

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is a darker shade of blue. The hourglass is centered on the page.

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Congressional Research Service

Report RL33345

*Federal Research and Development Funding: FY2007*

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March 13, 2007

**Abstract.** On December 9, 2006, President Bush signed a continuing resolution, or CR (P.L. 109-383, H.J.Res. 102) which provides spending at FY2006 levels (through February 15, 2007) for those agencies lacking enacted FY2007 appropriations bills. The House passed 10 of its 11 appropriations bills, and the Senate passed 3 of its 12 appropriations bills. The Senate Appropriations Committee passed its remaining 9 appropriation bills. Based on those current House and Senate actions, total federal R&D could reach an estimated \$140 billion in FY2007. Congress has passed two appropriations bills, the Department of Defense (P.L.109-289) and the Department of Homeland Security (P.L. 109 295, H.Rept. 109-699). The Department of Defense and the Department of Homeland Security are the only two agencies that have enacted FY2007 appropriations bills.

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# CRS Report for Congress

## Federal Research and Development Funding: FY2007

Updated March 13, 2007

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Prepared for Members and  
Committees of Congress

# Federal Research and Development Funding: FY2007

## Summary

On February 15, 2007 President Bush signed into law P.L. 110-5 (H.J.Res 20), which provides funding for the nine outstanding regular appropriations bills through September 30, 2007. The 109<sup>th</sup> Congress passed two appropriations bills, the Department of Defense (P.L. 109-289, H.Rept. 109-676) and the Department of Homeland Security (P.L. 109-295, H.Rept. 109-699). P.L. 110-5 will fund most agencies at FY2006 levels through September 30, 2007. However, P.L. 110-5 contains some exceptions to those guidelines, including the centerpiece of the President's proposed FY2007 R&D budget, the American Competitiveness Initiative (ACI). Agencies are required to report their estimated FY2007 R&D funding levels to Congress by March 15, 2007.

The Bush Administration had requested \$137.7 billion in federal research and development (R&D) funding for FY2007. That sum represented a 2.4% increase over the estimated \$134.5 billion that was approved in FY2006. National Aeronautics and Space Administration's (NASA's) space vehicles development program.

The centerpiece of the President's proposed FY2007 R&D budget was the American Competitiveness Initiative (ACI). The President proposed this initiative in response to growing concerns about America's ability to compete in the technological global market place. Over the next 10 years, the \$136 billion initiative would have committed \$50 billion for research, science education, and the modernization of research infrastructure. The remaining \$86 billion would have financed a revised permanent R&D tax incentive over the next 10 years. The current Research and Experimental Federal tax credit expires at the end of 2007.

As part of the \$50 billion for research, the President called for doubling federal R&D funding over 10 years. That increase would have included the physical sciences and engineering research in three agencies: the National Science Foundation (NSF), the Department of Energy's (DOE's) Office of Science, and the National Institute of Standards and Technology (NIST). Based on P. L. 110-5, H.J.Res. 20, both the House and Senate FY2007 appropriations actions would partially fund the President's ACI request. Based on House and Senate actions DOE's Office Science would receive \$200 million of ACI funding, NSF \$212 million, and NIST an estimated \$37 million for FY2007.

Despite the ACI proposal, total federal basic research funding for FY2007 would have been flat at \$28.2 billion (in real dollars). Five agencies accounted for 90% of all federal basic research expenditures in FY2006. Total federal research funding (the sum of basic and applied research) was projected to decline 2.6% in FY2007. That decline was due to a 6.6% drop in applied research funding. The Department of Defense (P. L. 109-289) and the Department of Homeland Security (P. L. 109-295) are the only two agencies that have enacted FY2007 appropriations bills.

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# Federal Research and Development Funding: FY2007

## Recent Developments

On February 15, 2007 President Bush signed into law P.L. 110-5 (H.J.Res 20), which provides funding for the nine outstanding regular appropriations bills through September 30, 2007. The 109<sup>th</sup> Congress passed two appropriations bills, the Department of Defense (P.L. 109-289, H.Rept. 109-676) and the Department of Homeland Security (P.L. 109-295, H.Rept. 109-699). P.L. 110-5 will fund most agencies at FY2006 levels through September 30, 2007. However, P.L. 110-5 contains some exceptions to those guidelines, including the centerpiece of the President's proposed FY2007 R&D budget, the American Competitiveness Initiative (ACI). Agencies are required to report their estimated FY2007 R&D funding levels to Congress by March 15, 2007.

The Bush Administration had requested \$137.7 billion in federal research and development (R&D) funding for FY2007. That sum represented a 2.4% increase over the estimated \$134.5 billion that was approved in FY2006. As in the recent past, the FY2007 increase over the FY2006 estimated funding levels was due to significant funding increases for the Department of Defense (DOD) and the National Aeronautics and Space Administration's (NASA's) space vehicles development program.

The centerpiece of the President's proposed FY2007 R&D budget was the American Competitiveness Initiative (ACI). The President had proposed this initiative in response to growing concerns about America's ability to compete in the technological global market place.<sup>1</sup> Over the next 10 years, the \$136 billion initiative would commit \$50 billion for research, science education, and the modernization of research infrastructure. The remaining \$86 billion would finance a revised permanent research and experimentation (R&E) tax incentive over the next 10 years. The current Research and Experimental Federal tax credit expires at the end of 2007

As part of the \$50 billion for research initiatives, the President called for doubling the federal R&D funding over 10 years. This increase would include the physical sciences and engineering research in three agencies: the National Science Foundation (NSF), the Department of Energy's (DOE's) Office of Science, and the National Institute of Standards and Technology (NIST). Based on P. L. 110-5, H.J.Res. 20, both the House and Senate FY2007 appropriations actions would partially fund the President's ACI request. Based on House and Senate actions DOE's Office Science would receive

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<sup>1</sup> See *Rising Above The Gathering Storm and Energizing and Employing America for a Brighter Economic Future*, The National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, The National Academies, 500 Fifth Street, NW Washington, DC 20001, 2005.

\$200 million of ACI funding, NSF is expected to receive an estimated \$217 million of ACI funding, while NIST is estimated to receive \$37 million of ACI funding in FY2007.

Based on current legislative actions, CRS estimates that funding for nondefense R&D expenditures will decline 2%, to an estimated \$57.2 billion. Spending for defense R&D (the sum of DOD's and DOE's defense programs) will increase over 4%, to an estimated \$80.1 billion. Most of the defense increase is due to significant increases in DOD development funding.

Despite the ACI proposal, total federal basic research funding for FY2007 would have been flat at \$28.2 billion (in real dollars). Five agencies accounted for 90% of all federal basic research expenditures in FY2006. Total federal research funding (the sum of basic and applied research) was projected to decline 2.6% in FY2007. That decline was due to a 6.6% drop in applied research funding. The Department of Defense (P. L. 109-289) and the Department of Homeland Security (P .L. 109-295) are the only two agencies that have enacted FY2007 appropriations bills. Funding for NIH in FY2007 would be flat in real dollars.

## Department of Agriculture (USDA)

The FY2007 request for research and education in the U.S. Department of Agriculture (USDA) was \$2,259.9 million, a 12.7% decrease (\$329.7 million) from the FY2006 estimate. (See **Table 1.**) 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 multidisciplinary agricultural research center, located at Beltsville, Maryland. There are approximately 100 research facilities throughout the United States and abroad. The 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. Included in the total support for USDA in FY2007 was \$1,027.8 million for ARS, an 18.8% decrease (\$238.4 million) from FY2006. The Administration had proposed reductions of \$146.0 million in all projects earmarked by Congress — \$50.0 million in project terminations and approximately \$49.0 million in formally unrequested projects. These amounts were to be redirected to high-priority Administration initiatives that included livestock production, food safety, crop protection, human nutrition, and new products/value-added. Included in the FY2007 request for ARS was \$8.4 million for buildings and facilities, a significant reduction from the FY2006 level of \$129.9 million. The \$8.4 million request by the Administration was to fund the design and site preparation of the Classical Chinese Garden of the U.S. National Arboretum. The Garden is a joint project between the governments of the United States and China.

The FY2007 request supported several research priority areas and strategic goals. The USDA assigned priority to the mapping and sequencing projects funded by USDA, such as sequencing genomes of agriculturally important species. The sequencing projects were to be coordinated with ongoing genomics initiatives supported by other federal agencies and facilitated by interagency working groups. Increases were provided for

research involving animal and plant genomes. Also, the FY2007 request provided support for research on emerging and exotic diseases as part of the infrastructure to enhance homeland security. USDA has stated that this research is significant in protecting the nation from the 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. Other research areas that were supported in the FY2007 request included bovine spongiform encephalopathy, air and water quality, food safety, obesity/nutrition, biobased products/bioenergy research, and agricultural information.

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 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 FY2007 request for CSREES was \$997.0 million, a decrease of \$124.5 million from the FY2006 level. Funding for formula distribution in FY2007 to the state Agricultural Experiment Stations (and other eligible institutions) was \$273.2 million, almost level with FY2006. The FY2007 request provided \$37.9 million for the 1890 formula programs, again almost level with FY2006. The FY2007 request was to modify the Hatch formula program by expanding the multistate research programs from 25% to 55.6%. A portion of the funds would be redirected to nationally, competitively awarded grants. It was anticipated that such an approach would continue the matching requirement and leverage nonfederal resources.

The FY2007 request would have funded the National Research Initiative (NRI) Competitive Grants Program at \$247.5 million, \$66.3 million above the FY2006 level. The proposed increase would have supported initiatives in agricultural genomics, emerging issues in food and agricultural security, the ecology and economics of biological invasions, plant biotechnology, and water security. In addition to supporting fundamental and applied science in agriculture, USDA contends that the NRI makes a significant contribution to developing the next generation of agricultural scientists. The FY2007 request included approximately \$7.0 million for grants to educational institutions and community-based organizations to benefit socially disadvantaged farmers and ranchers. These grants are intended to encourage greater participation of black farmers, tribal groups, and Hispanic and other minority groups in the USDA portfolio of commodity, loan, education, and grant offerings.

The Economic Research Service (ERS) is the principal intramural economic and social science research agency in USDA. The FY2007 request for ERS was \$82.5 million, a \$7.3 million increase over FY2006. The proposed increase would have continued the development of a consumer data and information system that provides USDA with, among other things, current food prices, food purchases, sales volumes, and information on consumer characteristics and purchasing behavior. In addition, the increase would support a comprehensive data collection and research program to examine the changing economic health of farm and nonfarm households in rural areas. The multiyear, longitudinal data generated by this initiative would support the programs administered by the Rural Development mission area. 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 FY2007 request for the NASS was \$152.6 million, \$13.3 million above the FY2006 level. Funding would have helped improve the quality of the principal economic indicators used by the Council of Economic Advisors and would support the analysis required to develop the upcoming 2007 Farm Bill. NASS would continue to develop the USDA Enterprise Architecture and the USDA Enablers initiatives.

On May 23, 2006, the House passed H.R. 5384, the Agriculture, Rural Development, Food and Drug Administration and Related Appropriations Act, 2007 (H.Rept. 109-463). The bill would have provided a total of \$2535.9 million for research and education activities in FY2007, \$276.0 million above that which was requested by the Administration, and \$53.7 million below the FY2006 estimate. H.R. 5384 would have provided \$1,197.6 million for ARS in FY2007. Included in the funding for ARS was \$140.0 million for buildings and facilities. The Administration had requested \$8.4 million. The bill supported CSREES at \$1,108.6 million, \$111.6 million above the request, \$12.9 million below the FY2006 estimate. Included in the total for CSREES was \$183.3 million for payments under the Hatch Act. The Committee recommended funding level was 3% above FY2006, and would have been the first time that this program had increased since 1999. The Senate reported its version on June 22, 2006, and provided a total of \$2,580.9 million for research and education in FY2007 (S.Rept. 109-266). Included in the Senate version was \$1,211.0 million for ARS, \$1,145.2 million for CSREES, \$76.0 million for ERS, and \$148.7 million for NASS. **(CRS Contact: Christine M. Matthews.)**

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

	FY2005 Act.	FY2006 Act.	FY2007 Req.	FY2007 House <sup>f</sup>	FY2007 Senate Comm.
<b>Agric. Research Service (ARS)</b>					
Product Quality/Value Added	\$104.6	105.4	\$93.8		
Livestock Production	84.1	85.1	69.8		
Crop Production	196.8	201.4	150.8		
Food Safety	102.7	104.6	108.1		
Livestock Protection	78.5	89.7	98.0		
Crop Protection	193.0	197.2	181.6		
Human Nutrition	83.7	84.8	84.4		
Environmental Stewardship	219.4	223.3	172.3		
National Agricultural Library	21.5	21.8	25.0		
Repair & Maintenance	17.8	17.7	17.7		
<b>Subtotal</b>	<b>1,102.0<sup>d</sup></b>	<b>1,123.7</b>	<b>1,001.4</b>	<b>1,057.6<sup>e</sup></b>	<b>1,127.6</b>
Buildings & Facilities	186.3	129.9	8.4	140.0	83.4
Trust Funds	18.0	0.0	18.0	0.0	0.0
<b>Total, ARS</b>	<b>1,306.3</b>	<b>1,253.6</b>	<b>1,027.8</b>	<b>1,197.6</b>	<b>1,211.0</b>
<b>Coop. St. Res. Ed. &amp; Ext. (CSREES) Research and Education</b>					
Hatch Act Formula	178.7	177.0	176.9	183.3	185.8
Cooperative Forestry Research	22.2	22.0	22.0	22.7	23.3
1890 Colleges and Tuskegee Univ.	12.3	37.2	37.9	38.3	39.1
Special Research Grants	135.5	126.9	18.1	103.5	119.3
NRI Competitive Grants	179.6	181.2	247.5	190.0	190.2
Animal Health & Disease Res.	5.1	5.0	0.0	5.0	5.0
Federal Administration	42.5	50.0	9.2	39.5	41.3



	FY2005 Act.	FY2006 Act.	FY2007 Req.	FY2007 House <sup>f</sup>	FY2007 Senate Comm.
Higher Education <sup>b</sup>	50.7	55.0	69.7	79.3	73.1
<b>Total, Coop. Res. &amp; Educ.<sup>c</sup></b>	<b>655.5<sup>d</sup></b>	<b>670.1</b>	<b>566.3</b>	<b>651.6</b>	<b>678.1</b>
<b>Extension Activities</b>					
Smith-Lever Sections 3b&c	275.5	273.0	273.2	281.4	286.6
Smith-Lever Sections 3d	86.7	92.0	91.5	64.0	65.8
Renewable Resources Extension	4.1	4.0	4.1	4.1	4.2
Integrated Activities	54.7	55.2	19.1	55.2	58.7
1890 Research & Extension	16.8	16.6	16.6	34.1	35.2
Other Extension Prog. & Admin.	7.8	14.7	26.2	18.2	16.6
<b>Total, Extension Activities<sup>c</sup></b>	<b>445.6</b>	<b>451.4</b>	<b>430.7</b>	<b>457.0</b>	<b>467.1</b>
<b>Total, CSREES<sup>e</sup></b>	<b>1,101.1</b>	<b>1,121.5</b>	<b>997.0</b>	<b>1,108.6</b>	<b>1,145.2</b>
Economic Research Service	74.2	75.2	82.5	81.0	76.0
National Agricultural Statistics Service	128.4	139.3	152.6	148.2	148.7
<b>Total, Research, Education &amp; Economics</b>	<b>\$2,610.0</b>	<b>\$2,589.6</b>	<b>\$2,259.9</b>	<b>\$2,535.9</b>	<b>\$2,580.9</b>

- a. Funding levels are contained in U.S. Department of Agriculture FY2007 Budget Summary and other documents internal to the agency.
- b. Higher education includes payments to 1994 institutions and 1890 Capacity Building Grants program, the Native American Institutions Endowment Fund, and the Alaska Native and Native Hawaiian-Serving Institutions Education Grants.
- 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.
- d. Totals may not add due to rounding. Research activities carried out in support of Homeland Security are include in Food Safety, Livestock Protection, and Crop Protection portfolios.
- e. Aggregate support for Homeland Security — FY2005, \$30.2 million, FY2006, \$35.6 million, and FY2007, \$81.5 million.
- f. H.R. 5384, Agriculture, Rural Development, Food and Drug Administration and Related Agencies Appropriations bill, 2007 (H.Rept. 109-463).
- g. Funding levels for specific programs were not available.
- h. H.R. 5384, S.Rept. 109-266.

## Department of Energy (DOE)

The Department of Energy had requested \$9.154 billion for R&D in FY2007, including activities in three major categories: Science, National Security, and Energy. (For details, see **Table 2**.) That request was 3.5% above the FY2006 level of \$8.848 billion. The House had provided a net increase of \$241 million (H.R. 5427). The Senate committee had recommended a net increase of \$738 million. (S.Rept. 109-274).

The requested funding for Science was \$4.102 billion, a 14% increase from FY2006. That unusually large increase reflected the ACI, which the President announced in February 2006 in his State of the Union address. Over the next 10 years, the ACI would have doubled R&D funding for the DOE Office of Science and two other agencies. About \$200 million of the requested increase in FY2007 would have supported an increased operating time for facilities managed by the Basic Energy Sciences program; the House and Senate appropriations reports for FY2006 both called for increased funding for this purpose. In the Fusion Energy Sciences program, the request included \$60 million for the International Thermonuclear Experimental Reactor (ITER), whose estimated U.S. total cost remains at \$1.12 billion through FY2014. The House would

have provided the requested amount for Science, plus \$30 million additional to fund earmarks in the Biological and Environmental Research program. The Senate committee had recommended increases of \$49 million to fund earmarks, \$25 million for water technology R&D, and \$24 million for national laboratory support for primary and secondary math and science education, and a transfer of \$39 million from a National Security program (along with internal Science transfers) to create a program in High Energy Density Science.

The requested funding for R&D in National Security was \$3.188 billion, a 7.4% decrease. Most of the reduction resulted from the completion of construction projects and the elimination of items funded at congressional direction in FY2006. The House would have provided an increases totaling \$143 million, including additional funds for Inertial Confinement Fusion and for the Reliable Replacement Warhead program. The Senate committee recommended a net increase of \$152 million, with additional funds for most weapons programs including the Reliable Replacement Warhead but a transfer of \$39 million out of Inertial Confinement Fusion as noted above.

The requested funding for R&D in Energy was \$1.864 billion, up 3.0% from FY2006. Within this total, R&D on nuclear, biomass, and solar energy would have increased, while natural gas and oil technology programs would have been terminated. Termination of the gas and oil technology programs was also proposed in FY2006, but was rejected by Congress. For FY2007, the House would have provided no funding for gas technology and just \$3 million for oil technology, but it rejected the request for additional nuclear energy R&D funding, and it increased funding for R&D on fossil energy, energy efficiency, and renewable energy. The net House increase for R&D in Energy would have been \$68 million. The Senate committee had recommended a total of \$27 million for the gas and oil technology programs and recommended other increases including \$65 million for biomass, \$100 million for nuclear energy, and \$100 million for coal. The Senate increase for nuclear energy R&D would have nearly doubled the program relative to FY2006. The net Senate committee recommendation for R&D in Energy would have been an increase of \$447 million. **(CRS Contact: Daniel Morgan.)**

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

	<b>FY2005 Comprbl</b>	<b>FY2006 Comprbl.</b>	<b>FY2007 Request</b>	<b>FY2007 House</b>	<b>FY2007 Sen. Cmte.</b>
<b>Science</b>	<b>3635.6</b>	<b>3596.4</b>	<b>4101.7</b>	<b>4131.7</b>	<b>4241.1</b>
Basic Energy Sciences	1083.6	1134.6	1421.0	1421.0	1445.9
High Energy Physics	722.9	716.7	775.1	775.1	766.8
Biological and Environmental Research	566.6	579.8	510.3	540.3	560.0
Nuclear Physics	394.5	367.0	454.1	454.1	434.1
Fusion Energy Sciences	266.9	287.6	319.0	319.0	307.0
Advanced Scientific Computing Rsrch.	226.2	234.7	318.7	318.7	318.7
High Energy Density Science	—	—	—	—	79.9
Other	374.9	276.0	303.5	303.5	328.7
<b>National Security</b>	<b>3406.9</b>	<b>3442.2</b>	<b>3188.0</b>	<b>3331.1</b>	<b>3339.6</b>
Weapons Activities <sup>a</sup>	2327.5	2311.7	2102.6	2196.5	2240.2
Naval Reactors	801.4	781.6	795.1	795.1	795.1
Nonproliferation and Verification R&D	219.8	318.8	268.9	308.1	282.9
Defense Environmental Cleanup TD&D	58.2	30.1	21.4	31.4	21.4
<b>Energy</b>	<b>1727.4</b>	<b>1809.0</b>	<b>1863.8</b>	<b>1931.5</b>	<b>2310.8</b>
Fossil Energy R&D	560.9	592.0	469.7	558.2	644.3
Energy Efficiency and Renewable Energy <sup>b</sup>	908.9	857.0	951.4	1051.6	1119.1
Nuclear Energy R&D	168.4	223.7	347.1	224.1	446.7
Electric Transmn. and Distribn. R&D	89.2	136.3	95.6	97.6	100.7
<b>Total</b>	<b>8769.9</b>	<b>8847.6</b>	<b>9153.5</b>	<b>9394.3</b>	<b>9891.5</b>

- a. Includes Stockpile Services R&D Support, Stockpile Services R&D Certification and Safety, Reliable Replacement Warhead, 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.
- b. Excluding Weatherization and Intergovernmental Activities.

## Department of Defense (DOD)

Nearly all of what the Department of Defense (DOD) spends on Research, Development, Test and Evaluation (RDT&E) is appropriated in Title IV of the defense appropriation bill (see **Table 3**). For FY2007, the Bush Administration requested \$73.2 billion for DOD's baseline Title IV RDT&E. The baseline Title IV RDT&E request was \$2.0 billion more than the total obligational authority available for Title IV in FY2006. RDT&E funds were also requested as part of the Defense Health Program (\$131 million)

and the Chemical Agents and Munitions Destruction Program (\$231 million). The five-year budget plan projects spending \$366.5 billion for RDT&E through FY2011. The Administration's FY2007 budget projection for RDT&E through FY2011 is nearly \$22 billion more than its projection last year.

While the FY2007 RDT&E request represents an increase in RDT&E funding over last year, Science and Technology (S&T) funding would decrease. S&T consists of basic and applied research and advanced development (6.1, 6.2, and 6.3 activities in the RDT&E account). Although the FY2007 S&T budget request (\$11.1 billion) was approximately \$600 million more than the amount requested by the Administration for FY2006, the FY2007 S&T request was \$2.2 billion less than the amount Congress appropriated for S&T in FY2006. The difference between the FY2007 S&T request and the amount appropriated by Congress for FY2006 roughly equals the amount the Administration claims was earmarked by Congress in the FY2006 S&T appropriation. The FY2006 request for basic research (\$1.4 billion) was \$70 million less than what Congress appropriated in FY2006 for basic research, but is over \$100 million more than what the Administration requested for basic research in FY2006. 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 FY2007 S&T request was approximately 2.6% of the overall baseline DOD budget request. This amount is below the 3% target that the Bush Administration and Congress have set. The FY2007 budget request for Missile Defense RDT&E was \$9.3 billion (an increase of \$1.7 billion from the amount available for Missile Defense in FY2006).

The House approved its defense appropriation bill (H.R. 5631) on June 20. The House voted to appropriate \$75.3 billion for Title IV RDT&E, about \$2.2 billion above what was requested. The increase went primarily to the S&T portion of the program, which was funded at \$13.3 billion. The S&T amount roughly equals 3.2% of the total appropriation for DOD (this includes the \$50 in additional war-related appropriations allocated in Title IX — no RDT&E funds were included in Title IX). The House also approved \$231 million for the Chemical Agents and Munitions Destruction Program. In a separate appropriation bill (H.R. 5385, the Military Quality of Life and Veterans Affairs and Related Agencies Appropriations Bill, 2007), the House approved \$444 million for RDT&E within the Defense Health Program. This includes \$115 million for the peer reviewed breast cancer research program and \$80 million for the prostate cancer program.

The Senate approved its defense appropriation bill on September 7. The Senate voted to appropriate \$73.0 billion for Title IV RDT&E, about \$200 million less than the Administration's request and about \$2.4 billion less than what the House approved. The Senate did approve more S&T funding than was requested, but was not as generous as the House. At just under \$12.0 billion, the Senate's S&T appropriation represents a little less than 3% of the total amount they appropriated for DOD (this does not consider the additional appropriations of \$50 billion allocated for continuing operations in the global war on terror). Of the \$50 billion allocated by the Senate for the Global War on Terror, \$298 was allocated to RDT&E. In addition, the Senate approved \$468 million in RDT&E funds for the Defense Health Program (including \$150 million for the peer reviewed breast cancer program and \$80 million for the peer reviewed prostate cancer program). The Senate also approved \$231 for RDT&E in the Chemical Agents and Munitions Destruction Program. The Senate appropriated about \$400 million less for DARPA than

was requested, making cuts in nearly all of DARPA's line items. The Senate approved \$9.4 billion for missile defense RDT&E, about \$62 million more than was requested.

The conference committee approved \$75.4 billion for Title IV RDT&E. (See P.L. 109-289.) This includes a general reduction of \$287 million due to improved economic assumptions (see Section 8106 of the conference report). The conference committee also approved \$13.3 billion for S&T. This does not include S&T's share of the general reduction. In Title IX of the conference bill, providing for additional funds for the war on terrorism, another \$408 million was added for RDT&E. In addition, Title IX provided \$1.9 billion for the Joint Improvised Explosive Device Defeat Fund. The Secretary may transfer funds to those budget activities, including RDT&E, as necessary to accomplish the purposes of defending troops against such devices. The conference committee also approved \$231 million in RDT&E for the Chemical Agents and Munitions Destruction program. However, it also, as part of the general reduction cited above reduced Title VI funding by \$9.5 million. The \$231 million figure mentioned above does not include the program's share of this general reduction. (CRS Contact: John Moteff.)

**Table 3. Department of Defense RDT&E**

	<b>FY2006 Estimate<sup>e</sup></b>	<b>FY2007 Request<sup>g</sup></b>	<b>FY2007 House Apprn.</b>	<b>FY2007 Senate Apprn.</b>	<b>FY2007 Conf. Apprn.</b>
<b>Accounts</b>		<b>Billions \$</b>			
Army	11,026	10,856	11,835	11,245	11,055
Navy	18,734	16,912	17,655	17,048	18,674
Air Force	21,671	24,397	24,457	23,974	24,516
Defense Agencies	19,555	20,810	21,208	20,543	21,291
(DARPA)	(2,979)	(3,294)	(3,327)	(2,893)	(3,135)
(MDA <sup>a</sup> )	(7,682)	(9,310)	(8,955)	(9,372)	(9,421)
Dir. Test & Eval	166	182	182	188	185
<b>Adjustments improved economic assumptions</b>				-317	-286
<b>Total Obligational Authority</b>	<b>71,152</b>	<b>73,157</b>	<b>75,337</b>	<b>72,998</b>	<b>75,435</b>
<b>Budget Activity</b>					
Basic Research	1,470	1,422	1,571	1,479	1,552
Applied Research	5,168	4,478	5,276	4,805	5,282
Advanced Dev.	6,603	5,183	6,461	5,702	6,494
Advanced Component Dev. and Prototypes	13,913	15,387	15,163	15,246	15,785
Systems Dev. and Demo	19,343	19,277	19,255	19,072	19,190
Mgmt. Support <sup>b</sup>	4,025	3,938	4,171	4,131	4,197
Op. Systems Dev	20,630	23,471	23,440	22,563	23,221

	<b>FY2006 Estimate<sup>e</sup></b>	<b>FY2007 Request<sup>g</sup></b>	<b>FY2007 House Apprn.</b>	<b>FY2007 Senate Apprn.</b>	<b>FY2007 Conf. Apprn.</b>
<b>Adjustments improved economic assumptions</b>				-317	-286
<b>Total Obligational Authority <sup>c</sup></b>	<b>71,152</b>	<b>73,156</b>	<b>75,337</b>	<b>72,998</b>	<b>75,435</b>
<b>Other Defense Programs</b>					
Defense Health Program	536	131	444	468	n/a <sup>h</sup>
Chemical Agents and Munitions Destruction	67	231	231	231	231
<b>Adjustments improved economic adjustments</b>				-94	-9
<b>Title IX Additional Appropriations for the Global War on Terror</b>	51 <sup>f</sup>		0	298	408

**Sources:** Figures based on Department of Defense Budget, FY2007 RDT&E Programs (R-1), February 2006. Figures for the Defense Health Program are taken from the Department of Defense Budget, FY2007 Operations and Maintenance Programs (O-1) document and the Chemical Agents, and Munitions Destruction Program figures are taken from the Department of Defense Budget, FY2007 Procurement Programs (P-1) document. Both released in February 2006. Totals may not add due to rounding. FY2007 House appropriation figures taken from H.Rept. 109-504, and for the Defense Health Program totals, from H.Rept. 109-464. Senate appropriation figures taken from S.Rept. 109-292. Conference figures taken from H.Rept. 109-676.

- a. Includes only BMD RDT&E. Does not include procurement and military construction.
- b. Includes funds for Developmental and Operational Test and Evaluation.
- c. Numbers may not agree with Account Total Obligational Authority due to rounding.
- d. The FY2005 figures in the R-1 reflect the FY2005 Supplemental (P.L.109-13) which included \$587 million for RDT&E. They do not include any rescissions passed as part of the FY2007 appropriation bills.
- e. The FY2006 figures reflect the 1% across the board cut called for in the FY2006 DOD Appropriations bill (P.L. 109-148). The FY2006 figures do not include the \$782 million requested for RDT&E in the \$72.4 billion FY2006 emergency supplemental request of February 16, 2006, nor the approximately \$19.0 million for RDT&E included in another Katrina-related supplemental, also requested February 16, 2006. Nor do the FY2006 figures include any rescissions passed as part of the FY2007 appropriation bills.
- f. It is not clear if the FY2006 figures in the R-1 reflect the \$91.9 million in additional RDT&E funding included in Title IX (Division A) and Title IX (Division B) of the FY2006 DOD Appropriations. Division A appropriated contingency funds for the Global War on Terror that included \$50.6 million for specified RDT&E programs. Division B provided emergency funds for hurricane relief that included \$41.6 million for specified RDT&E activities. The \$51 million listed here represents the Division A funds, and, therefore may lead to double counting.
- g. It is not clear if the FY2007 R-1 figures include any RDT&E funds associated with another request by the Administration for contingency funds for the Global War on Terror to be included as part of the FY2007 DOD appropriations bill.
- h. This is funded as part of the Military Quality-Veteran's Affairs Appropriation (H.R. 5385)

## National Aeronautics and Space Administration (NASA)

NASA had requested \$12.336 billion for R&D in FY2007. (For details, see **Table 4.**) That request was a 7.5% increase over FY2006, in a total NASA budget that would have increased by just 1.0%. Within the increase for NASA R&D overall, however, a large increase for Constellation Systems (primarily the new Crew Exploration Vehicle and its launch vehicle) would have been offset by decreases for Human Systems and Aeronautics and an increase for Science that was substantially less than previously projected. The House would have provided \$12.260 billion (H.R. 5672). The Senate committee had recommended \$12.300 billion (S.Rept. 109-280). Both the House and Senate provided less than requested for Exploration Systems and more for Aeronautics and Science.

Budget priorities throughout NASA are being driven by the Vision for Space Exploration. Announced by President Bush in January 2004 and endorsed by Congress in the NASA Authorization Act of 2005 (P.L. 109-155), the Vision includes returning the space shuttle to flight status, then retiring it by 2010; completing the space station, but discontinuing its use by the United States by 2017; returning humans to the moon by 2020; and then sending humans to Mars and “worlds beyond.” Constellation Systems, the only R&D program to receive a large increase in the FY2007 request, is responsible for developing vehicles to return humans to the moon. The reduced rate of growth in requested funding for the Science Mission Directorate, a total reduction of \$3.1 billion through FY2010 relative to projections in the FY2006 request, is mostly to offset higher than expected costs for returning the space shuttle to flight status.

The request for Science has been particularly controversial. It includes full funding for a Hubble Space Telescope servicing mission in early FY2008 (pending approval by the Administrator), but several robotic missions to Mars are cancelled or deferred. In addition, no funding was requested for the SOFIA airborne infrared telescope or the Europa mission to one of Jupiter’s moons. The request for Research and Analysis, which provides grant funding to individual researchers, was down 15% from FY2006 in most programs. The House had provided an increase of \$75 million for Science, including \$50 million for Research and Analysis. The Senate committee had recommended an increase of \$31.5 million and directed NASA to fund SOFIA through a reprogramming request.

The request for Aeronautics Research is also of congressional interest. Although the requested budget for aeronautics is about the same as was projected a year earlier, the proposed activities have changed significantly. The largest program, Vehicle Systems, has been renamed Fundamental Aeronautics and will now focus on “core competencies” in subsonic, supersonic, and hypersonic flight regimes, including work on rotorcraft. An amendment to the Senate FY2007 budget resolution (S.Amdt. 3033 to S.Con.Res. 83) increased the recommended funding for NASA aeronautics by \$179 million. The House would have provided an increase of \$100 million. The Senate committee also recommended an increase of \$35 million. **(CRS Contact: Daniel Morgan.)**

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

	FY2006 Estimated <sup>a</sup>	FY2007 Request	FY2007 House	FY2007 Sen. Cmte.
Science	5,253.7	5,330.0	5,404.8	5,361.5 <sup>d</sup>
<i>Solar System Exploration</i>	1,582.3	1,610.2	— <sup>c</sup>	1,610.2 <sup>d</sup>
<i>The Universe</i>	1,507.9	1,509.2	— <sup>c</sup>	1,509.2 <sup>d</sup>
<i>Earth-Sun Systems</i>	2,163.5	2,210.6	— <sup>c</sup>	2,242.1 <sup>d</sup>
Exploration Systems	3,050.1	3,978.3	3,827.6	3,921.5 <sup>d</sup>
<i>Constellation Systems</i>	1,733.5	3,057.6	3,041.6	2,960.8 <sup>d</sup>
<i>Exploration Systems Research and Technology</i>	692.5	646.1	511.4	686.1 <sup>d</sup>
<i>Human Systems Research and Technology</i>	624.1	274.6	274.6	274.6 <sup>d</sup>
Aeronautics Research	884.1	724.4	824.4	759.4 <sup>d</sup>
Cross-Agency Support Programs	533.5	491.7	425.2	491.7 <sup>d</sup>
International Space Station	1,753.4	1,811.3	1,777.9	1,811.3
Reductions not Allocated	—	—	—	— 45.3 <sup>d</sup>
<b>Subtotal R&amp;D</b>	<b>11,474.8</b>	<b>12,335.7</b>	<b>12,259.9</b>	<b>12,300.1</b>
Space Shuttle	4,777.5 <sup>b</sup>	4,056.7	4,056.7	4,056.7
Return to Flight <sup>e</sup>	—	—	—	1,000.0
Space and Flight Support	338.8	366.5	358.9	366.9
Hurricane Katrina <sup>e</sup>	—	—	—	40.0
Inspector General	32.0	33.5	33.5	33.5
<b>Total NASA</b>	<b>16,623.0<sup>b</sup></b>	<b>16,792.2</b>	<b>16,709.0</b>	<b>17,797.2<sup>e</sup></b>

- a. Figures for FY2006 are from NASA's January 2006 operating plan and are not final. Figures for FY2005 are not shown because changes in budget structure and program shifts between accounts make comparisons between FY2005 and FY2007 difficult.
- b. Includes \$349.8 million in emergency supplemental funding for Hurricane Katrina response and recovery.
- c. The House did not specify amounts at the "theme" level within Science.
- d. The Senate committee did not specify amounts within the Science, Aeronautics, and Exploration appropriations account. These amounts in the table are estimated by CRS based on the requested amounts and the program increases and decreases specified in the committee report (S.Rept. 109-280). The amount shown as "Reductions not Allocated" is calculated by CRS as the difference between the recommended overall decrease for the account and the sum of the specified program increases and decreases.
- e. The Senate committee recommended two new appropriations accounts, Return to Flight and Hurricane Katrina, both of which would be emergency funding. Excluding emergency funding, the Senate committee total for NASA is \$16,757.2 million. Neither new account would fund R&D.



## National Institutes of Health (NIH)

The President requested a program level budget of \$28.487 billion for NIH for FY2007, essentially equal to the FY2006 final budget and \$66.8 million (0.2%) lower than the FY2005 level of \$28.553 billion (see **Table 5**). The FY2006 amount was the first decrease in NIH's appropriation since 1970. (NIH lost an additional \$19.5 million in FY2006 funds in June 2006 when the HHS Secretary exercised his transfer authority to give the Centers for Medicare and Medicaid Services a total of \$40 million from other HHS discretionary accounts, dropping the NIH program level to \$28.468 billion.) The House and Senate Appropriations Committees reported separate FY2007 Labor-HHS-Education Appropriations bills (H.R. 5647, H.Rept. 109-515 and S. 3708, S.Rept. 109-287), but neither chamber scheduled floor action. The House committee recommended funding most of the NIH accounts at the same level as the request. The Senate bill would have provided a program level of \$28.688 billion, an increase of about \$220 million (0.8%) over the revised FY2006 amount and \$200 million above the request and the House amount. The Senate committee gave every NIH account a modest increase over FY2006, reversing the cuts to institute and center budgets proposed in the request. Currently, NIH is operating at the FY2006 rate under the continuing resolution (P.L. 109-383) that runs through February 15, 2007.

The bulk of NIH's budget comes through the Labor-HHS-Education appropriation (\$28.350 billion in the request). An additional small amount for environmental work related to Superfund comes from the Interior, Environment, and Related Agencies appropriation (H.R. 5386, H.Rept. 109-465 and S.Rept. 109-275). Those two sources constitute NIH's discretionary budget authority. In addition, NIH receives \$150 million preappropriated in separate funding for diabetes research and \$8.2 million from a transfer within the Public Health Service (PHS). As in past years, the budget request proposed that \$100 million of the NIH appropriation be transferred to the Global Fund to Fight HIV/AIDS, Tuberculosis, and Malaria. (The "NIH program level" cited in the Administration's budget documents, however, did not reflect that transfer.) The House Appropriations Committee did not include the requested bill language for the transfer, which would have come from the appropriation for the National Institute of Allergy and Infectious Diseases (NIAID). Instead, the committee report noted that it provided increased funding for HIV/AIDS activities in the Centers for Disease Control and Prevention (CDC) and the Health Resources and Services Administration (HRSA). The Senate committee included the \$100 million transfer as in the request.

FY2003 was the final year of the five-year effort to double the NIH budget from its FY1998 base of \$13.7 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 that were below the then-estimated 3.5% and 3.3% biomedical inflation index for those two years. (The index was subsequently updated to show inflation of 3.7% for FY2004 and 3.8% for FY2005.) The research advocacy community had originally urged that the NIH budget grow by about 10% per year in the post-doubling years. They modified their recommendation to 6% for FY2006 and 5% for FY2007,

maintaining that such increases would be needed to continue the momentum of scientific discovery made possible by the increased resources of the doubling years. With the projected biomedical inflation index at 3.5% for FY2006 and 3.4% for FY2007, the NIH budget has been losing ground in real terms each year since the end of the doubling in FY2003. In constant 2006 dollars, the FY2003 NIH budget was \$30.2 billion, the FY2004 level was \$30.0 billion, FY2005 was \$29.6 billion, FY2006 was \$28.5 billion, and the FY2007 request level was \$27.5 billion. In inflation-adjusted terms, the FY2006 budget was 5.7% below the FY2003 level, and the FY2007 request was 8.7% below the FY2003 level.

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 of which focuses 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 OD. 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 three centers, not included in the table, are funded through the NIH Management Fund, financed by taps on other NIH appropriations.)

Although the FY2007 President's budget requested the same overall level of funding for NIH as in FY2006 (not taking into account the later reduction in FY2006), there were variable increases and decreases among the ICs and among the different funding mechanisms. Most of the IC budgets would have decreased by 0.5%-0.8%, with several of the larger institutes losing between \$10 million and \$40 million. In the request, two accounts gained funds over FY2006: NIAID, up \$12 million (0.3%), largely due to pandemic influenza funding, and the Office of the Director (OD), up \$140 million (26.6%). The OD increase included a program formerly in NIAID for advanced development of biodefense countermeasures (up \$110 million) and the OD contribution to the NIH Roadmap (up \$29 million). Both programs are discussed below. In the House committee recommendation, funding for NIAID dropped 2.6% below FY2006 because the \$100 million Global Fund money was removed, as was \$25 million for construction and renovation of biosafety laboratories. The biodefense facilities construction money was moved to the more general extramural construction program in the National Center for Research Resources (NCRR), giving that account a 2.2% increase. The Senate committee bill did not move the laboratory construction funds.

*Specific priorities* highlighted in the budget request included several trans-NIH initiatives involving multiple institutes with coordination by OD. *Biodefense* activities were slated to receive a total of \$1.9 billion, a net increase of \$110 million (6.2%) over FY2006. The request planned for a \$160 million fund in OD (up \$110 million) for the advanced product development of vaccines and drugs that are priority targets for acquisition by Project BioShield. The activity would involve NIH more extensively than usual in working with academia and industry to bridge the research gap between investigational testing of a new drug and full product development. Also in OD was \$96 million for research on countermeasures against nuclear/radiological threats and chemical threats, the same as in FY2006.

The *NIH Roadmap for Medical Research Program*, launched in September 2003, has identified critical scientific gaps that may be constraining rapid progress in biomedical research. Consequently, the agency has developed a list of 28 NIH-wide initiatives to address the gaps. NIH planned to fund Roadmap initiatives at \$443 million for FY2007 (\$332 million from the institutes and centers and \$111 million from the Director's Discretionary Fund), up \$113 million (34%) from FY2006. Three core themes focus on new paths to biological discoveries (\$181 million), building multidisciplinary research teams (\$81 million), and improving the clinical research enterprise (\$181 million).

The *Genes, Environment, and Health* initiative would have received a total of \$68 million (up \$49 million) for its second year of funding. It will look for genetic and environmental interactions that might increase the risk of common chronic diseases and will work on new technologies for assessing the role of diet, physical activity, and environmental exposures in disease. On the other hand, a long-term (25+ year) environmental health study called the *National Children's Study*, after five years of planning, was proposed for cancellation in the request. The multi-agency study, mandated by the Children's Health Act of 2000 (P.L. 106-310), plans to examine the effects of environmental influences on the health and development of more than 100,000 children across the United States, following them from before birth until age 21. Its planned cost for FY2007 was \$69 million (up from \$10 million in FY2006), and the overall projected cost for the whole study is about \$2.7 billion. The House committee rejected the termination and included bill language directing NIH to spend \$69 million on the study. The Senate committee report directed NIH to continue with the study, noting that extra funding had been included in OD (the Senate OD total was \$20 million higher than the request).

The new *Pathway to Independence Award* program (\$15 million in the request) addresses NIH concerns about the support of new investigators, particularly younger scientists making the transition from training to independent research. The average age at which they receive their first independent grant has been increasing. In January 2006, NIH announced the new program to support promising postdoctoral scientists. The five-year awards will have a two-year mentored phase and a three-year independent phase. NIH expected to support 150-200 awards beginning in Fall 2006, and a similar number in each of the following five years, for a total commitment of almost \$400 million. The new *Clinical and Translational Science Award* (CTSA) program, administered by the National Center for Research Resources (NCRR), has been developed to foster transdisciplinary clinical research and training, with the goal of speeding the translation of the findings of "discovery" research into clinical practice. Begun in FY2006, the program will transition elements of existing clinical research programs into CTSA's. Funding was estimated at \$361 million for FY2007, including an additional \$3 million requested in NCRR, sponsor of the current General Clinical Research Centers program.

In addition to showing the appropriation by institute, the other common way to describe the NIH budget is by "funding mechanism." On average, the ICs devote more than 80% of their budgets to supporting peer-reviewed extramural research by awarding research project grants, 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 remaining 15%-20% of the IC budgets

supports their intramural research programs and research management costs. Budget data displayed by funding mechanism 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 research contracts, research career training, facilities construction, and so forth.

The largest category, “*research project grants*” (RPGs), represented 53% of the total NIH request, or \$15.1 billion. NIH estimated it would support a total of 37,671 RPGs in FY2007, which was 656 fewer grants than the estimate for FY2006. The main reason for the drop was that a large number of grants that were started toward the end of the doubling years were completing their funding cycles. (The average length of an RPG award is just under four years, but each year’s funds are awarded separately from that year’s appropriation.) Within the RPG total, about one quarter (9,337, for \$3.3 billion) were to be “competing” (new or competing renewal) grants, and the remaining three-quarters were to be noncompeting (continuation) grants. The estimated number of competing RPGs would have been 275 more than the FY2006 number. The request proposed that the average cost of a competing RPG would not increase over the FY2006 level, and that noncompeting grants would receive no inflationary increases. NIH expected that the “success rate” of applicants receiving funding for competing RPGs would be about 19%, the same as FY2006, compared with 22% in FY2005. During the doubling years, the success rate averaged 30%-32%.

In the request, support for research *centers* would have grown by 2.3% to \$2.8 billion; research *training* grants would have remained at the FY2006 level (\$760 million); research and development *contracts* would have increased by \$44 million (1.6%) to \$2.7 billion because of the Genes, Health, and Environment initiative; the *intramural* research program (\$2.8 billion) was slated to decrease by \$9 million (0.3%); research *management* and support would have increased by \$14 million (1.3%) to \$1.1 billion; extramural research *facilities construction* would have supported only the \$25 million for biosafety labs, with no funds (same as FY2006) for non-biodefense extramural construction; and funding for NIH’s own *buildings and facilities* remained at \$89 million. As noted above, by moving the \$25 million in facilities construction money from NIAID to NCRRL, the House bill made the funds available for open competition instead of being limited to biodefense facilities.

The NIH and other Public Health Service agencies within HHS are subject to a budget “tap” called the PHS Program Evaluation Transfer (section 241 of the PHS Act), which has the effect of redistributing appropriated funds among PHS agencies. The FY2005 and FY2006 Labor-HHS appropriations set the tap at 2.4%, as did the FY2007 Senate bill. The House bill returned the maximum tap to 1.0%, the level specified in the PHS Act. NIH, with the largest budget among the PHS agencies, is the largest “donor” of program evaluation funds and is a relatively minor recipient.

At the end of the 109<sup>th</sup> Congress, the House and Senate agreed on the first NIH reauthorization statute enacted since 1993, the NIH Reform Act of 2006 (P.L. 109-482). The law made managerial and organizational changes in NIH, focusing on enhancing the authority and tools for the NIH Director to do strategic planning, especially to facilitate and fund cross-institute research initiatives. It required

detailed tracking of the research portfolio and periodic review of NIH's organizational structure. The measure authorized, for the first time, overall funding levels for NIH, although not for the individual ICs, and established a "common fund" for trans-NIH research. For further information on NIH, see CRS Report RL33695, *The National Institutes of Health: Organization, Funding, and Congressional Issues*, by Pamela W. Smith. (CRS Contact: Pamela Smith.)

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

Institutes and Centers (ICs)	FY2005 actual <sup>a</sup>	FY2006 rev appr <sup>b</sup>	FY2007 request	FY2007 H.Comm.	FY2007 S.Comm.
Cancer (NCI)	\$4,828.2	\$4,790.1	\$4,753.6	\$4,753.6	\$4,799.1
Heart/Lung/Blood (NHLBI)	2,941.2	2,919.8	2,901.0	2,901.0	2,924.3
Dental/Craniofacial Res (NIDCR)	391.8	389.1	386.1	386.1	389.7
Diabetes/Diges/Kidney (NIDDK)	1,713.6	1,703.8	1,694.3	1,694.3	1,707.8
Neuro. Disorders/Stroke (NINDS)	1,539.4	1,533.7	1,524.8	1,524.8	1,537.7
Allergy/Infectious Dis (NIAID) <sup>c</sup>	4,402.8	4,380.3	4,395.5	4,270.5	4,395.5
General Medical Sci (NIGMS)	1,944.1	1,934.3	1,923.5	1,923.5	1,934.9
Child Health (NICHD)	1,270.3	1,263.9	1,257.4	1,257.4	1,264.5
Eye (NEI)	669.1	666.3	661.4	661.4	666.9
Environ Health Sci (NIEHS)	644.5	640.7	637.3	637.3	641.3
Aging (NIA)	1,052.0	1,045.9	1,039.8	1,039.8	1,048.9
Arthritis/Musculo/Skin (NIAMS)	511.2	507.6	504.5	504.5	508.6
Deafness/Comm'n Dis (NIDCD)	394.3	393.2	391.6	391.6	395.2
Nursing Research (NINR)	138.1	137.2	136.6	136.6	137.8
Alcohol Abuse (NIAAA)	438.3	435.6	433.3	433.3	436.6
Drug Abuse (NIDA)	1,006.4	999.3	994.8	994.8	1,000.3
Mental Health (NIMH)	1,411.9	1,402.6	1,394.8	1,394.8	1,403.6
Human Genome Res (NHGRI)	488.6	485.7	482.9	482.9	486.3
Bio Imaging/Bioengrg (NIBIB)	298.2	296.6	294.9	294.9	297.6
Research Resources (NCRR)	1,115.1	1,098.3	1,098.2	1,123.2	1,104.3
Complemnt/Alt Med (NCCAM)	122.1	121.4	120.6	120.6	122.0
Minority Hlth/Disparity (NCMHD)	196.2	195.3	194.3	194.3	196.8
Fogarty International Center (FIC)	66.6	66.3	66.7	66.7	66.8
Library of Medicine (NLM)	315.1	314.7	313.3	313.3	315.3
Office of Director (OD) <sup>d</sup>	405.1	527.2	667.8	667.8	687.8
Buildings & Facilities (B&F)	110.3	81.0	81.1	81.1	81.1
<i>Subtotal, Labor-HHS-ED Approp</i>	<i>\$28,414.5</i>	<i>\$28,329.8</i>	<i>\$28,350.0</i>	<i>\$28,250.0</i>	<i>\$28,550.7</i>
Superfund (Interior/Env Approp) <sup>e</sup>	79.8	79.1	78.4	79.4	79.4
<b>Total, NIH discr budget auth</b>	<b>\$28,494.4</b>	<b>\$28,409.0</b>	<b>\$28,428.4</b>	<b>\$28,329.4</b>	<b>\$28,630.1</b>
Pre-approp Type 1 diabetes <sup>f</sup>	150.0	150.0	150.0	150.0	150.0
NLM program evaluation <sup>g</sup>	8.2	8.2	8.2	8.2	8.2
<b>Total, NIH program level</b>	<b>\$28,652.6</b>	<b>\$28,567.2</b>	<b>\$28,586.6</b>	<b>\$28,487.6</b>	<b>\$28,788.3</b>
Global HIV/AIDS Fund transfer <sup>c</sup>	-99.2	-99.0	-100.0	0.0	-100.0
<b>Total, NIH prog level w/ transfer</b>	<b>\$28,553.4</b>	<b>\$28,468.2</b>	<b>\$28,486.6</b>	<b>\$28,487.6</b>	<b>\$28,688.3</b>

**Sources:** FY2007 NIH budget justification, H.Rept. 109-515, and S.Rept. 109-287.

**Note:** FY2007 funding was continued at the FY2006 rate until February 15, 2007 by P.L. 109-383.

a. Reflects across-the-board reduction (0.8%) of \$229.390m, Labor-HHS-ED reduction of \$6.787m for salaries and expenses, and an additional \$2.987m from NCI breast cancer stamp funds.

b. Reflects across-the-board rescission (1%) of \$285.974m, Interior/Env reduction of \$0.382m, and HHS transfer of \$19.462m to Centers for Medicare and Medicaid Services (mid-June 2006).

- c. NIAID totals include funds for transfer to Global Fund to Fight HIV/AIDS, TB, and Malaria (not in FY2007 House bill). FY2006 includes \$18.0m supplemental funding from Public Health and Social Services Emergency Fund (PHSSEF) for pandemic flu (P.L. 109-148), and a comparable transfer of \$49.5m from NIAID to OD for Advanced Development of countermeasures.
- d. OD has Roadmap funds for distribution to ICs (FY2005, \$59.520m; FY2006, \$82.170m; FY2007, \$110.700m). FY2005 includes \$47.021m transferred from PHSSEF for nuclear/radiological countermeasures. FY2006 includes the \$49.5m comparable transfer from NIAID.
- e. Separate account in the Interior/Environment/Related Agencies appropriation for NIEHS research activities mandated in Superfund legislation (formerly in VA/HUD appropriation).
- f. Pre-appropriated funds available to NIDDK for diabetes research (P.L. 106-554 and P.L. 107-360).
- g. Funds from PHS program evaluation set-aside (§ 241 of the PHS Act), \$8.2m for NLM each year.

## National Science Foundation (NSF)

The FY2007 request for the National Science Foundation (NSF) was \$6,020.0 million, a 7.9% increase (\$438.8 million) over the FY2006 level of \$5,581.2 million. (See **Table 6**). President Bush's ACI proposed to double the NSF budget over the next 10 years. The FY2007 request was to be the first installment toward that doubling effort. The FY2007 request for NSF was designed to support several interdependent priority areas: broadening participation in the science and engineering enterprise, providing world-class facilities and infrastructure, advancing research at the frontier, and bolstering K-12 education. NSF was to invest approximately \$640.0 million in programs targeted at those groups underrepresented in the science and engineering workforce. Total support for providing world-class facilities would have approached \$1.7 billion. Across the agency, activities for advancing research at the frontiers of science were anticipated to reach \$4.7 billion.

The 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 Administration requested \$40.6 million for the Office of International Science and Engineering. Also, in FY2007, NSF continued in its leadership role in planning U.S. participation in observance of the International Polar Year, which spans 2007 and 2008. A first-year investment of \$62.0 million was provided to address major challenges in polar research. Other proposed FY2007 highlights included funding for the National Nanotechnology Initiative (\$373.2 million), investments in Climate Change Science Program (\$205.3 million), continued support for homeland security (\$384.2 million), and funding for Networking and Information Technology Research and Development (\$903.7 million). Also, a new effort in the FY2007 request was to be a \$20.0 million program of fundamental research on new technologies for sensor systems that detect explosives.

Included in the FY2007 request was \$4,666.0 million for Research and Related Activities (R&RA), a 7.7% increase (\$334.5million) over the FY2006 level of \$4,331.5 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 FY2007 request had provided increased funding for the physical sciences — \$248.5 million, a 6.6% increase (\$15.4 million) over the FY2006 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. IA also

funds Partnerships for Innovation, disaster research teams, and the Science and Technology Policy Institute. The FY2007 request for IA was \$131.4 million, a 4.2% decrease (\$5.8 million) from the FY2006 estimate. The Office of Polar Programs (OPP) is funded in the R&RA. In FY2006, responsibility for funding the costs of icebreakers that support scientific research in polar regions was transferred from the U.S. Coast Guard to the NSF. The NSF will continue to operate and maintain the three icebreakers. The OPP was funded at \$438.1 million in the FY2007 request, 12.5% above the FY2006 level. Significant increases in OPP for FY2007 were directed at the programs for arctic and antarctic sciences.

Research project support in the FY2007 would have totaled \$2,413.7 million. This support is provided to individuals and small groups conducting disciplinary and cross-disciplinary research. Included in the total for research projects was support for centers, proposed at \$259.8 million. The NSF supports a variety of individual centers and center programs. The FY2007 request provided \$67.5 million for Science and Technology Centers, \$55.7 million for Materials Centers, \$62.8 million for Engineering Research Centers, \$37.4 million for Nanoscale Science and Engineering Centers, and \$6.5 million for Centers for Analysis and Synthesis.

The Major Research Equipment and Facilities Construction (MREFC) account would have been funded at \$240.5 million in the FY2007, a 26% increase (\$49.6 million) over the FY2006 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 directed at projects that have been approved by the National Science Board 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 stated that the projects scheduled for support in the FY2007 request met that qualification. Five ongoing projects and two new starts were proposed for funding in the FY2007 request: Atacama Large Millimeter Array Construction (\$47.9 million), EarthScope (\$27.4 million), Ice Cube Neutrino Observatory (\$28.7 million), National Ecological Observatory Network (\$12.0 million), Scientific Ocean Drilling Vessel (\$42.9 million), Alaskan Region Research Vessel (\$56.0 million), and Ocean Observatories Initiative (\$13.5 million).

The FY2007 request had also supported several NSF-wide investments in: biocomplexity in the environment (\$42.6 million), human and social dynamics (\$41.5 million), and mathematical sciences (\$78.5 million). Additional priority areas included those of strengthening core disciplinary research, continuing as lead federal agency in networking and information technology R&D, and sustaining organizational excellence in NSF management practices. The NSF maintained 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 21<sup>st</sup> century research and education. An investment of \$596.8 million in cyberinfrastructure would have allowed for funding of modeling, simulation, visualization, and data storage and other communications breakthroughs. NSF anticipated that this level of funding would 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 23% in FY2006.

The FY2007 request for the Education and Human Resources Directorate (EHR) was \$816.2 million, a 2.5% increase (\$19.5 million) over FY2006. 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 FY2007 request was to be as follows: precollege, \$215.0 million; undergraduate, \$196.8 million; and graduate, \$160.6 million. Priorities at the precollege level include research and evaluation on education in science and engineering (\$41.2 million), informal science education (\$65.6 million), and a new program, Discovery Research K-12 (\$104.1 million). Discovery Research was structured to combine the strengths of three existing programs and encourage innovative thinking in K-12 science, technology, engineering, and mathematics education.

At the undergraduate level, approximately 72% of the funding was to be in support of new awards and activities. Priorities at the undergraduate level included the Robert Noyce Scholarship Program (\$9.8 million), Course, Curriculum and Laboratory Improvement (\$86.5 million), STEM Talent Expansion Program (\$26.1 million), the National STEM Education Digital Library (\$16.0 million), the Federal Cyber Service (\$11 million), and Advanced Technological Education (\$45.9 million). The Math and Science Partnership Program (MSP) was transferred to the undergraduate level in the FY2007 request.

MSP was to be supported at \$46.0 million, a 27.2% decrease from the FY2006 estimate. Funding in the FY2007 request was to provide support for ongoing awards, in addition to data collection, evaluation, knowledge management, and dissemination. No new partnership awards were proposed in the budget request. The MSP has made approximately 80 awards, with an overall funding rate of about 9%. At the graduate level, priorities were those of Integrative Graduate Education and Research Traineeship (\$24.6 million), Graduate Research Fellowships (\$88.0 million), and the Graduate Teaching Fellows in K-12 Education (\$46.8 million). Added support was given to several programs directed at increasing the number of underrepresented minorities in science, mathematics, and engineering. Among these targeted programs in the FY2007 request were the Historically Black Colleges and Universities Programs (\$29.7 million), Tribal Colleges and Universities Program (\$12.4 million), Louis Stokes Alliances for Minority Participation (\$39.7 million), and Centers of Research Excellence in Science and Technology (\$24.9 million). Funding for the Experimental Program to Stimulate Competitive Research (EPSCoR) was supported at \$100.0 million in the FY2007 request, a slight increase of \$1.3 million over FY2006. Approximately 55% of the FY2007 request for EPSCoR was to be available for new awards and activities, with the balance supporting awards made in previous years.

On June 29, 2006, the House passed H.R. 5672, Science-State-Justice-Commence Appropriation Bill, FY2007 (H.Rept. 109-520). The bill would have provided \$6,020.0 million for the NSF in FY2007, the amount requested by the



Administration. Included in the funding was \$4,646.4 million for R&RA, again, the same as the request. The MREFC was to be funded at \$237.3 million, \$3.0 million below the Administration's request. The House bill did not include the \$3.0 million reimbursement to Judgment Fund of the U.S. Treasury for a settlement related to the Polar Aircraft Upgrades project. The EHR was to be funded at \$832.4 million, approximately \$16.2 million above the request. Included in the amount for the EHR was \$105.0 for EPSCoR, \$5.0 million above the amount requested. The Senate Committee on Appropriations reported its version of H.R. 5672 on July 13, 2006 (S.Rept. 109-280). The Senate provided a total of \$5,991.7 million for the NSF in FY2007, \$28.3 million below the request and the House bill. R&RA was funded at \$4,646.4 million, \$19.6 million below the Administration's request and the House version. Other funding levels included in the Senate version were \$237.3 million for MREFC, \$835.8 million for EHR, and \$110.0 million for EPSCoR. (CRS Contact: Christine Matthews.)

**Table 6. National Science Foundation**

(\$ in millions)

	FY2005 Act.	FY2006 Est.	FY2007 Req.	FY2007 House	FY2007 Senate Comm.
<b>Res. &amp; Related Act.</b>					
Biological Sciences	\$576.8	\$576.7	\$607.9		
Computer & Inform. Sci. & Eng.	490.2	496.4	526.7		
Engineering	557.1	580.9	628.6		
Geosciences	697.2	702.8	744.9		
Math & Physical Sci.	1,069.4	1,085.5	1,150.3		
Social, Behav. & Econ. Sci.	196.8	199.9	213.8		
Office of Cyberinfrastructure	123.4	127.1	182.4		
Office of International Sci. & Eng.	43.4	34.5	40.6		
U.S. Polar Programs	349.7	390.5	439.6		
Integrative Activities	130.9	137.2	131.4		
<b>Subtotal Res. &amp; Rel. Act</b>	<b>\$4,234.8</b>	<b>\$4,331.5</b>	<b>\$4,666.0</b>	<b>\$4,666.0<sup>c</sup></b>	<b>\$4,646.4<sup>c</sup></b>
Ed. & Hum. Resr.	843.5	796.7	816.2	832.4	835.8
Major Res. Equip. & Facil. Constr.	165.1	190.9	240.5	237.3	237.3
Salaries & Expenses	223.5	246.8	281.8	268.6	256.5
National Science Board	3.7	4.0	3.9	3.9	3.9
Office of Inspector General	10.2	11.4	11.9	11.9	11.9
<b>Total NSF<sup>a</sup></b>	<b>\$5,480.8</b>	<b>\$5,581.2</b>	<b>\$6,020.0</b>	<b>\$6,020.0</b>	<b>\$5,991.7</b>

- The totals do not include carry overs or retirement accruals. Totals may not add due to rounding.
- Additional funding resulting from H-1B Nonimmigrant Petitioner Receipts is \$26 million in FY2005, an estimated \$100 million in FY2006, and a projected \$100 million in FY2007.
- Specific funding allocations for each directorate or for individual programs and activities were not determined.

## Department of Homeland Security (DHS) R&D

The Department of Homeland Security (DHS) requested \$1.552 billion for R&D in FY2007, an increase of 4.5% from FY2006. This total included \$1.002 billion for the Directorate of Science and Technology, \$536 million for the Domestic Nuclear Detection Office (DNDO), and \$14 million for Research, Development, Test, and Evaluation (RDT&E) in the U.S. Coast Guard. (For details, see **Table 7.**) The request for DNDO was a 70% increase. The request for the S&T Directorate was a 13% decrease. The House provided \$956 million for the S&T Directorate; \$500

million for DNDO; and \$14 million for Coast Guard RDT&E. The Senate provided \$818 million for the S&T Directorate (less a rescission of \$200 million in unobligated prior-year funds); \$442 million for DNDO; \$18 million for Coast Guard RDT&E; and \$92 million for R&D in TSA (transferred from S&T). The final bill provided \$973 million for S&T (less \$125 million in rescinded prior-year funds); \$481 million for DNDO, and \$17 million for Coast Guard RDT&E. The final total of \$1.371 billion (excluding the rescission of unobligated funds) was an overall 9% reduction from FY2006, made up of a 16% decrease for S&T, a 53% increase for DNDO, and a 6% decrease for Coast Guard RDT&E.<sup>2</sup>

For individual portfolios within the S&T Directorate, comparing FY2007 with previous years is difficult because of several accounting factors. Certain expenses previously funded by each R&D portfolio were requested in the Management and Administration account in FY2007. Funds for DNDO were requested separately rather than as part of S&T. The former Transportation Security Administration R&D program, which was merged into S&T and funded in the R&D Consolidation line in FY2006, constituted part of the Explosives Countermeasures and Support of Components portfolios in the FY2007 request. The request indicated that some activities, most notably the Counter MANPADS program to protect commercial aircraft against portable ground-to-air missiles, would continue at their current level of effort in FY2007 but required little additional budget authority because prior-year funds remained unspent. After accounting for these factors, it appeared that the FY2007 request would reduce net funding for the Standards, Rapid Prototyping, SAFETY Act, and Critical Infrastructure Protection portfolios, and increase net funding for Cyber Security and the Office for Interoperability and Compatibility. Several of the requested net changes would have offset changes that Congress made in FY2006 relative to the FY2006 request. For congressional changes relative to the FY2007 request, see **Table 7**.

Both committee reports (H.Rept. 109-476 and S.Rept. 109-273) were highly critical of the S&T Directorate. The House committee reduced the Management and Administration account by \$5 million “for lack of responsiveness” to its information requests. It made \$98 million of that account unavailable for obligation until S&T provided budgetary information “with sufficient detail.” The Senate bill made \$60 million of the Management and Administration account unavailable for obligation pending the submission and approval of an expenditure plan. In the S&T Directorate’s main RDA&O account, the House committee made \$400 million unavailable for obligation until the Under Secretary reported on progress in addressing financial management deficiencies. The Senate transfer of S&T activities back to TSA was because “the Committee has repeatedly requested a breakout of funding ... which S&T has failed to provide.” The House committee report objected that the budget justification contains “no details of how risk assessment was used in its formulation or even which DHS agency was tasked with prioritizing risks and assigning them resources.” The Senate committee report described the S&T Directorate as “a rudderless ship without a clear way to get back on course.” The

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<sup>2</sup> DNDO was funded within the S&T Directorate in FY2006. The percentage increases given here for DNDO are relative to its FY2006 funding within S&T. The percentage decreases for S&T are relative to its FY2006 funding exclusive of DNDO.

conference report (H.Rept. 109-699) did not include such critical language, but language in the final bill did make \$60 million from Management and Administration and \$50 million from RDA&O unavailable for obligation pending congressional approval of an expenditure plan and a report on financial management. The President's signing statement construed these provisions on constitutional grounds as "calling solely for notification."<sup>3</sup>

The FY2007 budget request marked the end of a period of consolidation for DHS R&D programs. In the FY2004 appropriations conference report (H.Rept.108-280), Congress directed the department to consolidate its R&D activities into the S&T Directorate. This process began with several small programs in FY2005, but a proposed move of the Coast Guard RDT&E program was rejected by the Senate. In FY2006, the much larger R&D program of the Transportation Security Administration was moved into S&T, but again the Senate rejected moving the Coast Guard program. The FY2007 request proposed no further consolidations; conversely, it proposed dividing out DNDO funding into a separate account, which would comprise more than one-third of the department's R&D budget. The House committee report expressed puzzlement and dissatisfaction with the transfer but approved it anyway, because of the "critical importance of the DNDO mission" and "the liability [DNDO] would face" if left in S&T. The committee directed S&T to work with DNDO and support its R&D-related needs. The Senate committee made no comment on the separation of DNDO, but proposed transferring some S&T activities back to TSA. This Senate proposal was rejected in conference. (**CRS Contact: Daniel Morgan.**)

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<sup>3</sup> "President's Statement on H.R. 5441", White House press release October 4, 2006, online at [<http://www.whitehouse.gov/news/releases/2006/10/print/20061004-10.html>].

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

	FY2006 Enacted <sup>a</sup>	FY2007 Rqst.	FY2007 House	FY2007 Senate	FY2007 Final
<b>Science and Technology Directorate</b>	<b>1467.1</b>	<b>1002.3</b>	<b>956.3</b>	<b>618.4</b>	<b>848.1</b>
Management and Administration	80.3	195.9	180.9	106.4	135.0
R&D, Acquisition, and Operations	1386.8	806.4	775.4	512.0	713.1
Biological Countermeasures	376.2	337.2	337.2	327.2	350.2
Chemical Countermeasures	94.0	83.1	45.1	75.0	60.0
Explosives Countermeasures	43.6	86.6	76.6	5.0	86.6
Radiological/Nuclear Countermeasures <sup>b</sup>	18.9	-	-	-	-
Domestic Nuclear Detection Office <sup>b</sup>	314.8	-	-	-	-
Threat Awareness <sup>c</sup>	42.6	39.9	39.9	35.0	35.0
Standards	34.6	22.1	22.1	27.1	22.1
Support of DHS Components <sup>d</sup>	79.2	88.6	85.6	80.0	85.6
University and Fellowship Programs	62.4	52.0	52.0	50.0	50.0
Emergent and Prototypical Technology <sup>e</sup>	42.6	19.5	19.5	12.5	19.5
Counter MANPADS	108.9	4.9	4.9	40.0	40.0
SAFETY Act	6.9	4.7	4.7	4.7	4.7
Office of Interop. and Compatibility	26.2	29.7	29.7	25.0	27.0
Critical Infrastructure Protection	40.4	15.4	35.4	12.5	35.4
Cyber Security	16.5	22.7	22.7	18.0	20.0
Pacific Northwest National Laboratory	-	-	-	-	2.0
R&D Consolidation <sup>f</sup>	98.9	-	-	-	-
Rescis. of Unobd. Funds from Prior Yrs.	-20.0	-	-	-200.0	-125.0
<b>Transportation Security Administrn. R&amp;D <sup>f</sup></b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>91.6</b>	<b>-</b>
<b>Domestic Nuclear Detection Office <sup>c</sup></b>	<b>-</b>	<b>535.8</b>	<b>500.0</b>	<b>442.5</b>	<b>481.0</b>
Management and Administration	-	30.5	30.5	30.5	30.5
Research, Development, and Operations	-	327.3	291.5	234.0	272.5
Systems Acquisition	-	178.0	178.0	178.0	178.0
<b>U.S. Coast Guard RDT&amp;E</b>	<b>18.1</b>	<b>13.9</b>	<b>13.9</b>	<b>17.6</b>	<b>17.0</b>
<b>Total DHS R&amp;D</b>	<b>1485.2</b>	<b>1552.0</b>	<b>1470.2</b>	<b>1370.1</b>	<b>1246.1</b>
<b>Total (Excluding Prior-Year Rescissions)</b>	<b>1505.2</b>	<b>1552.0</b>	<b>1470.2</b>	<b>1570.1</b>	<b>1371.1</b>

- a. The FY2006 enacted figures have been reduced by the 1% general rescission (P.L. 109-148) and include a supplemental appropriation of \$525,000 for Coast Guard RDT&E.
- b. Funding for the Domestic Nuclear Detection Office (DNDO) was included in the budget for the Science and Technology Directorate in FY2006. It incorporated most of what had been in Radiological/Nuclear Countermeasures in FY2005. In FY2007, DNDO had a separate budget request.
- c. Threat Awareness is also known as Threat and Vulnerability Testing and Assessment.
- d. Support of DHS Components is also known as Conventional Missions.
- e. Emergent and Prototypical Technology combines two previous portfolios, Emerging Threats and Rapid Prototyping, whose funding in FY2006 has been summed for this table.
- f. The Transportation Security Administration R&D program was transferred into the Science and Technology Directorate in FY2006, and funding for it was requested in that year in the R&D Consolidation line. In FY2007, this activity is in the Explosives Countermeasures and Support of DHS Components portfolios, except in the Senate bill, which would have returned the former TSA activities to TSA.

## Department of Commerce (DOC)

### National Oceanic and Atmospheric Administration (NOAA)

For FY2007, the Administration had requested \$546 million for NOAA R&D. That sum represented a 12.6% decline from the \$610 million approved by Congress in FY2006. The Office of Oceanic and Atmospheric Research (OAR), is NOAA's primary research office. In FY2007 the Administration had requested \$349 million for OAR R&D, a 6% decline from FY2006 funding levels. Other R&D funding requested for FY2007 included \$73.1 million for the National Ocean Service (NOS), \$46.7 million for the National Marine Fisheries Service (NMFS), \$31.7 million for the National Weather Service (NWS), \$25.2 million for the National Environmental Satellite Data and Information Service (NESDIS), and \$52 million for the Office of Marine and Aviation Operations (OMAO). PAC funding of \$11.4 million was requested for R&D systems acquisition, including \$9.4 million for OAR and \$2.0 million for NWS, to enhance NOAA supercomputing capabilities.

The House Science, State, Justice, and Commerce (CJS) Appropriations bill for FY2007 would have funded NOAA R&D \$509 million, \$101 million below FY2006 estimated level. (H.Rept. 109-520.) NOAA does not analyze R&D funding for distribution until after final congressional appropriations are known. H.R. 5672 may have cut funding for research and development activities, especially those deemed not to be directly serving the agency's mission. The R&D programs that stood to be the most affected were federal/university/private sector scientific research partnerships. As a result, greater funding responsibility would have been shifted to NOAA's partners. Applied R&D would have faced fewer reductions and in the case of NOAA satellites, systems would have increased.

On July 13, 2006 the Senate Appropriations Committee reported H.R. 5672 which included \$779 million for NOAA R&D in FY2007. (S.Rept. 109-280). The committee proposed increases for ocean exploration, the National Centers for Coastal Science, programs in ocean and human health, and the National Underwater Research Program as was recommended by the JOCI. The committee recommended \$467.2 million for OAR. R&D partnership programs in climate, weather, and ocean and coastal research activities across the agency would have been funded at traditional levels and not cut as proposed in House appropriations and the President's request. The National Sea Grant College Program, which sponsors marine research and applied science in cooperation with states, would have received \$80 million, 25% more than in FY2006. PAC funding for systems acquisition and construction supporting OAR would have been \$18.4 million. The NOAA Fisheries recommendation included \$209.6 million for fishery science and habitat restoration activities, cooperative research, and R&D-related construction. The committee also recommended \$132.4 million for ocean science-related activities in the National Ocean Service. The committee would have provided \$7.5 million for the NWS U.S. Weather Research Program. NOAA's satellites program would have received \$21.6 million for applied research and \$11.9 million for R&D-related system acquisition. Also, \$37.9 million was recommended for (science) education programs, which was more than the House and the Senate request. The Office of Marine and Aviation Operations (OMAO) would have been provided \$92.7 million for marine data

acquisition (scored as R&D) and \$41.9 million to replace or procure new marine research vessels. The Senate Committee had approved an estimated \$779 million for NOAA R&D, \$269 million more than the House recommended.

For information on the agency's full budget request for FY2007, see CRS Report RS22410, *National Oceanic and Atmospheric Administration (NOAA) Budget for FY2007: President's Request, Congressional Appropriations, and Related Issues*, by Wayne A. Morrissey. (CRS Contact: Wayne A. Morrissey.)

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

NOAA	FY2006 Estimate	FY2007 Request	House	Senate Comm.
R&D Total	610	533	510	779
Office of Oceanic & Atmospheric Research (OAR) Line Office Total	372	349	302	467

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Financial Administration, NOAA Budget Office, *Research and Development Budgets FY2005-FY2007*, February 21, 2006. U.S. Congress, House, *Science, State, Justice, and Commerce Appropriations, FY2007* (H.Rept. 109-520), June 22, 2006, "House Recommendations," July 5, 2006.

## 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 precompetitive 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 Administration's FY2007 budget included \$581.3 million for NIST, almost 22.7% below the previous fiscal year. Support for internal R&D activities under the Scientific and Technology Research and Services (STRS) account would increase 18.3% to \$467 million (including \$8 million for the Baldrige National Quality Program). There was no funding for the Advanced Technology Program (ATP), and support for the Manufacturing Extension Partnership (MEP) would decline 55.7% to \$46.3 million. Construction funding would total \$68 million, a 60.8% decrease from FY2006. (See **Table 9**.)

The FY2007 appropriations bill passed by the House in the 109<sup>th</sup> Congress, H.R. 5672, provided NIST with \$627 million, a decrease of almost 16.6% from the earlier fiscal year due primarily to the absence of support for ATP. Financing for laboratory R&D in the STRS account increased 18.3% to \$467 million. MEP funding totaled \$92 million, 12% below FY2006. Funding for the construction budget was \$68 million.

The version of H.R. 5672 reported from the Senate Committee on Appropriations during the 109<sup>th</sup> Congress would have funded NIST at \$764 million, 1.6% above the previous fiscal year. While there was no financing for ATP, there was increased support for internal laboratory R&D, the Manufacturing Extension Partnership program, and construction activities. The STRS account was to receive \$467 million, the same amount included in both the Administration's request and the original House-passed bill. Funding for MEP increased 1.3% from FY2006 to \$106 million. Construction was to be financed at \$191 million, 10% above the earlier level and almost three times the amount provided by both the Administration's budget proposal and H.R. 5672 as passed by the House.

As part of the American Competitiveness Initiative, the Administration stated its intention to double over 10 years funding for "innovation-enabling research" done at NIST through its "core" programs (defined as internal research in the STRS account and the construction budget). To this end, the President's FY2007 budget requested an increase of 18.3% for intramural R&D at NIST. H.R. 5672, as passed by the House during the 109<sup>th</sup> Congress, provided this increased funding. It remains to be seen how support for this effort will evolve and how this might affect financing of extramural efforts such as ATP and MEP.

For FY2006, the President's budget requested \$532 million in NIST funding, a 23% decrease from FY2005 due primarily to an absence of support for ATP and a significant cut in financing for MEP. Included in the total figure was \$426.3 million for the STRS account, which primarily finances the internal R&D activities of the laboratory. This amount was 12.5% above the previous fiscal year and included \$5.7 million for the Quality Program. MEP was to be funded at \$46.8 million, 56% below FY2005 support. The construction budget was \$58.9 million.

H.R. 2862, as originally passed by the House, would have provided \$548.7 million for NIST, 21% below FY2005 funding. The STRS account was to receive \$397.7 million, 5% more than FY2005 but 6.7% below the President's request. Financing for MEP totaled \$106 million, a decrease of 1.4% from the earlier fiscal year and more than twice the Administration's budget request. There was no funding for ATP. Construction activities would have received \$45 million.

The version of H.R. 2862 initially passed by the Senate would have funded NIST at \$844.5 million, for FY2006, almost 21% above the FY2005 budget. Included in this amount was \$399.9 million for the STRS account (incorporating \$7.2 million for the Quality Program), an increase of 5.6% over previous funding. MEP was to receive \$106 million. Support for ATP, absent from both the President's budget request and the original House-passed bill, would total \$140 million, 2.6% more than the financing provided in FY2005. The construction budget was to be funded at \$198.6 million, more than double the earlier figure. This construction funding was more than three times that proposed by the Administration and more than four times that included in the original House version of the bill.

Subsequently, the final FY2006 appropriations legislation, P.L. 109-108, provides \$752 million for NIST (after the mandated rescissions but not including a \$7 million rescission from unobligated balances in the MEP account). This was an increase of 8.2% over FY2005 funding. Support for the STRS account totaled

\$394.8 million, including \$7.3 million for the Quality Program. This amount was an increase of 4.2% over the previous fiscal year. MEP received \$104.6 million and ATP was financed at \$79 million. The funding for MEP is a small decrease from FY2005, whereas support for ATP declines 42% from the earlier figure. The construction budget more than doubled to \$173.6 million.

For FY2005, the Omnibus Appropriations Act, P.L. 108-447, provided NIST with \$695.3 million (after a mandated 0.8% across-the-board rescission and a 0.54% rescission from Commerce, Justice, and 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 Quality Program), almost 12% over the previous fiscal year. The Manufacturing Extension Partnership was funded at \$107.5 million, an increase of 178% that brought support for the program up to pre-FY2004 levels. The Advanced Technology Program was financed at \$136.5 million (20% below FY2004), and the construction budget received \$72.5 million. The legislation also rescinded \$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 helps businesses (and small manufacturers) develop 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. Although support was provided again in the FY2006 appropriations legislation, it was 41% below the earlier fiscal year. In the 109<sup>th</sup> Congress, both the House-passed FY2007 appropriations bill and the version reported from the Senate Committee on Appropriations contained no funding for the program. It remains to be seen how the 110<sup>th</sup> Congress will address this issue.

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*, all by Wendy H. Schacht. **(CRS Contact: Wendy H. Schacht.)**



**Table 9. NIST**  
(\$ in millions)

NIST Program	FY2005 <sup>a</sup>	FY2006 <sup>b</sup>	FY2007 Request	House	Senate Comm.
<b>NIST Total</b>	695.3	752	581.3	627	764
<b>STRS<sup>c</sup></b>	378.8	394.8	467	467	467
<b>ATP</b>	136.5	79	0	0	0
<b>MEP</b>	107.5	104.6	46.3	92	106
<b>Construction</b>	72.5	173.6	68	68	191

- a. After mandated rescissions (but not including those to unobligated balances).  
b. Includes mandated rescissions (but not a \$7 million rescission from unobligated balances in the MEP account).  
c. Includes funding for the Baldrige National Quality Program.

## Department of Transportation (DOT)

The Bush Administration had requested \$767 million for the Department of Transportation's (DOT's) research and development budget in FY2007. That request represented a decrease of almost 8.5% below the estimated \$838 million approved for R&D in FY2006. (See **Table 10.**) Funding for the Federal Highway Administration (FHWA) would have increased to \$397, an increase of 4% for FY2007. R&D funding for the Federal Aviation Administration (FAA) would have declined from \$310 million to \$235 million in FY2007, a 24% decrease from FY2006 estimated funding levels. Some of that decline can be attributed to continued cuts in FFA's development activities. Finally, funding for DOT's other R&D programs would decline 9% below FY2006 funding levels to \$135 million.

The House appropriations bill (H.R. 5576) would have restored almost all of the President's proposed funding cuts for the FAA. Consequently, that would have resulted in a funding decrease of only \$5 million, rather than the \$75 million proposed by the President. The House bill had matched the President's \$397 million request for the FHWA. While the Senate would have funded the FHWA at the same level as the House, it had proposed to fund the FAA at \$48 million below the House approved level. (**CRS Contact: Mike Davey.**)

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

Department of Transportation	FY2006 Estimate	FY2007 Request	House	Senate Comm.
<b>Federal Highway Administration</b>	380	397	397	397
<b>Federal Aviation Administration</b>	310	235	305	257
<b>Others<sup>a</sup></b>	148	135	105	139
<b>Total</b>	838	767	807	793

- a. "Others" includes Office of the Secretary, Federal Motor Carrier Safety Administration, Federal Railroad Administration, Pipeline and Hazardous Materials Safety Administration, and the Research and Innovative Technology Administration.

## Department of the Interior (DOI)

The Administration had requested \$598 million for R&D in the Department of the Interior (DOI), a 5.7% decline from the \$634 million the agency estimates it received in FY2006. (See **Table 11.**) The U.S. Geological Survey (USGS) is the primary supporter of R&D (almost 90 % of the total) within DOI. The USGS areas of research includes mapping, geological resources, water quality, and biological resources. The proposed FY2007 budget for R&D within the USGS would have declined from \$558 million in FY2006 to \$532 million in FY2007, a 4.7% decline. The USGS is one of the major sponsors of earth science research, along with NSF, DOE, and NASA.

As indicated in the table, funding for Geological Mineral Resources research was proposed to decline 8.5%, whereas Water Resources was scheduled to decline 8.7%. The geological hazards program 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. The geologic resources program assesses the availability and quality of the nation's energy and mineral resources. The geologic processes program researches, monitors, and assesses the landscape to understand geological processes to help distinguish natural change from those resulting from human activity. 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. Enterprise Information conducts information science research to enhance the National Map and National Spatial Data infrastructure.

Funding for USGS Biological Research would have declined 3.3% below FY2006- estimated funding levels. This research program develops and distributes information needed in the conservation and management of the nation's biological resources. The program serves as the Department's research arm, utilizing the capabilities of 17 research centers and 40 Cooperative Research Units that support research on fish, wildlife, and natural habitats. Major research initiatives are carried out by USGS scientists who collect 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 DOI and other agencies, such as the Fish and Wildlife Service and the Bureau of Land Management.

The House-passed Interior and Environment appropriations bill (H.R. 5386) included an estimated \$630 million for R&D. That amount was \$32 million above the request, but \$4 million less than what the agency had received in FY2006. The Senate Department of Interior, Environment, and Related Agencies appropriations bill (S Rept. 109-275) included an estimated \$643 million for the conduct of R&D

in FY2007. That proposed funding amount was \$45 million above the President's request, and \$13 million above the House recommended funding level. (CRS Contact: Mike Davey.)

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

U. S. Geological Survey	FY2006 Estimate	FY2007 Request	House	Senate Comm.
National Mapping	40	46	47	48
Geological Resources	212	194	218	216
Water Resources	126	115	123	125
Biological Research	179	173	175	177
Enterprise Information	1	4	4	4
<b>USGS total<sup>a</sup></b>	<b>558</b>	<b>532</b>	<b>567</b>	<b>570</b>
Other agencies <sup>b</sup>	76	66	63	73
<b>Total all agencies</b>	<b>634</b>	<b>598</b>	<b>630</b>	<b>643</b>

a. USGS R&D estimates are from the USGS budget office, and the USGS FY2007 Budget Justification documents.

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

## Environmental Protection Agency (EPA)

The Environmental Protection Agency's (EPA's) 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. This account also provides funding for the scientific tools and knowledge necessary to support decisions relating to preventing, regulating, abating environmental pollution and to advance the base of understanding on environmental sciences.

On May 11, 2006, the House Committee on Appropriations (H.R. 5386) recommended a total of \$808 million for EPA's FY2007 S&T activities. Of that amount \$557million would have been for R&D, \$3 million below the FY2006 estimated funding level. (See **Table 12.**) The House Committee noted that the FY2007 request included \$61.0 million transferred into the S&T account from EPA's Environmental Programs and Management (EPM) account. That transfer of funds, which is more than the total S&T increase of the FY2007 request over the FY2006 enacted level, was for rent, security, and utilities costs that were handled previously in EPA's EPM account. This shift would have better reflected actual costs for personnel with S&T funds, according to EPA's FY2007 Congressional Justification document.

The Senate-passed Department of the Interior, Environment, and Related Agencies appropriations bill (S.Rept. 109-275), approved an estimated \$793 for EPA's S&T activities. Of that amount, \$596 million would be for R&D, \$12 million below the House passed bill.

Following are five noteworthy differences between levels in the budget request and House recommendations: 1) the FY2007 budget request zeroed the funding level for the category of congressionally mandated research projects, but the House Committee recommended \$30.0 million, which was approximately the amount enacted in FY2006 for this category; 2) the FY2007 budget requested \$12.5 million for its Climate Protection Program, approximately \$6.0 million less than the FY2006 level, but the House recommended a \$6.0 million increase over the FY2007 request level to restore the program to its FY2006 level; 3) the FY2007 budget request proposes to discontinue funds for directed Science to Achieve Results Research Fellowships (which competitively awards stipends and other research support to graduate students in environmentally related fields), but the House Committee stated that "funding reductions in this program are not acceptable;" 4) the FY2007 budget request proposed to discontinue EPA's Environmental Technology Verification centers (which verify the performance of innovative clean-up and other environmental technologies) for a savings of nearly \$3.0 million, but the House Committee recommended \$2.4 million to partially restore the program; and 5) the FY2007 budget requested \$44.5 million for homeland security preparedness, response, and recovery, up from the FY2006 enacted level of approximately \$36.0 million, but the House Committee recommended a level of \$39.5 million for FY2007. The Senate also would have restored funding for these programs as well. (CRS Contact: Michael Davey.)

**Table 12. Environmental Protection Agency**  
(\$ in millions)

EPA	FY2006 Enacted	FY2007 Request	House	Senate Comm.
<b>S&amp;T total</b>	730	788	808	793
<b>R&amp;D</b>	600	557	608	596
<b>Transferred from Superfund</b>	30.2	28	30	30.0