

Science + Technology

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SPECIAL UPDATE

FY 2001 R&D: Final Appropriations

More than two months into fiscal year (FY) 2001, President Clinton and the 106th Congress have finally reached agreement on FY 2001 appropriations, and the agreement includes record increases for R&D programs throughout the federal government. Total federal R&D exceeds \$90 billion for the first time to reach \$90.9 billion, an increase of \$7.6 billion (9.1 percent) over the FY 2000 funding level (see table on page 3).

The final omnibus appropriations bill, which the president signed into law on December 21, is a compilation of four of the 13 annual appropriations bills and dozens of pieces of unrelated legislation. It contains a 0.22 percent across-the-board cut for most programs. Nine appropriations bills were enacted separately earlier in the year, and the across-the-board cut applies to programs in these bills as well.

The agreement follows weeks of delay, caused in part by the uncertainty surrounding the presidential election, during which 21 continuing resolutions were required to keep the federal government operating. Although the final funding levels for most R&D programs were determined weeks or months ago, agencies such as the Department of Commerce and the National Institutes of Health (NIH) had to wait to receive their final appropriations until after a comprehensive agreement was concluded.

The following is a breakdown of appropriations for key R&D funding agencies.

Department of Defense (DOD) • DOD R&D totals \$41.8 billion, \$3.3 billion more than the president's request and \$2.5 billion or 6.4 percent more than FY 2000. DOD's basic research ("6.1") totals \$1.3 billion, 12.8 percent above FY 2000, while applied research ("6.2") totals \$3.7 billion, 7.7 percent above FY 2000. Including medical research programs, DOD S&T ("6.1" through "6.3" programs, representing basic and applied research and technology development) increases by 8.0 percent to \$9.4 billion. There is a separate \$349 million appropriation for congressionally designated medical research, including \$175 million for breast cancer research. The Defense Advanced Research Projects Agency (DARPA) budget increases by \$121 million or 6.4 percent to \$2.0 billion, including increases for DOD's contributions to the multi-agency information technology (IT) R&D initiative.

National Institutes of Health (NIH) • NIH is once again the beneficiary of strong congressional support for biomedical research. The NIH budget of \$20.4 billion represents a \$2.6 billion or 14.4 percent increase over FY 2000, keeping NIH on the third year of a course toward doubling its budget in five years. (NIH's R&D, as shown

in the table, is slightly less than the total NIH budget after subtracting overhead and research training costs.) Every institute receives an increase greater than 13 percent, and three receive increases greater than 20 percent.

A new NIH institute, the National Center on Minority Health and Health Disparities, receives \$130 million for research on diseases and conditions that disproportionately affect minority groups. Another new institute is also on the way: on December 15, Congress passed legislation (H.R. 1795) that would create the National Institute of Biomedical Imaging and Bioengineering by combining existing imaging and bioengineering programs within other institutes. At press time, the president had not yet signed the bill.

NIH plans to begin funding stem cell research in 2001 after putting into place a review board and strict guidelines on stem cell derivation. The final NIH budget does not contain a prohibition on stem cell research, but President-elect Bush has stated that he may take steps to block NIH funding of such research.

National Aeronautics and Space Administration (NASA) • NASA's total budget of \$14.3 billion in FY 2001, 4.8 percent more than FY 2000, is another piece of good news

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FY 2001 R&D

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for the agency in 2000 after a bad 1999 of lost missions and cost overruns. Total NASA R&D, which excludes the Space Shuttle and its mission support costs, increases 5.3 percent to \$10.3 billion.

The big winner is the Science, Aeronautics, and Technology (SAT) account, which receives \$6.2 billion, a stunning 10.7 percent above FY 2000. Space Science has 13.2 percent more than last year for a total of \$2.5 billion, including funding for a completely redesigned Mars program for the next decade.

NASA receives \$2.1 billion for continued development and construction of the International Space Station, \$213 million less than FY 2000 because of a planned reduction in costs after several cost overruns last year. The Space Station now has a permanent three-person crew in three connected modules, with more modules on the way in 2001.

Department of Energy (DOE) • DOE went from crisis to crisis in 2000, but total DOE R&D in FY 2001 rises 12.3 percent to \$8.0 billion. In March, DOE moved its weapons-related activities to a new semi-autonomous agency within DOE called the National Nuclear Security Administration (NNSA). The Weapons Activities program, the cornerstone of NNSA's mission to use science-based methods to ensure the safety and reliability of the nation's nuclear stockpile, receives \$2.5 billion for its R&D, a boost of 13.7 percent. This includes \$477 million, up \$80 million over FY 2000, for the Accelerated Strategic Computing Initiative. Despite controversies over ballooning project costs, construction of the National Ignition Facility (NIF) receives \$199 million, far more than the original \$74 million request in February.

In the Science account, Congress pro-

vides \$3.0 billion for R&D, a substantial 13.8 percent boost consistent with the Clinton Administration's proposal for a more balanced research portfolio. The biggest winner is Basic Energy Sciences, which receives \$1.0 billion for R&D in FY 2001 (up 29.7 percent). Most of the increase is for the Spallation Neutron Source (\$279 million, nearly double the FY 2000 funding level). Advanced Scientific Computing Research increases from \$128 million to \$168 million, a boost that will allow DOE to expand its participation in the IT R&D initiative.

National Science Foundation (NSF) • Congress provides NSF with a large increase in FY 2001 to \$4.4 billion, an increase of 13.3 percent. NSF's R&D funding, which excludes education and training activities and overhead costs, totals \$3.2 billion (up 13.2 percent). Congress provides less than the requested 20 percent increase in NSF R&D, but the final budget contains substantial increases for most programs.

The Computer and Information Science and Engineering directorate receives \$483 million (up 24.5 percent), allowing it to expand dramatically its participation in the IT R&D initiative. The Social, Behavioral, and Economic Sciences directorate, meanwhile, receives \$176 million for a boost of 20.6 percent, including funds for a new Children's Research initiative. NSF's large increase may be the first year of an effort by the agency's supporters to double its budget over five years.

Department of Commerce (DOC) • Funding for DOC's R&D programs increases slightly in FY 2000. The National Institute of Standards and Technology (NIST) sees its R&D budget decline 8.5 percent to \$419 million because funding for NIST's Construction of Research Facilities declines from \$107 million to \$35 million; most of the FY 2000 funding was a one-time appropriation for a new Advanced Measurement Laboratory. NIST intramural laboratory R&D programs grow by 8.8 percent to \$257 million. Funding for Advanced Technology Program R&D grows by 6.8 percent to \$123 million despite a House vote earlier this year to eliminate the program. The National Oceanic and Atmospheric Administration's (NOAA) programs for natural resources and environment R&D increase by \$47 million or 8.0 percent to

\$638 million.

Department of Agriculture (USDA) • Thanks to a windfall of congressionally designated projects and a last-minute decision to allow a new mandatory grants program to proceed, USDA R&D totals \$2.0 billion in FY 2001, a boost of \$190 million or 10.8 percent. Congress allows the Initiative for Future Agriculture and Food Systems (IFAFS) to spend its \$120 million allotment of mandatory funds in FY 2001 on its program of competitively awarded research grants, after earlier attempts to block it. Other competitively awarded research grants decline: the National Research Initiative receives \$106 million, well below \$119 million in FY 2000. Instead, Congress directs millions to congressionally designated research projects, including \$85 million (up 33.6 percent) for Special Research Grants and \$51 million in one-time projects in the June crop insurance bill.

Department of the Interior (DOI) • DOI's R&D budget rises 4.2 percent to \$597 million. The U.S. Geological Survey receives \$543 million for its R&D, a substantial 8.1 percent increase over FY 2000.

Environmental Protection Agency (EPA) • EPA has an FY 2001 R&D budget of \$686 million, \$39 million or 6.0 percent more than last year. The R&D total exceeds the request of \$673 million, but Congress reduces the request for R&D in the Climate Change Technology Initiative; most of the increase goes to more than 30 congressionally designated research projects, leaving most other EPA R&D programs with level funding.

Department of Transportation (DOT) • DOT has an R&D budget of \$701 million, a substantial boost of 15.5 percent or \$94 million over FY 2000. The Federal Aviation Administration (FAA) receives \$292 million for R&D, a large gain of 29.3 percent. Most DOT highway and traffic safety R&D programs also increase substantially. ●●●

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FOR MORE INFORMATION:

*Congressional Action on Research and Development in the FY 2001 Budget, Koizumi et al. (AAAS, 2000):
www.aaas.org/spp/dspp/rd/fy01.htm*

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R&D in FY 2001 Appropriations
(Budget authority in millions of dollars)

	FY 2000 Estimate	FY 2001 Request	FY 2001 Conf.	House-Senate Conference			
				Chg. from Request		Chg. from FY 2000	
				Amount	Percent	Amount	Percent
Defense (military)	39,282	38,576	41,846	3,270	8.5%	2,564	6.5%
("S&T" 6.1,6.2,6.3 + Medical)	8,667	7,609	9,363	1,754	23.1%	696	8.0%
(All Other DOD R&D)	30,615	30,967	32,482	1,516	4.9%	1,868	6.1%
National Aeronautics & Space Admin.	9,777	10,040	10,298	258	2.6%	521	5.3%
Energy	7,117	7,639	7,994	355	4.7%	878	12.3%
Health and Human Services	18,082	19,168	20,829	1,661	8.7%	2,747	15.2%
(National Institutes of Health)	17,102	18,094	19,597	1,503	8.3%	2,495	14.6%
National Science Foundation	2,863	3,431	3,240	-190	-5.5%	377	13.2%
Agriculture	1,763	1,824	1,953	129	7.1%	190	10.8%
Interior	573	590	597	7	1.2%	24	4.2%
Transportation	606	778	701	-78	-10.0%	94	15.5%
Environmental Protection Agency	647	673	686	13	2.0%	39	6.0%
Commerce	1,073	1,148	1,111	-37	-3.3%	38	3.5%
(NOAA)	591	594	638	44	7.5%	47	8.0%
(NIST)	458	497	419	-78	-15.7%	-39	-8.5%
Education	233	271	263	-8	-2.9%	30	13.0%
Agency for Int'l Development	122	98	124	26	26.6%	2	1.7%
Department of Veterans Affairs	655	655	684	29	4.5%	29	4.5%
Nuclear Regulatory Commission	53	53	53	0	-0.2%	0	-0.2%
Smithsonian	113	122	119	-3	-2.3%	6	5.5%
All Other	376	362	393	31	8.7%	17	4.6%
Total R&D	83,334	85,427	90,891	5,464	6.4%	7,557	9.1%
Defense R&D	42,583	41,981	45,543	3,562	8.5%	2,960	7.0%
Nondefense R&D	40,751	43,446	45,348	1,901	4.4%	4,597	11.3%
Nondefense R&D minus NIH	23,650	25,353	25,751	398	1.6%	2,101	8.9%
Basic Research	18,965	20,259	21,207	948	4.7%	2,242	11.8%
Applied Research	17,577	18,355	20,024	1,669	9.1%	2,446	13.9%
Total Research	36,542	38,613	41,231	2,618	6.8%	4,689	12.8%

AAAS estimates of R&D in FY 2001 appropriations bills. Includes conduct of R&D and R&D facilities.

All figures are rounded to the nearest million. Changes calculated from unrounded figures.

December 19, 2000 - Final FY 2001 appropriations funding levels.

All figures are adjusted to reflect rescissions and across-the-board cuts.

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Heard off the Hill

Queen's English • Apparently, even the Queen herself no longer speaks "the Queen's English." At least, so say researchers in Sydney who analyzed the vowel sounds of every Christmas address Queen Elizabeth II has made from the 1950s through the 1980s. "Our analysis reveals that the Queen's pronunciation of some vowels has been influenced by the standard southern-British accent of the 1980s, which is more typically associated with speakers who are younger and lower in the social hierarchy," they report.

---> *Washington Post*, December 25, 2000

I'm Not Dead Yet • Finally, scientists have discovered the fountain of youth—if you're a fruit fly, that is. University of Connecticut researchers have discovered a fruit fly gene that, when altered, increases a fly's average life-span from 37 to 70 days. The researchers dubbed the gene INDY, for "I'm Not Dead Yet," a line in a *Monty Python* movie. While other methods of lengthening life in fruit flies come with major tradeoffs such as underfeeding or an inability to reproduce, the INDY mutation seems to extend life without any costs—the mutated flies ate and reproduced just as much as normal ones. Scientists hope that the discovery, which was made accidentally during the course of a different experiment, will lead to better understanding of aging in humans.

---> *Science*, December 15, 2000

Ganymede's Ocean • Scientists already suspect that two of Jupiter's moons, Callisto and Europa, have subsurface oceans. Now, researchers have demonstrated the likely existence of such an ocean on Ganymede, a third moon. However, while Europa's ocean is thought to lie just a few miles below the surface, Ganymede's is probably at a depth of about 100 miles. As evidence of an ocean, scientists point to photographs of the moon's surface that seem to indicate the presence of ice layers, and measurements of Ganymede's magnetic field that suggest the existence of electric currents within the moon similar to those that might flow through salt water.

---> *American Institute of Physics*, December 28, 2000

Lost City • Scientists have reported many fascinating discoveries at deep-sea hydrothermal vents, geysers on the seafloor that spew out hot, mineral-rich water from deep within the earth. The vents give rise to a wide variety of life forms, from tubeworms and huge clams to eyeless shrimp. However, few of these discoveries are as dramatic as the "Lost City" which researchers in the North Atlantic recently stumbled upon. A garden of eerie skyscraper-like structures near a system of vents more than 3,200 feet below the ocean's surface, the area is unlike anything scientists have seen before. Huge towers, as much as 30 feet in diameter, soar as high as 18-story buildings. Most have caps of white, feathery minerals that have precipitated out of the water. "If this [terrain] was on land, it would be a national park," says geologist Jeff Karson.

---> *Washington Post*, December 15, 2000