Federal Research and Development Funding: FY2008

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Summary

The Consolidated Appropriations Act, 2008 (P.L. 110-161) was the measure used by Congress and the President to wrap up action on the regular appropriations acts in late 2007. On December 19, 2007, Congress completed action on the act, and it was signed into law by President Bush on December 26, 2007. Previously, action had been completed on only one of the regular appropriations acts, the Defense Appropriations Act, FY2008 (P.L. 110-116) which was signed into law by President Bush on November 13, 2007. The Consolidated Appropriations Act, 2008 provides appropriations covered in the eleven outstanding appropriations acts. To ensure continuity of government operations, Congress had passed four continuing resolutions (P.L. 110-92, P.L. 110-116 Division B, P.L. 110-137, and P.L. 110-149) that provided funding for all agencies that had not received appropriations from the beginning of FY2008 through passage of the Consolidated Appropriations Act.

The Bush Administration requested $142.7 billion in federal research and development (R&D) funding for FY2008. Total federal R&D funding for FY2008 provided in P.L. 110-161 and P.L. 110-116 is estimated to be $142.7 billion, a 1.2% increase over FY2007.

FY2008 funding for the American Competitive Initiative (ACI) fell short of the President's ten-year doubling target for innovation-related research at the National Science Foundation (NSF), Department of Energy's (DOE) Office of Science, and National Institute of Standards and Technology's (NIST) core laboratory programs. It also falls short of the authorization levels set by Congress that put R&D funding for these agencies on a seven-year doubling pace. Funding for DOE's Office of Science increased by 5.8% in FY2008 to $4.0 billion. NIST's core laboratory programs increased 1.4% in FY2008 to $441 million. Total FY2008 funding for NSF was increased by 2.5%. NSF's research and related activities increased by only 1.1%, joining other R&D agencies (notably the Environmental Protection Agency (-2.4%) and National Institutes of Health (0.5%)) whose R&D budgets decreased or received increases below the rate of inflation.

In total, DOE received $9.9 billion for R&D in FY2008, a 7.7% increase over FY2007, led by a 24.0% increase in its energy programs. Total funding for NIST increased by 11.7% in FY2008 to $755.8 million due in large measure to increases in its construction budget. NASA's FY2008 R&D budget increased to $12.8 billion, a 7.5% increase over FY2007, due primarily to increases in two initiatives: the international space station and the crew launch vehicle/crew exploration vehicle combination. FY2008 research, development, test, and evaluation (RDT&E) funding for the Department of Defense increased by 1.1%. DOD's science and technology research programs received $12.8 billion for FY2008, though DOD had requested $10.8 billion. DOD's request for a $3.9 billion RDT&E increase under its Global War on Terror initiative was not included in P.L. 110-116 or P.L. 110-161.

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Overview

Congress continues to take a strong interest in the health of the U.S. research and development (R&D) enterprise, and in providing sustained support for federal R&D activities. The federal government has played an important role in supporting R&D efforts that have led to scientific breakthroughs and new technologies, from jet aircraft and the Internet to defenses against disease and communications satellites. Most of the research funded by the federal government is in support of specific activities of the federal government as reflected in the unique missions of the funding agencies. The federal government has become the largest supporter of long term fundamental basic research, primarily because the private sector asserts it cannot capture an adequate return on long-term fundamental research investments. Some of the major agencies funding basic research include the National Institutes of Health (NIH), National Science Foundation (NSF), Department of Energy (DOE), National Aeronautics and Space Administration (NASA), and Department of Defense (DOD).

The Bush Administration requested $142.7 billion in federal R&D funding for FY2008.[1] Total R&D funding for FY2008 is approximately $142.7 billion, a 1.2% increase over the enacted FY2007 total of $141.1 billion.[2] Funding for FY2008 is provided for in the Defense Appropriations Act, 2008 (P.L. 110-116), signed into law by President Bush on November 13, 2007, and the Consolidated Appropriations Act, 2008 (P.L. 110-161), signed into law on December 26, 2007. P.L. 110-161 provides funding covered in the eleven appropriations acts on which action had not been completed.[3]

The President's FY2008 proposed R&D increase over the FY2007 funding level was due primarily to requested increases for NASA's space vehicles development program, the Department of Defense, and continuation of the American Competitiveness Initiative (ACI). While NASA received increased funding for the International Space Station ($2.2 billion, up 24.6%) and the Constellation program (3.0 billion, up 17.3%), DOD and the ACI did not receive the increases requested by the President. The President's proposed FY2008 increase for DOD RDT&E funding resulted almost entirely from its request for $3.9 billion for RDT&E in support of its Global War on Terror (GWOT) initiative. Congress chose not to address the GWOT request in P.L. 110-116 or P.L. 110-161, and has not completed action on separate legislation.

The ACI was proposed by President Bush in response to growing concerns about America's ability to compete in the global market place. The $136 billion ACI funding request included $50 billion for additional research, science education, and the modernization of research infrastructure

[1] The President's FY2008 R&D request was released before final passage of the Revised Continuing Appropriations Resolution (P.L. 110-5), which contains estimated agencies' funding levels for FY2007. Actual FY2007 appropriations levels were not specified by P.L. 110-5. Estimated funding levels for different agencies have become available as the agencies reported their FY2007 operating plans. Tables in this report reflect the agencies' FY2007 estimates derived from the CR. Unless otherwise indicated, all funding data are in current dollars.

[2] American Association for the Advancement of Science, http://www.aaas.org/spp/rd/upd1207tb.htm

[3] To ensure continuity of government operations, Congress passed, and the President signed, the first of four continuing resolutions (P.L. 110-92), which extended funding for all agencies from October 1, 2007, through November 16, 2007. The act became law on September 29, 2007, ahead of the start of FY2008. Congress subsequently passed three additional continuing resolutions (P.L. 110-116, P.L. 110-137, and P.L. 110-149), providing funding through enactment of the Consolidated Appropriations Act, 2008.The Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act of 2008 was passed by Congress, but vetoed by the President. Congress attempted, but failed, to override the President's veto of this act.

from FY2007 through FY2016. These funds were intended to double physical sciences and engineering research in three agencies—NSF, DOE's Office of Science, and NIST—over ten years.[4] Congress established authorization levels for FY2008-2010 that would put funding for R&D at these agencies on track to double in approximately seven years. However, FY2008 R&D funding provided in P.L. 110-161 for these agencies falls below these doubling targets. Total FY2008 funding for NSF was increased by 2.5%, though NSF's research and related activities increased by only 1.1%. The DOE Office of Science received a 5.8% increase for FY2008. NIST's FY2008 core laboratory R&D increased by 1.4%. The NIST construction and research facilities account increased 173.4% to $160.5 million in FY2008.[5] In addition, the ACI proposed $86 billion to finance a revised and permanent Research and Experimentation (R&E) tax credit over the 10-year period. Action to make the R&E tax credit permanent was not completed in 2007, nor was the credit extended. As a result, the R&E tax credit expired at the end of calendar year 2007.[6]

Funding levels for three federal multiagency research initiatives varied in the President's FY2008 request. Funding for the National Nanotechnology Initiative (NNI) would have increased by 4.0% to $1.447 billion (see CRS Report RS20589, *Manipulating Molecules: Federal Support for Nanotechnology Research*, by (name redacted)). Funding for the Networking and Information Technology R&D (NITRD) program would have remained essentially at the same level with funding at $3.057 billion (see CRS Report RL33586, *The Federal Networking and Information Technology Research and Development Program: Funding Issues and Activities*, by (name red acted)). The administration proposed $1.544 billion for the Climate Change Science Program, a decrease of 7.4%, primarily due to a decrease in NASA's funding[7] (see CRS Report RL33817, *Climate Change: Federal Program Funding and Tax Incentives*, by (name redacted)). FY2008 funding for these initiatives has not been determined.

Department of Energy (DOE)

The Department of Energy requested $9.781 billion for R&D in FY2008, including activities in three major categories: science, national security, and energy. (For details, see **Table 1**.) This request was 6% above the FY2007 level of $9.236 billion. The House provided $10.448 billion, or $667 million more than the request. The Senate committee recommended $10.566 billion, or $785 million more than the request. The final appropriation was $9.947 billion, or $166 million more than the request.

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[4] The ACI proposes to double "innovation-enabling physical science and engineering research" at the three agencies over ten years, and states that "individual agency allocations remain to be determined." (*The American Competitiveness Initiative: Leading the World in Innovation*, Office of Science and Technology Policy/Domestic Policy Council, The White House, February 2006.)

[5] NIST states that only $79.2 million of these funds is directed at "construction and major renovation and repair of NIST facilities." According to NIST, the balance of the increase in its construction and research facilities account is for "congressionally directed construction projects" and a construction grant program. http://www.nist.gov/public_affairs/budget.htm

[6] Since its enactment in 1981, the Research and Experimentation Tax Credit has been extended 12 times. Several bills have been introduced in the 110th Congress that would extend or make permanent the Research and Experimentation Tax Credit. For further information, see CRS Report RL31181, *Research and Experimentation Tax Credit: Current Status and Selected Issues for Congress*, by (name redacted).

[7] *Analytical Perspectives: Budget of the United States Government, Fiscal Year 2008*, Office of Management and Budget, The White House, 2007.

Table 1. Department of Energy R&D

($ in millions)

	FY2007 estimate	FY2008 request	FY2008 House	FY2008 Senate	FY2008 enacted
Science	**3,797**	**4,398**	**4,514**	**4,497**	**4,018**
Basic Energy Sciences	1,250	1,498	1,498	1,512	1,270
High Energy Physics	752	782	782	782	688
Biological and Environmental Research[a]	483	532	582	605	544
Nuclear Physics	423	471	471	471	433
Fusion Energy Sciences	319	428	428	427	287
Advanced Scientific Computing Research	283	340	340	335	351
Other	287	346	412	363	445
National Security	**3,236**	**3,132**	**3,245**	**3,285**	**3,199**
Weapons Activities[b]	2,162	2,037	1,882	2,099	2,015
Naval Reactors	782	808	808	808	775
Nonproliferation and Verification R&D	270	265	446	322	387
Defense Environmental Cleanup TD&D	21	21	108	55	21
Energy	**2,203**	**2,252**	**2,689**	**2,785**	**2,731**
Energy Efficiency and Renewable Energy[c]	1,193	1,031	1,559	1,408	1,440
Fossil Energy R&D	593	567	709	808	743
Nuclear Energy R&D[d]	319	568	335	471	438
Electricity Delivery & Energy Reliability R&D	99	86	86	98	110
Total	**9,236**	**9,781**	**10,448**	**10,566**	**9,947**

Notes: FY2007 figures are from the DOE operating plan (online at http://www.doe.gov/media/FY2007OperatingPlanForDOE.pdf). FY2008 figures are from the budget justification (online at http://www.cfo.doe.gov/budget/08budget/Start.htm), H.R. 2641 as passed by the House (and H.Rept. 110-185), S. 1751 as reported by the Senate Appropriations Committee (and S.Rept. 110-127), and P.L. 110-161 (and explanatory statement, *Congressional Record*, December 17, 2007, pp. H15913-H15952).

a. The House proposed splitting this item into two: Biological Research for $424 million and Climate Change Research for $158 million.

b. 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.

c. Excludes Weatherization and Intergovernmental Activities.

d. Includes University Reactor Infrastructure and Education Assistance, Nuclear Power 2010, Generation IV Nuclear Energy Systems Initiative, Nuclear Hydrogen Initiative, and Advanced Fuel Cycle Initiative.

The request for the DOE Office of Science was $4.398 billion, a 16% increase from FY2007. This increase reflected the American Competitiveness Initiative (ACI), which President Bush announced in the 2006 state of the union address. Over 10 years, the ACI would double R&D funding for the Office of Science and two other agencies. The House provided $4.514 billion, or

$116 million more than the request. The Senate committee recommended $4.497 billion, or $99 million more than the request. The final appropriation was $4.018 billion, $380 million less than the request but an increase of 6% from FY2007.

Within the Office of Science, the final amounts for several major programs were significantly different from either the request or the House and Senate amounts. In basic energy sciences, the request was a $248 million increase, mostly to expand facility operating time. The House provided the requested amount, and the Senate committee recommended an additional $12 million increase, but in the final appropriation, basic energy sciences received only $20 million more than in FY2007. The request for fusion energy sciences was a $109 million increase, almost entirely for the International Thermonuclear Experimental Reactor (ITER). The House and the Senate committee both provided approximately the requested amount, but the final appropriation was $141 million less than requested, with zero funding for the U.S. contribution to ITER. For high energy physics, the House and the Senate committee both provided the requested amount, but the final appropriation was $94 million less, which led to announcements of layoffs at Fermi National Accelerator Laboratory (Fermilab) and Stanford Linear Accelerator Center (SLAC).[8]

The requested funding for DOE national security R&D was $3.132 billion, a 3% decrease. Most of the reduction resulted from the scheduled completion of construction projects, most notably the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory. The request included $89 million for the reliable replacement warhead (RRW) program. The House provided $3.245 billion, including increases for nonproliferation and verification R&D, environmental cleanup technology development, and inertial confinement fusion, but no funding for the RRW. The Senate committee recommended $3.285 billion, including increases in the same areas and partial funding for the RRW. The Senate report noted that the committee was divided on the RRW and called for a bipartisan congressional commission "to evaluate and make recommendations on the role of nuclear weapons in our future strategic posture." The final appropriation was $3.199 billion, with increases for nonproliferation and verification R&D and inertial confinement fusion that were between the House and Senate amounts, no increase for environmental cleanup technology development, and no funds for the RRW.

The request for DOE energy R&D was $2.252 billion, up 3% from FY2007. Within this total, R&D on nuclear, hydrogen, biomass, and solar energy were to increase, while geothermal and natural gas and oil technology programs were to be terminated. The requested $249 million increase for nuclear energy R&D was mostly for the Advanced Fuel Cycle Initiative. For energy R&D overall, the House provided $437 million more than the request, and the Senate committee recommended $533 million more than the request. Both included additional funds for energy efficiency, renewable energy, and fossil energy, and both included smaller increases than requested in nuclear energy, with less emphasis on the Advanced Fuel Cycle Initiative. The final appropriation was $2.731 billion, or $479 million more than the request and 24% more than FY2007, with allocations generally intermediate between the House and the Senate. **(CRS Contact: (name redacted).)**

[8] Pier J. Oddone, director of Fermilab, presentation slides from an "all hands" meeting on December 20, 2007, http://www.fnal.gov/pub/today/files/All_Hands_Meeting_122007.ppt; Persis S. Drell, director of SLAC, presentation slides from an "all hands" meeting on January 7, 2008, http://today.slac.stanford.edu/misc/AllHands-010708.ppt.

Department of Defense (DOD)

Congress supports research and development in the Department of Defense (DOD) through its Research, Development, Test, and Evaluation (RDT&E) appropriation. The appropriation primarily supports the development of the nation's future military hardware and software and the technology base upon which those products rely.

Nearly all of what DOD spends on RDT&E is appropriated in Title IV of the defense appropriation bill (see **Table 2**). However, RDT&E funds are also requested as part of the Defense Health Program and the Chemical Agents and Munitions Destruction Program. The Defense Health Program supports the delivery of health care to DOD personnel and family. Program funds are requested through the Operations and Maintenance appropriation. The program's RDT&E funds support Congressionally directed research in such areas as breast, prostate, and ovarian cancer and other medical conditions. The Chemical Agents and Munitions Destruction Program supports activities to destroy the U.S. inventory of lethal chemical agents and munitions to avoid future risks and costs associated with storage. Funds for this program are requested through the Army Procurement appropriation. Typically, Congress has funded both of these programs in Title VI (Other Department of Defense Programs) of the defense appropriations bill. More recently, RDT&E funds have also been requested and appropriated as part of DOD's separate funding to support the Global War on Terror (GWOT). These appropriations have been located in Title IX of the defense appropriations bill. The Joint Improvised Explosive Device Defeat Fund also contains additional RDT&E monies. The Joint Improvised Explosive Device Defeat Office, which now administers the Fund, tracks, but does not report, the amount of funding allocated to RDT&E.

For FY2008, the Bush Administration requested $75.1 billion for DOD's baseline Title IV RDT&E, roughly $800 million less than the total obligational authority available for Title IV in FY2007. The FY2008 requests for RDT&E in the Defense Health Program and the Chemical Agents and Munitions Destruction program were $134 million and $221 million, respectively. This year's request for the Global War on Terror included both a FY2008 Title IX request and a FY2007 Title IX Supplemental request, with $2.9 billion and $1.4 billion being requested for RDT&E, respectively.

Since FY2001, funding for RDT&E in Title IV has increased from $42 billion to $76 billion in FY2007. In constant FY2008 dollars, the increase is roughly 58%. Historically, RDT&E funding has reached its highest levels in constant dollars, dating back to 1948.[9] Congress has appropriated more for RDT&E than has been requested, every year, since FY1996.

RDT&E funding can be broken out in a couple of ways. Each of the military services request and receive their own RDT&E funding. So, too, do various DOD agencies (e.g., the Missile Defense Agency and the Defense Advanced Research Projects Agency), collectively aggregated within the Defensewide account. RDT&E funding also can be characterized by budget activity (i.e. the type of RDT&E supported).Those budget activities designated as 6.1, 6.2 and 6.3 (basic research, applied research, and advanced development) constitute what is called DOD's Science and Technology Program (S&T) and represents the more research-oriented part of the RDT&E

[9] This historical data can be found in DOD's *National Defense Budget Estimates for the FY2008 Budget* (also known as the "Green Book"). Office of the Under Secretary for Defense (Comptroller).March 2007.pp 62-67. See http://www.defenselink.mil/comptroller/defbudget/fy2008/fy2008_greenbook.pdf. Last viewed May 10, 2007.

program. Budget activities 6.4 and 6.5 focus on the development of specific weapon systems or components (e.g. the Joint Strike Fighter or missile defense systems), for which an operational need has been determined and an acquisition program established. Budget activity 6.7 supports system improvements in existing operational systems. Budget activity 6.6 provides management support, including support for test and evaluation facilities.

S&T funding is of particular interest to Congress since these funds support the development of new technologies and the underlying science. Assuring adequate support for S&T activities is seen by some in the defense community as imperative to maintaining U.S. military superiority. This was of particular concern at a time when defense budgets and RDT&E funding were falling at the end of the Cold War. As part of its 2001 Quadrennial Review, DOD established a goal of stabilizing its base S&T funding (i.e., Title IV) at 3% of DOD's overall funding. Congress has embraced this goal. The FY2008 S&T funding request in Title IV is $10.8 billion, about $2.5 billion less than what was available for S&T in Title IV in FY2007 (not counting S&T funding requested as part of the GWOT request). Furthermore, the S&T request for Title IV is approximately 2.2% of the overall baseline DOD budget request (not counting funds for the Global War on Terror), short of the 3% goal. The ability for the Administration to meet its 3% goal has been strained in recent years as the overall Defense budget continues to rise. In the FY2007 defense authorization bill (P.L. 109-364, Sec. 217), Congress reiterated its support for the 3% goal, extended it to FY2012, and stipulated that, if the S&T budget request does not meet this goal, DOD submit a prioritized list of S&T projects that were not funded solely due to insufficient resources.

Within the S&T program, basic research (6.1) receives special attention, particularly by the nation's universities. DOD is not a large supporter of basic research, when compared to the National Institute of Health or the National Science Foundation. However, 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 (such as electrical engineering and material science). The FY2008 request for basic research ($1.4 billion) is roughly $140 million less than what was available for Title IV basic research in FY2007.

In Congressional action to date, Congress approved, and the President signed, the *U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007* (P.L. 110-28). The bill contained emergency supplemental funds, including additional FY2007 RDT&E funds in support of the Global War on Terror. As noted above, the RDT&E-related FY2007 GWOT supplemental request was $1.4 billion. Congress provided $1.1 billion. In addition, the act provided supplemental FY2007 RDT&E funds for the Defense Health Program to support additional trauma-related research. See **Table 3** below.

The House passed H.R. 3222, the *Department of Defense Appropriations Act, 2008*, on August 5. The bill provided $1.1 billion more in Title IV RDT&E funding than requested. The bill provided $12.2 billion in S&T funding (2.7% of the total funds appropriated for the Department), $1.4 billion more than requested. The House chose not to address the FY2008 GWOT request in this bill. It is not possible to compare directly the House figures with FY2007 numbers in **Table 2**, since the latter include GWOT (Title IX) funds from the FY2007 appropriations bill and the House figures do not yet include any FY2008 GWOT funds. In addition to the general increases in the S&T accounts, the House made some notable changes in the President's systems development requests, providing less funds for the Army's Future Combat System ($406 million less) and providing more funds for the Joint Strike Fighter (a total of $705 million more split between the Navy and the Air Force). The House provided $319 million more in RDT&E-related

funds for the Defense Health Program, including $127 million for breast cancer and $80 million for prostate cancer research. Also, Section 8105 of the bill includes a provision limiting the use of appropriations to pay negotiated indirect cost rates on basic research grants, contracts or other agreements to 20% of the direct costs. This may have an impact on university grants.

The Senate Appropriations Committee reported its version of H.R. 3222 (see S.Rept. 110-155) on September 14, 2007. The net effect of the Committee's recommendations was to reduce Title IV RDT&E by approximately $102 million. While increasing Title IV RDT&E by $265 million in the body of the bill, it reduced Title IV funds by $367 million in the General Provisions part of the bill, as part of a general reduction to account for revised economic assumptions. Similar to the House, the Senate Appropriations Committee did not include the FY2008 GWOT request in the bill. The Committee recommended $11.6 billion for the S&T portion of the program (before allocating the general reduction). This is roughly 2.6% of the total amount recommended for the Department (before accounting for the reduction). The Committee recommended roughly $196 million more than requested for the Joint Strike Fighter programs of the Navy and Air Force (reducing program funds in some areas, but increasing funding for a competitive engine development by $480 million). The Committee did not recommend cuts to the Army's Future Combat System programs. The Committee recommended $477 million for the RDT&E portion of the Defense Health Program, including $150 million for peer-reviewed breast cancer and $80 million for peer-reviewed prostate cancer research. It also included $50 million for additional unspecified peer-reviewed medical research. The Committee also increased funding for the RDT&E portion of the Chemical Agents and Munitions Destruction Program.

The conference committee filed its report (H.Rept. 110-434) on November 6, 2007. The conferees recommended $76.9 billion for Title IV RDT&E (this includes the $367 million general reduction to Title IV related to improved economic assumptions). The conferees recommended $12.8 billion for S&T (including $1.6 billion for basic research). The S&T appropriation represents approximately 2.8% of the total amount appropriated for the department (before considering the general reductions). The conferees approximately split their differences on the Future Combat System and the Joint Strike Fighter programs. The conferees recommended $536 million for RDT&E within the Defense Health Program (including peer reviewed research for breast cancer ($138 million), ovarian cancer ($10 million), prostate cancer ($80 million), and other medical research ($80 million). The conferees recommended $313 million for RDT&E within the Chemical Agents and Munitions Destruction program. On the issue of indirect costs on government contracts, grants and cooperative agreements for basic research, the conferees accepted the House proposal, but raised the ceiling to 35% and grandfathered those awards entered into before enactment of this act. The conferees also provided $11.6 billion to help accelerate the development and deployment of Mine Resistant Ambush Protected (MRAP) vehicles, to help protect against the improvised explosive devices being use in Iraq and Afghanistan. This is in addition to $5.2 billion provided earlier for the same purpose in H.J.Res. 52 (P.L. 110-92), which made continuing appropriations for FY2008. In both cases, Congress instructed the Secretary of Defense to transfer these funds to appropriate accounts, including the RDT&E account. Both chambers approved the conference report on November 8, 2007. The President signed the bill (P.L. 110-116) on November 13, 2007.

To address the FY2008 GWOT funding request, the House passed H.R. 4156 on November 14, 2007. It only considered about $50 million of the total request, those activities considered by the House to be in most immediate need of additional funds. The bill did not include any of the funding for RDT&E, although some of those projects could be supported with the MRAP funds appropriated above. H.R. 4156 also allowed the Secretary to transfer certain funds (e.g. those

allocated to the Iraqi Security Forces Fund, and others) to RDT&E accounts, or other accounts, to accomplish the purposes of those funds. On November 16, a Senate vote to end debate on the House bill (and on a Senate Republican alternative, S. 2340) failed. **(CRS Contact: John Moteff.)**

Table 2. Department of Defense RDT&E

($ in millions)

	FY2007 estimate[d]	FY2008 request	FY2008 House	FY2008 Senate	FY2008 enacted
Title IV					
By Account					
Army	10,963	10,590	11,510	11,355	12,127
Navy	18,880	17,076	17,719	17,472	17,919
Air Force	24,421	26,712	26,163	26,070	26,255
Defense Agencies	21,507	20,560	20,659	20,304	20,791
Dir. Test & Eval	184	180	180	180	180
Total Ob. Auth.[a]	**75,955**	**75,118**	**76,231**	**75,381**	**77,272**
By Budget Activity					
6.1 Basic Research	1,564	1,428	1,555	1,566	1,634
6.2 Applied Research	5,329	4,357	5,074	4,560	5,096
6.3 Advanced Development	6,432	4,987	5,562	5,520	6,039
6.4 Advanced Component Development and Prototypes	15,789	15,662	15,900	14,994	15,745
6.5 Systems Dev. and Demo	19,258	18,098	18,374	18,128	18,321
6.6 Management Support[b]	4,216	4,129	4,204	4,391	4,274
6.7 Op. Systems Dev[c]	23,367	26,455	25,561	26,224	26,163
Total Ob. Auth.[a]	**75,955**	**75,117**	**76,230**	**75,383**	**77,272**
Title IV Adjustments				-367[i]	-367[i]
Adjusted Total Ob. Auth.	**75,955**	**75,117**	**76,230**	**75,016**	**76,905**
Additional Appropriations - Global War On Terror (GWOT)	408[e]	3,872[g]	see note[h]	see note[h]	see notes[h,j]
Other Defense Programs					
Defense Health Program	348[f]	134	454	477	536
Chemical Agents and Munitions Destruction	231	221	221	312	313
Grand Total	**76,942**	**79,344**	**76,905**	**75,805**	**77,754**

Source: Except as mentioned below, the FY2007 estimate and the FY2008 budget request figures are based on Department of Defense Budget, Fiscal Year 2008 RDT&E Programs (R-1), February 2007. The FY2007 figure for Defense Health Program is based on P.L. 110-5 (H.J.Res. 20). Figures for Chemical Agents and Munitions Destruction Program are based on Department of Defense Budget, Fiscal Year 2008, Procurement Programs (P-1), February 2007. The budget request figure for the Additional Appropriations for Global War on Terror (GWOT) is based on President's Budget, Appendix, Additional 2007 and 2008 Proposals, February 2007. The House figures are based on H.Rept. 110-279 accompanying H.R. 3222, *Department of Defense Appropriations Bill,*

2008. The Senate figures are based on S.Rept. 110-155, accompanying H.R. 3222. The conference figures are based on H.Rept. 110-434.

a. Total Obligational Authority for Account and Budget Activity may not agree due to rounding.

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

c. Includes funding for classified programs.

d. Does not include the FY2007 Supplemental, P.L. 110-28 (H.R. 2206, *U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007).* See **Table 3**, below.

e. This is the enacted (not the estimated) level of funding for RDT&E-related FY2007 GWOT provided in Title IX of the *Department of Defense Appropriations Act, 2007* (P.L. 109-289).

f. This is the enacted (not the estimated) level of funding for RDT&E-related Defense Health Program activities, provided by P.L. 110-5 (H.J.Res. 20).

g. The original FY2008 GWOT request for RDT&E was $2.89 billion. On July 31, 2007, as part of a budget amendment adding $5.3 billion to the FY2008 GWOT request for the purpose of accelerating the development and deployment of Mine Resistant Ambush Protected (MRAP) vehicles, the Administration requested an additional $30 million in RDT&E funds. On October 22, 2007 the Administration submitted another amendment to the FY2008 GWOT request which included another $985 million for FY2008 GWOT-related RDT&E projects (bringing the total FY2008 GWOT RDT&E-related request, including the July amendment, to $3.9 billion).

h. The House and Senate chose not to address the FY2008 GWOT request in its FY2008 defense appropriations bill (H.R. 3222, P.L. 110-116). Both planned to take up that request in a separate bill. The House passed H.R. 4156 that considered only a portion of the FY2008 GWOT request. The bill focused on areas in immediate need of additional funds. The bill included no RDT&E funding. The President threatened to veto the bill and the Senate did not end debate on the bill. Subsequently, as part of the Consolidated Appropriations Act of 2008 (H.R. 2764, P.L. 110-161), Congress provided $70 billion in emergency FY2008 GWOT funding. No RDT&E funds were specifically included. However, Congress authorized the Secretary of Defense to transfer funds from the Iraqi Freedom Fund, the Afghanistan Security Forces Fund, the Iraq Security Forces Fund, and the Joint Improvised Explosive Device Defeat Fund to other appropriations, including RDT&E. Such transfers are not captured here. (Also, see Note j below).

i. I. Section 8098 of the Senate Appropriations Committee's reported bill recommended a general reduction to various Titles based on revised economic assumptions. The reduction for Title IV RDT&E was $367 million, to be distributed proportionately across all program elements, projects, and activities. The conferees agreed. See Section 8104 of the final bill.

j. As part of a resolution to make continuing appropriations for FY2008 (H.J.Res. 52, P.L. 110-92), Congress provided $5.2 billion for MRAP. Also, in the defense appropriations bill (H.R. 3222, Sec. 8121), Congress provided an additional $11.6 billion for MRAP. In both instances, the Secretary was instructed to transfer these funds to various accounts, including the RDT&E account. The figures here do not reflect any such transfers.

Table 3. Department of Defense RDT&E, FY2007 Emergency Supplemental

($ in millions)

	FY2007 Supplemental Request	FY2007 Supplemental House	FY2007 Supplemental Senate	FY2007 Supplemental Enacted
Additional Appropriations—Global War On Terror (GWOT)				
By Account				
Army	116	61	126	100
Navy	460	296	308	299
Air Force	221	133	234	187
Defense Agencies	651	546	523	513
Dir. Test & Eval				
Total Ob. Auth.[a]	**1,448**	**1,035**	**1,190**	**1,098**
By Budget Activity				
6.1 Basic Research				
6.2 Applied Research				
6.3 Advanced Development	4	0	4	0
6.4 Advanced Component Development and Prototypes	73	9	42	17
6.5 Systems Dev. and Demo	86	93	98	107
6.6 Management Support[b]	16	0	10	2
6.7 Op. Systems Dev	1,269	934	1,037	973
Total Ob. Auth.[a]	**1,448**	**1,036**	**1,191**	**1,099**
Other Defense Programs				
Defense Health Program		500	72	332
Grand Total	**1,448**	**1,1536**	**1,263**	**1,431**

Source: Figures for the FY2007 Supplemental Request are based on the Office of the Secretary of Defense, Fiscal Year 2007 Emergency Supplemental Request, Exhibits for FY2007, pp. 13-14. House, Senate and Enacted figures are taken from H.Rept. 110-107, *Making Emergency Supplemental Appropriations for the Fiscal Year Ending September 20, 2007, and Other Purpose,* Conference Report, to accompany H.R. 1591. H.R. 1591 was vetoed by the President. The House failed to overturn the President's veto. Both houses then passed and the President signed H.R. 2206 (*U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (*P.L. 110-28*)*. There is, as yet, no report accompanying H.R. 2206. However, the figures approved for each account (i.e. the Services and Defense Agencies) in H.R. 2206 agree with those approved in H.R. 1591. The table assumes the breakdown of those accounts by budget activity reported in H.Rept. 110-107 are valid for H.R. 2206.

a. Account vs. Budget Activity Total Obligational Authority numbers may not agree due to rounding.

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

National Aeronautics and Space Administration (NASA)

NASA requested $12.7 billion for R&D in FY2008. (For details, see **Table 4**.) This request was a 7.3% increase over FY2007, in a total NASA budget that was to increase by 6.4%. The House provided $13.1 billion (H.R. 3093 and H.Rept. 110-240). The Senate provided $12.9 billion (H.R. 3093 and S.Rept. 110-124 accompanying S. 1745). The final appropriation was $12.8 billion (P.L. 110-161 and explanatory statement, *Congressional Record*, December 17, 2007).

Table 4. NASA R&D

($ in millions)

	FY2007	FY2008 request	FY2008 House	FY2008 Senate	FY2008 enacted
Science	5,371	5,516	5,696	5,618	5,547
Astrophysics	*1,611*	*1,566*	*1631*	*1,555*	*1,579*
Earth Science	*1,409*	*1,497*	*1,572*	*1,624*	*1,524*
Heliophysics	*1,012*	*1,057*	*1,072*	*1,082*	*1,057*
Planetary Science	*1,340*	*1,396*	*1,421*	*1,357*	*1,387*
Exploration Systems	3,457	3,924	3,924	3,946	3,821
Constellation Systems	*2,550*	*3,068*	*3,068*	*3,098*	*2,991*
Advanced Capabilities	*907*	*856*	*856*	*849*	*830*
Aeronautics Research	717	554	700	550	622
Cross-Agency Support Programs	540	489	577	518	553
International Space Station	1,773	2,239	2,239	2,239	2,209
Subtotal R&D	**11,859**	**12,722**	**13,135**	**12,872**	**12,752**
Space Shuttle	3,977	4,008	3,988	4,008	3,981
Space and Flight Support	396	546	466	546	543
Inspector General	32	35	35	35	33
Return to Flight	—	—	—	1,000	—
Total NASA	**16,264**	**17,309**	**17,622**	**18,460**	**17,309**

Source: FY2007 amounts are from NASA briefing charts based on the March 2007 operating plan. FY2008 amounts are from the NASA budget justification (http://www.nasa.gov/news/budget/); H.R. 3093 as passed by the House and H.Rept. 110-240; H.R. 3093 as passed by the Senate and S.Rept. 110-124 (accompanying S. 1745); and P.L. 110-161 and explanatory statement, *Congressional Record*, December 17, 2007, pp. H15819-H15825. The italicized rows are shown in the categories NASA uses for FY2008, which are different from those it used for FY2007. In those rows, some FY2007 amounts have been calculated by CRS to make them comparable with FY2008; the FY2007 amounts for Earth Science and Heliophysics are CRS estimates. For comparability, the House amount for Education is included in Cross-Agency Support Programs, and unallocated general reductions are applied proportionally to the affected programs. FY2007 amounts are adjusted to reflect "full cost simplification" accounting changes.

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 regular flight status following the 2003 *Columbia* disaster, but then retiring it by 2010; completing the International 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." To replace the space shuttle and carry astronauts to the Moon, NASA is developing a new spacecraft and a new launch vehicle, known as Orion and Ares I. Their first crewed flight is expected in early 2015.

In general, the FY2008 request included substantial increases for programs related to the Vision and modest increases or even decreases for other programs. The request for Constellation Systems, the program responsible for developing Orion and Ares I, was an increase of $518 million or 20.3% relative to FY2007. The request for the International Space Station was an increase of $466 million or 26.3%. Meanwhile, among programs not focused on space exploration, the request for Science was an increase of $145 million or 2.7%, and the request for Aeronautics Research was a decrease of $163 million or 22.7%. In the final appropriation, Congress provided smaller increases than requested for Constellation Systems and the International Space Station, a larger increase for Science, and a smaller decrease for Aeronautics Research.

The effect of the Vision on science funding is of particular congressional interest. For example, the House report said that the requested budget would "sacrifice future missions of discovery to pay for present efforts," while the Senate report expressed concern that NASA science "is being left behind rather than being nurtured and sustained." Support for Earth Science has been a particular concern in both Congress and the scientific community. Although the FY2008 request included increased funding for Earth Science and projected further increases in FY2009 and FY2010 relative to previous plans, most of the increases were to cover cost growth and schedule delays in existing missions. In Astrophysics, the FY2008 request deferred the Space Interferometer mission (SIM) beyond FY2012. The House provided $180 million more than the request for Science, including $60 million for new Earth Science missions and a $50 million increase for SIM. The Senate provided $102 million more than the request for Science, with the bulk of the increase devoted to Earth Science. The final Science appropriation was an increase of $31 million, including increases for Earth Science ($27 million) and SIM ($38 million) but partially offsetting these with reductions in other programs. **(CRS Contact: (name redacted).)**

National Institutes of Health (NIH)

The President requested a budget of $28.558 billion at the program level for NIH for FY2008, $480 million (1.7%) below the final level of $29.038 billion for FY2007 (see **Table 5**). The FY2008 program level amount provided by the Consolidated Appropriations Act, 2008 (P.L. 110-161, December 26, 2007) was $29.170 billion, an increase of $131 million (0.45%) over the FY2007 level.

House and Senate actions on the original individual FY2008 appropriations bills had produced recommendations for increases for NIH above the FY2007 level of $569 million (2.0%) for the House and $770 million (2.7%) for the Senate, with program levels of $29.607 billion and $29.837 billion, respectively. Conferees had settled on a higher level of approximately $29.937 billion, but action could not be completed on the legislation. The FY2007 level had been derived from P.L. 110-5, the Revised Continuing Appropriations Resolution (CR), although actual FY2007 appropriations levels were not specified by the CR. The precise figures became available

as agencies reported their FY2007 operating plans, and the final amount for NIH was also affected by the FY2007 supplemental appropriations legislation, with a transfer of $99 million from NIH to the Office of the Secretary of HHS. The FY2007 NIH appropriation was $570 million (2.0%) more than the FY2006 program level of $28.468 billion.

The bulk of NIH's budget comes through the annual Labor-HHS-Education (Labor/HHS) appropriations legislation, with an additional small amount of funding, for environmental work related to Superfund, coming from the Interior, Environment, and Related Agencies appropriations bill. For the FY2008 Labor/HHS bill, the House and Senate Appropriations Committees reported H.R. 3043 (H.Rept. 110-231) and S. 1710 (S.Rept. 110-107), respectively. The eventual conference version of H.R. 3043 (H.Rept. 110-424) was vetoed by the President, who cited overall funding levels that were higher than he had requested. Lengthy negotiations between Congress and the Administration culminated in enactment of the Consolidated Appropriations Act, 2008 (H.R. 2764, P.L. 110-161), which provided funding for most government programs outside the Department of Defense. (For detailed tracking of the Labor/HHS appropriations bill, see CRS Report RL34076, *Labor, Health and Human Services, and Education: FY2008 Appropriations*, coordinated by (name redacted), by (name redacted), (name redacted), and (name redacted).)

Funding from the two regular appropriations bills (Labor/HHS and Interior/ Environment) constitutes NIH's discretionary budget authority. In addition, NIH receives $150 million pre-appropriated in separate funding for diabetes research, and $8.2 million from a transfer within the Public Health Service (PHS). For the past several years, about $100 million of the annual NIH appropriation has been transferred to the Global Fund to Fight HIV/AIDS, Tuberculosis, and Malaria. The FY2008 budget request proposed to increase the amount to $300 million, representing the entire U.S. contribution to the Global Fund. The House and Senate Labor/HHS bills agreed with that approach; in P.L. 110-161, the final amount of the transfer from the NIH appropriation was $295 million. The total of all funding available for NIH activities, taking account of add-ons and transfers, is called the program level.

FY2003 was the final year of a five-year undertaking by Congress 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. The research advocacy community had originally urged that the NIH budget grow by about 10% per year in the post-doubling years. For FY2004 and FY2005, however, Congress gave NIH increases of between 2% and 3%, levels which were below the biomedical inflation index for those two years. The advocates modified their recommendation to 6% for FY2006 and to 5% for FY2007, maintaining that such increases would be needed to keep up the momentum of scientific discovery made possible by the increased resources of the doubling years. Instead, the NIH appropriation for FY2006 declined 0.3%, marking the first decrease in the agency's budget since 1970. The FY2007 final level was a 2.0% increase over FY2006, compared to a projected biomedical inflation index of 3.7% for the year. For FY2008, the final funding level is 0.45% above FY2007, whereas the advocacy community had urged a 6.7% increase in the appropriation as a step towards reversing the decline in NIH's purchasing power that has occurred since FY2003. The FY2008 funding represents an estimated 11% decrease from FY2003 in inflation-adjusted terms.

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, particularly in areas of research that involve multiple institutes. The individual institutes and centers (ICs), each having a focus on particular diseases,

areas of human health and development, or aspects of research support, plan and manage their own research programs in coordination with the Office of the Director. As shown in **Table 5**, Congress provides a separate appropriation to 24 of the 27 ICs, to OD, and to a buildings and facilities account. (The other three centers, not included in the table, are funded through the NIH Management Fund, financed by taps on other NIH appropriations.)

The FY2008 President's request was developed prior to congressional completion of the FY2007 appropriation, and most of the institutes and centers wound up approximately level-funded from their FY2007 amounts. Several of the ICs that received increases from Congress in the FY2007 CR were dropped back in the FY2008 request to levels closer to their FY2006 funding. For example, the National Center for Research Resources (NCRR) was given $34 million extra in FY2007 for one-year Shared Instrumentation Grants; the FY2008 request decreased the NCRR budget by $19 million. The biggest institute, the National Cancer Institute, would have been cut by over $10 million (0.2%) in the request. The second largest, the National Institute of Allergy and Infectious Diseases (NIAID), would have been increased by $229 million (5.3%) over FY2007, but only $28 million of that amount was for NIAID programs. The other $201 million of the increase was for transfer to the Global Fund to Fight HIV/AIDS, Tuberculosis, and Malaria, mentioned earlier.

The House and Senate Labor-HHS-Education appropriations bills, in contrast, would have increased funding for most of the institutes and centers over their FY2007 levels by between 1.4% and 1.7% for the House and between 2.2% and 2.5% for the Senate. Somewhat larger increases would have gone to several ICs in both bills, including NCRR and NIAID. In the FY2008 final appropriation, increases for most of the ICs were considerably below 1%, and three ICs were decreased.

The two biggest changes in the request and in the appropriation were in the Buildings and Facilities account and in the Office of the Director. Many of the laboratories, animal facilities, and office buildings on the NIH campus are aging, and are in need of upgrading to stay compliant with health and safety guidelines and to provide the proper infrastructure for the Intramural Research program. The budget requested $136 million for Buildings and Facilities (B&F), an increase of $52 million (63%). The final appropriation included $119 million for B&F, an increase of $35 million (42%).

For the Office of the Director, the President and Congress handled the funding in two different ways, with the President requesting a $530 million (51%) drop in the account, and the appropriation giving a $62 million (5.9%) increase. The difference reflects a change in the way Congress funds the NIH Roadmap for Medical Research, which is a set of trans-NIH research activities designed to support high-risk/high-impact research in emerging areas of science or public health priorities. The initiatives are funded through a Common Fund that until FY2007 was supported partially in the OD appropriation and partially by contributions from each IC at a fixed percentage. The original FY2007 Roadmap total of $443 million required $332 million from the institutes and centers (a 1.2% tap on their budgets) and $111 million from the Director's Discretionary Fund. The final FY2007 CR, however, appropriated $483 million and placed the entire sum in OD, boosting that appropriation and allowing the ICs to use all of their funding for their own programs without the Roadmap tap for trans-NIH research. For FY2008, the request divided a planned total of $486 million for the Roadmap/Common Fund between the IC budgets ($364 million, a 1.3% tap) and OD ($122 million). The House and Senate bills supported the Common Fund entirely in OD, with the House bill providing a 2.5% increase to $495 million, and

the Senate providing a 10% increase to $531 million. The final amount in P.L. 110-161 was $496 million.

Also in the OD account for the first time in FY2007 was $69 million for the National Children's Study. This long-term (25+ year) environmental health study was proposed for cancellation in the FY2007 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. The overall projected cost for the whole study is about $2.7 billion. For FY2007, both appropriations committees directed NIH to continue with the study, and the CR provided the $69 million. The FY2008 request again included no funding for the study, but the final appropriation provided $110.9 million to OD for its continued support.

The NIH's two major concerns in the face of tight budgets are maintaining support of investigator-initiated research through research project grants (RPGs), and continuing to nourish the pipeline of new investigators. The FY2008 request concentrated resources on supporting research grants, planning to fund 10,188 competing RPGs, one of the highest numbers ever. However, the expected "success rate" of applications receiving funding would have remained at about 20%, and scientists with non-competing (continuation) grants would not have received inflationary increases for their costs. Both committee reports indicated that their funding would have supported a larger number of grants than the request and would have funded some increases in the average costs of grants. The explanatory statement for P.L. 100-161 says that it "provides funding for a low percent increase in the average cost of new as well as non-competing grants."

Several efforts were focused on supporting new investigators, to encourage young scientists to undertake careers in research despite the discouraging financial climate, and to help them speed their transition from training to independent research. The request and the bills included increases for new types of awards such as the Pathway to Independence, the Directors' Bridge awards, and New Innovator awards in the Common Fund. The Director's Pioneer Awards to encourage high risk research were also supported, as were clinical research training and the new Clinical and Translational Science Awards. In the final appropriation, the explanatory statement indicates that the Pioneer, New Innovator, and Bridge awards were funded at FY2007 levels, and that the Pathways to Independence program received funding at the level of the President's request.

The biodefense research portfolio was slated in the request to increase slightly by cycling one-time extramural construction costs into other research areas. The Senate bill as reported included legislative language on human embryonic stem cell research, expanding access to stem cell lines and tightening ethical guidelines for their use. To avoid controversy, however, the provisions were dropped before the bill went to the floor.

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 FY2008 appropriation kept the tap at 2.4%, the same as in FY2007. NIH, with the largest budget among the PHS agencies, becomes the largest "donor" of program evaluation funds, and is a relatively minor recipient.

At the end of the 109th 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 and reporting on 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 (NIH): Organization, Funding, and Congressional Issues*, by (name reda cted). **(CRS Contact: Pamela Smith.)**

Table 5. National Institutes of Health

($ in millions)

Institutes and Centers (ICs)	FY2007 adjusted[a]	FY2008 request	FY2008 House	FY2008 Senate	FY2008 enacted
Cancer (NCI)	$4,792.6	$4,782.1	4,880.4	4,910.2	4,805.1
Heart/Lung/Blood (NHLBI)	2,922.4	2,925.4	2,965.8	2,992.2	2,922.9
Dental/Craniofacial Research (NIDCR)	389.1	389.7	395.8	398.6	389.7
Diabetes/Digestive/Kidney (NIDDK)	1,703.0	1,708.0	1,731.9	1,747.8	1,705.9
Neurological Disorders/Stroke (NINDS)	1,533.0	1,537.0	1,569.1	1,573.3	1,543.9
Allergy/Infectious Diseases (NIAID)[b,c]	4,363.0	4,592.5	4,631.8	4,668.5	4,560.7
General Medical Sciences (NIGMS)	1,932.6	1,941.5	1,966.0	1,978.6	1,935.8
Child Health/Human Devel (NICHD)	1,252.8	1,264.9	1,273.9	1,282.2	1,254.7
Eye (NEI)	666.0	667.8	677.0	682.0	667.1
Environmental Health Sci (NIEHS)	647.2	637.4	652.3	656.2	642.3
Aging (NIA)	1,045.5	1,047.1	1,062.8	1,073.0	1,047.3
Arthritis/Musculoskel/Skin (NIAMS)	507.4	508.1	516.0	519.8	508.6
Deafness/Commun Disorders (NIDCD)	393.0	393.7	400.3	402.7	394.1
Nursing Research (NINR)	137.2	137.8	139.5	140.5	137.5
Alcohol Abuse/Alcoholism (NIAAA)	435.6	436.5	442.9	445.7	436.3
Drug Abuse (NIDA)	1,002.0	1,000.4	1,015.6	1,022.6	1,000.7
Mental Health (NIMH)	1,402.4	1,405.4	1,425.5	1,436.0	1,404.5
Human Genome Research (NHGRI)	508.3	484.4	494.0	497.0	486.8
Biomed Imaging/Bioenginrg (NIBIB)	296.4	300.5	303.3	304.3	298.6
Research Resources (NCRR)	1,131.6	1,112.5	1,171.1	1,178.0	1,149.4
Complementary/Alt Med (NCCAM)	121.4	121.7	123.4	124.2	121.6
Minority Health/ Disparities (NCMHD)	199.1	194.5	202.7	203.9	199.6
Fogarty International Center (FIC)	66.4	66.6	67.6	68.0	66.6
Library of Medicine (NLM)	321.6	312.6	325.5	327.8	321.0
Office of Director (OD)[c,d]	1,047.0	517.1	1,114.4	1,145.8	1,109.1
Common Fund (non-add)[d]	*(483.0)*	*(121.5)*	*(495.2)*	*(531.3)*	*(495.6)*
Buildings & Facilities (B&F)	83.6	136.0	121.1	121.1	119.0
Subtotal, Labor/HHS Approp	**$28,899.9**	**$28,621.2**	**$29,669.7**	**$29,899.9**	**$29,228.5**
Superfund (Interior approp to NIEHS)[e]	79.1	78.4	79.1	78.4	77.5

Institutes and Centers (ICs)	FY2007 adjusted[a]	FY2008 request	FY2008 House	FY2008 Senate	FY2008 enacted
Total, NIH discretionary budg auth	**$28,979.0**	**$28,699.7**	**$29,748.8**	**$29,978.3**	**$29,306.1**
Pre-appropriated Type I diabetes funds[f]	150.0	150.0	150.0	150.0	150.0
NLM program evaluation[g]	8.2	8.2	8.2	8.2	8.2
Global HIV/AIDS Fund transfer[b]	-99.0	-300.0	-299.8	-300.0	-294.8
Total, NIH program level	**$29,038.2**	**$28,557.9**	**$29,607.2**	**$29,836.5**	**$29,169.5**

Source: Tables in the explanatory statement on H.R. 2764, Consolidated Appropriations Act, 2008, in the Dec. 17, 2007 *Congressional Record*, Book II. For NIH, the Labor/HHS appropriation is in Division G on p. H16348-H16349, and the Interior/Environment appropriation is in Division F on p. H16174. H.R. 2764 became P.L. 110-161 on Dec. 26, 2007. Totals may not add due to rounding.

a. FY2007 reflects transfers among NIH ICs made under the Director's transfer authority. FY2007 also reflects transfer of $99.0m from NIH to the Office of the Secretary, as mandated by the supplemental appropriations act, P.L. 110-28 (see note c).

b. NIAID totals include funds for transfer to the Global Fund to Fight HIV/AIDS, TB, and Malaria.

c. For FY2007, the war/emergency supplemental appropriations act (P.L. 110-28, May 25, 2007) transferred funding for Advanced Development of Medical Countermeasures to the Public Health and Social Services Emergency Fund ($49.5m each from NIAID and OD).

d. OD has Roadmap funds for distribution to ICs. In FY2007 and in the FY2008 bills and final appropriation, all Roadmap/Common Fund money was in OD; in the FY2008 request, IC budgets included funds that were to be tapped for Roadmap contributions.

e. Separate account in the Interior/Environment/Related Agencies appropriation for NIEHS research activities related to Superfund.

f. Funds available to NIDDK for diabetes research under PHS Act § 330B (P.L. 106-554 and P.L. 107-360).

g. Additional funds from program evaluation set-aside (§ 241 of PHS Act).

National Science Foundation (NSF)

The Consolidated Appropriations Act, 2008 (P.L. 110-161, H.R. 2764), provides $6.065 billion for the National Science Foundation (NSF) in FY2008, $147.8 million above the enacted FY2007 level, and $364.0 million below the budget request. The act funds the Research and Related Activities (R&RA) account at $4.822 billion in FY2008, $53.5 million (1.1%) above the FY2007 level, and $310.2 million below the Administration's request. Appropriators agreed with the Administration's request to transfer the Experimental Program to Stimulate Competitive Research (EPSCoR) from the Education and Human Resources Directorate (EHR) to the R&RA. Report language from conferees directs NSF to review its polices concerning transformative research, research that is described as "cutting edge" and revolutionary. Several reports have been released recommending that NSF allocate funds specifically for this type of research. Appropriators have directed the agency to issue a report suggesting how transformative research can be included in NSF's portfolio of research activities. Additional report language in the report directs NSF to increase its support for physical infrastructure improvements of its academic research fleet and for aging facilities. P.L. 110-161 funds the Major Research Equipment and Facilities Construction (MREFC) at $220.7 million and the Education and Human Resources (EHR) Directorate at $725.6 million in FY2008.

The FY2008 request for the NSF was $6.429 billion, an 8.6% increase ($511.8 million) over the FY2007 estimate of $5.917 billion. (See **Table 6**.) President Bush's ACI has proposed to double the NSF budget over the next 10 years. The FY2008 request will be another installment toward that doubling effort. The FY2008 request for NSF was designed to support several interdependent priority areas: discovery research for innovation, preparing the workforce of the 21st century, transformational facilities and infrastructure, international polar year leadership, and stewardship. These particular areas of investments, similar to the goals contained in the President's proposed ACI, are designed to promote research that will drive innovation and support the design and development of world-class facilities, instrumentation, and infrastructure at the frontiers of discovery. The priorities will support also a portfolio of programs directed at strengthening and expanding the participation of underrepresented groups and diverse institutions in the scientific and engineering enterprise.

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 had requested $45.0 million for the Office of International Science and Engineering. Also, in FY2008, NSF continued in its leadership role in planning U.S. participation in observance of the International Polar Year, which spans 2007 and 2008. The FY2008 request for addressing the challenges in polar research was $464.9 million. A major focus of planned polar research would be in climate change and environmental observations. Other proposed FY2008 highlights included funding for the National Nanotechnology Initiative ($389.9 million), investments in Climate Change Science Program ($208.3 million), continued support for homeland security ($375.4 million), and funding for Networking and Information Technology Research and Development ($993.7 million).

Included in the FY2008 request was $5.131 billion for R&RA, a 7.6% increase ($363.0 million) above the FY2007 estimate of $4.768 billion. 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 FY2008 request provided increased funding for the physical sciences. Research is multidisciplinary and transformational in nature, and very often, discoveries in the physical sciences often lead 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 FY2008 request transferred support for EPSCoR from the EHR to IA. It was determined that placement in IA would allow the research focus and cross-directorate activities of EPSCoR to be more fully integrated in the agency and give it more leverage for improving and planning its research agendas. The FY2008 request provided $263 million for IA. Included in that amount was $107 million for EPSCoR. The EPSCoR request would support a portfolio of four investment strategies. Approximately 62.6% of the funding for EPSCoR would be for a combination of new and continuing awards.

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. While the NSF does not own the ships, it is responsible for the operation, maintenance, and staffing of the vessels. The OPP was to be funded at $464.9 million in the FY2008 request. Increases in OPP for FY2008 were directed at research programs for arctic and antarctic sciences—glacial and sea ice, terrestrial and marine ecosystems, the ocean, and the atmosphere, and biology of life in the cold and dark. The NSF also serves in a leadership capacity for several international research partnerships in polar regions.

The NSF supports a variety of individual centers and center programs. The FY2008 request provided $66.2 million for Science and Technology Centers, $59.2 million for Materials Research Science and Engineering Centers, $52.9 million for Engineering Research Centers, $42.4 million for Nanoscale Science and Engineering Centers, $27.0 million for Science of Learning Centers, and $11.5 million for Centers for Analysis and Synthesis.

Additional priority areas in the FY2008 request included those of strengthening core disciplinary research, and sustaining organizational excellence in NSF management practices. NSF maintains that researchers need not only access to cutting-edge tools to pursue the increasing complexity of research, but funding to develop and design the tools critical to 21st century research and education. An investment of $200.0 million in cyberinfrastructure would allow for funding of modeling, simulation, visualization, and data storage and other communications breakthroughs. NSF anticipated that this level of funding will make cyberinfrastructure more powerful, stable, and accessible to researchers and educators through widely shared research facilities. Increasing grant size and duration has been a long-term priority for NSF. The funding rate for research grant applications was 21% in FY2006 and 20% in FY2007. NSF planned to return to the 21% funding rate in FY2008. In addition, the average duration would be lengthened and the average award size increased.

The FY2008 request for the EHR Directorate was $750.6 million, $55.9 million (8%) below the FY2007 estimate. The EHR portfolio is focused on, among other things, increasing the technological literacy of all citizens, preparing the next generation of science, engineering, and mathematics professionals, and closing the achievement gap in all scientific fields. Support at the various educational levels in the FY2008 request was as follows: research on learning in formal and informal settings (includes precollege), $222.5 million; undergraduate, $210.2 million; and graduate, $169.5 million. Priorities at the precollege level include research and evaluation on education in science and engineering ($42.0 million), informal science education ($66.0 million), and Discovery Research K-12 ($107.0 million). Discovery Research is structured to combine the strengths of three existing programs and encourage innovative thinking in K-12 science, technology, engineering, and mathematics education.

Programs at the undergraduate level are designed to "create leverage for institutional change." Priorities at the undergraduate level included the Robert Noyce Scholarship Program ($10.0 million), Course, Curriculum and Laboratory Improvement ($37.5 million), STEM Talent Expansion Program ($29.7 million), Advanced Technological Education ($51.6 million), and Scholarship for Service ($12.1 million). The Math and Science Partnership Program (MSP), a crosscutting program, was proposed at $46 million in the FY2008 request. The MSP in NSF coordinates activities with the Department of Education and its state-funded MSP sites. The MSP in NSF 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 ($25.0 million), Graduate Research Fellowships ($97.5 million), and the Graduate Teaching Fellows in K-12 Education ($47.0 million). Added support was given to several programs directed at increasing the number of underrepresented groups in science, mathematics, and engineering. Among these targeted programs in the FY2008 request were the Historically Black Colleges and Universities Undergraduate Program ($30.0 million), Tribal Colleges and Universities Program ($12.9 million), Louis Stokes Alliances for Minority Participation ($40.0 million), and Centers of Research Excellence in Science and Technology ($29.5 million).

The MREFC account was funded at $244.7 million in the FY2008 request, a 28.1% increase ($53.8 million) over the FY2007 estimate. The MREFC supported 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 was directed to ongoing projects. Second priority was directed at projects that have been approved by the National Science Board for new starts. NSF required 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 FY2008 request met that qualification. Six ongoing projects and one new start were proposed for funding in the FY2008 request: Atacama Large Millimeter Array Construction ($102.1 million), Ice Cube Neutrino Observatory ($22.4 million), National Ecological Observatory Network ($8.0 million), South Pole Station Modernization project ($6.6 million), Alaskan Region Research Vessel ($42.0 million), Ocean Observatories Initiative ($31.0 million), and Advanced Laser Interferometer Gravitational Wave Observatory ($32.8 million).

On May 2, 2007, the House Committee on Science and Technology passed H.R. 1867 (H.Rept. 110-114), the National Science Foundation Authorization Act of 2007. The bill authorizes a total of $21.0 billion for the NSF for FY2008, FY2009, and FY2010, including $16.4 billion for R&RA, $2.8 billion for EHR, and $787.0 million for MREFC. Priorities to be addressed in the three-year authorization bill include those of supporting successful K-12 science, mathematics, and engineering education programs, promoting university-industry partnerships, balancing funding between interdisciplinary and disciplinary research, and improving funding rates for new investigators. **(CRS Contact: (name redacted).)**

Table 6. National Science Foundation

($ in millions)

	FY2007	FY2008 request	House FY2008	Senate FY2008	FY2008 enacted
Research & Related Activities					
Biological Sciences		633.0			
Computer & Inform. Sci. & Eng.		574.0			
Engineering		683.3			
Geosciences		792.0			
Math and Physical Sciences		1,253.0			
Social, Behav., & Econ. Sciences		222.0			
Office of Cyberinfrastructure		200.0			
Office of International Sci. & Eng.		45.0			
U.S. Polar Programs		464.9			
Integrative Activities[a]		263.0			
U.S. Arctic Research Commission		1.5			
Subtotal Res. & Rel. Act	**4,768.0[c]**	**5,131.7**	**5,139.7**	**5,156.1**	**4,821.5[c]**
Ed. & Hum. Resr.	694.7	750.6	822.6	850.6	725.6
Major Res. Equip. & Facil. Constr.	190.9	244.7	244.7	244.7	220.7

	FY2007	FY2008 request	House FY2008	Senate FY2008	FY2008 enacted
Agency Operations & Award Management.	248.3	285.6	285.6	285.6	281.8
National Science Board	4.0	4.0	4.0	4.0	4.0
Office of Inspector General	11.4	12.4	12.4	12.4	11.4
Total NSF[b]	**5,917.2**	**6,429.0**	**6,509.0**	**6,553.4**	**6,065.0**

a. Beginning in the FY2008 request, EPSCoR was transferred from the EHR Directorate to Integrative Activities.

b. The totals do not include carry overs or retirement accruals. Totals may not add due to rounding.

c. Specific funding allocations for each directorate or for individual programs and activities are not yet available.

Department of Agriculture (USDA)

On December 26, 2007, the President signed into law the Consolidated Appropriations Act, 2008 (P.L. 110-161, H.R. 2764). This act includes appropriations for agencies covered under the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2008, including the U.S. Department of Agriculture (USDA). P.L. 110-161 provides a total of $2.603 billion for research and education for USDA in FY2008, $301.6 million above the budget request and $74.7 million above the FY2007 enacted level.[10] (See **Table 7**.) The Agricultural Research Service (ARS) is USDA's in-house basic and applied research agency, and operates approximately 100 laboratories nationwide, including the world's largest multidisciplinary agricultural research center, located in Beltsville, Maryland. The ARS laboratories focus on efficient food and fiber production, 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 FY2008 is $1.176 billion for ARS, $138.5 million above the request and $47.1 million above the FY2007 enacted level. The Administration had proposed reductions of $141.0 million in funding add-ons designated by Congress for research at specific locations. The amounts were to be redirected to high-priority Administration initiatives that included livestock production, food safety, crop protection, and human nutrition. Included in the FY2008 appropriation for ARS is $47.1 million for buildings and facilities. The Administration had requested funding for the planning and design of the Biocontainment Laboratory and Consolidated Poultry Research Facility in Athens, Georgia.

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, education, and outreach. 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. P.L. 110-161 provides $1.130 billion for CSREES in FY2008, an increase of $135.9 million over the budget request and $7.8 million above the FY2007 enacted level. Funding for

[10] The funding estimates presented for FY2007 are based on the estimated full year amounts available under the Continuing Appropriations Resolution, 2007 (P.L. 110-5, as amended).

formula distribution in FY2008 to the state Agricultural Experiment Stations is $279.9 million, $5.7 million below the FY2007 level. Support for the 1890 formula programs is $41.3 million, almost level with FY2007. The FY2008 budget request proposed, as in previous years, to modify the Hatch formula program. It would expand the multistate research programs from 25% to approximately 60% and distribute a portion of the funds through competitively awarded grants. In previous years, Congress did not accept the Administration's proposed changes to the Hatch formula.

The Consolidated Appropriations Act funds the National Research Initiative (NRI) Competitive Grants Program at $192.2 million, a slight increase over the FY2007 enacted level of $190.2 million. In addition to supporting fundamental and applied science in agriculture, USDA maintains that the NRI makes a significant contribution to developing the next generation of agricultural scientists. The FY2008 appropriation includes funding 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 underrepresented groups in the USDA portfolio of commodity, loan, education, and grant offerings. In addition, NRI funding will support projects directed at developing alternate methods of biological and chemical conversion of biomass, and research determining the impact of a renewable fuels industry on the economic and social dynamics of rural communities. The Administration had proposed support for initiatives in agricultural genomics, emerging issues in food and agricultural security, the ecology and economics of biological invasions, plant biotechnology, and water security.

The FY2008 appropriation for USDA provides $77.9 million for the Economic Research Service (ERS), $2.7 million above the FY2007 enacted level; and $163.4 million for the National Agricultural Statistics Service (NASS), approximately $16.1 million above the FY2007 level. It is anticipated that the increase for ERS will expand the market analysis and outlook program and strengthen the coverage of increasingly complex global markets for various agricultural products. The increase for NASS will be in support of the 2007 Census of Agriculture. Funding will be available also to obtain contract services for extensive data collection and processing activities scheduled to occur in 2008. **(CRS Contact: (name redacted).)**

Table 7. U.S. Department of Agriculture R&D

($ in millions)

	FY2007[a]	FY2008 request[b]	House FY2008	Senate FY2008	FY2008 enacted
Agricultural Research Service (ARS)					
Product Quality/Value Added		104.6			
Livestock Production		70.7			
Crop Production		168.9			
Food Safety		103.2			
Livestock Protection		108.3			
Crop Protection		173.7			
Human Nutrition		84.1			
Environmental Stewardship		171.0			
National Agricultural Library		20.4			

	FY2007[a]	FY2008 request[b]	House FY2008	Senate FY2008	FY2008 enacted
Repair and Maintenance		16.6			
Subtotal	**1,128.9**	**1,021.5**	**1,076.3**	**1,154.2**	**1,128.9**
Buildings and Facilities	0.0	16.0	64.0	40.1	47.1
Total, ARS	**1,128.9**	**1,037.5**	**1,140.3**	**1,194.3**	**1,176.0**
Cooperative State Research, Education, & Extension (CSREES) Research and Education					
Hatch Act Formula	322.6	164.4	195.8	214.9	197.2
Cooperative Forestry Research	30.0	20.5	23.3	30.0	25.0
Evans-Allen Formula (Payments to 1890 Institutions)	40.7	38.3	42.0	40.7	41.3
Special Research Grants	14.7	18.1	110.2	67.7	92.4
NRI Competitive Grants	190.2	256.5	190.2	244.0	192.2
Animal Health and Disease Res.	5.0	0.0	5.0	5.0	5.0
Federal Administration	10.3	10.0	44.4	20.8	42.5
Higher Education[d]	37.6	40.5	36.5	38.4	48.9
Other Programs	50.7	44.3	24.0	39.3	28.5
Total, Cooperative Research. & Education[e]	**671.4**	**562.5**	**671.4**	**700.8**	**673.0**
Extension Activities					
Smith-Lever Sections 3b&c	285.6	273.2	281.4	285.8	279.9
Smith-Lever Sections 3d	94.5	91.5	100.9	95.5	98.2
Renewable Resources Extension	4.1	4.1	4.1	4.0	4.0
1890 Colleges, Tuskegee, & West Virginia State University Colleges	35.2	34.1	37.0	35.2	36.1
Other Extension Prog. & Admin.	30.9	28.3	40.5	37.8	38.3
Total, Extension Activities[e]	**450.3**	**431.1**	**463.9**	**458.3**	**456.5**
Total, CSREES[e]	**1,121.7**	**993.6**	**1,135.3**	**1,159.1**	**1,129.5**
Economic Research Service	75.2	82.5	79.3	76.5	77.9
National Agricultural Statistics Service	147.3	167.7	166.1	167.7	163.4
Integrated Activities	55.2	20.1	57.2	12.9	56.2
Total, Research, Education, and Economics	**2,528.3**	**2,301.4**	**2,578.2**	**2,610.5**	**2,603.0**

a. Funding levels for specific programs are not yet available.

b. Funding levels are contained in U.S. Department of Agriculture FY2008 Budget Summary and other documents internal to the agency.

c. Includes Hurricane Katrina Emergency Appropriations of $29.2 million.

d. Higher education includes payments to 1994 institutions and 1890 Capacity Building Grants program, the Native American Institutions Endowment Fund, the Alaska Native and Native Hawaiian-Serving Institutions Education Grants, and others.

e. Program totals may or may not include set-asides (non-add) or contingencies. The CSREES total includes support for Integrated Activities, Community Food Projects, and the Organic Agriculture Research and Education Initiative.

Department of Homeland Security (DHS)

The Department of Homeland Security (DHS) requested $1.379 billion for R&D in FY2008, a decrease of 6.3% from FY2007.[11] This total included $799 million for the Directorate of Science and Technology (S&T), $562 million for the Domestic Nuclear Detection Office (DNDO), and $18 million for Research, Development, Test, and Evaluation (RDT&E) in the U.S. Coast Guard. (For details, see **Table 8**.) The request for DNDO was a 17% increase. The request for the S&T Directorate was an 18% decrease, about half of which resulted from the transfer of some operational programs out of S&T into other DHS organizations.[12] The House provided a total of $1.351 billion: $777 million for S&T, $556 million for DNDO, and $18 million for Coast Guard RDT&E (H.R. 2638, H.Rept. 110-181). The Senate provided a total of $1.414 billion: $838 million for S&T, $550 million for DNDO, and $26 million for Coast Guard RDT&E (S. 1644, S.Rept. 110-84). The final appropriation was a total of $1.328 billion: $830 million for S&T, $473 million for DNDO, and $25 million for Coast Guard RDT&E (P.L. 110-161, explanatory statement in *Congressional Record*, December 17, 2007).

Starting in late 2006, the S&T Directorate realigned its programs and reorganized its management structure. The directorate's program structure is now as shown in **Table 8**. The directorate's university centers of excellence are expected to be aligned to match the new organization, with new centers being established for some topics. The requested reduction of $41 million in the Explosives program was due to the completion of efforts (known as Counter-MANPADS) to develop a prototype system for protecting commercial aircraft against ground-to-air missiles. The requested $51 million reduction in the Infrastructure and Geophysical program largely reflected the elimination of funding for community and regional initiatives previously established or funded at congressional direction. The operational programs transferred out of S&T are the BioWatch monitoring system, the Biological Warning and Incident Characterization (BWIC) system, and the Rapidly Deployable Chemical Detection System (RDCDS) from the Chemical and Biological program and SAFECOM from the Command, Control, and Interoperability program.

The House, citing unfilled staff positions in the S&T Directorate, provided $12 million less than the request for Management and Administration. It rejected the $14 million request for procurement of third-generation BioWatch units in the Chemical and Biological program. It provided $10 million more than the request for University Programs and instructed the S&T Directorate to report on how it selects university centers of excellence, determines the research topics for centers, and evaluates the quality of their work. The House provided no funding for the Analysis, Dissemination, Visualization, Insight, and Semantic Enhancement (ADVISE) program, a data-mining tool, and prohibited obligation of funds for ADVISE until DHS completed a

[11] The FY2007 appropriations bill rescinded $125 million in prior-year funds from the S&T Directorate. If the FY2007 enacted total for DHS R&D is reduced by the amount of this prior-year rescission, the FY2008 request was a 2.4% increase.

[12] If the FY2007 enacted funding for S&T is reduced by the amount of the prior-year rescission, the FY2008 request for S&T is only a 5.8% decrease. See previous footnote. If the FY2007 enacted amount is adjusted for both the rescission and the transfer of programs out of the S&T Directorate, the FY2008 request for S&T is a 5.4% increase.

privacy impact assessment.[13] Several other smaller changes added up to a net decrease of $10 million for Research, Development, Acquisition, and Operations (RDA&O).

The Senate provided an increase of $41 million for RDA&O. Within this total, reductions relative to the request included $13 million from the Chemical and Biological program, $14 million from the Innovation program, and zero funding for ADVISE. Increases included $18 million for the Explosives program to counter car bombs and other improvised explosive devices (IEDs) and $55 million for earmarks in the Infrastructure and Geophysical and Laboratory Facilities programs. The Senate provided a reduction of $2 million in Management and Administration.

The final appropriation included an increase of $35 million in RDA&O and a reduction of $4 million in Management and Administration. The Chemical and Biological program received $21 million less than requested, including $8 million less for third-generation BioWatch procurement. Innovation received $27 million less, and the explanatory statement directed S&T to provide a plan for how the program's funds will be allocated. University Programs received $11 million more than the request, and the explanatory statement called for a briefing similar to the report called for by the House. Explosives received $14 million more, including $15 million to counter car bombs and IEDs. The final appropriation included the Senate earmarks for $55 million. It provided no funding for ADVISE or its follow-ons or successors.

In DNDO, the proposed $47 million increase in Research, Development, and Operations focused primarily on the Transformational R&D program, whose goal is to identify, develop, and demonstrate technologies that fill major gaps in the nuclear detection architecture. The proposed $30 million increase in Systems Acquisition was to begin implementation of the Securing the Cities initiative in the New York City area. Congressional attention has focused recently on criticism of a cost-benefit analysis that DNDO conducted to support its assessment of next-generation Advanced Spectroscopic Portal (ASP) technology for radiation portal monitors.[14]

The House provided the requested amount for Systems Acquisition. The House committee recommended a $40 million reduction, including a $20 million reduction in the Securing the Cities initiative, but this was reversed by a floor amendment. As in past years, the House report directed DNDO not to procure ASP systems until the Secretary of Homeland Security certifies they are more effective than traditional radiation portal monitors.

In the Senate, the largest change relative to the request was a shift of $29 million from Systems Acquisition to Research, Development, and Operations. Of this amount, $20 million was to be spent on screening general aviation aircraft for illicit nuclear materials. The Senate committee recommended a $10 million reduction in the Securing the Cities initiative, half from Systems Acquisition and half from Research, Development, and Operations, but a floor amendment reserved the requested amounts for this initiative. The Senate provided no funding for full-scale procurement of ASP monitors until DHS provides the report and certification called for in the FY2007 appropriations conference report (H.Rept. 109-699).

[13] The assessment was published after passage of the House bill but before passage of the Senate bill. DHS Privacy Office, *Review of the Analysis, Dissemination, Visualization, Insight and Semantic Enhancement (ADVISE) Program*, July 11, 2007.

[14] See, for example, Government Accountability Office, *Combating Nuclear Smuggling: DHS's Decision to Procure and Deploy the Next Generation of Radiation Detection Equipment Is Not Supported by Its Cost-Benefit Analysis*, GAO-07-581T, testimony before the House Committee on Homeland Security, March 14, 2007.

The final appropriation provided $90 million less than the request for Systems Acquisition. As in previous years, it prohibited full-scale procurement of ASP monitors until their performance has been certified by the Secretary, and recognizing "the difficulty the Secretary faces" in making this certification, it provided funds for the National Academy of Sciences "to assist the Secretary in his certification decisions." It required the certification to be made separately for primary and secondary deployments. The final appropriation included the requested amount for Securing the Cities and $13 million related to screening of general aviation aircraft. **(CRS Contact: (name r edacted).)**

Table 8. Department of Homeland Security R&D

($ in millions)

	FY2007	FY2008 request	FY2008 House	FY2008 Senate	FY2008 enacted
Science and Technology Directorate	**848**	**799**	**777**	**838**	**830**
Management and Administration[a]	135	143	131	141	139
Research, Development, Acquisition, & Ops.	713	656	646	697	692
Borders and Maritime Security	33	26	26	26	25
Chemical and Biological[a]	314	229	215	216	208
Command, Control, and Interoperability[b]	63	64	61	62	57
Explosives	105	64	64	82	78
Human Factors	7	13	13	7	14
Infrastructure and Geophysical	75	24	24	64	64
Innovation	38	60	52	46	33
Laboratory Facilities	106	89	89	104	104
Test and Evaluation, Standards	25	26	28	24	29
Transition	24	25	26	24	25
University Programs	49	39	49	39	49
Homeland Security Institute[c]	—	—	—	5	5
Rescission of Unobl'd Prior-Year Funds	-125	—	—	—	—
Domestic Nuclear Detection Office	**481**	**562**	**556**	**550**	**485**
Management and Administration	30	34	31	32	32
Research, Development, and Operations	272	320	317	336	324
Systems Acquisition	178	208	208	182	130
U.S. Coast Guard RDT&E	**17**	**18**	**18**	**26**	**25**
Total DHS R&D	**1,346**	**1,379**	**1,351**	**1,414**	**1,340**
Total Excluding Prior-Year Rescission	**1,471**	**1,379**	**1,351**	**1,414**	**1,340**

Notes: Programs in the S&T Directorate have been realigned since the enactment of the FY2007 appropriation. For comparability, the FY2007 column is shown here in the new structure. (Enacted amounts for FY2007 are presented both ways, with a crosswalk between the two, in the FY2008 congressional budget justification.)

a. BioWatch and related programs are transferred from the S&T Directorate to the Office of Health Affairs in FY2008. The enacted FY2007 funding for these programs in S&T consisted of $1 million in the Management and Administration account plus $84 million in the Chemical and Biological program.

b. SAFECOM is transferred from the S&T Directorate to the National Protection and Programs Directorate in FY2008. Its enacted FY2007 funding in S&T was $5 million in the Command, Control, and Interoperability program.

c. In FY2007, the Homeland Security Institute (HSI) received funding from each of the S&T Directorate divisions. For FY2008, the Senate bill and the final appropriation broke out HSI funding as a separate item. The Senate committee report stated that HSI's total funding was $10 million in FY2007 and the same in the FY2008 request.

Department of Commerce (DOC)

National Oceanic and Atmospheric Administration (NOAA)

For FY2008, the Bush Administration requested essentially flat funding for NOAA's R&D programs. The Administration proposed cuts for some other NOAA research activities, including a 46% cut for the National Ocean Service R&D budget. However, it did propose an increase of the $19 million for the Office of Oceanic and Atmospheric Research (OAR), about 6.7% more than the FY2007 AAAS-estimated funding level.

The Department of Commerce, *NOAA FY2008 Budget Summary*, released February 8, 2007, indicated that NOAA R&D funding would be 16% of the agency's total budget request of $3.82 billion. The request was comprised of 86% research and 14% development funding. Seventy percent of NOAA R&D would be intramural, while 30% of applied research would be extramural. OAR accounts for 60% of all NOAA R&D in the President's FY2008 request.

The American Association for the Advancement of Science (AAAS) estimates that the Consolidated Appropriations Act of 2008 provides a total of $573 million for NOAA R&D (**Table 9**). This resulted in an overall increase of $41 million, or 7.6%, for the agency from FY2007 appropriation levels and would "result in a turnaround from the steady fall in Commerce R&D for most of the decade."[15] The largest decrease, compared with the FY2007 request, was a cut of $23 million for the National Ocean Service. However, Congress provided $6 million more than the FY2008 request for certain coastal science and ocean observation and assessment R&D activities. There was a combined increase of $53 million for OAR from FY2007 levels which is primarily targeted for climate change R&D, ocean exploration, and the National Sea Grant College Program. An increase of $3 million from FY2007 was proposed for NOAA satellite programs (NESDIS) National Polar Environmental Orbiting Satellite System (NPOESS) preparatory data project. Funding for NOAA Fisheries and the National Weather Service R&D was requested and appropriated for approximately at FY2007 levels. The explanatory statement for H.R. 2764 directs $6 million of the FY2008 NOAA budget be set aside for the National Academy of Sciences to consider establishment of a congressional Climate Change Study Committee, as was originally proposed by the House, for advising Congress about the scientific underpinning for national policy responses to climate change.

The Senate Committee on Appropriations had reported S. 1745 (S.Rept. 110-124) that would have provided $628 million for NOAA R&D, or an 18% increase from the AAAS FY2007 estimated funding level. The Senate report criticized NOAA for requesting steep cuts in key ocean programs in the past and for requesting only modest increases in ocean programs for

[15] American Association for the Advancement of Science, http://www.aaas.org/spp/rd/doc08f.htm.

FY2008 at the expense of steep cuts in other research program areas. The Senate report cited the Joint Ocean Commission (JOCI)s' January 2007 findings about the Administration's progress in developing a U.S. ocean policy which, they indicated may have influenced the Administration to request modest increases for some ocean research and ocean-related NOAA R&D programs. The Senate committee introduced $32 million for competitively-awarded research grants programs in OAR. Overall, the recommendation for OAR R&D was almost 32% percent more than the estimated FY2007 level and would have increased the OAR total to $371 million. For climate change R&D, the Senate recommended $217 million, or $24 million more than the request, including $140 million for competitive climate change research grants that had been funded at $126 million in FY2007.

For FY2008, the House Appropriations Committee recommended $585 million for NOAA R&D in H.R. 3093 (H.Rept. 110-240). This is $43 million, or 7.4%, less than recommended in S. 1745; $57 million, or 10.8%, more than the request; and $5 million, or 9.9%, more than the FY2007 estimated appropriation. The House would have provided $280 million for OAR climate change research, or $44 million more than the request. House-recommended competitive grants package for climate change research totaled $172 million, or $126 million more than the FY2007 appropriation. The House bill would have provided $346 million for OAR overall, 23% more than the request. The House report did not address funding JOCI policy/research recommendations. **(CRS Contact: Wayne Morrissey.)**

Table 9. NOAA R&D

($ in millions)

Type of R&D	FY2007 estimate[a]	FY2008 request	FY2008 Senate	FY2008 House	FY2008[b] enacted
National Ocean Service	65	36	51	37	42
National Marine Fisheries	42	42	45	41	42
Oceanic and Atmospheric Research	281	300	371	346	334
National Weather Service	24	23	**23**	**23**	**23**
National Env. Satellite and Data Information	24	27	27	27	27
All other NOAA R&D[c]	95	100	111	110	104
Total Conduct of R&D[d]	**532**	**528**	**628**	**585**	**573**

Source: Office of Management and Budget, R&D Bureau Report, February 1, 2007.

a. P.L. 110-5 (Reported as H.J.Res. 20)

b. P.L. 110-161 (Reported as Amendment to the Senate Amendment to H.R. 2764, Consolidated Appropriations Act of 2006, Div. B, Title I, Commerce, Justice, Science and Related Agencies

c. Includes marine research data acquisition services.

d. Funding data from the American Association for the Advancement of Science (AAAS).

National Institute of Standards and Technology (NIST)

The National Institute of Standards and Technology (NIST) is a laboratory of the Department of Commerce with a mandate 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 President's FY2008 budget requested $640.7 million for NIST, 5.3% below the FY2007 appropriation. Internal research and development under the Scientific and Technology Research and Services (STRS) account would have increased 15.2% to $500.5 million (including the Baldrige National Quality Program). There would be no funding for the Advanced Technology Program (ATP) and support for the Manufacturing Extension Partnership (MEP) would have been reduced 55.8% to $46.3 million. Construction expenses were to increase 60% to $93.9 million. (See **Table 10**.)

The initial FY2008 appropriations bill passed by the House, H.R. 3093, provided $831.2 million for NIST, 22.8% above FY2007. Included in this total was $500.5 million for the STRS account (with the Baldrige National Quality Program), an increase of 15.2% over the FY2007 figure. Support for ATP would have increased 17.7% to $93.1 million, while funding for MEP was to increase 3.9% to $108.8 million. The Committee Report to accompany the bill noted support for legislation (P.L. 110-69) that reestablishes ATP as the Technology Innovation Program while making some changes to the activity. The construction budget would more than double to $128.9 million.[16]

The version of H.R. 3093 passed by the Senate would have appropriated $863.0 million for NIST, $30.8 million of which was to be directed to other non-NIST programs, for a total appropriation of $832.2 million. The STRS account would have been funded at $502.1 million (including the Baldrige National Quality Program), 15.6% above FY2007. The Advanced Technology Program was to be financed at $100.0 million, with $30.8 million of this amount utilized for other activities in the Federal Bureau of Investigation and the U.S. Marshals Service. There was a stipulation in the bill that no single ATP award was to be made to companies with revenues greater than $1 billion. Support for the Manufacturing Extension Program would have increased 5.1% to $110.0 million. The construction budget would total $150.0 million, over two and one-half times FY2007 funding.

P.L. 110-161, the FY2008 Consolidated Appropriations Act, as passed by Congress, provides NIST with $755.8 million, an increase of 11.7% over FY2007 and almost 18.0% over the Administration's request. Support for the STRS account increases 1.4% to $440.5 million (including $7.9 million for the Baldrige National Quality Program). However, this amount is almost 12.0% below the President's budget proposal. The Technology Innovation Program (formerly the Advanced Technology Program) is appropriated $65.2 million (with an additional $5 million from FY2007 unobligated balances under ATP), 17.6% below the previous fiscal year. Funding for MEP totals $89.6 million, 14.4% less than FY2007, but 93.5% above the budget request. Support for construction almost triples to $160.5 million, an amount over one and one-half times that contained in the original budget proposal.

No final FY2007 appropriations legislation for NIST was enacted during the 109th Congress. A series of continuing resolutions funded the program at FY2006 levels through February 15, 2007.

[16] The sum of these figures may not total $831.2 million because of rounding.

However, P.L. 110-5, passed in the 110th Congress, provided $676.9 million in FY2007 support for NIST. Funding for the STRS account increased 10% over the previous fiscal year to $434.4 million while the construction budget decreased 66% to $58.7 million. Financing for ATP at $79.1 million and support for MEP at $104.7 million reflected similar funding in FY2006.

As part of the American Competitiveness Initiative, the Administration stated its intention to double over 10 years funding for "innovation-enabling research" performed 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; FY2007 appropriations for these programs increased 9.6%. For FY2008, the omnibus appropriations legislation provided for a small increase in the STRS account. This is in contrast to the Administration's FY2008 budget which included a 15.2% increase in funding, as did the original appropriations bill, H.R. 3093, as passed by the House, while the Senate-passed version contained a 15.6% increase.

Continued support for the Advanced Technology Program was a major funding issue. The ATP provided "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 cited it as a prime example of "corporate welfare," whereby the federal government invests in applied research activities that, they emphasize, should be conducted by the private sector. Others defended ATP, arguing that it assists businesses (and small manufacturers) in developing technologies that, while crucial to industrial competitiveness, would not or could not be developed by the private sector alone. Although Congress maintained (often decreasing) funding for the Advanced Technology Program, the initial appropriation bills passed by the House since FY2002 failed to include financing for ATP. During the 109th Congress, the version of the measure reported from the Senate Committee on Appropriations also did not fund ATP. For FY2006, support again was provided for the program, but the amount was 41% below that included in the FY2005 appropriations; FY2007 funding remained the same as the previous fiscal year. The Consolidated Appropriations Act, 2008 provides support, however reduced, for a new effort, the Technology Innovation Program, which replaces ATP and is focused on small and medium sized firms.

The budget for the Manufacturing Extension Partnership, another extramural program administered by NIST, was an issue during the FY2004 appropriations deliberations. Although in the recent past congressional support for MEP remained constant, the Administration's FY2004 budget request, the initial House-passed bill, and the FY2004 Consolidated Appropriations Act substantially decreased federal funding for this initiative, reflecting the President's recommendation that manufacturing extension centers "...with more than six years experience operate without federal contribution." However, P.L. 108-447 restored financing for MEP in FY2005 to the level that existed prior to the 63% reduction taken in FY2004. While the level of support decreased in FY2006, it remained significantly above the FY2004 figure; FY2007 funding remained at a similar level. For FY2008, support for this program has been reduced.

For additional information, see CRS Report 95-30, *The National Institute of Standards and Technology: An Appropriations Overview*; CRS Report 95-36, *The Advanced Technology Program*; and CRS Report 97-104, *Manufacturing Extension Partnership Program: An Overview*, all by (name redacted). **(CRS Contact: (name redacted).)**

Table 10. NIST

($ in millions)

NIST Program	FY2007	FY2008 Request	H.R. 3093 (passed House)	H.R. 3093 (passed Senate)	FY2008
STRS[a]	$434.4	$500.5	500.5	502.1	440.5
ATP	79.1	0	93.1	100[b]	65.2[c]
MEP	104.7	46.3	108.8	110	89.6
Construction	58.7	93.9	128.9	150.9	160.5
NIST Total	676.9	640.7	831.2	863[c]	755.8

Note: Figures may not add up because of rounding.

a. Includes funding for the Baldrige National Quality Program

b. Does not include the $30.8 million directed away from the ATP appropriation for use by other non-NIST programs

c. Funding is for the new Technology Innovation Program (TIP) the replaces ATP

Department of Transportation (DOT)

The Bush Administration requested $813 million for the Department of Transportation's (DOT) R&D budget in FY2008, an increase of approximately $19 million (2.4%) from FY2007 funding of $794 million. The House (H.R. 3074, H.Rept. 110-238, H.Rept. 110-446) provided a total of $836 million. The Senate (S. 1789, S.Rept. 110-131) provided a total of $847 million. The Consolidated Appropriations Act of FY2008 provides a total of $852 million, an increase of $58 million (7.3%) over the FY2007 funding level. (See **Table 11**.)

The President requested $410 million in FY2008 for Federal Highway Administration (FHWA) R&D, an increase of $49 million (13.6%) above the FY2007 funding level. The House and Senate each provided $410 million. The final appropriation for FHWA R&D in FY2008 is $410 million. Highway research includes the Federal Highway Administration's transportation research and technology contract programs. These research programs include the investigation of ways to improve safety, reduce congestion, improve mobility, reduce lifecycle construction and maintenance costs, improve the durability and longevity of highway pavements and structures, enhance the cost-effectiveness of highway infrastructure investments and minimize negative impacts on the natural and human environment.

As requested in the President's budget, the final appropriation for FHWA Intelligent Transportation Systems (ITS) R&D is $84 million, an increase of $20 million (30.3%) over FY2007. The FHWA budget also includes state highway R&D distributed to states and local governments to support their local R&D efforts. The President's budget included $172 million for this activity in FY2008, an increase of $9 million (6%) over FY2007. Both the House and Senate acts provided this amount, and the Consolidated Budget Act included $172 million.

The President's R&D request for the Federal Aviation Administration (FAA) for FY2008 was $258 million, down $45 million (14.9%) from FY2007. The request included $140 million in Research, Engineering and Development, $90.4 million in Air Traffic Organization Capital,$28.7

million in the Airport Improvement Program, and $0.1 million in Safety and Operations. The final appropriation for FAA R&D in FY2008 is $274 million, down $30 million (9.6%) from FY2007.

The President proposed $8 million for the Research and Innovative Technology Administration (RITA) to coordinate and advance the pursuit of transportation research that cuts across all modes of transportation, such as hydrogen fuels, global positioning, and remote sensing. The final appropriation for RITA R&D in FY2008 is $8 million, up $6 million (253%) from FY2007. **(CRS Contact: John Sargent.)**

Table 11. Department of Transportation R&D

($ in millions)

Department of Transportation	FY2007 estimate	FY2008 request	FY2008 House	FY2008 Senate	FY2008 enacted
Federal Highway Administration	361	410	410	410	410
Federal Aviation Administration	303	258	265	272	274
Other agencies[a]	130	146	160	165	167
Total	794	813	836	847	852

Note: R&D estimates are from the American Association for the Advancement of Science, http://www.aaas.org/spp/rd/dot08f.htm.

a. "Other agencies" includes National Highway Traffic Safety Administration, Federal Railroad Administration, Federal Transit Administration, Research and Innovative Technology Administration, Federal Motor Carrier Safety Administration, Pipeline and Hazardous Materials Safety Administration, and the Office of the Secretary.

Department of the Interior (DOI)

The Administration requested $621 million for R&D in the Department of the Interior (DOI) in FY2008, an estimated decline of 2.1% from FY2007 funding of $634 million. The House (H.R. 2643, H.Rept. 110-187) provided a total of $678 million. The Senate (S. 1696, S.Rept. 110-91) provided a total of $657 million. The Consolidated Appropriations Act of FY2008 provides a total of $661 million, an increase of $27 million (4.2%) over the FY2007 funding level. (See **Table 12**.)

The U.S. Geological Survey (USGS) is the primary supporter of R&D within DOI, accounting for nearly 90% of the department's total R&D appropriations. The four USGS research divisions are Geographic Research, Geological Resources, Water Resources and Quality, and Biological Research. Total funding for USGS in FY2007 was $564 million. The President's budget proposed a decrease in USGS R&D funding of 3.0% to $547 million. The House provided $602 million (an increase of 6.6%) for USGS, and the Senate provided $581 million (an increase of 3.0%). The Senate bill contained smaller increases for Geological Resources and Biological Research, and did not include funding for the House initiative related to various aspects of global climate change. The final appropriation for USGS in FY2008 is $583 million, an increase of $37 million (3.4%) over the FY2007 budget. Funding is increased in three of the four research areas, and an additional $7 million is provided for climate change research.

Funding for Geological Resources R&D in FY2008 increases by 2.5% to $219 million. The Geological Resources Program assesses the availability and quality of the nation's energy and

mineral resources. The Geological Resources Program researches, monitors, and assesses the landscape to understand geological processes to help distinguish natural change from those resulting from human activity. 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. Geographic Research R&D rises 3.3% to $46 million in FY2007.

Funding for Water Resources R&D, which focuses on activities aimed at improving the quality of U.S. groundwater, remains constant in FY2008 at $126 million. The Cooperative Water Program, which supports the collection of basic hydrologic data, studies of specific water-resources problems, and hydrologic research through USGS partnerships with state governments and other entities, is funded at $63 million in FY2008.

Funding for USGS Biological Research in FY2008 increases by 2.2% to $180 million. This research program develops and distributes information needed in the conservation and management of the nation's biological resources. The program serves as DOI's research arm, using 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. **(CRS Contact: John Sargent.)**

Table 12. Department of the Interior R&D

($ in millions)

DOI	FY2007 estimate	FY2008 request	H.R. 2643	S. 1696	FY2008 enacted
Geographic Research	44	42	47	46	46
Geological Resources	214	198	225	219	219
Water Resources	126	119	128	128	126
Biological Research	176	181	187	182	180
Climate Change Research	0	0	10	0	7
Enterprise Information	5	7	6	6	6
USGS total	**564**	**547**	**602**	**581**	**583**
Other agencies[a]	70	74	76	76	79
Total	**634**	**621**	**678**	**657**	**661**

Note: R&D estimates are from the American Association for the Advancement of Science http://www.aaas.org/spp/rd/int08f.htm, USGS budget office, and USGS FY2008 Budget Justification documents. Totals may not add due to rounding.

a. "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)

Title II of Division F of the Consolidated Appropriations Act for FY2008 (P.L. 110-161),[17] provided $785.8 million for the Environmental Protection Agency's (EPA) Science and Technology account, which reflects most of the Agency's R&D funding. The enacted FY2008 appropriation, which includes a transfer from the agency's Superfund account and reflects a 1.56% across the board rescission,[18] was less than 1% above the President's FY2008 request of $780.6 million, and 3% above the FY2007 appropriation of $763.6 million. (See **Table 13**.) Without adjusting for inflation, FY2008 funding for certain research activities increased relative to FY2007, however, funding for many of the program areas within the S&T account remained relatively constant or declined.

EPA, the regulatory agency responsible for carrying out a number of environmental laws, funds a broad portfolio of R&D activities to provide the necessary scientific tools and knowledge to support decisions relating to preventing, regulating, and abating environmental pollution. EPA's annual appropriations are requested, considered, and enacted according to eight line-item appropriations accounts, which were established by Congress during the FY1996 appropriations process. The Science and Technology (S&T) account incorporates elements of the former EPA Research and Development account, as well as a portion of the former Salaries and Expenses, and Program Operations accounts, which had been in place until FY1996. The S&T account is funded by a base appropriation plus a transfer of appropriated funds from the Superfund account. These transferred funds are dedicated to research on more effective methods to clean up contaminated sites.

R&D at EPA headquarters and laboratories around the country, as well as external R&D, is managed primarily by EPA's Office of Research and Development (ORD). Many of the programs implemented by other offices within EPA have a research component, but the research is not necessarily the primary focus of the program. A large portion of the S&T account appropriations fund EPA's R&D activities managed by ORD, including the agency's research laboratories and research grants, but the account also provides funding for the agency's applied science and technology activities conducted through its program offices (e.g. the Office of Water).

Most of the S&T account funds "actual" research activities, but the operational and administrative expenses of agency research facilities, such as rent, utilities, and security, are also funded within this account. The overall increase for FY2008 above FY2007 was mostly due to a continued shift in funds from the Environmental Programs and Management account to pay these operational and administrative expenses. When comparing funding for research alone (net after operations and administration expenses), the FY2008 consolidated appropriations provided a $6.4 million increase above the FY2008 request, but $17.5 million less than FY2007 (includes transfers from the Superfund account). (See **Table 13**). Consequently, funding enacted for FY2008 for many of EPA's research areas decreased, or remained flat, relative to FY2007.

[17] Title II of Division F of the Consolidated Appropriations Act for FY2008 (P.L. 110-161) signed by the President on December 26, 2007, appropriated a total of $7.46 billion for EPA. For more information regarding EPA's FY2008 appropriations see CRS Report RL34011, *Interior, Environment, and Related Agencies: FY2008 Appropriations*, coordinated by (name redacted) et al.

[18] P.L. 110-161 Division F, Title IV § 437.

However, funding for certain areas, such as Climate Protection and Global Change research, rose above the President's request for FY2008 and the prior year appropriation but in many cases not to the level that the House or the Senate Appropriations Committee had proposed for FY2008. For example, the FY2008 appropriations of $19.7 million for Global Change Research, was roughly 20% more than the $16.2 million provided for FY2007 and the $16.9 million requested, but significantly less than the $33.3 million the House had proposed. The Senate committee had proposed $18.6 million for this research activity. The FY2008 consolidated appropriations also did not include the largest increase recommended within the S&T account by the Senate committee. The Senate committee had recommended $14 million in a new-line item program activity for "extramural research grants." No such line-item program activity had been specified in previous appropriations, nor had it been included in the House proposed bill or the President's FY2008 request. These proposed extramural grants would have been in the form of competitive grants for "high-priority" air quality ($10.0 million) and water quality($4.0 million) research supplemental to other funding for these research activities elsewhere in the account.

Climate change due to emissions of greenhouse gases (GHG) resulting from human activities has drawn the attention of Congress as scientific understanding of the causes, extent, and impacts has grown. This attention was reflected in the debate regarding the FY2008 appropriations.[19] P.L. 110-161 included increases for EPA's global climate change activities within the S&T account, as noted above, as well as within other accounts. However, the FY2008 consolidated appropriations did not include a new account to establish a Commission on Climate Change Adaptation and Mitigation as the House had proposed; nor did the law provide funding in any other existing account for such a commission. The new account would have been supplemental to funding in the S&T account, and would have provided $50.0 million for FY2008. Of the total, $5 million would have been for the establishment and operations of a two-year multi-agency commission to analyze science questions related to climate change adaptation and mitigation and to recommend research priorities. The remaining $45.0 million proposed for this account would have been distributed to support federal agency climate change adaptation and mitigation research efforts based on the commission's recommendations. Neither the Senate Appropriations Committee nor the President had proposed funding for such a commission.

Some Members of Congress and an array of stakeholders have continually raised concerns about the adequacy of funding for scientific research at EPA. For example, EPA's Science Advisory Board (SAB) expressed its concerns about the "decreased trends in the funding of ecosystems research, decreased funding of the Science to Achieve Results (STAR) extramural and fellowship programs, and the elimination of the economics and decision sciences research program within ORD."[20] Similarly, the American Association for the Advancement of Science (AAAS), expressed its concerns regarding the President's FY2008 request and the enacted appropriations.[21]

The EPA funding debate for FY2008 took place within the context of a larger discussion about the adequacy of federal funding for many "core" scientific research activities administered by multiple federal agencies, including EPA. Some Members of Congress, scientists, and

[19] See discussion regarding climate change appropriations under the heading "Climate Change" in the CRS Report RL34011, *Interior, Environment, and Related Agencies: FY2008 Appropriations*, by (name redacted) et al.

[20] EPA's Science Advisory Board (SAB)comments on EPA's Strategic Research Directions and Research Budget for FY2008, An Advisory Report of the U.S. Environmental Protection Agency Science Advisory Board (EPA-SAB-07-004) http://yosemite.epa.gov/sab/sabpeople.nsf/WebCommittees/BOARD.

[21] American Association for the Advancement of Science FY2008 Appropriations Summary http://www.aaas.org/spp/rd/upd1207.htm.

environmental organizations have expressed concern about the downward trend in overall federal resources for scientific research over time. The debate continues to center around the question of whether the regulatory actions of federal agencies are based on "sound science," and how scientific research is applied in developing federal policy. **(CRS Contact: (name redacted))** .

Table 13. Environmental Protection Agency S&T Account

($ in millions)

Environmental Protection Agency	FY2007 Enacted	FY2008 Request	H.R. 2643 House-Passed	S. 1696 S. Comm. Reported	FY2008 Enacted[a]
Science and Technology Appropriations Account					
—Base Appropriations	*$733.4*	*$754.5*	*$783.3*	*$772.5*	*$760.1*
—Transfer in from Superfund Account	*30.2*	*26.1*	*26.1*	*26.1*	*25.7*
Science and Technology Total	**763.6**	**780.6**	**809.4**	**798.6**	**785.8**
—(Operations and Administration)	*(33.0)*	*(73.9)*	*(73.9)*	*(73.9)*	*(72.7)*
Net Science and Technology	**730.6**	**706.7**	**735.5**	**724.7**	**713.1**

Source: Prepared by the Congressional Research Service (CRS) using information in the Joint Explanatory Statement Accompanying Division F of the Consolidated Appropriations Act for FY2008 (P.L. 110-161, H.R. 2764), as presented in the Congressional Record, December 17, 2007.

a. Enacted amounts for FY2008 in the above table reflect a 1.56% across-the-board rescission required in P.L. 110-161 for any discretionary appropriations in Division F Titles I through IV of the law (Division F Title IV § 437 of P.L. 110-161).

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