



The Honorable Richard Durbin  
711 Hart Senate Building  
Washington, DC 20510

19 March 2020

Dear Senator Durbin,

On behalf of the American Geophysical Union (AGU), a non-profit, non-partisan scientific society with a community of 110,000 Earth and space scientists, I would like to thank you for your leadership on science issues and for the opportunity to share with you AGU's appropriations requests for fiscal year 2021.

AGU appreciates Congress' continued strong support of the Earth and space sciences and urges Congress to once again recognize that sustained increases in funding for science boost our economy, enhance our national security, and help to ensure the health and prosperity of Americans. AGU recognizes that difficult decisions must be made within the constraints of the current budget environment but urges Congress to prioritize the critical work done by our federal science agencies, which yields benefits that far outweigh the costs.

AGU wishes to highlight the following agencies that play a key role in sustaining the scientific enterprise: the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), the United States Geological Survey (USGS), the Department of Energy (DOE)'s Office of Science and the Advanced Research Projects Agency- Energy (ARPA-E), and the National Institute for Environmental Health Sciences (NIEHS).

### **NOAA**

For NOAA, AGU respectfully requests that Congress appropriate \$6.06 billion. This request will help bring NOAA back to an appropriate level of funding after being severely underfunded in previous years' spending bills and proposals. Since FY2018, NOAA's funding has been cut by over 8%, and the President's FY2021 proposal would cut the agency's funding by another 13%. NOAA is essential to our nation's economic stability. In 2019 alone, the U.S. saw 14 major weather and climate disaster events that resulted in \$45 billion in damages and at least 44 deaths. For example, losses from weather-related aviation delays alone are estimated at more than \$1 billion per year, and NOAA drought forecasts are worth up to \$8 billion per year to the farming, transportation, tourism, and energy sectors.<sup>1</sup> From large corporations to small businesses, the decision-based forecasts provided by NOAA save vital time, money, and resources. NOAA provides critical products and services to citizens, planners, emergency managers, and other decision makers when they need it the most. However, NOAA has been severely underfunded in previous spending bills and proposals.

NOAA also plays a unique and vital role in supporting homeland security and national defense. The nation's intelligence community has found that intensifying climate hazards are threatening

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<sup>1</sup> NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2020). <https://www.ncdc.noaa.gov/billions/>



infrastructure, health, and water, and food security—both nationally and globally.<sup>2</sup> The Pentagon has reported continuous impacts of climate change on its missions, operational plans, and military installations, including impediments to military testing and training and an increased necessity for maintenance and repairs at dozens of critical military installations.<sup>3</sup> Without robust funding at NOAA, we risk losing the data needed to make informed and proactive decisions, and our national security will be left in a dangerously vulnerable position.

### **NASA**

For NASA, AGU respectfully requests that Congress appropriate \$7.54 billion for NASA's Science Mission Directorate and \$126.85 million for NASA's Office of STEM Engagement. Both requests represent a real four percent increase over FY2020 funding levels. Additionally, we request that Congress appropriate equitable funding increases for each of the science mission areas within NASA's Science Mission Directorate. This request will allow NASA to steadily advance existing and new decadal survey missions across the sciences, ensuring the U.S. continues to be a global leader in the Earth and space sciences.

This leadership will also require the U.S. to continue and expand STEM programs, especially the unique STEM opportunities provided by our federal science agencies. Increased funding for STEM education and opportunities at NASA will directly benefit every state in the nation by providing additional opportunities for STEM students of all ages through Space Grant, Minority University Research and Education Project (MUREP), and Established Program to Stimulate Competitive Research (EPSCoR).

### **NSF**

For the NSF, AGU respectfully requests that Congress appropriate \$9 billion, an 8.7% increase over FY2020 funding levels. Although ambitious, this level of funding will allow the United States to keep up with global investments around the world. The United States still lead the world in total research and development investments in 2017, but data indicate that China was on track to surpass U.S. investments in 2019. According to the National Science Board's 2020 Science and Engineering Indicators, "[i]ncreasingly, the United States is seen globally as an important leader rather than the uncontested leader."

A \$9 billion budget would also allow NSF to continue implementing its 10 Big Ideas effort. This innovative long-term research agenda aims to allow future generations to reap the benefits of fundamental science and engineering research, to increase support for critical technologies with major national security and economic implications such as artificial intelligence and quantum information, and to further STEM education research to effectively serve students and adapt to meet future workforce needs, among many other goals.

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<sup>2</sup> Coats, D. R., (January 29, 2019). *Worldwide Threat Assessment of the U.S. Intelligence Community*. <https://www.dni.gov/files/ODNI/documents/2019-ATA-SFR---SSCI.pdf>.

<sup>3</sup> Office of the Under Secretary of Defense for Acquisition and Sustainment, U.S. Department of Defense, (January 2019). *Report on Effect of a Changing Climate to the Department of Defense*. <https://www.documentcloud.org/documents/5689153-DoD-Final-Climate-Report.html>.



### **USGS**

For the USGS, AGU respectfully requests that Congress appropriate \$1.35 billion, a 6.2% increase over FY2020 levels. The USGS is uniquely positioned to provide information and inform responses to many of the nation's greatest challenges because of its distinctive capacity to deploy interdisciplinary teams of experts to gather data, conduct research, and develop integrated decision support tools. This capacity allows the agency to improve ecosystem management, ensure accurate assessments of water quality and quantity, reduce risks from natural and human-induced hazards, deliver timely assessments of mineral and energy resources, and provide emergency responders with accurate geospatial data and maps. The requested funding would allow the agency to sustain current efforts in scientific discovery and innovation and make strategic investments that will produce the impartial knowledge and tools needed by decision-makers across the country.

### **DOE**

For the DOE Office of Science, AGU respectfully requests that Congress appropriate \$7.4 billion, which represents a real four percent growth over FY2020 levels. Additionally, AGU requests \$497 million for ARPA-E, which is in line with the bicameral, bipartisan ARPA-E reauthorization bills. As the nation's primary sponsor of physical sciences research with a proven model for success in discovery and innovation, the DOE Office of Science plays a vital role in the American scientific ecosystem. DOE's Office of Science sponsors research programs vital to American prosperity and security at research universities and national laboratories, helps maintain the U.S. pipeline of science and engineering talent, builds world-class scientific tools and facilities, and supports the network of 17 DOE National Laboratories. The Office of Science is also a leader in advancing critical industries of the future, including quantum information science, artificial intelligence, next-generation high performance computing, advanced communications networks, future energy technologies and engineering biology. These technologies will be critical for America for at least the next several decades and share bipartisan support from Congress and the Administration.

ARPA-E plays a unique role in maintaining America's global leadership in energy technologies and our energy security. In less than a decade, ARPA-E has demonstrated remarkable success in advancing high-risk, high-reward energy technology solutions. ARPA-E's track record includes 145 projects that have received over \$2.9 billion in private sector follow-on funding. Equally notable, 76 projects have formed new companies and 131 projects have partnered with other government agencies for further development. As another indicator of success, ARPA-E projects have advanced scientific understanding and technological innovation through 2,489 peer-reviewed journal articles and 346 patents.

### **NIEHS**

For the NIEHS, AGU respectfully requests that Congress appropriate \$860.3 million, a 7.2% increase over FY2020 levels. The NIEHS plays a unique role within the NIH as the leading institute conducting research in environmental influences on human illness and disability. Its research aids the understanding, treatment, and prevention of cancer, autism, asthma, Parkinson's disease, autoimmune diseases, chemical intolerance or toxicant-induced loss of tolerance, and chemical sensitivities. NIEHS research encompasses all types of exposures that can impact human health, including air pollution, endocrine disruptors, nanomaterials, and other contaminants. The results of



NIEHS research provide policymakers with essential, unbiased science to support informed decision-making affecting our health.

AGU asks you to provide \$84 million for the Superfund Research program, which supports the NIEHS's Superfund Program (SRP), in FY2021, a 3.7% increase over FY2020 levels. The SRP supports research to address the health impacts from hazardous substances in the environment, develop clean-up technologies for hazardous waste, advance new risk assessment methods, and prepare the future generation of scientists to work in interdisciplinary research teams to tackle such problems. The SRP provides the scientific research used by the NIEHS's Worker Training Program (WTP) to train hazardous waste workers, accelerate remediation efforts, and prevent health consequences related to chemical exposure. These programs also provide the safety tools and guidance to transform contaminated sites into new opportunities for residential, industrial, and commercial ventures – which means new jobs for the surrounding communities and new sources of revenue for state and local governments.

Overall, a strong and sustained investment in the full scope of the U.S. research enterprise is essential for the future health of the country. We greatly appreciate your continued leadership in safeguarding the nation's economic strength, national security, and public health through funding for America's science agencies. Thank you for your thoughtful consideration of this request.