



Analysis of the President's Fiscal Year 2019 Budget Request for Biological Sciences Research and Education

**A Report from the American Institute of Biological Sciences
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**Prepared by:
Jyotsna Pandey, Ph.D., Public Policy Manager
Robert Gropp, Ph.D., Co-Executive Director**

Summary

On 12 February 2018, President Trump released his proposed budget for fiscal year (FY) 2019. The plan would provide \$1.2 trillion for discretionary spending. On 9 February 2018, Congress approved a two-year budget agreement to increase discretionary spending by \$300 billion over two years, raising budget caps such that an additional \$63 billion was available to appropriators for FY 2018 and an additional \$68 billion is available for FY 2019. These increases in budget authority are for non-defense discretionary spending, which includes funding for the National Science Foundation, National Institutes of Health, and other non-defense research agencies. The caps for defense spending were also raised.

The Trump Administration initially proposed to cut non-defense spending by \$65 billion, but after the bipartisan budget deal was approved, the administration reworked its initial FY 2019 budget proposal to add back \$75 billion in spending.

Congress passed and President Trump signed into law the Omnibus Appropriations Act for FY 2018 on 23 March 2018, six months into FY 2018. Details of program level funding for each agency were still emerging during the preparation of this report. Therefore, this analysis compares budget allocations in the FY 2019 budget request with FY 2017 enacted spending levels.

Most federal science agencies would receive budget cuts in FY 2019 if the President's budget is enacted. The administration proposes \$156.8 billion for federal research and development, essentially level with FY 2017 funding and 11.3 percent below the FY 2018 level. The proposed funding is subject to congressional appropriations.

A Primer on the Federal Budget

Federal spending can broadly be categorized as discretionary or mandatory spending.

Congress determines discretionary spending on an annual basis through the appropriations process. Collectively, twelve pieces of legislation fund the federal government—everything from the military to national parks to research. Lawmakers set discretionary funding limits in authorizing legislation. Appropriations are then made within the threshold set by the authorizing legislation.

Funding for mandatory programs, however, is controlled by laws outside of the appropriations process. Examples include Social Security, Medicare, and certain agriculture programs. Congress would have to change these laws in order to change the funding level for these programs.

Mandatory spending has been a growing proportion of the federal budget. Approximately 60 percent of government spending is for mandatory programs.

Budget Sequestration

Since 2013, discretionary spending has been constrained by spending caps, which limit the total amount of federal funding for defense and non-defense programs each year. In November 2015, lawmakers negotiated a deal to increase the spending caps by \$80 billion for two years, which resulted in slight increases in federal spending for FY 2016 and 2017.

In February 2018, Congress approved a two-year budget agreement to raise the cap on discretionary spending by \$300 billion over two years. Under the Bipartisan Budget Act of 2018, non-defense discretionary spending -- the largest source of research funding -- will grow by \$63 billion in FY 2018 and can increase by \$68 billion in FY 2019.

Several agencies, including the National Science Foundation (NSF), the Environmental Protection Agency (EPA), the National Aeronautics and Space Administration (NASA), and the National Institutes of Health (NIH), that are funded under the discretionary budget might now be able to receive new funding in FY 2019.

Only discretionary funding is reported in this document.

All calculations in this report are relative to the FY 2017 enacted level, unless otherwise noted.

Agency Budget Summaries

United States Department of Agriculture (USDA)

- *Department of Agriculture request: \$19.9 billion (-\$6.1 billion)*
- *Research, Education, and Economics request: \$2.5 billion (-\$408 million)*

The proposed budget for research, education, and economics is 14 percent below the FY 2017 level.

The National Institute of Food and Agriculture (NIFA) partners with extramural academic institutions to conduct research, education, and extension activities. NIFA would receive \$1.3 billion (-8 percent) in FY 2019. Within NIFA, the Agriculture and Food Research Initiative (AFRI) would receive level funding at \$375 million for competitive extramural research grants. Lower priority programs such as Renewable Resources Extension Act (-\$4 million), Animal Health and Disease Research (-\$4 million), and the Food and Agriculture Defense Initiative (-\$8 million) would be eliminated. Sustainable Agriculture Research/Education and Extension is slated to receive \$19 million (-\$8 million) in FY 2019. The Expanded Food and Nutrition Education program would receive a \$13 million cut, and other higher education programs would also be slashed by 50 percent.

The Agricultural Research Service (ARS) conducts intramural research in the areas of natural and biological science. It would receive \$1 billion in FY 2019, \$250 million below FY 2017. Funding for all eight research areas within ARS would be decreased, resulting in an overall budget of \$925 million (-\$200 million) for research. Research in support of environmental stewardship would receive \$194 million (-\$23 million). Lower priority and extramural research would be eliminated. The request proposes the closure of twenty labs and worksites across the country including the New England Plant, Soil and Water Research Laboratory in Maine, the Biological Control of Insects Research Unit in Missouri, and the Crop Protection and Management Research Unit in Georgia. The budget includes \$42 million in additional funding to replace the Plum Island Disease Center with the National Bio- and Agro-Defense Facility, focused on the study of emerging animal diseases.

USDA Forest Service

- *Forest Service request: \$4.8 billion (-\$864 million)*
- *Forest and Rangeland Research request: \$261 million (-\$27 million)*

Funding for Forest Service research would decrease by 9.6 percent, and the agency's overall budget would decline by 15.3 percent. Research funding has been depressed since FY 2010, when program funding hit a high of \$312 million.

Nearly all Forest Service research program areas are targeted for budget cuts

compared to the FY 2018 continuing resolution (CR), including invasive species (-10 percent); wildlife and fish (-9 percent); water, air, and soil (-14 percent); wildland fire and fuels (-32 percent); inventory and monitoring (-20 percent); and resource management and use (-23 percent). National Fire Plan (\$14.8 million) would be moved from Wildland Fire Management into Forest and Rangeland Research in FY 2019.

Priority areas include the management of National Forest System lands and the agency's wildland fire suppression efforts. The Recreational R&D account would receive a boost of 135 percent compared to FY 2018 CR to develop knowledge and tools to inform decisions that improve outdoor recreation opportunities and sustain healthy ecosystems. Approximately \$75 million would be provided for Forest Inventory and Analysis for the collection, coordination, and assessment of field inventory data across the country.

Department of Commerce

National Oceanic and Atmospheric Administration (NOAA)

- *NOAA request: \$4.6 billion (-\$1.1 billion)*

Under the President's budget, funding for NOAA would be cut by 19.6 percent. The budget prioritizes timely and accurate weather forecasts and warnings, continued collection of vital data, efforts to manage and conserve marine resources, and safe and efficient ocean and coastal navigation.

The Office of Oceanic and Atmospheric Research would receive \$322 million, a 37 percent cut from the 2017 enacted level. Climate research activities would be slashed by \$40 million to \$98.6 million, ending competitive grants for climate-change research and studies aimed at understanding the impacts of global warming on the Arctic.

NOAA's Air Resources Laboratory in College Park, Maryland, which studies air chemistry and atmospheric transport of hazardous chemicals, would also be eliminated under the request. The plan calls for closing the Unmanned Aircraft Systems Program Office (-\$5.3 million) that supervises the use of aircraft for weather, polar, and marine observations.

The National Marine Fisheries Service would receive an 11 percent reduction in discretionary funding to \$810 million, with significant cuts to Protected Resources Science and Management, Fisheries Science and Management, and Habitat Conservation and Restoration.

The FY 2019 budget proposes decreased funding for the National Ocean Service (-26 percent). Large cuts are proposed for coastal science and management as well as navigation, observations, and positioning activity.

The request would eliminate \$273 million in grants, including the National Sea Grant College Program, the National Estuarine Research Reserve System, coastal zone management grants, and the Pacific Coastal Salmon Recovery Fund. The National Sea Grant College Program supports more than thirty American universities that conduct research, education, and training programs on ocean-related topics. The budget proposes to close the Office of Education (-\$26.8 million), which is responsible for competitive education grants (-\$5 million), an educational partnership program with minority serving institutions (-\$14.3 million), and watershed education and training programs (-\$7.4 million).

National Institutes of Standards and Technology (NIST)

- *NIST request: \$629 million (-\$325 million)*
- *Science and Technical Research Services request: \$573.4 million (-\$116.6 million)*

NIST would receive a 34 percent budget cut, with all of its accounts being significantly reduced.

The Scientific and Technical Research Services account would receive a 16.9 percent cut. Laboratory programs would receive \$516.6 million (-14.5 percent). Within lab programs, 325 staff positions, including 200 technical positions, would be cut in FY 2019. This represents a 10 percent reduction to the number of scientists and engineers at the agency. Most of the lab program areas, including health and biological systems measurements, would be reduced by nearly 20 percent.

The budget for the Strategic and Emerging Research Initiative Fund would be reduced by 23 percent. The National Measurement and Standards Laboratories would receive a 15.8 percent cut. The postdoctoral research program would see a 6 percent increase to \$13.9 million.

The Industrial and Technology Services account would receive \$15.1 million, which equates to a 90.1 percent budget cut. The budget further proposes a 63 percent cut to construction of research facilities, which would receive \$40.5 million.

Department of Energy (DOE)

DOE Office of Science

- *DOE request: \$30.6 billion (+\$521.9 million)*
- *Office of Science request: \$5.4 billion (no change)*
- *Biological and Environmental Research request: \$500 million (-\$112 million)*

DOE Office of Science is slated to receive flat funding in the President's budget request. \$2.2 billion or 40 percent of the budget would be reserved for research, with advanced

scientific computing research receiving \$899 million, an increase of \$252 million or 39 percent. \$2.1 billion would be directed to the operation of national labs and scientific instruments.

Funding for Biological and Environmental Research (BER) would be decreased by 18.3 percent, with funds directed to research in foundational genomic sciences, including the four bioenergy research centers, core research in earth and environmental sciences, and continued operation of three user facilities. The proposed level of funding for BER would be the lowest the program has received since FY 2007.

The request prioritizes core research activities within the Biological Systems Science, which would receive \$318.5 million, an increase of \$11.8 million. Support would decrease for foundational genomics research (-\$9.6 million), environmental genomics (-\$9.5 million) and computational biosciences (-\$0.4 million), but the Bioenergy Research Centers (+25 million) would receive a 33 percent boost, resulting in an overall increase in funding for Genomic Science (+5.5 million). The Biomolecular Characterization and Imaging Science account would receive a \$5.3 million boost.

Earth and Environmental Systems Sciences (formerly Climate and Environmental Sciences) would be cut by \$123.8 million to \$181.5 million, with funding reduced substantially for all accounts including atmospheric systems research (-\$13.4 million), environmental system science (-\$43.2 million), earth and environmental systems modeling (-\$56.9 million), and facilities and infrastructure (-\$4.7 million). Environmental system science supports the study of terrestrial ecosystems, including the Arctic.

Two of the BER scientific user facilities, namely the Joint Genome Institute and Atmospheric Radiation Measurement Research Facility, would receive slight increases in funding. Support for the third facility, the Environmental Molecular Sciences Laboratory, would be slightly reduced.

Budget for basic energy sciences would be slightly decreased by \$21.5 million to \$1.85 billion. Science Laboratories and Infrastructure is slated to receive \$126.9 million, a decrease of \$3.1 million, with the funds directed towards new construction projects at the Argonne and Brookhaven National Labs as well as ongoing construction efforts.

Workforce development for teachers and scientists would be cut by \$0.5 million to \$19 million, with funds targeted towards programs that place qualified students in STEM learning opportunities at Department of Energy laboratories as well as the National Science Bowl competition.

Environmental Protection Agency (EPA)

- *EPA request: \$6.1 billion (-\$1.9 billion)*
- *Science and Technology request: \$449 million (-\$274.6 million)*

Spending at EPA would decrease by 24 percent in the proposed budget. This would be the smallest budget for the agency since the 1990s. The number of full-time-equivalent staff positions would decrease from 15,416 in FY 2017 to 12,250 in FY 2019.

Funding for science and technology programs would be slashed by 37 percent, with cuts to climate change research and other environmental programs.

Within the Office of Research and Development, funding for research for sustainable and healthy communities would decline to \$52.5 million (-63.1 percent). Support would be targeted to research on contaminated sites, oil spills, and waste management. Funds would also support research efforts in ecosystems services and *EnviroAtlas*, a web-based tool for ecosystems services. The request eliminates research on toxicology, chemical exposure, and health impacts of planned infrastructure.

Support for research on safe and sustainable water resources would decrease by 36 percent. Most of the support would be directed to research in areas of nutrient management, impacts of harmful algal blooms, watersheds, and water infrastructure.

Chemical safety and sustainability research would be cut by 35 percent, with a decline in research on toxicity. The air and energy research budget would be reduced by 65 percent, with climate change research eliminated and air quality research significantly reduced.

A congressionally directed competitive grant program to support water quality research would be eliminated, resulting in savings of \$7.8 million. The agency also proposes to end the Science to Achieve Results (STAR) program, which funds research grants and graduate fellowships in environmental science and engineering, citing existence of duplicative programs within other federal agencies.

Other eliminated programs include the Atmospheric Protection Program; Global Change Research, which develops climate-change related scientific information to inform decision-making; and WaterSense, which aims to reduce water-use.

Department of Health and Human Services

National Institutes of Health (NIH)

- *NIH request: \$34.8 billion (+\$538 million)*

The President's budget proposes a slight increase of 1.6 percent for NIH. Most of the proposed increase would be allocated to consolidating within NIH three Department of Health and Human Services (HHS) agencies that fund research on healthcare quality, occupational health, and disabilities.

The budget consolidates the activities of HHS' \$324-million Agency for Healthcare Research and Quality within the NIH as the National Institute for Research on Safety

and Quality (+\$380 million). The plan would also transfer the National Institute of Disability, Independent Living, and Rehabilitation Research (+\$95 million) and the National Institute of Occupational Safety and Health (+\$225 million) into NIH.

The Office of the Director would receive increased funding of \$298 million or 17 percent. The Next Generation Researchers Initiative (NGRI), started in FY 2017 to address longstanding challenges faced by early-stage investigators, would receive \$100 million in dedicated funding within the Office of the Director which can be used by the agency's institutes and centers to supplement their NGRI efforts.

The National Institute of Neurological Disorders and Stroke (+3.4 percent), National Institute of Mental Health (+0.4 percent), and the National Institute on Drug Abuse (+6.2 percent) would receive very slight increases in funding. The buildings and facilities account would be boosted by 55 percent to \$200 million. All other institutes and centers are slated for reduced funding.

The Big Data to Knowledge (BD2K) initiative, launched by NIH in 2012, is entering its final stages and would receive \$30 million to begin the next phase of data science activities. The budget allocates \$50 million for prize competitions authorized by the America COMPETES Reauthorization Act of 2010 focusing on innovations that advance biomedical science and improve health.

The request proposes two initiatives to stretch NIH research funding -- capping at 90 percent the percentage of salary an investigator can draw from an NIH grant and reducing the maximum salary paid with NIH grant funds from \$187,000 to \$152,000.

The budget proposal also includes \$750 million in additional funding for NIH to deal with the opioid crisis. Of this, \$400 million would be allocated to investing in a public-private partnership to find new treatments and alternative medications.

Department of the Interior

United States Bureau of Land Management (BLM)

- *BLM request: \$1 billion (-\$222 million)*
- *Management of Lands and Resources request: \$930.6 million (-\$164.8 million)*

The budget for BLM would be cut by 17.6 percent in FY 2019. Support for Management of Lands and Resources would also be decreased by 15 percent.

A new Wildlife and Aquatic Habitat Management activity would receive \$119.4 million in funds transferred from multiple eliminated accounts.

The Land Resources activity would be cut by 30.7 percent. Under Land Resources, the account for management of soil, water, and air resources (-\$43.6 million), which includes a climate change program (-\$15 million), would be eliminated. A \$10 million

transfer from the Soil, Water, and Air Management account to the Rangeland Management account, which would receive an overall boost of 3.9 percent. Public Domain Forests Management would receive a small cut (-\$0.5 million), while Riparian Management (-\$21.3 million) would be eliminated.

The Wildlife and Fisheries Management activity (-\$115.8 million), along with Threatened and Endangered Species management (-\$21.6 million) would be eliminated, with a substantial portion of their funds being transferred to the new Wildlife Habitat Management account (\$81.8 million). The new Aquatic Habitat Management account (\$37.7 million), would receive funds through transfers from the eliminated Riparian Management, Fisheries Management, and Soil, Water, and Air Management accounts.

National Monuments and National Conservation Areas would receive \$26.3 million (-29 percent). The Resource Protection and Maintenance activity would receive a \$40.7 million cut, with its Abandoned Mine Lands account (-\$20 million) and Hazardous Materials Management account (-\$15.4 million) being consolidated with \$13.3 million in funding.

United States Fish and Wildlife Service (USFWS)

- *USFWS request: \$1.2 billion (-\$287 million)*

The proposed budget includes a 19 percent overall cut for the U. S. Fish and Wildlife Service (USFWS). The USFWS is the federal agency with primary responsibility for the management of biological resources. It is charged with protection of endangered species, migratory birds, marine mammals, and other fish and wildlife species.

The Resource Management account would receive \$1.1 billion (-\$128 million), with habitat conservation receiving a 35 percent cut and ecological services receiving a 12 percent cut. Ecological Services Listing uses scientific information to identify plant and animal species that are in danger of extinction or likely to become extinct and therefore require protection under the Endangered Species Act. The Listing activity would receive \$10.9 million, a reduction of \$9.6 million from FY 2017, to focus on the recovery of the more than 1,660 species listed as threatened or endangered, nearly 400 of which were listed between 2010 and 2017.

The USFWS budget for Science Support would be eliminated (-\$17 million), with future science needs being addressed by each Service program as needed. Accounts for wildlife refuge management, migratory bird management, fish and aquatic conservation, and general operations would all receive decreased support.

United States Geological Survey (USGS)

- *USGS request: \$860 million (-\$225.5 million)*
- *USGS Ecosystems Activity request: \$96.1 million (-\$63.6 million)*

The budget for the USGS would be cut by 20.7 percent in FY 2019. Funding decreases have been proposed for USGS programs across the board, with the exception of facilities.

Funding for the Water Resources program would be reduced by 23 percent, with the Water Resources Research Act program zeroed out. Support for the Natural Hazards program would also be slashed by 19 percent. This includes programs to monitor earthquakes and volcanoes, which would each be slashed by 21 percent. Other programs would also see deep cuts, with the Ecosystems budget reduced by 40 percent, Core Science Systems reduced by 20 percent, and Science Support programs cut by 15 percent.

The Ecosystems mission area would receive \$96.1 million. The request includes \$33.4 million (-\$12.6 million) for Wildlife programs, \$17.1 million (-\$234,000) for Invasive Species, \$11.3 million (-\$9.1 million) for Status and Trends, \$9.7 million (-\$11.4 million) for Fisheries, and \$24.6 million (-\$12.8 million) for Environments programs to support the Interior Department and other land managers' understanding and management of species and habitats.

Funding for the Cooperative Research Units, which conduct actionable science, provide technical assistance, and develop scientific workforce through graduate education and mentoring programs, would be eliminated. Funding for Museum collections, which supports the Biological Survey Unit (BSU), a group of USGS scientists stationed at the Smithsonian Institution's National Museum of Natural History, would also be zeroed out. Established in 1885, the BSU maintains an extensive collection of bird, reptile, and mammal specimens.

The request does not include any funding for the Whooping Crane program and would eliminate the unconventional oil and gas research program that supports research on the ecological effects of fracking. Support for ecosystems research in the Chesapeake Bay (-\$3.7 million), Everglades (-\$5.9 million), and the Arctic (-\$1.6 million) would also decline.

Under the Energy and Mineral Resources mission area, the request would allocate \$84 million (+\$11 million) to the Energy and Mineral Resources programs, a 15 percent increase from the 2017 level, while providing no funds for the Environmental Health program. The plan also includes a new "administrative initiative to help spur critical mineral resource development" for economic growth and national security.

The agency's current "Climate and Land Use Change" program would be restructured and renamed to "Land Resources", which would focus on land imaging, land change science, and climate change adaptation. The plan would provide \$13 million (-\$12.4 million) in funding for the National and Regional Climate Adaptation Science Centers (formerly regional Climate Science Centers), responsible for developing science and tools to address effects of climate change on land, water, wildlife, fish, ecosystems, and communities. Climate research and development would be reduced by \$8.9 million.

The plan would also provide \$73 million to support satellite operations, including continuing ground system development for launching Landsat 9 in partnership with the National Aeronautics and Space Administration in 2021.

The budget provides \$112 million for facilities, an increase of \$12 million over the 2017 level. The increase would be allocated to relocation of some activities from the Menlo Park campus to Moffett field, California, a part of the NASA Ames Research Center to facilitate collaboration between the agencies.

National Science Foundation (NSF)

- *NSF request: \$7.47 billion (-\$32.1 million)*
- *Research and Related Activities request: \$6.2 billion (+\$144.2 million)*
- *Major Research Equipment and Facilities Construction request: \$94.7 million (-\$128.1 million)*
- *Education and Human Resources request: \$873.4 million (no change)*
- *Biological Sciences Directorate request: \$738.2 million (-\$4.1 million)*

The President's budget request for NSF would provide a 0.4 percent decrease compared to the FY 2017 appropriation.

Funds directed to research would see a boost of \$144.2 million. However, most research directorates across the agency would receive decreased funding, with the exception of Geosciences (+3.3 percent), Office of Polar Programs (+14 percent), and Integrative Activities (+27.7 percent). Funding for the BIO directorate would decrease by 0.5 percent. Education activities would receive flat funding.

NSF would accelerate its "10 Big Ideas for Future Investments," allocating support to high-priority areas that integrate science and engineering fields and create partnership opportunities with industry, private foundations, other federal agencies, and the education sector. The agency would provide \$30 million to each of the six research-focused Big Ideas, that include Understanding the Rules of Life (URoL): Predicting Phenotype; Navigating the New Arctic (NNA); The Future of Work at the Human Technology Frontier (FW-HTF); and Harnessing the Data Revolution (HDR), among others, for a total of \$180 million. The remaining four, aimed at enhancing processes to improve U.S. science and engineering, would receive \$102.5 million. Additionally, NSF would invest \$60 million in two Convergence Accelerators directed towards HDR and FW-HTF in FY 2019 to "leverage resources across the agency to support the most innovative science."

Support for Agency Operations and Award Management would be decreased by 12.7 percent, due to the completion of the construction and relocation of NSF's new headquarters to Alexandria, VA.

The Education and Human Resources (EHR) Directorate would receive flat funding at \$837.4 million. Within EHR, the Division of Graduate Education would receive \$256

million (-5 percent) and the Division of Undergraduate Education would receive \$224.65 million (-2 percent). Support for human resource development would increase by 25 percent to \$187.2 million. NSF's investments in the STEM workforce would be cut by 10 percent to \$423 million.

Support for Major Research Equipment and Facilities Construction (MREFC) would be decreased by 57.5 percent as a result of completion of the construction of the National Ecological Observatory Network (NEON) and no new projects or transfers being planned in FY 2019. The request for MREFC includes funding to continue construction of two telescopes, the Daniel K. Inouye Solar Telescope and the Large Synoptic Survey Telescope, as well as two Regional Class Research Vessels, which provide scientific infrastructure to enable better understanding of the impacts of storm surges and tsunamis; natural resource identification and extraction; and fisheries and aquaculture.

NSF's cross-disciplinary initiatives would remain flat or decline in FY 2019. Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS), which supports research on the natural, social, and human-built factors involved in these interconnected systems, would receive \$16.4 million, a 70.6 percent decrease from FY 2017. This is because of a planned decrease in activities and support for INFEWS-related research being moved to Big Ideas and programs across the agency. The NSF Innovation Corps, which improves researchers' access to resources that help transfer knowledge to downstream technological applications, would receive \$30 million (+0.5 percent).

Cross-cutting programs would receive funding cuts all across the board. The Long-Term Ecological Research (LTER) network would receive \$29.1 million (-6 percent). The Research Experiences for Undergraduates program would be slashed by 15.1 percent. Graduate Research Fellowships would be cut by 15.3 percent to \$270 million and support for NSF's Research Traineeship program would be decreased by 1.4 percent to \$52.1 million. Support for Faculty early career development programs would also be cut by 10.9 percent.

NSF's Biological Sciences Directorate

The proposed 0.5 percent cut for the Biological Sciences Directorate (BIO) is the smallest cut proposed for an NSF research directorate on a percentage basis.

The number of BIO research grants awarded and the median award size would decrease slightly from FY 2017. The funding rate for BIO research grants is expected to decrease to 18 percent, a figure that does not include the pre-proposal process.

NSF's request would provide \$738.2 million in spending for BIO, which provides 69 percent of federal funding for fundamental non-medical biological research at academic institutions. Within the request for BIO, funding would be allocated to the five divisions as follows:

- Molecular and Cellular Biosciences: \$137.7 million (+0.5 percent)
- Integrative Organismal Systems: \$185 million (-14.2 percent)

- Environmental Biology: \$146.2 million (+0.5 percent)
- Biological Infrastructure: \$175.1 million (+34.4 percent)
- Emerging Frontiers: \$94.2 million (-17.2 percent)

Spending priorities for BIO would focus on Understanding the Rules of Life (URoL), National Ecological Observatory Network (NEON), and Understanding the Brain (UtB), which includes the BRAIN initiative. URoL, first introduced in 2017, would continue to emphasize research on relationships between genotype and phenotype in plants, animals, and microbes in FY 2019. NEON is scheduled to complete construction in fall 2018, at which point the BIO directorate will assume responsibility for funding all on-going operations and oversight. NEON would receive \$65 million in FY 2019, an increase of almost \$15 million from FY 2017, with their operations and maintenance funding included in the budget for the Division of Biological Infrastructure.

Workforce development programs within BIO would receive decreased support. Support for CAREER grants to support young investigators who excel as educators would decrease by 1.9 percent.

The directorate would solicit advice on emerging research using biological research collections, either vouchered biodiversity specimens or living stocks, and the digitized data and metadata for the collections. This assessment would guide future directorate investments.

Smithsonian Institution

- *Smithsonian Institution request: \$957 million (+\$94.1 million)*

Federal support for the Smithsonian Institution would increase by 11 percent. Smithsonian is also funded by private donations and a trust fund. Most of the increased support would be allocated to Facilities Capital (+\$85.6 million) to fund the renovation of the National Air and Space Museum.

The National Museum for Natural History would receive \$3.5 million under the Facilities Capital account to continue major revitalization work. Increased funding of \$5 million has been proposed for facilities maintenance to update security equipment and address the maintenance backlog.

Funding for preservation of collections would remain essentially flat at \$69.8 million. Digitization of collections to make them accessible online would remain a priority and would also receive level funding.

Essentially level funding is proposed for most of ongoing activities, including the research programs, efforts in digitization, public programs for dissemination of information, exhibitions, and educational programs.

The Smithsonian Environmental Research Center (SERC) conducts research on land and water ecosystems in the coastal zone and would receive \$4.2 million (+\$56,000). The Smithsonian Tropical Research Institute (STRI), which works towards understanding the biological and cultural diversity in the tropics would also receive a slight boost of \$142,000 to \$14.5 million. The Marine Global Earth Observatories (GEOs), which assess the health of coastal areas and the oceans to determine how to manage these resources, have six new sites scheduled to be added to the network in FY 2019. This would bring the total number of active Marine GEO sites to 15.

What's Next?

The President's budget request is only a proposal; it does not have binding authority. Congress uses the President's budget request as a starting point for their budget negotiations. Congress has already begun their consideration of the FY 2019 budget, although it will be several months before any final decisions are made.

About AIBS

The American Institute of Biological Sciences is a nonprofit 501(c)(3) scientific association dedicated to advancing biological research and education for the welfare of society. AIBS works to ensure that the public, legislators, funders, and the community of biologists have access to and use information that will guide them in making informed decisions about matters that require biological knowledge. The organization does this through informing decisions by providing peer-reviewed or vetted information about the biology field and profession and by catalyzing action through building the capacity and the leadership of the community to address matters of common concern.

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