Order Code IB10100

Issue Brief for Congress
Received through the CRS Web

Federal Research and Development Funding: FY2003

Updated June 7, 2002

John Dimitri Moteff
Resources, Science, and Industry Division

CONTENTS

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. 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.

In their respective budget resolutions, both houses of Congress have indicated their willing to support the President's request for additional R&D funding in the health and military areas, as well as increasing R&D beyond the Administration's request in other areas (e.g. NSF).

MOST RECENT DEVELOPMENTS

While a couple authorization bills have gone forward (e.g. defense, NSF), the appropriations process has yet to begin.

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 proposed relatively large increases for defense- and health-related R&D, while proposing more modest increases in other mission areas and cuts in some agencies' R&D budgets relative to FY2002 appropriations. 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 that balance should not be achieved at the expense of setting priorities.

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 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)

	FY2000 Act.	FY2001 Act.[d]	FY2002 Est.	FY2003 Req.
Agric. Research Service (ARS)				
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
Subtotal	**855.0**	**942.0**	**1,022.0[e]**	**1,049.0**
Buildings & Facilities	53.0	74.0	119.0	17.0
Total, ARS[a]	**908.0**	**1,046.0[c]**	**1,176.0**	**1,066.0**
Coop. St. Res. Ed. & Ext. (CSREES) Research and Education				
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[b]	28.0	35.0	36.0	36.0
Total, Coop. Res. & Educ.[c]	**490.0**	**518.0**	**556.0**	**566.0**
Extension Activities				
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
Total, Extension Activities[c]	**424.9**	**434.0**	**441.0**	**421.0**
Total, CSREES[c]	**1,074.0**	**995.4**	**1,042.1**	**1,032.0**
Economic Research Service	64.0	74.0	76.0	82.0
National Agric. Statistics Service	99.0	109.0	122.0	149.0
TOTAL, Research, Education & Economics	**$2,145.0**	**$2,224.4**	**$2,416.1**	**$2,329.0**

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.

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 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 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 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.

Both the House and the Senate Armed Services Committee have reported out their defense authorization bills (House: H.R. 4546, H. Rpt. 107-436; Senate:S. 2514, S. Rpt. 107-151). The House has approved its bill, the Senate is expected to vote on its bill early in June. Both the House and Senate committees have recommended increasing total RDT&E spending above the Budget request. However, some of the increase is a result of the committees 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 committees reduced the RDT&E account proportionately. Also, the Senate committee recommended reducing RDT&E to account for savings in contract services and financial management. Both the House and Senate committees recommended an increase in 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 Armed Services Committee has recommended transferring $770 million from BMD RDT&E to shipbuilding accounts.

Table 3. Department of Defense
($ millions)

	FY2002 estimate	FY2003 Request[c]	House Auth. (HR4546)	Senate Auth. (S2514)
Accounts				
Army	7,053	6,918	6,933	7,301
Navy	11,389	12,502	13,275	12,929
Air Force	14,548	17,601	18,803	18,604
Defense Agencies	15,285	16,614	17,191	16,491
(DARPA)	(2,253)	(2,685)	(2,578)	(2,245)
(BMDO[a])	(6,969)	(6,691)	(6,991)	(5,924)
Dir. Test & Eval	230	222	222	362
Dir. Op.Test/Eval				
Total Ob. Auth.	**$48,505**	**$53,857**	**$56,424**	**$55,686**
Budget Activity				
Basic Research	1,376	1,365	1,354	1,413
Applied Res.	4,086	3,780	3,832	3,971
Advanced Dev.	4,415	4,532	4,837	4,780
Demonstration/Validation	10,361	10,539	10,973	10,155
Engineering/Manufacturing Dev.	11,018	13,550	13,950	13,677
Mgmt. Support[b]	2,850	2,890	2,959	3,274
Op. Systems Dev.	14,399	17,200	18,674	18,767
Adjustments				
personnel cost accural			-155	-155
financial mgmt. svgs.				-107
contract services svgs.				-91
Total Ob. Auth.	**$48,505**	**$53,857**	**$56,424**	**$55,684**
Other Defense Programs				
Defense Health Program	464	67	67	67
Chemical Agents and Munitions Destruction	202	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.

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
Human Space Flight (R&D Only)	**2,298.5**	**1,893.7**
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*
Science, Aeronautics, and Technology	**8,047.8**	**8,844.5**
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
TOTAL NASA R&D	**10,346.3**	**10,738.2**
(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 $1.0 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 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 commitments such as instrumentation or construction and renovation activities.

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. On May 2, the Senate confirmed the President's choice of a new NIH director, Dr. Elias Zerhouni of Johns Hopkins University, after more than two years of interim leadership for the agency.

Table 5. National Institutes of Health (NIH)

($ millions)

Institutes and Centers (ICs)	FY2000 comp [a,b]	FY2001 comp [a,c]	FY2002 comp [a,d]	FY2003 request [a,e]
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 (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 Develmt (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
Subtotal, NIH Progs (L-HHS Approp)	**$17,820.2**	**$20,379.6**	**$23,542.4**	**$27,259.0**
Superfund (VA-HUD Approp, NIEHS) [f]	60.0	62.9	80.7	76.1
Total, NIH Budg. Auth. (proposed law)	**$17,880.2**	**$20,442.4**	**$23,623.1**	**$27,335.1**
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 net transfers ($3.633m) to DHHS and CDC.
c. FY2001 reflects rescission ($8.666m and $0.139m reduction in Superfund activities), transfers, net funding from breast cancer stamps, and comparable adjustments (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 proposed 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.

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). 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).

Table 6. National Science Foundation

($ millions)

	FY2000 Act.	FY2001 Act.	FY2002 Est.	FY2003 Req.
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
Subtotal Res. & Rel. Act	**2,979.9**	**3,372.3**	**3,598.6**	**3,783.2**
Ed. & Hum. Resr.	683.6	795.4	875.0	908.1[a]
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
Total NSF	**$3,923.4**	**$4,459.9**	**$4,795.9**	**$5,035.8**[b]

a. Excludes $78.5 million in FY2001, an estimated $90 million in FY2002, and $92.5 million in FY20003 from H-1B Nonimmigrant Petitioner Receipts.
b. The totals do not include carryovers or retirement accruals.

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 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. 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. 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 21st 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.

On May 7, 2002, the House introduced H.R. 4664, 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.

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 l5.9%, 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.

Highlights of the FY2003 R&D request include a $17 million, or 70%, increase for Climate and Observation Services (OAR). The President requested $6.1 million (OAR) for Energy Security, a new R&D initiative, that would study impacts of weather and climate on U.S. energy suppliers to help use energy more efficiently. A $20 million increase was requested for Climate Research R&D. Program Support R&D would be increased by $12 million, and $51.4 million of that would fund marine data acquisition, for which NOS would assume responsibility. An increase of $3.3 million was requested for Aircraft Services R&D. Funding for fleet maintenance and planning for NOAA marine research vessels would change little from FY2002 levels. Maintenance of facilities and labs where R&D is conducted is funded by the ORF Facilities account; procurement of equipment, systems, and

construction of new research facilities used for R&D, are funded by the Procurement Acquisition and Construction account; for FY2003 none of these are scored as R&D expenditures.

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 (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).

Others elements of DOT that support research and development are the U.S. Coast Guard, the Research and Special Programs Administration, and the Office of the Secretary. The biggest proposed reductions in R&D funding are concentrated in FAA, although some of those funds may be redirected to the newly formed Transportation Security Agency (TSA).

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 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.