

# ANALYSIS OF THE PRESIDENT'S FISCAL YEAR 2024 BUDGET REQUEST FOR BIOLOGICAL SCIENCES RESEARCH AND EDUCATION

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## SUMMARY

On March 9, 2023, President Joe Biden released his proposed budget for fiscal year (FY) 2024. The plan would provide \$1.7 trillion for discretionary spending, of which \$809 billion (+6 percent) would be allocated to non-defense discretionary spending and 886 billion (+3 percent) to defense spending. Non-defense discretionary spending includes funding for the National Science Foundation, National Institutes of Health, and other non-defense agencies.

All federal science agencies would receive budget increases in FY 2024 if the President's budget is enacted. The administration proposes \$210 billion for federal research and development, an increase of 4.4 percent relative to the FY 2023 enacted level. The proposed budget is subject to congressional appropriations.

Congress completed FY 2023 appropriations on December 29, 2022, nearly three months into the fiscal year. This analysis compares budget allocations in the FY 2024 budget request with FY 2023 enacted spending levels.

# A PRIMER ON THE FEDERAL BUDGET

Federal spending is broadly categorized as discretionary or mandatory.

Congress determines discretionary spending on an annual basis through the appropriations process. Collectively, twelve pieces of legislation (appropriations bills) fund the federal government — everything from the military to national parks to research.

Discretionary spending limits for various programmatic areas are established by a joint budget resolution adopted by Congress. These levels are informed by the recommendations of authorizing committees and political priorities. Each appropriations subcommittee is provided with a budget threshold within which they must fund the programs under their jurisdiction.

Funding for mandatory programs is controlled by laws outside of the appropriations process. Examples include Social Security, Medicare, and certain agriculture programs.

Mandatory spending has been a growing proportion of the federal budget for decades. Approximately two-thirds of the federal budget is allocated to mandatory spending programs.

## PLEASE NOTE:

Only discretionary funding is reported in this document. Calculations in this report are relative to the FY 2023 enacted level.

# AGENCY BUDGET SUMMARIES

## United States Department of Agriculture (USDA)

- *Department of Agriculture request: \$32.6 billion (+\$4.7 billion)*
- *Research, Education, and Economics request: \$4.2 billion (+\$295 million)*

Overall, USDA is proposed to receive a 14.4% increase; agricultural research is slated to receive a smaller increase. Climate change and clean energy continue to be major focal points for the Department, with \$350 million directed for climate science and research.

Intramural agricultural research in the Agricultural Research Service (ARS) is proposed to receive \$1.9 billion (+5.5 percent). Funding for research activities and other ARS programs would increase by \$194 million, but funding for buildings would be cut by \$91 million.

Significant increases would be directed to clean energy (+\$83 million), climate science (+\$88.5 million), and supporting the Cancer Moonshot (+\$20 million). For ARS base programs, the Environmental Stewardship and New Products divisions would see the largest increases. Within Environmental Stewardship, new funding is proposed for climate science and greenhouse gas monitoring, including establishing new climate hubs in Alaska and Hawaii, thereby adding to the existing network of 10 hubs. The Climate Hub Fellows initiative would be expanded to attract early career experts in needed scientific domains.

Some of these increases would be offset by shifting \$73.4 million in ongoing research “to meet higher priority research demands.” Cuts are proposed in every ARS research division, although Crop Protection is the only division that would see an overall funding decrease.

The Long-Term Agroecosystem Research (LTAR) Network would receive \$18 million in new funding, including establishing a new site in California; new research projects in Alaska, Hawaii, and the Southern Great Basin; and support for new climate sensors and data standardization.

The National Bio and Agro-Defense Facility could see an increase of \$13 million. This state-of-the-art biocontainment facility will be used to research emerging animal diseases.

The National Institute of Food and Agriculture (NIFA) partners with academic institutions to conduct extramural research, education, and extension activities. NIFA would be funded at \$1.9 billion (+9.1 percent) in FY 2024. Within NIFA, competitively awarded extramural research supported by the Agriculture and Food Research Initiative (AFRI) would receive a proportionally larger increase to \$550 million. In addition to addressing climate change and clean energy, targeted investments are proposed to promote food and nutrition security and assist underserved communities.

In terms of education, \$372 million is dedicated to creating career development opportunities for the next generation of scholars at Minority-Serving Institutions. The budget also includes \$10 million to help address the backlog of facility needs at land-grant universities.

## USDA Forest Service

- *Forest Service request: \$9.7 billion (+\$2.6 billion)*
- *Forest and Rangeland Research request: \$349.1 million (+\$41.8 million)*

Wildfire management continues to be the major focus of Forest Service activities, representing more than half of total funding for the agency and the largest single destination of new funding.

Research activities at the Forest Service would see an increase of 13.7 percent, including \$20.5 million for research related to climate mitigation, adaptation, and resilience on forests. More specifically, the agency will pursue research on nature-based solutions for climate risk reduction, carbon sequestration, wildfire prediction, and watershed restoration.

The Forest Service will continue supporting five Climate Hubs as part of USDA's network of regional research partnerships.

Notably, the agency is elevating the number of peer-reviewed publications authored by Forest Service researchers to a key performance indicator. This number has previously been tracked internally. The Forest Service also plans to accelerate scientific information transfer to land management agencies, private landowners, and agricultural producers on scientifically sound climate adaptation practices.

## Department of Commerce

### National Oceanic and Atmospheric Administration (NOAA)

- NOAA request: \$6.8 billion (+\$450.5 million)

Under the President's budget, NOAA would receive a 7 percent increase. Nearly \$1 billion of the agency's total request would be invested in research and development, and another \$300 million on science equipment and facilities.

Once again, NOAA's weather and climate observation satellites garner a significant portion of the overall increase proposed for the agency (+\$363 million).

Nearly \$80 million is requested for building a "climate-ready nation." A comparable amount would be used to bolster the "new blue economy" such as offshore wind, ocean and coastal mapping, and weather and space infrastructure to support fisheries, shipping, and livelihoods.

The Office of Oceanic and Atmospheric Research would be funded slightly below the FY 2023 enacted level (-1 percent), driven by the removal of congressionally directed projects accounts. Notable new funding includes \$3.5 million for regional climate science partnerships and \$0.6 million for extramural competitive research awards through the National Oceanographic Partnership Program. Support for the National Sea Grant College Program, which supports universities that conduct research, education, and training programs on ocean-related topics, would remain essentially flat.

In spite of an overall 6 percent reduction in discretionary funding, the National Ocean Service plans to invest an additional \$18 million in the National Marine Sanctuary System, \$4 million in Arctic science, \$3 million in ocean and coastal mapping, and \$6 million for foundational science to plan for offshore wind energy. Program cuts are proposed for geospatial modeling grants, the Cooperative Institute for Research to Operations in Hydrology, and certain congressionally directed spending. Other requested cuts for coastal resilience and coastal zone management grants would be offset by funding included in the Bipartisan Infrastructure Law.

The National Marine Fisheries Service would see a 2 percent increase. New funding is proposed to mitigate the effects of planned offshore wind on NOAA's scientific surveys (+\$15 million.) Other activities that would see additional funding include use

of climate science in fisheries management (+\$10 million), assessing impacts of offshore wind on protected species (+7 million) and fisheries (+\$7 million), and Endangered Species Act consultations (+\$3 million). The largest reduction would come from congressionally directed funding for industry grants.

The Office of Education would essentially be flat funded at \$35.7 million.

## National Institutes of Standards and Technology (NIST)

- *NIST request: \$1.63 billion (+\$4.7 million)*
- *Science and Technical Research Services request: \$995 million (+\$42 million)*

NIST is charged with promoting U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology. The agency would receive a nearly flat (+0.3 percent) budget in FY 2024.

The Scientific and Technical Research Services account would grow by 4 percent. The budget proposes new investments in key national priority areas, including climate and environmental sustainability (+\$5.5 million); advancing research in critical and emerging technologies, including biotechnology (+\$20 million); cybersecurity (+\$20 million); resilient domestic supply chains (+\$8 million); and diversity, equity, inclusion, and accessibility initiatives (\$+2.2 million). Laboratory programs, which provide industry, academia, and other federal agencies with research capabilities in measurement science, would receive \$860 million (+7 percent).

The Industrial Technology Services account would grow from \$212 million in FY 2023 to \$375 million, which translates to a 77 percent budget increase. Major new investments are proposed for its manufacturing programs: Manufacturing USA (+\$60 million) and Manufacturing Extension Partnership (+\$101 million).

The budget proposes a 43 percent cut to the Construction of Research Facilities account, which would receive \$262 million for the repair and revitalization of NIST facilities.

## Department of Energy (DOE)

### DOE Office of Science

- *DOE request: \$52 billion (+6.2 billion)*

- *Office of Science request: \$8.8 billion (+\$700 million)*
- *Biological and Environmental Research request: \$932 million (+\$23 million)*

DOE Office of Science is slated to receive a 9 percent boost in FY 2024. The Office supports both scientific research and design, development, construction, and operation of scientific user facilities. Approximately 32,000 researchers located at over 300 institutions and 17 DOE national laboratories are supported by grants from the Office of Science.

The FY 2024 request proposes increased investments in Administration priorities such as basic research on climate change and clean energy, including fusion energy, and increasing participation from underrepresented groups in research activities. The request also provides continued support for quantum information science, artificial intelligence, machine learning, microelectronics, and biopreparedness.

The Office of Science will increase support for its office-wide initiatives of Funding for Accelerated, Inclusive Research (FAIR) and Reaching a New Energy Sciences Workforce (RENEW). The FAIR initiative (+38 percent) is focused on enhancing research on clean energy, climate, and related topics at Minority Serving Institutions, while RENEW (+78 percent) aims to broaden participation and increase retention from underserved communities across research activities.

The Biopreparedness Research Virtual Environment initiative, which enables multidisciplinary research collaborations to respond to future pandemics and other biological threats, would see its budget grow from \$60 million to \$64 million. Another cross-cutting initiative, Energy Earthshots, which supports science at the nexus of clean energy production and climate change, would receive a 75 percent boost in funding.

Among the Office of Science's six research programs, fusion energy sciences would receive the largest boost (+33 percent), with biological and environmental research receiving only a small increase of 2.5 percent. Smaller increases are also proposed for the other research programs, including basic energy sciences (+6 percent), advanced scientific computing research (+5 percent), high energy physics (+5 percent), and nuclear physics (+1 percent).

The \$932 million for BER would support enhanced research on climate science by expanding the Urban Integrated Field Laboratories (+\$1 million) and the network of climate centers affiliated with Historically Black Colleges and Universities and Minority Serving Institutions. BER would continue investments in AI for improving



Earth and environmental system predictability, expand its Earthshots efforts, and advance biotechnology innovations to support advanced manufacturing.

Within BER, the 3 percent increase for Biological Systems Science prioritizes core research areas of genomic sciences (+2 percent), such as foundational genomics research on microorganisms with bioenergy and bioproduct traits; environmental genomics research to understand genotype to phenotype translations leading to beneficial bioenergy or bioproduct traits in crops; environmental microbiome science to understand the functions of environmentally relevant microbial communities in various ecosystems; and new computational bioscience tools. The four Bioenergy Research Centers, renewed for another 5 years, will continue to support multidisciplinary clean energy research.

BER will continue to support the Energy Earthshot Research Centers in FY 2024 to address key challenges for biological research at the interface of basic and applied energy research. The Energy Earthshot Research Centers are jointly supported by BER, advanced scientific computing research, and basic energy sciences to bring together multi-investigator, multi-disciplinary teams to perform energy research.

The budget would cut funding for two of the three BER scientific user facilities, namely, the Atmospheric Radiation Measurement Research Facility (-2 percent) and the Environmental Molecular Sciences Laboratory (-22 percent). The Joint Genome Institute would receive a small increase of 2 percent.

Earth and Environmental Systems Sciences—which supports the study of terrestrial ecosystems, including the Arctic—would receive an essentially flat budget of \$445 million. Minor funding increases are slated for most of its accounts, including atmospheric systems research (+1 percent), environmental system science (+3.5 percent), and earth and environmental systems modeling (+1 percent), while the facilities and infrastructure account would receive a 5 percent cut.

Advanced scientific computing research would receive a total of \$1.1 billion. Increases are proposed for its research activities (+\$73 million) and high performance computing and network facilities (+\$47 million), while the Exascale Computing Project would shrink by \$63 million as it closes out. The proposal includes continued support for quantum information science, including the National Quantum Information Sciences Research Centers.

The budget for basic energy sciences—which supports research in material physics, chemistry, geosciences, and biosciences—would grow by \$159 million to \$2.7 billion. The request would establish the new Microelectronics Science Research Centers, as



authorized by the CHIPS and Science Act. Continued support is proposed for fundamental research on clean energy, the Energy Frontier Research Centers, the Energy Innovation Hubs, and five research centers for nanoscale science.

The Science Laboratories Infrastructure account is slated to expand by 15 percent to \$322 million, with the funds directed to 10 ongoing construction projects to improve infrastructure across the national labs.

Workforce development for teachers and scientists would grow by 10 percent to \$4.6 million. The request prioritizes continued support for learning and hands-on research experiences at DOE national laboratories and efforts to diversify the STEM pipeline.

## Environmental Protection Agency (EPA)

- *EPA request: \$12.1 billion (+\$1.9 billion)*
- *Science and Technology request: \$967.8 million (+\$165.6 million)*

The President's budget request represents a 19 percent budget increase overall for the EPA.

Among the agency's top priorities for FY 2024 include tackling the climate crisis, through both new budget initiatives as well as the funding provided in the Inflation Reduction Act and the federal infrastructure bill. The EPA is also supporting the Administration's Cancer Moonshot initiative by preventing and mitigating cancer exposure.

EPA's Office of Research and Development would receive \$643 million. Increased funding would be directed to research on the impacts of climate change on human health and ecosystems, as well as updating the chemical safety assessment process. Research on PFAS exposure on human health and the environment will continue, as will ways to reduce PFAS levels in the environment. EPA is also conducting high-throughput toxicological screening assays on hundreds of PFAS chemicals. New funding is requested for predicting and communicating wildfire smoke to overburdened communities.

The Pesticide Risk Program is proposed to receive \$25 million in additional funding for activities to evaluate the risks of pesticides on endangered and threatened species and their habitats. This work is mandated by the Endangered Species Act; the EPA is implementing a 2022 work plan in response to litigation and court orders.

The Safe and Sustainable Water Research Program would receive \$5.6 million in increased funding to help address water contamination, harmful algal blooms, and diminished water availability.

The Water Quality Research and Support Grants is once again proposed for elimination. This congressionally directed competitive grant program supports water quality research.

## Department of Health and Human Services

### National Institutes of Health (NIH)

- *NIH request: \$48.6 billion (+\$920 million)*
- *Advanced Research Projects Agency for Health (ARPA-H) request: \$2.5 billion (+\$1 billion)*

NIH would receive a small budget increase of 2 percent in FY 2024, with most of this increase going to the National Cancer Institute as part of the Cancer Moonshot initiative.

ARPA-H is slated to receive \$2.5 billion in total, separate from the \$48.6 billion requested for NIH. The 67 percent funding boost for ARPA-H would fund high-risk, transformative research that drives biomedical innovations.

The request outlines a number of priorities for NIH in FY 2024, including continued support for the Cancer Moonshot initiative (\$716 million), advancing nutrition science (\$121 million), tackling the opioid epidemic, eradicating HIV in the United States, developing a universal influenza vaccine, expanding mental health research, addressing health disparities and inequities, researching the human health impacts of climate change, and continued support for pandemic preparedness activities.

The budget request would support a total of 44,410 research project grants, an increase of 790 above FY 2023, including a total of 10,414 new and competing grants.

Given the small proposed increase in overall funding, budgets for several NIH centers would remain flat:

- National Cancer Institute: +7 percent

- National Heart, Lung, and Blood Institute: flat
- National Institute of Neurological Disorders and Stroke: +0.6 percent
- National Institute of Allergy and Infectious Diseases: flat
- National Institute of General Medical Sciences: flat
- National Institute of Environmental Health Sciences: +2.5 percent
- National Institute of Mental Health: +8.5 percent
- National Human Genome Research Institute: flat
- National Institute of Biomedical Imaging and Bioengineering: flat
- National Library of Medicine: flat

The proposal would boost the Office of the Director's budget by 9.5 percent. The buildings and facilities account for NIH would remain flat at \$350 million, with priority given to addressing the maintenance and repair backlog at the agency.

The budget includes an increase of \$25 million for NIH to continue research related to the impact of climate change on human health, in collaboration with other federal agencies.

NIH will continue to fund health disparities and inequities research at \$95 million. This includes continued support for the UNITE initiative, an NIH-wide effort launched in FY 2021 to end racial inequities across the biomedical research enterprise.

The budget includes \$407 million (-63 percent) in funding made available through the 21st Century Cures Act, with \$86 million for the National Institute of Neurological Disorders and Stroke, \$86 million for the National Institute of Mental Health, and \$235 million for the Innovation Account.

The request includes \$270 million (flat) for the development of a universal influenza vaccine and \$26 million (flat) for the NIH-sponsored Centers for AIDS Research to continue research on HIV prevention and treatment. With respect to pandemic preparedness, \$2.69 billion is requested for NIH to support research and development on vaccines, diagnostics, and therapeutics, biosafety and biosecurity, and expanding lab infrastructure.

The agency requests level funding of \$1.8 billion for opioids, stimulants, and pain research. Within this total, \$1.2 billion would support ongoing research across NIH centers, while \$636 million would be allocated to the Helping to End Addiction Long-term (HEAL) Initiative, which was launched in April 2018 to combat opioid addiction and perform research on pain and addiction.

The proposal includes an increase of \$200 million for the National Institute of Mental Health to support improved diagnostics, treatments, and precision of care for mental health.

## Department of the Interior

### United States Bureau of Land Management (BLM)

- *BLM request: \$1.7 billion (+\$140 million)*
- *Management of Lands and Resources request: \$1.5 billion (+\$128.1 million)*

The Bureau of Land Management is responsible for more public lands than any other federal agency. The modest increase requested for BLM would support investments to improve the health and function of public lands.

Most of the increased funding is directed to the Management of Lands and Resources program, where more than half of the money would go to oil, minerals, and other resource activities.

Wildlife Habitat Management and Aquatic Resources is proposing \$28 million in enhanced activities for eradication and control of invasive species, re-establishing native plant communities, and other ecosystem restoration activities.

Cultural Resources Management would receive \$22.1 million, a \$2.1 million increase. Some of the new funding will support incorporation of Native American traditional knowledge in land management decisions. Another expanded initiative is new interpretive and educational materials on museum collections.

Twelve million in new funding for youth corps programs will improve public lands while providing training to young people. One of the proposed projects includes conducting cultural and paleontology site inventory, documentation, and stabilization.

The Seeds of Success program continues to train and employ Tribal youth in the collection and preservation of culturally important native plant species. BLM continues to work with other partners to implement the National Seed Strategy, a research-based native seed production program.

## United States Fish and Wildlife Service (USFWS)

- *USFWS request: \$2.1 billion (+\$67.9 million)*

The proposed budget includes a 3 percent overall increase for annual appropriations for the U.S. Fish and Wildlife Service, which is responsible for management of the nation's biological resources.

A major focus for USFWS is implementing the Biden Administration's America the Beautiful initiative, which aims to protect and restore 30 percent of our nation's lands and waters by 2030. One of the eight principles for the initiative is "using science as a guide."

The Science Applications program would receive \$55.5 million (+\$20.1 million) to support science partnerships with external stakeholders for collaborative landscape conservation activities, including sagebrush conservation, proactive conservation of at-risk species and their habitats, pollinator conservation, and nature-based solutions.

Science Applications also supports internal USFWS programs, such as disseminating climate adaptation science to natural resource managers. In FY 2024, the program will be investing in data managers and geospatial mapping capacity. Improvements to the agency's Science Catalog will make data more accessible to a variety of users. Identification and filling of science gaps will receive \$3.5 million in additional funding.

Fifteen million in new funding is proposed for conservation of at-risk species and their habitats and \$19 million in new funding would support delisting and downlisting of listed species. Support for international wildlife conservation is proposed to increase by \$10.9 million.

Major upgrades are proposed for permitting processes to better use the latest scientific information when evaluating development proposals' impacts on migratory birds.

## United States Geological Survey (USGS)

- *USGS request: \$1.8 billion (+\$289 million)*
- *USGS Ecosystems Activity request: \$395 million (+\$88 million)*

The budget for the USGS would be augmented by 19 percent. Funding increases are proposed for USGS programs across the board, with priority given to climate research and science focused on protecting of human health and safety.

The Ecosystems Mission Area—the primary biological science organization of the Department of the Interior—provides the science needed to achieve sustainable management and conservation of biological resources in wild and urban spaces. The Ecosystems account, which also includes Environmental Health programs, Land Change Science, and the Climate Adaptation Science Centers, would receive \$395 million in FY 2024 (+29 percent).

Other mission areas are also slated for budget increases. Water Resources would receive a nearly 3 percent increase to \$313 million, although the Water Resources Research Act program would be cut by \$0.5 million to \$15 million. Support for Natural Hazards would increase by 13 percent. This includes programs to monitor earthquakes (+10 percent), volcanoes (-5 percent), and coastal and marine hazards (+46 percent).

Core Science Systems is slated to receive \$369 million in FY 2024, a 30 percent boost. Most of the new funding would go to the Science Synthesis, Analysis, and Research (SSAR) Program, which would grow by 180 percent to \$85 million. Of this total, \$2.5 million would go to the Assessment of Biodiversity program to deliver a National Biodiversity Assessment Dashboard “to conduct an initial assessment that identifies nationwide biodiversity metrics; evaluates the role of protected areas; and projects vulnerabilities under future climate conditions.” The request for SSAR includes \$25.5 million to lead the development of the Administration’s American Conservation and Stewardship Atlas, a tool that will enable science to inform conservation for the America the Beautiful initiative. The Atlas will support conservation, stewardship, and restoration activities and provide the data needed to achieve the Administration’s goal of conserving 30 percent of America’s lands and waters by 2030.

The plan would provide \$144 million (+24 percent) for the National Land Imaging Program, including \$110 million to support the Landsat 7, 8, and 9 satellite ground and flight operations and an increase of \$12 million to support the development of Landsat Next, which is planned to launch by late 2030.

The Energy and Mineral Resources Mission Area is looking at a significant increase of 45 percent. Science Support programs at USGS would receive a 26 percent increase, while the Facilities account would get a 5 percent increase.



All research programs are slated for budget increases relative to FY 2023, including species management research (+21 percent), biological threats and invasive species research (+6 percent), land management research (+45 percent), environmental health research (+3 percent), and water use and availability science (+0.5 percent).

The 42 Cooperative Research Units (CRUs), which are located in 40 states, would see their budgets grow by 4 percent to \$29.3 million. The CRUs allow USGS to leverage research and technical expertise affiliated with these universities to conduct research, provide technical assistance, and develop scientific workforces through graduate education and mentoring programs.

Major investments are once again proposed for climate research. The National and Regional Climate Adaptation Science Centers are slated for a 38 percent increase in budget to \$87 million, with \$10.5 million (+\$3.5 million) set aside for Tribal Climate Adaptation Science. The Climate Adaptation Science Centers are responsible for developing the science and tools to address the effects of climate change on land, water, wildlife, fish, ecosystems, and communities. The Land Change Science account would nearly double to \$41 million.

Other climate-related investments include \$3.8 million in additional funding for research on coastal blue carbon sequestration, \$3.9 million in increased funding to improve resilience to coastal hazards, and \$10 million in new funding to model and forecast coastal hazards. The budget also proposes a \$5 million increase for assessing biological greenhouse gases and a \$5 million increase to provide decision tools to support clean energy deployment.

## National Science Foundation (NSF)

- *NSF request: \$11.3 billion (+\$1.4 billion)*
- *Research and Related Activities request: \$9 billion (+\$1.2 billion)*
- *Major Research Equipment and Facilities Construction request: \$305 million (+117 million)*
- *STEM Education request: \$1.4 billion (+\$73 million)*
- *Biological Sciences Directorate request: \$972 million (+\$115 million)*

The President's budget request would increase NSF's funding by 15 percent. This is a major boost of \$1.4 billion for the science agency, but the request falls short of the \$15.7 billion level authorized by the CHIPS and Science Act for FY 2024.



NSF’s proposal is organized around 4 major themes—advancing emerging industries for national and economic security, building a resilient planet, creating opportunities everywhere, and strengthening research infrastructure. Roughly \$2.4 billion is proposed to support investments in “emerging industries for U.S. competitiveness” that include advanced manufacturing, advanced wireless, artificial intelligence, biotechnology, microelectronics, semiconductors, and quantum information science.

NSF’s Bigs Ideas, launched in FY 2017, is slated to end as a “unifying concept” in FY 2023. According to NSF, most of the Big Ideas will “continue as core research programs or be superseded by new but related efforts.” Notably, in FY 2024 NSF will end the Understanding Rules of Life (URoL) Big Idea and build upon the knowledge gained through it to establish a new effort focused on “Using the Rules of Life,” which will support convergent, use-inspired research in biotechnology.

The research account at NSF would receive a total of \$9 billion, an increase of 15 percent over FY 2023. Of this total, \$1.2 billion would be set aside for the new Technology, Innovation, and Partnerships (TIP) Directorate to help translate research into practical applications. This represents a 35 percent bump for the commercialization-focused directorate compared to the total funding it received in 2023. \$300 million is requested under TIP’s budget to support up to 20 NSF Regional Innovation Engines in FY 2024 to create “regional-scale innovation ecosystems” and address the workforce and economic needs of regions across the country. Similarly, the Convergence Accelerator would receive \$100 million to “regionalize its approach to accelerate the translation of use-inspired research by investing in regional cohorts of transdisciplinary, multi-sector teams pursuing technology solutions to location-specific challenges.”

Overall, NSF’s Research and Related Activities account would be augmented by \$1.2 billion in FY 2024. All research directorates would see growth in their funding compared to FY 2023:

- Biological Sciences (BIO) Directorate: \$972 million (+13.5 percent)
- Computer and Information Science and Engineering (CISE) Directorate: \$1.2 billion (+12 percent)
- Engineering (ENG) Directorate: \$970 million (+20 percent)
- Geological Sciences (GEO) Directorate: \$1.8 billion (+12 percent)
- Office of Polar Programs (now within GEO): \$566 million (+4 percent)
- Mathematical and Physical Sciences (MPS) Directorate: \$1.8 billion (+9 percent)

- Social, Behavioral and Economic Sciences (SBE) Directorate: \$361 million (+15 percent)
- TIP Directorate: \$1.2 billion (+35 percent)
- Office of International Science and Engineering: \$71 million (+3 percent)
- Integrative Activities: \$658 million (+20 percent)

In FY 2024, the Directorate for STEM Education (EDU) would operate at \$1.4 billion, 5 percent above FY 2023. Within EDU, the Division of Undergraduate Education would see its budget cut by 5 percent, while the Division of Graduate Education would receive a 7 percent bump compared to FY 2023. Budget for the Division of Equity for Excellence in STEM would grow by 16 percent. The Graduate Research Fellowship Program within EDU, would receive a budget increase of 18 percent to \$380 million. Notably, it would support at least 2,500 new fellowships, augment the cost of education allowance from \$12,000 to \$16,000, and provide a stipend of \$37,000 per fellow in FY 2024.

Budget for the NSF INCLUDES, renamed in the CHIPS & Science Act of 2022 as the Eddie Bernice Johnson INCLUDES Initiative, would expand by roughly 44 percent to \$50.5 million. This program supports education and career pathways to help build a diverse and skilled American STEM workforce. EDU would invest \$10 million (+11 percent) in biotechnology through research and workforce development programs. The NSF Research Traineeship program would receive \$62.5 million, roughly 29 percent less than it received in FY 2023.

The Major Research Equipment and Facilities Construction (MREFC) account would receive \$305 million in FY 2024, a 63 percent boost relative to FY 2023, to support one new construction project and three ongoing major facility projects, including long-term upgrades of NSF's Antarctic infrastructure. Agency Operations and Award Management would receive a 9 percent boost, while support for the National Science Board would increase by 3 percent compared to FY 2023.

Among NSF's cross-cutting programs, the Long-Term Ecological Research (LTER) network is slated to receive \$33 million, a nearly 7 percent increase above FY 2023 and the Research Experiences for Undergraduates program would be augmented by 6 percent to \$85 million. However, support for Faculty early career development programs or CAREER grants would be cut by 11 percent to \$380 million.

## NSF's Biological Sciences Directorate

Overall, the BIO directorate is slated for a 13.5 percent increase. BIO provides about 66 percent of federal funding for basic non-medical biological research at academic institutions.

The FY 2024 request for BIO aligns with a number of Administration priorities, including “bio-technology to promote the bioeconomy, environmental forecasting and mitigating the impacts of global warming on essential ecosystem services, predicting and preventing the emergence of infectious diseases, and increasing racial equity and diversity across the STEM enterprise.”

Within BIO, funding would be allocated to each of its five divisions as follows:

- Biological Infrastructure (DBI): \$228 million (+9 percent)
- Environmental Biology: \$189 million (+11 percent)
- Integrative Organismal Systems: \$215 million (+9 percent)
- Molecular and Cellular Biosciences: \$157 million (+7 percent)
- Emerging Frontiers: \$184 million (+37 percent)

BIO would steward a new agency-wide program called BioFoundries to support “collaborative teams of researchers and technology developers who will generate the technologies, instrumentation, workflow pipelines, and advanced computing that will enable the advancement of biology, biotechnology, bioengineering and biomanufacturing.” \$30 million is requested in FY2024 to support 2 or 3 new BioFoundry awards.

BIO will continue investments in “building and broadening the biological sciences workforce” through its postdoctoral fellowships, the Building Research Capacity of New Faculty in Biology (BRC-BIO) program, the Research and Mentoring for Post baccalaureates in Biological Sciences (RaMP) program, and its Leading Culture Change through Professional Societies of Biology (BIO-LEAPS) program.

Increased investments of \$177 million (+\$29 million) are proposed within BIO to support the bio-economy through research funding programs in biotechnology, synthetic biology, genomics, bioinformatics, structural and computational biology, biophysics, and training fellowships to help build the U.S. workforce in this area. Other research directorates will work together with BIO to make investments in biotechnology, including ENG (\$106 million), GEO (\$12 million), CISE (\$7 million), MPS (\$62 million), SBE (\$1.5 million), and TIP (\$93 million). Overall, NSF proposes making an investment of \$470 million (+22 percent) in biotechnology in FY 2024.

BIO would once again prioritize investments in climate change, by increasing support for clean energy research and the U.S. Global Change Research Program by 17 percent to \$311 million. Other major BIO investments include advanced manufacturing (\$7 million), artificial intelligence (\$20 million), quantum information sciences (\$3.3 million), and improving undergraduate STEM education (\$5 million).

The National Ecological Observatory Network (NEON) would receive \$78 million through DBI, an increase of \$6 million above FY 2023.

BIO proposes to increase investments in synthesis centers focused on “integration and reuse of existing data to create new knowledge that will fuel advances in both basic and use inspired re-research across all scales of biological organization.” BIO requests \$6.5 million for Centers for Analysis and Synthesis within DBI, including \$4.5 million in continued support for a new center in environmental science that will leverage data being provided by NEON, LTER, and other environmental observatories and databases to support community efforts in ecological modeling and eco-forecasting.

The Biology Integration Institutes (BIIs) program, which supports collaborative research on frontier questions about life that span multiple disciplines within and beyond biology, would be funded at \$53.7 million (+52 percent). This request would support twenty BIIs in total, including 15 continuing awards and 5 new awards.

## Smithsonian Institution

- *Smithsonian Institution request: \$1.24 billion (+\$96 million)*

Federal support for the Smithsonian Institution would grow by 8 percent. This increase includes the congressionally mandated pay raise and funds to revitalize physical infrastructure. Smithsonian is also funded by private donations and a trust fund.

Funding for the development, preservation, and documentation of collections would increase by 11 percent to \$93 million. Research programs at the Smithsonian Institution are slated to receive an increase of 7.5 percent. Funding increases are also proposed for public programs for dissemination of information (+13.5 percent) and exhibitions (+3 percent).

The Facilities Capital account would receive \$265 million (+5 percent) for repair and revitalization of facilities.

A detailed budget proposal for the Smithsonian Institution had not been released as of May 8, 2023.

## 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 2024 budget, although it will be several months before any final decisions are made.

## ABOUT AIBS

The American Institute of Biological Sciences is the national scientific organization dedicated to advancing the biological sciences to promote an increased understanding of all life. Our mission is to promote the use of scientific information to inform decision making and advance biology for the benefit of science and society.

AIBS initiatives are unified by a commitment to promoting informed decision-making. Our strategic priorities include:

- **Publications and Communications** including reliable reports, analyses, and the peer-reviewed journal *BioScience*, which is a forum for integrating the life sciences and educating the public about biological sciences.
- **Scientific Peer Advisory and Review Services** for research proposals and programs sponsored by funding organizations, including the federal government, state agencies, private research foundations, and other non-government organizations, and to educate the community about the science of peer review.
- **Community Programs** that advance the field and profession of biology while promoting and providing leadership, with a particular emphasis on public policy and advocacy, education and professional development, as well as public awareness of science.

AIBS works with any stakeholder that advances the broad field and profession of biology. Organizations partner with us on initiatives, work with us to identify and communicate matters of common concern, and help connect us to their communities for idea and information exchange – particularly regarding public policy, education, public understanding of science, and matters of professional concern.

AIBS has member societies and organizations that support our work financially. AIBS has clients from government agencies to biological societies and other nonprofits that use our expert services for a fee.

## More Resources

AIBS will continue to report on significant developments in federal science funding, including Congressional appropriations, through the AIBS Public Policy Report. [Subscribe here](#).

Other budget resources are available on the AIBS website, including information on the federal budget process and factsheets on funding for the biological sciences. Please visit our [Policy Resources](#) page for more information.

For questions related to this publication, please contact the AIBS Public Policy Office at [publicpolicy@aibs.org](mailto:publicpolicy@aibs.org).

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