

**Testimony in Support of FY 2014 Funding for the
National Science Foundation**

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Subcommittee on Commerce, Justice, Science and Related Agencies

The Natural Science Collections Alliance appreciates the opportunity to provide testimony in support of fiscal year (FY) 2014 appropriations for the National Science Foundation (NSF).

The Natural Science Collections Alliance is a non-profit association that supports natural science collections, their human resources, the institutions that house them, and their research activities for the benefit of science and society. Our membership consists of institutions which are part of an international community of museums, botanical gardens, herbaria, universities, and other institutions that contain natural science collections and use them in research, exhibitions, academic and informal science education, and outreach activities.

The Role of NSF in Scientific Excellence

Federal support for science is an investment in our nation's future. The NSF supports research that creates new knowledge and helps to drive innovation and economic growth. NSF-supported research has led to improvements in human health, food and national security, energy, and natural resource management.

NSF also trains the next generation of researchers and science educators. The agency supports graduate student research training programs that help maintain our nation's global competitiveness. Moreover, K-12 education initiatives ensure a pipeline of scientifically skilled workers for tomorrow's jobs.

America's continued excellence in science and technology depends on sustained investments in research and science education. The progress of basic scientific research requires a steady federal investment. Unpredictable swings in federal funding can disrupt research programs, create uncertainty in the research community, and impede the development of solutions to the nation's most pressing problems.

Biological Research at NSF

NSF's Biological Sciences Directorate (BIO) is the primary federal funding source for basic biological research. BIO serves a vital role in ensuring our nation's continued leadership in the biological sciences by providing about 62 percent of federal grant support for fundamental biological research conducted at our nation's universities and other nonprofit research centers, including natural history museums.

BIO's support of transformative research has advanced our understanding of complex living systems and is leading the way forward in addressing major challenges, such as understanding how biological species diversity helps to regulate environmental systems, identifying novel and cost-effective methods for combating invasive species, and developing new bio-inspired technologies.

Equally important, BIO provides essential support for our nation's biological research infrastructure, such as natural science collections and natural history museums. These research centers enable scientists to study the basic data of life, conduct modern biological and environmental research, and provide undergraduate and graduate students with hands-on training opportunities.

Support for Scientific Collections

Scientific collections play a central role in many fields of biological research, including disease ecology and biodiversity science. Our member institutions also provide critical information about existing gaps in our knowledge of life on Earth. Indeed, the federal Interagency Working Group on Scientific Collections recognized this value in their 2009 report, which found that "scientific collections are essential to supporting agency missions and are thus vital to supporting the global research enterprise."

We strongly encourage Congress to sustain NSF's support for the digitization of high priority U.S. specimen collections. NSF's investment in digitization would enable the scientific community to ensure access to and appropriate curation of irreplaceable biological specimens and associated data, and will stimulate the development of new computer hardware and software, digitization technologies, and database management tools. This effort is bringing together biologists, computer science specialists, and engineers in multi-disciplinary teams to develop innovative imaging, robotics, and data storage and retrieval methods. These tools will expedite the digitization of collections and contribute to the development of new products or services of value to other industries.

NSF has supported efforts by the biological collections community to make biocollections and their associated data more accessible. A series of workshops of biocollection experts has resulted in a community-wide initiative to develop a Network Integrated Biocollections Alliance (NIBA). The NIBA is envisioned as a coordinated, large-scale effort to digitize the nation's biological collections. Federal support is necessary if this goal is to be achieved. For example, the effort will require new initiatives that will support advanced engineering of biocollections

cyberinfrastructure, enhanced training for collections staff, and infusing specimen-based learning into education, among other recommendations.

Other NSF Programs

The Dimensions of Biodiversity program supports cross-disciplinary research to describe and understand the scope and role of life on Earth. Despite centuries of discovery, most of our planet's biological species diversity remains unknown. This lack of knowledge is particularly troubling given the rapid and permanent loss of global biological diversity. Better understanding of life on Earth will help us protect valuable ecosystem services and make new bio-based discoveries in the realms of food, fiber, fuel, pharmaceuticals, and bio-inspired innovation.

The Directorate for Geosciences (GEO) also supports research and student training opportunities in natural history collections. GEO supports cross-disciplinary research on the interactions between Earth's living and non-living systems – research that has important implications for our understanding of water and natural resource management, climate change, and biodiversity.

Within the Directorate for Education and Human Resources, the Advancing Informal STEM Learning program is furthering our understanding of informal science, technology, engineering, and mathematics (STEM) education. This program, formerly called the Informal Science Education program, supports projects that create tools and resources for STEM educators working outside traditional classrooms, such as at museums, botanic gardens, and zoos.

Conclusion

Continued investments in the NSF programs that support natural science collections research and education are essential if we are to maintain the United States' global leadership in innovation. Sustained investments in NSF will help spur economic growth and new discoveries and continue to build scientific capacity at a time when our nation is at risk of being outpaced by our global competitors.

Thank you for your thoughtful consideration of this request and for your prior support of the National Science Foundation.