

# CRS Issue Brief for Congress

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## **Federal Research and Development Funding: FY2003**

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John Moteff, Coordinator  
Resources, Science, and Industry Division

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## Federal Research and Development 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. 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.

To help set those priorities the Administration plans to apply a set of performance criteria to all federal R&D programs during the FY2004 budget preparation process. How to design and apply these criteria will also be a subject of debate.

## MOST RECENT DEVELOPMENTS

*The Bush Administration released its FY2003 budget February 4. In it, the President requested \$111.8 billion for federal research and development.*

## BACKGROUND AND ANALYSIS

### Overview

The Bush Administration requested a total of \$111.8 billion for federal research and development for FY2003. This is \$8.6 billion above what is available for FY2002, an increase of 8.3%. However, the growth in the proposed research and development budget is not uniform across agencies or areas of research. The budget proposes relatively large increases for defense- and health-related R&D, while proposing more modest increases in other mission areas. The budget proposes cuts in some agencies' R&D budgets relative to FY2002 appropriations. Defense-related R&D accounts for about 56% of the total federal outlays for R&D. Health-related R&D has grown to about 56% of the total outlays for non-defense-related R&D. The continued pressure to increase both defense- and health-related R&D while holding other areas to modest growth raises, again, the issue of a balanced R&D portfolio. The Bush Administration states in its budget that balance should not be achieved at the expense of setting priorities.

The Bush Administration also proposes to hold R&D programs to a more rigorous performance accountability. Last year, the Department of Energy ran a pilot program to try to establish a set of criteria by which to judge the performance of its R&D programs. The Administration intends to apply a similar set of criteria to the rest of the federal R&D enterprise in deciding its FY2004 budgets. The purpose of the exercise is to guide investment to those programs that perform the best and best meet the government's goals and priorities. According to the Administration, those that perform badly would be transferred to other agencies, reduced, or eliminated. While few would say that R&D programs should be immune from accountability or that the benefits from federally funded research should not be maximized over a given investment, there is little agreement on how to judge program performance. The science and technology community has expressed willingness to work with the Administration but is concerned about what and how performance criteria will be applied. Associated with this initiative is an Administration effort to reduce the amount of R&D earmarking in the appropriations process.

### 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 NRI supports investigator-initiated research with the potential to contribute to significant breakthroughs in agricultural science in areas such as genetic resources, food safety, biobased products, human nutrition, invasive species, and global change.

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. The increased funding will support several priority areas: agricultural resources management survey (\$4.6 million), the Census of Agriculture (\$15.5 million), locality based agricultural county estimation program (\$1 million), and computer security and e-government (\$3.7 million).

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

	<b>FY2000 Act.</b>	<b>FY2001 Act.<sup>d</sup></b>	<b>FY2002 Est.</b>	<b>FY2003 Req.</b>
<b>Agric. Research Service (ARS)</b>				
Soil & Water Conservation	88.0	98.0	92.0	109.0
Plant Science	296.0	300.0	333.0	368.0
Animal Science	135.0	169.0	174.1	198.0
Commodity Conversion & Delivery	175.0	177.0	177.0	194.0
Human Nutrition	72.0	79.3	77.0	79.0
Integration of Agricultural Systems	32.0	35.1	39.0	40.0
Information and Library Sciences	18.0	21.5	20.0	23.0
Repair and Maintenance	19.0	18.2	18.2	18.2
Contingencies & Trust Funds	20.0	30.0	35.0	35.0
<b>Subtotal</b>	<b>855.0</b>	<b>942.0</b>	<b>1,022.0<sup>e</sup></b>	<b>1,049.0</b>
Buildings & Facilities	53.0	74.0	119.0	17.0
<b>Total, ARS<sup>a</sup></b>	<b>908.0</b>	<b>1,046.0<sup>c</sup></b>	<b>1,176.0</b>	<b>1,066.0</b>
<b>Coop. St. Res. Ed. &amp; Ext. (CSREES)</b>				
<b>Research and Education</b>				
Hatch Act Formula	180.5	180.1	180.1	180.1
Cooperative Forestry Research	21.9	21.9	21.9	21.9
1890 Colleges and Tuskegee Univ.	30.7	32.6	32.6	32.6
Special Research Grants	63.2	85.5	2.8	0.0
NRI Competitive Grants	119.3	105.8	120.0	240.0
Animal Health & Disease Res.	5.1	5.1	5.1	5.1
Federal Administration	14.8	41.1	45.0	20.0
Higher Education <sup>b</sup>	28.0	35.0	36.0	36.0
<b>Total, Coop. Res. &amp; Educ.<sup>c</sup></b>	<b>490.0</b>	<b>518.0</b>	<b>556.0</b>	<b>566.0</b>
<b>Extension Activities</b>				
Smith-Lever Sections 3b&c	276.5	275.9	275.9	275.9
Smith-Lever Sections 3d	88.5	89.0	85.5	85.5
Renewable Resources Extension	3.2	3.2	3.2	3.2
1890 Research & Extension	58.0	61.0	66.0	66.0
Federal Admin. & Special Grants	26.0	18.1	5.7	18.6
<b>Total, Extension Activities<sup>c</sup></b>	<b>424.9</b>	<b>434.0</b>	<b>441.0</b>	<b>421.0</b>
<b>Total, CSREES<sup>c</sup></b>	<b>1,074.0</b>	<b>995.4</b>	<b>1,042.1</b>	<b>1,032.0</b>
Economic Research Service	64.0	74.0	76.0	82.0
National Agric. Statistics Service	99.0	109.0	122.0	149.0
<b>TOTAL, Research, Education &amp; Economics</b>	<b>\$2,145.0</b>	<b>\$2,224.4</b>	<b>\$2,416.1</b>	<b>\$2,329.0</b>

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 11<sup>th</sup> terrorist attacks.

**Table 2. Department of Energy**  
(\$ millions)

	<b>FY2000</b>	<b>FY2001</b>	<b>FY2002</b>	<b>FY2003 Request</b>
<b>Science</b>	<b>2695.4</b>	<b>3235.2</b>	<b>3280.7</b>	<b>3285.0</b>
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
<b>Energy Supply</b>	<b>1280.1</b>	<b>1585.5</b>	<b>1709.6</b>	<b>1601.8</b>
Fossil Energy R&D	377.2	442.6	587.2	494.2
Clean Coal Technology	(101.0) <sup>1</sup>	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
<b>Environmental Quality</b>	<b>236.7</b>	<b>203.4</b>	<b>204.7</b>	<b>92.0</b>
Science and Technology <sup>2</sup>	236.7	203.4	204.7	92.0
<b>National Security</b>	<b>2988.1</b>	<b>3376.6</b>	<b>3699.1</b>	<b>3791.1</b>
Weapons Activities <sup>3</sup>	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
<b>Total</b>	<b>7200.3</b>	<b>8400.7</b>	<b>8894.1</b>	<b>8769.9</b>

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

<sup>2</sup> Within Defense Environmental Restoration and Waste Management.

<sup>3</sup> 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)

Most of the money requested for research and development in the Department of Defense (DOD) is found within its Research, Development, Test and Evaluation (RDT&E) account (Title IV in its appropriations). However, some additional research and development funds are requested in other accounts. These include the Defense Health Program (reported in the Office of the Secretary of Defense's—OSD's—Operations and Maintenance account) and the Chemical Agents and Munitions Destruction Program (found in OSD's Procurement account). Also, in FY2003, there are research and development funds associated with the proposed \$20 billion Defense Emergency Response Fund, requested in this year's DOD budget. The budget currently includes all of the Fund within the OSD Operations and Maintenance account.

The Bush Administration is requesting \$53.9 billion for the RDT&E account in FY2003. It is also requesting \$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. Although not yet identified within the budget, the Defense Emergency Response Fund, according to DOD officials, includes at least \$213 million for research and development. These funds will be transferred to their respective Program Elements during FY2003, if appropriated.

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. The Administration is requesting \$9.7 billion for S&T in FY2003. This is about \$200 million below the amount appropriated last year. However, DOD is counting 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 states 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.

The topline figure for DOD may also be a subject of some debate. It includes the Administration overall budget proposal to have agencies support their own retirement and other employee benefit accounts. This year's topline assumes that Congress will go along with this proposal. DOD also added these funds to its topline for the last two years, retroactively. The definition of topline affects whether DOD achieves its 3% goal. Gone in this debate is the old Congressionally inspired goal of achieving a 2% above inflation growth rate for S&T, using the FY1999 budget request as the baseline. S&T growth rate over the last three years has surpassed that goal.

The Administration is requesting \$6.7 billion in research and development for missile defenses, about \$300 million below what was appropriated last year. Also, DOD would like to exempt missile defense programs from some of the planning and reporting requirements that apply to other acquisition-related programs.

**Table 3. Department of Defense**  
(\$ millions)

	<b>FY2000</b>	<b>FY2001</b>	<b>FY2002 estimate</b>	<b>FY2003 Request<sup>c</sup></b>
<b>Accounts</b>				
Army	5,314	6,263	7,053	6,918
Navy	9,065	9,596	11,389	12,502
Air Force	14,527	14,313	14,548	17,601
Defense Agencies	9,551	11,316	15,285	16,614
(DARPA)	(1,850)	(1,977)	(2,253)	(2,685)
(BMDO <sup>a</sup> )	(3,457)	(4,208)	(6,969)	(6,691)
Dir. Test & Eval	265	225	230	222
Dir. Op. Test/Eval	31	35		
<b>Total Ob. Auth.</b>	<b>\$38,753</b>	<b>\$41,748</b>	<b>\$48,505</b>	<b>\$53,857</b>
<b>Budget Activity</b>				
Basic Research	1,139	1,287	1,376	1,365
Applied Res.	3,409	3,674	4,086	3,780
Advanced Dev.	3,789	3,972	4,415	4,532
Demonstration/Validation	6,514	8,052	10,361	10,539
Engineering/Manufacturing Dev.	8,879	8,441	11,018	13,550
Mgmt. Support <sup>b</sup>	3,076	3,342	2,850	2,890
Op. Systems Dev.	11,947	12,980	14,399	17,200
<b>Total Ob. Auth.</b>	<b>\$38,753</b>	<b>\$41,748</b>	<b>\$48,505</b>	<b>\$53,857</b>
<b>Other Defense Programs</b>				
Defense Health Program	295	432	464	67
Chemical Agents and Munitions Destruction	292	599	731	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.

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.

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

Funding Category	FY2002 Appropriations	FY2003 Request
<b>Human Space Flight (R&amp;D Only)</b>	<b>2,298.5</b>	<b>1,893.7</b>
International Space Station	1,721.7	1,492.1
Investments and Support*	412.9*	365.2*
Space Comm. and Data Systems*	163.9*	36.4*
<b>Science, Aeronautics, and Technology</b>	<b>8,047.8</b>	<b>8,844.5</b>
Space Science	2,867.1	3,414.3
Biological & Physical Research	820.0	842.3
Earth Science	1,625.7	1,628.4
Aero-Space Technology	2,507.7	2,815.8
Academic Programs	227.3	143.7
<b>TOTAL NASA R&amp;D</b>	<b>10,346.3</b>	<b>10,738.2</b>
(TOTAL NASA Budget)	(14,901.7)	(15,000.0**)

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 on NASA’s changing budget structure, see CRS Report RS21150: *The National Aeronautics and Space Administration (NASA): Overview, FY2003 Budget in Brief, and Issues for Congress*.

\*Calculated by CRS as a percentage of the funding in this category for the space station program versus other programs (primarily the space shuttle).

\*\*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 has decided to terminate two planetary programs: one to explore Europa, a moon of Jupiter; and the other to study Pluto. NASA states that the programs were canceled because they are too expensive. NASA had proposed terminating the Pluto project in FY2002, but Congress restored it in the FY2002 appropriation, providing \$30 million in FY2002. Congress also approved the Europa mission in the FY2002 appropriation, capping it at \$1.2 billion. NASA is proposing 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.

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. 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. In Aero-Space

Technology, funding for aeronautics research 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. As directed by Congress, NASA now identifies aeronautics funding separately from other funding in the Aero-Space Technology line. 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. For Academic programs, NASA is requesting 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.

## National Institutes of Health (NIH)

The President has requested a total of \$27.3 billion for NIH for FY2003, enough to complete the planned doubling of the NIH budget over the 5-year period since the FY1998 appropriation of \$13.6 billion. The requested amount is an increase of \$3.7 billion or 15.7% over the comparable FY2002 appropriation of \$23.6 billion (see **Table 5**). The total includes \$27.259 billion requested in the appropriation for the Departments of Labor, Health and Human Services, Education and Related Agencies (L-HHS), and \$76.1 million requested in the appropriation for the Departments of Veterans Affairs, Housing and Urban Development, and Related Agencies (VA-HUD). The VA-HUD funding is targeted for NIH's research responsibilities under the Superfund act. Included in the L-HHS amount is \$91.1 million for retirement and health benefits under the Administration's proposed Managerial Flexibility Act. This amount is not counted toward the doubling target. The total request under current law is \$27.244 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 (not including the comparability adjustments used in Table 5): FY1998 base, \$13.6 billion; FY1999, \$15.6 billion (up 14.5%); FY2000, \$17.8 billion (up 14.2%); FY2001, \$20.4 billion (up 14.3%); and FY2002, \$23.4 billion (up 15.1%).

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. 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). 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

**Table 5. National Institutes of Health (NIH)**

(\$ millions)

Institutes and Centers (ICs)	FY2000 comp <sup>a,b</sup>	FY2001 comp <sup>a,c</sup>	FY2002 comp <sup>a,d</sup>	FY2003 request <sup>a,e</sup>
Cancer (NCI)	\$3,299.6	\$3,740.1	\$4,209.7	\$4,724.5
Heart/Lung/Blood (NHLBI)	2,024.9	2,292.9	2,581.6	2,798.2
Dental/Craniofacial Research (NIDCR)	268.9	306.6	345.3	374.3
Diabetes/Digestive/Kidney Dis. (NIDDK)	1,141.3	1,306.9	1,470.8	1,609.3
Neurological Disorders/Stroke (NINDS)	1,029.8	1,175.7	1,331.6	1,443.4
Allergy/Infectious Diseases (NIAID)	1,812.4	2,069.4	2,542.4	3,999.4
General Medical Sciences (NIGMS)	1,371.1	1,532.2	1,726.5	1,881.4
Child Health/Human Developmt (NICHD)	861.4	982.0	1,117.2	1,218.1
Eye (NEI)	449.9	509.4	582.9	631.8
Environmental Health Sciences (NIEHS)	443.3	508.0	571.5	619.8
Aging (NIA)	688.0	788.8	896.1	971.7
Arthritis/Musculoskeletal/Skin (NIAMS)	349.2	396.4	450.2	488.2
Deafness/Communication Dis. (NIDCD)	264.1	302.1	343.1	372.0
Nursing Research (NINR)	90.3	105.5	120.8	130.8
Alcohol Abuse/Alcoholism (NIAAA)	293.1	342.3	385.9	418.5
Drug Abuse (NIDA)	686.8	782.5	890.9	967.9
Mental Health (NIMH)	974.1	1,108.2	1,253.6	1,359.0
Human Genome Research (NIHGR)	335.5	382.4	430.7	466.7
Biomedical Imaging/Bioenginrg (NIBIB)	0.2	68.9	112.0	121.4
Research Resources (NCRR)	674.6	812.2	1,012.5	1,091.4
Complementary/Alt. Medicine (NCCAM)	78.4	89.5	105.0	113.8
Minority Health/Disparities (NCMHD)	97.6	132.2	157.9	187.2
Fogarty International Center (FIC)	43.3	50.9	57.4	63.8
Library of Medicine (NLM)	215.0	242.4	281.8	315.2
Office of Director (OD)	162.2	191.5	238.8	258.5
Buildings & Facilities (B&F)	165.4	160.9	326.1	632.8
<b>Subtotal, NIH Progs (L-HHS Approp)</b>	<b>\$17,820.2</b>	<b>\$20,379.6</b>	<b>\$23,542.4</b>	<b>\$27,259.0</b>
Superfund (VA-HUD Approp to NIEHS) <sup>f</sup>	60.0	62.9	80.7	76.1
<b>Total, NIH Budg. Auth. (proposed law)</b>	<b>\$17,880.2</b>	<b>\$20,442.4</b>	<b>\$23,623.1</b>	<b>\$27,335.1</b>
Total, NIH Budg. Auth. (current law)		\$20,363.0	\$23,536.6	\$27,244.0

**Source:** NIH FY2003 Justification of Estimates for Appropriations Committees, and FY2002 Justification.

**Note:** Columns may not add due to rounding.

- a. Does not include transfers of funds for diabetes research (NIDDK) and drug control (NIDA).
- b. FY2000 (*not comparable*) reflects rescission (\$99.883m) and transfers (\$3.516m to DHHS under Secretary's 1% transfer authority; \$20m from NIAID to Centers for Disease Control; and \$19.883m to NIAID for NIH Challenge Grants). Includes \$40 million advance appropriation for Buildings and Facilities from FY1999 appropriation.
- c. FY2001 reflects rescission (\$8.666m and \$0.139m reduction in Superfund activities), transfers (\$5.8m to DHHS for Office for Human Research Protection and \$3.009m to Secretary), net funding available from sale of breast cancer stamps (\$4.846m), and comparable adjustments for the AREA Awards (OD to ICs) and transfers from ICs to NIBIB.
- d. FY2002 reflects rescission (\$9.273m), supplemental funding for bioterrorism appropriated to the PHS Emergency Fund by P.L. 107-117 (\$180m), and transfer to the Global Fund for HIV/AIDS, Malaria,

- and Tuberculosis (\$100m from NIAID and B&F). FY2002 is also comparable for the requested appropriation for the Global Fund in FY2003 (\$100m, NIAID).
- e. FY2003 assumes enactment of the Managerial Flexibility Act of 2001 and includes \$91.1m for accrued retirement and health benefits of current employees. FY2001 and FY2002, but not FY2000, are comparable for accrual costs (\$79.5m in FY2001 and \$86.5m in FY2002). The “current law” line shows budget authority without the accrual costs.
  - f. Separate account starting in FY2001. In FY2000, the appropriation was made to the Environmental Protection Agency, which reimbursed NIEHS for Superfund activities. In FY2002, includes supplemental of \$10.5 million from P.L. 107-117.

nearly 13% over the FY2002 level of \$4.9 billion. The budget of the National Cancer Institute 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%), the National Library of Medicine (12%), and the Fogarty International Center (11%).

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. Looking ahead to the post-doubling years, NIH has been analyzing strategies for maintaining a balance between current commitments and future flexibility so that new initiatives can still be supported even when appropriations are less generous. Possible strategies under consideration are giving full funding for all years of some grants and contracts, and devoting additional funding to one-time projects such as construction and renovation activities that do not carry future-year commitments.

Issues facing Congress include the need to weigh its previous commitment to completing the 5-year doubling of NIH against the many new needs for discretionary resources across the federal government. The \$3.7 billion increase requested for NIH is larger than the increase (\$2.4 billion) requested for total HHS discretionary programs; several other public health and human services agencies are proposed for decreased funding. In addition, there is a continuing disparity between funding for health research and support of other fields of science, including many whose advances are critical for progress in biomedical research. Finally, contentious issues in several areas of research oversight continue to draw attention: research on human stem cells, human embryo research, cloning, human subjects protection, gene therapy, and conflicts of interest on the part of researchers.

## **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 21<sup>st</sup> 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). As part of the Administration's new multi-agency Climate Change Research Initiative, the NSF will provide \$15 million for research to advance understanding in the highly focused areas of climate science and to facilitate policy decision making in climate research. In FY2003, the Administration proposes the transfer of three programs from other agencies to the NSF. The proposed transfers include the National Sea Grant program, currently at the National Oceanic and Atmospheric Administration (\$57 million), Environmental Education, currently at the Environmental Protection Agency (\$9 million), and Hydrology of Toxic Substances, currently at the United States Geological Survey (\$10 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. Research facility support in FY2003 is \$1,122 million, a 2% decrease from the FY2002 estimate.

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, established in FY1995, 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, a cornerstone of the President's education reform

agenda. The MSP will provide funding for states and local school districts to join with colleges and universities to strengthen K-12 science and mathematics education. Funding increases to \$27 million for Centers for Learning and Teaching (CLT). The focus of the CLTs will be on developing the next generation of professionals to manage and direct the development of instructional materials, large scale assessments, and education research and evaluation. Support will continue for Systemic Reform Initiatives and Instructional Materials Development. Selected programs at the undergraduate level are Advanced Technological Education, Louis Stokes Alliances for Minority Participation, Scholarship for Service, Historically Black Colleges and Universities-Undergraduate Program, and Tribal Colleges and Universities Program. An increase of 21.7% in FY2003 for graduate level programs will allow NSF to raise the stipend of graduate fellows and to increase the number of offers to new fellowships. Support at this level is directed at the Graduate Research Fellowship, Graduate Teaching Fellows in K-12 Education, Integrative Graduate Education and Research Traineeships, and Alliances for Graduate Education and the Professoriate. Funding for the Experimental Program to Stimulate Competitive Research (EPSCoR) is \$75 million. (An additional \$30 million from R&RA will support EPSCoR activities.) It is anticipated that the H-1B nonimmigrant petitioner fees collected in FY2003 will approximate \$92.5 million, \$2.5 million above the FY2002 estimate. P.L. 106-313, The American Competitiveness in the 21<sup>st</sup> Century Act, stipulates that H-1B receipts be used for computer science, engineering, and mathematics scholarships for disadvantaged students and precollege private and public sector partnerships.

**Table 6. National Science Foundation**  
(\$ millions)

	<b>FY2000 Act.</b>	<b>FY2001 Act.</b>	<b>FY2002 Est.</b>	<b>FY2003 Req.</b>
Res. & Related Act.				
Biological Sciences	\$418.3	\$486.0	\$508.4	\$525.6
Computer & Inform. Sci. & Eng.	388.6	478.2	514.9	526.9
Engineering	379.8	433.4	472.3	488.0
Geosciences	487.6	563.6	609.5	691.1
Math & Physical Sci.	755.9	854.1	920.5	941.6
Social, Behav. & Econ. Sci.	162.1	177.2	168.8	195.6
U. S. Res. Prog.	190.0	214.1	229.7	235.7
U.S. Antarctic Log. Act.	68.4	68.2	68.1	68.1
Integrative Activities	129.2	97.6	106.5	110.6
<b>Subtotal Res. &amp; Rel. Act</b>	<b>2,979.9</b>	<b>3,372.3</b>	<b>3,598.6</b>	<b>3,783.2</b>
Ed. & Hum. Resr.	683.6	795.4	875.0	908.1 <sup>a</sup>
Major Res. Equip. & Facil. Constr.	105.0	119.2	138.8	126.3
Salaries & Expenses	149.3	166.3	176.4	210.2
Office of Inspec. Gen.	5.6	6.6	7.0	8.1 <sup>b</sup>
<b>Total NSF</b>	<b>\$3,923.4</b>	<b>\$4,459.9</b>	<b>\$4,795.9</b>	<b>\$5,035.8<sup>b</sup></b>

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.



## **Department of Commerce (DOC)**

### **National Oceanic and Atmospheric Administration (NOAA)**

The President's annual request for research and development (R&D) funding for the National Oceanic and Atmospheric Administration (NOAA) does not appear as a line item in either the annual budget submission, NOAA budget justification documents, or congressional appropriations documents for any given fiscal year. In the FY2003 NOAA Budget in Brief, however, the agency for the first time, included a table of total R&D funding requested for each of its line offices. For FY2003, President Bush requested \$575 million for R&D at NOAA, which is about 18% of the total budget requested for the agency (\$3.206 billion). NOAA's Office of Financial Administration claims these figures are only initial estimates and will be updated later after the Office of Management and Budget passes back budget instructions to the agency.

The FY2003 R&D request is \$217 million, or 27%, less than the \$792 million appropriated by Congress for FY2002; \$109 million, or 16%, less than the \$684 million appropriated by Congress for FY2001; and \$35 million, or 5.7%, less than that appropriated by Congress for FY2000. The decline in funding results primarily from: 1) NOAA's request for a decrease of \$34 million (in R&D) for Ocean, Coastal, and Great Lakes Research because of a proposed transfer of the National Sea Grant College Program to the National Science Foundation (NSF); and 2) the National Marine and Fisheries Service (NMFS) R&D request now reflects an actual data call for proposed spending for this line office. Previously, the NMFS R&D request was based on a formula. R&D funding is about 25% of the total request for NOAA Operations, Research, and Facilities (ORF) of \$2,281 million.

R&D funding would be distributed among all ORF budget line offices, with \$284 million going to NOAA Research (OAR), and \$122 million going to NMFS. Remaining funds of \$55 million would go to the National Ocean Service (NOS), \$28 million to the National Weather Service (NWS), and \$11.5 million to the National Environmental Satellite Data and Information Service (NESDIS). NOAA's Office of Marine and Aviation Operations (OMAO) under Program Support (PS) provides R&D funding of \$75 million for Aircraft Services, Marine Services, Data Acquisition, and Fleet Maintenance and Planning. Another \$4 million in R&D funding is requested for NOAA's Other Accounts for the Promote and Develop American Fisheries Products Fund (PDAF), which would be spent on commercial development of fisheries and marine resources. Maintenance of R&D facilities, including OAR and non-OAR laboratories, is funded under Program Support (PS-Facilities) in the ORF account, but these are not scored as R&D expenditures. NOAA's Procurement Acquisition and Construction (PAC) account would provide \$21.5 million for systems acquisition (major research equipment) and new construction of research facilities, both of which may be used to conduct R&D; however, in the FY2003 request, PAC funding is no longer counted as an R&D expenditure.

Notable proposed R&D funding increases include \$17 million, or 70%, for Climate and Observation Services under OAR. NOS would fund all NOAA marine R&D-related data acquisition at \$51.4 million. An increase of \$13 million is requested for Coastal Ocean Science activities, but NOS' total R&D budget would actually decrease by \$5 million. New for FY2003, the President requested \$6.1 million of the Climate Research R&D budget to fund "Energy Security," which would study impacts of weather and climate on the U.S.

economy. NESDIS would receive an increase of \$2 million for security-related research under Environmental Satellite Observing Systems. The PS (OMAO) R&D budget is slated for a \$12 million increase to be divided among Aircraft Services and Data Acquisition (marine) and research vessel Fleet Maintenance and Planning.

## **National Institute of Standards and Technology (NIST)**

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. (For more information see CRS Report 95-30, *The National Institute of Standards and Technology: An Overview*.)

For FY2002, President Bush requested \$487.5 million in funding for NIST, 19% less than the FY2001 appropriation (see **Table 7**). Support for the STRS account would have been \$347.3 million, 11% over the previous fiscal year. The Manufacturing Extension Partnership was to be financed at \$106.3 million. New grants under the Advanced Technology Program would have been suspended pending evaluation of the activity; however, \$13 million was to be provided for ongoing project commitments. Construction efforts would be funded at \$20.9 million.

The final legislation, P.L. 107-77, funded NIST at \$674.5 million, an increase of 13% over FY2001. Included in this was \$321.1 million for the STRS account (3% above the previous fiscal year). The FY2002 Defense Appropriations Act added \$5 million to this account for cybersecurity activities. The Manufacturing Extension Partnership was financed at \$106.5 million and the Advanced Technology Program received \$184.5 million, a 27% increase. Construction was funded at \$62.4 million, triple the figure in the budget request and the House bill and almost twice that of FY2001.

## **Department of Transportation (DOT)**

According to the Bush Administration's Budget, the Department of Transportation is requesting \$725 million for research and development in FY2003. This is \$142 million below what was available in FY2002. The Budget identified three primary Administrations within DOT where research and development is supported—the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), and the Federal Aviation Administration (FAA). The R&D request in the FHWA is \$421 million and supports research to improve the quality and safety of the Nation's transportation system. The R&D request in NHTSA is \$58 million. This supports research in crash worthiness, crash avoidance, and data analysis to help reduce highway fatalities and injuries. The R&D request for FAA is \$95 million and supports R&D in areas such as aviation security and life-extension of aircraft. Another \$151 million in R&D is spent in other DOT agencies such as the Coast

Guard, the Federal Transit Administration, and the Federal Railroad Administration. The proposed reductions in R&D funding are concentrated in FAA and FHA, and some of the funds within those agencies are redirected toward the anti-terrorism mission. However, the budget does not yet reflect the allocation of funds going toward the newly created Transportation Security Agency.

## **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 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.

## **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. 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 7. R&D Budgets of Preceding Agencies**

(\$ millions)

	<b>FY2000 Actual</b>	<b>FY2001 Actual</b>	<b>FY2002 Estimate</b>	<b>FY2003 Request</b>
<b>National Oceanic &amp; Atmospheric Administration</b>	610	684	792	575
<b>National Institute of Standards &amp; Technology</b>	636	598	675	578
<b>Department of Interior</b>	645	622	660	628
<b>Department of Transportation</b>	603	792	867	725
<b>Environmental Protection Agency</b>	559	709	825 <sup>a</sup>	670

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