



# Analysis of: FY 2018 PRESIDENT'S BUDGET REQUEST

Research Universities & Institutions Practice

Memo last updated 21 June 2017

## OVERVIEW

The Trump Administration released its \$4.1 trillion FY 2018 Budget Request on May 23; and unsurprisingly, it tracked very closely to the “skinny budget” released in March 2017. The President’s FY 2018 Budget Request outlines a spending plan of \$1.150 trillion, down from \$1.181 trillion in FY 2017.<sup>1</sup> This amounts to \$54 billion in cuts across nearly every agency to support increases in defense, homeland security, and Veterans Affairs spending. Figure 1 outlines funding changes in discretionary spending for key departments.

In an effort to balance the budget, the Administration plans to reduce discretionary spending by \$1.5 trillion and mandatory spending by \$1.9 trillion over 10 years. Named *A New Foundation for American Greatness*, the President’s budget request calls for \$603 billion in defense spending (base) and \$462 billion for non-defense expenditures. These new spending levels are achieved by shifting \$54 billion (11%) from the current non-defense budget to the defense budget, thereby eliminating defense sequestration caps. This is notable, in part, because every science and technology agency and program outside the Department of Defense and the National Nuclear Security Administration is housed in the non-defense budget.

By comparison, the FY 2017 omnibus bill capped defense spending at \$551 billion and non-defense spending at \$519 billion.

The President’s budget maintains his campaign promises to increase military spending; and invest in infrastructure priorities, ultimately offsetting these increases with double-digit cuts in environmental, transportation, labor, and other domestic agencies.

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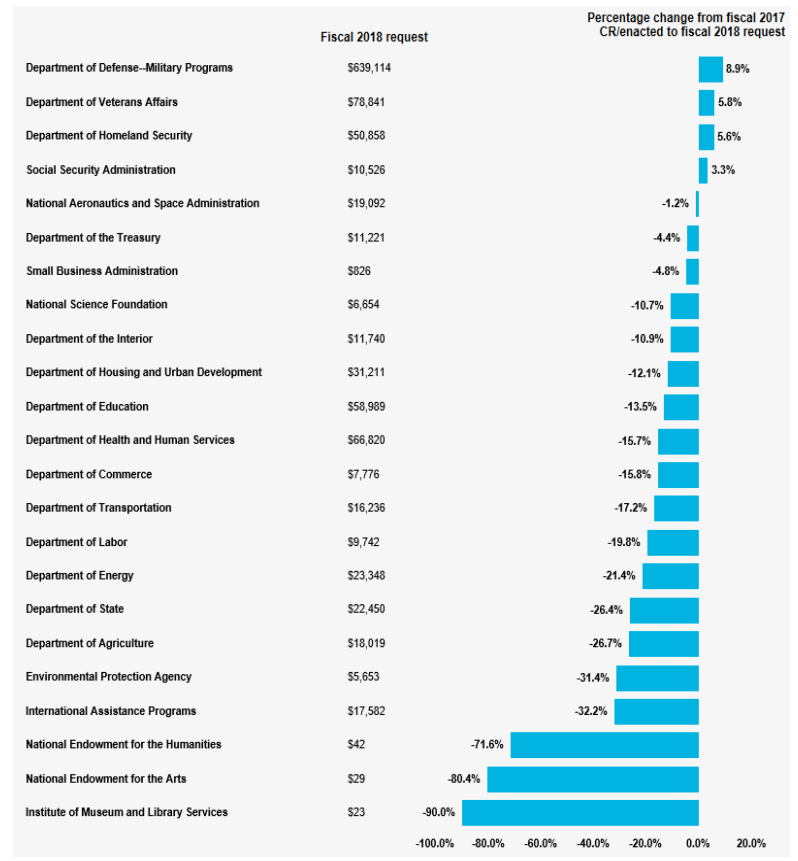
<sup>1</sup> Note. The President’s Budget Request document makes most comparisons against the December 2016 continuing resolution rather than the latest Fiscal Year 2017 appropriations figures. Comparisons throughout this memo may vary.

## NOTABLE INCREASES & NEW/RENEWED PRIORITIES

This plan calls for several new programs – both mandatory and discretionary – as well as funding increases to existing programs. Importantly, the budget proposal recommends a significant shift in discretionary funds to defense functions.

- A \$6 billion increase to the Pentagon.
- \$83.3 billion, 19.2% more than the level for FY 2017, would go to the Department of Defense's RDT&E accounts. \$2.24 billion would go to the military's basic science account, a \$117 million, 6% boost.
- Basic science programs at NASA would grow by 3%, or \$100 million, to \$3.71 billion.
- \$44.1 billion would be budgeted to the Department of Homeland Security, an increase of 6.8%.
- \$19 billion in funding for nationwide paid parental leave.
- \$200 billion in new funding over 10 years to support infrastructure development and modernization.
- \$2.6 billion in 2018 would fund a wall on the U.S.-Mexico border.
- \$82.1 billion in discretionary funding, and \$104.3 billion in mandatory funding, is allocated to Veterans Affairs.

Figure 1: Discretionary Spending Budget Authority by Agency (in millions). Source: Bloomberg Government



## NOTABLE DECREASES

However, the proposed cuts fall heavily on support for families and the poor, many of which are funded through mandatory spending. These include:

- A \$610 billion cut from Medicaid.
- A \$250 billion surplus from repealing Obamacare.
- A \$193 billion cut from SNAP benefits.
- A \$143 billion cut from student loan programs, including Pell Grants and loan forgiveness programs.
- A \$38 billion cut from Farm Bill subsidies.

The President's blueprint also proposed steep reductions in other areas.

- The State Department's budget would be cut by more than 28% in funding cuts for the State Department.
- Elimination of the National Endowment for the Arts (NEA), National Endowment for the Humanities (NEH), and the Institute of Museum and Library Services (IMLS).
- Rural development programming, overall, faces steep cuts, including a \$2 billion reduction to the Rural Utilities Service; elimination of housing repair grants for \$30 million in savings; and cuts in programs to maintain clean water and utilities, and for job training programs.
- The Commerce Department's Economic Development Administration (EDA) funding would be eliminated and its grantmaking to states, local governments, tribal organizations, economic development districts, universities, and other nonprofit entities is halted. This recommendation comes even though EDA is the only Federal agency focused exclusively on economic development.

Across multiple agencies, the White House proposes to cut federal spending for scientific research, including reducing funding for basic research by \$4.3 billion (13%). However, the blueprint contains few details for three important science agencies: the National Science Foundation, the National Institute of Standards and Technology, and the White House Office of Science and Technology Policy.

An 11% reduction to the Department of Agriculture.

- A 22% cut to the National Institutes of Health.
- An 11% cut to the National Science Foundation.
- Provide \$28.0 billion in total funding for the Department of Energy, a \$2.7 billion (8.9%) decrease from FY 2017. This deficit is caused, in part by, a 17% cut to the Department of Energy's Office of Science and a 69% reduction to its Office of Energy Efficiency and Renewable Energy. The Advanced Research Project Agency-Energy (ARPA-E) program would be eliminated by 2019. According to a report issued by the [House Democratic Committee on Appropriations](#), in 7 years of operation, ARPA-E has been appropriated \$1.5 billion, but attracted \$1.8 billion in private funding for 74 research teams. 56 new companies have been created from research funded by ARPA-E.
- A 30% reduction to the Environmental Protection Agency overall, with a 44% cut to science and technology programs.
- A 9% cut to the National Oceanic and Atmospheric Administration.
- A 23% cut to the National Institute of Standards and Technology.

The American Association for the Advancement of Science [explains](#) that R&D spending tends to track discretionary spending very closely. "This general state of affairs means this request may end up mattering even less than presidential budgets typically do – though there will certainly be legislators who will seize the opportunity to push for changes where they can."

## REACTION TO THE FY 2018 PRESIDENT'S BUDGET REQUEST

**President Trump's FY 2018 budget request is not binding.** Congress will treat *A New Foundation for American Greatness* as a starting point to craft its own budget resolution.

Congress largely ignored the administration's "skinny budget" proposal and, instead, increased funding to many agencies and programs that the Trump administration targeted for elimination. As this proposal closely mirrors the President's "skinny budget," some lawmakers are declaring the funding plan "dead on arrival."

While there is bipartisan trepidation about the President's proposed budget, there is some discord within the President's own party with regards to the proposal." "We know the president's budget is not going to be passed as proposed," Republican Senator John Cornyn (R-TX) said. Senate Armed Services Committee Chairman John McCain (R-AZ) stated "It is clear that this budget proposed today cannot pass the Senate." Senator Lamar Alexander (R-TN), chair of the appropriations subcommittee that oversees the Department of Energy, said, "We will not balance the budget by cutting discretionary spending." Senate Majority Leader Mitch McConnell (R-KY) said that the plan's cuts to foreign aid and the State Department budget are not likely to hold; and House Democrats have expressed significant opposition to reductions and eliminations in favored programs.

House Speaker Paul Ryan (R-WI) said Trump's budget, like those of his predecessors, will be heavily reworked by Congress. House Appropriations Committee Chairman Rodney Frelinghuysen (R-NJ) reiterated that Congress, not the executive branch, has the "power of the purse" and suggested that it will develop a plan very different than Trump's. He stated, "It is our job to analyze the request, go through each and every budget line, question every witness, and demand spending justifications on behalf of the taxpayers who are footing the bill. Only then can Congress put forward our own plan to fund the federal government, ensuring the wise investment of taxpayer dollars on important programs while trimming back or eliminating waste and duplication."

## MCALLISTER & QUINN'S ANALYSIS OF THE PRESIDENT'S FY 2018 BUDGET REQUEST

**As this budget proposal maintains many of the cuts outlined in the President's "skinny budget," it is unlikely that the final FY 2018 spending bill will adopt most of the Administration's recommendations.** As shown above, many Republicans disagree with proposed cuts to the Departments of State, Transportation, and Energy, as well as funding cuts to independent agencies. Furthermore, passing an appropriations bill will require bipartisan support: 60 votes are needed to pass procedural hurdles; and, Democrats thus have the leverage to oppose cuts and riders. The House Freedom Caucus, likely to support most of the Trump budget recommendations, ultimately would need Democrats' votes – and in negotiations, they will likely accept spending levels greater than requested.

This budget plan offers both areas of opportunity and areas of concern. However, the President's FY 2018 budget recommendations should be interpreted with the knowledge that the Administration has made a *request*, not passed a spending bill. McAllister & Quinn will monitor several items, in particular.

### 1 NIH Indirect Cost Rate Proposal May Not Pass:

The President's budget proposes to **eliminate institutionally negotiated indirect cost rates and administer a flat 10% indirect cost rate for NIH grants across the board.** *Science* estimates that indirect costs currently comprise about 30% of National Institutes of Health's (NIH) total grant funding. According to a 2014 *Nature* investigation, most universities have a negotiated rate of between 50 and 60%. And *Science* predicts that richer, private institutions would come out the winners if overhead rates are lower because they can fall back on large endowments ("[NIH plan to reduce overhead payments draws fire](#)," June 2, 2017).

Several groups, including the Association of American Universities, have come out with strong opposition to this proposal. **Although it appears that the President has the power to impose a lower rate, such a move has never been tested and lawmakers may be able to block any caps with legislation.**

### 2 Funding Agency Reorganizations Offer Opportunities for New Areas of Research:

Trump's FY 2018 budget request also proposes **significant reorganizations that may affect the operations and grantmaking priorities of several Federal agencies – particularly across the Department of Health and Human Services.**

Total discretionary funding to Health and Human Services agencies would be \$65.3 billion, \$12.7 million less than in FY 2017. This proposal calls for the CDC to cut research for chronic diseases, HIV/AIDS, work safety and health; and to prioritize areas such as opioid use and childhood obesity. The President's budget calls for the National Institutes of Health programs to be reorganized and consolidated, absorbing many of the functions of the Agency for Healthcare Research and Quality (AHRQ). Despite the reorganization, NIH funding would ultimately be reduced by 22%. For comparison, the NIH budget was cut by only 5% in 2013, the sequestration year. In that year, NIH made about 700 fewer research project awards, or an 8% drop in its trend, and the funding rate for grant applications dropped to 16.7% (AAAS: [First Trump Budget Proposes Massive Cuts to Several Science Agencies](#)). The current budget proposal calls for \$46 million in funding for investigator initiated research and training grants – a decrease of \$1.4 million from the FY 2017 level.

Likewise, **the Department of Energy (DOE) is in line for a major reorganization under the Trump Administration's spending plan.** Most DOE science and technology programs would be rolled back, in favor of "increased reliance on the private sector to fund later-stage research, development, and commercialization of energy technologies." In FY 2017, the DOE's funding priorities included: clean energy; a balanced basic and applied research portfolio; and energy efficient technologies. However, in FY 2018, the focus has shifted away from renewable energy programs, and towards basic scientific research; clean coal initiatives; and nuclear security issues.

Furthermore, the President also proposes to eliminate the Advanced Manufacturing R&D Consortia, formerly Facilities, which include the Critical Materials Hub and the Clean Water Hub. The Advanced Manufacturing Office (AMO) in DOE's Office of Energy Efficiency and Renewable Energy (EERE) would shift its emphasis, with the budget encouraging AMO to fund "25 to 50 competitively selected, merit-based, early-stage applied R&D projects (TRL 2-4) at National Laboratories, universities, and companies" with a focus on early stage applied R&D in "emerging manufacturing technology areas with significant potential for impact on energy and manufacturing." **The plan continues to outline parameters for these manufacturing research programs, including "funding projects that support materials for harsh conditions, energy conversion materials, materials for energy systems, roll-troll materials and processes, innovative computational process modelling in manufacturing, and energy intensive manufacturing processes."**

Given the drastic reduction, and a "lab-focused" budget request, **this proposal for DOE funding could result in cuts of more than \$1 billion in grants to universities and other institutions.** A reorganization of DOE priorities on this scale would most certainly shift the scope of future DOE solicitations and funding trends. For example, in 2016, approximately 24% of the Office of Science's budget of \$5.1 billion was issued as competitive solicitations. The President calls for just \$4.5 billion for the Office of Science in FY 2018, approximately 17% below FY 2016 levels – and the lowest level since 2008. This, coupled with proposed reductions to the availability of user facilities, threatens to significantly harm the trajectory and competitiveness of energy-related research. **Manufacturing USA, the national network of manufacturing innovation institutes, is partially defunded in the President's FY 2018 Budget Request.** There are currently 14 Institutes either established or underway, including eight Department of Defense (DOD)-led Institutes, five Department of Energy (DOE)-led institutes, and one Department of Commerce (DOC)-led institute. The President's budget proposes to eliminate all five of the DOE-led institutes, using the prior year's appropriation balances to terminate the institutes and conduct an assessment of its impact. The elimination of the DOE-led institutes falls in line with the Administration's new priorities for the agency. Although eliminating the Manufacturing USA DOE Institutes, the President's Budget does call, broadly, for \$28 million to support "early-stage applied R&D ... relevant to the productive use of energy in manufacturing, as well as the competitive manufacturing of energy related products." This recommendation would likely result in a shift in oversight over activities that the DOE-led institutes currently undertake.

The DOC would receive \$15 million in the President's budget for the Manufacturing USA program, \$10 million below FY 2017 enacted levels. The plan does not specify if the funds are to be used for coordination efforts, which are mandated by the Revitalize American Manufacturing and Innovation (RAMI) Act, or used towards the newly-established National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL).

**Although the Departments of Energy and Commerce would see significant reduction in funding for manufacturing research should this proposal be taken up, the Departments of Defense would receive \$115 million for the continuation of its eight existing manufacturing innovation institutes**

### **3 Proposed Cuts to Grant Funding Balanced by Continued Support for Key Research Areas:**

**Despite recommended funding reductions at NIH, the President's budget blueprint maintains funding for key areas of research, and reiterates support for research quality.** Opioid treatment research grants would be level funded at \$3 million. The proposal further maintains funding for 21<sup>st</sup> Century Cures Act programming, including the cancer moonshot, Brain Research through Advancing Innovative Neurotechnologies neuroscience initiative, and Precision Medicine Initiative's planned 1-million-volunteer health study. The President's budget also proposes to further enhance the NIH's policy on Rigor and Reproducibility to include additional types of grants, collaborating with scientific publications to improve the academic merit of publications and to increase data quality and accessibility.

The USDA's major granting program, **Agriculture and Food Research Initiative (AFRI)**, has also posted a change in their **research priorities**. Under this plan, FY 2018 investments will focus on three major areas: Sustainable Agricultural Systems, Foundational and Applied Science, and Education and Workforce Development. But the budget plan requests no funding for grants to support clean drinking water and wastewater facility upgrades. In 2016, these funds amounted to more than \$1.6 billion to over 600 communities and community partnerships.

**The National Science Foundation is slated for budget cuts that will impact its recent grantmaking trends.** For example, NSF expects to evaluate over 50,000 proposals in FY 2018, and – through its competitive merit review process – make nearly 11,000 awards, including **approximately 8,000 new research grants, with an estimated funding rate of 19%**. For comparison, in FY 2016, NSF funded 8,800 new research grants, with a funding rate of 21%. Directorate heads have been given the flexibility to decide what constitutes “core” programming within their portfolios, and make reductions in other areas. This will likely amount to 7-10% cuts across the directorates.

**However, NSF remains committed to the 10 Big Ideas that they announced in May 2016.** NSF Director France A. Córdova today publicly presented President Donald J. Trump's Fiscal Year 2018 NSF budget request to Congress with a “business as usual” sentiment. Córdova said, “This proposal allows us to determine the priorities for funding across the spectrum of science and engineering; facilitates interdisciplinary research and our goal to broaden participation in science; funds the construction of large facilities that will transform our understanding of nature; and seeds innovation and discovery by initiating our 10 Big Ideas.”

**In other areas, the Department of Defense's budget calls for new programming and budget increases in several areas that are of interest to university researchers.** Generalizing Complex Biological Signals; Pandemic Prevention; and Predicting Disease Transmission from Animal Carriers are new initiatives proposed under DARPA's Biomedical Technology and Basic Operational Medical Science program. The Multidisciplinary University Research Initiative (MURI) program would receive budget increases across all three service branches, with plans to expand awards in FY 2018. The Defense University Research Instrumentation Program (DURIP) funding is also slated for an increase in FY 2018. However, funding for the Minerva Initiative, DOD's Social Science Program, is recommended to decrease down roughly \$3.5 million in the FY 2018 President's Budget Request.

#### **What's Next**

As stated above, the budget will require bipartisan support in Congress to pass a FY 2018 funding bill. If the recent omnibus is a predictor of things to come, there will be bipartisan support for many science and public health initiatives slated for cuts.

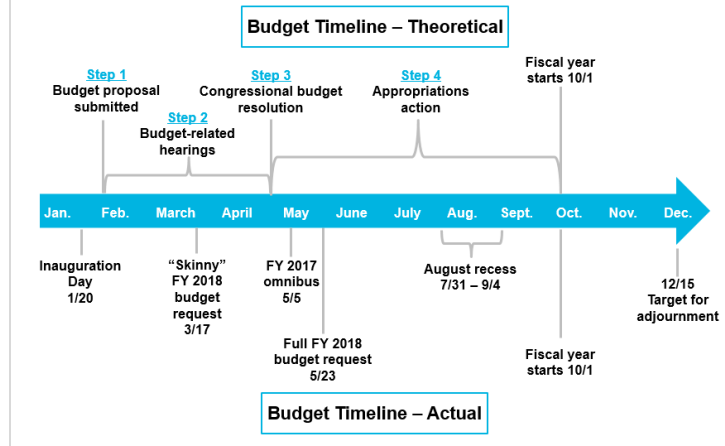


House and Senate appropriators have now begun to consider the President's budget proposal in order to craft the 12 annual spending bills. What's more, the President's plan arrived late and there is no current budget resolution to set the allocations needed to write the spending bills.

Congress has had difficulty enacting appropriations bills before the start of the new fiscal year (September 30). Bloomberg Government reports that it is unlikely that these spending matters will be resolved before December, well past the October 1 start of FY 2018.

Just like this year, the final spending bill will come down to a negotiation between the House and Senate Appropriations Committees, the White House, Nancy Pelosi (D-CA), and Chuck Schumer (D-NY). The Democrats have leverage, and are likely to continue to hold strong and demand that large increases in defense spending will only be granted if the GOP holds the line on non-defense discretionary spending.

Figure 2: FY 2018 Budget Timeline and Process. Source: Bloomberg Government, "Federal Budget and Appropriations 101"



**The most likely outcome is another continuing resolution (CR),** which would keep the federal government functioning at current spending levels. We anticipate a CR of about six months before an appropriations bill is passed.

**Agencies that require a structural reorganization and reprioritization of funds, like the DOE and NIH, will likely hold on to a large portion of their funds under the CR,** because none of the agencies can predict – with absolute certainty – that Congress will revert all changes proposed by the Trump Administration's budget request. However, some agencies may be reluctant to release solicitations or funds during this time until the budget is resolved. **We anticipate that many annual solicitations may be delayed or even eliminated as a consequence of the uncertainty surrounding this recent budget request.**

The current outlook for the funding landscape looks uncertain and disconcerting – at least in the near future. **Until Congress passes the FY 2018 appropriations bill, grant seekers need to strategize a path through this uncertain climate, to mitigate the impact of any deep cuts.** McAllister & Quinn is using its resources and connections to carve a stable path forward. **We emphasize the importance of being proactive in the federal funding search.** Conversations with agency insiders and program officers about future funding opportunities will be crucial in predicting, and accommodating for, FY 2018 funding priorities. New pots of money for the Department of Defense's Research, Development, Test, and Evaluation (RDT&E) programs and for the DOE's Advanced Scientific Computing Research (ASCR) program are some of the areas where new funding opportunities are likely to arise. **Taking proactive steps to identify these new and existing funding opportunities will result in institutional stability, amid the federal uncertainty.**

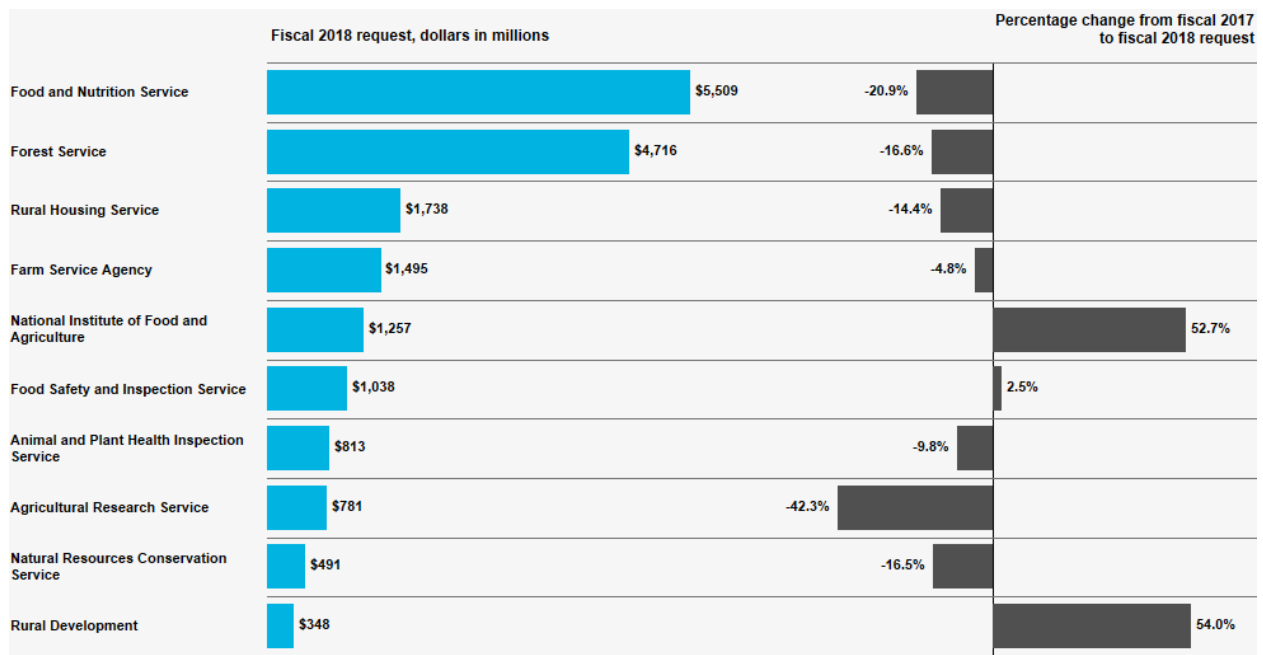
McAllister & Quinn has had a long history of working in, and through, the Federal budget process, and remains confident that the system of checks and balances will work. We are committed to assisting clients through this period of unpredictability by taking those proactive steps. The firm will continue to monitor legislation, Federal Advisory Committee meetings; proposers' days; Requests for Information; Broad Agency Announcements; and new solicitations. We will also interact with program officers to bring critical insight to clients, ensuring that they are strategically positioned for future opportunities.

# PROPOSED FY 2018 BUDGET BY AGENCY

## DEPARTMENT OF AGRICULTURE

The FY 2018 budget request provides roughly \$21 billion in discretionary spending to the Department of Agriculture (USDA) – approximately \$4.8 billion below FY 2017. Funding for mandatory programs is estimated to be \$116 billion, nearly \$7 billion below FY 2017 levels. The USDA states that it continues to focus on the use of capacity funds and competitive grants to generate the solutions to the Nation's most critical food and agriculture problems.

Figure 3: FY 2018 Budget Request, Department of Agriculture. Source: Bloomberg Government, "Budget Request Dashboard"



### Proposed Increases and New/Revised Programs; Flat Funding:

- \$55 million for Specialty Crop Research Initiative, an increase over FY 2016 levels.
- \$17.8 million for Minority Serving Institutions, which fall under the 1890's Capacity Coordination Initiative. Hispanic-Serving Institutions (HSI) education grants program would be funded at \$9.2 million; Native American Institutions would be funded at \$3.4 million; Alaska Native-Serving and Native Hawaiian Serving Institutions would be funded at \$3.2 million; and, Grants for Insular Areas programs would be funded at \$2 million. Overall, this is a \$7.9 million increase from FY 2017.
- \$162 million to establish a new grant fund to support infrastructure development across Rural America. This fund will utilize the existing authorities of Rural Development and will support projects that expand or improve the economic infrastructure of Rural America.



- Consistent levels of funding for most Formula Programs: \$19.3 million for 1890 Capacity Building Grants; \$243 million for Hatch Act; \$299 million for Smith-Lever 3(b) and 3(c); and \$68 million for the Expanded Food and Nutrition Education Program.
- \$1.3 billion to support extramural agricultural research, education, and extension activities through the National Institute of Food and Agriculture. This includes \$349.3 million for Agriculture and Food Research Initiative (AFRI), consistent with FY 2017 budget levels.

**Proposed Decreases and Program Eliminations:**

- \$29 million for the McIntire-Stennis Cooperative Forestry, a decrease from the \$34 million budgeted in FY 2017.
- \$165 million of discretionary funding for Agriculture Research Service, a reduction of 38%.
- \$5 million for the Veterinary Medical Services Act to provide incentives to hire veterinarians to work in shortage areas. This represents a \$4 million decrease from the FY 2017 level.
- Eliminate the Animal Health and Disease Research Program, which was funded at \$4 million in FY 2017.

## DEPARTMENT OF COMMERCE

The U.S. Department of Commerce's FY 2018 Budget requests \$7.8 billion in discretionary funding, a \$1.5 billion or 16% decrease from the FY 2017 level. The agency reports that the President's budget maintains the "core missions" of the National Oceanic and Atmospheric Administration (NOAA) and the National Institute of Standards and Technology (NIST). The request prioritizes the 2020 Decennial Census; infrastructure and staff for weather forecasting; marine resources management; ocean and coastal navigation; and enforcing laws that promote fair and secure trade.

Figure 4: FY 2018 Budget Request, Department of Commerce. Source: Bloomberg Government, "Budget Request Dashboard"

	Fiscal 2018 request, dollars in millions	Percentage change from fiscal 2017 to fiscal 2018 request
National Oceanic and Atmospheric Administration	\$4,775	-17.1%
Bureau of the Census	\$1,494	8.7%
National Institute of Standards and Technology	\$731	-24.6%
International Trade Administration	\$443	-8.1%
Bureau of Industry and Security	\$114	0.9%
Departmental Management	\$102	-10.5%
Bureau of Economic Analysis	\$97	-11.0%
National Telecommunications and Information Administration	\$36	-10.0%
Minority Business Development Agency	\$6	-81.3%
National Technical Information Service	\$0	
Regional Development Program	\$0	
Technology Administration	\$0	
United States Travel and Tourism Administration	\$0	

#### Proposed Increases and New/Revised Programs; Flat Funding:

- \$1.5 billion to fund the Census Bureau, a 10% increase over FY 2016 levels, to prepare for the 2020 Census.

#### Proposed Decreases and Program Eliminations:

- Eliminate the Economic Development Administration (EDA), and halt issuance of new EDA program grants.
- Eliminate the Minority Business Development Agency (MBDA).
- Eliminate the Regional Development Program.
- Eliminate the Hollings Manufacturing Extension Partnership (MEP), a public-private partnership that helps small and medium-sized U.S. manufacturers to become more globally competitive. According to the most recent data, each year the MEP program helps U.S. manufacturers create and retain more than 80,000 U.S. manufacturing jobs. \$6.0 million is requested in FY 2018 for the orderly wind down of federal funding for the program (Source: [House Democratic Committee on Appropriations](#)).

## NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

The FY 2018 budget request for NOAA totals \$4.77 billion in total discretionary funding, \$985 million less than FY 2017 level. According to the agency, "targeted NOAA grants and programs supporting coastal and marine management, research, and education" would absorb \$250 million in reductions. These cuts include an approximate 50% reduction to NOAA's research office budget. On the other hand, NOAA's request maintains the development of the current generation of polar orbiting and geostationary weather satellites, allowing JPSS and GOES-R Series satellite programs to remain on schedule in order to provide forecasters with critical weather data to help protect life and property.

**Proposed Increases and New/Revised Programs; Flat Funding:**

- Maintain funding for major satellite programs, including GOES-R and JPSS.
- Continue funding for NOAA research and development of survey, geospatial data management, and cartographic technologies through the Joint Hydrographic Center, the Coast Survey Development Laboratory, and other Navigation, Observation and Positioning programs.

**Proposed Decreases and Program Eliminations:**

- \$400 million to fund the Office of Oceanic and Atmospheric Research (OAR), one of the agency's primary research arms. This is a drop of 22% from the \$514 million budget in FY 2017.
- \$1.058 billion for the National Weather Service, down 6% from FY 2017.
- Eliminate the Polar Follow On (PFO) satellite program, in favor of reliance on commercial data.
- Eliminate funding for the Office of Education. This includes terminations to the Competitive Education Grants Program; the Educational Partnership Program for Minority Serving Institutions; the NOAA Bay-Watershed Education and Training program.
- Reduce or eliminate funding for competitive research grants to academic institutions and states, particularly those that advance understanding of the Earth's climate system and enhances regional decision-making capabilities. Eliminate the Sea Grant, Coastal Zone Management, Regional Coastal Resilience Grant Program, and Pacific Coastal Salmon Recovery grant programs. \$21 million would be cut from OAR's climate focused competitive research grants. Single-year cooperative agreements with academic institutions for joint ocean and coastal mapping centers would be discontinued. Eliminate the National Centers for Coastal Ocean Science (NCCOS) Competitive Research program, which provides grants to academic institutions to conduct ecological research that advances NOAA's mission. FY 2018 is scheduled to be the final year of funding for 35 of 50 open awards.
- Eliminate NOAA grants to state agencies and academic institutions that support operations of the National Estuarine Research Reserve System (NERRS).
- Eliminate the environmental genomics program at the Atlantic Oceanographic and Meteorological Laboratory (AOML).

*Figure 5: FY 2018 Budget Request, National Oceanic and Atmospheric Administration. Source: American Geophysical Union, The Bridge, "NOAA Cut 16% in President Trump's Budget Request."*

Program	FY17 Omnibus	FY18 President's Budget Request	Percent Change FY18 Request vs FY17 Omnibus
<b>Overall</b>	\$5,675.00	4,775.30	<b>-15.85%</b>
National Ocean Service (NOS)	\$521.10	\$387.00	<b>-25.73%</b>
National Marine and Fisheries Service (NMFS)	\$851.54	\$821.00	<b>-3.59%</b>
Oceanic and Atmospheric Research (OAR)	\$514.13	\$350.00	<b>-31.92%</b>
OAR Climate Research Program	\$158.00	\$128.00	<b>-18.99%</b>
National Weather Service (NWS)	\$1,121.57	\$1,059.00	<b>-5.58%</b>
NESDIS	\$2,203.60	\$1,816.00	<b>-17.59%</b>
Mission Support	\$261.47	\$234.00	<b>-10.51%</b>
Office of Marine and Aviation Operations	\$297.93	\$300.68	<b>0.92%</b>

## NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

The FY 2018 budget proposal request for NIST is \$725.0 million, a \$237.2 million reduction (32.6%) from the FY 2017 level. NIST proposes to reduce programs and projects across the NIST laboratory portfolio in order to preserve a core foundation in measurement science, although a series of cuts to core programs is also proposed. The budget targets programs that are of lower priority for reasons such as technology maturity, sub-critical effort, or where the work no longer requires the leading-edge measurement science capabilities of NIST. These recommended cuts include the elimination of NIST's Manufacturing Extension Partnership (MEP) program.

### Proposed Increases and New/Revised Programs; Flat Funding:

- Continues to fund NIST construction activities, including maintenance, repair, improvements, and major renovation of facilities occupied or used by NIST.

### Proposed Decreases and Program Eliminations:

- \$15.0 million for Manufacturing USA is funded, a \$10.0 million reduction from the FY 2017 level.
- \$15.5 million reduction for Advanced Networks, Connected Systems, and Data Science. NIST will reduce projects focusing on assessment of technologies for indoor location tracking of first responders, support for smart grid communications protocols, as well as the development of standards for the smart grid and other cyber physical systems, including the elimination of work on the development of standards and guidelines for wireless communications and process control for the manufacturing industry. These reductions will include the elimination of \$7.2 million in contracts and grants to research universities.
- \$8.3 million reduction for Advanced Materials Manufacturing. With reduced budgets, NIST will terminate, sub-critical research efforts in thin film photovoltaics that reduce the cost of solar energy, inorganic electronic materials critical for electronics, materials for advanced battery systems, as well as capabilities focused on computational modeling and characterization of advanced materials systems. NIST will also eliminate its nanomaterial environment, health, and safety (nano-EHS) program, ending the research and development efforts needed to develop new and continue providing existing standard reference materials.
- \$6.9 million reduction for Semiconductor and Microelectronic Measurements. NIST will discontinue lower-priority programs focusing on material reliability measurements for current generation semiconductors, the advancement of ultraprecise measurement technologies to measure changes in structure and magnetic state of semiconductors, the development and dissemination of 3D nanometer scale dimensional measurements, and research focused on the measurements necessary to advance micro-electrical mechanical systems, very small sensors and devices that have been successfully commercialized in a host of applications from automobiles and smartphones to personal fitness devices.
- \$6.6 million reduction for Environmental Measurements. This reduction will eliminate key research staff making it necessary for NIST to halt the production of secondary gas reference materials which help prolong the life of primary reference materials used to calibrate scientific instrumentation, reducing costs for users. NIST will also shut down the NIST marine environment program and our associated partnership with the Hollings Marine Laboratory in Charleston, South Carolina.
- \$6.3 million reduction for Time and Fundamental Measurement Dissemination. NIST will continue to maintain the U.S. time standard, and continue to advance the development of best in the world atomic clocks as part of its core foundational work in this area, and disseminate standard time through the internet. However, NIST will discontinue the dissemination of the U.S. time and frequency via the NIST radio stations in Hawaii and Ft. Collins, CO.

- \$5.9 million reduction for Cybersecurity. To focus on core NIST Cybersecurity activities and the work of NIST's National Cybersecurity Center of Excellence, NIST will eliminate program management resources from the former National Strategy for Trusted Identities in Cyberspace (NSTIC) program.
- \$5.9 million reduction for Resilience and Structural Engineering. NIST will eliminate lower-priority work on certain structural materials characterization and testing, including studies on the weathering of polymers conducted in support of a NIST-led consortia. In addition, NIST will eliminate the extramural Fire Grants Program that funds grants at multiple universities and standards development organizations (SDOs).
- \$4.1 million reduction for Quantum Science. NIST will focus on basic research while reducing funding for efforts that apply some of NIST's breakthroughs in quantum science into new metrology applications such as new sensing technologies that with further R&D could have an impact on the factory by reducing calibration needs in factories. Eliminated efforts include the development of compact cryogenics for novel quantum based sensors, the establishment of a best-in-the-world temperature measurement technology, the development of advanced materials like graphene to use as ion traps, and the application of new quantum sensors as detectors of greenhouse gases.
- \$5.4 million reduction for Biological Science and Health Measurements. NIST is focusing its efforts in the biosciences to build the measurement science capabilities necessary to support progress in these emerging areas. Therefore, NIST will eliminate older biological science and health measurement programs focused on measuring DNA damage, characterizing radionuclide based imaging techniques often used in the diagnosis of cancer, and developing new imaging tools to help advance new nanoscale therapies.
- \$3.7 million reduction for User Facilities. NIST operates two user facilities, the NIST Center for Neutron Research (NCNR) and the Center for Nanoscale Science and Technology (CNST). To meet the funding levels outlined in the President's FY 2018 budget request, NIST will reduce support at both facilities. At the NCNR, NIST will remove two instruments from the user program, selected to have the least impact on the overall user community, slow the development of new instruments, and cut back on support services provided to users. At the CNST, the reduced funds will slow the rate of replacement of the equipment, and reduce the number of staff available to support facility users. The proposed reductions will also eliminate \$1.2 million in grants.
- Eliminate federal funding of NIST's Manufacturing Extension Partnership (MEP) program.
- \$600.0 million, an \$88.7 million reduction (13%) from the FY 2017 level, for the Scientific and Technical Research and Services (STRS), an account that provides resources for NIST's Laboratory Programs. Reduce the Standards Coordination and Special Programs sub-program line by 36% or \$24.4 million dollars. This largely eliminates external R&D partnerships that expand and broaden the impact of the NIST Laboratory R&D programs. Eliminate cross-cutting R&D program management functions of the Office of Special Programs, leaving the individual NIST laboratories responsible for the remaining intramural work.
- Reduce funding for the Office of Special Programs by \$16 million. This move would terminate all extramural grant programs supported by the office, and eliminate the cross-NIST program management functions of the office. The major activities within the Office of Special Programs that will be eliminated include:
  - \$5.8 million reduction for Greenhouse Gas and Climate Measurements. This reduction will terminate support for three urban test beds: the Indianapolis Flux Experiment, or INFLUX; the Los Angeles Megacity Carbon Project; and the Northeast Corridor Project which stretches from Washington, D.C. to Boston, Massachusetts. Discontinuation of NIST's support will terminate modeling and other research efforts by test bed university partners across the U.S.
  - \$3.3 million reduction for NIST Consortium for Semiconductor and Future Computing Research. To meet the levels of the FY 2018 request, NIST will terminate support for this grant program.
  - \$2.7 million reduction for Forensic Science Program Management and Organization of Scientific Area Committees (OSAC) Support. To reduce costs, NIST will no longer support a centrally managed forensic science research program. NIST measurement science research supported by the current program will continue but will be managed by the specific NIST laboratory responsible for carrying out the work.

- \$4.2 million reduction for Office of Special Programs Management and Program Coordination. NIST will eliminate crosscutting R&D program management functions of the Office of Special Programs, leaving the individual NIST laboratories responsible for remaining intramural work to taking on those responsibilities.
- Cut the Standards Coordination Office by \$4.4 million. The reduction eliminates \$740,000 in grants and contracts for standards education and training related activities targeted at integrating standards and standardization which affect up to 92 percent of U.S. exports, into undergraduate and graduate programs in science, engineering, business, public policy, and law. In addition, NIST would reduce the Lab 2 Market (L2M) Initiative by \$3.5 million. L2M is a program intended to enhance technology transfer across the federal government.
- \$4.0 million reduction for NIST Center of Excellence Program. The NIST Center of Excellence Program supports collaborations between NIST and leading research institutes in emerging technology areas to expand NIST's impact and mission delivery through strategic partnerships with the country's foremost experts in critical technology areas. Currently NIST supports three Centers of Excellence in Advanced Materials, Community Resilience, and Forensic Science. To meet the requested funding levels for FY 2018, NIST would retain the centers most closely aligned with NIST's core mission space in advanced materials and disaster resilience.



## DEPARTMENT OF DEFENSE

The FY 2018 budget proposal request for the Department of Defense (DOD) is \$639.7 billion. Of this total funding, \$574 billion is requested for base funding, while the other \$65 billion is requested for Overseas Contingency Operations (OCO) funding, which is not subject to budget caps. Total funding for the DOD represents a \$54 billion increase in defense spending above FY 2017, offset by a commensurate cut in non-defense funds.

The DOD is the largest contributor to federal R&D expenditures. The bulk of those funds are administered through the DOD's Research, Development, Test and Evaluation (RDT&E) budget. Science and technology activities under RDT&E are further divided into Basic Research (6.1), Applied Research (6.2), and Advanced Technology Development (6.3). Despite overall increases to DOD, the President's FY 2018 request includes cuts to all three accounts, with the largest proposed cut of 6.5% (in comparison to FY 2017 enacted levels) to the advanced technology development budget. Basic and applied research would be cut by 2.1% and 6.1%, respectively.

The DOD also invests heavily into medical, biological and biodefense research funding. For many of the DoD entities that typically fund medical, biological science and biodefense related research -- including the Army, Navy, Air Force, Defense Health Agency (DHA), Defense Advanced Research Projects Agency (DARPA), Defense Threat Reduction Agency (DTRA) and the Joint Program Executive Office for Chemical and Biological Defense Program (JPEO-CBD) -- the basic, applied and advanced technology development budget lines in the President's request received modest increases.

## DEPARTMENT OF DEFENSE – MEDICAL, BIOLOGICAL AND BIODEFENSE RESEARCH FUNDING

### Proposed Increases and New/Revised Programs; Flat Funding:

- \$9.8M to support the DoD Cancer Moonshot initiative.
- 5% and 8% increases for basic research under warfighter technology and medical technology in the Army. This would add a total of only \$8.479 million to Army basic research initiatives.
- \$31.4 million to support applied biomedical technology, medical technology, medical advanced technology and medical development activities in the DHA. This represents a modest 10% increase.
- \$8.652 million increase, or 2%, requested for DTRA's total budget over FY 2017 levels. More than \$210 million was requested for the JPEO-CBD, a 19% increase over FY 2017 levels.
- Three new initiatives under DARPA's Biomedical Technology and Basic Operational Medical Science program elements are proposed: Generalizing Complex Biological Signals seeks to generalize complex biological signals across users via new architectures and systems, thus producing a flexible neural interface protocol among users that can receive and react to environmental, physiological, and neural information. Pandemic Prevention seeks to advance and integrate newly developed approaches, including bioinformatics assessment of genetic sequencing and nucleic acid-based vaccines, to address technology bottlenecks associated with each stage of medical countermeasure development, and predicting Disease Transmission from Animal Carriers, which will investigate how animal pathogens gain the ability to be transmitted to humans.

### Proposed Decreases and Program Eliminations:

- \$28.754 million cut to DARPA's basic operational medical research science, biomedical technology and biological warfare defense initiatives, despite the 6% funding increase to DARPA's total budget.
- \$1.0 million decrease in Combating Antibiotic Resistant Bacteria (CARB) research in DHA, based upon changes to the Sepsis and Malaria projects.

- Eliminate the Army High Performance Computing Research Center and Micro-Autonomous Systems Technology (MAST) CTA, and no FY 2018 funding is recommended.

#### DEPARTMENT OF DEFENSE – RESEARCH, DEVELOPMENT, TEST AND EVALUATION (RDT&E) FUNDING

Though the Department of Defense Budget would see an overall 10% increase in the RDT&E budget, these funds are primarily directed to the test/evaluation and demonstration accounts, as shown below. Of interest, the Multidisciplinary University Research Initiative (MURI) program would receive budget increases across the three service branches with plans to expand awards in FY 2018. The Defense University Research Instrumentation Program (DURIP) funding is increased from FY 2017 levels. However, the Minerva Initiative (DOD's Social Science Program) saw a decrease in funding, down roughly \$3.5 million in the FY 2018 President's Budget Request.

	FY 2017 ENACTED	FY 2018 REQUEST	% CHANGE
<b>Department of Army RDT&amp;E Accounts</b>			
Basic Research (6.1)	\$486,943,000	\$430,022,000	-11.7%
Applied Research (6.2)	\$1,220,274,000	\$889,182,000	-27.1%
Advanced Technology Development (6.3)	\$1,360,065,000	\$1,070,977,000	-21.3%
<b>Total 6.1,6.2,6.3 RDTE</b>	<b>\$3,067,282,000</b>	<b>\$2,390,181,000</b>	<b>-22.1%</b>
<b>Department of Army RDT&amp;E Program Element Highlights</b>			
Basic Research Sciences	\$293,116,000	\$263,590,000	-10.1%
University Research Initiatives	\$69,166,000	\$67,027,000	-3.1%
University and Industry Research Centers	\$112,280,000	\$87,395,000	-22.2%
<b>Department of Navy RDT&amp;E Accounts</b>			
Basic Research	\$562,970,000	\$595,901,000	+5.8%
Applied Research	\$980,326,000	\$886,079,000	-9.6%
Advanced Technology Development	\$823,888,000	\$686,342,000	-16.7%
<b>Total 6.1,6.2,6.3 RDTE</b>	<b>\$2,367,184,000</b>	<b>\$2,168,322,000</b>	<b>-8.4%</b>
<b>Department of Navy RDT&amp;E Program Element Highlights</b>			
Defense Research Sciences	\$422,748,000	\$458,333,000	+8.4%
University Research Initiatives	\$121,714,000	\$118,130,000	-2.9%
<b>Department of Air Force RDT&amp;E Accounts</b>			
Basic Research	\$545,024,000	\$505,259,000	-7.3%
Applied Research	\$1,325,652,000	\$1,284,114,000	-3.1%
Advanced Technology Development	\$807,705,000	\$794,017,000	-1.7%
<b>Total 6.1,6.2,6.3 RDTE</b>	<b>\$2,678,381,000</b>	<b>\$2,583,390,000</b>	<b>-3.5%</b>
<b>Department of Air Force RDT&amp;E Program Element Highlights</b>			
Defense Research Sciences	\$380,812,000	\$342,919,000	-9.9%
University Research Initiatives	\$150,044,000	\$147,923,000	-1.4%
<b>Defense-Wide RDT&amp;E Accounts</b>			
Basic Research	\$681,395,000	\$697,347,000	+2.3%
Applied Research	\$1,769,523,000	\$1,914,090,000	+8.2%
Advanced Technology Development	\$3,447,064,000	\$3,470,847,000	+0.7%
<b>Total 6.1,6.2,6.3 RDTE</b>	<b>\$5,897,982,000</b>	<b>6,082,284,000</b>	<b>+3.1%</b>

	FY 2017 ENACTED	FY 2018 REQUEST	% CHANGE
<b>Defense-Wide RDT&amp;E Program Element Highlights</b>			
Basic Research Sciences	\$362,297,000	\$432,347,000	+19.3%
Basic Research Initiatives	\$68,154,000	\$40,612,000	-40.4%
Defense Threat Reduction Agency Basic	\$35,436,000	\$37,201,000	+5.0%
National Defense Education Program	\$79,345,000	\$74,298,000	-6.3%
HBCU/Minority Institutions	\$33,572,000	\$25,865,000	-22.9%
<b>DARPA</b>			
Defense Research Sciences	\$362,297,000	\$432,347,000	16.2%
Basic Operational Medical Research	\$57,791,000	\$43,126,000	-34.0%
<b>Total Basic Research</b>	<b>\$420,088,000</b>	<b>475,473,000</b>	11.6%
Biomedical Technology	\$115,213,000	\$109,360,000	-5.4%
Information and Communication Technology	\$353,635,000	\$392,784,000	10.0%
Biological Warfare Defense	\$21,250,000	\$13,014,000	-63.3%
Tactical Technology	\$313,843,000	\$343,776,000	8.7%
Materials and Biological Technology	\$220,456,000	\$224,440,000	1.8%
Electronics Technology	\$221,911,000	\$295,447,000	24.9%
<b>Total Applied Research</b>	<b>\$1,246,308,000</b>	<b>\$1,378,821,000</b>	9.6%
Advanced Aerospace Systems	\$182,327,000	\$155,406,000	-17.3%
Space Programs and Technology	\$175,240,000	\$247,435,000	29.2%
Advanced Electronics Technologies	\$49,807,000	\$79,173,000	37.1%
Command, Control and Communications Systems	\$155,081,000	\$106,787,000	-45.2%
Network-Centric Warfare Technology	\$428,894,000	\$439,386,000	2.4%
Sensor Technology	\$241,288,000	\$210,123,000	-14.8%
<b>Total Advanced Technology Development</b>	<b>\$1,232,637,000</b>	<b>\$1,238,310,000</b>	0.5%
Management Support	\$74,003,000	\$77,786,000	4.9%
<b>Total RDT&amp;E Budget</b>	<b>\$2,973,036,000</b>	<b>\$3,170,390,000</b>	6.2%
<b>Chemical and Biological Defense Program</b>			
Basic Research	\$44,800,000	\$43,898,000	-2.0%
Applied Research	\$193,715,000	\$201,053,000	+3.6%
Advanced Technology Development	\$132,941,000	\$145,359,000	+8.5%
<b>Total RDT&amp;E</b>	<b>\$371,456,000</b>	<b>\$390,310,000</b>	<b>+4.8%</b>

### DOD RDT&E Budget Proposal Highlights

#### DOD Wide

DOD would receive \$115 million for the continuation of the National Advanced Manufacturing Initiative at eight DoD led-institutes : America Makes: The additive manufacturing and 3D printing Institute; DMDII: The Digital Manufacturing and Design Innovation Institute; AFFOA: The Advanced Functional Fabrics of America Institute; LIFT: The Lightweight Innovations For Tomorrow Institute; ARM: The Advanced Robotics Manufacturing Institute; AIM Photonics: The American Institute for Manufacturing Integrated Photonics; NextFlex: The flexible hybrid electronics Institute; and ARMI: The Advanced Regenerative Manufacturing Institute.

## Army

The Army's University Research Initiatives' budget would cut of approximately \$2 million. This supports the Army's funding of the Multidisciplinary University Research Initiative (MURI), the Defense University Research Instrumentation Program (DURIP), and the Presidential Early Career Awards for Scientists and Engineers (PECASE) program, and the Army's efforts in the Minerva Research Initiative (MRI). The \$2 million decrease is associated with the Army funding portion of the Minerva Research Initiative, which was slated to be cut from approximately \$3 million down to \$1 million in FY 2018. The Army will provide support for MURI awards made in prior years and identify six to eight new FY 2018 MURI awards to support basic science and/or engineering research at institutions of higher education that is of critical importance to national defense. Reduced funding for the Army's University and Industry Research Centers is associated with the Army High Performance Computing Research Center and Micro-Autonomous Systems Technology (MAST) CTA sun setting and is not proposed to receive any FY 2018 funding.

## Navy

\$2.16 billion is requested for the Science and Technology (S&T) program – an overall 8.4% reduction from FY 2017 enacted levels. However, \$35 million for 10 new Future Naval Capability initiatives in the areas of Capable Manpower, Enterprise and Platform Enablers, Expeditionary Maneuver Warfare, Forcenet, Sea Shield and Sea Strike.

## DARPA

Nearly a \$200 million increase to the DARPA budget is requested. But the following DARPA programs received cuts under the FY 2018 President's budget request: Basic Operational Medical Research; Biomedical Technology; Biological Warfare Defense; Advanced Aerospace Systems; Command, Control, and Communication Systems; and Sensor Technology. Chemical and Biological Defense Program.

## Chemical and Biological Defense Program

The proposed FY 2018 Research, Development, Test and Evaluation (RDT&E) budget for the Chemical and Biological Defense Program (CBDP) Program is \$1.097 billion, which is an increase of \$212 million. Notable increases include:

- \$285 million to continue support of research and development of medical countermeasures (MCMs) vaccines and therapeutics addressing high priority biological threats – an increase of \$38 million over FY 2017.
- \$295 million supporting RDT&E efforts advancing environmental (detectors and sensors) and medical surveillance (diagnostic and analytical devices) capabilities providing enhanced situational awareness of traditional and non-traditional chemical threats as well as traditional and emerging biological threats – an increase of \$112 million over FY 2017.
- \$104 million to continue support of research and development of medical countermeasures focused on protecting and treating against traditional and non-traditional chemical agents – an increase of \$22 million over FY 2017.
- \$93 million to support critical chemical and biological defense research, development, and test infrastructure and operations – an increase of \$3 million over FY 2017.
- \$91 million supporting biosurveillance, warning and reporting, decision support, and modeling and simulation capabilities – an increase of \$8 million over FY 2017.
- \$86 million supporting RDT&E for personnel/collective protection and hazard mitigation capabilities against traditional and non-traditional chemical threats as well as traditional and emerging biological threats – an increase of \$35 million over FY 2017.
- \$69 million supporting basic research and threat agent sciences advancing fundamental knowledge and experimental research in the life and physical sciences – an increase of \$24 million over FY 2017.

## DEPARTMENT OF EDUCATION

The FY 2018 budget proposal request for the Department of Education includes \$59 billion in discretionary funding, a \$9 billion or 13% decrease below the 2017 CR level. The Budget eliminates or reduces more than 30 programs that either; “duplicate other programs, are ineffective; or are more appropriately supported with State, local, or private funds.” The cuts to the Department of Education budget also includes reductions in college work-study programs and public-service loan forgiveness, while increasing investments in charter schools and school vouchers. Other initiatives – like the International Education and Foreign Language Studies – are declared duplicative; and the plan recommends eliminating them or shifting oversight to other agencies. Higher Education Act programs (excluding Pell Grants) are reduced by 6.4% compared to FY 2017, with Strengthening Institutions Program; federal supplemental educational opportunity grants; and teacher quality partnerships absorbing the biggest cuts.

Figure 5: FY 2018 Budget Request, Department of Education. Source: Bloomberg Government, “Budget Request Dashboard”

	Fiscal 2018 request, dollars in millions		Percentage change from fiscal 2017 to fiscal 2018 request	
Office of Federal Student Aid	\$20,731	-19.3%		
Office of Elementary and Secondary Education	\$19,400	-12.2%		
Office of Special Education and Rehabilitative Services	\$12,427	-6.6%		
Office of Postsecondary Education	\$1,787	-19.5%		
Office of Career, Technical, and Adult Education	\$1,477	-14.0%		
Office of Innovation and Improvement	\$1,208			2.5%
Office of English Language Acquisition	\$736			0.0%
Institute of Education Sciences	\$617			0.0%
Departmental Management	\$606			1.5%
Hurricane Education Recovery	\$0			

#### Proposed Increases and New/Revised Programs; Flat Funding:

- \$616.8 million, or 2% above the FY 2017 CR, for the Institute of Education Sciences. This includes slight boosts to research, development, and dissemination (up \$7 million or 3.8%); and statewide longitudinal data systems (up \$2.2 million or 6.8%).
- \$400 million to expand charter schools and vouchers for private and religious schools. A further \$1 billion is proposed for public schools to adopt choice-friendly policies.
- Education innovation and research grants under Title IV receive an additional \$270 million above FY 2017 levels.
- Funds the Pell Grant Program and supports year-round Pell Grants, which will increase aid available to eligible students by \$16.3 billion over 10 years. The budget also proposes the cancellation of \$3.9 billion from unobligated carryover funding.

- Special Education and Title I funds remain unchanged compared to federal funding levels in the first half of FY 2017.

**Proposed Decreases and Program Eliminations:**

- 35% cut to Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP).
- \$168 million cut to grants to states for career and technical education, down 15% compared to current funding.
- \$96 million cut (down 16%) for adult basic literacy instruction.
- \$13 million cut to Promise Neighborhoods (down 18%).
- Decrease funding for TRIO programs by \$90 million, making the total budget \$808 million in FY 2018. This reduction would be achieved by eliminating funding for the McNair Post-Baccalaureate Achievement and Educational Opportunity Centers programs because of limited evidence of effectiveness.
- Eliminate funding for the Strengthening Institutions Program (SIP), amounting to a \$86.5 million cut from FY 2017. The Trump Administration believes the SIP program is duplicative of approximately 9 other Title III and V programs.
- Eliminate funding for International Education and Foreign Language Studies' (IFLE) Domestic program, and decrease funding for the IFLE Overseas program. These cuts amount to \$72 million.
- Eliminate funding for 21st century community learning centers, totaling \$1.2 billion. This program provides funding to approximately 9,500 centers, serving more than 1 million students in before- and after-school and summer school programs aimed at boosting academic outcomes.
- Eliminate arts education programs totaling \$27 million.
- Eliminate support Native Hawaiian education or Alaska Native education. Indian education programs are decreased overall, with special programs for Indian children cut by over 34%.
- Eliminate funding to student support and academic enrichment fund, meant to help schools pay for mental-health services, anti-bullying initiatives, physical education, Advanced Placement courses and science and engineering instruction. The fund totals \$400 million for FY 2017.

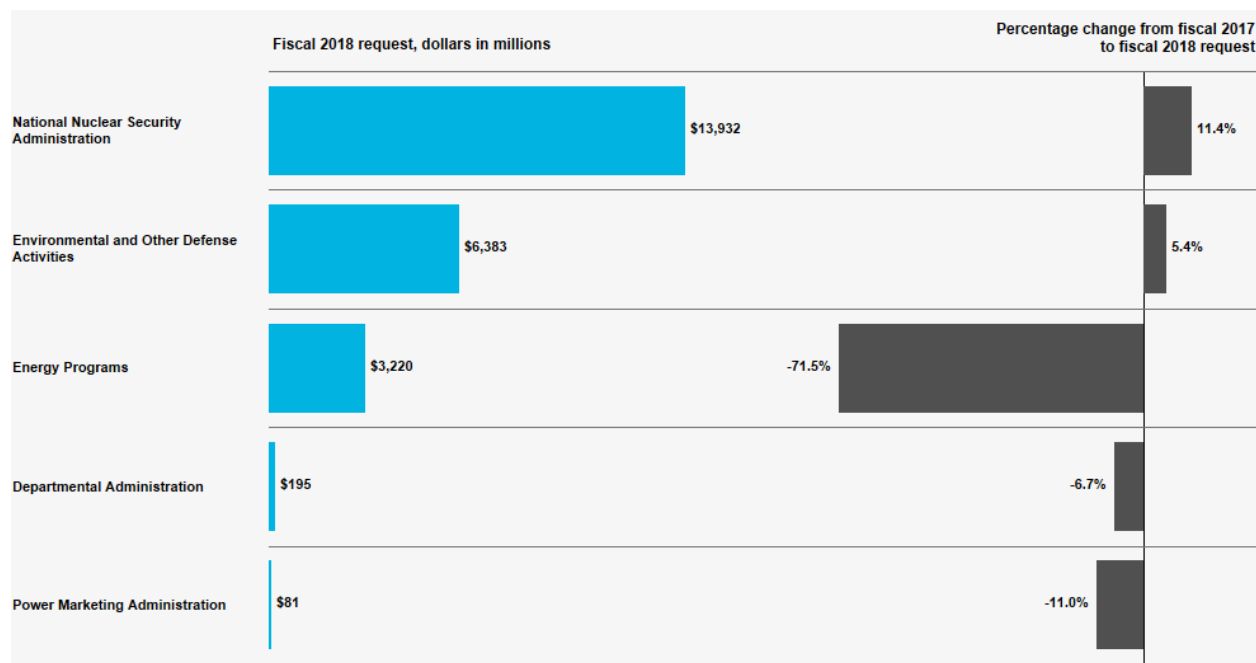


## DEPARTMENT OF ENERGY

As proposed by President Trump in his FY 2018 budget, the Department of Energy would be funded at \$28 billion, a 5.6% decrease from FY 2017. Several major clean, renewable energy programs are targeted for these cuts: the request proposes to eliminate the Advanced Research Project Agency – Energy (ARPA-E); the Loan Programs Office, which provides credit support to help deploy innovative clean energy technologies; the Weatherization Assistance Program; and the State Energy Program. It also cuts research funds for carbon capture and carbon storage. On the other hand, the budget increases funding to the National Nuclear Security Administration by about 11% as part of the Administration's overall pledge to boost defense spending. And even though the budget proposes a boost to the Advanced Scientific Computing Research (ASCR) program, spending on computing research, overall, will fall.

The Congress will now take the president's budgetary suggestions for energy, described in further detail below, and craft FY 2018 appropriations bills that will set actual levels of funding for the year. These will likely be vastly different from what has been proposed.

Figure 6: FY 2018 Budget Request, Department of Energy. Source: Bloomberg Government, "Budget Request Dashboard"



### Proposed Increases and New/Revised Programs; Flat Funding:

- \$10.2 billion for nuclear weapons activities, a 16% increase.
- \$722 million, an 11.6% increase, for the Advanced Scientific Computing Research (ASCR) program.
- \$508 million to reduce the timeline to achieve an exascale computing system, including \$347 million in the Office of Science and \$161 million in NNSA. With the \$286 million increase over the FY 2016 level, DOE intends to accelerate delivery of an exascale machine to 2021 to be closely followed by a second machine with a different architecture.

**Proposed Decreases and Program Eliminations:**

- \$4.5 billion for the Office of Science, an approximate cut of 17% below FY 2016 levels – and the lowest level since 2008. Such action may require the Office of Science to close one or more of its major facilities.
- \$1.555 billion for Basic Energy Sciences (BES), a 16.9% reduction. BES user facilities budgets are cut 6-10%, with several slated for closure including two of five nanoscience centers as well as the Stanford Synchrotron-Radiation Lightsource.
- \$673 million for High Energy Physics, a 18.4% reduction. Savings will come primarily from cutting research funding and facilities operations.
- \$503 million for Nuclear Physics, a reduction of 19.1%. This includes a cut in funding for the Rare Isotope Beams at Michigan State, a \$70 million project.
- \$310 million for fusion energy sciences, an 18.4% cut.
- The majority of the Department of Education's climate research program is in line to be cut or eliminated. Biological and Environmental Research (BER) would be funded at \$349 million – a 43% decrease in funding. Earth and Environmental Systems Sciences (EESSE) would be funded at \$123.6 million, a 61% cut.
- Eliminate ARPA-E.
- Eliminate Small Business Innovation Research and Small Business Technology Transfer programs.
- Eliminate all five of the DOE-led manufacturing innovation institutes, using the prior year's appropriation balances to terminate the institutes and conduct an assessment of its impact. The Administration says this will result in a savings of \$71 million. DOE-led Institutes that would be eliminated include: Power America: The advanced semiconductor Institute; IACMI: The Institute for Advanced Composites Manufacturing Innovation; RAPID: The Rapid Advancement in Process Intensification Deployment Institute; CESMII: The Clean Energy Smart Manufacturing Innovation Institute; and REMADE: Reducing Embodied-energy and Decreasing Emissions Institute.
- Provide \$28.0 billion in total funding for the Department of Energy, a \$2.7 billion (8.9%) decrease from FY 2017. This deficit is caused, in part by, a 17% cut to the Department of Energy's Office of Science and a 69% reduction to its Office of Energy Efficiency and Renewable Energy. The Advanced Research Project Agency-Energy (ARPA-E) program would be eliminated by 2019. According to a report issued by the [House Democratic Committee on Appropriations](#), in 7 years of operation, ARPA-E has been appropriated \$1.5 billion, but attracted \$1.8 billion in private funding for 74 research teams. Research funded by ARPA-E has led to the creation of 56 new companies.

**Department of Energy: Analysis**

- **The Department of Energy (DOE) is in line for a major reorganization under the Trump Administration's spending plan.** Most DOE science and technology programs would be rolled back, in favor of "increased reliance on the private sector to fund later-stage research, development, and commercialization of energy technologies." In FY 2017, the DOE's funding priorities included: clean energy; a balanced basic and applied research portfolio; and energy efficient technologies. However, in FY 2018, the focus has shifted away from renewable energy programs, and towards basic scientific research; clean coal initiatives; and nuclear security issues.
- The Advanced Manufacturing Office (AMO) in DOE's Office of Energy Efficiency and Renewable Energy (EERE) would shift its emphasis, with the budget encouraging AMO to fund "25 to 50 competitively selected, merit-based, early-stage applied R&D projects (TRL 2-4) at National Laboratories, universities, and companies" with a focus on early stage applied R&D in "emerging manufacturing technology areas with significant potential for impact on energy and manufacturing." **The plan continues to outline parameters for these manufacturing research programs, including "funding projects that support materials for harsh conditions, energy**

**conversion materials, materials for energy systems, roll-troll materials and processes, innovative computational process modelling in manufacturing, and energy intensive manufacturing processes.”**

- Given the drastic reduction, and a “lab-focused” budget request, **this proposal for DOE funding could result in cuts of more than \$1 billion in grants to universities and other institutions.** A reorganization of DOE priorities on this scale would most certainly shift the scope of future DOE solicitations and funding trends. For example, in 2016, approximately 24% of the Office of Science’s budget of \$5.1 billion was issued as competitive solicitations. The President calls for just \$4.5 billion for the Office of Science in FY 2018, approximately 17% below FY 2016 levels – and the lowest level since 2008. This, coupled with proposed reductions to the availability of user facilities, threatens to significantly harm the trajectory and competitiveness of energy-related research. **Manufacturing USA, the national network of manufacturing innovation institutes, is partially defunded in the President’s FY 2018 Budget Request.** There are currently 14 Institutes either established or underway, including eight Department of Defense (DOD)-led Institutes, five Department of Energy (DOE)-led institutes, and one Department of Commerce (DOC)-led institute. The President’s budget proposes to eliminate all five of the DOE-led institutes, using the prior year’s appropriation balances to terminate the institutes and conduct an assessment of its impact. The elimination of the DOE-led institutes falls in line with the Administration’s new priorities for the agency. Although eliminating the Manufacturing USA DOE Institutes, the President’s Budget does call, broadly, for \$28 million to support “early-stage applied R&D ... relevant to the productive use of energy in manufacturing, as well as the competitive manufacturing of energy related products.” This recommendation would likely result in a shift in oversight over activities that the DOE-led institutes currently undertake.
- **Although the Departments of Energy and Commerce would see significant reduction in funding for manufacturing research should this proposal be taken up, the Department of Defense would receive \$115 million for the continuation of its eight existing manufacturing innovation institutes.**

## ENERGY-RELATED PROGRAMS IN OTHER AGENCIES

- **National Institute of Standards and Technology:** \$8.3 million reduction for Advanced Materials Manufacturing. With reduced budgets, NIST will terminate sub-critical research efforts in thin film photovoltaics that reduce the cost of solar energy, inorganic electronic materials critical for electronics, materials for advanced battery systems, as well as capabilities focused on computational modeling and characterization of advanced materials systems. NIST will also eliminate its nanomaterial environment, health, and safety (nano-EHS) program, ending the research and development efforts needed to develop new and continue providing existing standard reference materials.
- **National Science Foundation:** \$24.4 million is allotted for Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS), a nearly 70% reduction in funding.
- **Environmental Protection Agency:** the agency would be funded \$5.653 billion, a 31.4% reduction below FY 2017 levels. These cuts would be achieved by eliminating 3,200 staff and over 50 programs, including those supporting international and domestic climate change research, partnership programs, and all geographic programs. Energy and climate-change related programs, such as the Clean Power Plan, would be eliminated..

## DEPARTMENT OF HEALTH & HUMAN SERVICES

The President's Budget request for U.S. Department of Health and Human Services proposes \$69 billion in discretionary budget authority and \$1.046 trillion in mandatory funding. The budget includes a proposed 18% cut, down from \$84.1 billion in FY 2017, to HHS' discretionary budget. Furthermore, the budget proposes \$1.046 trillion in mandatory funding for FY 2018 and \$665 billion in mandatory savings between 2018 – 2027.

Figure 7: FY 2018 Budget Request, Department of Health and Human Services. Source: Bloomberg Government, "Budget Request Dashboard"

	Fiscal 2018 request, dollars in millions		Percentage change from fiscal 2017 to fiscal 2018 request
National Institutes of Health	\$25,883	-18.3%	
Administration for Children and Families	\$14,482	-24.9%	
Health Resources and Services Administration	\$5,566	-9.7%	
Centers for Disease Control and Prevention	\$5,054	-20.6%	
Indian Health Service	\$4,739	-1.2%	
Substance Abuse and Mental Health Services Administration	\$3,771	-9.0%	
Centers for Medicare and Medicaid Services	\$2,008		6377.4%
Food and Drug Administration	\$1,888	-31.1%	
Administration for Community Living	\$1,851	-3.0%	
Departmental Management	\$1,479	-12.2%	

## CENTERS FOR DISEASE CONTROL

The President's FY 2018 budget recommendation for the Centers for Disease Control (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) is \$11.1 billion, a decrease of \$1.0 billion relative to FY 2017. This includes \$5.1 billion in budget authority, \$841 million from the Prevention and Public Health Fund, and \$143 million in Public Health Service (PHS) Evaluation Funds. \$51 million is included for CDC's Food Safety activities.

### Proposed Increases and New/Revised Programs; Flat Funding:

- \$49 million to support CDC's efforts around Zika preparedness and other vector-borne diseases, a \$23 million increase over the FY 2017 CR level.
- \$75 million to support activities preventing opioid abuse and overdose, consistent with the FY 2017 CR level.
- \$575 million for the Strategic National Stockpile—\$1 million above the spending level allowed by the FY 2017 CR—to maintain a repository of medical countermeasures that can be rapidly deployed to support state, territorial, and local response to public health threats.

### Proposed Decreases and Eliminations:

- \$701 million for discretionary programs supported within CDC's National Center for Immunization and Respiratory Disease, \$82 million below the funding level reflected in the FY 2017 CR. Of this, the influenza prevention and control program is prioritized.
- \$934 million for domestic HIV/AIDS, viral hepatitis, sexually transmitted infections, and tuberculosis prevention, a decrease of \$186 million below the FY 2017 CR level.
- \$460 million to support public health scientific services activities, a decrease of \$31 million below the FY 2017 CR level.
- \$952 million for chronic disease prevention and health promotion activities, a decrease of \$222 million below the FY 2017 CR level.
- \$337 for cancer prevention and control, an \$18 million decrease below the FY 2017 CR level
- \$100 million to support birth defects and developmental disabilities, a decrease of \$35 million below the FY 2017 CR level.
- \$157 million to support environmental health, a decrease of \$60 million below the FY 2017 CR level. \$35 million is included for lead prevention and safe water activities; and \$17 million is included for the Childhood Lead Prevention Program.
- \$216 million for injury prevention and control, a decrease of \$19 million below the FY 2017 CR level.
- \$200 million to support occupational health and safety, a decrease of \$138 million below the FY 2017 CR level.
- \$1.3 billion for public health and emergency preparedness activities, a \$136 million decrease from the FY 2017 CR level. \$551 million is provided to cooperative agreements to enable public health agencies to build resilient communities that have strong public health emergency management and response systems, all resulting in improving the overall safety of American communities.

## FOOD AND DRUG ADMINISTRATION

The FY 2018 President's Budget Request for the Food and Drug Administration (FDA) is \$5.1 billion – a \$456 million (10%) increase over the FY 2017 CR level. Of note, the FY 2018 President's Budget proposes a change in the way medical products are advanced to the market, placing a higher burden on the medical product industries. The proposed structure will be outlined in four bills to authorize user fee programs for prescription and generic drugs, biosimilar and medical devices. It also extends the change in structure by revising the animal drugs and animal generics programs. An estimated \$1 billion in user fees will be used to support all medical product review and approval activities across programs.

### **Proposed Increases and New/Revised Programs; Flat Funding:**

- With the support of funds from the 21st Century Cures Act, the FDA will build on recent advances in medical product innovation and ensure quicker access to safe and effective treatments for patients. Some of the latest activities associated with this task include: Further incorporating the patient perspective in the drug review process; Supporting the Oncology Center of Excellence; Advancing the review of breakthrough devices; Incorporating the latest in regulatory science evidence; and Continuing work on regenerative advanced therapies.
- \$3.2 billion total at the program level for Medical product safety investments, \$505 million above the spending appropriated under the annualized level of the FY 2017 CR.
- \$25 million to continue the Medical Countermeasures program, which supports the FDA's preparedness and response activities. These funds will support and accelerate the development, evaluation and approval of key medical countermeasures, as well as supporting the development and implementation of policies to advance emergency preparedness and response.
- \$672 million in user fees to support the FDA tobacco program, which aims to prevent people from starting to smoke; decrease the harms of tobacco use; and encourage quitting. In addition, the FDA conducts compliance

checks across 55 states, territories and tribal jurisdictions; and works to increase the tobacco industry's awareness of their obligations and the FDA's responsibilities.

**Proposed Decreases and Eliminations:**

- \$1.3 billion for overall food safety, a decrease of \$83 million. The FY 2018 President's Budget commits to continuing key public health and safety initiatives including response to outbreaks and implementation of Food Safety Modernization Act regulations. The President's Budget also proposes it will support – although at reduced levels – food safety research support, partnerships with academic institutes and international capacity building.

## HEALTH RESOURCES AND SERVICES ADMINISTRATION

The FY 2018 President's Budget provides a total of \$9.9 billion in funding for the Health Resources and Services Administration (HRSA), which is \$460 million below the funding level provided by the FY 2017 CR. The Primary Care program would see an \$89 million proposed increase while all other programs would be reduced, with the deepest cuts in Rural Health (50%) and Health Workforce programs (33%).

**Proposed Increases and New/Revised Programs; Flat Funding:**

- \$295 million for the Children's Hospital Graduate Medical Education Program, which supports residency training in pediatric care for 6,877 full-time residents.
- \$60 million in new mandatory funding to support 59 primary care residents' training in community-based, patient care settings.
- \$5.1 billion for health centers, which includes a \$3.6 billion budget for mandatory resources in FY 2018 and FY 2019. In addition, \$50 million is budgeted for grants related to the prevention, treatment and awareness of opioid abuse.
- \$667 million - an increase of \$30 million over the FY 2017 CR – to support maternal and child health block grants to states. The budget requests \$128 million for the Healthy Start program, representing a \$10 million increase over the FY 2017 CR. The budget also proposes \$400 million in mandatory resources for states to provide Home Visiting Services for at-risk pregnant women and mothers and their families.
- \$286 million for family planning, which aims to support low-income individuals with family planning and preventive health services. The overall goal of this program is to prevent unintended pregnancies and assist individuals and families with resources during pregnancy to result in healthy birth outcomes.
- \$10 million for the 340B Drug Pricing Program, in which drug manufacturers must supply outpatient prescription drugs at reduced prices to eligible health care organizations. The budget also aims to support efforts to increase transparency and improve program reliability.
- Programs supporting the collection and analysis of data to evaluate the national workforce's effectiveness are level-funded.

**Proposed Decreases and Eliminations:**

- \$2.3 billion for the Ryan White HIV/AIDS programs, a \$59 million decrease from the FY 2017 CR. The plan proposes to eliminate the Ryan White HIV/AIDS Education and Training Programs and other projects to fund direct health services to people living with HIV; but it maintains the \$899 million funding level for the AIDS Drug Assistance Program.
- \$771 million for HRSA health workforce programs, 33% less than the FY 2017 CR. The funding would be directed toward increasing the number of health care professionals working in communities that need specialists by



providing loan repayment programs and scholarships that are tied to a service commitment, like the National Health Service Corps. The programs proposed for elimination include diversity training programs; behavioral and mental health programs; oral health programs; nursing workforce development programs; public health and preventative medicine programs; and primary care training programs.

- The nearly \$675 million proposed increase to maternal and child health programs would be offset by cuts to programs for Sickle Cell Disease, Autism, and Heritable Disorders programs. In addition, the President proposes to eliminate the universal newborn hearing screening program and the program that supports Emergency Medical Services for Children.
- \$74 million for rural health – a more than 50% drop from the FY 2017 enacted level of \$149 million. The remaining funds are targeted to fund the Rural Health Outreach Network, Quality Improvement Grants, Rural Health Policy Development and Black Lung Clinics. The FY 2018 president's budget also proposes to eliminate Rural Hospital Flexibility Grants and State Offices of Rural Health.

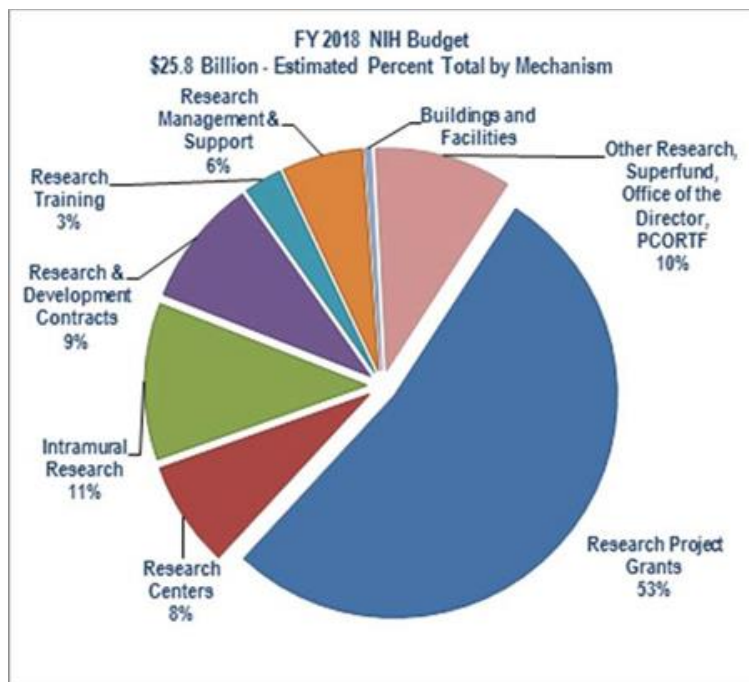
## NATIONAL INSTITUTES OF HEALTH

The President's FY 2018 budget requests cuts across the board at the National Institutes of Health (NIH). The budget provides \$26.9 billion to the NIH, which is \$7.7 billion, or 22%, less than the final FY 2017 budget for the agency. Notably, the proposal reorganizes the NIH structure by eliminating the Fogarty International Center; and redirecting funds to support evidence-based practice centers, research and treatment of the opioid epidemic, and the Healthcare Cost Utilization Project. A new institute would be formed, the National Institute for Research on Safety and Quality, which would absorb the Agency for Healthcare Quality and Research (AHRQ) and PCORI trust funds. All institutes and centers are slated for cuts.

The following changes are proposed to funding allocations to NIH extramural grant mechanisms.

- \$14.189 billion for research project grants, a reduction of \$3.739 billion from FY 2017. The budget for new/competing grants would decrease by \$1.648 million.
- \$2.080 billion for research centers, a decrease of \$417 million over FY 2017.
- \$738 million for research training activities, a decrease of \$106 million.

Figure 8: FY 2018 Budget Request, National Institutes of Health. Source: U.S. Department of Health and Human Services, "HHS FY 2018 Budget in Brief - NIH."



### Proposed Increases and New/Revised Programs; Flat Funding:

- \$496 million in 21st Century Cures Act funding, a 41% increase, from a mandatory funding stream separate from NIH's regular appropriation. This includes the Obama administration's Cancer Moonshot; The Brain

Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative; and Precision Medicine Initiative's planned 1-million-volunteer health study.

- \$272 million for the new National Institute for Research on Safety and Quality (NIRSQ) to launch new and continue selected activities of AHRQ. NIRSQ is projected to receive \$107 million in mandatory resources from the Patient-Centered Outcomes Research Trust Fund to continue translating and targeted dissemination of comparative clinical effectiveness research study results and workforce development efforts.
- NIRSQ priority programs include: \$46 million for investigator-initiated research grants and research training; \$10 million for the Healthcare Cost and Utilization Project; \$1 million for Evidence-Based Practice Centers; and \$3 million for opioid treatment research grants. NIRSQ will fund the Medical Expenditure Panel Survey at \$70 million, a \$4 million increase over the FY 2017 CR.

#### **Proposed Decreases and Eliminations:**

- \$7 million for the US Preventive Services Task Force (USPSTF), a decrease of \$4 million from the FY 2017 CR.
- \$4.474 billion for the National Cancer Institute, or \$1.031 billion less than the FY 2017 allocation.
- \$1.6 billion for the National Institutes of Diabetes & Digestive & Kidney Diseases, or \$355 million less than the FY 2017 CR.
- \$1.356 billion for the National Institute of Neurological Disorders and Stroke or \$337 million less than the FY 2017 allocation.
- Indirect costs for NIH grants capped as 10% of total research, in order to better target available funding toward high priority research. In addition, Federal research requirements for grantees will be streamlined to reduce grantee burden through targeted approaches as proposed by NIH.
- The Agency for Healthcare Quality and Research (AHRQ) would be absorbed by the National Institutes of Health under this plan. AHRQ's Health Information Technology portfolio and contract-funded activities in Health Services Research, Data, and Dissemination would be eliminated.
- Defunds the Fogarty International Center's \$70 million budget (FY 2017). Of that, \$25 million would be redirected to international research and research-related activities within the NIH Office of the Director.

#### **SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION**

The FY 2018 President's Budget proposes \$3.9 billion for SAMHSA, a reduction of \$399 million from the FY 2017 CR. Flat funding is dedicated to fighting the opioid epidemic and mental health programming receives a boost. However, this is balanced by overall reductions in both substance abuse prevention and mental health efforts.

#### **Proposed Increases and New/Revised Programs; Flat Funding:**

- \$2.7 billion – consistent with the FY 2017 CR level – for substance abuse treatment activities. \$589 million is targeted to fighting the opioid epidemic. This includes \$500 million authorized in FY 2017 and FY 2018 by the 21<sup>st</sup> Century Cures Act. \$17 million is included for programs authorized under the Comprehensive Addiction and Recovery Act of 2016, consistent with FY 2017 CR levels.
- \$5 million for Assertive Community Treatment in SAMHSA, a new program authorized by the 21st Century Cures Act. The program will help communities establish, maintain, or expand evidence-based efforts to avoid the dangerous and unsettling cycling of patients with mental illness through emergency and inpatient settings.
- \$119 million for the Children's Mental Health Services program, which is the same amount as the FY 2017 CR. Up to 10% of the funds will be available for a new demonstration project to translate previous research by the National Institute of Mental Health that indicated earlier psychosocial intervention with those at high risk may prevent the further development of serious emotional disturbances and ultimately serious mental illness.

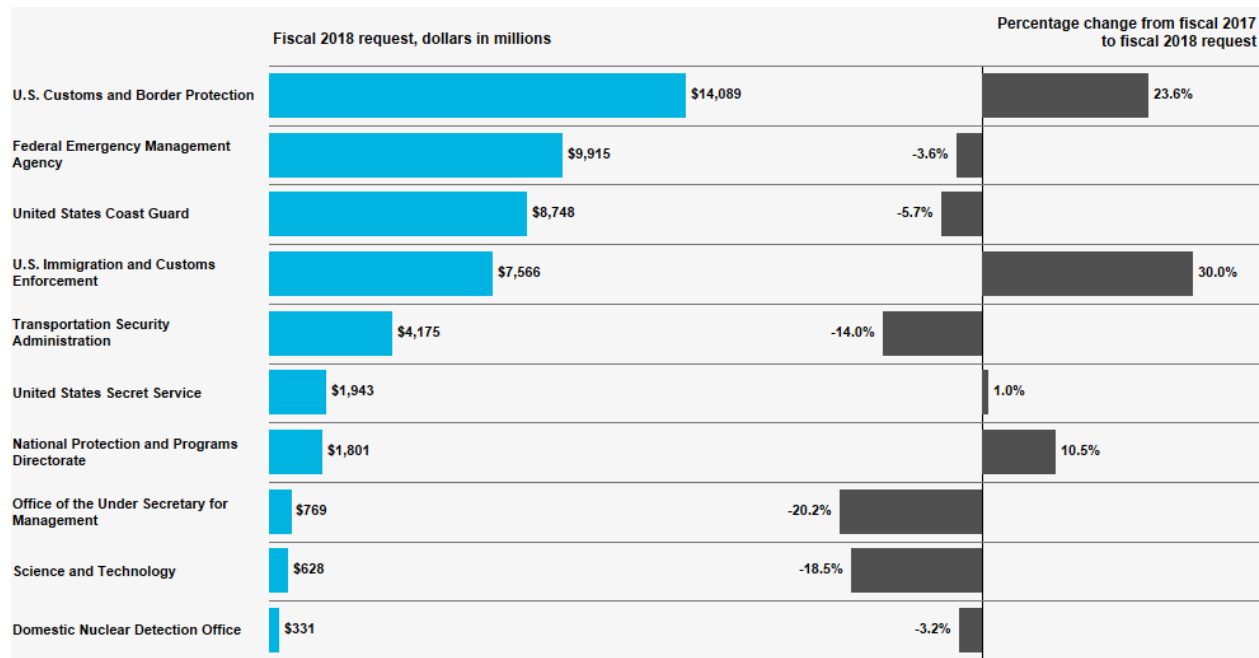
**Proposed Decreases and Program Eliminations:**

- \$150 million for substance abuse prevention efforts, a reduction of \$73 million under FY 2017 CR levels.
- \$912 million, \$252 million below the FY 2017 CR, for mental health activities.
- No funding for the Behavioral Health Workforce Education and Training (BHWET) program—a reduction of \$50 million below the FY 2017 CR.
- No funding for the Primary and Behavioral Healthcare Integration (PBHCI) program, a reduction of \$52 million below the FY 2017 CR. Instead, states can choose to dedicate federal resources received through the block grant or other sources of funding to integrate primary and behavioral health care. For example, eight states will participate in a Medicaid demonstration in FY 2018 to operate Certified Community Behavioral Health Centers.

## DEPARTMENT OF HOMELAND SECURITY

The Department of Homeland Security would receive a 6.8% increase under this plan, up to \$44.1 billion in FY 2018. This includes increases to Customs and Border Protection, immigration enforcement, and the National Protections and Programs Directorate.

Figure 9: FY 2018 Budget Request, Department of Homeland Security. Source: Bloomberg Government, "Budget Request Dashboard"



Although DHS is one of the only agencies to receive an increase in funding, the budget for its main research office, DHS Science and Technology Directorate, is cut by almost 20%. In total, the research arm will receive \$627.324 million in total funding.

### Proposed Increases and New/Revised Programs; Flat Funding:

- 24% funding increase for Customs and Border Protection. The increase would support border security technology, the southern border wall, and 5,000 border agents.
- 30% increase to support immigration enforcement, detention and removal operations, and 1,000 law enforcement officers at Immigration and Customs Enforcement.
- 11% funding increase for the National Protection and Programs Directorate.

### Proposed Decreases and Program Eliminations:

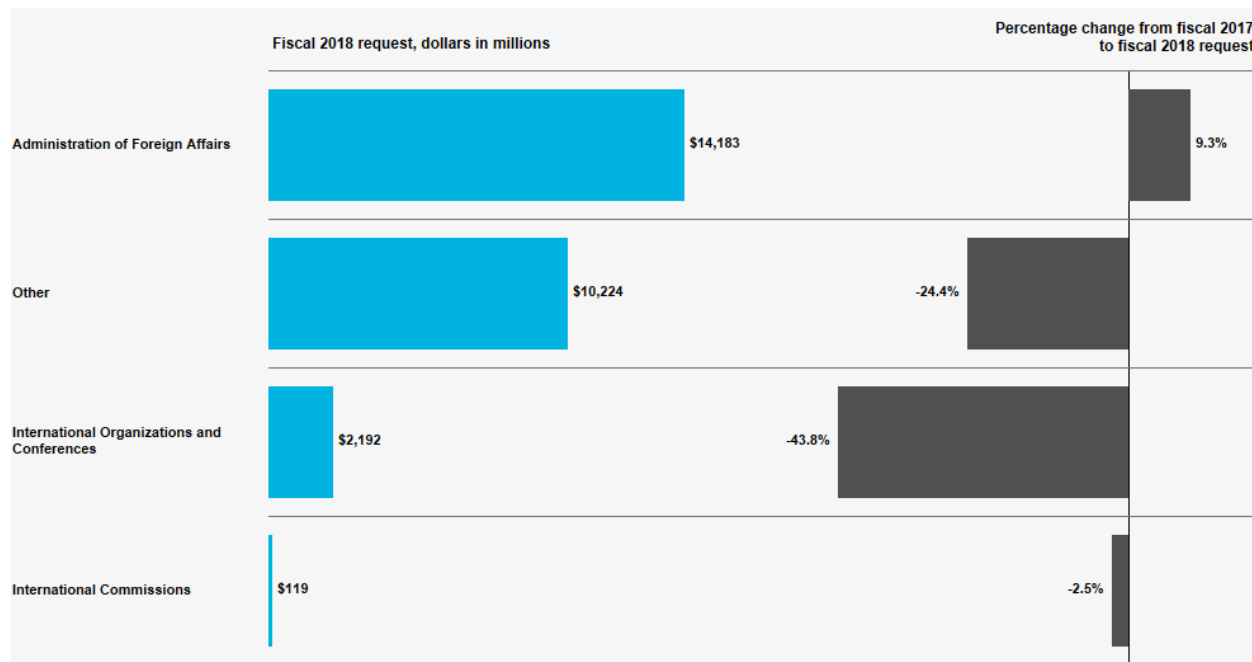
- Eliminate discretionary funding for the National Flood Insurance Program hazard mapping.
- \$29.7 million for DHS University Programs would receive— a 25% reduction from FY 2017 levels. This reduction would result in the elimination of three centers of excellence (COE), including the Maritime Security COE at Stevens Institute of Technology; the Terrorism COE; and, the Cross-Border Threat Screening and Supply Chain Defense COE.
- \$53.3 million for APEX R&D accounts are funded – a decrease of \$25.6 million.

- \$484 million for Border Security R&D programs – a decrease of \$8.348 million. This would eliminate R&D focused on Air Cargo Screening, Cargo and Conveyance Security, Cargo Forensics, Land Sea Cargo Screening.
- \$81.1 million for Counterterrorism R&D programs – a decrease of \$18.455 million. This would eliminate R&D focused on Chemical Security Analysis, and Multifunction Detectors.
- \$46.2 million for Cyber Security/Information Analysis R&D accounts – a decrease of \$20.234 million. This would eliminate R&D focused on Cyber Security Research Infrastructure and Cyber Transition and Outreach investments.
- \$61.3 million for First Responder/Disaster Resilience R&D accounts are funded – a decrease of \$11.555 million. This eliminates funding for Bio-Forensics R&D, Bio-Forensics Operations (NBFAC), Chemical Forensics, Explosives and Radiological/Nuclear Resiliency, Interoperability and Compatibility Standards
- \$52.6 million for Chemical, Biological and Explosive Defense R&D programs are funded – a decrease of \$5.748 million. These cuts would eliminate Agriculture Screening, Agricultural Surveillance, and Chemical Detection programs.

## DEPARTMENT OF STATE

The State Department (DOS) took a heavy cut under Trump's FY 2018 budget proposal. Though cuts are less than proposed in the "skinny budget," the DOS would receive \$28.2 billion from the FY 2018 budget request – a nearly 29% decrease from FY 2017 levels. \$10 billion would be shaved off its core program funding under proposals to eliminate climate change initiatives and to slash foreign aid, contributions to the United Nations and cultural exchanges. The FY 2018 President's Budget also calls for \$1.5 billion for Treasury International Programs, a 35% reduction from the previous year. The administration proposes \$12 billion for operations in war-torn areas such as Syria, Iraq and Afghanistan, down from more than \$20 billion.

Figure 10: FY 2018 Budget Request, Department of State. Source: Bloomberg Government, "Budget Request Dashboard"



### Proposed Increases and New/Revised Programs; Flat Funding:

- \$8 million for the prevention, treatment, and control of, and research on HIV/AIDS, a steady level of funding. \$4.975 billion would remain available until September 30, 2022. \$1.125 billion will go specifically to the Global Fund to Fight AIDS, Tuberculosis and Malaria Program, within Global Health Programs- State (GHP-State).
- \$1.506 billion for the Global Health Programs- State (GHP-State) account, which supports the goal of controlling the HIV/AIDS epidemic through the President's Emergency Plan for AIDS Relief (PEPFAR).

### Proposed Decreases and Program Eliminations:

- \$6.486 million discretionary funding for Global Health Programs, a reduction from the \$8.492 million allocated in FY 2017. This comes despite steady funding for the Global Health Programs- State (GHP-State) account
- \$363 million (26%) cut to the United Nations; and \$711 million (37%) cut to International Organizations and Peacekeeping activities.



- \$285 million for Educational and Cultural exchange programs (direct), a reduction of \$653 million compared to FY 2017. This includes elimination of the J. William Fulbright Educational Exchange Program and the Benjamin A. Gilman International Scholarship Program.
- \$820 million for supporting public diplomacy resources and programming. This includes streamlining the budget to fund core programs like the Fulbright and the International Visitor Leadership Program (IVLP).
- Eliminate the Global Climate Change Initiative. This includes the Strategic Climate Fund (SCF); and the Clean Technology Fund (CTF).

## DEPARTMENT OF TRANSPORTATION

The FY 2018 President's Budget requests \$16.2 billion for Department of Transportation's discretionary programs. This represents a 13% decrease from 2017 budget levels. Of note, the budget plan also includes \$200 billion to support infrastructure spending. The proposal also shifts air traffic control to a nonprofit organization.

Figure 11: FY 2018 Budget Request, Department of Transportation. Source: Bloomberg Government, "Budget Request Dashboard"

	Fiscal 2018 request, dollars in millions	Percentage change from fiscal 2017 to fiscal 2018 request
Federal Aviation Administration	\$12,776	-1.0%
Federal Transit Administration	\$1,493	-38.3%
Federal Railroad Administration	\$1,049	-37.5%
Maritime Administration	\$391	-2.0%
Pipeline and Hazardous Materials Safety Administration	\$231	3.6%
Office of the Secretary	\$160	-80.7%
National Highway Traffic Safety Administration	\$153	0.0%
Office of Inspector General	\$87	0.0%
Saint Lawrence Seaway Development Corporation	\$28	0.0%
Bureau of Transportation Statistics	\$0	
Federal Highway Administration	\$0	-100.0%
Federal Motor Carrier Safety Administration	\$0	
Surface Transportation Board	\$0	

#### Proposed Increases and New/Revised Programs; Flat Funding:

- \$9.9 billion for the operation, maintenance, communications, and logistical support of the air traffic control and air navigation systems. This is the same level as annualized under the FY 2017 CR. These increases are offset by a \$49 million cut to operating and other cost saving measures.
- \$1.3 billion to develop the policies, procedures and standards for safe Unmanned Aircraft Systems (UAS) operations in the National Airspace System (NAS), representing a \$7 million increase over FY 2017 CR levels.
- \$3.35 billion obligation limitation for Grants-in-Aid for Airports (sometimes called Airport Improvement Program, or AIP), an increase of \$6.4 million from the annualized level under the FY 2017 CR.
- Transit formula grants largely remained at stable levels, with an increase from \$1.820 billion (2017 level) to \$1.912 billion for State of Good Repair Grants. \$9 million is allocated to Technical Assistance and Workforce Development grants, which will assist grantees to provide more effective and efficient public transportation and administer federal funding in compliance with the law.
- \$646 million for formula grants to provide funds for capital, planning and operating assistance grants for transit service implemented by states in rural areas with populations of less than 50,000, at levels similar to FY 2017. Funding may also be used to support intercity bus service; Job Access and Reverse Commute activities; Public Transportation on Indian Reservations program; and the Appalachian Development Public Transportation Assistance Formula Program.
- Extend the authorities of the new National Surface Transportation and Innovative Finance Bureau (the Bureau), established under the Fixing America's Surface Transportation (FAST) Act.

**Proposed Decreases and Program Eliminations:**

- \$150 million to support environmental and safety research including fire research, propulsion and fuel systems, unmanned aircraft, advanced materials research, and weather research. This level is \$26.5 million less than the FY 2017 CR.
- \$4 million for minority business outreach, down from \$5 million in FY 2017.
- Halts federal funding of many new transit projects, citing local governments should be the lead.
- No funds to support the National Infrastructure Investments Grants program, Transportation Investment Generating Economic Recovery (TIGER) program.
- No funds to support to Amtrak's long-distance service, and eliminates funding for the Essential Air Service.
- Phases out Capital Investment grants for transit.
- Federal Transit Administration's Capital Investment Program (New Starts) is shortened. The 2018 Budget request includes \$1.2 billion (compared to \$2.143 billion in FY 2017) for the Capital Investment Grants account to increase the capacity of local transit networks and to meet ridership demands in communities across the nation.

## NATIONAL SCIENCE FOUNDATION

Funding for the National Science Foundation (NSF) in this proposal is at \$6.65 billion – a cut of more than 11% from FY 2016 – thereby bringing the agency's budget back to 2008 levels. NSF's research and related activities account (R&RA), which encompasses NSF's seven directorates, received a similar 11.14% cut in funding. These cuts will be absorbed, in part, by reducing the number of awards the agency makes. Of the seven cross-foundation investments, only NSF INCLUDES was spared reductions.

#### Increases and New/Revised Programs:

- \$14.88 million for Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES), an increase of 6.5% over FY 2016 actual.
- \$182.80 million to fully fund the construction of three major research equipment and facilities projects: the Daniel K. Inouye Solar Telescope (\$20.0 million); the Large Synoptic Survey Telescope (\$57.80 million); and the Regional Class Research Vessels (\$105.0 million).
- \$20.0 million for Computer Science for All (CSforAll).

#### Decreases and Eliminations:

- \$222.43 million for Cyber-Enabled Materials, Manufacturing, and Smart Systems (CEMMSS), \$49.09 million less than FY 2016 actual, a reduction of more than 18%.
- \$24.4 million for Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS), a nearly 70% reduction in funding.
- \$26.15 million for NSF Innovation Corps (I-Corps™), down \$3.59 million.
- \$31.15 million for Risk and Resilience, an \$11.79 million decrease.
- \$113.75 million for Secure and Trustworthy Cyberspace (SaTC), a cut of just over \$16 million.
- \$134.4 million for Understanding the Brain (UtB), which is \$38.29 million less than FY 2016 actual.
- \$40.0 million, a decrease of \$9.98 million, for CyberCorps®: Scholarship for Service (SfS) program.
- \$96.50 million, a decrease of \$8.27 million, for Improving Undergraduate STEM Education (IUSE). In FY 2018, \$15.0 million is included for IUSE: Hispanic Serving Institutions (HSI).
- \$59.0 million, a decrease of \$7.04 million, for Advanced Technological Education (ATE).
- \$100 million, a decrease of \$60 million, for EPSCoR.
- \$246.54 million, a decrease of \$85.80 million for the Graduate Research Fellowship Program (GRFP).
- \$40.10 million, a decrease of \$15.88 million, for NSF Research Traineeship (NRT).

Figure 12: FY 2018 Budget Request, National Science Foundation. Source: National Science Foundation, FY 2018 Budget Request to Congress, "NSF Summary Table."

NSF by Account	FY 2016 Actual	FY 2017 Annualized CR	FY 2018 Request	FY 2018 Request Change Over FY 2016 Actuals	
				Amount	Percent
BIO	\$723.78	-	\$672.11	-\$51.67	-7.1%
CISE	935.20	-	838.92	-96.28	-10.3%
ENG	915.68	-	833.49	-82.19	-9.0%
Eng Programs	727.16	-	657.28	-69.88	-9.6%
SBIR/STTR	188.52	-	176.21	-12.31	-6.5%
GEO	876.51	-	783.31	-93.20	-10.6%
MPS	1,348.78	-	1,219.43	-129.35	-9.6%
SBE	272.20	-	244.02	-28.18	-10.4%
OISE	49.07	-	44.02	-5.05	-10.3%
OPP	448.87	-	409.18	-39.69	-8.8%
IA	426.57	-	315.74	-110.83	-26.0%
U.S. Arctic Research Commission	1.43	-	1.43	-	-
Research & Related Activities	\$5,998.09	\$6,022.18	\$5,361.65	-\$636.44	-10.6%
Education & Human Resources	\$884.10	\$878.33	\$760.55	-\$123.55	-14.0%
Major Research Equipment & Facilities Construction	\$241.50	\$199.93	\$182.80	-\$58.70	-24.3%
Agency Operations & Award Management	\$351.11	\$329.37	\$328.51	-\$22.60	-6.4%
National Science Board	\$4.31	\$4.36	\$4.37	\$0.06	1.5%
Office of Inspector General	\$14.76	\$15.13	\$15.01	\$0.25	1.7%
<b>Total, NSF</b>	<b>\$7,493.86</b>	<b>\$7,449.30</b>	<b>\$6,652.89</b>	<b>-\$840.98</b>	<b>-11.2%</b>

## ARTS, HUMANITIES & LIBRARIES

In line with the “skinny budget” released in March 2017, the Trump administration proposes to eliminate the National Endowment for the Arts (NEA), National Endowment for the Humanities (NEH), and the Institute of Museum and Library Services (IMLS). These moves are described as part of the Administration’s plan to move the nation towards fiscal responsibility and to redefine the proper role of the Federal Government.

- Eliminate funding for the NEA. \$29 million will be appropriated to close out the agency. This is a \$150 million decrease from FY 2017.
- Eliminate funding for the NEH. \$42.3 million will remain for administration costs to carry out grants made before September 30, 2017. \$12.4 million would be allocated to honor matching grants made by NEH prior to October 1, 2017.
- Eliminate funding for the Institute of Museum and Library Services (IMLS), with \$23 million budgeted to conduct an orderly closeout beginning in 2018.

## DEPARTMENT OF INTERIOR

The President’s budget would fund the Department of Interior (DOI) at \$11.7 billion, approximately \$1 billion below current levels. The budget proposal prioritizes infrastructure of public lands by increasing funding for national parks to address their deferred maintenance backlog. The proposal includes:

- \$2.8 billion for the Fish and Wildlife Service (FWS), a decrease of \$202.9 million.
- \$2.6 billion for the National Park Service (NPS) funding, a reduction of \$296.6 million.

## ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) would be funded at \$5.653 billion, a 31.4% reduction below FY 2017 levels. These cuts would be achieved by eliminating 3,200 staff and over 50 programs, including those supporting international and domestic climate change research, partnership programs, and all geographic programs.

- Eliminates climate change related programs, like the Clean Power Plan.
- Eliminates regional environmental programs, like the Chesapeake Bay program.
- Eliminates environmental justice enforcement programs.
- Eliminates Coastal Zone Management (CZM) grants. The National Oceanic and Atmospheric Administration (NOAA) competitively awards a portion of the CZM funding for projects of special merit.
- Cuts grants to states, which provide financial assistance to states and tribes to help them develop and implement environmental programs, by 44% to \$597 million.
- \$250 million for the Office of Research & Development – a nearly 50% reduction.
- Cuts the Superfund program by \$327 million or 30%.

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The proposed budget includes a roughly 1% reduction in NASA's budget. This includes increased support to public-private commercial space programs and planetary science, countered by reducing support to climate programs and grant funding.

### **Proposed Increases and New/Revised Programs; Flat Funding:**

- \$1.930 billion, or a 16.6% increase, to planetary science programs, including funding for the Mars 2020 rover and a Jupiter Europa fly-by.
- \$817 million for Astrophysics receives, a \$750 million (9%) boost.
- No change to the budget for Heliophysics.

### **Proposed Decreases and Program Eliminations:**

- \$5.712 billion for the Office of Science, dropping 1% from enacted 2017 levels
- \$1.754 million for NASA's earth science program budget, a \$1.921 million (8.9%) reduction compared to 2017 levels.
- 2.5% reduction in funding for aeronautics research.
- Eliminates the Office of Education, which manages Space Grant, NASA's EPSCoR, and STEM programs at minority-serving institutions.
- Eliminates funding for PACE, OCO-3, DSCOVR, and CLARREO Pathfinder.
- Cancels the Asteroid Redirect Mission (ARM).

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