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AIBS*news*

SEPTEMBER 2008/VOLUME 58 NUMBER 8

Nothing Fishy: AIBS and NSC Alliance Take Icthyologists to Congress

On 25 June 2008, the Coalition for National Science Funding (CNSF) held its 14th Annual Capitol Hill science exhibition and reception, "The Path to Innovation: Scientific Discovery and Learning." AIBS and the Natural Science Collections Alliance (NSC Alliance)—an AIBS member society—are active members of CNSF.

CNSF is an alliance of more than 100 organizations united by a concern for the future vitality of the national science, mathematics, and engineering enterprise. The coalition supports the goal of increasing the national investment in the research and education programs of the National Science Foundation (NSF) in response to the unprecedented scientific, technological, and economic opportunities facing the United States.

The 2008 reception drew a large crowd, which included members of Congress and their staffs and a number of top NSF officials, including Director Arden L. Bement Jr., Deputy Director Kathie L. Olsen, and Assistant Director for Biology James Collins.

In addition to cosponsoring the exhibition and reception, AIBS teamed with the NSC Alliance to sponsor an exhibit. The AIBS–NSC Alliance exhibit showcased the vitally important role the NSF Biological Sciences Directorate plays in supporting natural science collections–based research and fundamental biodiversity research. The exhibit, presented by John Sullivan and Mark Henry Sabaj Pérez from the Academy of Natural Sciences in Philadelphia, showcased the NSF-funded All Catfish Species Inventory (ACSI). The ACSI research effort also includes principal investigators at the University of Florida, Auburn University, and Cornell University. The $4.68 million effort has involved 422 participants in 53 countries.



Robert Gropp (left), Mark Henry Sabaj Pérez, Representative Dennis Kucinich (D–OH), and John Sullivan discuss findings from the National Science Foundation–funded All Catfish Species Inventory research project. Photograph: Cristina Sabaj Perez.

The ACSI research is one of seven large-scale projects funded by the NSF's Planetary Biodiversity Inventories Program, which seeks to empower international teams of scientists and institutions to assemble a comprehensive framework for understanding Earth's biodiversity through worldwide, species-level inventories of major groups of organisms.

Before the exhibit and reception, Sullivan and Perez met with staff from the offices of Senator Bob Casey (D–PA) and Representative Robert Brady (D–PA). These meetings, arranged by the AIBS Public Policy Office, allowed congressional staff to learn about NSF-funded research being conducted in their state. The meetings were also an important opportunity to remind members of Congress that the NSF is centrally important to the nation's biological research enterprise—providing more than 65 percent of the federal funding for fundamental environmental biology research.

Bad Science Education Sanctioned in Louisiana

In recent months, lawmakers in Louisiana have attempted to pass legislation that, according to science education experts, would create a foothold for local teachers to include pseudoscience in the science classroom. The latest challenge to quality science education in Louisiana came in the form of SB 733, the misleadingly named "Louisiana Science Education Act."

Throughout the spring and early summer, local science advocates and national organizations worked aggressively to defeat SB 733, which was initially introduced in the Louisiana State Senate by Ben Nevers, a Democrat and long-time advocate for creationism and "teaching the controversy." The legislation, which was supported by conservative activist organizations such as the Louisiana Family Forum and the Seattle-based Discovery Institute, moved through the legislature with relative ease.

In June, AIBS sent a letter to the Speaker of the Louisiana House and to each member of the chamber urging them to oppose SB 733. The American

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Association for the Advancement of Science similarly expressed its opposition to the measure in a commentary in the *Shreveport Times.* Despite these efforts, in addition to the grassroots campaign of the newly formed Louisiana Coalition for Science and Louisiana-based scientists and expressions of concern from conservative writers and religious liberty organizations, the legislation was sent to the governor.

In a last-ditch effort, AIBS and seven member societies sent a letter to Governor Bobby Jindal, a Republican, asking that he veto the legislation. The joint statement is online at *www.aibs.org/position-statements/.*

Many scientists hoped that Governor Jindal, who received undergraduate degrees in biology and public policy from Brown University, would veto the legislation. Many also thought that since Governor Jindal served as the secretary of the Louisiana Department of Health and Hospitals, he might recognize the folly of signing legislation that would weaken the academic preparedness of Louisiana students wishing to pursue careers in the health and medical sciences. Unfortunately, neither of these experiences informed his decision, and he signed SB 733 on 27 June 2008.

Although SB 733 signals Louisiana's willingness to place politics above education and is an endorsement of bad science education, analysis of the final measure indicates that teachers are not free to simply introduce any "supplemental materials" and "alternative explanations" to accepted scientific knowledge. Supplemental materials must be approved by the state board of education; however, as legal experts with various groups have warned, if nonapproved materials or religious content is introduced into science classrooms, legal action will follow.

AIBS Comments on American Academy of Arts and Sciences White Paper

In June, the American Academy of Arts and Sciences released a White Paper titled "Advancing Research in Science and Engineering: Investing in Early Career Scientists and High-Risk, High-Reward Research." With the release of the White Paper, the Academy has helped trigger important discussions about the actions required to reinvigorate the US scientific research enterprise. AIBS comments on the final draft of the report can be found online at *www.aibs.org/position-statements.* A copy of the White Paper is available at *www.amacad.org/ARISE.*

NEON Receives New NSF Funding

The Director of the National Science Foundation (NSF) and representatives of the National Ecological Observatory Network (NEON) have completed two Cooperative Support Agreements that will fund the design and development of the NEON project as it prepares for its final NSF review. To complete the NEON construction-ready design and execution plan, $20.7 million will be used for organizational and project management support. A separate agreement for $3.8 million will support completion of the construction-ready design for NEON cyberinfrastructure.

NEON is a continental-scale ecological observation platform for understanding and forecasting the impacts of climate change, land-use change, and invasive species on ecology. The NEON science mission is to identify and understand critical continental-scale environmental drivers and ecological responses. The network will support a range of long-term ecological research activities and enhance the capacity of scientists to forecast future states of ecological systems affected by the changing environment.

"New ways of observing provide powerful new ways of understanding the world," said NEON Chief Executive Officer David Schimel. "Just as new sensors have revolutionized medicine, astronomy, and geology, NEON will provide a whole new window on ecological systems."

Design and deployment. Observatory design partitions the United States into 20 ecoclimatic domains using a statistical analysis of ecoclimatic state variables such as vegetation, landforms, climate, and ecosystem performance. Each domain hosts one fully instrumented NEON Candidate Core Site located in a wildland area. Each candidate site will act as a

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detector in the national observatory, sensing a portion of the domain, much as a single detector in a digital camera detects information from a portion of the scene being photographed, while the whole megapixel array creates an image.

NEON will consist of distributed sensor networks and experiments linked by advanced cyberinfrastructure to record ecological data for an estimated 30 years. The observatory will collect data using a complex array of instruments deployed within the 20 carefully selected sites across the continental United States and Alaska, Hawaii, and Puerto Rico. The new NSF funds provide essential support for NEON, Inc., to finish the design and construction plan for the network.

Collectively, the domains represent US ecological and climate variability at the continental scale. Additional relocatable and mobile instruments, as well as airborne observation and land-use analysis capacity, will extend the reach of NEON standardized measurements and increase the usefulness of observatory data to researchers, educators, and policymakers.

"This award will support a team of world-class scientists, engineers, and software developers to complete a detailed, construction-ready blueprint for the implementation of NEON candidate sites, installation of sensors, data acquisition and management software, and the software environment for production of high-level data products and ecological forecasts," Schimel said. "When this design is complete, NEON, Inc. will be ready to build and commission the network on behalf of NSF and the scientific community."

Experiments. Two NEON experiments are also planned. The aquatic experiment (STREON) will consist of a suite of instruments deployed in small streams in selected NEON domains. It will focus on aquatic nutrients, simplification of food webs, and extreme events such as drought and floods. STREON will also sample water chemistry, whole stream metabolism, algae, microbes, and fish. The NEON Global Change Experiment currently under development will consist of a rain-in/rain-out manipulation of climate variables, such as temperature and carbon dioxide. It will also focus on manipulations and investigations of both vegetation and water balance.

"During the next year's intensive design and engineering phase, NEON, Inc. will collaborate extensively with the scientific community to ensure that, as the final design decisions, trade-offs, and options are considered, we make the right decisions to maximize the science return on investment from the network," said NEON Board Chair James A. MacMahon.

Education and outreach. The new NSF funding will enable NEON to rapidly hire additional scientific staff and key senior leaders, including a chief of education and outreach. NEON education and outreach will focus on preparing society and the scientific community to use observatory data, information, and forecasts. Data collected throughout the network will become a resource for broadening public understanding of ecological issues. Decisionmakers will use NEON data to address important environmental issues, such as the spread of invasive species and infectious diseases, and the impacts of a warmer, drier climate in the western United States on water supply and on the frequency and intensity of wildfires.

Students and nonscientists will learn about ecology through user-friendly NEON Web portals. By demystifying science and making it accessible to a variety of audiences, NEON is expected to transform the way people think about their environment and to enhance their knowledge of ecosystems. Citizen scientists will have opportunities to contribute data to the network. NEON education programs will also enable the next generation of scientists to work effectively with continental-scale data, attain new levels of collaboration with their peers, and better communicate ecological science to the public.

Cyberinfrastructure. The nation's current research infrastructure provides glimpses of large-scale, long-term phenomena, but it was not designed to capture them systematically. NEON sensors and cyberinfrastructure will deliver an integrated data resource focused on important US environmental drivers of ecological change: biotic (biodiversity, invasive species, and diseases); abiotic (geochemistry, hydrology, climate change); and social (economics, land use, and land cover).

A portion of the new NSF funding will support NEON field testing of its sensor networks and cyberinfrastructure—an important step toward delivering the 600 billion annual measurements the observatory will need to create the first continental-scale perspectives of complex ecological change. For more information about NEON cyberinfrastructure, design, and deployment, and a list of candidate core sites, visit *www.neoninc.org.*

Recent Education Reports Online at *www.aibs.org*

- Results of a survey on plant pathology education in America: Current status and future challenges
- New assessment database to support research on undergraduate STEM education
- New BioClub for students
- Call for examples: Evolution across the Curriculum project
- AIBS and NESCent cosponsor Evolution Symposium and Education Workshop at NABT Conference
- Teaching resources from the National Evolutionary Synthesis Center
- Human Anatomy and Physiology Society Institutes
- No Child Left Behind update
- Department of Education releases new report
- Members of Congress move to improve STEM education
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- Call for applications from DANS

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Original interviews

- "Computer Games in Teaching Science," with Eric Klopfer, director of the MIT Scheller Teacher Education Program
- "Why Is Dengue Fever on the Rise?" with Duane Gubler, professor and chair of Tropical Medicine, University of Hawaii

Recent Public Policy Reports Online at *www.aibs.org*

Public Policy Report for 21 July 2008

- Academies report on need for professional science masters degrees
- Cheney staff censored climate testimony, says former EPA official
- EPA warns that warming is threat to humans
- FDA launches science policy program

Public Policy Report for 7 July 2008

- Louisiana sets aside science
- AIBS cosponsors congressional reception showcasing science
- Bad economy puts pressure on state budgets
- House adopts budget agreement
- House and Senate consider science funding
- New in *BioScience:* "A New Farm Bill, Research Structure at USDA"
- *BioScience* article makes a splash
- From the *Federal Register*
- Now in the AIBS Bookstore: *Communicating Science: A Primer for Working with the Media*

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