

Issue Brief for Congress

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Federal Research and Development Funding: FY2003

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R&D Funding FY2003

SUMMARY

The Bush Administration requested \$111.8 billion in federal research and development (R&D) funding for FY2003. This is \$8.6 billion above what is available for federal R&D in FY2002. The growth is concentrated in the areas of defense (Department of Defense) and health (National Institutes of Health). The budget proposed more modest growth in other mission areas and proposed decreases in some agencies' R&D budgets when compared to FY2002 budget authority. The proposed allocation of R&D resources continues the debate regarding balance in the federal R&D portfolio.

Under the President's proposal non-defense R&D would increase 7.2% to \$53.2 billion. NIH would receive a 16% increase in funding reaching \$27.3 billion, comprising nearly 50% of non-defense R&D spending. If approved, this would complete Congress's goal of doubling NIH funding between FY1999 and FY2003. Funding for defense R&D (the sum of DOD and DOE's defense R&D) would increase 9.9% to \$58.8 billion. While funding for DOD's R&D program is scheduled to increase over 10%, its basic and applied research programs are scheduled to decline 5.8%.

Federal support for basic research would increase \$1.9 billion, reaching a record \$25.5 billion. This is primarily due to a record increase of \$1.185 billion in NIH's basic research program. Total federal research funding (basic + applied research) is proposed to increase 6.5%, to \$51.9 billion.

Funding for NSF's research budget would increase 3.5%, with a proposed

research budget of \$3.783 billion for FY2003. This is far below efforts to double the agency's research budget over the next five years.

The Administration's R&D budget contains increases for three interagency initiatives which includes \$710 million, for the National Nanotechnology Initiative, a proposed 17% increase. The Networking and Information Technology R&D program, and the U.S. Global Change Research Program would receive 2.5% and 2.6% increases respectively.

Some in the science and technology community are concerned that the continued emphasis on defense and health short-changes R&D in other areas. The Administration states that balance must not come at the expense of setting priorities.

Congress has not completed work on any of its appropriations bills. However the Senate Appropriations Committee has completed work on all 13 of its bills, while the House Appropriations Committee has completed work on six of its bills. Based on Senate actions, CRS estimates that total Federal R&D spending would exceed \$115 billion, of which \$56 billion is for DOD R&D, and \$27 billion is for NIH. Further, based on Senate actions, for the first time in history, funding for NIH R&D will exceed total funding for all remaining federal civilian R&D programs in FY2003. However, given that House appropriators' have approved \$10 billion less in discretionary spending than the Senate, it may be difficult to sustain some of the Senate's proposed increases for civilian R&D.

MOST RECENT DEVELOPMENTS

On June 27, the House passed its DOD appropriations bill (H.R. 5010), approving \$57.8 billion for RDT&E, \$3.9 billion more than requested by the President. On July 18th, the Senate Appropriations Committee passed its FY2003 DOD spending bill that proposes to fund RDT&E at \$ 56.6 billion. On July 18th, the Senate Appropriations Committee also passed its FY2003 Labor/HHS appropriations bill (S. Rpt. 107-216) that funds NIH at the President's requested amount of \$27.3 billion. Both the House (H.R. 5093) and Senate (S. 2708) have passed their respective Interior appropriations bills that restores proposed Administrations R&D funding cuts and rejects the Administration's proposal to move Interior's Toxic Hydrology Program to NSF. Congress has approved and the President has signed a \$30 billion FY2002 Supplemental Appropriations bill, that includes \$425 million for R&D, of which 70 %, or \$337 million is for DOD.

BACKGROUND AND ANALYSIS

Department of Agriculture (USDA)

The FY2003 budget request for research and education in the U.S. Department of Agriculture (USDA) is \$2,329 million, a decrease of \$87.1million (3.6%) from the FY2002 level of \$2,416.1 million (see **Table 1**). The FY2003 request provides increased funding for several research priority areas: emerging and exotic diseases of animals (\$8 million), emerging and exotic diseases of plants (\$5.4 million), new uses for agricultural products (\$9 million), global climate change (\$6.5 million), agricultural genomes (\$6.9 million), biosecurity (\$5 million), agricultural information services (\$2 million), and homeland security supplemental (\$5 million). Research programs on emerging and exotic diseases are part of the infrastructure to enhance homeland security and protect agriculture and food supply. The USDA has five biocontainment complexes where research and diagnostic work is done on organisms that pose serious threats to the crop, poultry, and livestock industries. The FY2003 request proposes the termination of all projects earmarked by Congress in FY2001 and FY2002 for an estimated savings of \$90 million. In addition, the request includes reductions in several base programs totaling \$15 million.

The USDA conducts in-house basic and applied research. The Agricultural Research Service (ARS) is the lead federal agency for nutrition research, operating five major laboratories in this area. Other ARS laboratories focus on efficient food and fiber production, preservation of genetic resources, development of new products and uses for agricultural commodities, development of effective biocontrols for pest management, and support of USDA regulatory and technical assistance programs. The FY2003 request provides \$1,049 million for ARS, \$27 million above the FY2002 level. ARS reports that the majority of its facilities, constructed prior to 1960, have become functionally obsolete. Many of the facilities are not in total compliance with current health and safety standards. The FY2003 request provides an additional \$17 million for modernization and construction at four ARS locations - - Beltsville, Maryland (\$4.2 million), Plum Island, New York (\$2 million), National Agricultural Library (\$7.4 million), and National Arboretum (\$3 million).

The Cooperative State Research, Education, and Extension Service (CSREES) distributes funds to universities and organizations that conducts agricultural research. Funding is distributed to the states through competitive awards, formula funding, and other means. The FY2003 request for CSREES is \$1,032 million, a decrease of \$10.1 million from the FY2002 estimate. Funding for earmarked programs and certain lower priority work is terminated in order to support competitively awarded grants and other high priority programs. Funding for formula distribution in FY2002 to the state agricultural experiment stations (and other eligible institutions) through the Smith-Lever Act would be \$275.9 million, level with FY2002. The FY2003 request funds the National Research Initiative (NRI) Competitive Grants Program at \$240 million, an increase of \$120 million over the FY2002 level.

The Economic Research Service (ERS) is the principal intramural economic and social science research agency in USDA. The request for ERS in FY2003 is \$82 million, an increase of \$6 million over the previous fiscal year. Included in the increase is funding for two priority areas: the agricultural resources management survey (\$2.7 million), and the initiative on the effects of invasive pests and diseases on the competitiveness of U.S. agriculture (\$2 million). The National Agricultural Statistics Service (NASS) conducts the Census of Agriculture and provides current data on agricultural production and indicators of the well-being of the farm sector. The Administration requests \$149 million for NASS in FY2003, \$27 million above the FY2002 level.

Both the House and Senate Appropriations Committees have reported their respective versions of the FY2003 appropriations bill for USDA. HR. 5263 (H. Rept. 107-623), reported on July 26, 2002, provides a total of \$2,323.1 million for research and education activities in FY2003, \$5.9 million less than the Administration's request. The Senate reported S. 2801 (S. Rept. 107-223) on July 25, funding research and education activities at \$2,433.8 million in FY2003, \$110.7 million above the request. Floor action is expected in September.

Table 1. U.S. Department of Agriculture
(millions \$)

	FY2002 Est.	FY2003 Req.	FY2003 House	FY2003 Senate
Agric. Research Service (ARS)				
Soil & Water Conservation	92.0	109.0		
Plant Science	333.0	368.0		
Animal Science	174.1	198.0		
Commodity Conversion & Delivery	177.0	194.0		
Human Nutrition	77.0	79.0		
Integration of Agricultural Systems	39.0	40.0		
Information and Library Sciences	20.0	23.0		
Repair and Maintenance	18.2	18.2		
Contingencies & Trust Funds	35.0	35.0		
Subtotal	1,022.0^e	1,049.0	1,002.2	1,060.8
Buildings & Facilities	119.0	17.0	95.3	101.0
Total, ARS^a	1,176.0	1,066.0	1,097.5	1,161.8
Coop. St. Res. Ed. & Ext. (CSREES) Research and Education				
Hatch Act Formula	180.1	180.1	182.0	185.6
Cooperative Forestry Research	21.9	21.9	23.0	22.5
1890 Colleges and Tuskegee Univ.	32.6	32.6	36.0	35.6
Special Research Grants	2.8	0.0	102.8	104.2
NRI Competitive Grants	120.0	240.0	130.0	164.0
Animal Health & Disease Res.	5.1	5.1	5.1	5.3
Federal Administration	45.0	20.0	27.1	26.5
Higher Education ^b	36.0	36.0	27.5	36.3
Total, Coop. Res. & Educ.^c	556.0	566.0	572.6	611.7
Extension Activities				
Smith-Lever Sections 3b&c	275.9	275.9	277.0	284.2
Smith-Lever Sections 3d	85.5	85.5	84.2	83.7
Renewable Resources Extension	3.2	3.2	5.0	4.1
1890 Research & Extension	66.0	66.0	14.0	32.1
Federal Admin. & Special Grants	5.7	18.6	17.1	20.8
Total, Extension Activities^c	441.0	421.0	441.8	452.9
Total, CSREES^c	1,042.1	1,032.0	1,014.4	1,064.6
Economic Research Service	76.0	82.0	73.3	65.7
National Agric. Statistics Service	122.0	149.0	137.9	141.7
TOTAL, Research, Education & Economics	\$2,416.1	\$2,329.0	\$2,323.1	\$2,433.8

a. The total for ARS excludes trust funds and support for Counter-Drug Research and Development and for Anti-Drug Research and Related Matters.

b. Higher education includes payments to 1994 institutions and 1890 Capacity Building Grants program.

c. Program totals may reflect set-asides (non-add) or contingencies.

d. Excludes support for Fund for Rural America, Agricultural Risk Protection Act, and Initiative for Future Agriculture and Food Systems.

e. Excludes funding for Homeland Security Supplemental.

Department of Energy (DOE)

For FY2003, DOE requested \$8.8 billion for all R&D activities, including activities in each of DOE's four business lines: Science, Energy Supply, Environmental Quality, and National Security. This request is 1.4% below the FY2002 level.

The requested funding for Science is \$3.3 billion, essentially the same as in FY2002. The largest change would be a reduction of 12% in the Biological and Environmental Research program. The Administration states that this reduction reflects the completion of activities funded by congressional earmarks in FY2002. The request includes full funding for continued construction of the Spallation Neutron Source.

The requested funding for R&D in Energy Supply is \$1.6 billion, down about 6% from FY2002. Much of the reduction is in the Fossil Energy R&D program. The Administration states that this reduction results largely from this year's pilot application of specific investment criteria to certain DOE applied R&D programs. The requested budget would also reduce funding for energy conservation R&D and increase funding for nuclear energy R&D.

The requested funding for R&D in Environmental Quality is \$92 million, down 55% from FY2002. This change results from an internal review of the entire Office of Environmental Management (whose total budget request was \$6.7 billion). Based on the review, the Administration plans to refocus the Office's Science and Technology program on R&D that it feels supports more directly the cleanup and closure of DOE waste sites.

The requested funding for R&D in National Security is \$3.8 billion, which is 2.5% more than in FY2002. The apparent reduction in funding for Nonproliferation and Verification R&D is an artifact of \$78 million in one-time supplemental funding for FY2002 that was provided after the September 11th terrorist attacks.

The Senate Appropriations Committee recommended increases above the requested levels of \$50 million for Science, \$112 million for Fossil Energy R&D, \$11 million for Nuclear Energy R&D, and \$41 million for Renewable Energy, and a reduction of \$15 million for R&D in Environmental Quality (S. 2784 Energy, and S. 2708 Interior). The House of Representatives (H. R. 5093) provided an increase of \$175 million for Fossil Energy R&D. Information on House and Senate action in other areas and further details of funding for specific programs will be available in the next update of this report.

Table 2. Department of Energy
(\$ millions)

	FY2000	FY2001	FY2002	FY2003 Request
Science	2695.4	3235.2	3280.7	3285.0
High Energy Physics	682.5	695.9	713.2	725.0
Nuclear Physics	338.5	351.8	359.0	382.4
Biological & Environmtl.	425.9	514.1	570.3	504.2
Basic Energy Sciences	791.7	973.8	999.6	1019.6
Adv. Scientific Computing	153.5	161.3	157.4	169.6
Fusion Energy Sciences	220.6	242.0	247.5	257.3
Other	82.7	296.3	233.7	226.9
Energy Supply	1280.1	1585.5	1709.6	1601.8
Fossil Energy R&D	377.2	442.6	587.2	494.2
Clean Coal Technology	(101.0) ¹	104.4	42.5	40.0
Nuclear Energy R&D	98.3	48.7	53.0	71.5
Renewable Energy	331.3	370.5	386.4	407.7
Energy Conservation R&D	473.3	619.3	640.5	588.4
Environmental Quality	236.7	203.4	204.7	92.0
Science and Technology ²	236.7	203.4	204.7	92.0
National Security	2988.1	3376.6	3699.1	3791.1
Weapons Activities ³	2113.1	2448.2	2687.6	2799.7
Naval Reactors	670.2	688.8	689.3	708.0
Nonprolif. & Verification	204.8	239.6	322.3	283.4
Total	7200.3	8400.7	8894.1	8769.9

¹ Accounts for deferrals of previously appropriated funds. The amounts are not included in the totals.

² Within Defense Environmental Restoration and Waste Management.

³ Includes Stockpile R&D, Science Campaigns, Engineering Campaigns except Enhance Surety and Enhance Surveillance, High Energy Density Physics, Advanced Simulation and Computing, and portions of Readiness in Technical Base and Facilities.

Department of Defense (DOD)

The Bush Administration requested \$53.9 billion for the RDT&E account in FY2003. It also requested \$67 million in research and development within the Defense Health Program and \$303 million for research and development in the Chemical Agents and Munitions Destruction Program and \$213 million for additional research and development within the \$20.1 billion Defense Emergency Response Fund.

The Science and Technology (S&T) portion of the RDT&E account remains an issue. In testimony before the Senate Armed Services Committee (June 5, 2001) the Under Secretary of Defense for Acquisition, Technology, and Logistics, Pete Aldridge, suggested that DOD should set S&T funding at 3% of DOD's topline (i.e. DOD's total budget). DOD incorporated the 3% target into its Quadrennial Defense Review (QDR). Some Members have embraced this goal and it is endorsed in the Senate Budget Resolution (S. Con. Res. 100). The Administration requested \$9.7 billion for S&T in FY2003. This is about \$200 million below the amount appropriated last year. However, DOD counted the \$213 million in research and development within the transfer account mentioned above as S&T funding. This would bring the FY2003 S&T request to \$9.9 billion. This represents 2.7% of DOD's topline, short of the Administration's own goals. The Administration stated that it intends to reach the 3% goal over time and that the large increase in DOD's topline made it difficult to do this year.

Both the House and the Senate have approved their defense authorization bills (House: H.R. 4546, H.Rept. 107-436; Senate: S. 2514, S.Rept. 107-151). Both voted to increase total RDT&E spending above the Budget request. However, some of the increase is a result of transferring the RDT&E projects requested as part of the Defense Emergency Response Fund directly to the Title IV accounts. Because the proposal to fund personnel expenses (retirement, etc.) directly through departmental budgets is not within their jurisdiction and must be acted on separately, both bills reduced the RDT&E account proportionately. Also, the Senate bill reduced RDT&E to account for savings in contract services and financial management. Both the House and Senate bills increased S&T spending (the House \$10.0 billion, the Senate \$10.1 billion). The House voted to increase ballistic missile defense RDT&E \$300 million, the Senate voted to reduce BMD RDT&E by \$1 billion, and add it to a fund that the President may spend either on BMD or counter-terrorism activity.

The House approved its defense appropriations bill (H.R. 5010) June 27. It voted to increase RDT&E \$3.9 billion above the President's request (to \$57.8 billion). It also voted to increase S&T funding \$1.7 billion above the President's request (to \$11.4 billion). Given the House also voted a total of \$354.7 billion for all of DOD, the S&T appropriation is 3.2% of DOD's topline. It voted a large increase in the Defense Health Program, as has become standard for the appropriators; adding \$150 million and \$85 million, respectively, for the Army's Peer Reviewed Breast Cancer and Prostrate Cancer Programs.

The Senate approved its bill (H.R. 5010, amended in the nature of a substitute, S. Rpt. 107-213) on August 1. The Senate approved a 9% increase for DOD's S&T programs, recommending \$10.8 billion, \$700 million below the House level. The Senate also added \$150 million and \$85 million for Breast Cancer and Prostate research, as well as \$10 million for ovarian cancer, and \$50 million for peer-reviewed research on other medical topics.

Table 3. Department of Defense
(\$ millions)

	FY2002 estimate	FY2003 Request^c	House Auth. (HR45 46)	Senate Auth. (S2514)	House Apprn. (HR501 0)	Senate Apprn. (HR5010)
Accounts						
Army	7,053	6,918	6,933	7,301	7,447	7,410
Navy	11,389	12,502	13,275	12,929	13,562	13,276
Air Force	14,548	17,601	18,803	18,604	18,639	18,538
Defense Agencies	15,285	16,614	17,191	16,491	17,863	16,611
(DARPA)	(2,253)	(2,685)	(2,578)	(2,245)	(2,851)	(2,698)
(BMDO ^a)	(6,969)	(6,691)	(6,991)	(5,924)	(6,821)	(6,145)
Dir. Test & Eval	230	222	222	362	242	303
Dir. Op. Test/Eval	–	–	–	–	–	–
Total Ob. Auth.	\$48,505	\$53,857	\$56,424	\$55,686	\$57,753	\$56,138
Budget Activity						
Basic Research	1,376	1,365	1,354	1,413	1,418	1,491
Applied Res.	4,086	3,780	3,832	3,971	4,451	4,479
Advanced Dev.	4,415	4,532	4,837	4,780	5,483	4,822
Demonstration/Validation	10,361	10,539	10,973	10,155	10,905	9,832
Engineering/Manufacturing Dev.	11,018	13,550	13,950	13,677	13,449	14,106
Mgmt. Support ^b	2,850	2,890	2,959	3,274	3,053	3,200
Op. Systems Dev.	14,399	17,200	18,674	18,767	19,150	18,362
Adjustments						
personnel cost accrual	–	–	-155	-155	-155	-155
financial mgmt. svgs.				-107		
contract services svgs.				-91		
Total Ob. Auth.	\$48,505	\$53,857	\$56,424	\$55,684	\$57,754	\$56,137
Other Defense Programs						
Defense Health Program	464	67	67	67	400	394
Chemical Agents and Munitions Destruction	202	303	303	303	303	303

Source: FY2001 to FY2003 figures based on Department of Defense Budget, Fiscal Year 2003 RDT&E Programs (R-1), February 2002. FY2001 to FY2003 figures for Defense Health Program and Chemical Agents and Munitions Destruction Program come from OMB's FY2003 Budget Appendix. All other figures come from prior year R-1s and OMB budgets. Totals may not add due to rounding.

a. Includes only BMD RDT&E. Does not include procurement and military construction.

b. Includes funds for Developmental and Operational Test and Evaluation.

c. Does not include RDT&E funds associated with the proposed Defense Emergency Response Fund.

National Aeronautics and Space Administration (NASA)

The National Aeronautics and Space Administration (NASA) is requesting \$10,738.2 million for R&D for FY2003, out of a total NASA budget request of \$15,000 million (see **Table 4**). That is a 3.7% increase over what was appropriated in FY2002 for R&D. The Senate Appropriations Committee would increase NASA's total FY2003 budget request by \$200 million in the FY2003 VA-HUD-IA appropriations bill (S. 2797, S. Rept. 107-222). By the definitions used in this report, all of that would be for R&D programs.

NASA's FY2003 request for the International Space Station is \$1.839 billion, comprised of \$1.492 billion in the Human Space Flight (HSF) account, and \$347 million for research aboard the station in the Biological and Physical Research section of the Science, Aeronautics, and Technology (SAT) account. The \$1.839 billion request is \$254 million less than the comparable figure for FY2002, reflecting the fact much of the hardware has been built and the Bush Administration has decided to terminate construction early, at a stage it calls "core complete." The FY2003 request is slightly higher than the \$1.818 billion NASA projected it would need for FY2003 last year. For more information, see CRS Issue Brief IB93017. The Senate Appropriations Committee approved the requested funding.

Table 4. National Aeronautics and Space Administration
(\$ millions)

Funding Category	FY2002 Appropriations	FY2003 Request	Senate App. Cmte.
Human Space Flight (R&D only)	2,298.5	1,893.7	1,893.7
International Space Station	1,721.7	1,492.1	1,492.1
Investments and Support*	412.9	365.2	365.2
Space Comm. & Data Systems*	163.9	36.4	36.4
Science, Aeronautics, and Technology	8,047.8	8,844.5	9,044.5
Space Science	2,867.1	3,414.3	3,492.3
Biological. & Physical Research	820.0	842.3	852.9
Earth Science	1,625.7	1,628.4	1,682.3
Aero-Space Technology	2,507.7	2,815.8	2,814.6
Academic Programs	227.3	143.7	202.4
TOTAL NASA R&D	10,346.3	10,738.2	10,938.2
(TOTAL NASA Budget)	(14,901.7)	** (15,000.0)	(15,200.0)

Prepared by CRS using data from NASA's FY2003 Budget Estimate (page MY-1), available at [www.nasa.gov]. NASA's budget is evolving towards full cost accounting and NASA is shifting programs between accounts, making annual comparisons difficult. Hence, only FY2002 and FY2003 are shown here. For more information, see CRS Report RL31347: *The National Aeronautics and Space Administration's FY2003 Budget Request: Description, Analysis, and Issues for Congress*.

*Calculated by CRS as a percentage of the funding in this category for the space station program, which is counted as R&D, versus other programs (primarily the space shuttle), which are not..

**Excludes federal retiree costs. If they are included, NASA's FY2003 budget request is 15,117.0 million.

For Space Science, NASA is requesting \$3.414 billion in FY2003. NASA wants to terminate two planetary programs—one to explore Europa, a moon of Jupiter, and the other to study Pluto and the Kuiper Belt (thought to be the source of some comets)—because they are too expensive. NASA proposed terminating the Pluto project in FY2002, but Congress restored it in the FY2002 VA-HUD-IA appropriations act. Congress also approved the Europa mission in the FY2002 appropriation, capping its total cost at \$1.0 billion. For FY2003, the Senate Appropriations Committee added \$105 million for the Pluto/Kuiper Belt mission; none was added for Europa. NASA is requesting \$124 million for a new Nuclear Systems Initiative in FY2003 to develop new spacecraft nuclear power sources, and perform research on nuclear propulsion, to enable planetary spacecraft to reach their destinations more quickly and operate for longer periods of time. The Senate Appropriations Committee cut that request by \$13 million. Combined with other decisions, the committee made a net addition of \$78 million to NASA's space science account.

Funding for NASA's Earth Science program would remain essentially level in the FY2003 request. NASA is completing the launches of the first set of spacecraft in its Earth Observing System to study global climate change. Plans to initiate construction of a second series are largely on hold awaiting decisions from the Bush Administration on the Climate Change Research Initiative. The Senate Appropriations Committee made a net addition of about \$54 million to this account, comprising approximately \$57 million in additions and \$3 million in reductions. In addition to funding research on the space station, the Office of Biological and Physical Research is requesting funds for two new programs: "Generations" and the "Space Radiation Initiative." Generations would use the space station and other free-flying spacecraft to study how organisms adapt to the space flight environment, and the capacity of terrestrial life to evolve in space. The radiation initiative would augment existing research into the hazards to humans of the space radiation environment. The Senate Appropriations Committee added \$10.6 million to this account. In Aero-Space Technology, funding for aeronautics research in the NASA request would decline about 10% (from \$599 million to \$541 million). NASA states that the decline is attributable to earmarks in the FY2002 budget for which the agency is not requesting funds in FY2003. NASA is requesting a significant increase in funding for R&D related to building a second generation reusable launch vehicle. That program, the Space Launch Initiative (SLI), received \$467 million in FY2002, and \$759 is requested in FY2003. For more information on SLI, see CRS Issue Brief IB93062. The Senate Appropriations Committee made a net decrease of \$1.25 million in the Aero-Space Technology account, comprising \$28.75 million in additions for various activities, and a \$30 million reduction for the SLI program. For Academic Programs, NASA is requesting \$144 million, approximately half of what it received in FY2002. NASA explains that the request does not include continued funding for congressional earmarks included in the FY2002 appropriations. The Senate Appropriations Committee added \$58.65 million in congressionally directed funding.

National Institutes of Health (NIH)

On July 22, the Senate Appropriations Committee reported S. 2766, the FY2003 appropriations bill for the Departments of Labor, Health and Human Services, Education and Related Agencies (L-HHS) (S. Rpt. 107-216). The bill includes a total of \$27.19 billion for NIH, \$25 million above the adjusted President's request (see **Table 5**). On July 25, the committee reported S. 2797, the appropriation for the Departments of Veterans Affairs, Housing and Urban Development, and Related Agencies (VA-HUD). The VA-HUD funding provides \$76 million for NIH, the same as the President's request, to carry out research programs under the Superfund act. Together, the two appropriations total \$27.27 billion, an increase of \$3.73 billion or 15.9% over the comparable FY2002 appropriation of \$23.54 billion. (The President's request, for a total of \$27.34 billion, counted additional funding not approved by the Senate committee. The request assumed enactment of the Administration's proposed Managerial Flexibility Act and included \$91 million in the L-HHS amount for accrued retirement and health benefits of employees.)

The \$27.27 billion is enough to complete the planned doubling of the NIH budget over the 5-year period since the FY1998 appropriation of \$13.6 billion. The 5-year doubling plan had its genesis in the mid-1990s, when a coalition of advocates for biomedical research began telling Congress that the time was ripe for exploiting new discoveries in the life sciences. They urged Congress to devote substantial new resources to support of research on genetic medicine, drug discovery, mechanisms of disease, and numerous other areas in which the "biological revolution" had opened up scientific opportunities. Broad bipartisan support for the 5-year doubling plan has allowed Congress to increase the NIH appropriation at a fairly steady pace of 14%-15% per year since FY1998. The appropriations and increases during those years have been as follows (L-HHS amounts only): FY1998 base, \$13.6 billion; FY1999, \$15.6 billion (up 14.5%); FY2000, \$17.8 billion (up 14.2%); FY2001, \$20.3 billion (up 14.1%); and FY2002, \$23.5 billion (up 15.5%).

NIH's plans for its FY2003 budget had to be adjusted after the terrorist attacks of September 2001. Of the \$3.7 billion increase in the request, \$1.5 billion or 40% is devoted to bioterrorism-related activities, which would total \$1.75 billion, up from \$275 million in FY2002. Most of this new funding would go to the National Institute of Allergy and Infectious Diseases (NIAID), whose budget would increase by 57% overall, to support research on potential bioterrorism agents and on new drugs and vaccines, together with laboratory upgrades. The Senate committee allowance for NIAID is \$263 million less than the request, giving the institute an increase of 47% over FY2002 and the prospect of funding fewer of its planned biodefense activities. Another large increase from the bioterrorism funding is in the Buildings and Facilities account, to ensure the security and capabilities of the NIH intramural labs and research facilities. Some of these efforts are already underway with FY2002 funding (NIH received \$180 million in the anti-terrorism supplemental appropriations act). The Senate committee provided the requested amount for this account.

A second major emphasis in the President's request is support of cancer research. Total cancer funding across many of NIH's institutes would reach \$5.5 billion, an increase of nearly 13% over the FY2002 level of \$4.9 billion. The budget of the National Cancer Institute (NCI) would increase by over 12%, whereas the increases requested for most of the other institutes and centers is 8%-9%. Some areas with increases higher than 9% include

minority health and health disparities (19%) and the National Library of Medicine (12%). The Senate committee provided the requested amount for NCI, the Library, and the minority health center, and increases above the request for many of the other institutes. The request would support a record number of research project grants (38,038, up from 36,630 in FY2002), including 9,854 (up 477) in the new and competing renewal category. To process and review the large increase in grant applications, the President is requesting a 17% increase in the overall “research management and support” mechanism, with NIAID receiving an increase of 85% for management.

Table 5. National Institutes of Health (NIH)

(\$ millions)

Institutes and Centers (ICs)	FY2001 comp ^a	FY2002 comp ^b	FY2003 request ^c	FY2003 S Comm ^c
Cancer (NCI)	\$3,720.9	\$4,128.4	\$4,642.4	\$4,642.4
Heart/Lung/Blood (NHLBI)	2,287.0	2,560.2	2,776.4	2,820.0
Dental/Craniofacial Research (NIDCR)	304.6	343.1	372.2	374.1
Diabetes/Digestive/Kidney (NIDDK)	1,302.8	1,466.4	1,604.6	1,637.3
Neurological Disorders/Stroke (NINDS)	1,172.1	1,312.8	1,424.4	1,466.0
Allergy/Infectious Diseases (NIAID)	2,062.1	2,534.5	3,990.5	3,727.5
General Medical Sciences (NIGMS)	1,531.0	1700.1	1,855.0	1,853.6
Child Health/Human Develmt (NICHD)	978.1	1113.1	1,213.8	1,213.8
Eye (NEI)	507.8	581.2	630.0	634.3
Environmental Health Sciences (NIEHS)	503.0	566.1	614.3	617.3
Aging (NIA)	786.1	893.1	968.7	1,000.1
Arthritis/Musculoskeletal/Skin (NIAMS)	395.0	448.7	486.6	489.3
Deafness/Communication Dis. (NIDCD)	301.1	342.0	370.8	372.8
Nursing Research (NINR)	105.2	120.4	130.4	131.4
Alcohol Abuse/Alcoholism (NIAAA)	340.5	384.1	416.8	418.8
Drug Abuse (NIDA)	779.5	887.7	964.6	968.0
Mental Health (NIMH)	1,103.1	1238.1	1,343.1	1,350.8
Human Genome Research (NIHGR)	381.1	429.3	465.1	468.0
Biomedical Imaging/Bioenginrg (NIBIB)	68.8	262.0	271.2	283.1
Research Resources (NCRR)	811.2	986.5	1,065.3	1,161.3
Complementary/Alt. Medicine (NCCAM)	89.1	104.6	113.2	114.1
Minority Health/Disparities (NCMHD)	132.0	157.7	186.9	186.9
Fogarty International Center (FIC)	50.5	56.9	63.4	60.9
Library of Medicine (NLM)	238.2	227.3	310.3	310.3
Office of Director (OD)	188.3	235.4	255.1	258.0
Buildings & Facilities (B&F)	160.9	326.1	632.8	632.8
Subtotal, NIH (L-HHS Approp)	\$20,300.1	\$23,455.8	\$27,167.9	\$27,192.9
Superfund (VA-HUD Approp, NIEHS) ^d	62.9	80.7	76.1	76.1
Total, NIH Budget Authority	\$20,363.0	\$23,536.6	\$27,244.0	\$27,269.0

Sources: S. Rept. 107-216 on S. 2766 (FY2003 L-HHS), and NIH FY2003 Appropriations Justification.

Note: Columns may not add due to rounding.

All columns reflect transfers from ICs to NIBIB (\$150m in FY2002 and FY2003), and do not include transfers of funds for diabetes research (NIDDK) and drug control (NIDA).

a. FY2001 comparable reflects rescission (\$8.666m and \$0.139m reduction in Superfund activities) and net funding from breast cancer stamps.

- b. FY2002 comparable reflects rescission (\$9.273m) and supplemental funding for bioterrorism appropriated to the PHS Emergency Fund by P.L. 107-117 (\$180m). Includes \$100m that was later transferred to the Global Fund for HIV/AIDS, Malaria, and Tuberculosis (NIAID, \$25m and B&F, \$75m).
- c. FY2003 request is adjusted to omit Administration's proposal for accrued retirement and health benefits of current employees. Request and Senate Committee allowance include \$100m in NIAID for transfer to the Global Fund.
- d. Separate account in the VA-HUD appropriation starting in FY2001, for NIEHS activities mandated in Superfund legislation. In FY2002, includes supplemental of \$10.5 million from P.L. 107-117.

National Science Foundation (NSF)

The FY2003 request for the National Science Foundation (NSF) is \$5,035.8 million, a 5% (\$239.9 million) increase over the FY2002 estimate of \$4,795.9 million (see **Table 6**). The FY2003 request provides support for several interdependent priority areas: biocomplexity in the environment (\$79.2 million, 36.3% above FY2002), information technology research (\$285.8 million, 3% above FY2002), learning for the 21st century (\$184.7 million, 27.5% above FY2002), nanoscale science and engineering (\$221.3 million, 11.3% above FY2002), mathematical sciences (\$60.1 million, 100.3% above FY2002), and social, behavioral and economic sciences (\$10 million, new in the FY2003 request). The request provides a second installment of \$200 million for the President's Math and Science Partnerships program (MSP). Additional FY2003 highlights include increased funding for graduate students (\$26.2 million), continued support of plant genome research (\$75 million), increased investment in NSF's administration and management portfolio (\$268.1 million), and funding for the Partnerships for Innovation program (\$5 million). Included in the FY2003 request is \$3,783.2 million for Research and Related Activities (R&RA), a 5.1% increase (\$184.6 million) over the FY2002 estimate of \$3,598.6 million. R&RA funds research projects, research facilities, and education and training activities. In the FY2003 request, the NSF has placed an emphasis on funding rates for new investigators and on increasing grant size and duration. The R&RA includes Integrative Activities (IA), created in FY1999. IA funds major research instrumentation, Science and Technology Centers, Science of Learning Centers, Partnerships for Innovation, disaster response research teams, and the Science and Technology Policy Institute. The FY2003 request for IA is \$110.6 million, an increase of \$4.1 million over FY2002.

Research project support in the FY2003 request totals \$2,560 million, an increase of 5.3% over FY2002. Support is provided individuals and small groups conducting disciplinary and cross-disciplinary research. Included in the total for research projects is support for centers, proposed at \$380 million. NSF supports a variety of individual centers and center programs. The request provides \$45 million for Science and Technology Centers, \$53 million for Materials Centers, \$62 million for Engineering Research Centers, and \$13 million for Physics Frontiers Centers.

Table 6. National Science Foundation
(\$ millions)

	FY2001 Act.	FY2002 Est.	FY2003 Req.	FY2003 Senate
Res. & Related Act.				
Biological Sciences	\$486.0	\$508.4	\$525.6	525.6
Computer & Inform. Sci. & Eng.	478.2	514.9	526.9	616.9
Engineering	433.4	472.3	488.0	568.0
Geosciences	563.6	609.5	691.1	684.5
Math & Physical Sci.	854.1	920.5	941.6	1,056.6
Social, Behav. & Econ. Sci.	177.2	168.8	195.6	195.6
U. S. Res. Prog.	214.1	229.7	235.7	245.7
U.S. Antarctic Log. Act.	68.2	68.1	68.1	68.1
Integrative Activities	97.6	106.5	110.6	170.6
Subtotal Res. & Rel. Act	3,372.3	3,598.6	3,783.2	4,131.6
Ed. & Hum. Resr.	795.4	875.0	908.1 ^a	947.8
Major Res. Equip. & Facil. Constr.	119.2	138.8	126.3	79.3
Salaries & Expenses	166.3	176.4	210.2	182.2
Office of Inspec. Gen.	6.6	7.0	8.1	9.1
Total NSF	\$4,459.9	\$4,795.9	\$5,035.8^b	\$5,353.4

a. Excludes \$78.5 million in FY2001, an estimated \$90 million in FY2002, and \$92.5 million in FY2003 from H-1B Nonimmigrant Petitioner Receipts.

b. The totals do not include carryovers or retirement accruals.

The Major Research Equipment and Facilities Construction (MREFC) account is funded at \$96.3 million in FY2003, a 20.6% decrease (\$25 million) from the FY2002 level. The MREFC supports the acquisition and construction of major research facilities and equipment that extend the boundaries of science, engineering, and technology. Seven projects are supported in this account for FY2003, five ongoing projects and two new projects—construction of the Atacama Large Millimeter Array (\$30 million), the Large Hadron Collider (\$9.7 million), the Network for Earthquake Engineering Simulation (\$13.6 million), the South Pole Modernization Project (\$6 million), Terascale Computing Systems (\$20 million), Earthscope (\$35 million), and the National Ecological Observatory Network, Phase I (\$12 million). No funds are requested in FY2003 for the High-Performance Instrumented Airborne Platform for Environmental Research (HIAPER) or the IceCube R&D project because they have been determined to be of lower priority.

The FY2003 request for the Education and Human Resources Directorate (EHR) is \$908.1 million, a 3.8% increase (\$33.1 million) over FY2002. Support at the various educational levels in the FY2003 request is as follows: precollege, \$359.6 million; undergraduate, \$157.4 million; and graduate, \$136.9 million. Support at the precollege level includes \$200 million for the MSPI directed at funding for states and local school districts to join with colleges and universities to strengthen K-12 science and mathematics education. On June 5, 2002, the House passed H.R. 4664 (H. Rept. 107-488), the National Science Foundation Authorization Act of 2002. The bill authorizes appropriations for NSF in FY2003, FY2004, and FY2005. Congressional action attempts to double the NSF's budget

over the next 5 years, proposing a total of \$5,515.3 million in FY2003, \$6,342.6 million in FY2004, and \$7,293.9 million in FY2005. For the R&RA, H.R. 4664 provides \$4,138.4 million in FY2003, \$4,735.6 million in FY2004, and \$5,445.9 million in FY2005. The bill was referred to the Senate Committee on Health, Education, Labor, and Pensions.

On July 25, the Senate Appropriations Committee reported S. 2797 (S. Rept. 107-222), VA/HUD and Independent Agencies Appropriations Bill, FY2003. The bill provides a total of \$5,353.4 million for NSF in FY2003, a 6.3% increase (\$317.6 million) above the request and an 11.8% increase (\$ 564.2 million) above the FY2002 estimate. S.2797 funds R&RA at \$4,131.6 million, \$348.4 million above the request and \$533 million above the FY2002 estimate. The EHR is provided \$947.8 million in FY2003, \$39.7 million above the Administration's request and \$72.8 million above the FY2002 estimate.

Department of Commerce (DOC)

National Oceanic and Atmospheric Administration (NOAA)

The President's request for R&D funding for NOAA has never appeared as a line item in the annual budget submission; however, for the first time, the agency presented a table of total R&D funding requested for each of its line offices in its FY2003 *Budget in Brief*. Those line offices include: National Ocean Service (NOS), National Marine Fisheries Service (NMFS), NOAA Research (OAR), National Weather Service (NWS), National Environmental Satellite Data and Information Service (NESDIS), and Program Support (PS). For FY2003, President Bush requested a total of \$575 million for NOAA R&D, which is 18.5% of the agency's \$3.1 billion request. NOAA's Office of Financial Administration (OFA) reported that this amount could change when OMB passes back FY2003 budget instructions to the agency. The R&D request is 25% of NOAA's Operations, Research and Facilities (ORF) account, for which \$2,281 million was requested. Further, it is \$217 million, or 27.4%, less than that appropriated by Congress for FY2002; \$109 million, or 15.9%, less than that appropriated by Congress for FY2001; and \$35 million, or 5.7%, less than that appropriated by Congress for FY2000. In FY2003 extramural grants would account for 15% of R&D funding. The reduction in the FY2003 R&D request can be attributed to two factors: 1) The President proposed to transfer the Sea Grant Program to NSF, which would decrease R&D funds for Ocean, Coastal, and Great Lakes programs (OAR) by \$34 million, and; 2) For FY2003 OFA required an actual accounting of R&D requested for NMFS; in prior years that request was estimated by use of a formula. (For more information see CRS Report 95-30, *The National Institute of Standards and Technology: An Overview*.)

National Institute of Standards and Technology

In the Administration's FY2003 budget proposal, the National Institute of Standards and Technology (NIST) would receive \$577.5 million, 15% below the amount appropriated for FY2002 by P.L. 107-77. This decrease is due primarily to a decline in support for the Advanced Technology Program (ATP) and the Manufacturing Extension Partnership (MEP). ATP would receive \$107.9 million, 35% below the current fiscal year, and MEP would be funded at \$12.9 million. The 89% decrease in financing for MEP is due to the President's recommendation that manufacturing extension centers operating for more than 6 years do so

without federal funding. In-house R&D under the Scientific and Technical Research and Services (STRS) account would increase 25% to \$402.2 million. (It should be noted that the FY2002 Defense Appropriations Act added \$5 million to the STRS account for cybersecurity activities.) Construction would be funded a \$54.5 million.

S. 2778, as reported from the Senate Committee on Appropriations, would provide NIST with \$692.2 million. Of this amount, \$336.4 million is for the STRS account (3% above the previous fiscal year), \$185.4 million is to fund ATP, and \$106.6 million is to finance MEP. Funding for ATP and MEP remains virtually the same as in FY2002. The construction budget would receive \$63.8 million. (For more information see CRS Report 95-30, *The National Institute of Standards and Technology: An Overview*.)

Department of Transportation (DOT)

According to the Bush Administration's Budget, the Department of Transportation (DOT) requested \$725 million for research and development in FY2003. This is \$142 million below what was available in FY2002. In a DOT document made available after the Budget was released, the agency's R&D budget request was stated as \$736 million. There are four Administrations within DOT that are the primary supporters of research and development—the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), and the Federal Aviation Administration (FAA), and the Federal Railroad Administration (FRA). A fifth, the newly formed Transportation Security Administration (TSA) has yet to allocate its budget, but will also support R&D. According to the DOT document, the R&D budget requests for these Administrations were as follows: FHWA (\$266 million), FAA (\$225 million), NHTSA (\$59 million), and FRA (\$31 million). On July 25th, the Senate Appropriations committee approves S. 2808, that includes \$697 million for DOT R&D in FY2003. This represents a \$94 million, or a 11.9% decrease from FY2002.

Department of Interior (DOI)

According to the President's budget, the Administration requested \$628 million for R&D in the Department of Interior. This is \$32 million below what was available in FY2002. The U.S. Geological Survey (USGS) is the primary supporter of R&D (about two-thirds of the total) within DOI. Areas of research include mapping, and research in geological, water, and biological resources. The FY2003 budget for R&D within the USGS would decline even more than DOI's overall R&D budget. Reductions are proposed in a couple of Water Resource programs, one of which (the Toxic Substances Hydrology Program) would be transferred to NSF. The Senate appropriations bill (S. 2708) would increase R&D funding to \$684 million, an increase of 3.7%, or \$24 million over the President's request. The House bill (H.R. 5093) would provide \$681 million for R&D. Both bills reject the Administration's proposal to move the Toxic Substances Hydrology Program to NSF. While the President propose cutting USGS's R&D programs by 7% to \$542 million, the Senate bill would provide \$598 million, and the House bill \$595 million for R&D, a 2.6% and 2.1% increase respectively over FY2002 funding levels.

Environmental Protection Agency (EPA)

The Administration requested \$670 million for EPA's R&D activities for FY2003. This compares with \$735 million enacted in FY2002 (an 8.8% reduction), which was supplemented by \$90.3 million in FY2002 for Homeland Security (for an S&T total of \$825.3 million in FY2002; the FY2003 request is a reduction of 18.8%). According to Administrator Whitman and the Office of Management and Budget, the reduction is due to increased levels of partnerships with private and public sources, and to the Administration's elimination of various congressionally designated research projects. The Senate Appropriations Committee on July 25, 2002 recommended \$710 million for S&T in FY2003, and recommended transferring \$86 million from the Superfund account, for a total of \$796 million for S&T. Major continuing congressional concerns are the quality of science upon which EPA bases its regulations, criteria, and programs, and the degree to which environmental data and information will be available (balancing the need for security and confidentiality). R&D in EPA is also referred to as the "S&T Account," which would incorporate elements of the former research and development account (also called extramural research) as well as EPA's in-house R&D and technology efforts.

Table 8. R&D Budgets of Preceding Agencies

(\$ millions)

	FY2000 Actual	FY2001 Actual	FY2002 Estimate	FY2003 Request
National Oceanic and Atmospheric Administration	\$610	\$684	\$792	\$575
National Institute of Standards & Technology	636	598	675	578
Department of Interior	645	622	660	628
Department of Transportation	603	792	867	725
Environmental Protection Agency	559	709	825 ^a	670

a. Includes \$90.3 million in supplemental funding for Homeland Security.