



Written Testimony American Geosciences Institute

Testimony Submitted by American Geosciences Institute

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To the United States House of Representatives Committee on Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies Regarding the National Science Foundation, National Oceanic and Atmospheric Administration, National Institute of Standards and Technology, National Aeronautics and Space Administration, and the Office of Science and Technology Policy

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Thank you for this opportunity to provide the American Geosciences Institute's perspective on fiscal year (FY) 2018 appropriations for geoscience programs within the Subcommittee's jurisdiction.

The American Geosciences Institute (AGI) supports critical earth science research conducted by the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), the National Institute of Standards and Technology (NIST), and the National Aeronautics and Space Administration (NASA). Cutting-edge research on the Earth, energy, and the environment has fueled economic growth, mitigated losses, and improved our quality of life. All of these agencies carry out vital mission-focused geoscience research and participate in a range of interagency collaborations with the U.S. Geological Survey, the Department of Energy, other federal agencies, and state, tribal, and local agencies on topics ranging from emergency planning and response to anticipating water availability. The Earth system is highly complex and interconnected, geoscience information from all these agencies is vital for decision making at all levels of government and by the private sector.

AGI respectfully requests at least \$8 billion funding for NSF, including \$1.4 billion for the Geoscience Directorate. AGI supports \$6.1 billion for NOAA, \$1 billion for NIST, \$2 billion for NASA Earth Science programs, \$5.6 million for OSTP, and continued support for statistical data collection at the Department of Commerce.

AGI is a nonprofit federation of 51 geoscientific and professional societies that represent more than 250,000 geologists, geophysicists, and other Earth scientists. Founded in 1948, AGI provides information services to geoscientists, serves as a voice for shared interests in our profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in society's use of resources, resilience to hazards, and the health of the environment.

The American Geosciences Institute (AGI) appreciates the difficult choices that Congress is facing in developing the FY 2018 budget. Investing in our nation's future workforce, in our scientific and Earth monitoring infrastructure, and in the research and development that feeds innovation will reinforce the United States' role as the global leader. We respectfully request that this Subcommittee maintain your commitment to a strong future for the nation by funding critical scientific research, infrastructure, and data collection at the agencies under your jurisdiction.

National Science Foundation

Research across all areas of science and engineering contributes knowledge and understanding about many societal issues ranging from homeland security to cyberinfrastructure, and it produces revolutionary and often unforeseen breakthroughs. Basic research provides information that is used to improve people's quality of life, it is the foundation for a dynamic and innovative economy, and it strengthens the security of the nation. NSF not only provides core funding and essential infrastructure for basic research, it also supports the education and training of the next generation of the workforce.

AGI believes that investment in NSF programs, where funding is allocated based on scientific merit and competitive peer review, will pay important dividends in maintaining U.S. dominance in science and technology far into the future. **AGI supports funding of \$8 billion for NSF.**

NSF Geosciences Directorate: The Geosciences Directorate (GEO) is the principal source of federal support for academic earth scientists and their students who seek to understand the Earth and the processes that sustain and support life and human well-being. The Geosciences Directorate provides about 64 percent of federal funding for basic geoscience research at academic institutions and supports indispensable research infrastructure and instrumentation. Geoscience researchers study natural hazards including earthquakes, tornadoes, hurricanes, drought, solar storms, and all aspects of the air, water, ice, and rocks that define our environment and provide the raw materials for economic prosperity.

The GEO Directorate supports the entire geoscience community, which includes petroleum geologists, geotechnical engineers, ocean and atmospheric scientists, hydrogeologists, economic geologists, soil scientists, natural hazards specialists, and other experts who work with the Earth system. Most geoscientists work in the private sector, in state and federal agencies, and as consultants. The GEO Directorate helps universities to provide this skilled workforce to meet the economic, safety, and environmental needs of the nation. Research funded by GEO is contributing to the U.S. energy boom, to our understanding of the land-ocean interface, and to our fundamental understanding of the Earth processes that impact our health and safety.

AGI respectfully asks the Subcommittee to provide the Geosciences Directorate with at least \$1.4 billion for FY 2018.

NSF's Division of Polar Programs (PLR) funds basic research in the Arctic and Antarctic and manages all U.S. activities in Antarctica as a single, integrated program. The polar regions are

the focus of intense scientific and political interest as new navigation routes are opening access to resources and presenting security challenges. NSF-funded research and infrastructure are helping the United States understand environmental conditions in extreme environments, develop polar technology, and construct data-driven strategic and security policies. **AGI suggests a minimum of \$465 million for the Division of Polar Programs.**

A centralized pool of national geoscience infrastructure is an efficient way to achieve the maximum return on investment and to ensure that the nation has the equipment and expertise needed to respond rapidly to opportunities and emergencies. AGI strongly supports robust and steady funding for infrastructure and the operation and maintenance of major facilities, including the Academic Research Fleet, the continuation of the important geodetic, seismic, and related geophysical functions in the GAGE and SAGE multi-user facilities, Ocean Discovery Program, the Ocean Observatories Initiative, and the National Center for Atmospheric Research (NCAR). **AGI supports \$325 million for these essential facilities within the Geosciences Directorate.**

Directorate for Education and Human Resources: AGI's *Status of the Geoscience Workforce Report 2016* predicts a shortfall of approximately 90,000 geoscientists by 2024. NSF funding for geoscience education is essential to develop the competitive, skilled workforce that can fill this predicted gap in areas of vital national interest including energy and raw materials. Geoscience education also creates an informed citizenry prepared to make well-founded decisions about our planet and its resources. Outreach and education are important at all levels from K-12 through graduate-level education and should include formal and informal outlets to facilitate lifelong learning. **AGI strongly supports funding for geoscience education at all levels and particularly supports programs to diversify the geoscience student population and workforce such as the INCLUDES (Inclusion across the Nation of Communities of Learners that have been Underrepresented Discoverers in Engineering and Science) initiative.** AGI urges Congress to provide \$900 million for NSF's Directorate for Education and Human Resources.

Department of Commerce

National Oceanic and Atmospheric Administration: Geoscientists rely on NOAA for much of the data and long-term monitoring that enable research and rapid response for events such as hurricanes, drought, marine oil spills, and a range of coastal phenomena. The National Weather Service (NWS), Oceanic and Atmospheric Research (OAS), National Ocean Service (NOS), and the National Environment Satellite, Data and Information Service (NESDIS) programs provide the data necessary for understanding and mitigating these events and sustaining our natural resources. Extreme weather events cause major impacts throughout the country, triggering coastal erosion, landslides, and flooding. AGI supports increased, dedicated funding for NWS to support landslide hazard assessments and to reduce losses from landslides and other ground failures. We also recommend continued funding for the National Sea Grant College program, which supports applied research, education, and communication of marine and coastal science.

AGI supports \$5.85 billion for NOAA and respectfully requests that the subcommittee continue to support NOAA's observation, analysis, and research initiatives.

National Institute of Standards and Technology: Earth scientists and geotechnical engineers versed in the geosciences conduct basic research at NIST that is used by the public and private sectors to build resilient communities and stimulate economic growth. NIST research and information is essential for understanding natural hazards, identifying the infrastructure needed to build strong communities, and stimulating economic growth.

NIST is the lead agency for the National Earthquake Hazard Reduction Program (NEHRP), an interagency program responsible for the efficient coordination of research and resources to understand and mitigate earthquakes, but has received only a small portion of authorized funding in the past. **AGI strongly supports \$1 billion for NIST and urges Congress to reauthorize and fund the National Earthquake Hazards Reduction Program (NEHRP).**

Bureau of Economic Analysis and Census Bureau: AGI relies on key information from the Bureau of Economic Analysis and the Census Bureau, including the American Community Survey, when developing our analyses of the geoscience workforce. **Please maintain your support for continued, consistent statistical data collection in the Department of Commerce.**

National Aeronautics and Space Administration

NASA's fleet of Earth-observing satellites provides the data necessary to understand our dynamic planet. Scientists, farmers, industry, and emergency managers rely heavily on data gathered from space to support Earth and space weather predictions, to detect and monitor emergency situations such as volcanic eruptions, oil spills, and droughts, and to understand the links between the oceans, atmosphere, land, and biological systems. Government agencies and the private sector use NASA information intensively for decision making and in business.

Landsat satellites have been observing Earth's land surfaces continuously since 1972; geoscientists use Landsat data to monitor, predict, and react to drought, wildfires, changes in vegetation, and other changes to the Earth's surface. Data from the GRACE and SMAP missions allow scientists to calculate groundwater and soil moisture levels, providing vital information for farmers and water managers to ensure a stable supply of food and water.

AGI strongly supports the continuation of the NASA Earth Science program. Satellites and remote sensing provide unique information about the Earth's air, ice, water, land, and biological systems – information that is essential for well-informed decision making by government and the private sector. AGI recommends funding of \$2 billion for NASA Earth Science to ensure the continued collection, preservation, and dissemination of long-term, consistent datasets.

Office of Science and Technology Policy

The President must have the best possible advice on the science and technology that underpin the nation's prosperity and security. **Please support \$5.6 million for OSTP.**

Thank you for the opportunity to present this testimony to the Subcommittee. If you would like any additional information for the record, please contact Maeve Boland at 703-379-2480, ext. 228 voice, 703-379-7563 fax, mboland@agiweb.org, or 4220 King Street, Alexandria VA 22302-1502.