Hendricks County, local leadership organized a *Planning with POWER* Committee that meets monthly and advises the Hendricks County Plan Commission on incorporating natural resource protection into the comprehensive planning process. Currently this group is helping to update and revise the subdivision control ordinances.
- The *Planning with POWER* Project has held several meetings in Elkhart County to discuss natural resource protection and to help initiate a comprehensive land use plan update. The *POWER* project is also working with several watershed projects in Elkhart County.

- The *POWER* project has delivered several presentations including a developers' workshop in Howard County. McCormick serves on the Wildcat Creek Watershed Alliance Land Use Committee and is providing expertise on natural resource protection on an ongoing basis in Howard County.
- In Dearborn County, the *POWER* project has been working with both the City of Aurora and Dearborn County on long-range planning. Presently, the *POWER* project is helping plan a hillside slippage workshop for developers, builders, and other local officials in collaboration with the Indiana Land Resources Council and the local Soil and Water Conservation District.
- In Putnam County, *Planning with POWER* has been working closely with a farmland preservation group and more recently with the Indiana Land Use Consortium on a community workshop concerning land use and the environment in the county. The *POWER* project also presented information on water quality status. County planners are discussing updating the county comprehensive plan as well as discussing GIS initiatives.
- Lake and Porter County Plan Commissions are working with *POWER* on natural resource protection, septic issues, and a Smart Growth Initiative Project in collaboration with the Northwestern Indiana Regional Planning Commission. A series of workshops have addressed the regional growth issues and their impact on the Lake Michigan shoreline and surrounding farmland in these counties.
- In Tippecanoe County, *Planning with Power* has provided guidance to the Tippecanoe Vision 2020 Land Use and Environmental Committees that are addressing future needs and priorities related to growth and natural resource protection in the county. *POWER* is also working with the joint Storm Water Management Committee, which is addressing storm water education, post construction storm water issues, and best management practices.



The *Planning with POWER* Project is also working closely with the recently formed Indiana Land Resources Council (composed of appointees by the governor and chaired by the Lt. governor of Indiana) as it works with local communities on balancing growth and development with natural resource protection across the state. The *Planning with POWER* Project has been asked by the Indiana Land Resources Council to provide assistance and guidance to its first efforts to assess the needs of community land-use decision makers.

### **Water Quality**

Water quality has become a major issue along the southern shores of Lake Michigan in recent years. The sources of pollution are many, and the culprits diverse.

Non-point source pollution (NPS) is polluted runoff that results from a variety of land use practices. It spreads by rainfall and snowmelt that move across the ground as runoff and pick up and transport pollutants to wetlands, lakes, rivers, coastal waters and drinking water sources. In Indiana, NPS is the leading cause of water quality problems, including impairments to drinking water supplies, recreation, fisheries, and wildlife.

Pathogens are disease-causing microorganisms, such as bacteria and viruses that come from the fecal waste of animals and humans. Pathogens wash off the land from wild animals, farm animals, and pet waste. They can also enter the lake from improperly functioning septic systems, leaky sewer lines, and boat sanitary disposal systems.

Nutrients are compounds that stimulate plant growth, such as nitrogen and phosphorous. In high concentrations, nutrients may become both an environmental and health threat. Nutrients in polluted waters may come from agricultural fertilizers, septic systems, home lawn care products, and yard and animal wastes.

Toxins are substances that can harm aquatic and human life. They are created by a variety of human practices and products like heavy metals, pesticides and organic compounds like PCBs. Many toxins are resistant to breakdown and tend to pass through the food chain and concentrate in top predators. Oil,

grease and gasoline from roadways, and chemicals used in home, gardens, yards and on farm crops, are major sources of toxic contaminants.

All of the above factors, alone or in combination, have resulted in beach closures, fish consumption advisories, reduced drinking water quality, and a loss of recreational value for certain water bodies.

### ***Reducing Beach Closures Due to E. coli Contamination***

Each summer, thousands of people visit Indiana's Lake Michigan beaches during the summer months. Throughout the summer, beaches are periodically closed or posted to swimmers due to high bacterial counts (*Escherichia coli*). Illinois-Indiana Sea Grant has partnered with Indiana University Northwest and Save the Dunes Conservation Fund to develop the Monitoring and Public Notification Plan for Indiana's Lake Michigan Beaches.

The contractors have written the draft Quality Assurance Procedure Plan (QAPP) allowing the state to apply for U.S. EPA 2004 BEACH Grant funding. Contractors have also held three public meetings, one in each county affected by this funding or, in other words, impacted by Lake Michigan. The public was asked to comment by August 15, 2003 on the Indiana Lake Michigan Beach Evaluation, Classification Public Notification Plan. The Interagency *E. coli* Task Force, which includes state and federal agencies, non-profit organizations, academic institutions and interested citizens, actively provided guidance on the plan.

Completing the draft QAPP has enabled the state to apply for next year's beach money. It has also started Indiana on a process of developing a consistent monitoring and public notification plan for the beaches of Lake Michigan, thereby, further protecting the health of the beach going public. One result is a Web site created by Sea Grant to provide current water quality information about Indiana's Lake Michigan beaches so that the 1.7 million beach goers can assess their risks before



leaving home. In July and August of 2003, shortly after its inception, the site <http://swann2.ansc.purdue.edu/nwibeach> had approximately 3,000 visitors per day. An undergraduate student was funded to design this site.

### *Reducing Risk of Contaminants from Wild Caught Fish*

Fish take in contaminants such as polychlorinated biphenyls (PCBs) and mercury from the water they live in and the food they eat. These contaminants build up in the fish and through consumption, eventually in humans. The Indiana Department of Environmental Management in conjunction with the State Department of Health issue fish consumption advisories based on a composite of skin-on filets, however skin-off filets may be used. The advisories are developed to help the angler plan which fish to keep as well as how often and how much fish to eat.

Leslie Dorworth, IISG water quality specialist has partnered with a Purdue University researcher to create *Contaminants in Fish and Seafood: A Guide to Safe Consumption*, a fact sheet developed in a easy-to-read brochure format. It is intended for women who might become pregnant, are pregnant, nursing and young children. A follow-up survey, which will be developed with researchers at Purdue University will ascertain if this brochure has impacted or changed consumers' seafood eating habits. The survey will be distributed to individuals who work with resource-poor families in both Illinois and Indiana as well as through doctors' offices.

### *River Restoration: Practices and Concepts*

Many dams were built in the Midwest during the late 1800s and early 1900s. Over time, weathering and water pressure slowly break down a dam so that it requires repair, replacement, or removal.

A workshop on dam modification and removal took place in the spring of 2003. The event was sponsored by Sea Grant and Chicago Wilderness and explored a variety of perspectives on the subject, including biological, socioeconomic and civil engineering. The focus of this workshop was technical, unlike the prior IISG dam workshop. Presenters and participants included natural resource managers, environmental consultants, park department staff, landscape architects, consulting engineers, city planners, public works directors and municipal engineers. Attendees at

this workshop series have reported using the workshop information in their work, as a backbone for communications to the public and local officials, and as a basis for education within their organizations.

### *Expanding the Scope of Research Supporting Illinois-Indiana Sea Grant Outreach to End Users*

In 2003, Illinois-Indiana Sea Grant entered into a partnership with the U.S. EPA GLNPO and USDA, CSREES to establish an outreach specialist in GLNPO in Chicago. This Great Lakes ecosystem extension specialist is responsible for helping clients access U.S. EPA research and monitoring results to improve the quality of the Great Lakes. In her first eight months, this specialist developed products that distill the extensive indicator data used to assess the state of the Great Lakes ecosystem into short publications that answer the questions: 1) Can I eat the fish? 2) Can I drink the water? and 3) Can I swim in the water? These messages report the current condition of the lake and likely trends, and are now being distributed to agencies and elected officials around the Great Lakes in the U.S. and Canada, putting critical information into the hands of those in a position to improve the quality of the Great Lakes ecosystem. In addition, a 10-year Lake Michigan mass balance study is being completed. This complex model and modeling results are now being packaged and will be delivered to state officials in all states surrounding Lake Michigan in early 2004.

### *Communications*

The communications unit works closely with IISG subject-matter specialists to develop publications and other products that proactively respond to client needs. Communications staff also responds to requests for information from diverse audiences, from classroom teachers to research scientists, and from fish farmers to regional planners.

Communications specialists use their skills in product development, packaging, and marketing to further the IISG mission. These efforts improve efficiency and quality of production and distribution; increase public awareness through media efforts; increase usage of IISG materials; and increase IISG responsiveness to audience needs.

Through implementation of the IISG marketing plan for the Biological Resources thematic area, over 10,000 teachers and at least 5,000 water resource

managers and recreational water users have access to helpful information on introductions, impacts, and control measures for aquatic invasive species. IISG promoted fact sheets on: zebra mussels, which were sent to DNR fishing managers, lake managers and boaters; ballast water invasions, which were sent to port authorities; and invasive aquatic plants, which were sent to horticultural and professional nursery associations, plant societies, and to Extension Service Master Gardeners. A flier on the new CD-Rom *Exotics to Go!* was distributed via the Web and through individual mailings to water resource managers and educators.

*University of Illinois in the Home*, an insert in the *Chicago Tribune*, provided Illinois-Indiana Sea Grant an opportunity to inform 100,000 newspaper subscribers that the region faces the threat of water shortages in the coming years. In addition, the publication included an article referring readers to the Sea Grant Web site for more information on a range of water-related topics.

*The Illinois Steward*, an award-winning magazine of the University of Illinois, published several articles written by Sea Grant communications staff. “Youth on the Illinois River: Stewardship Experiences that Last a Lifetime” and “Building Barriers to Invasive Species” were featured in an issue focused on the Illinois River. *The Illinois Steward* is an educational outreach publication that reaches 3,000 readers; it strives to increase awareness and respect for the natural world and to foster the responsible use and preservation of the natural resources.

*What is Wrong With This Picture?* is a new IISG exhibit that highlights the human pathways through which aquatic exotics can be introduced into new waterbodies. It is a game in which players try to identify seven human activities that can spread exotics. This cartoon-oriented exhibit has been extremely well received at several shows in the two states, engaging both young and old alike.

The Sea Grant *Water Wheel* is another new exhibit designed to inform young and old alike about a variety of water-related issues. To play the game, participants spin the wheel, which stops on one of six categories. These have included aquaculture, drinking water, beaches, pollution, exotic species, and fish



advisories. A participant then fishes for a multiple-choice question from the appropriate color-coded bucket and chooses an answer; then finds out whether it is correct. This game was played by thousands at U of I College of ACES Open House, the Farm Progress Show, and at the Indiana State Fair where it was displayed for several weeks.

Three radio messages developed by Illinois-Indiana Sea Grant won an Agricultural Communicators in Education (ACE) Gold Award in the class Audio Spot Production. The judge commented, “Anyone who listens to these spots will pay close attention to them and I believe also log onto the Web site you referred them to.” The radio spots also earned an Outstanding Professional Skill Award. Sea Grant’s entry was selected as the “best of the best” among all gold winners from each class in the category Electronic Media: Audio. Two of these radio messages were broadcast on WLS-AM, a major Chicago area station in 2002, to raise awareness about *E. coli* outbreaks at the beach, and the potential for water shortages in the region. WGN, the top-rated AM radio station in Chicago, featured a third message about the impact of invasive species, on its popular show “The Great Outdoors,” which has a target audience of anglers and boaters.

ACE also honored *Arrest That Invader!* with a Bronze Award in the class Educational Project, Non-credit. This display was created in 2002 to teach people of all ages about the impacts of invasive aquatic plants. The judge noted, “This project, in its simple directness, addressed all elements of good educational design eloquently and merits an award. This project is a model of how designing by objective should be done. Superb!”

## EDUCATION

### ***Zebra Mussel Mania Traveling Trunk***

The Zebra Mussel Mania Traveling Trunk Project continues to receive high praise from educators who use it to teach about aquatic exotic species and their impacts. Eight additional sites have been added to the National Lending Network, creating a total of 38 sites in the U.S. and Canada. In 2003, this project has offered curriculum to over 86 teachers who have educated 2,580 students about zebra mussel biology, spread, impact, and people's role in the spread and control of this species.

### ***ESCAPE from Exotics: Break Out of your Classroom Routine and Explore the World of Exotic Aquatics***

The Exotic Species Day Camp project compendium of 36 teacher-developed lesson plans, titled *ESCAPE*, has been distributed nationally reaching 200 teachers and non-formal educators. IISG developed a teacher-to-teacher mentoring project to infuse Sea Grant educational materials into more schools. Twenty



teachers in Illinois and Indiana have formed teams to integrate *ESCAPE* into their current biology, environmental

science, and ecology curricula. By using exotic species as a continuing theme, these schools or districts are providing a more cohesive education program, from the elementary through the high school level.

Through the *Mentoring with ESCAPE Project*, IISG is reaching out to underserved teacher groups such as pre-service, urban, and novice teachers. At the 2003 Hoosier Science Teacher Association Conference in a half-day workshop, 26 teachers collaborated with Sea Grant education staff. Using *ESCAPE* curriculum, attendees learned about ANS through four themes: species introduction, survival, impact, and solutions.

### ***Exotic Aquatics on the Move***

An extensive marketing campaign was conducted to promote the use of IISG education products, including classroom activities in *ESCAPE* and *Exotic Aquatics on the Move*, along with the *Community Stewardship Guide on Exotic Aquatic Activities*. This campaign targeted thousands of classroom and non-formal

educators using announcements created for teacher Web sites, newsletters, and e-mail listservs. Since its inception, 200 teachers have now been trained to teach activities from the *Exotic Aquatics on the Move* project, many of whom have requested the 22 lessons, which are offered on a CD, as an important tool to help them meet national geography education standards.

## RESEARCH-OUTREACH LINKAGE

The formal procedure instituted in spring 2000 to integrate research with outreach activities was continued during this reporting period. Extension specialists provide input in the development of program RFPs and input and analysis on the compatibility of pre-proposals with thematic area objectives and potential for impact. After projects are selected, extension specialists and the media specialist meet with researcher(s), the research coordinator, and the associate director prior to project initiation to identify outreach actions that will foster positive impacts. The extension specialist contacts researchers quarterly to stay abreast of progress and ongoing results and relays this information to the program administration. The media specialist initiates a press releases or public information activities at the appropriate time.

A closer working relationship with researchers enables outreach personnel to include researchers into workshops, conferences, and events. This coordinated research and outreach approach focuses on impacts from the beginning and ensures that outreach efforts are targeted towards programming that will help clients derive benefits from the research. This same process has been implemented for all projects beginning in March 2002 and for all new projects funded through NSIs. In addition, all new research proposals beginning in FY 2000 are required to identify how research results can connect to clients.

As a result of this process, the IISG Research Symposium will be held in 2004 in Chicago. This symposium brings Illinois-Indiana Sea Grant researchers together with agency officials, university administrators, and the media. Research results will be presented and a proceedings produced.

## RESEARCH

Research projects in Aquaculture, Biological Resources, and Water Quality were conducted in FY 2003. Funding through omnibus, development funds, and National Strategic Initiatives has supported research on variety of issues important to the environmental health and economic success of the southern Lake Michigan region.

### ***Aquaculture: Biotechnology***

Paul Collodi (R/A-03-01) has explored ways to improve Midwest aquaculture by developing gene transfer and targeting technology to manipulate genetic characteristics of fish and enhance aquaculture production. To develop this technology, the fish aromatase gene was targeted for inactivation. During the first year of this project, zebrafish embryonic stem (ES) cell lines were derived. During this second year, electroporation conditions for the introduction of vector DNA into the cells were optimized and methods were developed for isolating colonies of homologous recombinants. The zebrafish ES cell lines established from this work are the first germ-line competent ES cell cultures available from any fish species. The ES cell lines, along with the methods developed for targeting mutations in the cells, will be valuable tools in manipulating the zebrafish genome.

The gene targeting methods developed from this work may be applied to other species of fish to improve aquaculture production, enhance disease resistance, or control fertility for the purpose of biological containment. Collodi is currently working to use the ES cell lines along with the in-vitro methods they developed to isolate colonies of homologous recombinants to target mutations to the zebrafish aromatase genes and generate a knockout line of fish.

### ***Biological Resources: Invasive Species***

Bighead and silver carp, large filter-feeding fishes originally from Asia, are moving upstream in the Illinois River and are now threatening the Great Lakes ecosystem. Mark Pegg and John Chick (A/SE ANS 01-01) of INHS are exploring the efficacy of various methods for stopping the spread of Asian Carp. These fish grow rapidly and can attain sizes well over 25 kg so concerns are that both species may limit food resources for many other fish species. Both bighead and silver carp consume microscopic organisms found

in the water (plankton) that are also an important and necessary food source for several species of adult fishes native to the Great Lakes (i.e. whitefish). An electric fish barrier, built in the Chicago Sanitary and Ship Canal near Romeoville, Illinois, may help to check the upstream migration of bighead and silver carp.

The researchers' goals are to evaluate the efficacy of this existing electric barrier, in addition to testing other potential barrier types, using controlled experiments. They tested an electric barrier with similar operating parameters to the fish dispersion barrier near Romeoville, Illinois, an experimental sound-bubble barrier, and a barrier that incorporates the electric and sound-bubble technologies. The electric barrier suite of trials proved effective at stopping bighead carp with no fish



Mark Pegg

successfully moving through the barrier. Two separate experiments were conducted with the sound-bubble barrier. The first experiment used a relatively low-frequency range and had a 57 percent successful repel rate; whereas, the second experiment used a wider range of frequencies and had a 95 percent successful repel rate. The final experiment integrated both barrier types. While some fish did initially successfully move through the barrier, this only occurred within about the first hour of each trial suggesting that there may be other factors that influenced this response. Though the findings were somewhat mixed, they generally indicate that both barrier types, in addition to being used in tandem, can be effective in restricting the movement of bighead and silver carp under the proper conditions. However, considerable work remains to refine each barrier type settings to ensure the highest effectiveness and also to evaluate all barrier types on individuals smaller than 250 mm.

These experiments to evaluate how bighead carp and silver carp respond to electric barriers are highly relevant given that the main purpose of the active Chicago Sanitary and Shipping Canal electric barrier was to block colonization of the benthic round goby

(*Neogobius melanstomus*), rather than bighead and silver carp. These experiments are proving valuable in providing information on how bighead and/or silver carp may react to similarly constructed fish behavior structures like electric or acoustic-bubble barriers in the environment. There is an immediate need to stop these two species from entering the Great Lakes and these experiments have been able to provide relatively swift and direct insight into what will or will not be feasible. The researchers have also been able to identify a baseline of effective barrier technologies that can be used to stop the range expansion of these invasive carp species into the Great Lakes and other ecosystems. Additionally, they have been able to provide Smith-Root Inc. and Fish Guidance Systems, Ltd. feedback on barrier operation issues, species specific designs, and also to assist in developing a barrier that will be most effective at stopping Asian carp.

Research conducted by David Lodge's team (R/ES-05-01) at the University of Notre Dame provides information on how the trade in live aquatic plants and animals may be contributing to the introduction and spread of harmful alien species in the southern basin of Lake Michigan. Lodge is determining which species available for purchase may be capable of surviving in the region. These species come from the bait, pet, water garden, and biological supply trades. After purchasing plants, the researchers removed and counted animals (e.g. snails) that were attached to the plants. The transport of species in this manner may pose a significant risk of introducing new invaders. Lodge has found that there are many known economically and environmentally damaging plant and animal species being distributed through the trades. Many other species that are highly likely to be harmful are also available for purchase. The spread of known animal and plant invaders pose the greatest risk, but of more concern is the risk of invasions not known to be established yet.

A statistical risk assessment for aquatic invasive plants in the Great Lakes region will allow state agencies to identify species likely to be invasive before they are introduced. By restricting sale and transport of these species, significant future economic and environmental costs will be avoided. The researchers can determine how the risk of introduction depends on the type of plants purchased

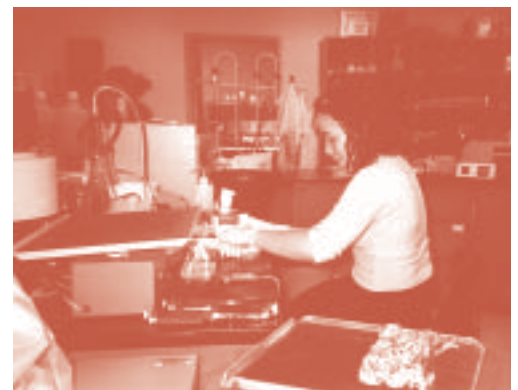
and the point of purchase. These results will be used to establish best practice guidelines for the industries with respect to collection, decontamination, and shipping procedures. Information and advice from industry leaders and representatives from the biological supplies, pet, water garden, and bait trades are being incorporated into the production, and distribution of educational literature to vendors of live aquatic organisms in the southern Lake Michigan basin.

### **Water Quality: Bacteria**

High levels of *E. coli* near beaches and in rivers signify the possible contamination of pathogenic bacteria, which may pose a threat to public health. Each summer, numerous beach closures are due to high *E. coli* counts. In research funded through a National Strategic Initiatives project, investigators Charles Tseng and Evert Ting (R/PS-01-00) developed DNA "fingerprinting" techniques that can identify the sources of *E. coli* bacteria (the human or animal species that hosts them). Specifically, they have been evaluating and determining a suitable restriction enzyme for generating *E. coli* ribotypes that correlate with host species, and establishing a functional ribotype library for bacterial source tracking. In addition, they are conducting field studies for tracking the source of *E. coli* contamination.

*E. coli* isolates from humans and animals were ribotyped using the automated RiboPrinter Microbial Characterization System (DuPont-Qualicon). The main objective was to determine the applicability of this automated ribotyping system for tracking the source of *E. coli* contamination. A library of DNA fingerprints could be accessed by researchers and public health agencies to detect and mitigate for sources of bacterial contamination of public beaches. Over 500

*E. coli* isolates from human and nonhumans have been constructed to build such a library. The library also includes



fingerprints of more than 50 environmental *E. coli* isolates from beach sand and lake water.

Tseng and Ting have now established a database of *E. coli* ribotypes from humans and animals.

Environmental agencies can use this information to manage for reducing water pollution problems. The database has been used for two projects on field applications: 1) tracking the source of *E. coli* contamination in Illinois Lake Country beaches and ravines, and 2) tracking the source of *E. coli* contamination in Turkey Creek, Oklahoma.

### ***Water Quality: Chemical Contaminants***

Many wetland areas of the southern Lake Michigan region contain elevated concentrations of a number of metals such as zinc and lead, resulting from the disposal of steel mill slag that was often used to fill in low-lying, marshy land. Atmospheric deposition and industrial activity have also contributed to increases in the ambient concentrations of metals in this region. Since many of these elements can be toxic to plants and animals, even in very small amounts, they pose a potentially significant threat to the healthy functioning of the wetland ecosystem.

The primary objective of researcher Jean-Francois Gaillard (R/PS-01-01) is to determine the chemical forms (chemical speciation) under which metals are present in wetland sediments and plants. In contrast to the conventional chemical extraction procedures used to determine this chemical speciation, this research will develop direct speciation methods based on the use of a spectroscopic method using x-rays generated at a synchrotron source. Gaillard has compared the results of conventional wet extraction methods, such as the Tessier and the BCR sequential extraction methods, to a direct speciation method based on the use of x-ray absorption spectroscopy (XAS). The advantage of this approach is to reduce problems associated with experimental artifacts created during conventional extraction procedures.

Results show that these wet chemical extraction methods, which target specific metal phases, can lead to significant biases in metal speciation. The primary problem of these two methods is related to the early dissolution of metal sulfides that can be construed as metal adsorbed to either iron or manganese oxides. During this past year Gaillard has also tested the use

of a polycapillary optic to focus the incoming x-ray beam to small spots in order to map the distribution and chemical speciation of metals at the micro-scale. In the case of highly contaminated sediments, excellent results have been obtained for mapping the distribution of elements directly as well as obtaining good quality data to perform spatially-resolved spectroscopic measurements.

In a complementary project, Robert Hudson (R/PS-0201) at the University of Illinois is conducting research on mercury availability as it relates to management implications. Managing mercury pollution in watersheds depends on being able to quantify (model) the relationship of mercury loads and levels of contaminants to rates of mercury methylation and demethylation. At present, there is no model capable of doing so without calibration to each site being investigated.

In making decisions about how to remediate contaminated brownfield sites and sediments, local data concerning the long-term fate and transport of the hazardous materials are needed, i.e., whether it is best to leave them in place, to seal them from surface exposure to immobilize them, or to remove contaminated materials. In cases of mercury contamination, the production of methylmercury (methylation), its release to nearby waterbodies, and its subsequent bioaccumulation in food webs are the prime concerns. It is important to know whether mercury-laden sediments, like those found near old metal smelters in the Grand Calumet basin or in contaminated sediments at the mouths or rivers draining to the Great Lakes, provide a significantly larger source of methylmercury than do sediments with more moderate mercury loads. Such information would help determine what kind of remediation will be most effective and the extent of clean up needed.

The primary benefits from this project are the development of 1) a new analytical method for measuring both the inorganic mercury and methylated forms of mercury at the ultra-trace levels (parts per trillion) found in the environment and 2) new methods of preparing samples of water, sediment, and biota that permit the use of the new method to analyze their methylmercury content. When completed and disseminated, the new methods will significantly reduce the costs of analyzing environmental samples

for inorganic mercury and methylmercury. This will permit better characterization of contaminated sites so that appropriate remediation strategies can be devised. It will also permit natural resource agencies to afford greater numbers of analyses when surveying polluted systems so that contaminated areas are more likely to be found. Finally, these data and model improvements can be used in calibrating watershed-scale management models used for the development of Total Maximum Daily Loads and Remedial Action Plans being developed for the Grand Calumet watershed.



<u>Principal Investigator</u>	<u>Co-PI</u>	<u>Title of Project</u>	<u>Agency/Source</u>	<u>Start Date</u>	<u>End Date</u>	<u>Amount</u>
<b>Illinois-Indiana Sea Grant Funded Researchers:</b>						
Chick, John H.		An Evaluation of Barriers For Preventing the Spread Of Bighead Carp in the Great Lakes	National Sea Grant College Program	2002	2004	\$101,543
Chick, John H.		An Evaluation of Acoustic/Bubble Barriers for Preventing The Spread of Asian Carp to The Great Lakes	International Joint Commission	10/01/02	01/31/03	\$10,000
Chick, John H.		Movement and Dispersion Of Juvenile Asian Carp and Round Gobies	US EPA	01/01/03	12/31/04	\$56,000
Collodi, Paul		Fish Embryo Cell Cultures for Targeted Gene Inactivation	USDA	12/15/01	12/31/03	\$150,000
Collodi, Paul	N. Bols	Zebrafish ES Cell Lines for Targeted Mutagenesis	NIH	07/01/03	06/30/06	\$975,000
Epifanio, John		Lake Michigan Fisheries Outreach Enhancement	Illinois-Indiana Sea Grant	01/01/02	02/28/04	\$15,000
Epifanio, John		Great Lakes Network Regional Fisheries Extension Enhancement	Illinois-Indiana Sea Grant	01/01/02	02/28/04	\$13,000
Gunderson, J.	Patrice Charlebois M. Klepinger J. Schwartz D. Jensen R. Kinunmen E. Obert F. Snyder R. Pitman	Aquatic Nuisance Species: A National ANS-HACCP Training Initiative to Prevent the Spread of Aquatic Nuisance Species in Baitfish for Stocking	National Sea Grant	10/01/01	09/30/03	\$148,245
Jensen, D.	Patrice Charlebois Robin Goettel M. Meyers J. Starinchak D. Lodge R. Sanders W. Rendall M. Conlin S. Curcio M. Klepinger F. Lichtkoppler	A National ANS Outreach Campaign for the Aquarium Industry and Hobbyist Consumers: A Collaborative Effort Involving the Pet Industry Joint Council, the U.S. Fish and Wildlife Service and the Great Lakes Sea Grant Network	National Sea Grant	06/01/03	07/31/05	\$300,000
Lodge, David	R. Warner	National Sea Grant College Program: Aquatic Nuisance Species Outreach Program	National Sea Grant	06/01/03	05/31/05	\$149,973
Gary Lamberti	D. Lodge	Ecological Forecasting and Risk Analysis of Nonindigenous Species: Strategic Optimization Using a Bio-economic Approach	NSF-IRCEB	06/01/02	05/31/07	\$2,989,645
Padilla, D.K.		Metapopulation Dynamics And Control of the Zebra Mussel in Freshwater and Estuarine Systems: The Effects of Hydrodynamics, Larval Supply, and Embayments	National Sea Grant	2002	2003	\$294,647

*Extramural Funds . . . continued*

<u>Principal Investigator</u>	<u>Co-PI</u>	<u>Title of Project</u>	<u>Agency/Source</u>	<u>Start Date</u>	<u>End Date</u>	<u>Amount</u>
Ting, W.T.E.		Tracking the Source of <i>E. coli</i> Contamination in Four Lake County Beaches and Two Ravines by Ribotyping	Lake County Department of Health, Illinois	01/01/02	04/30/03	\$26,000
Ting, W.T.E.		Ribotyping for Tracking the Potential Sources of <i>E. coli</i> in Turkey Creek, Oklahoma	USGS	01/01/02	09/30/03	\$30,000
Turco, Ron	Leslie Dorworth L.S. Lee P.S.C. Rao A.E. Konopka M. Bischoff T. Filley L. Nies C. Jafvert F. Whitford	Contaminant Remediation Optimization Program	Environmental Protection Agency	11/15/02	03/31/04	\$500,000
<b>Illinois-Indiana Sea Grant Staff:</b>						
Charlebois, Patrice		Augmentation of ANS Outreach activities in Illinois	Illinois Department of Natural Resources	07/01/02	06/30/03	\$10,000
Charlebois, Patrice		Illinois State Comprehensive Management Plan for Aquatic Nuisance Species	Illinois Department of Natural Resources	04/01/01	03/31/04	\$6,000
Charlebois, Patrice	R. Warner	National Sea Grant College Program: Aquatic Nuisance Species Outreach Program	National Sea Grant	06/01/03	05/31/05	\$13,138
Dorworth, Leslie	S. Wilmore E. Szarletta	Developing Indiana's Lake Michigan Beach Program	Indiana Department of Environmental Management	09/15/02	09/30/04	\$58,694
Einstein, Mark		NCRAC Extension Project	Michigan State University/USDA	09/01/02	08/31/03	\$5,500
Einstein, Mark		NCRAC Extension Project	Michigan State University/USDA	09/01/03	08/31/04	\$5,500
Goettel, Robin	R. Fortner H. Domske M. Zhuikov M. Klepinger A. Danielski	ESCAPE from Exotics: Break Out of Your Classroom Routine by Exploring the Interesting World of Exotic Aquatic Species	NOAA/Sea Grant	01/01/03	12/31/03	\$31,065
Goettel, Robin		Sea Grant Extension and Communications Activities	University of Illinois Extension	10/01/02	09/30/03	\$5,000
Goettel, Robin		Sea Grant Extension and Communications Activities	University of Illinois Extension	10/01/03	09/30/04	\$5,000
Goettel, Robin	R. Warner	National Sea Grant College Program: Aquatic Nuisance Species Outreach Program	National Sea Grant	06/01/03	05/31/05	\$31,090
Warner, Richard	Phil Mankin	Management of Conservation Buffers for Upland Wildlife in Illinois	IDNR - FWS	07/01/02	06/30/03	\$125,000
Warner, Richard	Phil Mankin	Management of Conservation Buffers for Upland Wildlife in Illinois	IDNR - FWS	07/01/03	06/30/04	\$176,400

*Extramural Funds . . . continued*

<u>Principal Investigator</u>	<u>Co-PI</u>	<u>Title of Project</u>	<u>Agency/Source</u>	<u>Start Date</u>	<u>End Date</u>	<u>Amount</u>
Warner, Richard		FY2003 Water Resources Institute Annual 104(b) Base Program	USGS – Dept. of Commerce	03/01/03	02/29/04	\$84,000
Warner, Richard		USGS and National Institutes for Water Resources Intern Program	USGS – Dept. of Commerce	03/01/03	02/28/06	\$145,395
Warner, Richard		Intergovernmental Agreement	Illinois Dept. of Natural Resources	07/01/02	12/31/03	\$60,000
Warner, Richard	K. Smothers K. Braden	Midwest Technology Assistance Center (MTAC) for Small Public Water Systems	US Environmental Protection Agency	07/15/01	01/31/06	\$1,455,974
Warner, Richard		Research and Publication of Book, “Creating Habitats and Homes for Illinois Wildlife”	Illinois Dept. of Natural Resources	07/01/02	09/30/03	\$24,826

# *Program Awards*

JANUARY 1 - DECEMBER 31, 2003

<u>Awardee</u>	<u>Co-Awardee</u>	<u>Date</u>	<u>Award Name</u>	<u>Awarding Organization</u>
Charlebois, Patrice	M. Zhuikov	04/01/03	National Sea Grant Blue Ribbon Award	Sea Grant Week 2003
Goettel, Robin		04/16/03	Bronze Award for Educational Project, Non-credit; Awarded To "Arrest that Invader! Education Project"	Agricultural Communicators in Education
Miles, Irene	Brian Miller R. Atterberry T. Gleason	03/27/03	Gold Award for Audio Spot Production	Agricultural Communicators in Education
Miles, Irene	Brian Miller R. Atterberry T. Gleason	05/12/03	Outstanding Professional Skill Award for Electronic Media: Audio	Agricultural Communicators in Education
TePas, Kristin	Charlebois, Patrice J. Gunderson M. Klepinger R. Kinnunen F. Snyder D. Jensen E. Obert S. Curcio	06/11/03	Outstanding Program Award	Great Lakes Sea Grant Network Leader Award

<u>Project Number</u>	<u>Title</u>	<u>Investigator</u>	<u>Affiliation</u>
<u>Completed During this Omnibus Cycle</u>			
(F/C 643-1145-1741)	The Fiscal Impact of Development in a Combined Fiscal-Environment for Indiana Local Officials	Larry DeBoer	Purdue University
A/SE(ANS)-01-01	Aquatic Nuisance Species – A National HACCP Training Initiative to Prevent the Spread of Aquatic Nuisance Species in Baitfish and Fish for Stocking	Patrice Charlebois	Illinois Natural History Survey
A/SE(ANS)-06-01	ESCAPE from Exotics: Break out of your classroom routine by exploring the interesting world of exotic aquatic species	Robin Goettel	University of Illinois
R/CF-02-99	Influence of Upwelling Events on Larval and Juvenile Yellow Perch	John Janssen	University of Wisconsin-Milwaukee
<u>Ongoing at Time of Omnibus Submission</u>			
A/SE(ANS)-01-03	Implementation of a National Outreach Strategy for the Pet/Aquarium Industry	Patrice Charlebois	Illinois Natural History Survey
A/SE(ANS)-08-01	Transferring Sea Grant Research and Outreach Results to the Nation Using a World Wide Web Server	Brian Miller	Purdue University
R/A-01-02	Modeling the Inactivation of <i>Vibrio parahaemolyticus</i> in Oysters by High Pressure Processing	Peter Slade	Illinois Institute of Technology
R/A-03-01	Targeted Inactivation of the Fish Aromatase Gene	Paul Collodi	Purdue University
R/ANS-01-03	Evaluating the Ecological and Economic Value of the 100th Meridian Initiative	David Lodge	University of Notre Dame
R/ANS-02-02	Metapopulation Dynamics and Control of the Zebra Mussel in Freshwater and Estuarine Systems: The Effects of Hydrodynamics, Larval Supply, and Embayments (Thru NY)	Christopher Rehmann	University of Illinois
R/ANS-03-02	An Evaluation of Barriers for Preventing the Spread of Bighead and Silver Carp to the Great Lakes	Mark Pegg	Illinois Natural History Survey
R/CMB-27	Effects of Invasive Invertebrate Predators on The Food Webs of the Great Lakes	Carla Caceres	University of Illinois
R/ES-04-01	Bighead Carp in the Upper Mississippi River: Competition with Native Filter-Feeding Fishes and Potential Threats to the Great Lakes	John Chick	Illinois Natural History Survey
R/ES-05-01	Quantifying Pathways of Nonindigenous Aquatic Species	David Lodge	University of Notre Dame

**Universities**

Kentucky State University  
Aquaculture Research Program  
Loyola University  
Department of Biology  
Northwestern University  
Department of Civil Engineering  
Purdue University  
Animal Disease Diagnostic Laboratory  
Environmental Sciences and Engineering Institute  
School of Agriculture  
Agricultural Communications Service  
Agricultural Research Programs  
Cooperative Extension Service  
Department of Agricultural Economics  
Department of Animal Sciences  
Department of Food Science  
Department of Forestry and Natural Resources  
Purdue University Calumet  
School of Engineering, Mathematics & Science  
Purdue University North Central  
Department of Biological Sciences  
University of Georgia  
Savannah River Ecology Laboratory  
University of Illinois at Chicago  
College of Urban Planning and Public Affairs  
Institute of Environmental Science and Policy  
The Great Cities Institute  
University of Illinois at Urbana-Champaign  
Department of Animal Biology  
Department of Civil and Environmental Engineering  
Department of Urban and Regional Planning  
Environmental Council  
School of Agriculture, Consumer, Environmental Sciences  
Agricultural Experiment Station  
Cooperative Extension Service  
Department of Natural Resources and Environmental Sciences  
Information Technology and Communications Services  
Water Resources Research Center  
University of Minnesota-Duluth  
National Resources Research Institute  
University of Notre Dame  
Center for Environmental Science and Technology  
Department of Biological Sciences  
University of Wisconsin-Madison  
Aquaculture Program  
University of Wisconsin-Milwaukee  
Great Lakes WATER Institute

**State and Federal Agencies**

Cook County Forest Preserve  
Great Lakes Commission  
Great Lakes Fisheries Commission  
Great Lakes Panel on Aquatic Nuisance Species  
Illinois Department of Natural Resources  
Division of Education  
Office of Resource Conservation  
Illinois Environmental Management  
Illinois International Port District  
Illinois Natural History Survey  
Indiana Department of Environmental Management

Indiana Department of Natural Resources  
Division of Water  
Fish and Wildlife  
Indiana Dunes National Lakeshore  
Indiana Dunes State Park  
Indiana Land Resources Council  
Inter-Agency Fish Advisory Council  
International Joint Commission  
Lake County Health Department  
National Oceanic and Atmospheric Administration  
Natural Resources Conservation Service  
Ocean and Atmospheric Research  
Soil and Water Conservation Districts  
South Carolina Department of Natural Resources  
U.S. Army Corps of Engineers, Chicago District  
U.S. Environmental Protection Agency  
Great Lakes National Program Office  
Region 5 - Lake Michigan  
U.S. Fish and Wildlife Service  
Department of the Interior  
U.S. Geological Survey  
Biological Resources Division  
United States Coast Guard  
Wisconsin Department of Natural Resources

**Sea Grant Institutions**

Connecticut Sea Grant College Program  
Florida Sea Grant College Program  
Great Lakes Sea Grant Program Network (GLSGN)  
Hawaii Sea Grant College Program  
Louisiana Sea Grant College Program  
Michigan Sea Grant College Program  
Minnesota Sea Grant College Program  
Mississippi-Alabama Sea Grant College Program  
National Sea Grant College Program (NSGCP)  
New York Sea Grant College Program  
North Carolina Sea Grant College Program  
Ohio Sea Grant College Program  
Pennsylvania Sea Grant College Program  
Sea Grant Association (SGA)  
Washington Sea Grant College Program  
Wisconsin Sea Grant College Program

**Partnerships**

Aquaculture Information and Technology Task Force of the Joint Subcommittee on Aquaculture  
Chicago Academy of Sciences  
Chicago Botanic Gardens  
Chicago Wilderness Consortium  
Cooperative Extension Service  
Hendrick's County Planning with POWER Advisory Committee  
Illinois Aquaculture Association  
Indiana Aquaculture Industry Association  
Inter-Agency Technical Task Force on E. coli  
John G. Shedd Aquarium  
NASAC: National Association of State Aquaculture Coordinators  
NCRAC: USDA North Central Regional Aquaculture Center  
World Aquaculture

**Publications Developed by Illinois-Indiana Sea Grant Staff****Biological Resources**Brochures

TePas, K.M., S. White, and P.M. Charlebois. Invaders in Our Waters page and cover page in 2004 Illinois Fishing Information booklet.

Fact Sheets

Editors: Goettel, Robin, Irene Miles. Poster and Brochure designer—Susan White. Co-Authors: Susan White, Stephen Wittman, Karen Ricker, Paul Focazio, Eric Obert, Elizabeth LaPorte, Marie Zhuikov. Title: Research on Native and Invasive Species in the Great Lakes Region—Selected Projects from the Great Lakes Sea Grant Network.

Goettel, Robin, Jennifer Fackler, Patrice Charlebois, Kristin TePas, Susan White. Great Lakes Invasions, Newspapers in Education Teacher Supplement (Chicago Tribune). Designer—Susan White.

Media Coverage

Goettel, Robin. NOAA. Coastlines, “Teachers ESCAPE,” volume 32, number 1, Summer 2003.

Goettel, Robin. National Wildlife Refuge Association-Web Links, “Illinois-Indiana Sea Grant Program,” <http://www.refugenet.org>, April 30, 2003.

Goettel, Robin. The Great Lakes Schoolship Inland Seas Education Association Web Site, “ESCAPE,” <http://www.greatlakeseducation.org/invasivespecies/resources.shtml>, April 30, 2003.

Goettel, Robin. Invasivespecies.gov Web Site, “ESCAPE,” “Exotic Species Day Camp,” “Zebra Mussels: Lessons Learned in the Great Lakes Region,” <http://www.invasivespecies.gov/education/act.shtml>, April 30, 2003.

Goettel, Robin. American Society of Plant Biologists Web Site, “ESCAPE – Exotic Species Compendium of Activities to Protect the Ecosystem,” <http://www.aspb.org>, April 30, 2003.

Goettel, Robin. Listserv web site, “Exotic Aquatic Species and Environmental Education,” <http://listserv.state.in.us>, April 30, 2003.

Products

Charlebois, Patrice, Kristin TePas, Randi Grigoletti. Bighead and Silver Carp WATCH. ID card.

TePas, Kristin, Patrice Charlebois, Susan White. Stop Aquatic Hitchhikers. Advertisement on Illinois boat registration mailers. Envelope.

TePas, Kristin. Illinois ANS Program postcard advertising program web site. Postcard.

Publications

Goettel, Robin. 2003. The Chicago Tribune “News In Education” Curriculum Guide “The Great Lakes Invasion”. November 2003.

Goettel, Robin. 2003. The Helm, “ESCAPE Provides Ideal Tool for Mentoring Teachers,” Illinois-Indiana Sea Grant. Summer 2003.

**Great Lakes Ecosystem**Fact Sheets

Beardsley, K.E. “Lake Michigan Mass Balance Study: Atrazine Data Report Highlights”. Fact Sheet, distributed with Meeting Invitations.

Beardsley, K.E., R. Lawson, and S. Glutting. “Great Lakes Coastal Wetlands Consortium Fact Sheet”. Fact Sheet for upcoming state meetings.

Beardsley; K.E., P. Horvatin, P. Bertram, H. Shear, H. Leadlay, E. Clark, and C. Forst. “State of the Great Lakes Fact Sheet Series”. Folder and Fact Sheet Series. EPA 905-F-03-001.

Products

Beardsley, K.E. and L. Jacobs. “R/V Lake Guardian Position Report”. Daily fact sheet reporting on location of GLNPO’s research vessel, the survey underway, survey objectives, sampling and sampling progress.

**Marketing**Brochures

Merrifield, Lisa, Phil Mankin, and Susan White. Designer—Susan White. Illinois-Indiana Sea Grant Graduate Fellowships. Felkner, Charles and Susan White. Indiana Aquaculture Fall Meeting in Indianapolis, IN announcement/agenda brochure. A New Look at Indiana Aquaculture.

Merrifield, Lisa, Susan White, and Robin Goettel. Designer—Susan White. Find research funding through Illinois-Indiana Sea Grant College Program.

## **Water Quality**

### Brochure

Dorworth, Leslie. River Restoration: Practices and Concepts Series. Beyond the basics of dam removal and modification workshop. IISG-03-05.

### Conference Notes

Dorworth, Leslie and D. Trgovcich-Zacok (Eds.). River Restoration: Practices and Concepts Series. Beyond the basics of dam removal and modification workshop. IISG-03-05.

### Extended Abstracts

Dorworth, Leslie. 2003. Developing Indiana's Lake Michigan Beach Program. Coastal Zone 03.

### Fact Sheets

Beardsley, K.E., P. Horvatin, P. Bertram, H. Shear, H. Leadlay, E. Clark, and C. Forst. "State of the Great Lakes Fact Sheet Series". Folder and Fact Sheet Series. EPA 905-F-03-001.

Dorworth, Leslie. Brownfields: Barriers to Redevelopment IISG-03-11.

Dorworth, Leslie. Understanding Why Some Organic Contaminants Pose a Health Risk. IISG-03-08.

Dorworth, Leslie. Understanding Contaminated Sediments: Bioavailability of Contamination. IISG-03-09.

Dorworth, Leslie. The Rural Brownfield: Community Threats and Risk Reduction Approaches. IISG-03-10.

Dorworth, Leslie, C. Santerre, and Brian Miller. 2003. Contaminants in fish and seafood. IISG-03-01.

### Website

Dorworth, Leslie. Indiana's Lake Michigan Beaches (iisgcp.org).

## **Publications Developed by Illinois-Indiana Sea Grant-Funded Researchers**

### Abstracts

Bauer, C.R., and G.A. Lamberti. 2003. Interactions of Great Lakes yellow perch with three benthic invaders: zebra mussels, round gobies, and Eurasian ruffe. North American Benthological Society. Athens, GA, May 26-31.

Stoeckel, J.A., C.R. Rehmann, D.W. Schneider, and D.K. Padilla. 2003. Supply of zebra mussel larvae in large river systems: role of a run-of-the-river reservoir. North American Benthological Society Annual Meeting.

Ting, W.T.E., D.S. Johnson, A.M. Holler, K.T. Tran, and C.C. Tseng. 2003. A study of the sources of *E. coli* contamination at Marquette Park Beach by Random Amplified Polymorphic DNA typing. Abstr. Q414, p. 589 In Abstracts of the 103<sup>rd</sup> General Meeting of the American Society for Microbiology, Washington, DC.

### Articles

Carr, M.L., C.R. Rehmann, J.A. Stoeckel, D.K. Padilla, and D.W. Schneider. 2003. Measurements and consequences of retention in a side embayment in a tidal river. *Journal of Marine Systems*, accepted for publication.

Dean-Ross, Deborah. 2003. Use of PAH-Degrading Bacteria in Bioremediation of PAH-Contaminated Sediments. *Transactions of the Second International Symposium on Contaminated Sediments, 2003*. Pages 252-257.

Dettmers, J. and M.A. Pegg. 2003. Evaluating the Effectiveness of an Electric Barrier. *INHS Reports*. In press.

Fan, O., A. Alestrom, P. Alestrom, and P. Collodi. 2003. Development of cell cultures with competency for contributing to the zebrafish germ line. *Critical Reviews in Eukaryotic Gene Expression*. In press.

Lasrado, J.A., C.R. Santerre, J.L. Zajicek, J.R. Stahl, D.E. Tillett, and D.C. Deardorff. 2003. Determination of PCBs in fish tissue using enzyme-linked immunosorbent assay (ELISA). *Journal of Food Science* 68(1):133-136.

Rehmann, C.R., Stoeckel, J.A., and Schneider, D.W. 2003. Effect of turbulence on the mortality of zebra mussel veligers. *Canadian Journal of Zoology*, 81, 1063-1069.

Schneider, D.W., J.A. Stoeckel, C.R. Rehmann, K.D. Blodgett, R.E. Sparks, and D.K. Padilla. 2003. A developmental bottleneck in pelagic larvae: implications for spatial population dynamics. *Ecology Letters*, 6, 352-360.

Stoeckel, J.A., C.R. Rehmann, D.W. Schneider, and D.K. Padilla. 2003. Retention and supply of zebra mussel larvae in a large river system: importance of upstream lakes. Submitted to *Freshwater Biology*.

Taylor, r.M., M.A. Pegg, and J.H. Chick. 2003. Some observations on the effectiveness of two behavioral fish guidance systems for preventing the spread of bighead carp to the Great Lakes. *Aquatic Invaders* 14:1-5.

Tidewell, James H., Shawn D. Coyle, Leigh Anne Bright, Aaron Van Arnum, and David Yasharian. 2003. Effect of water temperature on growth, survival, and biochemical composition of largemouth bass *Micropterus salmoides*. *Journal of the World Aquaculture Society* 34(2):175-183.

Wan, P., C.R. Santerre, P.B. Brown, and D.C. Deardorff. 2003. Chlorpyrifos residues before and after cooking of catfish fillets. *Journal of Food Science* 68(1):12-15.



Book Chapters

Fan, L., A. Alestrom, P. Alestrom, and P. Collodi. 2003. Production of zebrafish germ line chimeras. In: (H. Schatten, ed). *Methods in Molecular Medicine*. Humana Press, USA. In press.

Invited Papers

Lamberti, G.A. 2003. Linkages among aquatic ecosystems: from bears to bacteria. Miami University of Ohio. Oxford, Ohio. June 10.

Rehmann, J.A. 2003. "Zebra Mussel Transport in Rivers," St. Anthony Falls Laboratory, Department of Civil and Environmental Engineering, University of Minnesota.

Rehmann, J.A. 2003. "Zebra Mussel Transport in Rivers," seminar in the Parsons Laboratory, Department of Civil and Environmental Engineering, Massachusetts Institute of Technology.

Rehmann, J.A. 2003. "Zebra Mussel Transport in Rivers," Department of Civil and Environmental Engineering, Georgia Institute of Technology.

Media Coverage

Lodge, D.M. Quoted in "Aliens on the shores," 2003 EMBO Reports 4(6):547-550.

Lodge, D.M. Quoted in news story in 2003 Science (301:157-158) on "Can well-timed jolts keep out unwanted exotic fish?"

Lodge, D.M. 2003. Biological Hazards Ahead. New York times op-ed, 19 June 2003, P. A27.

Pegg, Mark. Barrier Urged for Area River – Scientists Call Invasive Species a Major Threat. Chicago Tribune, Chicago, IL. 5/13/2003.

Posters

Lasrado, J.A., C.R. Santerre, J.R. Stahl, T. Holtemeyer, and D.C. Deardorff. A Rapid Method to Improve the Indiana Fish Consumption Advisory. Purdue Botanical Center Symposium, 02/27-28/2003. West Lafayette, IN.

Lasrado, J.A., C.R. Santerre, J.R. Stahl, T. Noltemeyer, and D.C. Deardorff. A Rapid Method to Improve the Indiana Fish Consumption Advisory. ESEI (The Environmental Sciences and Engineering Institute), Environmental Symposium, 04/11/03. Lafayette, IN.

Stone, S., T. Heil, A.L. Dahl, J.-F. Gaillard, and J.P.G. Quintana. Polycapillary Optics for Micro-XRF and Spatially Resolved XAS. Poster presentation at the last x-ray absorption spectroscopy meeting (SAFS-XII) in Lund, Sweden. 06/22-27/03.

Presentations

Keller, R. and D.M. Lodge. "The Trade In Live Aquatic Species: What Species Are Involved, What Risks Are Posed, and How Can These Risks Be Best Managed". Invited oral presentation in "Intentional Pathways of Invasive Species" symposium at American Fisheries Society Meeting, Quebec City, Canada. August 10-14, 2003.

Keller, R. and D.M. Lodge. "The Trade In Live Aquatic Species: What Species Are Involved, What Risks Are Posed, and How Can These Risks Be Best Managed". Invited oral presentation in "Prediction, Inventory and Monitoring" symposium at "Invasive Plants of The Upper Midwest" Meeting. Madison, Wisconsin, September 27, 2003.

Lasrado, J.A., C.R. Santerre, and J.R. Stahl. 2003. Analysis of Fish Consumption Advisories. Institute of Food Technologists, Chicago, IL. Paper #45K-13, Technical Poster Session.

Lasrado, J.A., C.R. Santerre, J.R. Stahl, T. Noltemeyer, and D.C. Deardorff. 2003. A Rapid Method to Improve the Indiana Fish Consumption Advisory. ESEI (The Environmental Sciences and Engineering Institute), Environmental Symposium, April 11, Lafayette, IN. (Graduate Paper Competition – First Place.)

Lasrado, J.A., C.R. Santerre, J.R. Stahl, T. Noltemeyer, and D.C. Deardorff. 2003. A Rapid Method to Improve the Indiana Fish Consumption Advisory. Purdue Botanical Center Symposium, February 27-28, West Lafayette, IN.

Lodge, D.M. Invited speaker, Society of Conservation Biology symposium on Values and Ecosystem Management of the Great Lake. Duluth, June 2003.

Lodge, D.M. NSF Workshop on China-US ecological cooperation. Arizona State University, April 2003.

Lodge, D.M. Invited speaker, symposium on invasive species. Illinois State University, April 2003.

Pegg, M.A., R.M. Taylor, and J.H. Chick. Aquatic nuisance species: an evaluation of barriers for preventing the spread of bighead carp to the Great Lakes. Presented at the Annual Meeting of the Upper Mississippi River Conservation Committee, Collinsville, Illinois. March 2003.

Pegg, M.A., R.M. Taylor, and J.H. Chick. Assessment of electric and sound-bubble barriers in preventing the movements of bighead carp. Presented to the Dispersion Barrier Advisory Panel, Chicago, Illinois. January 2003.

Sampson, S.J., J.H. Chick, and M.A. Pegg. Dietary Overlap Between Asian Carp and Three Native Fishes of the I(llinois and Mississippi Rivers: Preliminary Results. Presented at the Illinois Chapter of the American Fisheries Society Annual Meeting, Rend Lake, Illinois. March 2003.

Shade, C.W. and R.J.M. Hudson. 2003. Kicking the distillation habit: Resin-based strategies for isolating inorganic and methylmercury from natural organic matter. Natural Organic Matter in Soils and Water Symposium, Ames Iowa, March.

Shade, C.W. and R.J.M. Hudson. 2003. Development of a novel HPLC-FIA system for rapid pre-concentration, depreciation, and detection of inorganic and methylmercury. IAGLR Great Lakes Meeting, Chicago, IL, June.

## *Publications . . . continued*

Shim, S.M., C.R. Santerre, J. Burgess, and D.C. Deardorff. 2003. Omega-3 Fatty Acids and PCB in Fish Oil Supplements. Institute of Food Technologists, Chicago, IL. Paper #45K-14, Technical Poster Session. (Toxicology and Safety Evaluation Division Graduate Paper Competition – Second Place.)

Shim, S.M., C.R. Santerre, L.E. Dorworth, B.K. Miller, J.R. Stahl, and D.C. Deardorff. 2003. Semipermeable Membrane Devices (SPMDs) to Predict total PCB in Fish Tissue (ESEI (The Environmental Sciences and Engineering Institute), Environmental Symposium, April 11, Lafayette, IN.

Shim, S.M., C.R. Santerre, L.E. Dorworth, B.K. Miller, J.R. Stahl, and D.C. Deardorff. 2003. Semipermeable Membrane Devices (SPMDs) to Predict Total PCB in Fish Tissue. Purdue Botanical Center Symposium, February 27-28, West Lafayette, IN.

Taylor, R.M., M.A. Pegg, and J.H. Chick. Experimental evaluation of barriers for preventing the spread of bighead carp to the Great Lakes. Presented at the American Fisheries Society meeting, Quebec City, Quebec Canada. August 2003.

Taylor, R.M., M.A. Pegg, and J.H. Chick. Aquatic nuisance species: an evaluation of barriers for preventing the spread of bighead carp to the Great Lakes. Presented at the International Conference on Invasive Species, Windsor, Canada. June 2003.

Taylor, R.M., M.A. Pegg, and J.H. Chick. Aquatic nuisance species: an evaluation of barriers for preventing the spread of bighead carp to the Great Lakes. Presented at the Illinois Chapter American Fisheries Society Annual Meeting, Rend Lake, Illinois. March 2003.

### TV Coverage

Pegg, Mark, and John Chick. Bighead Carp, NBC National News. 06/27/03.

Pegg, Mark, and John Chick. Bighead Carp, NBC Affiliate in Peoria, IL. 06/28/03.

Pegg, Mark, and John Chick. Bighead Carp, NBC interview shown on British Broadcasting Corp. 07/01/03.

Pegg, Mark, and John Chick. Bighead Carp, Fuji News (Japan). 08/04/03.

**Students supported by the Illinois-Indiana Sea Grant College Program in 2003**

<b>Level of Study</b>	<b>Number of Students</b>
Undergraduate and post-baccalaureate	7
Graduate students (MS candidates)	5
Graduate students (PhD candidates)	4
Post Doctoral associates	<u>1</u>
Total Supported	17

**Students supported by the Illinois-Indiana Sea Grant College Program in 2002**

<b>Level of Study</b>	<b>Number of Students</b>
Undergraduate and post-baccalaureate	12
Graduate students (MS candidates)	15
Graduate students (PhD candidates)	6
Post Doctoral associates	<u>1</u>
Total Supported	34

*Workshops, Seminars, Short Courses, Field Tours, and Conferences*

JANUARY 1 - DECEMBER 31, 2003

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Venue/Location</u>	<u>Subject</u>	<u>Attendees</u>
Charlebois, Patrice		05/14-15/03	Chicago Department of Environment and US Fish and Wildlife Service, Chicago, IL	Aquatic Invasive Species Summit. Steering Committee and Facilitator	60
Dorworth, Leslie	D. Trgovcich-Zacok	06/04/03	Elgin Community College, Elgin, IL	River Restoration: Practices and Concepts Series. Beyond the Basics of Dam Removal and Modification Workshop	73
Dorworth, Leslie		10/23-24/03	Purdue University Calumet Hammond, IN	Region 5 Water Quality Coordinators Meeting	12
Einstein, Mark	Angela Archer	05/01/03	Marine BioInvasives, San Diego, CA	Marine Nonindigenous Species Review	200
Goettel, Robin		10/17/03	Illinois Science Teachers Association, Peoria, IL	Exotic Aquatic Species: A Multidisciplinary Approach Integrating Social and Life Science	25
Goettel, Robin		08/29/03	Purple Loosestrife Workshop, Spooner, WI	ESCAPE Activities for Wetland Managers and Educators	25
Goettel, Robin		04/12/03	University of Illinois, College of Education, Urbana, IL	Education Workshop on Exotic Aquatic Species for Pre-Service Teachers	6
Goettel, Robin		07/20/03	National Marine Educators Association Conference, Wilmington, NC	Reality Internet: Surviving Aquatic Species Challenge	30
Goettel, Robin		03/24/03	Clean Water Celebration, Peoria, IL	Exotic Species Workshop for Middle School Students – Two Sessions	60
Goettel, Robin	Irene Miles	02/08/03	Chicago River Student Conference – Friends of The Chicago River, Amundsen High School, Chicago, IL	Hyacinth Jeopardy and ESCAPE Beware Invader!	35
Goettel, Robin	Susan White Valerie Eichman	04/04/03	Minnetrissa Cultural Center, Muncie, IN	Science Spectrum 2003 - Teacher Professional Development Experience	28
Goettel, Robin	Valerie Eichman	01/30/03	Eastern Illinois University College of Education, Charleston, IL	Education Workshop on Exotic Aquatic Species – A Pre-Service Workshop for Future Science Teachers	60
Goettel, Robin	Valerie Eichman	02/19/03	Hoosier Association of Science Teachers Convention, Indianapolis, IN	Bring Exotics into the Classroom – A Team Approach	19
Goettel, Robin	Valerie Eichman	07/14/03	Engineering Water Camp Workshop, University of Illinois, College of Education, Urbana, IL	Engineering of Water - Summer Water Camp	20
Goettel, Robin		10/17/03	Illinois Science Teachers Association, Peoria, IL	Exotic Aquatic Species: A Multidisciplinary Approach Integrating Social and Life Science	25
Goettel, Robin	Patrice Charlebois Jennifer Fackler Toni Manzo	10/22/03	Shed Aquarium, Chicago, IL	Sea Grant Education Workshop - ESCAPE from Exotics and NIE Program	22

*Workshops, Seminars, Short Courses, Field Tours, and Conferences*  
 JANUARY 1 - DECEMBER 31, 2003

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Venue/Location</u>	<u>Subject</u>	<u>Attendees</u>
Goettel, Robin	Rachel Somers	12/05/03	Louisiana Science Teachers Association Conference, New Orleans, LA	Water Hyacinth and Other Exotic Creatures—What Makes them a Menace?	8
Goettel, Robin	Patrice Charlebois Brian Miller	12/16/03	Peggy Notebaert Nature Museum, Chicago, IL	Aquatic Invasive Species Workshop for Museum Educators and Volunteer Interpreters	18
Mankin, Phil		11/12-13/03	Chicago, IL	Economic and Financial Management of Small Water Supply Systems. Workshop	18
Miles, Irene	Karen Ricker Christine Manninen Gail Kratzenberg Jennifer Day	06/25/03	IAGLR Conference, Chicago, IL	Biological Invasions: How Media Communications Can Impact Policy and Research Agendas. Panel Discussion	27
TePas, Kristin		04/29/03	Office of Law Enforcement: Division of Investigations, Topeka, IL	Aquatic Nuisance Species: Know Our Invaders. Workshop	10
TePas, Kristin		04/15/03	Region 3, Office of Law Enforcement, Champaign, IL	Aquatic Nuisance Species: Know Our Invaders. Workshop	26
TePas, Kristin		04/21/03	Region 1, Office of Law Enforcement, Sterling, IL	Aquatic Nuisance Species: Know Our Invaders. Workshop	30
TePas, Kristin		04/15/03	Region 2, Office of Law Enforcement, Bartlett, IL	Aquatic Nuisance Species: Know Our Invaders. Workshop	34
TePas, Kristin		03/26/03	Region 5, Office of Law Enforcement, Bement, IL	Aquatic Nuisance Species: Know Our Invaders. Workshop	30
TePas, Kristin		06/04/03	Region 4, Office of Law Enforcement, Alton, IL	Aquatic Nuisance Species: Know Our Invaders. Workshop	28
Warner, Richard		01/10-11/03	Pheasants Forever National Workshop, Minneapolis, MN	A Midwestern Pheasant Habitat Perspective. Part 1	125
Warner, Richard		01/10-11/03	Pheasants Forever National Workshop, Minneapolis, MN	A Midwestern Pheasant Habitat Perspective. Part 2	125
Warner, Richard		10/22/03	Annual University of Illinois Extension Conference, Urbana, IL	Diseases From the Wild: The Emerging Importance of the West Nile Virus and Other Zoonosis in Illinois	35

*Posters / Presentations to Scientific and Professional Audiences*

JANUARY 1 - DECEMBER 31, 2003

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Location</u>	<u>Title/Event</u>	<u>Attendees</u>
Beardsley, Kate	Ron Rossmann Louis Blume	06/23/03	Chicago, IL	Mercury in Lake Michigan Ecosystem Components, International Association of Great Lakes Research (IAGLR), DePaul University	50
Charlebois, Patrice		04/04/03	Bloomington, IL	Aquatic Invasive Plants: Predictions for Illinois. Illinois Lake Management Association 18 <sup>th</sup> Annual Conference	75
Charlebois, Patrice	Kristin TePas	04/04/03	Bloomington, IL	The Illinois State Comprehensive Management Plan for Aquatic Nuisance Species. Illinois Lake Management Association 18 <sup>th</sup> Annual Conference	100
Charlebois, Patrice	Kristin TePas	04/05/03	Normal, IL	Illinois Invasive Species Symposium	150
Cole, B.A.	Richard Warner P.W. Brown Phil Mankin P.D. Hubert	09/06-10/03	Burlington, VT	Wild Turkey Use of Agricultural Fields in Central Illinois. The Wildlife Society 10 <sup>th</sup> Annual Conference	150
Einstein, Mark		06/09/03	Burlington, VT	Web Site Statistics – Great Lakes Sea Grant Network Conference	50
Einstein, Mark	Angela Archer	03/17/03	La Jolla, CA	Marine BioInvasives. SGNIS Poster Presentation	150
Goettel, Robin	Irene Miles Susan White S. Wittman K. Ricker P. Focazio E. Obert M. Zhuikov E. LaPorte	06/23-25/03	DePaul University Chicago, IL	ILEC 2003 – Global Threats to Large Lakes: Managing in an Environment of Instability and Unpredictability; Research on Native and Invasive Species in the Great Lakes Region poster and brochures	500
Hollis, K.M.	C. Anchor J. Chelsvig Richard Warner L.L. Hungerford	04/16-17/03	Grand Rapids, MI	Disease Surveillance of Urban White-Tailed Deer from Cook County, Illinois. Michigan Chapter of The Wildlife Society	75
Hollis, K.M.	D.R. Etter C. Anchor J. Chelsvig T.R. Van Deelen D.R. Ludwig B.P. Piccolo Richard Warner	04/16-17/03	Grand Rapids, MI	Home-Range Size, Survival, and Habitat Use for Urban Deer from Chicago, Illinois. Michigan Chapter of The Wildlife Society	75
Hubert, P.D.	Phil Mankin D.J. Olson Richard Warner	12/09-10/03	Kansas City, MO	Optimizing Wildlife Habitat Initiatives Related to Farm Programs: the Illinois Experience. 64 <sup>th</sup> Midwest Fish and Wildlife Conference	50
Hubert, P.D.	T.R. Van Deelen Richard Warner P.W. Brown	01/17/03	Bloomington, MN	Survival of Turkey Hens in East-Central Illinois and Application to Turkeys in Northern Climates. Northern Wild Turkey Workshop	50
Jaffe, Martin		04/10/03	Batavia, IL	Institutional Arrangements for Conjunctive Use in Regional Water Supply Planning, 2003 Spring Meeting of the Illinois Groundwater Association, Fermilab. Invited.	50

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Location</u>	<u>Title/Event</u>	<u>Attendees</u>
Jaffe, Martin		04/11/03	Naperville, IL	An Overview of Land Use Planning and Zoning, Illinois Association of Municipal Managers Assistants, 7 <sup>th</sup> Annual Conference – Community Development 101: What Planners Think Managers Really Need to Know. Northern Illinois University. Invited.	75
Jaffe, Martin		04/29/03	Chicago, IL	The Great Lakes Charter Annex (Annex 2001), Northeast Illinois Planning Commission, Southern Lake Michigan Basin Water Supply Planning and Management Task Force. Invited.	35
Kammin, L.A.	Richard Warner Phil Mankin C.L. Hoffman	12/09-10/03	Kansas City, MO	Conservation Buffer Filter Strips as Habitat for Grassland Birds in Illinois. 64 <sup>th</sup> Midwest Fish and Wildlife Conference	50
McCormick, Robert		01/14/03	West Lafayette, IN	Illinois-Indiana Sea Grant Staff Meeting	17
McCormick, Robert		02/25/03	Nashville, IN	Purdue Extension Land Use Training (Waycross Center - Brown County)	30
McCormick, Robert	Cindy Salazar	05/19/03	Groton, CT	National NEBO – US	50
McCormick, Robert		08/06/03	Indianapolis, IN	Indiana Department of Environmental Management – Watershed Group (Indiana Government Center)	25
McCormick, Robert		08/22/03	Indianapolis, IN	Coastal Management Group (Indiana Government Center)	5
McCormick, Robert		10/01/03	New Albany, IN	North Central Extension Agricultural and Natural Resource Program Leaders	12
Piccolo, K.A.	Richard Warner T.E. Gosselink T.R. Van Deelen	12/09-10/03	Kansas City, MO	Habitat Preferences of Dispersing Red Foxes in Central Illinois. 64 <sup>th</sup> Midwest Fish and Wildlife Conference	100
Shim, S.M.	Leslie Dorworth Brian Miller	02/27/03	West Lafayette, IN	Semipermeable membrane devices (SPMDs) to predict total PCB in fish Tissue. Purdue Botanical Center Symposium	50
Shim, S.M.	Leslie Dorworth Brian Miller	04/11/03	Lafayette, IN	The Environmental Sciences and Engineering Institute	35
Sorensen, K.C.	J.W. Stucki Richard Warner M.J. Plewa	06/22-26/03	Modena, Italy	Alteration of Mammalian-Cell Toxicity of Pesticides by Structural Iron (II) in Ferruginous Smectite. Euroclay, Conference Of the European Clay Groups	100
Strode, P.K.	Richard Warner	02/15/03	Denver, CO	Implications of Climate Change for North American Wood Warblers (Parulidae). National meeting, American Association for the Advancement of Science. Poster	1,000
Strode, P.K.	Richard Warner	08/09/03	Urbana, IL	Spring Phenology and Trophic Ecology Of Trees, Caterpillars, and Migrating Neotropical-Nearctic Songbirds. American Ornithologists' Union Annual Meeting	500
TePas, Kristin		02/19/03	Indianapolis, IN	Exotic Species Biology and Impact & Exotic Species Management Options. Hoosier Association of Science Teachers, Inc. Conference	6

*Posters / Presentations . . . continued*

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Location</u>	<u>Title/Event</u>	<u>Attendees</u>
Vistine, S.M.	T.E. Gosselink T.R. Van Deelen Richard Warner	12/09-10/03	Kansas City, MO	Home Range Characteristics of Coyotes in East Central Illinois: the Importance of Linear Landscape Features. 64 <sup>th</sup> Midwest Fish and Wildlife Conference	100
Vistine, S.M.	Richard Warner T.R. Van Deelen T.E. Gosselink	09/06-10/03	Burlington, VT	Home Range Characteristics of Coyotes in the Intensively Farmed Landscape of East-Central Illinois. The Wildlife Society 10 <sup>th</sup> Annual Conference	50
Walk, J.W.	E.L. Kershner Richard Warner	08/06-09/03	Urbana, IL	Habitat Use by Eastern Meadowlarks and Dickcissels in a Grassland-Agriculture Landscape. American Ornithologists' Union, 121 <sup>st</sup> State Meeting	100
Walk, J.W.	E.L. Kershner Richard Warner	08/06-09/03	Urbana, IL	Predation and Brood Parasitism of Grassland Bird Nests Near Agricultural and Wooded Edges. American Ornithologists' Union, 121 <sup>st</sup> State Meeting	100
Warner, Richard		12/09-10/03	Kansas City, MO	Conservation Buffers, Agriculture, and Wildlife: Where From Here? 64 <sup>th</sup> Midwest Fish and Wildlife Conference	50
Warner, Richard		02/19/03	Springfield, IL	Watersheds From a Global Perspective. Streams and Watershed Workshop, Illinois Department of Natural Resources	35
Warner, Richard		08/06-09/03	Urbana, IL	Welcome to Avian Research in Illinois. American Ornithologists' Union, 121 <sup>st</sup> State Meeting	150
Warner, Richard		09/23/03	Urbana, IL	Keynote address: Ecology in the Real World. Undergraduate Environmental Majors in Biology Honors Program Banquet	100
Warner, Richard		10/08/03	Peoria, IL	Keynote speaker: The Illinois River: Connections to Next Generation. The 2003 Conference on the Management of the Illinois River System	250
Yaremych, S.A.	Richard Warner Phil Mankin J.D. Brawn A.J. Raim R.J. Novak	02/10/03	Dubuque, IA	West Nile Virus Causes High Mortality in a Free-ranging Population of American Crows. The Wildlife Society IL, IA, WI Joint Chapter Meeting	150
Yaremych, S.A.	Richard Warner Phil Mankin J.D. Brawn A.J. Raim R.J. Novak	March 2003	Minneapolis, MN	American Mosquito Control Association	300
Yaremych, S.A.	Richard Warner Phil Mankin J.D. Brawn A.J. Raim R.J. Novak	08/06-09/03	Urbana, IL	West Nile Virus and Survival of American Crows in Central Illinois. American Ornithologists' Union, 121 <sup>st</sup> Stated Meeting	100



*Formal Presentations to Landowners and Other Audiences*  
 JANUARY 1 - DECEMBER 31, 2003

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Venue/Location</u>	<u>Subject</u>	<u>Attendees</u>
McCormick, Robert		02/04/03	Franklin, IN	Planning With POWER	30
McCormick, Robert		02/04/03	Martinsville, IN	Planning With POWER	10
McCormick, Robert		02/11/03	New Castle, IN	Planning With POWER (Henry)	8
McCormick, Robert		02/12/03	Bloomington, IN	Planning With POWER (Monroe)	20
McCormick, Robert		02/14/03	Danville, IN	Planning With POWER (Hendricks)	15
McCormick, Robert		02/14/03	Indianapolis, IN	Planning With POWER (Marion)	20
McCormick, Robert		02/19/03	Corydon, IN	Planning With POWER (Harrison)	25
McCormick, Robert		02/20/03	Lebanon, IN	Planning With POWER (Boone)	10
McCormick, Robert		02/20/03	Noblesville, IN	Planning With POWER (Hamilton)	35
McCormick, Robert		02/21/03	Shelbyville, IN	Planning With POWER (Shelby)	20
McCormick, Robert		02/28/03	Nashville, IN	Planning With POWER (Brown)	15
McCormick, Robert		03/06/03	Greenfield, IN	Planning With POWER (Hancock)	15
McCormick, Robert		04/09/03	Buffalo, IN	Farm Land Protection (White)	100
McCormick, Robert		06/24/03	Enos, IN	Planning With POWER/ Comprehensive Plan (Newton)	20
McCormick, Robert		07/16/03	Crown Point, IN	Planning With POWER (Lake)	6
McCormick, Robert		08/13/03	Enos, IN	Comprehensive Land Use Planning (Newton)	10
McCormick, Robert		09/09/03	Goshen, IN	Planning With POWER (Elkhart) St. Joseph River Basin Commission	20
McCormick, Robert		09/15/03	Greencastle, IN	Comprehensive Land Use Planning (Putnam)	20
McCormick, Robert		09/25/03	Enos, IN	POWER/Comprehensive Planning (Newton)	15
McCormick, Robert		10/07/03	Greencastle, IN	Comprehensive Plan/Planning With POWER (Putnam)	12
Warner, Richard		08/23/03	Mendota, IL	Illinois Pheasant Management Workshop	75

*Poster Displays / Exhibits*

JANUARY 1 - DECEMBER 31, 2003

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Venue/Location</u>	<u>Subject</u>	<u>Attendees</u>
Beardsley, Kate		06/23/03	International Association of Great Lakes Research (IAGLR), DePaul University, Chicago, IL	Coordinated both for the Great Lakes National Program Office. Displayed outreach materials and discussed programs with Conference attendees.	600
Charlebois, Patrice	Kristin TePas	04/04/03	Bloomington, IL	Exotic Aquatics in Illinois. Illinois Lake Management Association 18 <sup>th</sup> Annual Conference	100
Charlebois, Patrice	Kristin TePas	04/05/03	Normal, IL	Exotic Aquatics in Illinois. Illinois Invasive Species Symposium	150
Goettel, Robin	Susan White	10/21/03	Illinois Extension Conference Share Fair; Champaign, IL	Illinois-Indiana Sea Grant's outreach materials	50
Goettel, Robin	Lisa Merrifield Irene Miles Susan White	10/07-09/03	2003 Governor's Conference on the Management of the Illinois River System; Peoria, IL	Research on Native and Invasive Species in the Great Lakes Region – Selected Projects from The Great Lakes Sea Grant Network Poster	300
Goettel, Robin	Valerie Eichman Phil Mankin Lisa Merrifield Irene Miles Richard Warner Susan White	03/14-15/03	College of ACES Open House, Urbana, IL	Sea Grant's Water Wheel of Information	225
Goettel, Robin	Susan White	03/24/03	Clean Water Celebration, Peoria, IL	Arrest that Invader! display	175
Goettel, Robin	Brian Miller Phil Mankin Lisa Merrifield Susan White	04/26-30/03	National Sea Grant Week, Galveston, TX	Optimizing Impact: Linking Research to Outreach (Better Management Practices poster)	350
Goettel, Robin	Susan White	04/05/03	Minnetrista Cultural Center, Muncie, IN	Science Spectrum 2003—Arrest that Invader! and Fishing for Information displays	125
Goettel, Robin	Irene Miles Kristin TePas Susan White	08/06-17/03	Indiana State Fair, Indianapolis, IN	Sea Grant's Water Wheel of Information display	2,000
McCormick, Robert		02/08/03	Annual Purdue Ag. Alumni Fish Fry, West Lafayette, IN	Planning With POWER display	1,200
McCormick, Robert	Brian Miller	05/19/03	National NEMO Network Conference, Groton, CT	Planning With POWER display	50
McCormick, Robert	Cindy Salazar	06/13/03	4-H Roundup Conference West Lafayette, IN	Planning With POWER display	300
McCormick Robert		0923/03	Farm Progress Show, Henning, IL	Planning With POWER display	100,000
TePas, Kristin	Patrice Charlebois Robin Goettel Susan White	01/15-19/03	Chicago Land Outdoor Show, Chicago, IL	What's wrong with this picture? display	2,000
TePas, Kristin	Patrice Charlebois Randi Grigoletti	02/22-23/03	Spring Fever Outdoor Show, Valparaiso, IN	What's wrong with this picture? display	600

<u>Presenter</u>	<u>Co-Presenter</u>	<u>Date</u>	<u>Venue/Location</u>	<u>Subject</u>	<u>Attendees</u>
TePas, Kristin		03/08/03	12 <sup>th</sup> Annual Grundy County Environmental Fair, Morris, IL	What's wrong with this picture? display	500
White, Susan	Robin Goettel Irene Miles Angela Archer Cindy Salazar Charles Felkner Chad Dolan Mark Einstein	09/23/03	Farm Progress Show, Henning, IL	Sea Grant's Water Wheel of Information display	200

**Interactive Multimedia**

TePas, Kristin M.; Patrice .M. Charlebois, and Angela Archer. Illinois ANS Program website (revised).

**News Releases**

- Miles, Irene. Dam Removal Workshop: What's Next?. Illinois-Indiana Sea Grant via email to media in Illinois and Indiana; posted on several websites.
- Miles, Irene. ANS Web Page Links to the Latest Resources. Illinois-Indiana Sea Grant. Via email to media in Illinois; posted on several Web sites.
- Miles, Irene. Control of Purple Loosestrife Now a National 4-H Project. Illinois-Indiana Sea Grant via email to media in Illinois and Indiana; posted on several websites.
- Miles, Irene. Governor's Conference to Consider Illinois River Issues. Illinois-Indiana Sea Grant via email to media in Illinois; posted on several websites.
- Miles, Irene. New Fisheries Leadership School in Session. Illinois-Indiana Sea Grant via email to media in Illinois and Indiana; posted on several websites.
- Miles, Irene. New Fisheries Leadership School in Session. Illinois-Indiana Sea Grant via email to media in Illinois, Indiana and Wisconsin; posted on several websites
- Miles, Irene. Reel in the Latest Fish Consumption Advisories. Illinois-Indiana Sea Grant via email to media in Illinois and Indiana; posted on several websites.
- Miles, Irene. Spin the Water Wheel at the Farm Progress Show. Illinois-Indiana Sea Grant via email to media in Illinois and Indiana; posted on several websites.
- Miles, Irene. Worldwide Volunteer Beach Cleanup in September. Illinois-Indiana Sea Grant via email to media in Illinois and Indiana; posted on several websites.
- Miles, Irene. Soak Up Indiana Beach Closing Info on New Web Site. Illinois-Indiana Sea Grant via email to a large number of media in Illinois and Indiana; posted on several websites.
- Miles, Irene. ID Invasive Asian Carp With the New Watch Card. Illinois-Indiana Sea Grant via email to a large number of media in Illinois; posted on several websites.
- Miles, Irene, Ronald Litke (NIPC). Tri-State Planners Focus on Long-Term Water Supply. NIPC and Illinois-Indiana Sea Grant via email to media in Illinois, Indiana and Wisconsin; posted on several websites.
- Miles, Irene. Steer Your Boat Clear of Invasive Aquatic Species. Illinois-Indiana Sea Grant via email to media in Illinois and Indiana; posted on several websites

**Newspaper and Trade Journal Coverage**

- "Long-Term Water Supply Plans," Evergreen Park Courier. Evergreen Park, 5/29/2003.
- "Aquaculture extension agents absorb new techniques and ideas at national conference," Jim Szyper. Regional Notes – CTSA. Waimanalo, HI. 6/1/2003
- "Would you know Asian carp if you saw one?" Bob Maciulus. The Star/www.starnewspapers.com (the south and southwest suburbs of Chicago). 9/25/2003
- "Conference to target Illinois River 'vision'," Dave Shiley. The News-Gazette, Champaign, Illinois. 9/7/2003
- "Steer your boat clear of invasive aquatic species," Irene Miles. Daily Review Atlas, Monmouth, Illinois. 7/11/2003
- "Steer your boat clear of invasive aquatic species," Irene Miles. The News-Progress, Sullivan, Illinois. 6/4/2003
- "Illinois, Purdue partner for Farm Progress Show," Roseville Independent, Roseville, Illinois. 8/21/2003
- "Reel in the latest fish consumption advisories," The Register-Mail, Galesburg, Illinois. 7/28/2003
- "Web Sites: SGNS and AquaNIC," Don Webster. Maryland Aquafarmer, College Park, MD. 3/1/2003
- "Long-Term Water Supply Plans," Midlothian Bremen-Messenger, Midlothian, Illinois. 5/29/2003
- "Hunting & Fishing Days in great outdoors," Bob Maciulis. The Herald News, Joliet, Illinois. 9/20/2003
- "NIPC Hosted Managers Meeting Regarding Long-Term Water Supply Plans," Beverly News, Chicago, Illinois. 5/29/2003
- "NIPC Hosted Managers Meeting Regarding Long-Term Water Supply Plans," Worth Citizen, Worth, Illinois. 5/29/2003
- "NIPC Hosted Managers Meeting Regarding Long-Term Water Supply Plans," Burbank Stickney Independent, Burbank, Illinois. 5/29/2003
- "NIPC Hosted Managers Meeting Regarding Long-Term Water Supply Plans," Mt. Greenwood Express, Chicago, Illinois. 5/29/2003
- "Long-Term Water Supply Plans," Oak Lawn Independent, Oak Lawn, Illinois. 5/29/2003
- "New Fisheries Leadership School in Session," Irene Miles. Farm Pond Harvest, Momence, Illinois. 6/21/2003
- "Officials gear up for Farm Progress Show," John Peverly. The News Gazette, Champaign, Illinois. 9/19/2003
- "Warnings about fish, global warming and war," Greg Kline. The News-Gazette, Champaign, Illinois. 8/18/2003
- "Public can speak on plan for beach," David Mitchell. The Vidette Times, Valparaiso, IN. 6/21/03
- "Beach plan taking shape," Kathy Ceperich. Post Tribune, Gary, IN. 7/17/03
- "Springy Asian carp among state nuisances. The Herald News. Joliet, IL. Bob Maciulis. 12/06/03.

**Beardsley, Kate**

Great Lakes Coastal Wetlands Monitoring Consortium  
State of the Great Lakes Ecosystem Conference (SOLEC) Executive Committee

**Charlebois, Patrice**

Advisory Panel for Great Lakes Model Rapid Response Plan  
Aquatic Nuisance Species Task Force; Communications, Education & Outreach Committee  
Asian Carp Rapid Response Task Force  
Asian Carp Rapid Response Task Force Outreach Subcommittee  
Dispersal Barrier Advisory Panel  
Great Lakes Panel on Aquatic Nuisance Species, Information and Education Committee  
Great Lakes Panel on Aquatic Nuisance Species, Vice Chair and Member  
Illinois Department of Natural Resources, Aquatic and Terrestrial Nuisance Species Task Force  
Illinois Natural History Survey, Public Information and Outreach Committee  
Illinois State Management Plan for Aquatic Nuisance Species Steering Committee  
International Association for Great Lakes Research

**Dorworth, Leslie**

Blue Green Algae Task Force  
Wolf Lake Task Force  
Inter-Agency Technical Task Force on E. coli  
Great Lakes Sea Grant Network Coastal Land Use Committee  
Environmental Management Policy Committee (voting member)  
Grand Calumet River/Indiana Ship Canal Corridor Vision Steering Committee  
Northwest Indiana Science Olympiad  
Lake Michigan Monitoring and Coordinating Council  
NIRPC's Watershed Advisory Group  
Chicago Wilderness Streams Task Force  
Chicago Wilderness Science and Land Management Task Force

**Einstein, Mark**

Agricultural Network Information Center (AGNIC) Project, Executive Board Member

**Felkner, Charles**

Indiana Aquaculture Association  
Indiana Extension Educators Association  
National Association of County Agricultural Agents  
U.S. Shrimp & Prawn Growers Association

**Goettel, Robin**

Association for Communications Excellence  
Asian Carp Rapid Response Committee, Outreach Subcommittee  
Centers of Regional Environmental Education, Illinois Planning Committee—East Central Region  
Chicago Wilderness, Education Organizing Committee  
Environmental Educators Association of Illinois  
Great Lakes Sea Grant Network Conference Planning Committee  
Hoosier Association of Science Teachers, Inc.  
Illinois Science Teachers Association  
National Marine Educators Association  
National Sea Grant Communications Products Contest Committee  
National Sea Grant Exhibits and Special Events Taskforce  
National Sea Grant Outreach Growth Committee  
National Sea Grant Educators Network, Executive Committee—Member-at-large  
University of Illinois College of ACES Open House Planning Committee

*Professional and Committee Affiliations . . . continued*

**Jaffe, Martin**

American Planning Association, Water Resources Subcommittee, Environmental Policy Guide Task Force  
City of Chicago, Department of Environment, Lake Calumet Government Working Group  
City of Chicago, Department of Planning and Development and Mayor's Committee on Nature and Wildlife, Chicago  
Biodiversity Plan Working Group  
City of Gary, Department of Environmental Affairs, Green Link Bikeway Project Stakeholders Group  
City of Gary, Department of Planning, Delta Institute, and Grand Cal Task Force, Riverfront Revival Project  
Chicago Metropolis 2020 Project, Commercial Club of Chicago, Natural Environment Work Group  
Chicago Wilderness, Sustainability Team  
Ely Chapter, Lambda Alpha International Honorary Land Economics Society  
Illinois Environmental Protection Agency, Division of Water, Basin-wide Management Technical Team  
Illinois Groundwater Association  
Journal of Architectural and Planning Research, Editorial Board  
Northeastern Illinois Regional Planning Commission, Southeast Wisconsin Regional Planning Commission, and Northwest  
Indiana Regional Planning Commission, Tri-State Water Supply Consortium Steering Committee  
Northwestern Indiana Regional Planning Commission, Watershed Planning Technical Team  
Planning and Environmental Law, Editorial Board  
University of Illinois at Chicago Institute for Environmental Science and Policy, Faculty Steering Committee  
Urban Land Institute, Chicago District Council  
Village of Wilmette Historic Preservation Commission

**Phil Mankin**

American Society of Mammalogists  
Illinois Habitat Fund Advisory Committee, Illinois Department of Natural Resources  
Illinois Water Resources Center, Research Coordinator,  
The International Association of Natural Resource Pilots  
Water 2004 Planning Committee  
The Wildlife Society

**McCormick, Robert**

American Whitewater Affiliation  
Epsilon Sigma Phi National Extension Honorary  
Indiana Rural Development Association  
Purdue University Cooperative Extension Specialists Association

**Merrifield, Lisa**

Champaign County Cooperative Extension, Advisory Board

**Miles, Irene**

Association for Communications Excellence  
IAGLR Conference Media Research Forum Planning Committee

**Miller, Brian**

Association of Natural Resource Extension Professionals  
Indiana Aquatic Invasive Species Management Plan Advisory Committee  
Indiana Chapter of The Wildlife Society, Continuing Education Committee  
Indiana Chapter of The Wildlife Society, Fall Meeting Planning Committee  
Indiana Coastal Management Program Coastal Advisory Board  
Indiana Coastal Zone Management 6217, Urban Practices Workgroup  
Indiana Prescribed Fire Council  
Interdisciplinary Research Committee  
International Association for Society and Natural Resources  
Lake Calumet Intergovernmental Working Group  
Lake Calumet Stewardship Initiative Board Member  
National 4-H Wildlife Habitat Evaluation Contest Executive Committee  
National Assembly of Sea Grant Extension Program Leaders, Past Chair  
National Sea Grant Academy, Co-organizer and trainer  
North Central Regional Aquaculture Center, Purdue Extension Representative to Technical Advisory Committee

North Central Section of the Wildlife Society  
NRCS State Technical Committee  
Purdue CES Forest and Woodland Stewardship, Management and Utilization Oversight Team  
Purdue CES Land Use Team  
Purdue CES Water Quality Common Interest Group  
Purdue University Cooperative Extension Specialist Association  
Sea Grant Coastal Communities and Economies National Theme Team  
State Wetland Management Plan User Advisory Committee  
Tri-State Water Use Consortium Steering Committee Member

**TePas, Kristin**

American Fisheries Society  
Aquatic Nuisance Species Rapid Response Project, Advisory Group,  
Asian Carp Rapid Response Committee, Outreach Subcommittee  
Society for Conservation Biology

**Warner, Richard**

Illinois State Water Plan Task Force Committee  
Mississippi River Valley Aquatic Nuisance Species Task Force  
Leopold Center Competitive Grants Review Panel, Iowa State University  
UIUC Water Resources Center Competitive Grants Review Panel  
Illinois Department of Natural Resources Special Fund Review Committee  
North-Central Regional Experiment Station Committee NCA-23  
University of Illinois Graduate Committee on Natural Areas  
North Central Region Aquaculture Committee (NCRAC) Board of Directors  
National Association of University Fish and Wildlife Programs, UI Delegate  
Illinois Chapter of the Wildlife Society Regional/National, Ad Hoc Agricultural Policy Committee  
The Wildlife Society  
Partnership Illinois Water Issues Ad Hoc Advisory Board  
University of Illinois Graduate Fellowship Board  
Cook County Forest Preserve District and Animal Control Advisory Committee  
Scientific Advisor to the Illinois Legislative Delegation: Science and Health Policies for Zoonosis and Related Infectious Diseases (via. Ill. Reps. Beth Coulson and Sarah Feigenholtz)

**White, Susan**

Association for Communications Excellence; Marketing, Graphic Design, and Publications Special Interest Groups

