THE HELM

News and Information from the Illinois-Indiana Sea Grant College Program **Fall 2002**

Wingspread Accord Ties Future Growth To Natural Resources

In a historic agreement, four regional planning agencies in Illinois, Indiana and Wisconsin have committed to work together to manage environmental and economic resources for the future.

"By planning for the region as a whole, these agencies can work with local governments to develop comprehensive and consistent policies and programs that protect natural resources for the future," said Brian Miller, Illinois-Indiana Sea Grant associate director. "This accord can be a model for intergovernmental cooperation."

"This agreement began several years ago in an attempt to start a dialog between these agencies and to make the case for incorporating natural resource and coastal concerns into long-term plans," said Miller. "Natural resources don't respect political boundaries."

The Wingspread Tri-State Regional Accord covers 17 counties in the southern Lake Michigan region. Included in the accord are the Northwestern Indiana Regional Planning Commission, the Southeastern Wisconsin Regional Planning Commission, the Chicago Area Transportation Study, and the Northeastern Illinois Planning Commission, which initiated and led the project.

Sea Grant provided the initial funding to bring the four agencies together. At a two-day conference last year at the Wingspread Conference Center, in Racine, Wisconsin, about 40 agency officials met to discuss critical planning concerns for the region as a whole, such as infrastructure limitations and economic global competitiveness.

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Inside This Issue

U of I Ecologist Named Sea Grant Director

Dick Warner

Richard E. Warner, a University of Illinois ecologist and administrator, has been appointed the director of the Illinois-Indiana Sea Grant College Program (IISG). Sea Grant is administered through the U of I and Purdue University in Indiana.

"Warner has an ideal background to help our campus address the emerging issues and opportunities pertaining to an enhanced and sustainable environment and economy in the metroplex along southern Lake Michigan," said Paul W. Bohn, U of I interim vice chancellor for research. "These issues are critical to our state and region and Illinois-Indiana Sea Grant is an ideal hub for these activities."

Warner brings to Sea Grant a background rich in fisheries and wildlife research with an emphasis on solving problems. "As an ecologist, I've used a systems approach, combining different knowledge bases and schools of thought. I think it's important to bring together a variety of agencies to address problems and to consider solutions," said Warner.

He began his research career at the Illinois Natural History Survey (INHS) in 1975 and was awarded his doctorate in interdisciplinary environmental studies from the U of I in 1981. In 1990, Warner took on an administrative role as the INHS director of the Center For Wildlife Ecology. Most recently, Warner served as assistant dean for research in the College of Agricultural, Consumer and Environ mental Sciences (ACES). He is also a professor in the Department of Natural Resources and Environmental Sciences.

"I'd like Sea Grant to be a clearinghouse for unbiased, sound scientific information about coastal concerns," said Warner. "Through increased education and communication efforts we can raise awareness and help facilitate solutions related to critical issues such as coastal development, water quality and the impact of invasive species."

The southern Lake Michigan region is the third highest population center in the country and the largest that sits on fresh water. "With its connection to the Mississippi River and the Gulf of Mexico, critical issues along Lake Michigan can take on national importance," said Warner.

"With the Sea Grant program in the Office of the Vice Chancellor for Research," added Bohn, "our colleges and the scientific surveys will work more effectively on these complex, cross-cutting issues. We expect that the federal government will pay more attention to policy, research, and outreach needs in the Great Lakes region in the future. Through both land-grant universities, the Illinois-Indiana Sea Grant College Program will help the two states communicate effectively with federal agencies and policymakers, and benefit from these funding opportunities."

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Sea Grant
ILLINOIS - INDIANA

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Removing Dams Reconnects the River System

Many dams built in Illinois and Indiana during the late 1800s and early 1900s have stood well beyond their life span and are in need of repair or replacement. In recent years, there is growing interest in the idea of simply removing some of these dams.

"This springs in part, from safety concerns related to these older structures," said Leslie Dorworth, Illinois-Indiana Sea Grant aquatic ecology specialist, who organized a dam removal workshop last April, sponsored by Sea Grant, Purdue University Calumet and Chicago Wilderness, and attended by 75 natural resource managers. "It can also prove to be less expensive to remove a dam rather than repair it," she added. "And, in the last decade or so we have come to understand the negative impacts these relic dams are having on the environment."

This dam in the Waubonsie Creek in Oswego, Illinois was removed in 1999, allowing redhorse suckers, after many year of blocked access, to go upstream to spawn.

"Basically, dams fragment a river. The area above the dam changes from a river ecosystem into a lake ecosystem," said Robert Linke, an environmental and civil engineering consultant, who spoke at the workshop. Most game fish can't breed or find food in their new environment. The result is that many river species in that location either die out or move on. "On the east and west coasts, a number of dams have been removed because long-distance fish migration is critical to some species in those regions," added Linke.

North America is home to 297 mussel species, more than any other continent in the world and 95 percent of these live in riverine ecosystems. "If dams prohibit fish from moving up and down river," said Linke, "then they impact the mussels as well because fish play a critical role in the dispersal and ultimately, the survival of native mussels." In fact, many Midwestern mussel species no longer exist in their historical range because when a population has been wiped out, dams have prevented other mussels downstream from re-colonizing that river system.

"Basically, dams fragment a river. The area above the dam changes from a river ecosystem into a lake ecosystem"

By inhibiting basic functions of the river, dams can degrade water quality. "They impair a river's ability to assimilate not only natural waste produced by organisms in the river," said Linke, "but also much of the manmade wastes we process and discharge from our sewage treatment plants."

"All rivers and streams transport sediment, and when you build a dam you stop that movement," said Linke. "A dam can cause fine grain particles to settle in the middle of the river channel. These particles are more likely to collect and

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An Electric Barrier to the Flow of Invasive Species

The electric barrier in the Chicago Sanitary and Ship Canal, which was officially activated on April 18, is designed to allow water and boats to flow through the canal, but not fish.

"The intention is that fish experience increasing levels of electricity as they move through it," said Patrice Charlebois, Illinois-Indiana Sea Grant biological resource specialist. "The idea is that at some point, the fish will be compelled to turn around."

The electric barrier is located in the Chicago Sanitary and Ship Canal near Romeoville, Illinois. (The arch over the canal is a gas pipeline and is not related to the barrier.)

"The new 60-foot barrier is the first of its size," said Charlebois. "It is an experiment, a first step in the development of a more comprehensive barrier. We anticipate that it will be more effective for species going up river because some fish may be stunned by the electricity and then carried downstream through the barrier with the river current."

In recent years, several exotic fish species accidentally introduced into either the Great Lakes or the Mississippi River have made their way through the canal and into the other watershed. The next fish poised to pass from the Illinois River into Lake Michigan is the bighead carp. With the barrier in place, this species may be deterred (see accompanying story). A future threat may come from the Eurasian ruffe, which is now in Lake Superior.

The Great Lakes-St. Lawrence and the Mississippi River drainage basins, two of the largest in North America, were connected in 1900 when the Chicago Sanitary and Ship Canal was constructed to force the Chicago River to flow away from Lake Michigan, towards the Illinois and Mississippi Rivers. This prevented sewage in the Chicago River from contaminating Lake Michigan, Chicago's drinking water source. And it opened a new transportation route.

"For years, pollution in the Chicago waterways provided an impenetrable barrier through which very few organisms of any type could pass," said Charlebois, who is also the coordinator of the Illinois State Comprehensive Management Plan for Aquatic Nuisance Species. "After 30 years of concerted efforts to clean up the waterways, it has become an open system, with organisms free to travel in either direction."

The barrier project began in 1996, when Congress, through the National Invasive Species Act, directed the U.S. Army Corps of Engineers to explore ways to stop fish from moving between the watersheds. The Dispersal Barrier Advisory Panel was convened, which included Charlebois and Rip Sparks, IISG's former research coordinator, along with government regulators, commercial users and conservation, research and recreation groups. The panel explored a number of ideas and settled on the idea of an electric barrier.

Simulated Barrier Stops Bighead Carp

Amy Heberlein, who has provided summer help for Chick and Pegg's research project, holds a bighead carp. These carp can grow to 50 pounds in the U.S.

The electric barrier may effectively stop Asian carp from entering Lake Michigan, according to preliminary research results. In the early stages of an Illinois-Indiana Sea Grant-funded study, researchers found that more than 99 percent of bighead carp were deterred by a simulated electric barrier modeled after the actual one.

Using fish raceways to do controlled experiments, John Chick and Mark Pegg of the Illinois Natural History Survey are testing the potential effectiveness of the present electric barrier in stopping Asian carp. Two species of Asian carp, bighead and silver, are migrating closer to the actual barrier site, located in the Chicago Sanitary and Ship Canal near Romeoville, Illinois, and have been spotted as close as 25 miles from Lake Michigan.

Thus far in the study, there were 381 attempts by bighead carp to pass through the simulated barrier—379 times the fish turned around. Only one fish went through the barrier, and in fact, did it twice. “This was a smaller carp, which was not surprising. Smaller fish are less susceptible to the electric current,” said Pegg. These tests were done for six continuous hours per day for three days.

Chick and Pegg will also test whether other types of barriers can effectively stop the bighead carp. They will experiment with “fish guidance systems” that use sound and a “wall of bubbles.” “We will test the effectiveness of these technologies and then try them in combination. Perhaps the fish can become used to one or the other, but in combination, they may prove successful,” added Pegg.

Asian carp, which have grown to 50 pounds in U.S. waters, were brought here for use in aquaculture in the 1970s, and escaped into the Upper Mississippi River System. The populations of these species have increased dramatically in some areas.

“They consume zooplankton, which all fishes typically feed on in their juvenile stages, so bighead carp have the potential to adversely affect every species of fish in the Mississippi River and Great Lakes,” said Pegg. To assess this threat, Chick and Pegg will study the impact of bighead carp on the food supply of native fish.

The researchers will sample fish in a number of contiguous backwater and side-channel habitats in the Illinois and Mississippi Rivers where the bighead carp congregate with native filter-feeding fishes. They will examine the diet of these fish and measure the availability of zooplankton.

“These data may provide an understanding of the potential effects of bighead carp on the aquatic communities and fisheries of the Great Lakes,” said Pegg.

At the University of Illinois, College of ACES Open House, junior plant deputies studied the plant line up, threw the bad guys in the slammer and received their badges and pencils. The younger crowd was amused by the "Arrest That Invader" water garden.

Invader Plants Nabbed By Local Plant Deputies

Bad Guys ID'd at Public Events

Major arrests have been made in the long fight against invading aquatic plant species. Purple loosestrife, Eurasian watermilfoil and the elusive Hydrilla verticillata have all been booked for their disruptive activities.

This break in the investigation came about when junior plant deputies were assigned the task of picking these non-native species out of a plant line-up created by Illinois-Indiana Sea Grant. Positive IDs led to numerous arrests at both the University of Illinois College of Agricultural, Consumer and Environmental Sciences Open House, at It's Wild in Chicago at the Field Museum, and at the Illinois State Fair.

The young detectives studied the plant line-up carefully before they fingered the bad guys. After gathering all the evidence, children of all ages from Central Illinois and the Chicago area, picked out the culprits' mug shots and sent them to jail, a.k.a. the slammer. For their efforts they were rewarded with official junior plant deputy badges and pencils, highly prized as evidence collecting tools, as they change color at the touch of a fingerprint.

Sea Grant authorities will continue this successful crime sweep, known as "Arrest That Invader!" at future public gatherings.

TePas Provides Outreach and Education for ANS Efforts

Kristin TePas is now assisting Pat Charlebois, biological resources specialist, doing invasive species outreach and education for Sea Grant. She is also affiliated with the Illinois Natural History Survey. As the assistant director of the aquatic nuisance species management program for Illinois, TePas helps create publications, makes presentations and fields inquiries from the general public.

Sparks Sails into the Sunset

Rip Sparks and graduate student, Traci Barkley work together to check a fish trap. These traps are used to monitor populations.

By Lisa Merrifield (Lisa Merrifield, research program specialist, worked closely with Rip Sparks for two years on Sea Grant and a variety of other projects.)

We know him in a jacket and tie, discussing the merits and impacts of research proposals. But Rip Sparks is now spending most of his time wearing hip waders as he tags fish. On March 31, Rip retired from his position as the research coordinator for Illinois-Indiana Sea Grant, a position he had held since 1998.

During his tenure with Sea Grant, Rip coordinated research efforts as the IISG research budget doubled. He orchestrated the first symposium of Sea Grant research in Chicago last year, where IISG-funded researchers spoke about their work to a packed house of EPA officials, other researchers, city employees and citizens. And he oversaw the publication of "Making Waves," a research guide that details the promising work being done.

Although Rip is very comfortable in an administrative role, he is most at home in the water. He could be called an amphibian, perhaps. According to his student, Traci Barkley, Rip really shows his true colors while catching and marking round gobies. He talks softly to his aquatic test subjects, trying to calm their fears a bit.

Rip is also not afraid to be an educator, even under adverse circumstances. During one fish-surveying trip, he diligently explained the significance of invasive species to a couple of "inebriated hooligans," who had just thrown several fish traps into the water. It is unclear how much of the discussion they remembered the next day, but it was not for lack of trying.

Rip has come to his appreciation of aquatic systems through a career dedicated to studying them. He received a Ph.D. in Biology from Virginia Polytechnic Institute and State University in Blacksburg, Virginia in the 1970s. He spent 26 years as Director of the Illinois Natural History Survey Large River Research Program.

In retirement, Rip plans to continue his research on aquatic systems, focusing for now on the electric barrier, constructed to curb the spread of aquatic nuisance species between Lake Michigan and the Chicago River. He also plans to spend more time with his grown, twin daughters, both of whom live in Minnesota, and with his family and friends. While we will miss Rip and his contributions to IISG, we can be assured that even in retirement, he will continue to serve the waterways in Illinois and Indiana.

IISG to Help Improve Beach Monitoring

Illinois-Indiana Sea Grant, along with the Save the Dunes Conservation Fund and Indiana University Northwest, have been awarded $58,694 from the Indiana Department of Environmental Management to develop an *E.coli* beach monitoring and notification plan for Indiana's portion of the Lake Michigan shoreline.

This funding is part of the BEACH Act, passed by Congress in 2000 in an effort to reduce the risk of disease to users of the nation's recreational waters. Under the act, the U.S. Environmental Protection Agency is required to award grants to states to develop and implement monitoring and assessment programs.

The goals of the Indiana BEACH Act grant are to establish a more consistent monitoring plan and to improve notification of beach closings and advisories to beach-goers. The partnering organizations will evaluate, prioritize, and classify Indiana's Lake Michigan beaches and other public points of access to coastal waters according to health risk. The Interagency *E.coli* Task Force, which includes state and federal agencies, non-profit organizations, academic institutions and interested citizens, will guide this process to completion.

"In the spring of 2003, the public can expect to find a Web site through the Sea Grant server that provides up-to-date, critical information about beaches and beach closings in Indiana," said Leslie Dorworth, IISG aquatic ecology specialist.

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concentrate pollutants such as excess nitrogen or phosphorus that run off of farm fields, lawns and gardens, or that flow in industry wastewater."

Excess sediment and phosphorus can contribute to eutrophication, or low-dissolved oxygen levels in a river. The water above the dam tends to slow down and warm up. These conditions cause algae blooms that can leave the river smelly and uninhabitable for many species.

"There are thousands of dams in Illinois and Indiana that no longer serve a function. Thanks to electricity, our society no longer relies on small river dams to support industry, jobs and a good quality of life," said Linke. "We can't remove all dams," he added, "but local stakeholders should make a value judgement as to whether a dam is worth maintaining, in light of its potential impacts."

Wingspread Accord continued from page 1

At this meeting, IISG identified water supplies and critical coastal resources as two key assets that may be impacted by future growth in the southern Lake Michigan region. Miller made the case that future regional plans should incorporate the protection of critical resources such as wetlands, coastal habitats, and other key natural areas. In addition, he urged planners to seek a balance between future growth and a finite water supply.

The deep aquifer system in the western suburbs of Milwaukee and Chicago are being overtaxed, and the lake is being used to its legal limit, leaving shallow aquifers as the region's primary future water supply resource," said Martin Jaffe, IISG coastal business and environment specialist. "Unfortunately, shallow aquifers are more susceptible to depletion and pollution than the region's larger deep aquifer system. As a result, they will need to be managed much more comprehensively."

"With this accord, planning would take place on a watershed or aquifer basis. Cooperation between the three states can facilitate better water resource management strategies to keep deep aquifer use at or below its sustainable yield, and to promote best management practices to reduce groundwater pollution risks," said Jaffe.

Sea Grant continues to play a leading role in addressing critical regional coastal recource issues by proposing collaborative workshops with the planning agencies to define coastal concerns in the southern Lake Michigan basin," added Jaffe.

The Envelope Please . . .

The rewards of participating in research, education and outreach related to coastal concerns are plenty, but winning awards for these efforts provides a great bonus.

The ESCAPE (*Exotic Species Compendium of Activities to Protect the Ecosystem*) project brought home the gold as a non-credit educational project, and an Outstanding Professional Skill Award, for distance education and instructional design, in this year's Agricultural Communicators in Education (ACE) competition.

ESCAPE is a collection of 36-interactive activities that spark student curiosity and interest in the world of non-native aquatic species and their impacts on the environment. Developed by teachers who attended Great Lakes Sea Grant Network workshops, the activities help students understand ecosystem concepts, while tapping into critical thinking skills. The research-based lessons span science, geography, math, and language arts.

Accepting these awards are Robin Goettel, IISG communications coordinator, Valerie Eichman, education projects assistant, and Susan White, publications production and marketing assistant. Also contributing in the Great Lakes Sea Grant Network were Helen Domske, NY; Rosanne Fortner, OH; Doug Jensen, MN; and Mike Klepinger, MI. For more information about ordering ESCAPE, go to www.iisgcp.org/edu/escape/index.html or contact Valerie Eichman at eichman@uiuc.edu or 217-244-8809.

This spring, the BeachWatch information campaign won a gold award in external communications programs from ACE. This marketing effort also won the Outstanding Professional Skill Award in the ACE category, integrated communications programs.

BeachWatch is a series of eye-catching posters and postcards that provide critical information about *E.coli* outbreaks, and about other beach and water quality issues. They were distributed to major museums, a national and a state park, and environmental organizations and other institutions involved with citizens interested in water quality issues. The posters were also promoted at conferences, including the Great Lakes Beach Conference in Chicago and the Illinois Lake Management Meeting in Springfield.

These awards are shared by IISG staff members Irene Miles, media specialist, Leslie Dorworth, water quality specialist, and Debra Levey Larson, former media specialist.

Candice Bauer, a Ph.D student at the University of Notre Dame was awarded "Best Oral Presentation in Applied Research" at the 49th Annual Meeting of the North American Benthological Society in LaCrosse, Wisconsin held June 3-8, 2001. Her paper was entitled,“Potential Interactions Between Eurasian Ruffe and Round Gobies in the Great Lakes: Prey and Habitat Preferences.” Bauer has been supported by Gary Lamberti's IISG project entitled, “Zebra Mussels, Round Gobies, and Eurasian Ruffe: Predicting Ecological Impacts of the 'Exotic Triad' to Improve Control.”

Graduate student Joanne Lasrado, whose Purdue University research is funded by IISG, won the Institute of Food Technology, Toxicology and Safety Evaluation Division's Graduate Paper Competition in June in Anaheim, California, with her poster titled, “Measurement of PCBs in Fish Tissue Using GC and ELISA.” The competition judges commented on her broad appreciation for the subject matter and on her enthusiastic presentation of the research.

Illinois-Indiana Sea Grant Publications

Stop Ballast Water Invasions

As part of the shipping industry, you can help prevent the introduction and spread of aquatic nusance species by acting on the information presented in this brochure. Includes ballast management tips, aquatic nuisances species information, and regulations regarding ballast water. Also included are provisions, reporting and verification, and enforcement programs. 8pp. **For a free copy, please contact Susan White at 217-333-9441 or white2@uiuc.edu**

Don't Dump Bait Stickers

Preprinted stickers for bags and minnow buckets carry a message that discourages release of unwanted bait into the wild. **To obtain your free sticker(s), please contact Susan White at 217-333-9441 or white2@uiuc.edu**

Improved Decision-Making for Water Resources:

The Key to Sustainable Development for Metropolitan Regions

153 pp. **To obtain a free copy, please contact Susan White at 217-333-9441 or white2@uiuc.edu.**

Annual Report 2001

This report describes the activities of the Illinois-Indiana Sea Grant College Program for the period from January 1, 2001 until December 31, 2001. **To obtain a copy, please contact Susan White at 217-333-9441 or white2@uiuc.edu.**

Protecting Our Water and Environmental Resources

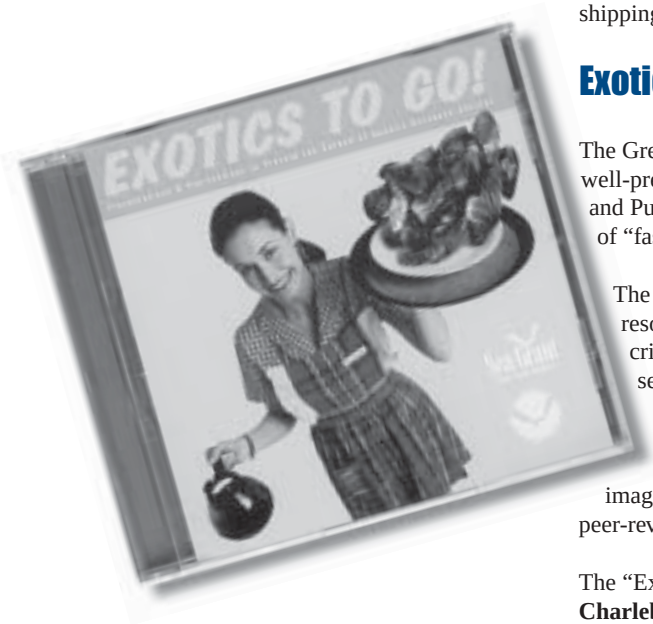
A model for incorporating natural resources into local land use decisions. **To order this fact sheet, contact Cindy Salazar at 765-494-3573 or cindy@fnr.purdue.edu**. You can download this publication at **www.planningwithpower.org**.

How to Get Started: Protecting Your Town from Polluted Runoff

To order this fact sheet, which provides a step-by-step process for citizens and local leaders, **contact Cindy Salazar at 765-494-3573 or cindy@fnr.purdue.edu**. You can download this publication and others in the series at www.planningwithpower.org.

Exotic Aquatics on the Move CD-ROM

This National Sea Grant project is a collection of 22 lessons in pdf format. These K-12, teacher-developed lessons are linked to National Geography Education Standards. Includes Hyacinth Jeopardy, The Purple Problem, and Zebra-Bingo with a Twist. The cost is **$7.00**, including shipping and handling. **Contact Valerie Eichman at eichman@uiuc.edu or 217-244-8809**.



Exotics To Go! CD-Rom

The Great Lakes Sea Grant Network is serving up a compact disk with a full menu of fresh and well-prepared information about aquatic nuisance species (ANS). "Exotics To Go! Presentations and Publications to Prevent the Spread of Aquatic Nuisance Species," is billed as the equivalent of "fast food" for people who need outreach materials about ANS.

The convenient package of educational materials is designed to help lake associations, natural resource agency staff, Extension educators, and teachers distribute accurate, timely, and critical information about ANS. Included species are zebra mussels, purple loosestrife, several fish, and two waterfleas.

The CD contains 22 publications in PDF format, lists of people to contact about ANS concerns, and offers seven adaptable PowerPoint presentations—including scripts, images, and talking points—that focus on zebra mussel impacts and control. All materials were peer-reviewed to ensure quality.

The "Exotics To Go!" CD is available from Illinois-Indiana Sea Grant for **$2.50**. **Contact Pat Charlebois at 847- 872-8677 or charlebo@uiuc.edu.**

Read about and order other IISG publications at www.iisgcp.org/pubs.

Happenings & Education around Lake Michigan (*The HELM*), reports on Illinois-Indiana Sea Grant research, extension, education and other Lake Michigan issues and activities.

For a free subscription, program information or to send suggestions for articles or editorial correspondence write to us at the address above or contact

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Illinois-Indiana Sea Grant College Program fosters the creation and stewardship of an enhanced and sustainable environment and economy along southern Lake Michigan and in the Great Lakes region through research, education and outreach.

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