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TUFTS UPDATE – JULY 9, 2018
PREPARED BY LEWIS-BURKE ASSOCIATES LLC

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Introduction

This edition of the Tufts Washington Update provides late-June and early-July congressional and administration updates, funding opportunities, and appropriations updates. Faculty, staff, and researchers are welcome to schedule calls with the Lewis-Burke Tufts team or meet with the team when they visit Washington, DC. Contact Amber Cassady, Lewis-Burke Associates LLC, at amber@lewis-burke.com with any questions or comments related to the Update's content or for more information on updates and opportunities.

Congressional Updates

Senate Passes Bipartisan Farm Bill

The Senate easily passed its version of the Farm Bill, the *Agriculture Improvement Act of 2018*, on June 28 by a vote of 86-11. The 11 "no" votes were all Republican. With the House narrowly passing its Farm Bill earlier in June, the two chambers will now negotiate a final Farm Bill. A major point of contention will be the Supplemental Nutrition Assistance Program (SNAP) and the related work requirements in the House bill. The Research Title is not typically controversial, but the Senate bill authorizes or funds several programs not in the House bill, most notably mandatory funding for the Foundation for Food and Agriculture Research (FFAR), and those differences will need to be addressed.

Highlights from the *Agriculture Improvement Act of 2018* Research Title:

- Would reauthorize the **Agriculture and Food Research Initiative (AFRI)** at the current level of $700 million through fiscal year (FY) 2023.
- Would make the following additions to AFRI priority areas: soil health, automation and mechanization for labor intensive tasks in the production and distribution of specialty crops. It would also include special consideration to "an institution to carry out collaboration in biomedical and agricultural research using existing research models."
- Would authorize a **New Beginning for Tribal Students Initiative** – authorizes $5 million in competitive grants to land-grant institutions that would support tribal students for recruiting, tuition, learning and student services: requires matching funds (limit of $500k per state).
- Would authorize a new **Urban, Indoor, and Other Emerging Agricultural Production Research and Extension grants program** and provide $4 million in mandatory funding and $10 million in discretionary funding annually through FY 2023. Additionally, it would authorize $14 million (through 2021) to conduct a follow-on study to the census of agriculture for the year 2017 including community and rooftop gardens, indoor farms, high tech vertical technology, hydroponics and other innovations.
- Would authorize a new **Agriculture Advanced Research and Development Authority (AGARDA) pilot program** that would support research and development activities to overcome long-term and high-risk research challenges in food and agriculture. $10 million is authorized annually through FY 2023 and the program will be overseen by the USDA Office of the Chief Scientist. Priority is given to development of new technologies for specialty crops and those that address the intentional/unintentional threats to ag and food supply.
- Would expand the Agricultural Genome Initiative to the **Agricultural Genome to Phenome Initiative** and authorize discretionary funding of $30 million annually through FY 2023.
- Would authorize a **Research Equipment competitive grants program** at $5 million (note this program was not included in the 2014 Farm Bill but has previously been authorized in law).
- Would reauthorize the **Nutrition Education program** – *does not incorporate the House's consolidation to Nutrition title with mandatory funding.*
- Would reauthorize the **Non-Land Grant Colleges of Agriculture (NLGCA) capacity building program**.
- Would provide the **Foundation for Food and Agriculture Research (FFAR)** an additional $200 million dollars.

- o Requires the Foundation to publish an annual notice with research priorities, scheduling for funding competitions, and information on how funding will be evaluated.
  - o Directs that FFAR submit a strategic plan no later than 1 year after enactment describing a path to become self-sustaining.
- Would reconstitute the **Pollinator Health Task Force**, which was originally established by Executive Order in 2014, to focus on addressing issues related to pollinator health and disease, population decline, and Federal pollinator protection activities as well as the implementation of the 2015 National Pollinator Health Strategy.

Sourced and Additional Information:
- The Committee press release can be found at https://www.agriculture.senate.gov/newsroom/rep/press/release/roberts-stabenow-announce-bipartisan-farm-bill-passes-senate-on-86-11-vote.
- The bill text can be found at https://www.agriculture.senate.gov/imo/media/doc/Agriculture%20Improvement%20Act%20of%202018.pdf.
- Section-by-section summary of the bill can be found at https://www.agriculture.senate.gov/imo/media/doc/Section-by-sections%20(Committee%20Print).pdf.

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Administration Updates

Scott Pruitt Resigns as EPA Administrator

Effective July 6, Scott Pruitt has officially resigned from his position as Administrator of the U.S. Environmental Protection Agency (EPA) amid intensifying public and congressional scrutiny of his stewardship of the agency. The move is largely attributed to a mounting series of scandals related to Pruitt's personal expenditures. President Trump has named Deputy Administrator Andrew Wheeler as acting EPA Administrator in the interim. Wheeler formerly was a lobbyist for Murray Energy, a coal company, and a congressional aide for Senator Jim Inhofe (R-OK) on the Senate Environment and Public Works Committee.

Pruitt's tenure at EPA was characterized by his efforts to redefine the agency's role in national environmental policy while shifting environmental protection activities to state and local authorities. This was reflected in both the fiscal year (FY) 2018 and 2019 budget requests, which included severe reductions in funding for EPA--with disproportionately high cuts for its Science and Technology account—as well as restructuring proposals that would shutter regional offices such as the National Center for Environmental Research which is responsible for administering extramural research grants.

Environmental interest groups and other research organizations have grown increasingly vocal in their opposition to many policies Pruitt had implemented while at EPA. These have included a ban on EPA grant recipients from serving as members of the EPA Science Advisory Board and a potential new rule

that would severely curtail the number of studies EPA could use to help formulate new regulations related to air and water quality. It is unclear how Wheeler will proceed with the implementation of these policies, but it should be noted that Congress has already demonstrated a willingness to push back on the Administration's plans for EPA. Appropriators specifically have rejected proposed spending cuts and agency reorganization plans, choosing instead to provide flat funding for EPA and explicitly disallow office closures without congressional approval.

Sources and Additional Information:
- The full text of Pruitt's resignation letter is available at https://www.politico.com/story/2018/07/05/scott-pruitt-resignation-letter-695292.

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Funding Opportunities

Office of Naval Research Releases Funding Opportunity for Young Investigator Program (YIP)

On July 5, the Office of Naval Research (ONR) released its fiscal year (FY) 2019 funding opportunity announcement (FOA) for the Young Investigator Program (YIP). This popular program, which is also offered by other DOD branches such as the Army Research Office (ARO) and the Air Force Office of Scientific Research (AFOSR), provides early career university faculty a path into the Navy's research enterprise through multi-year research grants. With this program, ONR identifies promising young tenure-track faculty in their first or second year who demonstrate the ability to deliver innovative research aligned with ONR's research priorities. Competition for this program has been intense in recent years; ONR awarded 32 proposals out of 340 for the FY 2018 competition.

DOD will accept any proposals that address research areas outlined in ONR's broad research portfolio that are of interest to ONR program managers. A complete list of topics of interest to each of ONR's six departments – Expeditionary Maneuver Warfare and Combating Terrorism (Code 30); Command, Control Communications, Computers, Intelligence, Surveillance, and Reconnaissance (Code 31); Ocean Battlespace Sensing (Code 32); Sea Warfare and Weapons (Code 33); Warfighter Performance (Code 34); and Naval Air Warfare and Weapons (Code 35) – is available on ONR's science and technology homepage located at http://www.onr.navy.mil/Science-Technology/Departments.aspx.

ONR has offered the following best practices to increase the success of YIP candidates:
- Contact the ONR program manager before submitting a proposal.
- Try to understand the program officer's portfolio and interests.
- Review the ONR website; become familiar with Navy terminology/where your technology fits in.
- Demonstrate merit with a record of publishing in peer reviewed journals and a strong letter of support from the university and/or department.
- Submit a complete curriculum vitae with the white paper and/or proposal package.

Due Date: Proposals should be submitted no later than **August 31, 2018 at 11:59 EST.** Applicants are strongly encouraged to contact the Program Manager in their technical area to discuss their research ideas before submitting a proposal.

Total Funding and Award Size: Individual awards will be funded at a maximum of $500,000 for a two-year base period, with a possibility to extend for one more year for an additional $250,000. ONR anticipates making multiple awards but does not specify the number of awards or overall funding for this competition.

Eligibility and Limitations: This BAA is open to first or second tenure-track faculty who have received their degree on or after January 1, 2011. Faculty from institutions of higher education that award degrees in science, engineering, and/or mathematics are eligible to apply. U.S. nonprofit organizations operating for scientific and educational services may also submit proposals. Note that ONR makes awards to institutions, not individuals. Researchers therefore must submit proposals along with a letter of support from the university through appropriate administrators. Additional eligibility and submission instructions can be found in the full FOA.

Sources and Additional Information:
- The Full FOA is available at www.grants.gov under solicitation number "N00014-18-S-F009."
- Information on ONR's research focus areas can be found at http://www.onr.navy.mil/Science-Technology/Departments.aspx.
- A list of ONR Program Managers is available at https://www.onr.navy.mil/our-research/our-program-managers.

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Office of the National Coordinator for Health Information Technology Releases Notice of Funding Opportunity for the Leading Edge Acceleration Projects (LEAP) in Health IT Program

On June 29, the Office of the National Coordinator for Health Information Technology (ONC) at the Department of Health and Human Services (HHS) released a Notice of Funding Opportunity (NOFO) for the Leading Edge Acceleration Projects (LEAP) in Health Information Technology (IT) program, which represents the next generation of HITECH-era SHARP activities. As stated in the NOFO, funding is intended to "address well-documented and fast emerging challenges that inhibit the development, use, and/or advancement of well-designed, interoperable health IT." ONC intends to award two $1 million awards for a period of two years, with the possibility of funding for an additional one to three years. ONC will award one winning applicant for each of the two focus areas, and that total funding for each awardee will be $1 million for two years. ONC will issue one award each per the following areas of interest: "Expanding the scope, scale, and utility of population-level data-focused application programming interfaces (APIs);" and "Advancing clinical knowledge at the point of care." The funding opportunity will have an open application period of three years, and ONC will hold an informational webinar on July 12 for interested applicants.

Sources and Additional Information:
- The NOFO for the ONC LEAP in Health IT can be found at https://www.healthit.gov/topic/onc-funding-opportunities/leading-edge-acceleration-projects-leap-notice-funding-opportunity.
- A fact-sheet on the SHARP program can be found at https://www.healthit.gov/sites/default/files/factsheets/get-the-facts-about-sharp-program.pdf.

Department of Energy Announces Funding Opportunity for Environmental Performance of Wind Turbines

The Department of Energy's (DOE) Wind Energy Technologies Office within the Office of Energy Efficiency and Renewable Energy (EERE) released a Notice of Intent (NOI) for an upcoming funding opportunity announcement (FOA) titled "Advanced Wind R&D to Reduce Costs and Improve Environmental Performance."

As stated in the NOI, three topic areas that may be included in the upcoming solicitation are:
- Advancing Smart Curtailment Strategies
- Advanced Component Research and Development, and
- Development and Validation of Offshore Wind Monitoring and Mitigation Technologies

These topics focus on improving efficiency of wind turbines while also monitoring and reducing impacts on bats and other wildlife. The upcoming FOA is expected around mid-July 2018. DOE anticipates funding multiple cooperative agreements in response to the upcoming FOA that would each last about two to three years.

Sources and Additional Information:
- The NOI is available at https://eere-exchange.energy.gov/Default.aspx#FoaIdbb5d4359-c02e-4164-b6bf-db0bc3b1ac49.
- The full FOA will be posted to https://eere-exchange.energy.gov/.

Department of Defense Releases Solicitation for Vannevar Bush Faculty Fellowship

On June 25, the Department of Defense (DOD) released the fiscal year (FY) 2019 Vannevar Bush Faculty Fellowship (VBFF) solicitation. The VBFF program is intended to attract and engage the best and brightest in academia to conduct a range of basic research in areas of interest to DOD. DOD is particularly interested in ambitious "blue sky" research that will lead to revolutionary discoveries, new fields of research, or disruption of existing theories. The program was released by the Office of Naval Research (ONR) and is overseen by the Basic Research Office within the Office of the Under Secretary of Defense for Research and Engineering (USD(R&E)).

Proposals are invited in the following DOD basic research areas:

1. **Engineering Biology:** DOD seeks revolutionary basic research for engineering biology addressing specialty materials and biological sensing to improve warfighter capabilities. The solicitation explicitly calls for "innovative and fundamental approaches to understanding biological process. Multidisciplinary as well as theoretical, physical, biophysical, biochemical, molecular,

and synthetic biology approaches are likely necessary to overcome the technical hurdles that currently prevent biology from being a scalable top-down engineering discipline."

2. **Quantum Information Science (QIS):** DOD requests research on quantum science to better understand quantum phenomena, which may potentially provide revolutionary capabilities for "information security, enabling novel materials design, attaining precise navigation and positioning even without GPS, improved sensing, and accomplishing significant improvements in high resolution imaging."

3. **Cognitive Neuroscience:** DOD is interested in basic research studies that provide insights into the mechanisms of human cognitive skills. The studies can be "theoretical, computational, neuronal, and molecular basic neuroscience research to study the mechanisms of human cognitive skills. In addition, large scale models of cortical systems and neural-based cognitive architectures are sought."

4. **Novel Engineered Materials:** DOD seeks research for the discovery of new materials that enable "transformative functionalities" as well as capabilities for controlling material behaviors under extreme environments. Material types include quantum materials, non-equilibrium materials, and materials that either repair themselves or self-assemble.

5. **Manufacturing Science:** DOD is interested in "increasing knowledge, understanding, and manipulative capability associated with materials and materials systems with a focus on the practical control of useful physical, chemical, or mechanical properties." Proposed efforts can address materials synthesis, processing, or design of materials systems. DOD seeks enhanced understanding and knowledge of fundamental processes for future material fabrication and manufacturing processes.

6. **Applied Mathematics (Theory and Experiments) and Statistics:** DOD seeks mathematical breakthroughs to provide the foundations to address future DOD challenges such as artificial intelligence, foundation of deep learning networks, analysis and exploitation of large data sets, quantifying risk in complex endeavors, behaviors in sociotechnical networks, cybersecurity, encryption and compressive sensing. In addition, DOD states the need for "fundamental mathematical advances that will increase the efficiency and efficacy of computational modeling of physical phenomena, both to understand those phenomena and, ultimately, to inform the engineering design process."

7. **Other Fields of Research with High Potential:** Applicants may submit a research proposal that does not fit into one of the aforementioned categories; all proposals must support DOD research priorities and focus on basic, transformative science that provides new thinking about the phenomena being studied.

The objectives of the VBFF program are to:
• Support unclassified basic scientific research that could be the foundation for future revolutionary capabilities for DOD;

- Educate and train outstanding student and post-doctoral researchers for the defense and national security workforce;
- Foster long-term relationships between outstanding university researchers and DOD; and
- Familiarize select university researchers and their students with DOD's current and future challenges.

All awardees will receive the title of VBFF fellow and will be introduced to DOD's critical research needs through interactions with DOD science and technology (S&T) leaders, visits to DOD labs, and invitations to technical workshops.

White Papers are required and are due by **August 17, 2018 at 11:59 PM EDT**. Applicants must register on the AcquTrak portal (https://acqupass.noblis.org/ApplyVBFF) by **August 15, 2018 at 11:59 PM EDT** to submit a white paper. Applicants will submit full proposals by invitation only no later than **January 18, 2019 at 11:59 PM EST.**

Total Funding and Award Size: DOD anticipates awarding multiple awards, with an individual maximum award of $3 million over five years. The solicitation does not indicate how many awards DOD intends to make and notes that DOD may not necessarily allocate fellowships equally among the topics. In FY 2017, 13 awards were made while in FY 2018, 11 awards were made – four for materials, two for mathematics, two for quantum, one for manufacturing, one for biology, and one for cognitive neuroscience.

Eligibility and Limitations: The competition is open to accredited U.S. institutions of higher education (universities) with doctoral degree-granting programs. The program seeks outstanding faculty, who are either a U.S. citizen or permanent resident, with tenure and full-time research staff with the skill, knowledge, and resources necessary to conduct the proposed research as the principal investigator (PI). PIs may submit only one application in response to this funding opportunity. There is no limit to the number of applications that an institution may submit.

Sources and Additional Background:
- The full solicitation can be found at www.grants.gov under solicitation number "N00014-18-S-F008."
- The announcement of the FY 2018 winners can be found at https://www.defense.gov/News/News-Releases/News-Release-View/Article/1485787/dod-announces-2018-class-of-vannevar-bush-faculty-fellowship/source/GovDelivery/.
- DOD's overview of the VBFF program can be found at https://basicresearch.defense.gov/Programs-Workshops/Vannevar-Bush-Faculty-Fellowship/.

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Department of Energy Announces Intent to Release Funding Opportunity for Energy-Water Desalination Hub

On June 22, the Department of Energy's (DOE) Advanced Manufacturing Office (AMO) within the Office of Energy Efficiency and Renewable Energy (EERE) released a notice of intent (NOI) to issue a funding opportunity announcement (FOA) in **July 2018** entitled *Energy-Water Desalination Hub*. The solicitation is intended to facilitate the development of low-cost, energy-efficient water desalination systems. The objective is to use interdisciplinary teams that span industries – academia, private industry, non-profit sector, and DOE National Labs – to pursue a "strategic R&D investment portfolio with the highest impact for energy efficiency, water efficiency, and cost reductions to enable achievement of pipe parity of desalination from a range of water sources."

It is anticipated that successful applicants will need to address the following technical areas of interest:

- **Materials Research and Development**: "Materials discovery has the potential to improve both materials in specific components and in water treatment systems for desalination and related water treatment technologies, including membranes, pipes, tanks and pumps that dramatically increase their performance, efficiency, longevity, etc.
- **New Processes Research and Development**: Novel technology processes and system design concepts are needed to lower cost and energy for water treatment, including new technologies related to water pre-treatment systems (e.g. upstream from the desalination unit operation) and to address associated challenges such as water reuse, water efficiency, and high-value coproducts.
- **Modeling and Simulation Tools**: Multi-scale models and simulation tools are needed to use and inform R&D to predict performance and optimize design and operation of new desalination technologies and related water-treatment systems.
- **Integrated Data and Analysis**: In order to consistently define, track, and achieve pipe parity performance metrics in the highest impact areas, a central, strategic, non-biased, integrated analysis and metrics tracking team will be critical to the Hub's overall success."

This solicitation is highly anticipated by the research community and is an opportunity for universities with strengths in this area to become a leader in desalination research and development. It is anticipated that the total funding level for this funding opportunity will be $100 million over five years.

Sourced and Additional Information:
- The full NOI is available at http://www.lewis-burke.com/sites/default/files/notice_of_intent_to_issue_de-foa-0001905.pdf

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Appropriations Updates

Senate Appropriations Committee Approves FY 2019 Labor, Health and Human Services, and Education Appropriations Bill

On June 28, the Senate Committee on Appropriations approved its fiscal year (FY) 2019 Labor, Health and Human Services, and Education Appropriations bill, which is the final of the 12 FY 2019 appropriations bills approved by the Committee. Action now moves to the Senate floor, although timing for when the bill will be considered is unclear, particularly with a potential Supreme Court confirmation looming over the upper chamber.

The bill would provide a total of $39.1 billion for the National Institutes of Health (NIH), an increase of $2 billion (5.4 percent) above the FY 2018 enacted level and $4.1 billion above the President's FY 2018 budget request. The total includes $711 million for specific initiatives in the NIH Innovation Account authorized in the 21st Century Cures Act. The Senate total for NIH is $800 million (2 percent) more than provided in the House subcommittee's version approved on June 15.

The bill would continue to invest in agency-wide activities at the Department of Health and Human Services (HHS) which have garnered bipartisan support; such as programs to combat the opioid epidemic, efforts to strengthen rural health, and activities to address childhood trauma. In addition, the bill would again reject many of the Administration's proposals to consolidate or eliminate funding for health programs, including moving several agencies to NIH.

For FY 2019, the Senate Committee bill would fund the Department of Education (ED) at $74.9 billion, a $610 million increase over the FY 2018 enacted level. This proposal represents a nearly $500 million increase over the House appropriations bill and an approximately $8 billion increase over the President's budget request, a clear rejection of the cuts proposed by the Administration.

National Institutes of Health

The bill would provide a total of $39.1 billion for the NIH, an increase of $2 billion (5.4 percent) above the FY 2018 enacted level and $4.1 billion above the president's FY 2018 budget request. The total includes $711 million for specific initiatives in the NIH Innovation Account authorized in the 21st Century Cures Act. The Senate total for NIH is $800 million (2 percent) more than provided in the House subcommittee's version approved on June 15.

The bill would also retain the salary cap at Executive Level II ($189,600), rejecting the FY 2019 budget request proposal to decrease it to Level V ($153,800). In addition, the Senate bill rejects the Administration's proposal to cap the percentage of an investigator's salary that can be paid with grant funds at 90 percent and does not call for any changes to NIH salary support. Additionally, the bill includes a provision identical to last year that bars the Department of Health and Human Services (HHS) from deviating from negotiated facilities and administrative (F&A) cost rates.

As authorized in the 21st Century Cures Act, the bill would provide funding for several research initiatives supported by the NIH Innovation Account, including $400 million for the Cancer Moonshot,

which is transferred to the National Cancer Institute (NCI) from the Office of the Director (OD). The Innovation Account also would provide $10 million for regenerative medicine and $186 million for the Precision Medicine Initiative (PMI), both of which are administered by OD.

The Committee directs NIH to split the $500 million Congress included in the FY 2018 omnibus appropriations bill between the National Institute on Drug Abuse (NIDA) and the National Institute of Neurological Disorders and Stroke (NINDS) to use before the end of FY 2019. In the report accompanying the bill, the Committee urges NIH to expand research on medications used to treat and reduce chronic pain and supports the creation of opioid research centers, preferably in states with high levels of prescription opioid use, overdose deaths, and racial and ethnic diversity.

The Committee would direct a total of $429.4 million to the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative. The bill also would provide $2.34 billion for Alzheimer's Disease research, an increase of $425 million above FY 2018. The bill includes an increase of $37 million for combating antibiotic-resistant bacteria for a total of $550 million for that research within the National Institute of Allergy and Infectious Diseases (NIAID). The bill also would increase funding for research to develop a universal flu vaccine by $20 million.

Within the National Institute of General Medical Sciences (NIGMS), the bill would direct $361.8 million to the Institutional Development Awards (IDeA) program for a $11.2 million (3.2 percent) increase above FY 2018. For the National Center for Advancing Translational Sciences (NCATS), the bill would provide $560 million to the Clinical and Translational Science Awards (CTSA) program, which would be $17.2 million (3.2 percent) above last year.

Of note, the report accompanying the bill includes a section acknowledging the Committee's strong concerns around the Chinese government's attempts to influence academic institutions and directs the NIH director to develop a publicly available list of Confucius Institutes that have received NIH funding since 2013 and the amount each institution received. Additionally, on big data, the Committee directs NIH to finalize a set of metrics and milestones in its strategic plan that were dropped from the final version released on June 4. The report also notes that successful implementation will require cooperation from all 27 institutes and centers and, "entail relinquishing some, perhaps much, of the autonomy they now have over data management, technology and tools, and training." To ensure this happens, the report directs the to-be-hired NIH Chief Data Strategist to provide quarterly briefings to the Committee on efforts to implement the big data strategic plan.

Other Department of Health and Human Services:

Overall, the Committee would continue to invest in opioid-related activities through HHS, including continuing funding for the newly established Rural Opioids Response program at the Health Resources Administration (HRSA), which currently has its first open solicitation for planning grants. The Committee would increase funding for several rural health activities, which is a priority of both the Administration and the Senate Labor, Health and Human Services, Education, and Related Agencies Subcommittee Chairman, Roy Blunt (R-MO). The bill would also emphasize an agency wide focus on children exposed to trauma and encourages coordination on activities to address childhood trauma and, "promote

through grant awards, best practices for identifying, referring, and supporting children exposed to trauma."

The Committee's bill would also reject proposals outlined in the President's FY 2019 budget request to move the Agency for Healthcare Research and Quality (AHRQ), the National Institute for Occupational Safety and Health (NIOSH), and the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) to NIH.

Of note to universities engaging in opioid research and response activities, the Committee's bill would provide funding to support opioid-related initiatives at the National Institutes of Health (NIH) and other agencies at the Department of Health and Human Services (HHS). The bill would provide a total of $3.7 billion to support efforts combatting opioid abuse, which is a $145 million increase above the FY 2018 enacted level. The Committee outlines several initiatives to fight prescription opioid and heroin abuse, including $1.5 billion to support State Response Grants administered by the Substance Abuse and Mental Health Services Administration (SAMHSA). This funding amount would replace the program amount of $500 million which was authorized in the 21st Century Cures Act and is set to expire. The bill would also continue set-aside funding for states with the highest age-adjusted opioid use related mortality rate and $50 million in grants to Indian tribes or organizations. As mentioned previously, the Committee would continue to provide NIH with $500 million to support research related to, "opioid addiction, development of opioid alternatives, pain management and addiction treatment." Additionally, the Centers for Disease Control and Prevention (CDC) would maintain funding at $475 million to support all 50 states with opioid prevention and surveillance efforts. The bill would also create a new $5 million initiative to address infectious diseases associated with the opioid epidemic, given a recent uptick of HIV and Hepatitis C infections across the country. With respect to rural communities and the opioid epidemic, the Committee would also provide $20 million to support the establishment of three rural centers of excellence on substance use disorders in order "to support the dissemination of best practices related to the treatment for and prevention of substance use disorders within rural communities."

HRSA would receive $1.072 billion in the bill, which is a $12 million increase above the enacted FY 2018 level. Most Title VII health professions programs would receive level funding in FY 2019, after receiving increases in the FY 2018 omnibus. However, the Area Health Education Centers (AHEC) would receive a $2 million increase in FY 2019. Title VIII Nursing Workforce Development Programs would receive $249 million in FY 2019, the same as the FY 2018 enacted level. Within Title VIII Nursing Workforce Development programs, the Committee would continue to provide funding for the, "clinical training of sexual assault nurse examiners to administer medical forensic examinations and treatments to victims of sexual assault." HRSA currently has an open funding opportunity for this program with FY 2018 funding. Within HRSA's workforce programs, the bill would also increase funding for Children's Graduate Medical Education (GME) to $350 Million, which is $10 million above the FY 2018 enacted level.

Overall, the bill would include almost $319 million for rural health programs at HRSA, which is $28 million above the FY 2018 enacted level. This would include an increase of $2 million to support the Office for the Advancement of Telehealth at HRSA. Within telehealth, $2 million would support an evidence-based tele behavioral health system focused on opioids.

Within the CDC, the Senate Committee discards the Administration's repeated proposal to block grant chronic disease prevention funding to the states. Similar to language in the pending FY 2019 House

LHHS-ED bill, the Senate recognizes the importance of addressing antibiotic-resistant bacteria though a "One Health" approach and encourages CDC to support collaborations in this area.

Within the Administration on Community Living (ACL), NIDILRR would receive $109 million, a $4 million increase above the FY 2018 enacted level. The increase of $4 million would be used to "fund competitive research grants that helps individuals with disabilities, with a particular emphasis on seniors, maintain or improve independence."

Department of Education

For FY 2019, the Senate Committee bill would fund the Department of Education (ED) at $74.9 billion, a $610 million increase over the FY 2018 enacted level. This proposal represents a nearly $500 million increase over the House appropriations bill and an approximately $8 billion increase over the President's budget request, a clear rejection of the cuts proposed by the Administration.

The bill would provide $6,195 for the maximum individual Pell Grant award for the 2019-2020 award year, a $100 increase over both the House proposed level and the current maximum award of $6,095. In recent years, the maximum Pell Grant award was automatically increased with an inflation adjustment, but that authority expired in FY 2017. The bill would also reduce by $1.2 billion the current Pell Grant surplus to fund the increase to the maximum grant and other items in the bill.

Other student aid programs of interest to the higher education community would be unchanged from current funding levels, including the Supplemental Education Opportunity Grants (SEOG) Program at $840 million and the Federal Work-Study (FWS) program at $1.13 billion. The President's budget request for FY 2019 proposed eliminating the SEOG program and cutting FWS significantly. The Committee also reaffirms the FY 2018 omnibus language that would directly allow FAFSA information sharing with relevant third parties, under the explicit consent of an applicant, and clarifies this would include organizations that assist students in applying for Federal, State, local, or tribal funds.

The bill would provide flat funding of $1.01 billion for the TRIO programs and $350 million for the GEAR UP program. While the Senate Committee bill rejects the cuts to these programs proposed by President Trump for FY 2019, the Committee's recommendation falls short of the House proposed levels for TRIO and GEAR UP, of $1.06 billion and $360 million respectively.

Similar to the House Committee bill, the Senate Appropriations bill proposes level funding of $72 million for the Title VI International Education and Foreign Language Studies programs. Further, like the House bill, the Senate Appropriations bill would maintain the Graduate Assistance in Areas of National Need (GAANN) program at $23 million, a recent low for the program, which for many years had been funded at approximately $30 million.

The Title V Developing Hispanic Serving Institutions (HSI) program would be increased by $2.7 million, to $125.9 million, and the Promoting Post-Baccalaureate Opportunities for Hispanic Americans (PPOHA) program would receive $11.3 million, a $244,000 increase over FY 2018 enacted funding levels. The Senate Appropriations bill rejects the President's budget request proposal to consolidate several minority-serving institution programs.

The Senate Committee bill would provide a $2 million increase for the Institute of Education Sciences (IES), up to $615 million overall, with the increase slated for national assessment funding. The education and special education research programs would be flat funded at FY 2018 levels.

The bill would also continue to support, at $5 million, a pilot program to support competitive grants to fund open textbook projects at institutions, which was created under the FY 2018 omnibus bill. The Committee bill would provide an additional $350 million toward the Public Service Loan Forgiveness (PSLF) program and notes the Committee's continued concern with how ED is managing the PSLF program. It calls for ED to report to Congress on the Department's progress to addressing the temporary expansion of the PSLF program to certain applicants who were initially deemed ineligible for loan forgiveness. Report language also directs the Secretary of Education to share data with Congress on the prevalence of Confucius Institutes under foreign gift reporting requirements.

National Institutes of Health
(in thousands of $)

	FY 2018 Enacted	FY 2019 House	FY 2019 Senate	Senate vs. FY 2018 Enacted	Senate vs. House
NIH, Total	**37,084,000**	**38,334,000**	**39,084,000**	**2,000,000 (5.4%)**	**750,000 (2.0%)**
National Cancer Institute (NCI)	5,957,015	6,136,037	6,147,125	190,110 (3.2%)	11,088 (0.2%)
National Heart, Lung, and Blood Institute (NHLBI)	3,382,232	3,423,604	3,490,171	107,939 (3.2%)	66,567 (2.0%)
National Institute of Dental and Craniofacial Research (NIDCR)	447,735	453,082	462,024	14,289 (3.2%)	8,942 (2.0%)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)	1,968,083	1,994,333	2,030,892	62,809 (3.2%)	36,559 (1.8%)
National Institute of Neurological Disorders and Stroke (NINDS)	2,149,482	2,228,780	2,275,580	126,098 (5.9%)	46,800 (2.1%)
National Institute of Allergy and Infectious Diseases (NIAID)	5,280,665	5,368,029	5,506,190	225,525 (4.3%)	138,161 (2.6%)
National Institute of General Medical Sciences (NIGMS)	2,785,400	2,818,667	2,874,292	88,892 (3.2%)	55,625 (2.0%)
Institutional Development Award	350,575	365,575	361,763	11,188 (3.2%)	-3,821 (1.0%)

(IDeA)					
Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)	1,460,637	1,469,346	1,507,251	46,614 (3.2%)	37,905 (2.6%)
National Eye Institute (NEI)	772,308	781,540	796,955	24,647 (3.2%)	15,415 (2.0%)
National Institute of Environmental Health Sciences (NIEHS)	751,143	760,113	775,115	23,972 (3.2%)	15,002 (2.0%)
National Institute on Aging (NIA)	2,577,550	3,005,831	3,084,809	507,259 (19.7%)	78,978 (2.6%)
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)	586,661	593,663	605,383	18,722 (3.2%)	11,720 (2.0%)
National Institute on Deafness and Other Communications Disorders (NIDCD)	459,974	465,467	474,653	14,679 (3.2%)	9,186 (2.0%)
National Institute of Mental Health (NIMH)	1,757,657	1,790,231	1,871,250	113,593 (6.5%)	81,019 (4.5%)
National Institute on Drug Abuse (NIDA)	1,376,657	1,400,126	1,420,591	43,934 (3.2%)	20,465 (1.5%)
National Institute on Alcohol Abuse and Alcoholism (NIAAA)	509,604	515,658	525,867	16,263 (3.2%)	10,209 (2.0%)
National Institute on Nursing Research (NINR)	158,033	159,920	163,076	5,043 (3.2%)	3,156 (2.0%)
National Human Genome Research Institute (NHGRI)	558,072	563,531	575,882	17,810 (3.2%)	12,351 (2.2%)
National Institute of Biomedical Imaging and Bioengineering (NIBIB)	377,618	382,384	389,672	12,054 (3.2%)	7,288 (2.0%)
National Institute on Minority Health and Health Disparities (NIMHD)	305,108	306,821	314,845	9,737 (3.2%)	8,024 (2.6%)
National Center for Complementary and Integrative Health (NCCIH)	142,018	143,882	146,550	4,532 (3.2%)	2,668 (1.9%)

National Center for Advancing Translational Sciences (NCATS)	**762,454**	**751,219**	**806,787**	**44,333 (5.8%)**	**55,528 (7.4%)**
John E. Fogarty International Center (FIC)	**75,733**	**76,637**	**78,150**	**2,417 (3.2%)**	**1,513 (2.0%)**
National Library of Medicine (NLM)	**428,553**	**433,671**	**442,230**	**13,677 (3.2%)**	**8,559 (2.0%)**
Office of the Director (OD)	**1,814,745**	**1,902,828**	**1,922,660**	**107,915 (5.9%)**	**19,832 (1.0%)**
Common Fund	588,116	595,139	606,885	18,769 (3.2%)	11,746 (2.0%)
NIH Innovation Account[1]	**110,000**	**711,000[2]**	**711,000**	**601,000 (546.4%)**	**--**
Building Facilities	**128,863**	**200,000**	**200,000**	**71,137 (55.2%)**	**--**

Department of Health and Human Services (Other)

(In millions of $)

	FY 2018 Enacted	FY 2019 House	FY 2019 Senate	Senate vs. FY 2018 Enacted	Senate vs. FY 2019 House
Health Resources and Services Administration (HRSA)	**7,014**	**6,858**	**7,134**	**120 (1.7%)**	**276 (4.0%)**
Title VII	396	371[*]	398	2 (0.5%)	27 (7.3%)
Title VIII	249	241	249	--	8 (3.3%)
Substance Abuse and Mental Health Services Administration (SAMHSA)	**5,159**	**5,607**	**5,738**	**579 (11.2%)**	**131 (2.3%)**
Mental Health Services	1,487	1,344	1,566	79 (5.3%)	222 (16.5%)
Substance Abuse Treatment	3,264	3,850	3,812	548 (16.8%)	-38 (1.0%)

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[1] The NIH Innovation Account, authorized in the Cures Act, is derived from mandatory funding, rather than discretionary funding that supports most NIH activities. Per statute, the Account supports four specific NIH initiatives and will end in FY 2026, hence, it is not considered part of the NIH base budget.

[2] The funds in the NIH Innovation Account are distributed among several institutes, including $400 million to NCI for the Cancer Moonshot and $57.5 million each to NINDS and NIMH for the BRAIN Initiative. The totals for these agencies reflects the transfer of these funds. The Innovation Account total in this chart of $711 million includes the Moonshot and BRAIN funding transferred to the ICs.

Substance Abuse Prevention	248	249	200	-48 (19.4%)	-49 (19.7%)
Agency for Healthcare Research and Quality (AHRQ)	**334**	**334**	**334**	--	--
Centers for Disease Control and Prevention (CDC)	**8,301**	**7,638**	**7,868**	**-433 (5.2%)**	**230 (3.0%)**
Chronic Disease Prevention and Health Promotion	1,163	1,197	1,167	4 (0.3%)	-30 (2.5%)
National Institute for Occupational Safety and Health (NIOSH)	335	335	335	--	--
Environmental Health	206	196	206	--	10 (5.1%)
Administration on Community Living (ACL)	**2,172**	**2,182**	**2,177**	**5 (0.2%)**	**-5 (0.2%)**
National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)	105	105	109	4 (3.8%)	4 (3.8%)
Administration for Children and Families (ACF)	**38,219**	**38,115**	**38,412**	**193 (0.5%)**	**297 (0.8%)**
Office of the National Coordinator for Health IT (ONC)	**60**	**43**	**60**	--	**17 (39.5%)**

*Does not include funding for Screening and Treatment for Maternal Depression.

Department of Education
(In thousands of $)

	FY 2018 Enacted	FY 2019 House	FY 2019 Senate	Senate vs. FY 2018 Enacted	Senate vs. FY 2019 House
ED, Total	**74,320,337**	**74,433,012**	**74,929,896**	**609,559 (0.8%)**	**496,884 (0.7%)**
Promise Neighborhoods	78,254	78,254	78,254	--	--
Innovation and Improvement*					
Education Innovation and Research	120,000	145,000	135,000	15,000 (12.5%)	10,000 (6.9%)
Student Financial Assistance*					
Pell Grant†	6,095	6,095	6,195	100 (1.6%)	100 (1.6%)
SEOG	840,000	840,000	840,000	--	--
Federal Work-Study	1,130,000	1,130,000	1,130,000	--	--
Higher Education*					

Title V Aid for Developing HSIs	123,183	123,183	125,898	2,715 (2.2%)	2,715 (2.2%)
Promoting Post-Baccalaureate Opportunities for Hispanic Americans	11,052	11,052	11,296	244 (2.2%)	244 (2.2%)
Title VI International Education and Foreign Language Studies (Domestic and Overseas)	72,164	72,164	72,164	--	--
TRIO Programs	1,010,000	1,060,000	1,010,000	--	50,000 (4.7%)
GEAR UP	350,000	360,000	350,000	--	10,000 (2.8%)
GAANN	23,047	23,047	23,047	--	--
Institute of Education Sciences	**613,462**	**613,462**	**615,462**	**2,000 (0.3%)**	**2,000 (0.3%)**
Research, Development and Dissemination	192,695	192,695	192,695	--	--
Research in Special Education	56,000	56,000	56,000	--	--
Regional Education Laboratories	55,423	55,423	55,423	--	--
Statewide Longitudinal Data Systems	32,281	32,281	32,281	--	--

* Categories included for ease of reading the chart.
† The Pell Grant is listed as the total maximum grant award an individual could receive, including mandatory and discretionary funding. It is *not* listed in thousands of dollars.

Sources and Additional Information:
- The bill is available at https://www.congress.gov/115/bills/s3158/BILLS-115s3158pcs.pdf.
- The report accompanying the bill is available at https://www.congress.gov/115/crpt/srpt289/CRPT-115srpt289.pdf.

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Senate Appropriations Committee Approves FY 2019 Defense Appropriations Bill

On June 28, the Senate Appropriations Committee (SAC) approved its fiscal year (FY) 2019 Defense Appropriations bill with a 30-1 bipartisan vote. The bill would provide $607.1 billion for Department of Defense (DOD) base programs, which is $20.5 billion above the FY 2018 level, but $10 billion below the President's FY 2019 budget request. The bill would also provide $67.9 billion in Overseas Contingency Operations (OCO) funding.

The Committee's recommendations emphasize increased investments in research and development to acquire advanced technologies to defend the nation in a complex and shifting national security

environment, with a notable increase for basic research of $529 million more than the President's budget request.

Of interest to the research community, the bill would provide $95.1 billion for Research, Development, Test, and Evaluation (RDT&E) programs, which surpasses the FY 2018 level by $6.8 billion and the House bill by $3.9 billion. Within RDT&E, the SAC would allocate $15.4 billion for DOD's science and technology (S&T) accounts (6.1-6.3), a $563 million (3.8 percent) increase over the FY 2018 level and $993 million (6.9 percent) over the House's bill. The Committee explicitly recognized the role of basic research investments in providing the foundation for DOD innovation and transformational future technologies, and significantly increased basic research (6.1) accounts by $529 million (23.3 percent) across the Services and defense-wide.

The SAC would fund the Defense Advanced Research Projects Agency (DARPA) at $3.4 billion, $58 million more than the House's bill and $375 million above the FY 2018 level. The SAC also supports the Defense Health Program's R&D at $1.6 billion, $365 million less than the FY 2018 level but $230 million over the House's bill.

The Committee placed significant emphasis on emerging technologies including hypersonics, directed energy, artificial intelligence (AI), microelectronics, and robotic and autonomous systems. Specific provisions include:

- Hypersonics: The Committee recommends an increase of $928 million to develop hypersonics capabilities to deter threats from competitors. This includes a $50 million increase specifically for DARPA to develop offensive hypersonic weapons.

- Artificial Intelligence: The Committee recommends an additional $308 million to achieve dominance in AI, including increases of $150 million for Project Maven and $83 million for a Joint Artificial Intelligence Center, and directs the Undersecretary of Defense for Research and Engineering (USD(R&E)) to brief the defense committees on a plan for the additional funding.

- Robotics and Autonomous Systems: The SAC encourages the Secretary of the Army to invest in technologies that improve the durability of Unmanned Aerial Systems (UAS) as well as multi-fuel capable, hybrid electric propulsion systems for UAS. The Committee also encourages the Navy to support investments in developing autonomous maritime robotic systems, noting university-based research can play a key role in enhancing a variety of underlying capabilities such as acoustic and non-acoustic detection, shared autonomy, adaptive decision making, docking, 3-D imaging, and power and data transfer.

- Trusted Microelectronics: The Committee recommends an additional $447 million (76.1 percent) above the budget request to accelerate DARPA's Electronics Research Initiative (ERI) and directs USD(R&E) to a provide a report on the scope of DOD's microelectronics challenges, as well as current needs for domestic manufacturing capabilities and infrastructure in order to provide future microelectronics for DOD weapon systems.

Other research priorities include:

- Manufacturing: Recommends an additional $5 million for manufacturing engineering grants and encourages DOD to prioritize funding under this program to support community colleges and technical schools in order to support a workforce for the defense industrial base. The Committee also increased funding for the Manufacturing Engineering Education Program (MEEP) by $15 million. The Committee expresses support for the Army's work in Transformative Manufacturing Technology and encourages the Secretary of the Army to transfer manufacturing technologies to the industrial base.

- National Defense Education Program (NDEP): Recommends an additional $100 million for basic research under this program, recognizing that DOD needs further investments in STEM education to support national security.

- Materials: The bill included multiple provisions pertaining to materials. The Committee encourages the Army Research Lab (ARL) to expand its Open Campus initiative to its Materials and Manufacturing Science Labs to support education and R&D for materials and metals processing science efforts, and to continue investments in computational modeling and simulation research to quickly and efficiently characterize and develop new materials. The Committee also recommends additional funding for R&D for advanced composites for next-gen air and space vehicles, recognizing universities' continued contributions to better understand the technology and processes in developing these capabilities.

- Technology Transfer: The Committee continued to emphasize the importance of using research to develop new capabilities and get them into the hands of the warfighter. The bill encourages DOD to emphasize and provide funding for technology transfer to non-federal entities, including academia and non-profit organizations to leverage work being done at federal labs. The bill also directs USD(R&E) to assess DOD's test and evaluation infrastructure to further development of emerging technologies for the warfighter.

- Space Acquisition Strategy: The Committee expressed concerns over space-related risks and followed up on language in last year's bill for the Air Force to report on strategies for space acquisition, including progress on development efforts in space situational awareness (SSA); precision, navigation, and timing (PNT); weather; wide-band communications; and other efforts.

- Accelerated Acquisitions: The Committee would provide the Navy with $1.4 billion, an increase of 150 percent over FY 2018, for programs intended to expedite acquisitions of new technologies and capabilities. The Committee also directs the Navy to submit a report discussing how programs under accelerated acquisitions are properly managed to ensure responsible use of funds and fiscal transparency.

- Medical: The Committee recommended $330 million for the Peer-Reviewed Medical Research Program and detailed its priorities to include "acute lung injury, antimicrobial resistance, arthritis, autism, burn pit exposure, cardiomyopathy, chronic migraine and post-traumatic headache, congenital heart disease, constrictive bronchiolitis, diabetes, dystonia, eating disorders, emerging infectious diseases, epidermolysis bullosa, focal segmental glomerulosclerosis, frontotemporal degeneration, Guillain-Barre Syndrome, gulf war illness,

hearing regeneration and restoration, hemorrhage control, hepatitis B, hereditary angioedema, hydrocephalus, immunomonitoring of intestinal transplants, inflammatory bowel diseases, interstitial cystitis, lung injury, lupus, metals toxicology, mitochondrial disease, multiple sclerosis, musculoskeletal conditions, myotonic dystrophy, nanomaterials for bone regeneration, neurofibromatosis, nutrition optimization, orthopedics, pancreatitis, Parkinson's, pathogen-inactivated blood products, polycystic kidney disease, post-traumatic osteoarthritis, pressure ulcers, pulmonary fibrosis, reconstructive transplantation, resilience training, respiratory health, Rett syndrome, rheumatoid arthritis, scleroderma, sleep disorders, spinal muscular atrophy, tinnitus, tissue regeneration, tuberculosis, tuberous sclerosis complex, vascular malformations, vision, and women's heart disease." The SAC restricted topics to these areas and directs DOD to select projects with clear scientific merit and relevance to military health.

The Committee listed its priorities for the Peer-Reviewed Cancer Research Program to prioritize bladder cancer, blood cancers, brain cancer, colorectal cancer, immunotherapy, kidney cancer, liver cancer, mesothelioma, neuroblastoma, pancreatic cancer, pediatric brain tumors, rare cancers, and stomach cancer.

Under Defense Health R&D, the Committee would also prioritize research in orthotics and prosthetics, chronic pain management, mental and behavioral health, respiratory health, epilepsy, melanoma, sleep disorders, cell-based flu vaccines, and trauma. Lastly, the Committee directs DOD to develop a plan to ensure that women and minorities are better represented in extramurally-conducted clinical trials.

The Senate is expected to consider the defense spending bill as a package with the Labor, Health and Human Services, and Education (L-HHS-ED) bill. Senate leadership is packaging the two bills to increase odds they will pass, as defense is the top priority for Republicans and programs in the L-HHS-ED bill are a top priority for Democrats.

FY 2019 Defense Appropriations Bill
As reported by the Senate Appropriations Committee on June 28, 2018
(In thousands of $)

	FY 2018 Enacted	FY 2019 Request	FY 2019 HAC	FY 2019 SAC	SAC vs. FY 2018	SAC vs. Request	SAC vs. HAC
RDT&E, total	88,308,133	91,056,950	91,218,284	95,131,819	6,823,686 (7.7%)	4,074,869 (4.5%)	3,913,535 (4.3%)
S&T, Total	14,863,004	13,661,667	14,433,672	15,426,977	563,973 (3.8%)	1,765,310 (12.9%)	993,305 (6.9%)
6.1, Total	2,343,154	2,269,206	2,298,102	2,798,456	455,302 (19.4%)	529,250 (23.3%)	500,354 (21.8%)
6.2, Total	5,681,752	5,100,359	5,571,178	5,577,344	-104,408 (1.8%)	476,985 (9.4%)	6,166 (0.1%)

6.3, Total	6,838,098	6,292,102	6,564,392	7,051,177	213,079 (3.1%)	759,075 (12.1%)	486,785 (7.4%)
Army RDT&E	**10,647,426**	**10,159,379**	**10,108,108**	**10,812,458**	**165,032 (1.5%)**	**653,079 (6.4%)**	**704,350 (7.0%)**
Army 6.1	470,022	445,895	442,241	582,645	112,623 (24.0%)	136,750 (30.7%)	140,404 (31.7%)
Army 6.2	1,369,382	919,609	1,324,701	1,166,109	-203,273 (-14.8%)	246,500 (26.8%)	-158,592 (12.0%)
Army 6.3	1,478,677	1,026,698	1,159,984	1,494,535	15,858 (1.1%)	467,837 (45.6%)	334,551 (28.8%)
Navy RDT&E	**18,010,754**	**18,481,666**	**17,658,244**	**18,992,064**	**981,310 (5.4%)**	**510,398 (2.8%)**	**1,333,820 (7.6%)**
Navy 6.1	621,901	597,378	619,378	737,878	115,977 (18.6%)	140,500 (23.5%)	118,500 (19.1%)
Navy 6.2	994,110	891,471	889,198	1,027,056	32,946 (3.3%)	135,585 (15.2%)	137,858 (15.5%)
Navy 6.3	816,707	750,995	742,253	901,810	85,103 (10.4%)	150,815 (20.1%)	159,557 (21.5%)
Air Force RDT&E	**37,428,078**	**40,178,343**	**40,939,500**	**40,896,667**	**3,468,589 (9.3%)**	**718,324 (1.8%)**	**-42,833 (0.1%)**
Air Force 6.1	520,259	517,819	516,369	642,819	122,560 (23.6%)	125,000 (24.1%)	126,450 (24.5%)
Air Force 6.2	1,434,714	1,312,342	1,384,342	1,430,342	-4,372 (-0.3%)	118,000 (9.0%)	46,000 (3.3%)
Air Force 6.3	869,117	814,797	865,797	919,097	49,980 (5.8%)	104,300 (12.8%)	53,300 (6.2%)
Defense Wide RDT&E	**22,010,975**	**22,016,553**	**22,291,423**	**24,049,621**	**2,038,646 (9.3%)**	**2,033,068 (9.2%)**	**1,758,198 (7.9%)**
Defense Wide 6.1	730,972	708,114	720,114	835,114	104,142 (14.2%)	127,000 (17.9%)	115,000 (16.0%)
Defense Wide 6.2	1,883,546	1,976,937	1,972,937	1,953,837	70,291 (3.7%)	-23,100 (1.2%)	-19,100 (1.0%)
Defense Wide 6.3	3,673,597	3,699,612	3,796,358	3,735,735	62,138 (1.7%)	36,123 (1.0%)	-60,623 (1.6%)
Defense Health R&D	**2,039,315**	**710,637**	**1,443,237**	**1,673,837**	**-365,478 (17.9%)**	**963,200 (135.5%)**	**230,600 (16.0%)**

Sources and Additional Information:

- The press release summarizing the SAC's Defense Appropriations Bill is available at https://www.appropriations.senate.gov/news/fy2019-defense-appropriations-bill-approved-by-subcommittee.
- The complete text of the SAC defense appropriations bill is available at https://www.appropriations.senate.gov/imo/media/doc/FY2019%20Defense%20Appropriations%20Act,%20S.3159.pdf.

- The committee report is available at
  https://www.appropriations.senate.gov/imo/media/doc/FY2019%20Defense%20Appropriations%20Act,%20Report%20115-290.pdf.
- An audio of the mark up of the Defense and Labor-HHS-Ed Appropriations bill is available at
  https://www.appropriations.senate.gov/hearings/full-committee-markup-of-the-defense-and-labor-h-appropriations-bills-for-fy2019.
- A comprehensive analysis of the House Defense Appropriations Bill is available at
  http://www.lewis-burke.com/sites/default/files/appropriations_update_-_house_appropriations_committee_approves_fy_2019_defense_appropriations_bill.pdf.

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Senate Appropriations Committee Approves FY 2019 Homeland Security Appropriations Bill

On June 21, the Senate Appropriations Committee approved its version of the fiscal year (FY) 2019 Homeland Security spending bill. The Senate bill includes $48.3 billion in net discretionary funding for the Department of Homeland Security (DHS), which represents an increase of 1.3 percent above the FY 2018 level and 1.7 percent above the President Trump's FY 2019 budget request. While the bill would provide robust investments in DHS immigration authorities and fulfill the President's initial $1.6 billion request to improve currently deployed fencing along the Southwest border, President Trump has expressed frustration that the Committee would not meet the Administration's updated request of $2.2 billion for a border wall and has yet to issue his support for the bill.

For the DHS Science and Technology Directorate (S&T), the Senate bill would provide $813.1 million, which is $27.8 million below the FY 2018 enacted level but $229.8 million more than the President's FY 2019 budget request. Within this amount, the Senate bill would sustain $40.5 million in funding for the Office of University Programs (OUP) to maintain all current DHS Centers of Excellence (COE) and reject the President's proposed drastic cuts to the program. Additionally, in the explanatory report accompanying the bill, the Committee directs specific funding amounts to various research and development (R&D) priorities. These directives could provide useful insight into future DHS S&T funding opportunities and initiatives. Key S&T priorities of interest to the research community are outlined below.

- $4.5 million to support the **Biometrics Technology Apex Engine**, which promotes operational efficiencies and testing to inform the applications of biometric technologies across the agency. The request directs S&T to "leverage existing biometric expertise by developing a long-term cooperative relationship with a research entity that has a history of successfully collaborating with other federal agencies that utilize biometrics and that offers degrees in biometric systems." Apex Engines provide a baseline persistent repository of research and development expertise and capabilities. Other Apex programs supported by the bill include the **Data Analytics Engine** and **Next Generation Cyber infrastructure.**
- $12.9 million for **air-based border technologies**. The Committee notes the threat of air domain awareness along the northern border and that existing systems fail to detect low aircraft that

facilitate illegal smuggling. Within this amount, the report recommends specific funding for the following program:
- o $6 million for partnerships with qualified research universities to develop an "operational array of sensors and associated test events along the northern border that will enable operational testing, including within mountainous and rugged terrains." The Committee explains "the purpose of these operational tests shall be to validate the suitability of available sensor technologies and provide measurable results that can inform future operations and investments."
- $4 million for **enabling small UAS technologies** with encouragement to utilize resources at the existing SUAS demonstration site at Mississippi State University and the Federal Aviation Administration (FAA) UAS Center of Excellence, including:
  - o $2 million to "test sensors as parts of systems to solve more complex maritime problems."
- $13 million for the research, development, and testing of **counter unmanned aerial systems (UAS)**. The Committee expresses frustration that DHS lacks some legal authorities to carry out major operations in this space and is poised to increase the amount provided for this effort should DHS be allowed to broaden its anti-aircraft efforts.
- $70 million for **cybersecurity** R&D through the Apex Programs, Network and System Security and Investigations, and Natural Disasters and Resiliency accounts. Within this amount, $36.7 million is directed to support the needs of the National Protection and Preparedness Directorate (NPPD), DHS' head agency for cyber operations. Moreover, $3 million is directed to support "self-adapting security mechanisms that utilize data analytics-driven scoring to measure weaknesses in software design."
- $6.2 million for **cyber-physical systems** research, including:
  - o $1.6 million for collaboration between S&T and the Department of Energy on cybersecurity of energy deliverable systems.
- $31.7 million to support **cargo security and port of entry programs**, including:
  - o $2 million to develop "thermoplastic composite materials that reduce costs and improve intrusion sensor integration."
  - o $6 million to develop "algorithms for cargo imaging equipment and to pursue advanced analytics for targeting and determining criminal networks on the basis of cargo movement."
- $16.8 million for **port and coastal surveillance**, including:
  - o $8 million for "research, development, test, and evaluation of existing unmanned, self-powered maritime sensor platforms capable of detecting surface and subsurface threats."
- $8.5 million to develop new tools for the Department and its partners to use to improve their capability to **detect and stop the flow of opioids**, including:
  - o $1.5 million for S&T to collaborate with Homeland Security Investigations (HSI) and a university partner in this effort by "developing opioid-related investigative, training, analytical, and other capabilities."
- $7 million to develop ethical **soft target protection technologies**, such as capabilities to protect national monuments, hospitals, schools, sporting arenas, hotels, cultural centers, movie theaters, restaurants, places of worship, nightclubs, etc.

- $18.2 million for **explosives threat assessment** and to continue partnerships with relevant federal entities to understand and categorize homemade explosives.
- $12.3 million for **canine detection technologies**, including:
  - $7 million for collaborations with academia to develop scientifically-validated canine mobile sensing technologies for explosives detection.
- $105.2 million for **natural disaster resiliency** projects, including:
  - $5 million for an educational partnership agreement with the Army Corps of Engineers and one or more educational institutions to develop capabilities to improve the integrity of the country's dams and levees. The institution(s) should have expertise collaborating with relevant agencies such as the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS).

While the Committee is largely supportive of DHS' recent efforts to seek new authorities to commercialize technologies, such as partnership intermediary agreements between DHS and other stakeholders, they remain concerned with the effectiveness of the Silicon Valley Innovation Program (SVIP). SVIP is a major initiative at the agency to streamline products to DHS operations, but the report notes that only one technology has reached the final stage of development and encourages the agency to justify SVIP's return on investment. Further, the Committee encourages the agency to leverage Centers of Excellence to accelerate the commercialization of technologies to market.

Lewis-Burke Associates LLC will continue to monitor this bill as it progresses to the Senate floor. Additional funding details can be found in the chart below.

Senate Homeland Security Appropriations Bill, FY 2019

(in thousands of $)

	FY 2018 Enacted	FY 2018 Request	FY 2019 Senate	Senate vs. FY 2018	Senate vs. Request
DHS	**47,723,000***	**47,522,467***	**48,334,000***	**611,000 (1.3%)**	**811,533 (1.7%)**
Science and Technology Directorate	840,943	583,283	813,116	-27,827 (3.4%)	229,833 (32.9%)
University Programs	40,500	21,746	40,500	--	18,754 (60.3%)

Approximate net discretionary funding

Sources and Additional Information:
- Draft text for the Senate bill can be found at https://www.congress.gov/bill/115th-congress/senate-bill/3109/text?q=%7B%22search%22%3A%5B%22dEPARTMENT+OF+HOMELAND+SECURITY+APPROPRIATIONS+BILL%2C+2019%22%5D%7D.
- Accompanying report language is available at https://www.congress.gov/congressional-report/115th-congress/senate-report/283/1?r=11&overview=closed.

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