

Appropriations Update: Senate Appropriations Committee Releases Draft FY 2023 Commerce, Justice, Science Appropriations Bill

Lewis-Burke Associates LLC – August 3, 2022

On July 28, the U.S. Senate Appropriations Committee released its draft fiscal year (FY) 2023 Commerce, Justice, Science, and Related Agencies (CJS) appropriations bill. The bill would provide \$85.8 billion in FY 2023 for the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), National Institute of Standards and Technology (NIST), and Department of Justice (DOJ), among other programs. This represents an approximately 13 percent increase over the FY 2022 enacted level of \$75.78 billion.

The bill would provide substantial to major increases to many programs of interest across its portfolio compared to FY 2022 funding levels. In many cases, these increases fall short of the growth proposed in the president's FY 2023 budget request. The Senate draft bill proposes larger increases over FY 2022 funding for NSF and NASA compared to the House version while the House bill would provide larger increases than the Senate bill for others, such as the Economic Development Administration (EDA) and NOAA.

The top-line funding levels for agencies relevant to the research community are as follows:

- The **National Science Foundation (NSF)** would be funded at **\$10.3 billion**, \$1.5 billion or 17 percent above the FY 2022 enacted level and \$707 million above the House proposed level, but \$154 million below the president's budget request. NSF's **Research and Related Activities (R&RA) account** would be funded at \$8.3 billion, \$1.2 billion or 16 percent above the FY 2022 enacted level, \$616 million above the proposed House level, and \$104 million below the president's FY 2023 budget request. **STEM Education (EDU)**, NSF's proposed new name for the Education and Human Resources account and Directorate, would receive \$1.3 billion, \$321 million or 32 percent above the FY 2022 level, \$77 million above the proposed House level, and \$50 million below the president's FY 2023 budget request. Notably, a significant portion of the EDU increase would be devoted to a transfer of funding for the Graduate Research Fellowship Program from R&RA to EDU.
- The **National Aeronautics and Space Administration (NASA)** would be funded at **\$26 billion**, a \$1.9 billion, or 8 percent increase over the FY 2022 enacted level. This would be \$520 million above the FY 2023 House level and equal to the president's budget request. However, it is important to note that the allocation of funds would deviate from the request. The **Science Mission Directorate** would receive \$8 billion, an increase of \$431 million or 5 percent above the FY 2022 enacted level. This is \$140 million above the FY 2023 House proposed level, and \$57 million above the president's budget request. The **Space Technology Mission Directorate** would receive \$1.3 billion, an increase of \$154 million or 12 percent above the FY 2022 enacted level. This would be \$14 million above the FY 2023 House proposed level, but \$174 million below the request.
- The **National Oceanic and Atmospheric Administration (NOAA)** would be funded at **\$6.5 billion**, an increase of 634 million or 11 percent over FY 2022, but \$275 million less than the House FY

2023 proposal and \$352 million below the president's FY 2023 budget request. The bill would provide \$687.8 million for the **Office of Oceanic and Atmospheric Research (OAR)**, an \$88.3 million or 14.7 percent increase over the FY 2022 enacted level. This would be \$21 million or 3 percent above the president's budget request, but \$11 million or 1.5 percent below the House. The **Climate Research Program** would receive \$233 million, \$33 million or 16.5 percent more than the FY 2022 enacted level, but 9.2 percent below the budget request and 8.3 percent below the House proposal.

- The **National Institute of Standards and Technology (NIST)** would be funded at **\$1.7 billion**, an increase of \$466 million or 38 percent over the FY 2022 enacted level, \$229 million or 16 percent, above the president's budget request, and \$222 million or 15 percent above the House. NIST's **core research programs** would be funded at **\$975 million**, \$125 million or 15 percent above the FY 2022 enacted level, consistent with the president's budget request, and \$22 million or 2 percent above the House.
- The **Economic Development Administration (EDA)** would be funded at **\$450 million**, \$76 million or 20 percent above the FY 2022 enacted level but \$60 million less than the House-proposed level and \$52 million below the president's budget request.
- The **Department of Justice (DOJ)** would receive **\$38.5 billion**, a \$3.3 billion or 9 percent increase over the FY 2022 enacted level. This funding would be consistent with the House-proposed level and approximately \$715,000 below the president's budget request. The National Institute of Justice (NIJ), DOJ's primary external research program, would receive **\$43 million**, a \$13 million or 43 percent, increase over the FY 2022 enacted level. This funding level is consistent with the president's budget request and \$8 million higher than the proposed funding level in the House.

The Senate Appropriations Committee has not announced markup dates for any of its FY 2023 appropriations bills, including the Commerce, Justice, Science, and Related Agencies (CJS) bill. There is a chance that instead of marking up the bills and passing them out of committee, the Senate chooses to move directly to conference negotiations with the U.S. House of Representatives as they did for FY 2022 appropriations. Final funding levels are likely to differ from both House and Senate drafts as no budget agreement on overall spending or the split between defense and non-defense spending has yet been struck. Note that while Republicans have not yet agreed to overall funding levels, the Senate CJS draft bill does include Republican priorities and is not solely a Democratic draft. While releasing the text of the draft bills is an important step, it is highly unlikely that FY 2023 appropriations will be finalized by the start of the fiscal year on October 1, 2022. Congress will need to pass a continuing resolution (CR) extending FY 2022 funding for federal agencies likely until after the election and possibly through the end of the calendar year.

Below are additional details on the Senate CJS FY 2023 bill and the corresponding committee report. Specific funding information is available in the charts following the narrative.

National Science Foundation (NSF)

The Senate CJS bill would provide the National Science Foundation (NSF) with \$10.34 billion, which is \$1.5 billion or 17 percent above the FY 2022 level, far above the House's proposal of \$9.63 billion but \$154.1 million less than the president's budget request. The proposed NSF increase would be the biggest for the agency in many years.

The Senate bill would provide \$8.32 billion for **Research & Related Activities (R&RA)**, 16.2 percent above the FY 2022 level and \$616.4 million above what the House would provide, but \$104 million below the president’s budget request. The Senate explanatory statement notes the importance of the breadth of NSF research and education to advance “complex problems important to the Nation.” The Committee encourages NSF to continue its efforts for increased partnership with industry, foundations, non-profit organizations, and international activities. Like previous Senate committee reports, the Senate draft bill would encourage NSF to support U.S. scientific research facilities and instruments engaged in cutting edge research as well as core research programs and would direct NSF to allocate no less than FY 2022 enacted levels for these activities. Several specific facilities are called out for full funding at the request level – the Daniel K. Inouye Solar Telescope (DKIST), the Very Long Baseline Array (VLBA), and the Center for High Energy X-Ray Science (CHEXS).

The Senate explanatory statement, similar to the House bill, recognizes the creation of the new **Directorate for Technology, Innovation, and Partnership (TIP)** within R&RA, but reminds NSF of the importance of supporting foundational basic research across the NSF research portfolio. Like the House, the Senate would not specify a funding level for TIP. Within TIP, the Senate would provide \$200 million for the Regional Innovation Engines (NSF Engines) and directs NSF to award at least 20 percent of NSF Engines to EPSCoR states. The Senate would provide \$200 million for NSF Engines, equal to the request level and \$30 million above the House level.

The Committee explanatory statement discusses several of the Administration’s priority areas:

- Supports the Administration’s requested funding for the **U.S. Global Change Research Program (USGCRP)** and **clean energy technology**. NSF requested \$913 million for the climate change related USGCRP and \$500 million for clean energy technology, 61 percent and 31 percent, respectively, above FY 2021 levels.
- Would provide \$261 million for **Quantum Science**, including \$211 million for research and workforce activities and \$50 million to support National Quantum Information Science Research Centers as set out in the *National Quantum Initiative Act*. This amount is equal to the president’s budget request and \$41 million above the FY 2022 level.
- Would provide up to the request level of \$734.4 million for **Artificial Intelligence (AI)**. The explanatory statement encourages NSF to continue workforce efforts in AI, including focused outreach to community colleges and minority serving institutions as well as encouraging programs for non-computer science students and general data literacy. The explanatory statement also encourages NSF to support research into **Social Media Content Moderation Algorithms** as authorized in the *National Artificial Intelligence Initiative Act of 2020*.
- The Administration’s other research emerging priority areas, including advanced manufacturing, advanced wireless, biotechnology, and microelectronics and semiconductors, are not mentioned in the Senate explanatory statement.

Much of the Senate explanatory statement echoes themes from previous years, but there are several new research areas highlighted, which include:

- Support for the new **Growing Research Access for Nationally Transformative Equity and Diversity (GRANTED)** that aims to support underserved institutions. NSF proposed \$50 million for the new program in the president’s budget request, while the House would provide \$30 million.
- Commending NSF for investing in **critical biological infrastructure** including computational tools and similar to the House directs NSF to review the mechanisms it uses to support biological infrastructure investments.

- Support for research and infrastructure related to **Ocean Research** and encourages NSF to support the construction or acquisition of local-class research vessels through the Major Research Instrumentation Program or Mid-scale Research Infrastructure programs.
- Recognizing support for **Academic Research Infrastructure** construction and modernization to maximize U.S. scientific and economic competitiveness, and encourages NSF to evaluate its requirements for facilities to ensure adequate institutional support capabilities.
- Encouraging NSF to fund **Disaster Research** related to landslides and earthquakes and prioritize funding for the deployment of early warning systems.
- Support for NSF portfolio review recommendations related to Seismology and Geodesy Facilities, including broadening funding mechanisms in collaboration with other federal agencies.
- Support for the **Social, Behavioral, and Economic Sciences (SBE)** Directorate and recognizes the importance of SBE research on “advancing scientific understanding of public health, defense and security, education and learning, and the interface between humans and technology.”
- Commending NSF for its stewardship of the **National Center for Science and Engineering Statistics (NCSES)** and supports the request and staffing increases to fulfill the initiatives in the *Foundations for Evidence-Based Policymaking Act of 2018*.

The explanatory statement contains many provisions that echo guidance provided in previous years, specifically:

- Funding the **EPSCoR program** at no less than \$247.3 million, level with the president’s budget request. The Committee also commends NSF’s commitment to the **Geography of Innovation** and the upcoming congressionally-directed report from NSF reviewing large funding initiatives led by institutions in EPSCoR states and at Minority Serving Institutions.
- Fully funding the **Mid-Scale Research Infrastructure** program and recommending NSF make at least two awards in an EPSCoR State. *Note that only the smaller Mid-Scale Research Infrastructure R-1 competition is funded under R&RA.*
- Providing \$37.9 million for the **Historically Black Colleges and Universities (HBCU) Excellence in Research Program**, equal to the budget request, \$7.6 million below the House proposal, and \$16 million above the FY 2022 level.
- Directing NSF to continue research and related activities on **sustainable chemistry research** as authorized under section 509 of the *America COMPETES Reauthorization Act of 2010* and the *FY 2021 National Defense Authorization Act* (P.L. 116-283, Title II, Subtitle E), which authorizes interagency activities and support for partnerships between academic institutions and industry on sustainable chemistry issues.
- Highlighting support under the **Understanding the Rules of Life** initiative of “NSF’s funding for research in plant genomics and directs NSF to continue to advance the ongoing plant genomics research program, to further its work in crop-based genomics research, and to maintain a focus on research related to crops of economic importance.”
- Encouraging NSF, within the **Navigating the New Arctic program**, to increase support for research and infrastructure in the North Atlantic region of the Arctic, and to develop multinational partnerships to address global concerns related to Arctic change.
- Encouraging NSF to provide appropriate funding to operating current **Astronomy** facilities, developing instrumentation, and preparing for new world-class scientific research facilities based on recommendations included in the Astro2020 decadal survey. The Committee also expects NSF to support a balanced portfolio of astronomy research grants. New for FY 2023, the Committee includes specific concern about the Kitt Peak National Observatory and the impact on the facility of

the recent Contreras Fire. As in previous years, the Committee also provides specific guidance related to Solar Astronomy and the Green Bank Observatory.

- Highlighting NSF and NOAA collaborations associated with the **Vortex-SE** program focused on devastating tornadoes in the southeastern U.S. The Committee notes its expectation that NSF adequately fund VORTEX-SE going forward and to utilize collaborative opportunities.

Many previous areas of interest for the Committee were **not** included in the FY 2023 draft explanatory statement, including language on spectrum innovation, online influence, high performance computing, math institutes, ultra-fast lasers, domestic manufacturing, i-corps, plastics, the cybersecurity workforce, and deepfakes.

Education and Human Resources (EHR) would be supported at \$1.3 billion, \$321 million or 31.9 percent above the FY 2022 level, \$77.2 million above what the House would provide, and \$50 million below the budget request proposal. The Committee would accept the proposal to rename EHR to the **Directorate for STEM Education (EDU)** consistent with the House. The EDU increase would be much larger than the increase proposed for R&RA in part because the Committee would accept the Administration's proposed move of all funding for the Graduate Research Fellowship Program to EDU. Currently EHR funds 50 percent of the program while R&RA funds the other 50 percent. The increase in funding for EDU not including the transferred GRFP funds would be \$216 million or 19.5 percent above the FY 2021 level.

As in previous years, the explanatory statement would provide specific amounts for many education and workforce programs within EHR:

- Approving the proposal to consolidate the **Graduate Research Fellowship Program (GRFP)** within EDU. The Committee would support the proposed increase to the fellowship stipend and would fully fund GRFP at the request level of \$355 million, \$59 million above the FY 2022 level and \$35 million above the House level.
- Approving the large increases proposed in the budget request for existing programs to broaden participation in STEM fields supported through the newly named Division of Equity for Excellence in STEM (EES), formerly the **Division on Human Resource Development**. The Committee recommends \$55 million for the **Hispanic Serving Institutions** program, "to build capacity at institutions of higher education that typically do not receive high levels of NSF funding," \$6.5 million above the FY 2022 enacted level but \$5 million below the House and budget request levels; \$22 million for the **Tribal Colleges and Universities Program (TCUP)**, \$4.5 million above the FY 2022 enacted level, \$1 million below the budget request and \$3 million above the House proposal; \$46.5 million for the **HBCU Undergraduate Program (HBCU-UP)**, \$8.5 million above the FY 2022 level, level with the budget request and \$1 million above the House proposal; \$12 million for the **Alliance for Graduate Education and the Professoriate (AGEP)**, \$3.5 million above the FY 2022 enacted level, \$2 million below the budget request, and \$2 million above the House proposal; \$69.5 million for the **Louis Stokes Alliances for Minority Participation (LSAMP)**, \$18.5 million above the FY 2022 enacted level, \$1 million below the budget request, and \$12.5 million above the House proposal; and \$33 million for the **Centers for Research Excellence in Science and Technology (CREST)**, \$8 million above the FY 2022 level, but \$4.5 million below the House proposal and \$8 million below the budget request.
- \$46.5 million for the **Inclusion Across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES)** initiative, \$25 million above the FY 2022 level and \$16 million more than the House would provide, but \$4 million below the budget request.

- \$75 million for the **Advanced Technological Education** program, equal to the FY 2023 budget request, \$3 million below what the House would provide, and \$1.5 million below the FY 2022 enacted level.
- \$67 million for the **Robert Noyce Scholarship Program**, the same as the FY 2022 enacted level, the budget request, and the House proposal.
- \$70 million to support the **Advancing Informal STEM Learning (AISL)** program, \$5 million below the budget request and \$5 million over the FY 2022 enacted level.

Additionally, the explanatory statement includes language encouraging NSF to support projects that develop **hands-on and experiential learning opportunities** in STEM education, for example through robotics competitions and collaboration with the Department of Education on **transformational education innovation and translation**. The Committee notes that the latter activities may include large-scale digital learning platforms, research into learning and inclusive education involving students, teachers, and parents.

The **Major Research Equipment and Facilities Construction (MREFC)** account would be funded at \$187.23 million, \$61.8 million or 24.8 percent below the FY 2022 level and even with the budget request and House proposal. The explanatory statement would fully fund at the budget request level all projects in the MREFC pipeline, including **Antarctic Infrastructure Modernization, High Luminosity-Large Hadron Collider Upgrade, Regional Class Research Vessels**, and the **Vera C. Rubin Observatory**. The explanatory statement would provide \$76.25 million for **Mid-scale research infrastructure**, the same as the budget request, FY 2022 level, and House-proposed level and encourages NSF to fund at least one mid-scale project led by an institution in an EPSCoR state (*note only the larger midscale research infrastructure (Mid-Scale RI-2) awards are funded under MREFC*). The explanatory statement encourages NSF to continue planning for future major facilities needed for U.S. scientific leadership and as in past years would encourage GAO to continue its annual review of MREFC projects.

National Science Foundation

(In millions of \$)

	FY 2022 Enacted	FY 2023 Request	FY 2023 House	FY 2023 Senate	Senate vs. FY 2022	Senate vs. Request	Senate vs. House
NSF, total	8,838.00	10,492.08	9,631.14	10,338.00	1,500.00 (17.0%)	-154.08 (1.5%)	706.86 (7.3%)
Research & Related Activities	7,159.40	8,425.99	7,705.53	8,321.91	1,162.51 (16.2%)	-104.08 (1.2%)	616.38 (8.0%)
STEM Education & Human Resources	1,006.00	1,377.18	1,250.00	1,327.18	321.18 (31.9%)	-50.00 (3.6%)	77.18 (6.2%)
MREFC	249.00	187.23	187.23	187.23	-61.77 (24.8%)	--	--
Agency Operations and Award Management	400.00	473.20	460.00	473.20	73.20 (18.3%)	--	13.2 (2.9%)
NSB	4.60	5.09	5.09	5.09	0.49 (10.7%)	--	--

Office of Inspector General	19.00	19.00	23.29	23.39	4.39 (23.1%)	4.39 (23.1%)	0.1 (0.4%)
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National Aeronautics and Space Administration (NASA)

NASA would receive \$25.97 billion, an increase of \$1.9 billion or 8 percent above the FY 2022 enacted level and equal to NASA’s FY 2023 request. The Senate’s draft proposal is also 2.1 percent or \$527.6 million above the House’s proposal. Every directorate – with the exception of the Space Technology Mission Directorate – would be funded at levels equal to or slightly above the request.

NASA’s **Science Mission Directorate (SMD)** would receive \$8.04 billion, an increase of \$431.3 million or 5.7 percent above FY 2022, \$57.4 million above the request, and \$140.7 million above the House mark. The draft Senate bill would largely support SMD’s programs and missions at the requested level, as well as the cadence of the division-specific competitive mission opportunities.

The **Earth Science Division (ESD)** would receive \$2.34 billion, \$281.4 million or 13.6 percent above the FY 2022 level but \$65.4 million or 2.7 percent below the request. This is slightly above (\$11.3 million) the House’s proposal. The draft Senate bill would fully fund NASA’s major ongoing Earth science missions and the next round of Venture class missions, as well as NASA’s plan to consolidate missions recommended by the National Academies’ 2017 Earth Science Decadal Survey (ESAS 2017) within an Earth System Observatory. It would provide the requested level for NASA to initiate the Earth System Explorers (ESEs) program, which was established in response to the ESAS 2017 recommendation that NASA create a new mission class to address the Decadal’s “Target Observables” priorities. Prior direction from the Senate supported the establishment of ESEs and the benefits of competed missions. However, the explanatory statement accompanying the bill conflates the “Designated Observables” missions currently in early development with the yet-to-be-competed “Target Observables”/ESE missions by directing NASA compete the former. This is possibly a mistake, which would presumably be rectified in the report accompanying any final FY 2023 appropriations.

The draft Senate bill would provide \$3.2 billion to the **Planetary Science Division (PSD)**, an increase of \$89.4 million or 2.9 percent above FY 2022 – \$11.3 million above the House proposed level – and \$49.6 million above the request. The bill supports PSD’s current missions under development, the timely cadence of competitive opportunities, and reverses NASA’s proposal to reduce funding for planetary defense activities. Like the House, the Senate explanatory statement does not specify funding to initiate new priorities from the recent National Academies’ 2023 Planetary Decadal survey. However, it would require NASA to submit a report detailing a 5-year strategy for initiating the recommended Uranus orbiter/probe mission, support increases to the New Frontiers program’s cost cap, and would direct that PSD adhere to lunar-related recommendations in executing the Lunar Discovery and Exploration Program. Mars Sample Return would be funded at the requested level although the explanatory statement notes concern over future cost growth and schedule slips. It also supports utilizing a modified Ingenuity-class helicopter to fetch samples cached by the Perseverance rover. NASA and the European Space Agency recently announced a simplified MSR architecture using the Perseverance rover to deliver samples to a Mars Ascent Vehicle with redundant collection capabilities provided by two Ingenuity-class helicopters, in place of an ESA-supplied fetch rover.

The **Astrophysics Division (APD)** would receive 1.56 billion, a \$50.5 million or 0.5 percent decrease from FY 2022, \$7.9 million below the request, and \$36 million above the House. Part of the decrease from FY 2022 is due to the planned development wind down of the Nancy Grace Roman Space Telescope and the proposed termination of the Stratospheric Observatory for Infrared Astronomy (SOFIA) mission, the latter of which is not commented on in the explanatory statement. The relatively flat funding for other programs would allow ongoing missions in development and operations to continue but would limit APD's ability to implement new initiatives, including recommendations from the Astronomy and Astrophysics 2020 Decadal Survey (Astro2020). The explanatory statement does not specify funding but does voice support for the Astro2020's highest priority for a technology maturation program as a precursor to the development of a "Great Observatories" flagship mission. Astrophysics Research program would be funded at the requested \$329.8 million.

The bill would provide the **Heliophysics Division (HPD)** \$828.4 million, an increase of \$50.5 million or 6 percent above the FY 2022 enacted level and \$68.2 million, or 8 percent, above both the president's budget request and the House proposed level. The explanatory statement notes concern that HPD failed to obligate funds from FY 2022 – the division carried over almost \$300 million – and highlights that this is impeding progress on key missions including the Geospace Dynamics Constellation (GDC), and the Dynamical Neutral Atmosphere-Ionosphere Coupling (DYNAMIC) mission which NASA proposed to terminate. In response, the draft Senate bill would provide GDC \$78 million, \$15 million above the request, and \$10 million for the initiation of the DYNAMIC mission. The explanatory statement would spread out the additional funding above the request to all of HPD's program lines, except for Heliophysics Technology, which would receive \$28.4 million, equal to the requested level but \$1.5 million below the House proposed level.

- The Solar Terrestrial Probes program would receive \$213 million, \$24.2 million or 12.8 percent above the request level.
- The Heliophysics Explorer program would receive \$172.9 million, \$15 million or 9.5 percent above the request but \$16.3 million or 8 percent below the FY 2022 level.
- Heliophysics Research would receive \$236.8 million, \$11.5 million or 5 percent above the request, and would encourage HPD to increase the percentage of its budget going to competitive research from 14 to 25 percent per year.
- The Living with a Star program would receive \$152.3 million, \$15 million or 11 percent above the request and notes support for the applied research activities in addition to GDC.
- The explanatory statement also would provide \$25 million for the Space Weather program, 2.7 million or 12 percent above the request and equal to the House proposed level, and would allocate \$2 million, a \$1 million increase from the FY 2022 enacted level, for the new Space Weather Centers of Excellence which are currently being competed.

The **Space Technology Mission Directorate (STMD)** would receive \$1.26 billion, an increase of \$163.8 million or 15 percent above FY 2022 and \$13.9 million or 1.1 percent above the House, but \$174 million or 12 percent below the request. The explanatory statement highlights Congress's perennial support for the cross-disciplinary nature of the directorate and highlights support for its ongoing development programs to enable robotic and human exploration. The explanatory statement would fully fund the Regional Economic Development Program and would direct the program to continue collaboration with the NIST Hollings Manufacturing Extension Partnership and to expand the program to all 50 states. The explanatory statement is also aligned with the House's proposal to provide the requested amount for nuclear thermal propulsion (NTP) and on-orbit servicing, assembly, and manufacturing. \$27 million would be allocated for the student-focused flight opportunities program, \$2 million above the request

but \$3 million below the House proposed level. The explanatory statement also expresses support for investment in a mix of technologies for space nuclear power, including nuclear fission and nuclear electric propulsion, in order to ensure deployment of nuclear power on the lunar surface in the mid-2020s ahead of human surface missions.

The report would provide \$971.5 million for the **Aeronautics Research Mission Directorate**, an increase of \$90.8 million or 10 percent above the FY 2022 level, \$21.5 million or 2.3 percent above the House mark, and equal to the request. The explanatory statement notes support for the Sustainable Flight National Partnership to bring new electric and hybrid electric aircraft concepts to market, and further directs ARMD to work with the Department of Energy to overcome energy storage challenges for novel modes of mobility in electric air flight. The explanatory statement also supports NASA’s subsonic aircraft fuel efficiency developments and directs NASA to work with industry to develop a test hybrid-electric drag reduction system. The draft Senate bill would provide \$50 million for the Hypersonic Technology Program (HTP), equal to FY 2022 and \$5 million above the House proposed level. This would include \$10 million for continued collaboration between HTP, industry, and academia for carbon material testing and \$5 million to development of new materials characterizations. The draft bill would provide \$8 million, equal to the request but \$2 million below the House mark, to establish a new program for Advanced Capabilities for Emergency Response Operations.

The bill would provide \$150.1 million for **Science, Technology, Engineering, and Math (STEM) Engagement**, an increase of \$13.1 million or 9.6 percent above FY 2022 and equal to the House and request proposed levels. The increase would include \$57 million for the Space Grant program, equal to the request but \$5 million or 8.8 percent below the House proposed level. This amount is intended to provide at least \$850 thousand in base funding, \$150 thousand less than the House proposal, for each Space Grant state consortium to award competitive grants that address local, regional, and national STEM needs.

National Aeronautics and Space Administration

(In thousands)

	FY 2022 Enacted	FY 2023 Request	FY 2023 House	FY 2023 Senate	Senate vs FY 2022 Enacted	Senate vs FY 2023 Request	Senate vs House
NASA, total	24,041,300	25,973,800	25,446,200	25,973,800	1,932,500 (8.0%)	-- (0.0%)	527,600 (2.1%)
Science	7,614,400	7,988,300	7,905,000	8,045,700	431,300 (5.7%)	57,400 (0.7%)	140,700 (1.8%)
Earth Science	2,064,700	2,411,500	2,334,800	2,346,100	281,400 (13.6%)	-65,400 (2.7%)	11,300 (0.5%)
Planetary Science	3,120,400	3,160,200	3,200,000	3,209,800	89,400 (2.9%)	49,600 (1.6%)	9,800 (0.3%)
Astrophysics	1,568,900	1,556,000	1,525,000	1,561,000	-7,900 (0.5%)	5,000 (0.3%)	36,000 (2.4%)
Heliophysics	777,900	760,200	760,200	828,400	50,500 (6.5%)	68,200 (9.0%)	68,200 (9.0%)
Biological and Physical Sciences	82,500	100,400	85,000	100,400	17,900 (21.7%)	--	15,400 (18.1%)

Aeronautics	880,700	971,500	950,000	971,500	90,800 (10.3%)	--	21,500 (2.3%)
Space Technology	1,100,000	1,437,900	1,250,000	1,263,850	163,850 (14.9%)	174,050 (12.1%)	13,850 (1.1%)
Deep Space Exploration Systems	6,791,700	7,478,300	7,323,700	7,547,750	756,050 (11.1%)	69,450 (0.9%)	224,050 (3.1%)
Space Operations	4,041,300	4,266,300	4,256,000	4,293,500	252,200 (6.2%)	27,200 (0.6%)	37,500 (0.9%)
STEM Engagement	137,000	150,100	150,100	150,100	13,100 (9.6%)	-- (0.0%)	-- (0.0%)
Space Grant	54,500	57,000	62,000	57,000	2,500 (4.6%)	-- (0.0%)	-5,000 (8.1%)
EPSCoR	26,000	26,000	26,000	26,000	-- (0.0%)	-- (0.0%)	-- (0.0%)
MUREP	43,000	48,100	48,000	48,100	5,100 (11.9%)	-- (0.0%)	100 (0.2%)
Safety, Security, & Mission Services	3,020,600	3,208,700	3,138,700	3,228,700	208,100 (6.9%)	20,000 (0.6%)	90,000 (2.9%)
Construction and Environmental Compliance and Restoration	410,300	424,300	424,300	424,300	14,000 (3.4%)	-- (0.0%)	-- (0.0%)
Office of Inspector General	45,300	48,400	48,400	48,400	3,100 (6.8%)	-- (0.0%)	-- (0.0%)

National Oceanic and Atmospheric Administration (NOAA)

The FY 2023 draft Senate Appropriations bill would provide NOAA with \$6.511 billion, an increase of \$633.5 million or 10.8 percent over the FY 2022 enacted level. This is 5.4 percent below the FY 2023 president's budget request and 4.1 percent below the House proposal but would still be a historic increase contributing to the agency's growth under the Biden Administration. The **Operations, Research, and Facilities** account would receive \$4.6 billion, an increase of \$432.5 million or 10.4 percent above the FY 2022 enacted level, nearly flat with the House proposal and slightly higher than the president's budget request. As with the House bill, all NOAA research offices and programs of interest would receive an overall increase from FY 2022 enacted levels. While the House bill and the budget request both supported Climate Change Adaptation and Resilient Infrastructure as well as the creation of a Senior Climate Advisor position, the Senate draft does not include similar provisions. The explanatory statement accompanying the bill critiques NOAA's handling of Infrastructure Investment and Jobs Act (IIJA) funds, noting that some solicitations took over seven months to be released following enactment. This is significant because the agency will be expected to move faster on these programs in future fiscal years, especially if additional funds become available in a new reconciliation package.

The bill would provide \$687.8 million for the **Office of Oceanic and Atmospheric Research (OAR)**, an \$88.3 million or 14.7 percent increase over the FY 2022 enacted level. This would be \$21 million or 3 percent above the president's budget request, but \$11 million or 1.5 percent below the House. The **Climate Research Program** would receive \$233 million, \$33 million or 16.5 percent more than the FY 2022 enacted level, but 9.2 percent below the budget request and 8.3 percent below the House proposal. This funding would include \$107 million for the climate laboratories and cooperative institutes (CIs), an increase of \$18 million over the FY 2022 enacted level. The competitive climate research account would receive \$70 million, an increase of 6.1 percent over the FY 2022 level, but a significant drop of 31.5 percent and 23.5 percent, respectively, from the House and budget request proposed levels. Of note, the explanatory statement includes language encouraging NOAA to provide climate-focused competitive opportunities for early career researchers. Ocean labs and CIs would receive \$40 million, an increase of \$2.9 million or 7.8 percent over the FY 2022 enacted and budget request levels, but \$2 million less than the House proposal. The Senate bill would also provide an \$8 million increase over the FY 2022 level for OAR's Climate Adaptation Partnerships, continually known as the **Regional Integrated Sciences and Assessments Program (RISA)**, a significant jump of \$5.5 million from the House proposal. The **Sea Grant College Program** would receive \$90 million, a \$14 million increase over the FY 2022 enacted level and the Sea Grant Aquaculture Program would receive a \$1.5 million increase to \$15 million. Combined, the Senate proposal for Sea Grant programs is 8.8 percent higher than the House report and 17.3 percent higher than the budget request. As in previous years, Sea Grant programs are encouraged in both the House and Senate bills to increase work to enhance coastal resilience. Finally, the bill would provide \$46.5 million for **Ocean Exploration and Research**, an increase of 7.1 percent over the FY 2022 and requested levels, but \$1 million less than the House report.

The **National Ocean Service (NOS)** would receive \$701 million, an increase of \$63.3 million or 9.9 percent over the FY 2022 enacted level and just slightly above both the House bill and the president's budget request. The bill would include \$84 million, an increase of \$5 million over FY 2022 enacted levels, for **Coastal Zone Management Grants** and a flat \$34 million for the **National Oceans and Coastal Security Fund**. However, the Fund will receive an additional \$492 million over five years in the Infrastructure Investment and Jobs Act bringing total funds for FY 2023 to 132.4 million.

The **National Marine Fisheries Service (NMFS)** would receive \$1.1 billion, an increase of \$94 million or 9.3 percent over the FY 2022 enacted level, nearly flat with the House and requested amounts. The explanatory statement would direct NOAA to support the growth of climate ready fisheries and would provide \$1 million toward Fisheries and Ecosystem Science Programs and Services to create a pilot program providing insights and advice on climate smart fisheries management to practitioners and industry. Notably, the statement would require NOAA to provide the Committee with a detailed spending plan for the Saltonstall-Kennedy (S-K) Grant Program, and would require the agency to consult regional committees on priorities before moving forward with the next round of the competition. The language also encourages NOAA to prioritize projects improving marketing and growth of the seafood industry, to meet the original intent of the program. If included in final FY 2023 appropriations, these provisions could delay the release of future S-K competitions and guide priorities away from the current direction of resilient and climate-ready fisheries toward support for industry.

The **National Weather Service (NWS)** would be funded at \$1.3 billion, an increase of \$77.4 million or 6.6 percent over the FY 2022 enacted level, a very slight decrease from the house proposal and 2.7 percent above the president's budget request. This would include \$177.2 million for the Office of Science and

Technology Integration, an increase of \$15.6 million or 9.7 percent over the FY 2022 enacted level, about \$10 million less than the House proposal, but \$18 million above the budget request.

The **Office of Space Commerce (OSC)** would be funded at \$80 million, a large increase of \$64 million over FY 2022 enacted levels but \$7.7 million less than the House proposal and the request. This level of funding would allow OSC to develop operations space situational awareness capabilities by FY 2025. The bill would join the House in approving the request to transfer OSC out of NOAA to the Department of Commerce’s office of Mission Support.

National Oceanic and Atmospheric Administration

(In thousands of \$)

	FY 2022 Enacted	FY 2023 Request	FY 2023 House	FY 2023 Senate	Senate vs. FY 2022 Enacted	Senate vs. FY 2023 Request	FY 2023 Senate vs. House
NOAA, total	5,877,349	6,884,137	6,785,881	6,510,833	633,484 (10.8%)	-373,304 (5.4%)	-275,048 (4.1%)
Operations, Research, and Facilities (ORF)	4,157,311	4,484,209	4,608,232	4,589,855	432,544 (10.4%)	105,646 (2.4%)	-18,377 (0.4%)
Oceanic and Atmospheric Research (OAR)	599,448	666,275	699,132	687,767	88,319 (14.7%)	21,492 (3.2%)	-11,365 (1.6%)
<i>Climate Research</i>	200,000	256,639	254,216	233,000	33,000 (16.5%)	-23,639 (9.2%)	-21,216 (8.3%)
<i>Climate Competitive Research</i>	66,000	91,503	102,216	70,000	4,000 (6.1%)	-21,503 (23.5%)	-32,216 (31.5%)
<i>Ocean, Coastal and Great Lakes Research</i>	237,020	236,639	260,000	272,500	35,480 (15.0%)	35,861 (15.2%)	12,500 (4.8%)
<i>Sea Grant and Marine Aquaculture Program</i>	89,000	89,551	96,500	105,000	16,000 (18.0%)	15,449 (17.3%)	8,500 (8.8%)
<i>Ocean Exploration and Research (OER)</i>	43,410	43,894	47,500	46,500	3,090 (7.1%)	2,606 (5.9%)	-1,000 (2.1%)
National Weather Service (NWS)	1,174,470	1,219,309	1,258,860	1,251,874	77,404 (6.6%)	32,565 (2.7%)	-6,986 (0.6%)
National Ocean Service (NOS)	637,700	686,895	689,193	700,986	63,286 (9.9%)	14,091 (2.1%)	11,793 (1.7%)
<i>Coastal Science and Assessment: Competitive Research</i>	21,500	35,517	25,500	30,000	8,500 (39.5%)	-5,517 (15.5%)	4,500 (17.6%)

<i>National Oceans and Coastal Security Fund</i>	34,000	0	34,000*	34,000	0 (0.0%)	N/A	0 (0.0%)
National Marine Fisheries Service (NMFS)	1,015,955	1,106,389	1,099,964	1,110,076	94,121 (9.3%)	3,687 (0.3%)	10,112 (0.9%)
Procurement, Acquisition, and Construction (PAC)	1,672,689	2,332,662	2,131,000	1,874,329	201,640 (12.1%)	-458,333 (19.6%)	-256,671 (12.0%)
National Environmental Satellite, Data, and Information Systems	1,294,989	1,873,858	1,402,056	1,370,029	75,040 (5.8%)	-503,829 (26.9%)	-32,027 (2.3%)

*While the National Oceans and Coastal Security Fund received flat funding from the omnibus legislation, it did receive \$492 million over five years in the *Infrastructure Investment and Jobs Act* which will continue to inflate the FY 2023 funding for the program.

National Institute of Standards and Technology (NIST)

The National Institute of Standards and Technology (NIST) would be funded at \$1.7 billion, an increase of \$466 million (38 percent) above the FY 2022 enacted level, \$229 million (16 percent) above the president’s budget request, and \$222 million (15 percent) above the House proposed level. NIST’s technical and scientific research programs would be funded at \$975 million, an increase of \$125 million (15 percent) above the FY 2022 enacted level, consistent with the president’s budget request, and \$22 million above the House proposed level.

Overall, the bill would continue support for many of NIST’s long-standing priorities including quantum information science (QIS), artificial intelligence (AI), and cybersecurity. The bill would provide:

- \$61 million for NIST’s research program in **quantum information science (QIS)**, \$12 million above FY 2022 enacted levels.
- \$10 million for **cybersecurity** research, outreach, industry partnerships, and other activities including the National Cybersecurity Center of Excellence (NCCoE). The bill would direct NIST to support **National Initiative for Cybersecurity Education (NICE) cooperative agreements** for cybersecurity education and workforce development. The bill would also provide up to \$5 million for NIST and NCCoE to continue its research in cybersecurity of genomic data.
- Up to \$12 million above FY 2022 enacted levels to expand NIST’s **artificial intelligence (AI)** research and measurement science efforts. The bill would direct NIST to “develop standards, metrics, and tools for government, corporate, and academic uses of AI to train and test systems, model AI behavior, and compare systems.”
- \$2 million above FY 2022 enacted levels for **forensic science research**, including funding to support technical merit evaluations.

- The requested level for **Climate and Energy Measurement, Tools, and Testbeds**, including \$5 million to support a NIST Center of Excellence in climate change measurement.
- Up to \$2.5 million for NIST to establish a **robotics training center** “in partnership with an academic institution that has expertise in robotics and automation in the manufacturing sector.”
- \$3.25 million for NIST’s **unmanned aerial vehicle (UAV)** research challenges and credentialing program, including funding to “partner with academic institutions to execute UAV prize-based challenges and to establish the measurements and standards infrastructure necessary for credentialing remote pilots.”
- Up to \$8 million above FY 2022 enacted levels to support NIST’s standards development of **critical and emerging technologies**.
- The Committee encourages NIST to work with academic institutions, in collaboration with State and industry partners, to develop new **composite technologies** to solve problems in the manufacturing space and related materials industries.
- \$5.8 million above FY 2022 enacted levels for NIST to improve **workforce diversity, equity, and inclusion**, including a new program for postdoctoral researchers from underrepresented backgrounds in STEM careers to work in NIST laboratories.

Additional research areas supported by the Committee include forward-looking building standards; greenhouse gas program and urban dome initiative; regenerative medicine standards; circular economy; pyrrhotite testing and mitigation; graphene research and commercialization; measurement service modernization; iEdison system; and Malcom Baldrige Performance Excellence Program.

The draft bill would provide \$200 million for the **Manufacturing Extension Partnership (MEP)** program, an increase of \$42 million over FY 2022 enacted levels, \$75.3 million less than the president’s budget request, and \$12 million below the House. The bill would include \$70 million for **Manufacturing USA**, which would quadruple program funding compared to FY 2022 enacted levels, falls \$27 million short of the president’s budget request, and would be \$52 million above the House level. Of this amount, at least \$40 million is to support new, broadly competed NIST-funded institutes. Notably, the House report does not mention the creation of additional NIST-led manufacturing institutes, while the president’s budget request proposes five new institutes. The bill would also direct NIST to provide a report on the state of biomanufacturing capacity in the U.S., citing the importance of supply chain resilience for domestic manufacturing.

National Institutes of Standards and Technology

(In thousands)

	FY 2022 Enacted	FY 2023 Request	FY 2023 House	FY 2023 Senate	Senate vs. FY 2022 enacted	Senate vs. FY 2023 Request	FY 2023 Senate vs. House
NIST, total	1,230,063	1,467,549	1,474,181	1,696,339	466,276 (37.9%)	228,790 (15.6%)	222,158 (15%)
Scientific and Technical Research and Services	850,000	975,000	953,000	974,946	124,946 (14.7%)	-54 (0.01%)	21,946 (2.3%)

Industrial Technology Services	174,500	372,300	230,000	270,000	95,500 (54.7%)	-102,300 (27.5%)	40,000 (17.4%)
Manufacturing USA	16,500	97,000	18,000	70,000	53,500 (342.2%))	-27,000 (27.8%)	52,000 (288.9%)
Manufacturing Extension Program (MEP)	158,000	275,300	212,000	200,000	42,000 (26.6%)	-75,300 (27.4%)	-12,000 (5.7%)

Economic Development Administration (EDA)

The draft bill would fund the **Economic Development Administration (EDA)** at \$450 million, \$76.5 million or 20.4 percent above the FY 2022 enacted level, but \$60 million less than the proposed House level and \$52.5 million below the president’s budget request. The Committee continues to focus on supporting economic recovery in the wake of the COVID-19 pandemic and promoting long-term economic growth, specifically in rural communities. The bill would also specifically direct EDA to prioritize grant applications, where applicable, to applicants that can demonstrate that a project will benefit underserved communities.

The Committee would fund the **Regional Innovation Program (RIP)**, rebranded by EDA as the Build to Scale program, at \$50 million which is the same as the House mark and \$5 million above the FY 2022 enacted level and budget request. Notably, the House and Senate bills would fund RIP at its authorized level of funding for the first time. The explanatory statement accompanying the bill would direct EDA to award no less than 40 percent of the funds to rural communities and urge EDA to support applicants from “diverse geographic areas.” Additionally, the Senate explanatory statement recommends that EDA support the development of regional innovation clusters focused on “commercialization of new forest products” and other industries that would help regions “adversely impacted by rapid changes in the timber and pulp marketplaces” thrive economically.

The **Public Works** program would receive \$125 million, \$4.5 million above the FY 2022 enacted level and the House proposed level and \$1 million above the president’s budget request. Additionally, the **Economic Adjustment Assistance** program would receive \$43 million, \$5.5 million or 14.6 percent above the FY 2022 level and \$1 million above the House bill. These are EDA’s most flexible programs and support initiatives that range from construction to workforce development initiatives and beyond.

The draft bill would provide \$20 million for the proposed **Recompete Pilot Program**, \$30 million less than the budget request proposed and \$50 million less than the House bill. The program would provide grants to communities experiencing persistently high employment gaps among prime-age workers (ages 25-54) to develop 10-year comprehensive economic development plans (“Recompete Plans”) and invest in the implementation of those plans. Plans would be locally tailored to address multifaceted needs of communities to engage those not participating in the labor force and could include workforce training, infrastructure improvements, entrepreneurial guidance and more. This pilot program would be used as a test to evaluate a new model of grant making for EDA where clusters of projects are strategically funded in particularly distressed communities for extended periods of time, with the hopes of being scaled.

The Committee would provide \$10 million for the **STEM Apprenticeship program**, the same funding level as the budget request, an \$8 million increase above the FY 2022 enacted level, and \$5.5 million above the House proposed level. The Committee urges EDA to, where applicable, prioritize implementation grants. It should be noted that four-year universities have been allowed to participate in recent competitions for this program. The Senate bill would provide \$55 million for Assistance to Energy Transition Communities, an expansion of EDA’s Assistance to Coal Communities program, which is \$13.5 million above the FY 2022 enacted level but \$25.5 million less than what the House bill and budget request would provide. Of the \$55 million that would go towards closing energy plants throughout the country, \$16.5 million would be directed to nuclear power plant closures, \$5 million would be for biomass power plant closures, and \$33.5 million would be for assisting coal communities.

The explanatory statement would direct EDA to design and implement methods to increase investments in high-poverty urban areas. Finally, the explanatory statement would support efforts at EDA to assist public-private partnerships focused on diversifying local economies.

Economic Development Administration *(in thousands)*

	FY 2022 Enacted	FY 2023 Request	FY 2023 House	FY 2023 Senate	Senate vs. FY 2022 enacted	Senate vs. FY 2023 Request	Senate vs. FY 2023 House
Economic Development Administration (EDA)	373,500	502,518	510,000	450,018	76,518 (20.5%)	52,500 (10.4%)	59,982 (11.8%)
Regional Innovation Program	45,000	45,000	50,000	50,000	5,000 (11.1%)	5,000 (11.1%)	---
Public Works Program	120,500	124,000	120,500	125,000	4,500 (3.7%)	1,000 (0.8%)	4,500 (3.7%)
Economic Adjustment Assistance Program	37,500	48,000	42,000	43,000	5,500 (14.7%)	5,000 (10.4%)	1,000 (2.4%)
Research and Evaluation Program	2,000	2,000	2,000	3,500	1,500 (75%)	1,500 (75%)	1,500 (75%)
STEM Apprenticeship Program	2,000	10,000	4,500	10,000	8,000 (400%)	---	5,500 (122%)

Department of Justice (DOJ)

The **Department of Justice (DOJ)** would receive \$38.6 billion, nearly the same as the House proposed level, \$3.3 billion over the FY 2022 enacted level, and around \$715,000 below the president’s budget request. The Committee would provide \$88 million for **Research, Evaluation, and Statistics (RES)**, within DOJ’s Office of Justice Programs (OJP). Included in RES funding, the **National Institute of Justice (NIJ)**, DOJ’s primary external research program that leverages university partnerships to strengthen science and enhance justice, would receive \$43 million, which would be \$8 million above the House proposed level, \$13 million above the FY 2022 enacted level, and the same as the president’s budget request.

The explanatory statement accompanying the draft bill designates certain research priorities for NIJ, including up to \$16 million to evaluate the **First Step Act** program and activities. The *First Step Act* is a 2018 bill that provided support for programming to reform prisons and reduce recidivism. The budget

request called for funding to be transferred from the Federal Bureau of Prison to fund this research, but the Senate bill would instead allow for funding to come from NIJ’s budget. Additional specified funding amounts for research in the explanatory statement include: \$1.2 million to allow NIJ to provide funding to a research university to **study school-based hate crimes in K-12**; \$2.5 million to support **research on violence against women and Indian women**; and \$1 million for a research university to study law enforcement **responses to opioid overdoses**. In addition to specified funding amounts, the explanatory statement notes support for research on “domestic violence radicalization, school violence, violence against Native Americans, and domestic violence homicide prevention.” The explanatory statement further directs NIJ to enter into a public-private partnership with research and correctional institutions to further research the impact of correctional education and recidivism.

The explanatory statement identifies addressing violence against women, supporting crime victims, strengthening police-community relations, responding substance use disorders, and improving juvenile justice as key Department-wide priorities. Of note, the draft bill would provide historic investments in the *Violence Against Women Act* programs, including \$732 million for the **Office on Violence Against Women (OVW)**. This would be a 27 percent increase above the FY 2022 enacted level, and 14 percent over the House recommendation, but \$268 million below the president’s budget request. This funding would support several new programs authorized in the *Violence Against Women Act Reauthorization of 2022*. Of this, \$25 million would be provided to address violence on college campuses. The Senate bill would also appropriate **\$583.7 million** for the **Community Oriented Policing Services (COPS)** Community Policing Development (CPD) program, \$71.9 million above the FY 2022 enacted level and \$39.7 above the House proposed level, but \$67.2 million below the president’s budget request. CPD can support law enforcement partnerships with research institutions.

For DOJ’s **Office of Juvenile Justice and Delinquency Prevention**, the bill would provide **\$471 million**, \$111 million above the FY 2022 enacted level, \$61 million above the House proposed level, and \$289 million below the president’s budget request. This plus-up would include \$25 million for a new program that would help states turn youth incarceration facilities into community-based alternatives, as well as \$20 million for a Tribal youth program, initiatives that were also highlighted in the president’s budget request.

Department of Justice

(In thousands)

	FY 2022 Enacted	FY 2023 Request	FY 2023 House	FY 2023 Senate	Senate vs. FY 2022 Enacted	Senate vs. FY 2023 Request	FY 2023 Senate v. House
DOJ total	35,207,110	39,267,728	38,502,776	38,552,249	3,345,139 (9.5%)	-715,479 (1.82%)	49,473 (0%)
Research, Evaluation, and Statistics	70,000	88,000	80,000	88,000	18,000 (25.7%)	0 (0%)	8,000 (10%)
National Institute of Justice	30,000	43,000	35,000	43,000	13,000 (43.3%)	0 (0%)	8,000 (23%)

Sources and Additional Information:

- The Senate explanatory statement is available at <https://www.appropriations.senate.gov/imo/media/doc/CJSFY23RPT.PDF>.
- The draft FY 2023 Commerce, Justice, Science, and Related Agencies bill is available at https://www.appropriations.senate.gov/imo/media/doc/CJS_FY2023.PDF.
- A summary of the bill is available at <https://www.appropriations.senate.gov/imo/media/doc/CJS%20FY%2023%20Summary.pdf>.