

American Geophysical Union  
American Geosciences Institute  
American Institute of Professional Geologists  
Columbia University  
Consortium for Ocean Leadership  
Geological Society of America  
National Association of Marine Laboratories  
Society for Mining, Metallurgy and Exploration  
Soils Science Society of America  
University Corporation for Atmospheric Research

12 November 2015

The Honorable Richard Shelby  
304 Russell Senate Office Building  
Washington, D.C. 20510

The Honorable John Culberson  
2372 Rayburn House Office Building  
Washington, D.C. 20515

The Honorable Barbara Mikulski  
503 Hart Senate Office Building  
Washington, D.C. 20510

The Honorable Mike Honda  
1713 Rayburn House Office Building  
Washington, D.C. 20515

On behalf of the above signed geoscience organizations and our tens of thousands of Earth, ocean, and space scientist members, we would like to thank you for your support in reducing the detrimental effects that sequestration has had on the American scientific effort. As you begin crafting a budget that meets the new requirements of the *Bipartisan Budget Act of 2015*, we urge you to recognize that investing in geoscience research is essential to the well-being and prosperity of the United States and its citizens.

The *Bipartisan Budget Act of 2015* provides a 5.2% increase in discretionary spending for FY 2016. We encourage you to enact spending bills that provide a parallel increase in funding for our federal science agencies, including NASA, NSF, NOAA, and USGS. A 5.2% increase in funding would help the U.S. to retain its leadership in innovation and remain prosperous economically. Without this level of growth, our federal science agencies will be unable to maintain cutting-edge research in all fields, train enough future scientists to fulfill national needs, and provide better weather forecasts. Listed below are a few examples of the types of critical missions that additional funding will allow NASA, NSF, NOAA, and USGS to pursue for the benefit of the nation:

- NASA's Earth science missions help us quantify drought in the West, respond to flooding in the South, observe land-use changes in the East, and track agricultural water use in the Midwest. These observations, and many others like them, are integral to protecting our infrastructure, food supply, and public health and safety. For example, NASA's AQUA satellite uses the "MODIS" technology to monitor dangerous algal blooms that can decimate the economies of coastal communities. These blooms, which are caused by excessive levels of nutrients, produce green slime on the surface of waters that can be seen from space and a type of cyanobacteria that is dangerous to people and animals. This technology is not only cheaper

than ground-based research, but has led to the development of an app that informs users, such as charter boat captains and water treatment plant managers, when and where harmful algal blooms are developing.

- NSF is responsible for funding the majority of our nation's basic research, which ensures the global competitiveness of the U.S. scientific enterprise. NSF funds 64% of all basic geoscience research conducted at universities. These funds are critical to supporting our future science and engineering workforce through grants for graduate- and undergraduate-level students. In 2013, the NSF Geosciences Directorate (GEO) was only able to fund 8.7 percent of the grant applications it received for positions at research experiences for undergraduates (REU) sites. The limited funding forced NSF to turn down many thousands of highly qualified students for these incredibly beneficial undergraduate learning experiences. Field research is critical to a career in many industries - such as the oil and gas industry. With an expected shortfall of 150,000 trained geoscientists by 2022, strong federal support of NSF and programs like REU is essential to prevent companies from looking outside the U.S. to fill these positions.
- NOAA combines cutting-edge research and world-class facilities to ensure that the U.S. is resilient and weather-ready. Approximately one-third of our GDP is affected by weather and the environment, and therefore many sectors of our economy rely on NOAA data. Industries such as agriculture, fisheries, and aviation rely on the agency's satellite program to deliver high-quality continuous data and its oceanographic program to provide insights on our coasts. NOAA is currently planning the next phase of its Joint Polar Satellite System (JPSS) to improve weather forecasting. Information from JPSS is essential to providing a 2-3 day warning time for severe weather events which will reduce the rate of injury and fatality.
- The U.S. Geological Survey (USGS) provides impartial information about hazards, such as earthquakes and floods, and natural resources, such as water, energy, and minerals, to keep the nation prosperous, healthy, and secure. For example, working collaboratively with health agencies, the USGS examined the airborne debris in the aftermath of the World Trade Center Attack to identify how to protect local residents and first responders. The agency is working on similar efforts to help us understand and cope with the effects of wildfires, oil and chemical spills, and flooding. The USGS National Minerals Information Center (NMIC) tracks the global flow of strategic minerals needed for telecommunications, conventional and renewable energy, agriculture, and national security. These efforts are vital because the US is increasingly reliant upon imports from countries like China to meet the national demand. From 1990 to 2014, the number of nonfuel minerals that the U.S. imports jumped from 45 to 65, and the U.S. depends entirely on foreign sources for 19 of these commodities.

In order to continue crucial and cutting edge research initiatives and put America on a path to scientific growth and progress, we ask that you provide at least a 5.2% increase in funding across NASA, NOAA, NSF, and USGS. When drafting appropriations legislation, we also urge you to avoid policy riders that deprioritize the geosciences, limit the ability of federal scientists and researchers to attend scientific and technical meetings, or restrict the use of climate data. Such riders impede the rate of scientific progress, slow economic growth, and put our national security at risk. America's economic strength, public safety, and national security depend on our commitment to invest in the Earth and space sciences.

Thank you for your consideration of our requests.