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Federal Research and Development Funding: FY2003

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Michael E. Davey
Resources, Science, and Industry Division

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SUMMARY

On February 7th, President Bush signed a continuing resolution, or CR (P.L. 108-5), which essentially maintains spending at FY2002 levels for the 11 appropriations bills lacking enacted FY2003 appropriations, through February 20, 2003. The 107thCongress completed work on 2 of its 13 appropriations bills, Defense and Military Construction.

On January 28th, the Senate completed work on an FY2003 Omnibus appropriations bill, (H.J.Res. 2) that includes the 11 agencies currently operating under a CR. CRS estimates that the Senate's actions would result in a total Federal R&D budget of $116 billion. The Senate estimate includes $57.4 billion for DOD R&D approved by the 107th Congress. The Senate Omnibus resolution includes an estimated $27.2 billion for NIH, essentially what the President requested for FY2003. The Senate also recommended a 12% increase for NSF's Research and Related Activities Account, and a 5% increase for NASA's R&D programs. These totals do not reflect potential across-the-board cuts Congress could employ in order to move closer to the President's proposed discretionary spending levels. After the House completes work on its version of the Omnibus bill, it will have to resolve any recommended funding differences with the Senate approved bill. To date, in most instances, (except for NIH) the House and Senate have provided more funding for R&D, than the President's request.

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

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

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

MOST RECENT DEVELOPMENTS

February 7, 2003, President Bush signed P.L. 108-5, that will allow agencies lacking FY2003 appropriations to operate at FY2002 spending levels until their respective FY2003 spending bills are passed; or, until February 20, 2003, when the continuing resolution expires. The 108th Congress initiated its legislative session on January 7, 2003, to resume work on the remaining FY2003 11 appropriations bills. Congress has approved, and the President has signed, a $30 billion FY2002 Supplemental Appropriations bill, P. L. 107-206, that includes $425 million for R&D, of which 70 %, or $337 million is for DOD. For an overview of the current funding status of the FY2003 R&D budget, see CRS Report RS21735, *Federal R&D Under a Continuing Resolution, and Prospects for FY2003 Funding*.

BACKGROUND AND ANALYSIS

Department of Agriculture (USDA)

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

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

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

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

The Senate Omnibus appropriations bill includes an estimated $2.464 billion for the Department of Agriculture's R&D program, about $135 million more than the request.

Table 1. U.S. Department of Agriculture

(millions $)

	FY2002 Est.	FY2003 Req.	FY2003 House	FY2003 Senate Omnibus
Agric. Research Service (ARS)				
Soil & Water Conservation	92.0	109.0		
Plant Science	333.0	368.0		
Animal Science	174.1	198.0		
Commodity Conversion & Delivery	177.0	194.0		
Human Nutrition	77.0	79.0		
Integration of Agricultural Systems	39.0	40.0		
Information and Library Sciences	20.0	23.0		
Repair and Maintenance	18.2	18.2		
Contingencies & Trust Funds	35.0	35.0		
Subtotal	**1,022.0[e]**	**1,049.0**	**1,002.2**	**1,053.6**
Buildings & Facilities	119.0	17.0	95.3	101.0
Total, ARS[a]	**1,176.0**	**1,066.0**	**1,097.5**	**1,154.6**
Coop. St. Res. Ed. & Ext. (CSREES) Research and Education				
Hatch Act Formula	180.1	180.1	182.0	185.6
Cooperative Forestry Research	21.9	21.9	23.0	22.5
1890 Colleges and Tuskegee Univ.	32.6	32.6	36.0	35.6
Special Research Grants	2.8	0.0	102.8	103.8
NRI Competitive Grants	120.0	240.0	130.0	204.3
Animal Health & Disease Res.	5.1	5.1	5.1	5.3
Federal Administration	45.0	20.0	27.1	29.0
Higher Education[b]	36.0	36.0	27.5	32.8
Total, Coop. Res. & Educ.[c]	**556.0**	**566.0**	**572.6**	**651.4**
Extension Activities				
Smith-Lever Sections 3b&c	275.9	275.9	277.0	281.2
Smith-Lever Sections 3d	85.5	85.5	84.2	93.4
Renewable Resources Extension	3.2	3.2	5.0	4.1
1890 Research & Extension	66.0	66.0	14.0	47.1
Federal Admin. & Special Grants	5.7	18.6	17.1	20.7
Total, Extension Activities[c]	**441.0**	**421.0**	**441.8**	**452.8**
Total, CSREES[c]	**1,042.1**	**1,032.0**	**1,014.4**	**1,104.2**
Economic Research Service	76.0	82.0	73.3	65.1
National Agric. Statistics Service	122.0	149.0	137.9	140.9
TOTAL, Research, Education & Economics	**$2,416.1**	**$2,329.0**	**$2,323.1**	**$2,464.8**

a. The total for ARS excludes trust funds and support for Counter-Drug Research and Development and for Anti-Drug Research and Related Matters.
b. Higher education includes payments to 1994 institutions and 1890 Capacity Building Grants program.
c. Program totals may reflect set-asides (non-add) or contingencies.
d Excludes support for Fund for Rural America, Agricultural Risk Protection Act, and Initiative for Future Agriculture and Food Systems.
e. Excludes funding for Homeland Security Supplemental.

Department of Energy (DOE)

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

The requested funding for R&D in National Security is $3.8 billion, which is 2.2% more than in FY2002. The apparent reduction in funding for Nonproliferation and Verification R&D is an artifact of $78 million in one-time supplemental funding for FY2002 that was provided after the September 11th terrorist attacks. The House Appropriations Committee recommended (H.R. 5431) an increase of approximately $90 million above the request. The Senate Appropriations Committee recommended (S. 2784) an increase of approximately $140 million above the request. Both committees provided the requested amount for continued construction of the National Ignition Facility.[1]

The requested funding for Science is $3.3 billion, an increase of 0.1% over 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 House Appropriations Committee recommended (H.R. 5431) a reduction of $8 million below the request. The Senate Appropriations Committee recommended (S. 2784) an increase of $50 million above the request.

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 House provided (H.R. 5093 Interior) and the House Appropriations Committee recommended (H.R. 5431 Energy) a total increase of $223 million above the request. The Senate Appropriations Committee recommended (S. 2708 Interior and S. 2784 Energy) a total increase of $214 million above the request.

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 is $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 House Appropriations Committee recommended (H.R. 5341) an increase of $11 million above the request. The Senate Appropriations Committee recommended (S. 2784) a decrease of $15 million below the request.

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[1] The House and Senate Appropriations Committees made their recommendations relative to an adjusted request that excludes certain federal retiree costs included in the Administration request. See note, Table 2.

Table 2. Department of Energy
($ millions)

	FY2002 Comparable	FY2003 Request	FY2003 House [1]	FY2003 Senate [2]
National Security	**3721.1**	**3804.3**	**3893.9**	**3943.1**
Weapons Activities [3]	2709.5	2812.9	2903.7	2942.9
Naval Reactors	689.3	708.0	706.8	706.8
Nonprolif. & Verific. R&D	322.3	283.4	283.4	293.4
Science	**3280.7**	**3285.1**	**3271.2**	**3329.5**
Basic Energy Sciences	999.6	1019.6	1019.6	1044.6
High Energy Physics	713.2	725.0	725.0	730.0
Biolog. & Envtal. Rsch.	570.3	504.2	504.2	531.2
Nuclear Physics	359.0	382.4	382.4	387.4
Fusion Energy Sciences	247.5	257.3	248.5	259.3
Adv. Scientific Computing	157.4	169.6	174.6	169.6
Other	233.7	227.0	216.9	207.4
Energy Supply	**1709.6**	**1601.8**	**1816.4**	**1807.5**
Energy Conservation R&D	640.5	588.4	684.7	635.9
Fossil Energy R&D	587.2	494.2 [4]	664.2	641.0
Renewable Energy	386.4	407.7	396.0	448.1
Nuclear Energy R&D	53.0	71.5	71.5	82.5
Clean Coal Technology [5]	42.5	40.0	0.0	0.0
Environmental Quality	**204.7**	**92.0**	**103.0**	**77.0**
Science and Technology [6]	204.7	92.0	103.0	77.0
Total	**8916.1**	**8783.2**	**9084.5**	**9157.1**

Note: The FY2002 Comparable and FY2003 Request columns include funding for an Administration proposal that would require agencies to pay the full government share of accruing retirement costs for certain federal employees. This proposal has not been enacted, and the other two columns generally do not reflect these costs. Thus these two columns are not exactly comparable to the other two in all cases, although the effect is small in percentage terms.

[1] As reported by the Appropriations Committee, except Energy Conservation R&D, Fossil Energy R&D, and Clean Coal Technology, which are as passed by the House.
[2] As reported by the Appropriations Committee.

[3] Includes Stockpile R&D, Science Campaigns, Engineering Campaigns except Enhanced Surety and Enhanced Surveillance, Inertial Confinement Fusion (called High Energy Density Physics in the FY2003 budget request), Advanced Simulation and Computing, and a prorated share of Readiness in Technical Base and Facilities.
[4] In addition, the Administration requested a transfer of $40 million from Clean Coal Technology to Fossil Energy R&D.
[5] Amounts shown for Clean Coal Technology are allocations from previously appropriated funds.
[6] Within Defense Environmental Restoration and Waste Management.

Department of Defense (DOD)

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

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

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

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

Table 3. Department of Defense

($ millions)

	FY2002 Estimate	FY2003 Req.[c]	House Auth. (H.R. 4546)	Senate Auth. (S. 2514)	House Apprn. (H.R. 5010)	Senate Apprn. (H.R. 5010)	Conf. Apprn. (H.R. 5010)
Accounts							
Army	7,053	6,918	6,933	7,301	7,447	7,410	7,628
Navy	11,389	12,502	13,275	12,929	13,562	13,276	13,865
Air Force	14,548	17,601	18,803	18,604	18,639	18,538	18,729
Defense Agencies	15,285	16,614	17,191	16,491	17,863	16,611	17,734
(DARPA)	(2,253)	(2,685)	(2,578)	(2,245)	(2,851)	(2,698)	(2,778)
(BMDO[a])	(6,969)	(6,691)	(6,991)	(5,924)	(6,821)	(6,145)	(6,741)
Dir. Test & Eval	230	222	222	362	242	303	246
Dir. Op.Test/Eval	–	–	–	–	–		
Total	**$48,505**	**$53,857**	**$56,424**	**$55,686**	**$57,753**	**$56,138**	**$58,202**
Budget Activity							
Basic Research	1,376	1,365	1,354	1,413	1,418	1,491	1,494
Applied Res.	4,086	3,780	3,832	3,971	4,451	4,479	4,598
Advanced Dev.	4,415	4,532	4,837	4,780	5,483	4,822	5,383
Demonstration/Validation	10,361	10,539	10,973	10,155	10,905	9,832	11,059
Engineering/Manufacturing Dev.	11,018	13,550	13,950	13,677	13,449	14,106	14,034
Mgmt. Support[b]	2,850	2,890	2,959	3,274	3,053	3,200	3,075
Op. Systems Dev.	14,399	17,200	18,674	18,767	19,150	18,362	19,120
Adjustments							
personnel cost accural			-155	-155	-155	-155	-155
financial mgmt. svgs.				-107			
contract services svgs.				-91			
Section 8100 svgs.							-299
Section 8109 svgs.							-107
Total Ob. Auth.	**$48,505**	**$53,857**	**$56,424**	**$55,684**	**$57,754**	**$56,137**	**$58,202**
Other Defense Programs							
Defense Health Program	464	67	67	67	400	394	459
Chemical Agents and Munitions Destruction	202	303	303	303	303	303	303

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

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

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

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

The Senate approved its bill (H.R. 5010, amended in the nature of a substitute, S.Rept. 107-213) on August 1. The Senate approved a 9% increase for DOD's S&T programs, recommending $10.8 billion, $700 million below the House level. The Senate also added

$150 million and $85 million for Breast Cancer and Prostate research, as well as $10 million for ovarian cancer, and $50 million for peer-reviewed research on other medical topics.

Both the House and Senate approved the conference report accompanying H.R. 5010 (H.Rept. 107-732). The bill as reported appropriated $58.2 billion in the Title IV RDT&E account, and another $459 million in RDT&E for the Defense Health Program and $306 million for RDT&E in the Chemical Agents and Munitions Demilitarization Program. The bill also appropriated $11.5 billion for S&T. However, this does not include the adjustments identified below. The $11.5 billion figure is 3.2 % of the total DOD appropriation of $355 billion.

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. In November 2002, the White House submitted an amended FY2003 budget request for NASA, but the total amount of funding for the agency in FY2003 would not change, just how it is allocated. See CRS Report RL31347 for details on the budget amendment. NASA appropriations are included in the VA-HUD-IA appropriations bill. Both the Senate and House Appropriations Committees reported out bills (S. 2797, S.Rept. 107-222; H.R. 5605, H.Rept. 107-740) in July and October 2002, respectively, but no such bill cleared the 107th Congress. The Senate committee issued revised recommendations in January 2003 as part of Senate Amendment 1 to H. J. Res 2, the Omnibus Continuing Appropriations resolution, which contains FY2003 funding for NASA and other agencies. **The following text reflects the Senate committee recommendations in January 2003, not July 2002.**

The Senate Appropriations Committee recommended a total increase of $125.5 million for NASA. The Senate approved the revised figures on January 23, 2003 as part of H. J. Res. 2, but also included an across-the-board reduction of 2.9% for all agencies, including NASA. The October 2002 report of the House Appropriations Committee would increase NASA's budget request by $300 million By the definitions used in this report, all of the funding increases are 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. For more information, see CRS Issue Brief IB93017. The Senate Appropriations Committee recommended a $35 million cut. The House committee approved the requested funding.

For Space Science, NASA is requesting $3.414 billion in FY2003. NASA wants to terminate two planetary programs—one to explore Europa, a moon of Jupiter, and the other to study Pluto and the Kuiper Belt (thought to be the source of some comets) — because they are too expensive.

Table 4. National Aeronautics and Space Administration

($ millions)

Funding Category	FY2002 Approp.	FY2003 Request	H. App. Cmte. Oct. '02	S. App. Cmte. Jan. '03
Human Space Flight (R&D only)	**2,298.5**	**1,893.7**	**1,893.7**	**1,861.7**
International Space Station	1,721.7	1,492.1	1,492.1	1,457.1
Investments and Support*	412.9	365.2	365.2	365.2
Space Comm. & Data Systems*	163.9	36.4	36.4	36.4
Science, Aeronautics, and Technology	**8,047.8**	**8,844.5**	**9,144.5**	**9,003.0**
Space Science	2,867.1	3,414.3	3,556.2	3,515.5
Biological. & Physical Research	820.0	842.3	854.2	1,675.6
Earth Science	1,625.7	1,628.4	1675.0	851.8
Aero-Space Technology	2,507.7	2,815.8	2,883.4	2,762.7
Academic Programs	227.3	143.7	178.9	197.9
TOTAL NASA R&D	**10,346.3**	**10,738.2**	**11,038.2**	**10,864.7**
(TOTAL NASA Budget)	(14,901.7)	**(15,000.0)	(15,300.0)	(15,125.5)

Prepared by CRS using data from NASA's FY2003 Budget Estimate (page MY-1), available at [http://www.nasa.gov] and congressional committee reports. NASA's budget is evolving towards full cost accounting and NASA is shifting programs between accounts, making annual comparisons difficult. Hence, only FY2002 and FY2003 are shown here. For more information, see CRS Report RL31347. Totals may not add due to rounding.

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

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

NASA proposed terminating the Pluto project in FY2002, but Congress restored it in the FY2002 VA-HUD-IA appropriations act. Congress also approved the Europa mission in the FY2002 appropriations act, capping its total cost at $1.0 billion. For FY2003, the Senate Appropriations Committee added $105 million for the Pluto/Kuiper Belt (PKB) mission, making it the first of the New Frontiers missions, for which $15 million was approved (making $120 million available for PKB); none was added for Europa. The House Appropriations Committee added $105 million for a "Kuiper Belt/Pluto" mission, and $40 million for Europa. NASA is requesting $124 million for a new Nuclear Systems Initiative in FY2003 to develop new spacecraft nuclear power sources, and perform research on nuclear propulsion. The Senate Appropriations Committee cut that request by $13 million; the House committee cut it by $17 million. Combined with other decisions, the Senate committee made a net addition of $101 million for space science; the House committee added $142 million.

Funding for NASA's Earth Science program would remain essentially level in the FY2003 request. NASA is completing the launches of the first set of spacecraft in its Earth Observing System to study global climate change. Plans to initiate construction of a second series are largely on hold awaiting decisions from the Bush Administration on the Climate Change Research Initiative. The Senate Appropriations Committee made a net addition of about $47 million for earth science; the House committee added $46.6 million. The Office of Biological and Physical Research funds research on the space station, and also is requesting funds in FY2003 for two new programs: "Generations" and the "Space Radiation Initiative." Generations would use the space station and other free-flying spacecraft to study how organisms adapt to the space flight environment, and the capacity of terrestrial life to evolve in space. The radiation initiative would augment existing research into the hazards

to humans of the space radiation environment. The Senate Appropriations Committee added a net of $9.5 million to this account. The House committee added a net of $11.9 million, *inter alia* disapproving the Generations initiative on the basis that it is unaffordable.

In Aero-Space Technology, funding for aeronautics research in the NASA request would decline about 10% (from $599 million to $541 million). NASA states that the decline is attributable to earmarks in the FY2002 budget for which the agency is not requesting funds in FY2003. The Senate Appropriations Committee approved the full request for aeronautics, plus an increase of about $6 million in the vehicle systems program. The House Appropriations Committee approved the full request, plus increases of $19 million in vehicle systems and $7 million in airspace systems. In its original budget request, NASA proposed a significant increase (from $467 million in FY2002, to $759 million in FY2003) for R&D related to building a second generation reusable launch vehicle—the Space Launch Initiative (SLI). It is this part of the FY2003 budget that was affected by the November 2002 budget amendment. (Other parts of NASA's budget were also affected, but in FY2004 and beyond). NASA proposed combining its programs to develop technologies for "second generation" and "third generation" launch vehicles (the shuttle is the "first generation"), and then allocating some of that funding for a new program, the Orbital Space Plane (OSP). OSP is not a launch vehicle, but a spacecraft for taking crews to and from the space station. NASA's decision to include it in the space transportation development part of its budget, instead of the space station account, may be controversial. For more information on SLI and changes proposed in the budget amendment, see CRS Issue Brief IB93062 and CRS Report RL31347. The Senate Appropriations Committee approved combining the second and third generation technology programs, but cut the revised SLI request of $879 million to $800 million, and allocated less ($115 million instead of $297 million) of the combined amount to the Orbital Space Plane, and more ($695 million instead of $584 million) to the launch vehicle technology development program. The House committee issued its report prior to the budget amendment. It decreased SLI by $31 million.

For Academic Programs, NASA is requesting $144 million, approximately half of what it received in FY2002. NASA explains that the request does not include continued funding for congressionally directed funding included in the FY2002 appropriations. The Senate Appropriations Committee added $54 million. The House committee added $35.2 million.

National Institutes of Health (NIH)

The omnibus FY2003 appropriations bill (H.J.Res. 2), passed by the Senate on January 23, 2003, provided appropriations for NIH totaling $27.24 billion, before any across-the-board reductions (see **Table 5**). Most of the amount, $27.16 billion, is included in the appropriations for the Departments of Labor, Health and Human Services, Education and Related Agencies (L-HHS). An additional $76 million comes through the appropriation for the Departments of Veterans Affairs, Housing and Urban Development, and Related Agencies (VA-HUD). The VA-HUD funding is for NIH research programs under the Superfund act. The $27.24 billion total, virtually the same as the adjusted President's request, is an increase of $3.73 billion or 15.9% over the comparable FY2002 appropriation of $23.51 billion. (The President's request, totaling $27.34 billion, counted additional funding not approved by the Senate. The request assumed enactment of the Administration's proposed

Managerial Flexibility Act and included $91 million in the L-HHS amount for accrued retirement and health benefits of employees.)

If enacted, the $27.2 billion would be enough to complete the planned doubling of the NIH budget over the 5-year period since the FY1998 appropriation of $13.6 billion. The 5-year doubling plan had its genesis in the mid-1990s, when a coalition of advocates for biomedical research began telling Congress that the time was ripe for exploiting new discoveries in the life sciences. They urged Congress to devote substantial new resources to support of research on genetic medicine, drug discovery, mechanisms of disease, and numerous other areas in which the "biological revolution" had opened up scientific opportunities. Broad bipartisan support for the 5-year doubling plan has allowed Congress to increase the NIH appropriation at a fairly steady pace of 14%-15% per year since FY1998. In considering final conference action on the omnibus bill, Congress will be deciding whether it wants to complete the doubling in the face of other priorities.

The plans originally formulated by NIH's institutes and centers for their FY2003 budget requests had to be adjusted after the terrorist attacks of September 2001. Of the $3.7 billion increase in the President's request, $1.5 billion or 40% was devoted to bioterrorism-related activities, which totaled $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 under the request would increase by 57% overall, to support research on potential bioterrorism agents and on new drugs and vaccines, together with laboratory upgrades. In the Senate bill, the appropriation for NIAID is $263 million less than the request, giving the institute an increase of 47% over FY2002 and the prospect of funding fewer of its planned biodefense activities. Another large increase from the bioterrorism funding is in the Buildings and Facilities account, to ensure the security and capabilities of the NIH intramural labs and research facilities. Some of these efforts were started with FY2002 funding (NIH received $180 million in the anti-terrorism supplemental appropriations act). The Senate provided $608 million for this account, $25 million below the request.

The President's request also emphasized support of cancer research. Total cancer funding across many of NIH's institutes would reach $5.5 billion, an increase of nearly 13% over the FY2002 level of $4.9 billion. The budget of the National Cancer Institute (NCI) would increase by over 12%, while increases of 8%-9% were requested for most of the other institutes and centers. The Senate provided the requested amount for NCI, and increases above the request for many, but not all, of the other institutes. The request would support a record number of research project grants (38,038, up from 36,630 in FY2002), including 9,854 (up 477) in the new and competing renewal category.

Table 5. National Institutes of Health (NIH)

($ millions)

Institutes and Centers (ICs)	FY2001 comp [a]	FY2002 comp [b]	FY2003 request [c]	FY2003 Senate [c]
Cancer (NCI)	$3,720.9	$4,128.4	$4,642.4	$4,642.4
Heart/Lung/Blood (NHLBI)	2,287.0	2,560.2	2,776.4	2,820.0
Dental/Craniofacial Research (NIDCR)	304.6	343.1	372.2	374.1
Diabetes/Digestive/Kidney (NIDDK)	1,302.8	1,466.4	1,604.6	1,637.3
Neurological Disorders/Stroke (NINDS)	1,172.1	1,312.8	1,424.4	1,466.0
Allergy/Infectious Diseases (NIAID)	2,062.1	2,534.5	3,990.5	3,727.5
General Medical Sciences (NIGMS)	1,531.0	1,700.1	1,855.0	1,853.6
Child Health/Human Develmt (NICHD)	978.1	1,113.1	1,213.8	1,213.8
Eye (NEI)	507.8	581.2	630.0	634.3
Environmental Health Sciences (NIEHS)	503.0	566.1	614.3	617.3
Aging (NIA)	786.1	893.1	968.7	1,000.1
Arthritis/Musculoskeletal/Skin (NIAMS)	395.0	448.7	486.6	489.3
Deafness/Communication Dis. (NIDCD)	301.1	342.0	370.8	372.8
Nursing Research (NINR)	105.2	120.4	130.4	131.4
Alcohol Abuse/Alcoholism (NIAAA)	340.5	384.1	416.8	418.8
Drug Abuse (NIDA)	779.5	887.7	964.6	968.0
Mental Health (NIMH)	1,103.1	1,238.1	1,343.1	1,350.8
Human Genome Research (NIHGR)	381.1	429.3	465.1	468.0
Biomedical Imaging/Bioenginrg (NIBIB)	68.8	262.0	271.2	283.1
Research Resources (NCRR)	811.2	986.5	1,065.3	1,161.3
Complementary/Alt. Medicine (NCCAM)	89.1	104.6	113.2	114.1
Minority Health/Disparities (NCMHD)	132.0	157.7	186.9	186.9
Fogarty International Center (FIC)	50.5	56.9	63.4	60.9
Library of Medicine (NLM)	238.2	277.3	310.3	302.1
Office of Director (OD)	188.3	235.4	255.1	258.0
Buildings & Facilities (B&F)	160.9	296.0	632.8	607.8
Subtotal, NIH (L-HHS Approp)	**$20,300.1**	**$23,425.7**	**$27,167.9**	**$27,159.7**
Superfund (VA-HUD Approp, NIEHS) [d]	62.9	80.7	76.1	76.1
Total, NIH Budget Authority	**$20,363.0**	**$23,506.5**	**$27,244.0**	**$27,235.8**

Sources: *Congressional Record* 1/15/03 on Senate omnibus bill; NIH FY2003 Appropriations Justification.
Note: Columns may not add due to rounding.
All columns reflect transfers from ICs to NIBIB ($150m in FY2002 and FY2003), and do not include transfers of funds for diabetes research (NIDDK) and drug control (NIDA).

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

b. FY2002 comparable reflects rescission ($9.273m) and supplemental funding for bioterrorism appropriated to the PHS Emergency Fund by P.L. 107-117 ($180m). Includes $100m that was later transferred to the Global Fund for HIV/AIDS, Malaria, and Tuberculosis (NIAID, $25m and B&F, $75m).

c. FY2003 request is adjusted to omit proposal for accrued retirement and health benefits of current employees. Request and Senate amount include $100m in NIAID for transfer to the Global Fund. For NLM, Senate bill provides additional $8.2m in evaluation tap funding for total program level of $310.3.

d. Separate account in the VA-HUD appropriation starting in FY2001, for NIEHS activities mandated in Superfund legislation. In FY2002, includes supplemental of $10.5 million from P.L. 107-117.

National Science Foundation (NSF)

The FY2003 request for the National Science Foundation (NSF) is $5,035.8 million, a 4.7% ($227.3 million) increase over the FY2002 level of $4,808.5 million (see **Table 6**). The FY2003 request provides support for several interdependent priority areas: biocomplexity in the environment ($79.2 million, 36.3% above FY2002), information technology research ($285.8 million, 3% above FY2002), learning for the 21st century ($184.7 million, 27.5% above FY2002), nanoscale science and engineering ($221.3 million, 11.3% above FY2002), mathematical sciences ($60.1 million, 100.3% above FY2002), and social, behavioral and economic sciences ($10 million, new in the FY2003 request). The request provides a second installment of $200 million for the President's Math and Science Partnerships program (MSP). Additional FY2003 highlights include increased funding for graduate students ($26.2 million), continued support of plant genome research ($75 million), increased investment in NSF's administration and management portfolio ($268.1 million), and funding for the Partnerships for Innovation program ($5 million). Included in the FY2003 request is $3,783.2 million for Research and Related Activities (R&RA), a 5.1% increase ($184.9 million) over the FY2002 level of $3,598.3 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.

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. Support will continue for Systemic Reform Initiatives and Instructional Materials Development. 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. 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.

Table 6. National Science Foundation

($ millions)

	FY2002 Act.	FY2003 Req.	FY2003 House (Oct. 2002)	FY2003 Senate Omnibus (Jan.2003)
Res. & Related Act. Biological Sciences	$508.4	$525.6	$584.7	$528.1
Computer & Inform. Sci. & Eng.	514.9	526.9	592.1	596.2
Engineering	472.3	488.0	543.2	559.0
Geosciences	609.5	691.1	700.9	671.2
Math & Physical Sci.	920.5	941.6	1,058.5	1,042.9
Social, Behav. & Econ. Sci.	168.8	195.6	195.6	187.5
U. S. Res. Prog.	229.7	235.7	254.0	242.8
U.S. Antarctic Log. Act.	68.1	68.1	70.4	67.2
Integrative Activities	106.5	110.6	150.6	133.9
Subtotal Res. & Rel. Act	**3,598.6**	**3,783.2**	**4,150.0**	**4,028.6**
Ed. & Hum. Resr.	894.3a	908.1	910.6	920.6
Major Res. Equip. & Facil. Constr.	138.8	126.3	159.5	58.5
Salaries & Expenses	170.0	210.2	193.9	179.8
Office of Inspec. Gen.	6.8	8.1	9.0	8.9
Total NSF	**$4,808.5**	**$5,035.8**[b]	**$5,422.9**	**$5,199.9**

a. Includes $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.

On October 10, 20002, the House Committee on Appropriations reported H.R. 5605 (H.Rept. 107-740), VA/HUD and Independent Agencies Appropriations Bill, FY2003. The bill provides a total of $5,422.9 million for NSF in FY2003, a 7.7% increase ($387.1 million) above the Administration's request and a 12.8% increase ($614.4 million) over the FY2002 level. Included in the total support is $4,150 million for the R&RA and $910.6 million for the EHR.

Department of Commerce (DOC)

National Oceanic and Atmospheric Administration (NOAA)

The President's request $575 million for NOAA R&D funding, which for the first time appears as a separate line item in the budget. 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). The R&D request is 25% of NOAA's Operations, Research and Facilities (ORF) account, for which $2.281 billion was requested. The President's proposed R&D budget, represents a 27% decline in NOOA R&D spending. 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. The Senate Omnibus bill rejects the transfer of the Sea Grant Program to NSF, and recommends an estimate $670 million for NOAA R&D.

National Institute of Standards and Technology

In the Administration's FY2003 budget proposal, the National Institute of Standards and Technology (NIST) would receive $577.5 million, 15% below the amount appropriated for FY2002 by P.L. 107-77. This decrease is due primarily to a decline in support for the Advanced Technology Program (ATP) and the Manufacturing Extension Partnership (MEP). ATP would receive $107.9 million, 35% below the current fiscal year, and MEP would be funded at $12.9 million. The 89% decrease in financing for MEP is due to the President's recommendation that manufacturing extension centers operating for more than 6 years do so without federal funding. In-house R&D under the Scientific and Technical Research and Services (STRS) account would increase 25% to $402.2 million. (It should be noted that the FY2002 Defense Appropriations Act added $5 million to the STRS account for cybersecurity activities.) Construction would be funded a $54.5 million. The Senate Omnibus bill would provide NIST with $720.9 million. Of this amount, $363.4 million is for the STRS account (13% above the previous fiscal year), $185.4 million is to fund ATP, and $106.6 million is to finance MEP. The construction budget would receive $65.5 million. (For more information see CRS Report 95-30, *The National Institute of Standards and Technology: An Overview*.)

Department of Transportation (DOT)

According to the Bush Administration's Budget, the Department of Transportation (DOT) requested $725 million for research and development in FY2003. This is $142 million below what was available in FY2002. In a DOT document made available after the Budget was released, the agency's R&D budget request was stated as $736 million. There are four Administrations within DOT that are the primary supporters of research and development—the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), and the Federal Aviation Administration (FAA), and the Federal Railroad Administration (FRA). A fifth, the newly formed Transportation Security Administration (TSA) has yet to allocate its budget, but will also support R&D. According

to the DOT document, the R&D budget requests for these Administrations were as follows: FHWA ($266 million), FAA ($225 million), NHTSA ($59 million), and FRA ($31 million). The Senate Omnibus bill includes an estimated $780 million for DOT R&D.

Department of Interior (DOI)

According to the President's budget, the Administration requested $628 million for R&D in the Department of Interior. The U.S. Geological Survey (USGS) is the primary supporter of R&D (about two-thirds of the total) within DOI. Areas of research include mapping, and research in geological, water, and biological resources. The FY2003 budget for R&D within the USGS would decline even more than DOI's overall R&D budget. Reductions are proposed in a couple of Water Resource programs, one of which (the Toxic Substances Hydrology Program) would be transferred to NSF. The Senate Omnibus bill would increase R&D funding to $660 million, or $32 million over the Presidents request. The House bill (H.R. 5093) would provide $681 million for R&D. Both bills reject the Administration's proposal to move the Toxic Substances Hydrology Program to NSF.

Environmental Protection Agency (EPA)

The Administration requested $731 million in the FY2004 budget for Science and Technology at EPA, including R&D activities under Superfund. The Senate provided $707 million for EPA's FY2003 R&D activities, including R&D under the Superfund account, as reported in the January 28, 2003 Congressional Record. The Administration had requested $670 million. This compares with $735 million enacted in FY2002, which was supplemented by $90.3 million in FY2002 for Homeland Security (for an S&T total of $825.3 million in FY2002). Major continuing congressional concerns are the quality of scientific information which EPA disseminates and information 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).

Table 7. 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.