

Testimony of Anthony F. (Bud) Rock
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submitted to the
House Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies
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Seeking Support for the Following Programs in FY 2013:
National Science Foundation – Education & Human Resources/Informal Science Education
National Oceanic and Atmospheric Administration – Education
National Aeronautics and Space Administration – STEM Education and Accountability

Introduction

Chairman Wolf, Ranking Member Fattah, and Members of the Subcommittee—thank you for the opportunity to submit written testimony for the record. My name is Anthony (Bud) Rock, and I serve as the Chief Executive Officer of the Association of Science-Technology Centers (ASTC). My testimony will address the importance of science, technology, engineering, and mathematics (STEM) education, and will focus specifically on the fiscal year (FY) 2013 budgets for programs at three federal agencies for which your Subcommittee has jurisdiction: (1) the Informal Science Education (ISE)/Advancing Informal STEM Learning (AISL) program at the National Science Foundation (NSF), which would receive \$47.82 million in FY 2013, a \$13.58 million (22%) cut from the FY 2012 estimated level of \$61.40 million; (2) the education programs at the National Oceanic and Atmospheric Administration (NOAA), which would receive \$11.3 million in FY 2013, a \$13.8 million (55%) cut from the FY 2012 estimated level of \$25.1 million; and (3) the STEM Education and Accountability program at the National Aeronautics and Space Administration (NASA), which would receive \$37 million in FY 2013, a \$13 million (26%) cut from the FY 2012 estimated level of \$50 million.

Our Request

On behalf of ASTC and the 359 U.S. science center and museums we represent, I urge the Subcommittee to continue its strong support for STEM education programs within the three federal agencies cited above as its work on the Commerce, Justice, Science, and Related Agencies (CJS) Appropriations Bill for fiscal year 2013 progresses. **Specifically, I urge you to do all you can to restore the proposed substantial cuts to NSF’s ISE program, NOAA’s Education Program Base (and, in particular, the Environmental Literacy Grants program (ELG) contained therein), and NASA’s STEM Education and Accountability program. In addition, I hope you will consider including the following suggested report language that would clearly direct NSF to use the ISE/AISL program to continue to support public engagement in STEM:**

The ISE program will invest in the design, development, and implementation of models, resources, and public engagement programs for STEM learning throughout the lifespan. Proposals can use a broad range of communication formats and experiences, such as mobile and broadcast media, virtual learning environments, exhibitions, TV, radio, films, citizen science, and after-school and/or out-of-school programs. Investigators should make a case for the

innovative contributions of such deliverables, and should advance an informal learning infrastructure that deepens the public's—particularly students and teachers'—STEM expertise."

Including this report language in the CJS Appropriations Bill is a priority for ASTC, and it is offered in response to a change in the ISE program's focus that has lessened the positive community impact science centers and museums can have through securing ISE awards. ASTC hears from its members regularly—and has confirmed by viewing recent award listings—that the ISE program has become centrally focused on formal (university-led) research to the detriment of educational and public engagement efforts conducted through science centers.

About ASTC and Science Centers

ASTC is a nonprofit organization of science centers and museums dedicated to providing quality educational experiences to students and their families as well as furthering public engagement with science among increasingly diverse audiences. Now, more than ever before, we must spark the interests of our young people in all that science has to offer. This is exactly why community-based science centers throughout the country are providing unique educational programs that excite, energize, and enrich our understanding of science and its many applications—frequently with support from NSF, NOAA, and NASA, in addition to other federal agencies.

Science centers are unique places where visitors can discover, explore, and test ideas and, most importantly, learn how science impacts their quality of life. Their offerings are varied, and include interactive exhibits, hands-on science experiences for children, professional development opportunities for teachers, and educational programs for adults.

ASTC now counts more than 600 members, including 455 operating or developing science centers and museums in 45 countries. Collectively, these institutions garner 82 million visits annually worldwide. **Here in the United States, your constituents pass through science center doors nearly 60 million times to participate in intriguing educational science activities and explorations of scientific phenomena.** The most recent *Science and Engineering Indicators* (2012) generally affirms this data, offering that:

Involvement with S&T outside the classroom in informal, voluntary, and self-directed settings—such as museums, science centers, zoos, and aquariums—is another indicator of the public's interest in S&T. By offering visitors the flexibility to pursue individual curiosity, such institutions provide a kind of exposure to S&T that is well-suited to helping people develop further interest. In the 2008 [General Social Survey], 61% of Americans indicated that they had visited an informal science venue during the previous year. About half (52%) said they had visited a zoo or aquarium, and more than one-quarter had visited a natural history museum (28%) or an S&T museum (27%).

Science centers come in all shapes and sizes, from large institutions in metropolitan areas—like the Franklin Institute in Philadelphia, the Center of Science and Industry (COSI) in Columbus, and the California Science Center in Los Angeles—to smaller centers in less populated areas—like the Shenandoah Valley Discovery Museum in Winchester, Virginia, the Mary G. Harden Center for Cultural Arts in Gadsden, Alabama, and the University of Kansas Natural History

Museum in Lawrence, Kansas. ASTC works with science centers and museums—small, large, and everywhere in-between—to educate and inform visitors on critical societal issues, locally and globally, where understanding of and engagement with science are essential. As liaisons between the science community and the public, science centers are ideally positioned to heighten awareness of critical issues including energy, the environment, infectious diseases, and space; increase understanding of important new technologies; and promote meaningful informed debate between citizens, scientists, policymakers, and the local community.

Science Centers as an Integral Part of the Nation’s Educational Infrastructure

Science centers are physical—and virtual—places where science and citizens meet. Many have scientists on staff, and some feature research facilities on-site. Through exhibits and programming—like lectures and science cafés—science centers bring current research findings to the public while encouraging discussion and debate of current science issues. More and more, science centers are also getting members of the public involved in research projects themselves.

Our centers reach a wide audience, a significant portion of which are school groups. **Here in the U.S., 90% of our members offer school field trips, and we estimate that nearly 11 million children attend science centers and museums as part of those groups each year.** Field trips, however, are just the beginning of what science centers and museums contribute to our country’s educational infrastructure, as:

- 90% offer classes and demonstrations
- 89% offer school outreach programs
- 82% offer workshops or institutes for teachers
- 75% offer curriculum materials
- 71% offer programs for home-schoolers
- 56% offer after-school programs
- 41% offer programs that target senior citizens, and
- 39% offer youth employment programs.

The Importance of Federal Support for STEM Education

As the Subcommittee knows, there is a strong consensus that improving STEM education is critical to the nation’s economic strength and global competitiveness in the 21st century. Reports like the National Academies’ *Rising Above the Gathering Storm* (2005) and the President’s Council of Advisors on Science and Technology’s *Prepare and Inspire* (2010) have emphasized the need to attract and educate the next generation of American scientists and innovators, and have recommended that we increase our talent pool by vastly improving K-12 science and mathematics education. Clearly, in order to improve STEM education, we must draw on a full range of learning opportunities and experiences, including those in non-school settings.

In its report entitled *Learning Science in Informal Environments: People, Places, and Pursuits* (2009), the National Research Council (NRC) of the National Academies said “beyond the schoolhouse door, opportunities for science learning abound...” The NRC found, among other things, that there is ample evidence to suggest that science learning takes place throughout the lifespan and across venues in non-school settings. Furthermore, the report highlighted the role of

after-school STEM education in promoting diversity and broadening participation, finding that non-school environments can have a significant impact on STEM learning outcomes in historically underrepresented groups, and that these environments may be uniquely positioned to make STEM education accessible to all. Given the important role science centers and museums play in the education of both students and teachers, ASTC strongly supports the STEM education activities of NSF, NOAA, and NASA.

National Science Foundation

Located within NSF's Directorate for Education and Human Resources (EHR) and the Division of Research on Learning in Formal and Informal Settings (DRL), the Informal Science Education program (which NSF proposes to rename "Advancing Informal STEM Learning") supports innovation in anywhere, anytime, lifelong learning through investments in research, development, infrastructure, and capacity-building for STEM learning outside formal school settings.

For years, ISE funding has supported museum-community partnerships like "LEAP Into Science," a collaboration between Philadelphia's Franklin Institute and the Free Library of Philadelphia Foundation that identifies the role of crucial intermediaries in the science learning of children and points to the opportunities offered through a museum and library partnership to provide engaging science resources in under-resourced communities where many adults lack science expertise and confidence. Through an emphasis on literacy and science, LEAP into Science builds the capacity of after-school leaders, teens, and parents to be competent science learners and facilitators and to connect science centers, parents, and libraries in support of the science learning and achievement of children. Project features include a workshop model for families with K-4 children, enrichment sessions for after-school students, family events at the Franklin Institute, professional development for library and after-school youth staff, and a national expansion conference. LEAP Into Science programming is now featured at 10 expansion sites across the nation, including those in New York and Ohio.

Funding for NSF's ISE program has hovered between \$61 million and \$65.8 million since FY 2003. For FY 2013, NSF is requesting \$47.8 million, a \$13.58 million reduction from the FY 2012 estimated level of \$61.4 million.

National Oceanic and Atmospheric Administration

Since 2005, NOAA's Office of Education has helped advance public environmental literacy and STEM learning through the Environmental Literacy Grants (ELG) program, a competitive grant program that supports formal and informal/non-formal education projects implemented on regional to national scales. The ELG program's primary mission is to increase the understanding and use of environmental information to promote stewardship and increase informed decision making by U.S. educators, students, and the public, which directly contributes to NOAA's mission. The ELG program is the longest standing and most comprehensive national grants program focused on environmental literacy, and through this focus, makes a distinctive contribution to STEM education.

To date, 75 competitive awards have been made, supporting a wide range of projects including teacher training, experiential learning for youth and families, and the development of media products and public opinion research. In 2010, NOAA provided funding to help the Science Museum of Virginia in Richmond—along with a team of federal, state, and private institutions—create the Earth System Display Center based on the popular *Science on a Sphere* (SOS) platform. The Center’s goal is to capture visitor attention, spur interest in climate change literacy, and demonstrate the local impacts of energy consumption, stormwater management, agriculture practices, and climate change can have a global effect. SOS is a centerpiece of the museum's overall interpretive program and a catalyst for meaningful interaction and learning.

Over the last two fiscal years, the NOAA Education Program Base has received \$24.95 million (FY 2011 spending plan) and \$25.09 million (FY 2012 estimated), while Competitive Education Grants saw \$8.04 million in funding (estimated) in FY 2012. For FY 2013, NOAA proposes cutting \$6.3 million from its Education Program Base, which includes a termination of its Competitive Education Grants/Environmental Literacy Grants program.

National Aeronautics and Space Administration

NASA’s education programs inspire interest in STEM among America’s youth and have a positive impact on the number of students who are proficient in STEM and choose to pursue careers in STEM fields. NASA Education accomplishes its mission through mutually beneficial relationships with colleges and universities, elementary and secondary schools and school districts, and over 400 museums and science centers. The STEM Education and Accountability program provides competitive opportunities for NASA Centers, visitor centers, institutions of informal education, schools, universities, and non-profit organizations, who develop lessons, materials, research opportunities, and hands-on activities that draw on NASA’s unique missions.

NASA’s STEM Education and Accountability projects received \$50 million in funding (estimated) for FY 2012. For FY 2013, NASA proposes \$37 million, a \$13 million reduction.

Conclusion

While I appreciate the extremely challenging budget scenario that confronts the Subcommittee, I urge you to recognize the importance of the STEM education offerings science centers and museums provide to students, families, and teachers—and the integral related federal support provided by NSF, NOAA, and NASA—by: (1) including report language that will ensure NSF returns the focus of its ISE/AISL program towards supporting public engagement in science; (2) restoring funding for the ISE/AISL program to its FY 2012 estimated funding level; (3) rejecting the proposed termination of NOAA’s Competitive Education Grant Program and restoring the NOAA Education Program Base and the Competitive Education Grants/Environmental Literacy grant programs to their FY 2012 estimated funding levels; and (4) restoring proposed cuts to NASA’s STEM Education and Accountability program by providing the FY 2012 funding level.

Thank you once again for your strong support for America’s science centers and museums—and for the opportunity to present these views. I would be happy to respond to any questions or provide additional information as needed by the Subcommittee.