

CRS Report for Congress

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Federal Research and Development Funding: FY2006

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Federal Research and Development Funding: FY2006

Summary

The Bush Administration has requested \$132.2 billion in federal research and development (R&D) funding for FY2006. This sum, represents a \$505 million increase over the FY2005 estimated funding level of \$131.7 billion. In real dollars, total federal R&D would decline for the first time since FY1996. The proposed FY2006 R&D budget reflects the Administration's objective of constraining the growth of federal discretionary spending.

For the first time since FY1995, funding for defense R&D (the sum of the Department of Defense's (DOD) and the Department of Energy's (DOE) defense R&D programs) would be flat with a requested \$74.9 billion. This is due primarily to a proposed 21% reduction in DOD's science and technology programs. Funding for federal civilian R&D is proposed to increase \$188 million to \$57 billion, a 0.3% increase over the FY2005 estimated funding level. Most of this increase can be attributed to increases in the National Aeronautics and Space Administration (NASA) budget and the Department of Transportation. Based on current funding proposals, most of the civilian R&D agencies' budgets are proposed to decline, in real dollars, in FY2006.

Funding for federal research (the sum of basic and applied research) would decline from \$55.2 billion to \$54.8, a 0.6% reduction. Total funding for basic research is proposed to decline from \$26.9 billion in FY2005 to \$26.6 billion in FY2006. Most of the decline in basic research support can be attributed to proposed reductions in DOD's and NASA's basic research programs.

The Administration proposes to reduce funding for all three of its multi-agency initiatives. Funding for the National Nanotechnology Initiative would decline 2.5% to \$1.1 billion, following four years of funding increases. The Networking and Information and Technology R&D initiative would decline 6.8% to \$2.4 billion, while the Climate Change Science Program is proposed to decline 1.4% to \$1.9 billion, primarily due to cuts in NASA's contributions to space-based observations of the environment.

The 109th Congress is facing difficult decisions for funding federal R&D. For the first time in a decade, total federal R&D funding is proposed to decline in real dollars. Since President Bush took office, defense R&D funding has increased 45%, in real dollars, while concomitantly civilian R&D has increased 23%. However, if the doubling of National Institutes of Health budget, between FY1999 and FY2003, is subtracted from the total, civilian R&D has declined in real dollars. Given the important role that federal civilian R&D plays in the education of future scientists and engineers, as well as the development of technological innovation, a variety of special interest groups are likely to call on Congress to restore funding for civilian R&D. If the President insists on holding the line on civilian discretionary spending, any increase for civilian R&D funding would have to be obtained at the expense of other federal programs.

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Federal Research and Development Funding: FY2006

Recent Developments

The Bush Administration has requested \$132.2 billion in federal research and development (R&D) funding for FY2006. This sum, represents a \$505 million increase over the FY2005 estimated funding level of \$131.7 billion. In real dollars, total federal R&D would decline for the first time since FY1996. The proposed FY2006 R&D budget reflects the Administration's objective of constraining the growth of federal discretionary spending.

For the first time since FY1995, funding for defense R&D (the sum of the Department of Defense's (DOD) and the Department of Energy's (DOE) defense R&D programs) would be flat with a requested \$74.9 billion. This is due primarily to a proposed 21% reduction in DOD's science and technology programs. Funding for federal civilian R&D is proposed to increase \$188 million to \$57 billion, a 0.3% increase over the FY2005 estimated funding level. Most of this increase can be attributed to increases in the National Aeronautics and Space Administration (NASA) budget and the Department of Transportation. Based on current funding proposals, most of the civilian R&D agencies' budgets are proposed to decline, in real dollars, in FY2006.

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The Administration proposes to reduce funding for all three of its multi-agency initiatives. Funding for the National Nanotechnology Initiative would decline 2.5% to \$1.1 billion, following four years of funding increases. The Networking and Information and Technology R&D initiative would decline 6.8% to \$2.4 billion, while the Climate Change Science Program is proposed to decline 1.4% to \$1.9 billion, primarily due to cuts in NASA's contributions to space-based observations of the environment.

The 109th Congress is facing difficult decisions for funding federal R&D. For the first time in a decade, total federal R&D funding is proposed to decline in real dollars. Since President Bush took office, defense R&D funding has increased 45%, in real dollars, while concomitantly civilian R&D has increased 23%. However, if the doubling of National Institutes of Health budget, between FY1999 and FY2003, is subtracted from the total, civilian R&D has declined in real dollars. Given the

important role that federal civilian R&D plays in the education of future scientists and engineers, as well as the development of technological innovation, a variety of special interest groups are likely to call on Members of Congress to restore funding for civilian R&D. If the President insists on holding the line on civilian discretionary spending, any increase for civilian R&D funding would have to be obtained at the expense of other federal discretionary programs.

Department of Agriculture (USDA)

The FY2006 budget request for research and education in the U.S. Department of Agriculture (USDA) is \$2,346.3 million, a 12.8% decrease (\$345.7 million) from the FY2005 estimate of \$2,692 million (see **Table 1**). The FY2006 request provides support for several research priority areas and strategic goals. One priority is that of advancing cutting edge agricultural research by shifting funding from noncompetitive and formula programs to competitive programs. A new \$75 million competitive grant program is being created to allow State Agricultural Experiment Stations to support research focused on the needs and concerns at the regional, state, and local level. The Administration maintains that the potential of genetic resources has the capability of addressing the varied needs of agriculture. High priority has been given to the mapping and sequencing projects funded by USDA, such as sequencing genomes of agriculturally imported species. The sequencing projects will be coordinated with ongoing genomics initiatives supported by other federal agencies and facilitated by interagency working groups. Increases totaling \$9.2 million are proposed for animal genomes and plant genomes research. Also, the FY2006 budget request provides an increase of \$12.5 million in support of research on emerging and exotic diseases as part of the infrastructure to enhance homeland security. USDA states that this research is significant to protecting the Nation from deliberate or unintentional introduction of an agricultural health threat. The USDA has biocontainment complexes where research and diagnostic work is done on organisms that pose serious threats to the crop, poultry, and livestock industries. The FY2006 request provides a \$55 million increase for efforts to respond to agricultural health threats. In addition, USDA is concerned with training and educating the next generation of agricultural scientists and supporting core university-based research. The FY2006 request provides \$5 million for the creation of a Higher Education Agrosecurity Program that would award grants to colleges and universities for interdisciplinary degrees in such areas as food defense professionals.

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, including the world's largest multi-disciplinary agricultural research center located at Beltsville, Maryland. There are approximately 100 research facilities throughout the U.S. and abroad. 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 FY2006 request provides \$1,079.1 million for ARS, a 17.4% decrease (\$226.9 million) from the FY2005 estimate. Reductions of \$175 million are proposed in all projects earmarked by Congress in order to finance the Department's high priority program increases. An additional \$28 million would be

made available from project terminations to fund critical research priorities detailed in the budget request. The request includes an increase of \$2.5 million for bioenergy and biobased products research. Funding will be directed at developing a system for more efficient harvesting and processing of biomass crops for energy production. The FY2006 request proposes a \$1.8 million increase in air and water quality research and \$3.2 million for research in support of the President's Climate Change Research Initiative. The 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 FY2006 request for ARS includes \$65 million for buildings and facilities.

The Cooperative State Research, Education, and Extension Service (CSREES) distributes funds to State Agricultural Experiment Stations, State Cooperative Extension Systems, land-grant universities, and other institutions and organizations that conduct agricultural research. Included in these partnerships is funding for research at the 1862 institutions, 1890 historically black colleges and universities, and 1994 tribal land-grant colleges. Funding is distributed to the states through competitive awards, statutory formula funding, and special grants. The FY2006 request for CSREES is \$1,041.2 million, a decrease of 12.1% (\$142.8 million) from the FY2005 estimate. The request proposes a reallocation of research formula funds made to institutions under the Hatch Act and McIntire-Stennis Act. The Animal Health formula grant program has been zeroed out in the FY2006 request. In addition, selected federal formula payments will be phased out over a two-year period and redirected at supporting a newly created regional, State, and local competitive grants program. Funding for formula distribution in FY2006 to the state Agricultural Experiment Stations (and other eligible institutions) would be \$275.9 million, almost level with the FY2005 estimate. The request proposes a slight increase for the 1890 formula programs. The FY2006 request funds the National Research Initiative (NRI) Competitive Grants Program at \$250 million, \$70.4 million above the FY2005 estimate. The increase will support initiatives in agricultural genomics, human nutrition and obesity, nanotechnology, food safety, water quality, and pest related programs. Language is included in the request that would remove USDA limitations on indirect costs which the Department states would help put the NRI on level with other federal competitive grant programs.

The Economic Research Service (ERS) is the principal intramural economic and social science research agency in USDA. The request for ERS in FY2006 is \$81 million, a \$7 million increase over FY2005. The majority of the increase (\$5.8 million) will continue the development of a consumer data and information system. The National Agricultural Statistics Service (NASS) conducts the Census of Agriculture and provides current data on agricultural production and economic indicators of the well-being of the farm sector. The Administration requests \$145 million in FY2006, \$17 million above the FY2005 estimate. Funding would support Presidential and Department eGovernment initiatives, such as eTraining and eTravel. NASS will continue the development of the USDA Enterprise Architecture and the USDA Enablers initiatives. **(CRS Contact: Christine Matthews.)**

Table 1. U.S. Department of Agriculture R&D
(\$ in millions)

	FY2004 Act.	FY2005 Est.	FY2006 Req.^a
Agric. Research Service (ARS)			
Product Quality/Value Added	\$110.0	\$104.6	97.7
Livestock Production	95.4	84.1	63.4
Crop Production	178.7	196.8	159.6
Food Safety	98.9	102.7	107.6
Livestock Protection	78.3	78.5	87.6
Crop Protection	183.6	193.0	180.1
Human Nutrition	81.5	83.7	81.7
Environmental Stewardship	212.8	219.4	178.2
National Agricultural Library	22.8	21.5	22.5
Funds for Homeland Security	[20.8]	[30.2]	[69.2]
Repair & Maintenance	17.9	17.8	17.8
Subtotal	1,088.1	1,102.0	996.1
Buildings & Facilities	64.0	186.0	65.0
Trust Funds	14.0	18.0	18.0
Total, ARS	1,166.1	1,306.0	1,079.1
Coop. St. Res. Ed. & Ext. (CSREES)			
Research and Education			
Hatch Act Formula	179.1	178.7	89.4
Cooperative Forestry Research	21.8	22.2	11.1
1890 Colleges and Tuskegee Univ.	11.4	12.3	12.5
Special Research Grants	124.2	135.5	18.3
NRI Competitive Grants	164.0	179.6	250.0
Animal Health & Disease Res.	4.5	5.1	0.0
Federal Administration	37.5	42.5	8.8
Higher Education ^b	42.3	50.7	55.9
Total, Coop. Res. & Educ.^c	626.7	667.4	557.5
Extension Activities			
Smith-Lever Sections 3b&c	277.7	275.5	275.9
Smith-Lever Sections 3d	80.6	86.7	91.4
Renewable Resources Extension	4.0	4.1	4.1
1890 Research & Extension	14.9	16.8	14.9
Other Extension Prog. & Admin.	61.9	62.5	45.4
Total, Extension Activities^c	439.1	445.6	431.7
Total, CSREES^c	1,132.8	1,184.0	1,041.2
Economic Research Service	71.0	74.0	81.0
National Agricultural Statistics Service	128.0	128.0	145.0
TOTAL, Research, Education & Economics	\$2,497.9	\$2,692.0	\$2,346.3

a. Funding levels are contained in U.S Department of Agriculture FY2006 Budget Summary and other documents internal to the agency.

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. The CSREES total includes support for Integrated Activities, Community Food Projects, and the Organic Agriculture Research and Education Initiative.

Department of Energy (DOE)

For FY2006, DOE has requested \$8.4 billion for R&D, including activities in each of the department's four business lines: Science, National Security, Energy Supply, and Environmental Quality. This request is 4.6% below the FY2005 level. For details, see **Table 2**.

The requested funding for Science is \$3.5 billion, a 3.8% decrease from FY2005. With completion of the Spallation Neutron Source expected in the third quarter of FY2006, the request for Basic Energy Sciences includes less for construction but more for facility operations. The net requested increase for Basic Energy Sciences is \$41 million. In the Fusion Energy Sciences program, construction of the International Thermal Nuclear Reactor (ITER) research facility is expected to start as soon as the international partners (the United States, China, Japan, South Korea, Russia, and the European Union), agree on a site. With ITER funding of \$50 million, the net requested increase for the fusion program is \$17 million. The other Science programs would all see decreased funding, especially Biological and Environmental Research, with a requested decrease of \$126 million, of which \$80 million corresponds to one-time projects funded at congressional direction in FY2005.

The requested funding for R&D in National Security is \$3.3 billion, a 3.8% decrease. Last year, Congress rejected FY2005 research funding for the Robust Nuclear Earth Penetrator. This program is included in the FY2006 request this year, and although the sum requested is only \$4 million, the program is likely to remain controversial. Funding for R&D on nuclear proliferation detection would increase by \$46 million or 43%.

The requested funding for R&D in Energy Supply is \$1.7 billion, down 6.6% from FY2005. Within this total, Fossil Energy R&D is down \$80 million, with the natural gas and oil technology programs proposed for termination. Nuclear Energy R&D would see a \$20 million increase.

The requested funding for R&D in Environmental Quality is \$21 million. This is less than half the FY2005 level and follows several years of substantial reductions that resulted from a reorientation of the program, following an internal review of the Office of Environment in 2002. (CRS Contact: Daniel Morgan.)

Table 2. Department of Energy R&D
(\$ in millions)

	FY2004 Comparable	FY2005 Comparable	FY2006 Request
National Security	3344.8	3392.8	3274.7
Weapons Activities ^a	2354.7	2367.4	2216.5
Naval Reactors	761.9	801.4	786.0
Nonproliferation and Verification R&D	228.2	224.0	272.2
Science	3536.4	3599.5	3462.7
Basic Energy Sciences	991.3	1104.6	1146.0
High Energy Physics	716.2	736.4	713.9
Biological and Environmental Research	624.0	581.9	455.7
Nuclear Physics	379.8	404.8	370.7
Fusion Energy Sciences	255.9	273.9	290.6
Advanced Scientific Computing	196.8	232.5	207.1
Other	372.4	265.4	278.7
Energy Supply	1770.4	1773.5	1656.5
Fossil Energy R&D	659.0	571.9	491.5
Energy Conservation R&D	560.0	559.2	548.6
Renewable Energy	352.3	380.3	353.6
Nuclear Energy R&D	127.6	170.6	191.0
Electric Transmission and Distribution R&D	71.5	91.5	71.8
Environmental Quality	61.4	59.7	21.4
Technology Development and Deployment	61.4	59.7	21.4
Total	8713.0	8825.5	8415.3

a. Includes Stockpile Services (R&D Support, R&D Certification and Safety, Advanced Concepts, Robust Nuclear Earth Penetrator, and Reliable Replacement Warhead only), Science Campaigns, Engineering Campaigns (except Enhanced Surety and Enhanced Surveillance), Inertial Confinement Fusion, Advanced Simulation and Computing, and a prorated share of Readiness in Technical Base and Facilities. Additional R&D activities may take place in the subprograms of Directed Stockpile Work that are devoted to specific weapon systems, but these funds are not included in the table because detailed funding schedules for those subprograms are classified.

Department of Defense (DOD)

Nearly all of what the Department of Defense spends on Research, Development, Test and Evaluation (RDT&E) is appropriated in Title IV of the defense appropriation bill (see **Table 3**). For FY2006, the Bush Administration is requesting \$69.4 billion for Title IV RDT&E. This is essentially unchanged from the \$69.2 billion available for Title IV in FY2005. RDT&E funds are also requested as part of the Defense Health Program (\$169 million) and the Chemical Agents and Munitions Destruction Program (\$48 million). The six-year budget plan estimates spending \$404.6 billion for RDT&E through FY2011. When compared to last year's budget estimate, funding for RDT&E would be reduced by nearly \$9 billion between

FY2006 and FY2009, reflecting an overall reduction in the DOD's proposed budgets to help reduce the federal budget deficit.

While the FY2006 RDT&E request represents a modest increase in RDT&E funding over last year, Science and Technology (S&T) funding would drop significantly. S&T consists of basic and applied research and advanced development (6.1, 6.2 and 6.3 activities in the RDT&E account). The FY2006 S&T request represents nearly a 20% reduction from FY2005 S&T funding, not counting inflation (all dollar figures and comparisons made in this discussion do not consider inflation). Congress increased the FY2005 appropriation for S&T above what the Administration had requested. The FY2006 S&T budget request is \$31 billion (less than 1%) below the amount requested by the Administration for FY2005. The FY2006 request for basic research is \$1.3 billion, an overall reduction of 12.8% from FY2005. A noticeable exception is basic research within the Chemical and Biological Defense Program which would be increased by 34%. Over half of DOD's basic research budget is spent at universities and represents the major contribution of funds in some areas of science and technology. The FY2006 S&T request is 2.5% of the overall Department of Defense budget request of \$419.3 billion. This is below the 3% target that both the Bush Administration and Congress have set.

The FY2006 budget request for Missile Defense RDT&E is \$7.8 billion (a decrease of \$1 billion from the amount available for Missile Defense in FY2005). The budget request for the Defense Advanced Research Projects Agency (DARPA) was \$3.1 billion, an increase of about \$100 million above the FY2005. The Navy and the Air Force requests are both slightly above FY2005 funding. The Army's request is slightly below, but its S&T request is roughly 40% below the FY2005 level.

(CRS Contact: John Moteff)

Table 3. Department of Defense RDT&E
(\$ in millions)

	FY2004	FY2005 Estimate	FY2006 Request
Accounts			
Army	10,202	10,558	9,734
Navy	14,773	16,907	18,038
Air Force	20,233	20,812 ^e	22,612
Defense Agencies	18,856	20,612	18,803
(DARPA)	(2815)	(2,977)	(3,084)
(MDA ^a)	(7,567)	(8,783)	(7,775)
Dir. Test & Eval	302	310	168
Total Ob. Auth.	64,366	69,199	69,355
Budget Activity			
Basic Research	1,358	1,513	1,318
Applied Res.	4,347	4,850	4,139
Advanced Dev.	6,185	6,708	5,064
Advanced Component Dev. and Prototypes	12,947	14,711	14,143
Systems Dev. and Demo	15,339	17,222	19,754
Mgmt. Support ^b	4,443	3,721	3,777
Op. Systems Dev. ^c	19,747	20,475	21,160
Adjustments			
Total Ob. Auth. ^d	64,366	69,200	69,355
Other Defense Programs			
Defense Health Program	486	507	169
Chemical Agents and Munitions Destruction	252	205	48

Source: Figures based on Department of Defense Budget, Fiscal Year 2006 RDT&E Programs (R-1), February 2004. Figures for Defense Health Program and Chemical Agents and Munitions Destruction Program come from OMB's FY2006 Budget Appendix. 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. Includes classified programs.
- d. Numbers may not agree with Account Total Obligational Authority due to rounding.
- e. Includes \$100 million for Air Force Tanker Transfer Fund

National Aeronautics and Space Administration (NASA)

NASA's FY2006 total budget request is \$16.456 billion, a 2.4% increase over the amount it received in the FY2005 Consolidated Appropriations Act — \$16.07 billion (adjusted for the across the board rescission). Separately, NASA received \$126 million in a FY2005 emergency supplemental for hurricane relief, making its total FY2005 budget \$16.196 billion (see **Table 4**). For the purposes of this report,

NASA's "R&D budget" is NASA's total budget minus the space shuttle program and space flight support. Using that definition, the FY2006 R&D request is \$11.5 billion, compared to a preliminary estimate of \$11 billion in FY2005. It must be stressed that the FY2005 figure is preliminary. The figure is based on NASA's December 23, 2004 Initial Operating Plan (IOP). In the IOP, however, NASA notes that another \$287 million may be needed in FY2005 for the shuttle program. Some of that funding may come from NASA's R&D activities. Thus, a final figure will not be known until future iterations of the operating plan are submitted to Congress.

In January 2004, President Bush directed NASA to focus its efforts on returning humans to the Moon by 2020, and someday sending them to Mars and "worlds beyond." Under this "Vision for Space Exploration," the space shuttle program would be terminated in 2010, when space station construction is expected to be completed; U.S. space station research would focus only on that which is needed to support extended stays by humans on the Moon and eventual trips to Mars instead of the multi-disciplinary program that was planned; and NASA would end its involvement in the space station program by FY2017. By terminating the shuttle and space station earlier than expected, that funding could be redirected to accomplishing the Vision. NASA would build a Crew Exploration Vehicle (CEV) whose primary purpose is sending astronauts to the Moon, but could also be used to take them to the space station by 2014. U.S. astronauts would have to rely on Russia to take them to and from the space station between 2010 and 2014. Most of the funding for the Vision would come from redirecting money from other NASA activities. Part of the debate over the Vision is the future of those "other" activities, including aeronautics, Earth science, and certain space science disciplines. Other issues include whether the shuttle should be terminated in 2010, or if it should be maintained until a replacement is available so that NASA is not dependent on Russia for access to the space station, and whether U.S. use of the space station should end in FY2017, or if NASA should continue using it for research purposes as originally planned.

The President's announcement came 11 months after the 2003 space shuttle *Columbia* accident sparked a review of U.S. goals in space. The extent to which Congress has endorsed the Vision is debatable. Supporters point to the fact that Congress appropriated almost all of the funding NASA requested for FY2005 (\$16.07 billion instead of \$16.24 billion), and gave NASA wide latitude on how to spend it, as indicative of congressional support. However, the conferees on the FY2005 Consolidated Appropriations Act stated (H. Rept. 108-792) that although they were appropriating substantial funds for the Vision, "to date there has been no substantive Congressional action endorsing this initiative." See CRS Report RS21720 for more on the Vision.

Another issue is whether NASA should send a servicing mission to the Hubble Space Telescope, either using the shuttle or a robotic mission, so it can continue scientific operations with new instruments. A shuttle servicing mission had been planned prior to the *Columbia* accident, but NASA Administrator O'Keefe canceled that mission, primarily because of shuttle safety concerns. Hubble advocates have been seeking a reversal of that decision, arguing that Hubble can continue to deliver important scientific data for many more years if the new instruments and other equipment are installed. **(CRS Contacts: Marcia Smith and Daniel Morgan)**

Table 4. NASA R&D Funding
(\$ in millions)

Category	FY2004 Actual	FY2005 Estimate*	FY2006 Request
Science, Aeronautics, and Exploration	7,873	**7,681	**9,661
Science ^A	5,600	5,527	5,476
Aeronautics	1,057	906	852
Biological and Physical Research	986	1,004	— ^b
Exploration Systems	— ^c	25	3,165
Education	230	217	167
Exploration Capabilities			
- <i>International Space Station</i>	<i>1,364</i>	<i>1,676</i>	<i>1,857</i>
Exploration Systems	1,588	1,654	— ^c
Total NASA R&D	10,525	*11,011	11,518
Total NASA	15,378	16,196^d	16,456

Source: Office of Management and Budget [<http://www.whitehouse.gov/omb/budget/fy2006/nasa.html>]. Totals may not add due to rounding.

* Figures in this column are from NASA's Initial Operating Plan (IOP), dated December 23, 2004, and are not final. The IOP notes, for example, that additional costs for returning the space shuttle to flight are anticipated, and may result in further shifts of funds into the shuttle program, which could mean less funding allocated to R&D activities.

** The FY2005 totals for the SA&E and Exploration Capabilities accounts are different from those in the table included in NASA's FY2006 budget justification documents because the OMB table shows the shift of "Exploration Systems" from one account to the other. The NASA table uses the FY2006 budget structure without showing a "trace" between last year's budget presentation and this year's. Since the OMB table shows that trace, and includes FY2004, it is used in this report. The shift of Exploration Systems into the SA&E account is responsible for the significant increase in funding in that account in FY2006.

^aIn the FY2006 request, "Science" incorporates the former Space Science and Earth Science line items.

^b In the FY2006 request, Biological and Physical Research became part of Exploration Systems.

^c In the FY2006 request, funding for Exploration Systems was moved into the SA&E account.

^d Includes \$126 million FY2005 supplemental for hurricane relief. Regular appropriations were \$16.07 billion.

National Institutes of Health (NIH)

The President has requested a total FY2006 budget for NIH of \$28.845 billion, an increase of \$195.7 million (0.7%) over the FY2005 total program level of \$28.650 billion (see **Table 5**). The bulk of NIH's budget comes through the appropriation for the Departments of Labor, Health and Human Services, and Education (L-HHS), with an additional small amount from the VA-HUD appropriation for environmental work related to Superfund (that appropriation is shifting to the new Interior and Environment Subcommittee in the House). Those two sources constitute NIH's discretionary budget authority, which would increase by \$145.7 million (0.5%) in the

request, rising to \$28.590 billion from the FY2005 level of \$28.444 billion. In addition, NIH receives \$150 million pre-appropriated in separate funding for diabetes research, and has other funds transferred to and from other appropriations.

FY2003 was the final year of the five-year effort to double the NIH budget from its FY1998 base of \$13.6 billion to the FY2003 level of \$27.1 billion. The annual increases for FY1999 through FY2003 were in the 14%-15% range each year. For FY2004 and FY2005, faced with competing priorities and a changed economic climate, Congress and the President gave increases of between 2% and 3%, levels which were below the estimated 3.5% and 3.3% biomedical inflation index for those years. The research advocacy community had urged that the NIH budget grow by about 10% per year in the post-doubling years. For FY2006, advocates have modified their stance, maintaining that a 6% increase is needed to keep up the momentum of scientific discovery made possible by the increased resources of the doubling years (the projected biomedical inflation index for FY2006 is 3.2%).

The agency's organization consists of the Office of the NIH Director and 27 institutes and centers. The Office of the Director (OD) sets overall policy for NIH and coordinates the programs and activities of all NIH components. The individual institutes and centers (ICs), each with a focus on particular diseases, areas of human health and development, or aspects of research support, plan and manage their own research programs in coordination with the Office of the Director. As shown in Table 5, Congress provides a separate appropriation to 24 of the 27 ICs, to OD, and to a buildings and facilities account. (The other 3 centers, not included in the table, are funded through the NIH Management Fund, financed by taps on other NIH appropriations.) On average, the ICs devote over 80% of their budgets to supporting peer-reviewed extramural research by awarding research project grants (RPGs), research center grants, contracts, training grants, construction grants, and many other types of funding to researchers in universities and other institutions around the country. The other 15%-20% of the IC budgets supports their intramural research programs and research management costs. An alternate way, therefore, to describe the NIH budget is by "funding mechanism," which reveals the balance between extramural and intramural funding, as well as the relative emphasis on support of individual investigator-initiated research versus funding of larger projects, comprehensive research centers, agency-directed contracts, research career training, facilities construction, and so forth.

For FY2006, the President's request once again places major emphasis on support of research project grants, and offsets the increases with cuts in research facilities construction funds. RPGs account for 54% of the total NIH budget (\$15.5 billion). The proposed total of 38,746 RPGs is 402 lower than in FY2005, including 658 fewer noncompeting grants but a higher (and more costly) number of new and competing renewal grants (9,463 compared to 9,216). Funding for the competing awards has to cover a large cohort of expensive AIDS clinical trials and HIV vaccine grants. Also proposed for increases are research center grants (up 2.3% overall), especially biotechnology centers (up 15%); R&D contracts (up 4.9%), with increases focused in biodefense and AIDS; the NIH intramural research program (up 0.8%); and research training grants (up 0.3%), where the number of training slots would be reduced in order to pay for increases in stipends and health insurance coverage for post-doctoral trainees. The two funding mechanisms proposed for decreases are

extramural research facilities construction grants (down 83% from \$179 million to \$30 million) and the intramural buildings and facilities account (down 24% from \$118 million to \$90 million). In the extramural program, \$30 million would be used for biodefense laboratories, instead of \$149 million in one-time costs in FY2005, and non-biodefense facilities would have no additional funding, instead of \$30 million provided by Congress in FY2005 after a presidential request for zero. The intramural facilities funding would support maintenance needs on the NIH campus but no new construction. The request holds steady the level that Congress set in FY2005 for the Public Health Service Program Evaluation Transfer, a budget “tap” of 2.4% (up from 2.2% in FY2004) to which NIH and other PHS agencies are subject. It has the effect of redistributing appropriated funds among PHS agencies.

Specific priorities highlighted in the budget request include biodefense, HIV/AIDS, neurosciences research, and the initiatives collectively known as the NIH Roadmap for Medical Research. The *Roadmap*, launched in September 2003, has identified critical scientific gaps that may be constraining rapid progress in biomedical research, and has set out a list of NIH-wide priorities and initiatives to address them. Roadmap initiatives would be funded at \$333 million for FY2006 (\$250 million from the institutes and centers and \$83 million from the Office of the Director), up \$98 million or 42% from FY2005. Three core themes focus on new paths to biological discoveries (\$169 million), building multidisciplinary research teams (\$44 million), and improving the clinical research infrastructure (\$120 million). *Biodefense* activities would receive a total of \$1.8 billion, a net increase of \$56 million (3.2%) over FY2005. After accounting for the non-recurring costs for laboratories, research activities would increase by \$175 million (11%) over FY2005. Of those totals, \$1.7 billion comes from the regular NIH appropriation (up \$6 million or 0.35%, with research increasing by \$125 million or 8%), and \$97 million is appropriated through the Public Health and Social Services Emergency Fund account in the Office of the HHS Secretary. That money is targeted for research on countermeasures against nuclear and radiological threats (\$47 million, same as FY2005) and chemical threats (\$50 million, new in FY2006). *HIV/AIDS* funding, at \$2.9 billion or over 10% of the NIH budget, is proposed for a \$12 million overall increase, but a \$100 million increase in research on HIV vaccines. The budget gives lesser priority to other HIV/AIDS activities such as research on prevention, therapeutics, or international or minority AIDS. NIH would continue to support the Global Fund for HIV/AIDS, Tuberculosis, and Malaria through a transfer of \$100 million from the NIH appropriation to the Global Fund. The *NIH Blueprint for Neuroscience Research*, at \$26 million requested, is a new framework of initiatives and working groups among 15 institutes and centers involved in the neurosciences. In both intramural and extramural research, it would encourage pooling resources, enhancing training, and developing research tools and infrastructure to serve the whole neuroscience community. **(CRS Contact: Pamela Smith)**

Table 5. National Institutes of Health (NIH)
(\$ in millions)

Institutes and Centers (ICs)	FY2004 budg auth ^a	FY2005 approp ^b	FY2006 request	FY05-06 % change
Cancer (NCI) ^a	\$4,739.4	\$4,825.3	\$4,841.8	0.3%
Heart/Lung/Blood (NHLBI)	2,878.1	2,941.2	2,951.3	0.3%
Dental/Craniofacial Research (NIDCR)	383.0	391.8	393.3	0.4%
Diabetes/Digestive/Kidney (NIDDK)	1,671.2	1,713.6	1,722.1	0.5%
Neurological Disorders/Stroke (NINDS)	1,500.7	1,539.4	1,550.3	0.7%
Allergy/Infectious Diseases (NIAID) ^c	4,303.0	4,402.8	4,459.4	1.3%
General Medical Sciences (NIGMS)	1,904.8	1,944.1	1,955.2	0.6%
Child Health/Human Development (NICHD)	1,241.8	1,270.3	1,277.5	0.6%
Eye (NEI)	652.7	669.1	673.5	0.7%
Environmental Health Sciences (NIEHS)	631.1	644.5	647.6	0.5%
Aging (NIA)	1,024.6	1,052.0	1,057.2	0.5%
Arthritis/Musculoskeletal/Skin (NIAMS)	500.9	511.2	513.1	0.4%
Deafness/Communication Disorders (NIDCD)	381.9	394.3	397.4	0.8%
Nursing Research (NINR)	134.7	138.1	138.7	0.5%
Alcohol Abuse/Alcoholism (NIAAA)	428.4	438.3	440.3	0.5%
Drug Abuse (NIDA) ^a	994.6	1,006.4	1,010.1	0.4%
Mental Health (NIMH)	1,381.3	1,411.9	1,417.7	0.4%
Human Genome Research (NHGRI)	478.8	488.6	491.0	0.5%
Biomedical Imaging/Bioengineering (NIBIB)	288.8	298.2	299.8	0.5%
Research Resources (NCRR)	1,179.0	1,115.1	1,100.2	-1.3%
Complementary/Alternative Med (NCCAM)	116.9	122.1	122.7	0.5%
Minority Health/Health Disparities (NCMHD)	191.5	196.2	197.4	0.6%
Fogarty International Center (FIC)	65.3	66.6	67.0	0.6%
Library of Medicine (NLM)	308.5	315.1	318.1	0.9%
Office of Director (OD) ^d	327.1	358.0	385.2	7.6%
Buildings & Facilities (B&F)	99.0	110.3	81.9	-25.7%
Subtotal, Labor/HHS Appropriation	\$27,807.4	\$28,364.5	\$28,509.8	0.5%
Superfund (VA/HUD approp to NIEHS) ^e	78.3	79.8	80.3	0.6%
Total, NIH discretionary budget authority	\$27,885.7	\$28,444.4	\$28,590.1	0.5%
Pre-appropriated Type 1 diabetes funds ^f	150.0	150.0	150.0	0.0%
NLM program evaluation ^g	8.2	8.2	8.2	0.0%
Public Health/Soc Serv Emergency Fund ^g	0.0	47.0	97.0	106.3%
Total, NIH program level	\$28,043.9	\$28,649.6	\$28,845.3	0.7%
<i>Global HIV/AIDS Fund transfer^c</i>	<i>-149.1</i>	<i>-99.2</i>	<i>-100.0</i>	<i>0.8%</i>

Source: NIH FY2006 congressional budget justification.

- a. FY2004 reflects across-the-board reduction of \$182.951m and is comparable for transfers to NIBIB, OD, and B&F, and for transfer to DHHS for Public Health Reports (\$70,000). NCI amount includes \$3.472m breast cancer stamp funds. NIDA amount reflects \$3.818m real transfer from ONDCP (Office of National Drug Control Policy).
- b. FY2005 reflects across-the-board reduction (0.8%) totaling \$229.390m, and Labor/HHS/Ed reduction of \$6.787m for salaries and expenses.
- c. NIAID totals include funds for transfer to the Global Fund to Fight HIV/AIDS, TB, and Malaria.
- d. OD has Roadmap funds for distribution to ICs (FY2004, \$38.4m; FY2005, \$59.5m; FY2006, \$83.0m).
- e. Separate account in the VA-HUD appropriation for NIEHS activities mandated in Superfund legislation (shifting to Interior appropriation subcommittee in House for FY2006).
- f. Funds available to NIDDK for diabetes research in accordance with P.L. 107-360.
- g. Additional funds available: From the program evaluation set-aside (sec. 241 of the Public Health Service Act), \$8.2m for NLM each year; and from the Public Health and Social Services Emergency Fund appropriation, for NIH research on nuclear and radiological countermeasures, \$47.0m in FY2005 and FY2006, and for chemical countermeasures, \$50.0m in FY2006.

National Science Foundation (NSF)

The FY2006 request for the National Science Foundation (NSF) is \$5,605 million, a 2.4% (\$132.2 million) increase over the FY2005 level of \$5,472.8 million (See **Table 6**). The FY2006 request provides support for several interdependent priority areas: biocomplexity in the environment (\$84 million), human and social dynamics (\$39 million), and mathematical sciences (\$89 million). Additional priority areas include those of strengthening core disciplinary research, providing broadly accessible cyberinfrastructure and world-class research facilities, broadening participation in the science and engineering workforce, and sustaining organizational excellence in NSF management practices. The NSF states that researchers need not only access to cutting-edge tools to pursue the increasing complexity of research, but funding to develop and design the tools critical to 21st century research and education. An investment of \$509 million in cyberinfrastructure will allow for funding of modeling, simulation, visualization and data storage, and other communications breakthroughs. NSF anticipates that this level of funding will make cyberinfrastructure more powerful, stable, and accessible to researchers and educators through widely shared research facilities. Increasing grant size and duration has been a long-term priority for NSF. The funding rate for research grants applications has declined from approximately 30% in the late 1990s to an estimated 20% in FY2005.

In the FY2006 request, the NSF will increase the funding rate to 21%, while maintaining current gains in award size and duration. In FY2006, grant size will approximate \$136,800, and the length will be three years. NSF asserts that international research partnerships are critical to the Nation in maintaining a competitive edge, addressing global issues, and capitalizing on global economic opportunities. To address these particular needs, the FY2006 request proposes \$35 million for the Office of International Science and Engineering. Also, in FY2006, NSF will provide leadership in planning U.S. participation in observance of the International Polar Year scheduled during 2007. Additional FY2006 highlights include funding for the National Nanotechnology Initiative (\$343.8 million), investments in Climate Change Science Program (\$196.9 million), continued support for homeland security (\$344 million), and funding for Networking and Information Technology Research and Development (\$803.2 million).

Included in the FY2006 request is \$4,333.5 million for Research and Related Activities (R&RA), a 2.7% increase (\$112.9 million) over the FY2005 level of \$4,220.6 million. R&RA funds research projects, research facilities, and education and training activities. Partly in response to concerns in the scientific community about the imbalance between support for the life sciences and the physical sciences, the FY2006 request provides increased funding for the physical sciences — \$230.1 million, a 2.3% increase (\$5.2 million) over the FY2005 estimate. Research in the physical sciences often leads to advances in other disciplines. R&RA includes Integrative Activities (IA), and is a source of funding for the acquisition and development of research instrumentation at U.S. colleges and universities. It funds also Partnerships for Innovation, disaster research teams, and the Science and Technology Policy Institute. The FY2006 request for IA is \$134.9 million, a 3.8% increase (\$5 million) over the FY2005 estimate. The Office of Polar Programs is funded in the R&RA. The FY2006 request would transfer responsibility to NSF from

the U.S. Coast Guard for funding the maintenance and operation of polar ice breaking activities.

Research project support in the FY2006 request totals \$2,757.1 million. Support is provided to individuals and small groups conducting disciplinary and cross-disciplinary research. Included in the total for research projects is support for centers, proposed at \$358.5 million. NSF supports a variety of individual centers and center programs. The FY2006 request provides \$51 million for Science and Technology Centers, \$58 million for Materials Centers, \$61.8 million for Engineering Research Centers, \$19.5 million for Physics Frontiers Centers, \$36 million for the Plant Genome Virtual Centers, and \$17.2 million for the Mathematical Science Research Institutes.

The Major Research Equipment and Facilities Construction (MREFC) account is funded at \$250 million in the FY2006 request, a 44% increase (\$76.4 million) over the FY2005 level. The MREFC supports the acquisition and construction of major research facilities and equipment that extend the boundaries of science, engineering, and technology. Of all federal agencies, NSF is the primary supporter of “forefront instrumentation and facilities for the academic research and education communities.” First priority for funding is directed to ongoing projects. Second priority is given to projects that have been approved by the National Science Board (NSB) for new starts. NSF requires that in order for a project to receive support, it must have “the potential to shift the paradigm in scientific understanding and/or infrastructure technology.” NSF contends that the projects receiving support in the FY2006 request meet that qualification.¹ There are no new starts proposed in the FY2006 request. However, two new starts are requested in FY2007, and one start is requested in FY2008. In the order of priority, they are the Ocean Observatories in FY2007; the Alaska Region Research Vessel in FY2007; and the Advanced Laser Interferometer Gravitational Wave Observatory (LIGO) in FY2008. Those projects receiving support in the FY2006 request are Atacama Large Millimeter Array Construction (\$49.2 million), EarthScope (\$50.6 million), IceCube Neutrino Observatory (\$50.5 million), Rare Symmetry Violating Processes (\$41.8 million), and Scientific Ocean Drilling Vessel (\$57.9 million).

¹ In December 2004, the NSB announced that the new guidelines for the development, review, and approval of major facilities would be available in June 2005.

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

	FY2004 Act.	FY2005 Est.	FY2006 Req.
Res. & Related Act.			
Biological Sciences	\$587.1	\$576.6	\$581.8
Computer & Inform. Sci. & Eng.	605.4	613.7	620.6
Engineering	565.6	561.3	580.7
Geosciences	713.4	694.2	709.1
Math & Physical Sci.	1,091.6	1,069.9	1,086.2
Social, Behav. & Econ. Sci.	184.3	197.0	198.8
Office of International Sci. & Eng.	40.8	33.7	34.5
U.S. Polar Programs.	341.7	344.4	386.9
Integrative Activities	163.5	129.9	134.9
Subtotal Res. & Rel. Act	\$4,293.3	\$4,220.6	\$4,333.5
Ed. & Hum. Resr.	944.1	841.4	737.0
Major Res. Equip. & Facil. Constr.	184.0	173.7	250.0
Salaries & Expenses	218.9	223.2	269.0
National Science Board	2.2	4.0	4.0
Office of Inspector General	9.5	10.0	11.5
Total NSF^a	\$5,652.0^b	\$5,472.8	\$5,605.0

- a. The totals do not include carry overs or retirement accruals. Totals may not add due to rounding.
b. Additional funding resulting from H-1B Nonimmigrant Petitioner Receipts is \$57.3 million in FY2004, \$100 million in FY2005, and a projected \$100 million in FY2006.

The FY2006 request for the Education and Human Resources Directorate (EHR) is \$737 million, a 12.4% decrease (\$104.2 million) from the FY2005 estimate. The EHR portfolio is focused on, among other things, increasing the technological literacy of all citizens, preparing the next generation of science, engineering, and mathematics professionals, and closing the achievement gap in all scientific fields. Support at the various educational levels in the FY2006 request is as follows: precollege, \$140.8 million; undergraduate, \$135 million; and graduate, \$155 million. The focus at the precollege level in FY2006 is at teacher development activities (\$58.8 million) and informal science education (\$63.1 million). At the undergraduate level, approximately 72% of the funding is in support of new awards and activities. Priorities at the undergraduate level include the Robert Noyce Scholarship Program, Course, Curriculum and Laboratory Improvement, STEM Talent Expansion Program, the National STEM Education Digital Library, the Federal Cyber Service, and Advanced Technological Education. At the graduate level, priorities are those of Integrative Graduate Education and Research Traineeship, Graduate Research Fellowship, and the Graduate Teaching Fellows in K-12 Education. The request provides \$60 million for the President's Math and Science Partnerships program (MSP), a 24.4% decrease from the FY2005 estimate. (The MSP is a five-year investment to improve the performance of U.S. students in science and mathematics at the precollege level). Funding in the FY2006 request will provide support for ongoing awards, in addition to data collection, evaluation, knowledge management, and dissemination. The MSP has made 80 awards in a three year period, with an overall funding rate of approximately 9%. No new partnership awards are proposed in the FY2006 request. Several programs are directed at increasing the number of underrepresented minorities in science and engineering. Among these targeted

programs in the FY2006 request are the Historically Black Colleges and Universities Programs (\$25 million), Tribal Colleges and Universities Program (\$10 million), Louis Stokes Alliances for Minority Participation (\$35 million), and Centers of Research Excellence in Science and Technology (\$18.5 million). Funding for the Experimental Program to Stimulate Competitive Research (EPSCoR) is \$94 million in the FY2006 request, almost level with the FY2005 estimate. Approximately 35% of the request would be available for new awards and activities, with the balance supporting awards made in previous years.

(CRS Contact: Christine Matthews.)

Department of Homeland Security (DHS) R&D

For FY2006, the Department of Homeland Security has requested \$1.37 billion for R&D, an increase of 4.2% (see **Table 7**). For the first time, all R&D funding for the department is included in the request for the Directorate of Science and Technology. Reflecting direction originally given in the FY2004 appropriations conference report (H.Rept.108-280), R&D programs currently in the Transportation Security Administration and Coast Guard, together with some other smaller programs, would be consolidated in the S&T Directorate in FY2006. Last year, the FY2005 budget request also proposed consolidating the Coast Guard R&D program, but the change was controversial, and Congress did not approve it. This is the first budget to propose consolidation for the TSA R&D program, because the Homeland Security Act (P.L.107-296), which established DHS, required that TSA be maintained as a single distinct entity until November 2004.

Although the proposed total R&D budget for DHS would change by less than in any previous year since the department's creation, there are some substantial shifts in funding for individual programs. The newly created Domestic Nuclear Detection Office would receive \$227 million. Combined with the existing radiological and nuclear countermeasures program, this would mean a doubling of funding in the radiological/nuclear area. Chemical countermeasures, support for other department components, and efforts to counter the threat from MANPADs (portable ground-to-air missiles) would also all roughly double. Meanwhile, funding for rapid prototyping would drop from \$76 million to \$21 million, and the R&D activities currently conducted by the TSA (which appear as part of R&D Consolidation in the FY2006 request) would drop from \$178 million to \$109 million. **(CRS Contact: Daniel Morgan.)**

Table 7. Department of Homeland Security R&D
(\$ in millions)

	FY2004 Actual	FY2005 Enacted	FY2006 Request
Science and Technology Directorate	912.8	1115.4	1368.4
Salaries and Expenses	43.9	68.6	81.4
R&D, Acquisition, and Operations	868.9	1046.8	1287.0
Bio Countermeasures	454.9	362.6	362.3
NBACC	4.3	35.0	-
Chemical Countermeasures	22.9	53.0	102.0
Explosives Countermeasures	7.0	19.7	14.7
Rad/Nuc Countermeasures	105.7	122.6	19.1
DNDO	-	-	227.3
TVTA	58.7	65.8	47.0
Critical Infrastructure Protection	12.1	27.0	20.8
Cyber Security	10.3	18.0	16.7
Standards	32.3	39.7	35.5
Support of DHS Components	20.8	54.6	93.6
Univ & Fellowship Programs	22.0	70.0	63.6
Emerging Threats	11.2	10.8	10.5
Rapid Prototyping	68.4	76.0	20.9
Counter MANPADS	16.7	61.0	110.0
SAFETY Act	-	10.0	5.6
Ofc of Interop. & Compatibility	-	21.0	20.5
R&D Consolidation	-	-	116.9
Unobligated Balance	21.6	-	-
TSA R&D	144.6	178.0	-
U.S. Coast Guard RDT&E	14.9	18.5	-
Customs R&D	1.5	1.4	-
TOTAL	1073.8	1313.3	1368.4

Department of Commerce (DOC)

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) is the largest agency of the Department of Commerce (DOC), and accounts for about 40% of the DOC budget request for FY2006. The President requested \$527 million for R&D programs and facilities at NOAA, which is reported to be 14.2% of total *budget authority* proposed for NOAA, or \$3.7 billion.² The R&D request is \$52 million, or

² OMB's R&D Bureau estimates differ: \$640 million for FY2004; \$636 million for FY2005; and \$565 million requested for FY2006. However, those amounts include capital costs for equipment and maintenance of R&D facilities, which NOAA does not score as R&D
(continued...)

9% less than the \$579 million appropriated for FY2005, and \$38 million, or 6.7% less than that appropriated for FY2004 (see **Table 8**). Funding for the Office of Oceanic Research, NOAA's largest research program, would decline 10% to \$372.2 million, \$41.6 million below FY2005 estimated funding of \$413.8 million. The Administration also proposes to reduce funding for the Ocean, Coastal, and Great Lakes Research account by 19%, to \$119 million, which contrasts with a recommendation of the United States Commission on Ocean Policy to double ocean and coastal research budgets over the next five years. Funding for Climate Change Research would remain at FY2005 funding levels (For additional information on the OPC recommendations and the President's response, see CRS Issue Brief IB10132, *Ocean Commissions: Ocean Policy Review and Outlook*.)

The President's plan would cut tsunami hazard research funding, at the expense of increasing funding for hardware for detection, as well as hiring additional personnel at the two National Weather Service tsunami warning centers. Criticism has been voiced by some scientists. (See CRS Report RL32739, *Tsunamis: Monitoring, Detection and Early Warning Systems*. For tsunami warning funding, see CRS Report RL32739, *Tsunamis: Monitoring, Detection and Early Warning Systems*.)

Other NOAA R&D decreases include \$24 million from National Ocean Service Operations (marine research data collection); that obligation was transferred to the Office of Marine and Aviation Operations (OMAO). Reductions of \$7.7 million are proposed for marine mammal R&D. Further, \$3.4 million is terminated for "other fishery-related projects," such as fishery impact on habitats and product quality and safety, and \$4.3 million is terminated from fishery support activities. Increases are proposed for fishery information networks, enforcement, and fishery stock inventory R&D activities. The Climate Observation and Services program would be increased by \$18 million, but \$8 million is terminated from climate partnership programs. Additionally, \$11 million is terminated from certain Weather and Air Quality R&D partnership programs, while concomitantly \$12.8 million is proposed to be cut from Ocean, Coastal and Great Lake ecosystems R&D partnerships. NOAA Satellite product development would be reduced \$2.8 million, and \$4 million is terminated for "research to operations" partnerships with NASA. Satellite data assimilation R&D funding would increase by \$1 million. NOAA has also requested to procure high performance computers at a cost of \$12.5 million. (For information on NOAA's full budget request for FY2006, see the CRS web page for *Commerce, State, Justice, the Judiciary and Related Agency Appropriations, FY2006*, at [<http://www.congress.gov/brbk/html/apcjs41.html>].)

(CRS Contact: Wayne A. Morrissey)

² (...continued)
obligations.

Table 8. NOAA R&D
(\$ in millions)

NOAA	FY2004	FY2005 Estimate	FY2006 Request
Total	565	578.2	527.4
Office of Oceanic Research	414.6	413.8	372.2

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Financial Administration, *Research and Development Budgets FY2004-2006*, February 23, 2005.

(CRS Contact: Wayne A. Morrissey)

National Institute of Standards and Technology (NIST)

The National Institute of Standards and Technology (NIST) is a laboratory of the Department of Commerce. It is mandated to increase the competitiveness of U.S. companies through appropriate support for industrial development of pre-competitive generic technologies and the diffusion of government-developed technological advances to users in all segments of the American economy. NIST research also provides the measurement, calibration, and quality assurance techniques that underpin U.S. commerce, technological progress, improved product reliability, manufacturing processes, and public safety.

The President's FY2006 budget requests \$532 million in funding for NIST, a 23% decrease from FY2005 due primarily to an absence of support for the Advanced Technology Program (ATP) and a significant cut in financing for the Manufacturing Extension Partnership (MEP) (see **Table 9**). Included in the total figure is \$426.3 million for the Scientific and Technology Research and Services (STRS) account which covers primarily the internal R&D activities of the laboratory. This amount is 12.5% above the current fiscal year (and includes \$5.7 million for the Baldrige National Quality Program). MEP would be funded at \$46.8 million, 56% below FY2005 support. The construction budget would be \$58.9 million.

For FY2005, the Omnibus Appropriations Act, P.L. 108-447, provided the NIST with \$695.3 million (after a mandated 0.8% across-the-board rescission and a 0.54% rescission from Commerce, Justice, State discretionary accounts). This amount was 14% above FY2004 funding. Internal research and development under the STRS account was \$378.8 million (including funding for the Baldrige National Quality Program), almost 12% over the previous fiscal year. The Manufacturing Extension Partnership was funded at \$107.5 million, an increase of 178% that brings support for the program up to pre-FY2004 levels. The Advanced Technology Program is financed at \$136.5 million (20% below FY2004) and the construction budget received \$72.5 million. The legislation also rescinds \$3.9 million of unobligated balances from prior year funds in the ATP account.

Continued support for the Advanced Technology Program has been a major funding issue. ATP provides "seed financing," matched by private sector investment, to businesses or consortia (including universities and government laboratories) for

development of generic technologies that have broad applications across industries. Opponents of the program cite it as a prime example of “corporate welfare,” whereby the federal government invests in applied research activities that, they argue, should be conducted by the private sector. Others defend ATP, arguing that it assists businesses (and small manufacturers) in developing technologies that, while crucial to industrial competitiveness, would not or could not be developed by the private sector alone. While Congress has maintained support for the Advanced Technology Program, the initial appropriation bills passed by the House since FY2002 provided no funding for ATP. While support again is provided in the FY2005 appropriations legislation, it is 20% below the earlier fiscal year.

The budget for the Manufacturing Extension Partnership, another extramural program administered by NIST, was an issue during the FY2004 appropriations deliberations. While in the recent past, congressional support for MEP remained constant, the Administration’s FY2004 budget request, the initial House-passed bill, and the FY2004 Consolidated Appropriations Act substantially decreased federal funding for this initiative reflecting the President’s recommendation that manufacturing extension centers “...with more than six years experience operate without federal contribution.” However, P.L. 108-447 restores financing for MEP in FY2005 to the level that existed prior to the 63% reduction taken in FY2004. For additional information see CRS Report 95-30, *The National Institute of Standards and Technology: An Overview*, CRS Report 95-36, *The Advanced Technology Program*, and CRS Report 97-104, *The Manufacturing Extension Partnership Program: An Overview*. (CRS Contact: Wendy H. Schacht)

Table 9. NIST
(\$ in millions)

NIST Program	FY2004*	FY2005*	FY2006 Request
NIST Total	610.7	695.3	532
STRS**	337.2	378.8	426.3
ATP	170.5	136.5	0
MEP	38.7	107.5	46.8
Construction	64.2	72.5	58.9

* After mandated rescissions (but not including those to unobligated balances)

** Includes funding for the Baldrige National Quality Program

Department of Transportation (DOT)

The Bush Administration requested \$808 million for the Department of Transportation’s (DOT) research and development budget in FY2006. This represents an increase of 8% over the FY2005 estimated funding level of \$748 million. (see **Table 10**). Support for the Federal Highway Administration (FHWA) would increase from an estimated \$336 million to \$444 million in FY2006. As in the recent past, most of this increase is the result of the Administration’s proposal to

shift some resources away from state highway grants to highway research, an approach Congress has rejected in the past. R&D funding for the Federal Aviation Administration (FAA) would decline 11%, to \$233 million, primarily due to a 27% cut in FAA development activities, as well as the Administration proposal to eliminate \$17 million in FY2005 Congressional earmarks. FAA research focuses on a number of topics including weather research, air craft safety, human factors research, and the development of “free flight technology to improve aviation system capacity.” Finally funding for FAA security R&D has declined significantly with the transfer of aviation security and Coast Guard R&D to DHS. (CRS Contact: Mike Davey.)

Table 10. Department of Transportation R&D
(\$ in millions)

Department of Transportation	FY2004	FY2005 Estimate	FY2006 Request
Federal Highway Administration	333	336	444
Federal Aviation Administration	248	263	233
Others ^a	80	138	131
Total	661	748	808

a. Other includes; Office of the Secretary, Federal Motor Safety Administration, Federal Railroad Administration, Pipeline Hazardous Materials Administration, and the Research & Innovation Administration.

Department of the Interior (DOI)

The Administration requested \$582 million for R&D in the Department of the Interior (DOI) (see **Table 11**), a 4.9% decline from the \$612 million the agency estimates it received in FY2005. The U.S. Geological Survey (USGS) is the primary supporter of R&D (over 90 % of the total) within DOI. The USGS areas of research include mapping, research in geological resources, water quality, and biological resources. The proposed FY2006 budget for R&D within the USGS would decline from \$540 million in FY2005 to \$514 million. The USGS is one of the major sponsors of earth science research, along with NSF, DOE, and NASA.

As indicated in the table, Geological Mineral Resources research funding is proposed to decline 13%, while Water Resources is scheduled to decline 5.5%. The Geological hazards programs conducts basic and applied research, collects long-term data, operates a variety of monitoring networks, and helps to warn the public of impending disasters such as earthquakes. Recently, the Administration announced that NOAA and the DOI, will work together to develop an improved tsunami and earthquake warning system in the United States. The Water Resources research focuses on activities aimed at improving the quality of the U.S. ground water. Within the earth sciences, the USGS plays a major role in important geological hazards research, including research on earthquakes and volcanoes.

The USGS Biological Research Activity develops and distributes information needed in the conservation and management of the Nation's biological resources. This program serves as the Department's research arm utilizing the capabilities of 17 research centers, as well as 40 Cooperative Research Units that support research on fish, wildlife, and natural habitats. Major research initiatives are carried out by USGS scientists by collecting scientific information through research, inventory and monitoring investigations. These activities develop new methods and techniques to identify, observe, and manage fish and wildlife, including invasive species and their habitats. Nearly 90% of USGS research is performed within Interior labs to address the science needs of Interior and other agencies such as the Fish and Wildlife Service and the Bureau of Land Management. If Congress approves the President's proposed budget for FY2006, funding for DOI R&D will have declined 18%, in real dollars, since FY2004. (CRS Contact: Mike Davey)

Table 11. Department of Interior R&D
(\$ in millions)

U. S. Geological Survey	FY2004	FY2005 Estimate	FY2006 Request
National Mapping	33	36	43
Geological Resources	210	206	179
Water Resources	129	126	119
Biological Research	175	172	173
USGS Total^a	547	540	514
Other Agencies ^b	128	70	68
Total All Agencies	675	610	582

a. USGS R&D estimates are from the USGS budget office, and the USGS FY2006 Budget Justification documents.

b. Other includes, the Bureau of Reclamation, Bureau of Land Management, the Minerals Management Service, and the National Park Services

Environmental Protection Agency (EPA)

The Science and Technology (S&T) account incorporates elements of the former research and development account (also called extramural research) and EPA's in-house research, development, and technology work. The FY2006 S&T total request of \$791.2 million includes \$30.6 million transferred from the Superfund account (see **Table 12**). The Consolidated Appropriations Act of 2005 provides \$779.9 million for S&T activities, including \$35.8 million transferred from Superfund. The FY2005 S&T total request of \$725.3 million included \$36.1 million from Superfund. The FY2004 S&T total enacted amount of \$826.1 million included \$44.4 million from Superfund, including the mandatory across-the-board 0.59% rescission. As reported in EPA's FY2006 Annual Performance Plan and Congressional Justification, there were \$758.1 million obligated for S&T in FY2004. Noteworthy in the FY2006

request is \$8.3 million to cover the Science to Achieve Results (STAR) Fellowship program as well as three other fellowship programs (the request does not specify an amount exclusively for the STAR Fellowship program), while in the FY2005 Consolidated Appropriations Act is the provision to fully restore the STAR Fellowship program alone to its \$16.2 million FY2004 level. Also noteworthy in the FY2006 Justification are the statements that \$3 million from the National Environmental Technology Competition (a student competition to develop sustainable environmental solutions), \$5.8 million from portions of EPA's ecosystem protection research program, \$1.5 million from National Ambient Air Quality Standards research, along with other research activities, will be redirected to fund other EPA priorities. Beyond the appropriateness of funding levels, a continuing question is the degree to which efforts to insure sound science (such as the Information Quality Act and the Office of Management and Budget's Peer Review guidelines) will impact EPA's S&T work. **(CRS Contact: Michael Simpson)**

Table 12. EPA

(\$ in millions)

EPA	FY2004	FY2005 Estimate	FY2006 Request
S&T Total	758.1	779.9	791.2
Specifically for S&T	nd	744.1	760.6
Transferred from Superfund	nd	35.8	30.6

nd=no data