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Federal Research and Development Funding: FY2004

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SUMMARY

The Bush Administration requested $122.7 billion in federal research and development (R&D) funding for FY2004. This is $5.3 billion above the estimated $117.4 billion that was appropriated for federal R&D in FY2003. This proposed 4.2% increase for R&D is based on new Office of Management and Budget (OMB) FY2003 estimates for civilian R&D, approved by the 108th Congress, on February 13, 2003 (as part of the FY2003 Omnibus appropriation bill P.L. 108-7) that were not available when the President unveiled his FY2004 federal budget on February 3, 2003. Consequently, FY2004 R&D funding comparisons with FY2003 R&D estimates contained in this issue brief (except for DOD R&D numbers which were approved in the 107th Congress) are different than those discussed in the President's FY2004 budget documents. Further, estimated FY2003 civilian R&D agency totals in this issue brief (except for Homeland Security) include a 0.65 across-the-board reduction, as called for in P.L. 108-7.

The President's proposed $4.8 billion increase for DOD R&D ($61.827 billion), along with a $332 million increase for R&D in the Department of Homeland Security, account for almost the entire increase for federal R&D in FY2004. In fact, based on estimated FY2003 spending levels, civilian R&D would decline from $56 billion to $55.8 billion in FY2004. Defense R&D (the sum of DOD's R&D programs and DOE's defense related programs) would increase 8.2%, to $66.9 billion. DOD's basic and applied research programs are proposed to decline 7% and 14% respectively, below FY2003 funding levels. DOD's development activities account for the entire increase in its budget.

The Administration has requested $27.070 billion for basic research, a 3.7% increase over FY2003, while applied research funding would be flat at $26.784 billion. For FY2004 NIH's basic research budget would increase 1.8% to $14.983 billion. Despite signing an NSF reauthorization bill (P.L.107-368) that calls for doubling NSF's budget over the next 5 years, the President requested a 3.2% increase for NSF ($5.5 billion) in FY2004, far below the average annual 14% increase needed to double the budget in five years.

Within the Department of Commerce, the Administration has proposed a 30% reduction for the National Institute of Standards and Technology R&D programs by phasing out funding for the Advanced Technology Program (ATP), as well as federal support for the Manufacturing Extension Partnership Program (MEP).

Congress has begun work on a number of its FY2004 appropriations bills. See individual agency write ups for specifics.

MOST RECENT DEVELOPMENTS

President Bush has proposed to increase R&D spending 4.2% in FY2004, requesting a record level of $122.7 billion. DOD would receive the largest proposed increase, climbing to a proposed record high of $61.8 billion. The Department of Homeland Security's research budget would increase 30% to $1 billion. As President Bush continues to restrain the growth of civilian discretionary spending, civilian R& D will have to compete with other priorities such as health, education, transportation, and homeland security. Congress is currently working on a number of appropriations bills. Based on current congressional actions defense R&D is likely to increase 10% over FY2003 levels, while most civilian R&D programs are likely to increase from 2% to 5%.

BACKGROUND AND ANALYSIS

Department of Agriculture (USDA)

The FY2004 budget request for research and education in the U.S. Department of Agriculture (USDA) is $2,266 million, a decrease of $113.6 million from the FY2003 level of $2,379.6 million (see **Table 1**). The FY2004 request provides increased funding for several continuing research priority areas: new uses for agricultural products, global climate change, agricultural genomes, biosecurity, agricultural information services, and homeland security supplemental. Other priority areas include protecting agriculture and U.S. trade from terrorism, and emerging and exotic diseases of both plants and animals. Research programs on emerging and exotic diseases are part of the infrastructure to enhance homeland security. The USDA has five biocontainment complexes where research and diagnostic work is done on organisms that pose serious threats to the crop, poultry, and livestock industries. Also, USDA is concerned with training and educating the next generation of agricultural scientists and supporting core university-based research. The request provides increased funding to address these areas.

The USDA conducts in-house basic and applied research. The Agricultural Research Service (ARS) is the lead federal agency for nutrition research, operating five major laboratories in this area, including the world's large multi-disciplinary agricultural research center located at Beltsville, Maryland. There are approximately 100 research facilities throughout the U.S. and abroad. ARS laboratories focus on efficient food and fiber production, preservation of genetic resources, development of new products and uses for agricultural commodities, development of effective biocontrols for pest management, and support of USDA regulatory and technical assistance programs. The FY2004 request provides $1,034 million for ARS, $121.1 million below the FY2003 level. Reductions are proposed in all projects earmarked by Congress in FY2003 in order to finance high priority program increases. The FY2004 request proposes a $3.5 million increase for animal genomics and $8.3 million for emerging diseases and biosecurity. There is also an increase proposed for information technology cyber security and animal waste related problems. The ARS reports that the majority of its facilities, constructed prior to 1960, have become functionally obsolete. Many of the facilities are not in total compliance with current health and safety standards. The FY2004 request for ARS includes $24 million for buildings and facilities.

The Cooperative State Research, Education, and Extension Service (CSREES) distributes funds to universities and organizations that conduct agricultural research. Included is funding for research at the 1862 institutions, 1890 historically black colleges and universities, and 1994 tribal land-grant colleges. Funding is distributed to the states through competitive awards, formula funding, and other means. The FY2004 request for CSREES is $1,019 million, almost level funding with FY2003. Funding for earmarked programs and certain lower priority work is terminated in order to support competitively awarded grants and other high priority programs. Funding for formula distribution in FY2004 to the state agricultural experiment stations (and other eligible institutions) would be $276 million, a slight increase over FY2003. The request proposes increases for the 1890 formula programs in response to the higher authorization levels enacted in the 2002 Farm Bill. Increases are proposed for CSREES graduate fellowships. The FY2004 request funds the National Research Initiative (NRI) Competitive Grants Program at $200 million, $34 million above the FY2003 level.

The Economic Research Service (ERS) is the principal intramural economic and social science research agency in USDA. The request for ERS in FY2004 is $77 million, an increase of $8.3 million over the previous fiscal year. Included in the increase is funding for two priority areas: the security analysis system for USDA ($1 million), and the genomics initiative ($1.1 million). The security analysis system will improve USDA's ability to mitigate security threats to the Nation's food supply. The genomics initiative will provide for the collection on foreign market requirements for genetically-engineered products. The National Agricultural Statistics Service (NASS) conducts the Census of Agriculture and provides current data on agricultural production and indicators of the well-being of the farm sector. The Administration requests $136 million for NASS in FY2004, a decrease of $2.4 million from FY2003.

On June 25, 2003, the House Appropriations Committee marked up the Department of Agriculture and Related Agencies Act of FY2004 (H.R. 2673). The House measure provides $1,049.9 million for ARS, $121.4 million below the FY2004 request and $102 million below the FY2003 level. The House measure funds CSREES at $1,099.4 million, $80.4 million above the Administration's FY2004 request and $82.3 million above the FY2003 estimate. The Senate (S. 1427) provided $1,115 million for ARS and $1,127 million for CSREES.

Table 1. U.S. Department of Agriculture

(millions $)

	FY2002 Act.	FY2003 Est.	FY2004 Req.
Agric. Research Service (ARS)			
Soil & Water Conservation	92.0		102.0
Plant Sciences	333.0		355.0
Animal Sciences	174.1		191.0
Commodity Conversion & Delivery	177.0		180.0
Human Nutrition	77.0		77.0
Integration of Agricultural Systems	39.0		41.0
Information and Library Sciences	20.0		23.0
Repair and Maintenance	18.2		18.0
Contingencies & Trust Funds	35.0		23.0
Subtotal	**1,022.0**	**1,036.7**	**1,010.0**
Buildings & Facilities	119.0	118.7	24.0
Total, ARS a	**1,176.0**	**1,155.4**	**1,034.0**
Coop. St. Res. Ed. & Ext. (CSREES) Research and Education			
Hatch Act Formula	180.1	179.0	180.0
Cooperative Forestry Research	21.9	21.7	22.0
1890 Colleges and Tuskegee Univ.	32.6	35.4	68.0
Special Research Grants	2.8	147.3	0.0
NRI Competitive Grants	120.0	166.0	200.0
Animal Health & Disease Res.	5.1	5.1	5.0
Federal Administration	45.0	48.2	15.0
Higher Education **b**	36.0	36.9	30.0
Total, Coop. Res. & Educ.[c]	**556.0**	**587.3**	**514.0**
Extension Activities			
Smith-Lever Sections 3b&c	275.9	279.4	276.0
Smith-Lever Sections 3d	85.5	90.1	89.0
Renewable Resources Extension	3.2	4.5	4.0
1890 Research & Extension	66.0	46.8	14.0
Other & Extension Programs	5.7	8.6	36.0
Total, Extension Activities c	**441.0**	**429.8**	**422.0**
Total, CSREES c	**1,042.1**	**1,017.1**	**1,019.0d**
Economic Research Service	76.0	68.7	77.0
National Agric. Statistics Service	122.0	138.4	136.0
TOTAL, Research, Education & Economics	**$2,416.1**	**$2,379.6**	**$2,266.0**

a. The total for ARS excludes trust funds and support for Counter-Drug Research and Development and for Anti-Drug Research and Related Matters.
b. Higher education includes payments to 1994 institutions and 1890 Capacity Building Grants program.
c. Program totals may reflect set-asides (non-add) or contingencies.
d. Includes $63 million for Integrated Activities and $11 million for the Native American Endowment Fund and Interest.

Department of Energy (DOE)

For FY2004, DOE requested $8.6 billion for R&D, including activities in each of the department's four business lines: National Security, Science, Energy Supply, and Environmental Quality. This request is 1.0% below the FY2003 level (see **Table 2**).

The requested funding for R&D in National Security is $3.6 billion, which is 2.2% above the FY2003 level after adjusting for programs transferred to the Department of Homeland Security on March 1, 2003. The bulk of the increase is in the Naval Reactors program, which is beginning development of a new nuclear reactor design for future navy ships. The request includes full funding for continued construction of the National Ignition Facility, scheduled for completion in 2008.

The requested funding for Science is $3.3 billion, an increase of 1.3% over FY2003 after adjusting for programs transferred to the Department of Homeland Security. Within this overall small increase, there would be no major funding shifts between programs. The request includes full funding for continued construction of the Spallation Neutron Source, scheduled for completion in 2006.

The requested funding for R&D in Energy Supply is $1.6 billion, down 8.7% from FY2003. The largest reduction is a 16.3% cut in the Fossil Energy R&D program, which has begun to apply specific investment criteria for applied R&D as part of the President's Management Agenda. The requested budget would also reduce funding for Energy Conservation R&D by 12.0%. The requested 5.9% increase for Renewable Energy is largely the result of the Hydrogen Fuel Initiative; most other Renewable Energy subprograms would be reduced.

The requested funding for R&D in Environmental Quality is $64 million, down 46% from FY2003. This change, which follows a 41% reduction in FY2003, reflects the continued reorientation of the program following an internal review of the entire Office of Environmental Management (whose total FY2004 budget request is $7.2 billion).

Table 2. Department of Energy
($ millions)

	FY2002 Comparable [a]	FY2003 Appropriated [a]	FY2004 Request
National Security	**3397.7**	**3548.2**	**3626.7**
Weapons Activities [b]	2450.7	2643.5	2654.4
Naval Reactors	687.6	702.2	768.4
Nonproliferation & Verification R&D	259.4	202.5	203.9
Science	**3309.5**	**3268.9**	**3310.9**
Basic Energy Sciences	979.6	1022.2	1008.6
High Energy Physics	697.4	722.0	738.0
Biological & Environmental Research	554.1	507.2	499.5
Nuclear Physics	350.6	382.0	389.4
Fusion Energy Sciences	241.1	248.3	257.3
Advanced Scientific Computing	150.2	168.6	173.5
Other	336.5 [c]	218.6 [d]	244.6
Energy Supply	**1750.5**	**1796.2**	**1639.3**
Energy Conservation R&D	621.5	623.5	548.8
Fossil Energy R&D	577.8	620.8	519.3
Renewable Energy	382.7	419.6	444.2
Nuclear Energy R&D	126.5	132.3	127.0
Clean Coal Technology [e]	42.0	0.0	0.0
Environmental Quality	**200.2**	**117.4**	**63.9**
Technology Development & Deployment [f]	200.2	117.4	63.9
Total	**8657.9**	**8730.7**	**8640.8**

a. Figures for FY2002 and FY2003 are adjusted to reflect program transfers, including the transfer of former DOE R&D programs that became part of the Department of Homeland Security on March 1, 2003. FY2003 figures have also been reduced to reflect the 0.65% across-the-board rescission.
b. Includes Stockpile R&D, Science Campaigns, Engineering Campaigns except Enhanced Surety and Enhanced Surveillance, Inertial Confinement Fusion (called High Energy Density Physics in the FY2003 budget request), Advanced Simulation and Computing, and a prorated share of Readiness in Technical Base and Facilities.
c. For FY2002, "Other" Science funding includes $99.7 million for Small Business Innovation Research (SBIR). SBIR expenditures for FY2003 and FY2004 are not included in "Other" as they will be funded by transfers from the individual Science programs. This is why "Other" funding appears larger in FY2002 than in subsequent years.

d. For FY2003, funding for Science is subject to a general reduction of $20 million. Since DOE's allocation of this reduction to particular programs is not yet known, the full $20 million has been taken out of the "Other" category for the purposes of this table.
e. Funds for Clean Coal Technology in FY2002 were allocated from previously appropriated funds. The balance of funds for this program was transferred to Fossil Energy R&D in FY2003.
f. Within Defense Site Acceleration Completion in the FY2004 request. Formerly known as Science and Technology within Defense Environmental Restoration and Waste Management.

Department of Defense (DOD)

Nearly all of what the Department of Defense spends on Research, Development, Test and Evaluation (RDT&E) is appropriated in Title IV of the defense appropriation bill (see **Table 3**). For FY2004, the Bush Administration is requesting $61.8 billion for Title IV RDT&E. This is approximately $5 billion above the amount made available in Title IV dollars for FY2003. The request would also represent the largest ever single-year RDT&E budget (beginning in 1962), when measured in FY2004 dollars. The 6-year budget plan estimates $394 billion for RDT&E. The House-passed (H.R. 2658) defense appropriations bill would boost RDT&E programs 12.3%, while the Senate passed version of H.R. 2658 recommends $64.8 billion for RDT&E in FY2004, a 10.4% increase over FY2003.

While the FY2004 RDT&E request would boost RDT&E funding overall, the proposed increases are focused on development activities. Basic research and applied research are proposed at levels below FY2003 funding, declining 7% and 14% respectively. Over half of DOD's basic research budget is spent at universities and represents the major contributor of funds in some areas of science and technology. Much of the support of research at DOD laboratories comes from applied research accounts.

S&T funding, which consists of basic and applied research and advanced development (6.1, 6.2 and 6.3 activities in the RDT&E account) is 2.5% of the overall Department of Defense topline of $379.9 billion. In testimony before the Senate Armed Services Committee (June 5, 2001) the Under Secretary of Defense for Acquisition, Technology, and Logistics, Pete Aldridge, suggested that DOD should set S&T funding at 3% of DOD's topline. While the President recommended a reduction for S&T spending, the House appropriations approved $11.9 billion for S&T, a 10.5% increase, while the Senate version of H.R. 2658 recommends $11.4 billion, a 5.4% increase over FY2003.

DOD's budget request for ballistic missile defense RDT&E is $7.7 billion, about $1 billion more than the FY2003 appropriation. In addition, the Administration is requesting the deployment of an operationally capable test system in Alaska, and is asking that operational test and evaluation requirements be waived. Other issues include another request to transfer some S&T programs out of the Office of the Secretary of Defense and to the Services. Last year Congress did not allow some of these transfers to take place. Also, the Defense Advanced Research Projects Agency's (DARPA) Total Information Awareness RDT&E program came under scrutiny. The FY2002 Omnibus Appropriations bill (H.J.Res. 2, P.L. 108-007) approved in February contained a provisions that requires a report of the program by May 2003, and that Congress must approve any deployment of a system that uses data on people living in the United States.

Table 3. Department of Defense
($ millions)

	FY2002 Actual	FY2003 Estimate	FY2004 Request
Accounts			
Army	7,018	7,535	9,123
Navy	11,379	13,631	14,107
Air Force	14,479	18,560	20,336
Defense Agencies	15,517	17,061	17,974
(DARPA)	(2,260)	(2,690)	(2,954)
(MDA[a])	(6,910)	(6,719)	(7,729)
Dir. Test & Eval	229	238	287
Total Ob. Auth.	**$48,622**	**$57,025**	**$61,827**
Budget Activity			
Basic Research	1,350	1,417	1,309
Applied Res.	4,094	4,289	3,670
Advanced Dev.	4,430	5,067	5,253
Demonstration/Validation	10,125	10,754	13,197
Engineering/Manufacturing Dev.	10,676	13,737	15,913
Mgmt. Support[b]	3,646	3,106	3,028
Op. Systems Dev.	14,303	18,656	19,458
Total Ob. Auth.[c]	**$48,624**	**$57,026**	**$61,828**
Other Defense Programs			
Defense Health Program	432	456	66
Chemical Agents and Munitions Destruction	202	294	252

Source: FY2002 to FY2004 figures based on Department of Defense Budget, Fiscal Year 2004 RDT&E Programs (R-1), February 2002. FY2002 to FY2004 figures for Defense Health Program and Chemical Agents and Munitions Destruction Program come from OMB's FY2004 Budget Appendix. Totals may not add due to rounding.
a. Includes only BMD RDT&E. Does not include procurement and military construction.
b. Includes funds for Developmental and Operational Test and Evaluation.

National Aeronautics and Space Administration (NASA)

The National Aeronautics and Space Administration (NASA) is requesting $11.041 billion for R&D for FY2004, out of a total NASA budget request of $15.469 billion (see **Table 4**). That R&D figure is almost exactly the same as NASA received for R&D in FY2003—$11.029 billion. Comparing NASA's FY2003 appropriations and its FY2004 request on a program by program basis is virtually impossible this year, even though comparisons can be made at the aggregate level, such as for total R&D. Budget comparisons at a greater level of refinement are not meaningful for two reasons. First, NASA transitioned to full cost accounting in its FY2004 budget, where personnel and facilities costs are included in program costs, instead of being accounted for separately (as done in the past). Hence, it can appear as though the budget estimate for a particular program in FY2004 is much higher than FY2003, when, in fact, the difference is due primarily to the inclusion of those costs, not programmatic changes. Therefore care must be taken when using NASA's FY2004 budget materials. NASA released data that allows the FY2003 *request* to be compared to the FY2004 request in full cost accounting, but FY2003 appropriations figures

are not in full cost accounting and thus are not comparable to the FY2004 request. Second, NASA has completely restructured its budget. Last year, the two accounts were Human Space Flight (HSF), and Science, Aeronautics, and Technology (SAT). This year, NASA has created two new budget categories that seek to demonstrate that the agency's mission is "Science, Aeronautics, and Exploration," and that mission is supported by "Space Flight Capabilities" such as a space station, a space shuttle, other systems, and investing in new technologies.

NASA's FY2004 request for the International Space Station is $2.285 billion, comprising $1,707 million in the Space Flight Capabilities account, and $578 million in the Biological and Physical Sciences account. The space station has been controversial for many years because of schedule slippage and cost overruns, but this year the impact on the program of the space shuttle *Columbia* tragedy will probably be the focus on attention. For further details, see CRS Report RS21408 and CRS Issue Brief IB93062.

For Space Science, NASA is requesting $4.007 billion in FY2004. Last year NASA wanted to terminate a proposed mission to Europa, one of the moons of Jupiter, because, at $1 billion, it was too expensive. This year, NASA is proposing a more expensive mission to Europa and two other Jovian moons, Callisto and Ganymede. Called the Jupiter Icy Moon Orbiter (JIMO), it would utilize nuclear power and propulsion which NASA is developing under its Nuclear Systems Initiative (NSI). JIMO and NSI are grouped together in NASA's FY2004 budget under the name Project Prometheus. The request for Project Prometheus is $279 million; the 5-year (FY2004-2008) projected cost is $3 billion, and the total program cost is estimated at $4 billion, though NASA cautions that it will not have a reliable estimate for 2-3 more years because the program is early in its formulation stage. Last year NASA also had wanted to terminate a mission to Pluto and the Kuiper Belt, but Congress directed NASA to continue the program, and NASA includes it in its FY2004 budget request.

The request for the Earth Science program is $1.552 billion. NASA is completing the launches of the first set of spacecraft in its Earth Observing System (EOS) to study global climate change. Plans to initiate construction of a second series have been terminated in favor of using instruments on a new generation of weather satellites (the National Polar-orbiting Operational Environmental Satellite System—NPOESS) being built by the National Oceanic and Atmospheric Administration (NOAA) and DOD. NASA is building a spacecraft, called the NPOESS Preparatory Project (NPP), that will be a "bridge" between the EOS satellites and NPOESS. NPP will test instruments that could later be included on NPOESS. NASA also will launch other spacecraft to make environmental measurements. The request for the Office of Biological and Physical Research is $973 million, including $578 million for research on the space station. The extent to which the grounding of the shuttle fleet will impact OBPR's budget is unknown at this time.

Funding for NASA's Office of AeroSpace Technologies is split in the FY2004 budget request. Aeronautics is in the "Science, Aeronautics, and Exploration" account, and the rest of OAT's activities are in "Crosscutting Technologies" in the "Space Flight Capabilities" account. The request for aeronautics is $959 million, and $1.673 billion is requested for the rest of OAT's activities. OAT includes the Space Launch Initiative (SLI), which is included in "Crosscutting Technologies." The FY2004 request for SLI reflects changes NASA proposed in November 2002 to its Integrated Space Transportation Plan. Under that plan, NASA will rely on the space shuttle longer than planned. Some of the funding that was

Table 4. National Aeronautics and Space Administration

($ millions)

Category	FY2003 Request (Nov. 2002, (not in full cost accounting)	FY2003 *Request* in Full Cost Accounting	FY2004 Request in Full Cost Accounting
Science, Aeronautics & Exploration	**7,015**	**7,101**	**7,661**
Space Science	3,414	3,468	4,007
Earth Science	1,628	1,610	1,552
Biological & Physical Research	842	913	973
Aeronautics	986	949	959
Education	144	160	170
Space Flight Capabilities (R&D only)	**3,321**	**3,619**	**3,380**
Space Flight			
Space Station*	(1,492)	(1,851)	(1,707)
Crosscutting Technologies	1,829	1,768	1,673
Space Launch Initiative	(879)	(1,150)	(1,065)
Other	(950)	(617)	(607)
Total NASA R&D	10,336	10,720	11,041
Total NASA	***15,000***	***15,000***	***15,469***

Source: NASA FY2004 budget documents. Totals may not add due to rounding. NASA submitted an amended FY2003 budget request in November 2002, which NASA used in developing the numbers in this table. NASA completely changed its budget structure in the FY2004 request, and transitioned to "full cost accounting" where personnel and facilities costs are included in program budgets, instead of separately, as had been done historically. **The NASA-provided figures in the center column adjust the FY2003 numbers as though they had been prepared in full cost accounting. They are for comparison purposes only and do not reflect actual funding increases or decreases.**

*Does not include funding for space station research, which is embedded in the Biological and Physical Research line. For FY2004, that amount is $578 million, making the total FY2004 space station request $2,285 million. Some also would include funding for the Orbital Space Plane in the space station request, but NASA includes it in the Space Launch Initiative line.

expected to be spent on building a successor to the shuttle instead will be spent on improving it, funding the space station, and for building an Orbital Space Plane (OSP) to take crews to and from the space station. NASA would continue technology development for new space launch vehicles, but delay until 2009 a decision on what to build. OSP is discussed in CRS Issue Brief IB93017; the technology development effort, called NGLT, is discussed in CRS Issue Brief IB93062. NASA is requesting $1.065 billion for the Space Launch Initiative (comprising OSP and NGLT) in FY2004.

National Institutes of Health (NIH)

The FY2003 appropriation essentially completed the 5-year doubling of the NIH budget, an effort which had meant increases of 14%-15% per year since FY1999. The FY2004 President's request provides for a much smaller increase, one considerably lower than the "soft landing" approach of 8%-10% increases for the post-doubling years which has been urged by research advocates. The Administration budget includes a total of $27.893 billion for NIH, an increase of $727 million or 2.7% over the FY2003 program level of $27.166 billion (see **Table 5**). Of that amount, $150 million has already been appropriated (in separate funding for diabetes research), so the amounts requested for congressional consideration are $27.664 billion under the request for the Labor-Health and Human Services-Education (L-HHS) appropriation, and $79 million under the request for the VA-HUD appropriation. The total request for new appropriations of $27.743 billion is an increase of $677 million or 2.5% over the FY2003 budget authority of $27.066 billion. The FY2003 appropriation, provided by the Consolidated Appropriations Resolution (P.L. 108-7, H.J.Res. 2), was a $3.6 billion or 15.4% increase over FY2002. (The "target" for FY2003 to have fully doubled the FY1998 level of $13.622 billion was $27.244 billion.)

The Senate Appropriations Committee (S. 1356) provides $28.2 billion for FY2004, an 3.8% increase over FY2003, while the House-passed bill (H.R. 2660) matches the President's funding request for FY2004. Both the House and Senate bills match the Presidents's proposed 17% increase for biodefense R&D.

The FY2004 Administration budget documents portray the increase for NIH's research programs as larger than the overall 2.7% increase, because about $1.4 billion of the FY2003 appropriation was for facilities costs (much of it related to bioterrorism) and other one-time expenses. By devoting those funds to research in FY2004, the request would increase spending on research programs by about $2 billion or nearly 8%, while spending on NIH's intramural buildings and facilities would drop 87% and the extramural facilities construction program would be zeroed out entirely. The request would support a record number of research project grants (37,467), including 10,509 in the new and competing renewal category.

Research areas of particular emphasis include biodefense (requested for $1.625 billion), HIV/AIDS ($2.87 billion), diabetes and obesity ($946 million), and broad initiatives in genetics, regenerative medicine, structural biology, bioinformatics, nanotechnology, and molecular imaging. In addition, NIH wants to encourage a culture of scientists from many disciplines working together in large teams, and also wants to improve the national clinical research infrastructure with better information exchange and more effective partnerships among federal agencies, academic centers, health professionals, industry, and patient groups. A new effort, termed the "NIH Roadmap," has been made to identify critical roadblocks and knowledge gaps that may be constraining rapid progress in biomedical research. The NIH Director's Discretionary Fund is requested for a $35 million increase that would be allocated to NIH institutes and centers for programs addressing such roadblocks. Later this year the Institute of Medicine will complete a congressionally-mandated study on the organizational structure of NIH and will make recommendations for any changes that it thinks would enhance research effectiveness and interdisciplinary cooperation. (For further information, see the "Biomedicine Issues" section of CRS Report RL31846, *Science and Technology Policy: Issues for the 108th Congress, 1st Session*.)

Table 5. National Institutes of Health (NIH)

($ millions)

Institutes and Centers (ICs)	FY2002 comp [a]	FY2003 enacted [b]	FY2004 request [c]
Cancer (NCI)	$4,113.7	$4,592.3	$4,770.5
Heart/Lung/Blood (NHLBI)	2,553.7	2,793.7	2,868.0
Dental/Craniofacial Research (NIDCR)	341.8	371.6	382.4
Diabetes/Digestive/Kidney (NIDDK)	1,559.6	1,722.7	1,820.0
Neurological Disorders/Stroke (NINDS)	1,309.4	1,456.5	1,468.9
Allergy/Infectious Diseases (NIAID)	2,525.8	3,706.1	4,335.3
General Medical Sciences (NIGMS)	1,697.8	1,847.0	1,923.1
Child Health/Human Develmt (NICHD)	1,109.4	1,205.9	1,245.4
Eye (NEI)	579.5	633.1	648.2
Environmental Health Sciences (NIEHS)	563.3	614.2	630.8
Aging (NIA)	890.8	993.6	994.4
Arthritis/Musculoskeletal/Skin (NIAMS)	447.4	486.1	502.8
Deafness/Communication Dis. (NIDCD)	341.1	370.4	380.4
Nursing Research (NINR)	120.2	130.6	134.6
Alcohol Abuse/Alcoholism (NIAAA)	382.8	416.1	430.1
Drug Abuse (NIDA)	892.1	961.7	995.6
Mental Health (NIMH)	1,234.2	1,341.0	1,382.1
Human Genome Research (NIHGR)	427.9	465.0	478.1
Biomedical Imaging/Bioenginrg (NIBIB)	261.7	278.3	282.1
Research Resources (NCRR)	985.0	1,138.8	1,053.9
Complementary/Alt. Medicine (NCCAM)	104.2	113.4	116.2
Minority Health/Disparities (NCMHD)	157.4	185.7	192.7
Fogarty International Center (FIC)	55.5	63.5	64.3
Library of Medicine (NLM)	274.3	300.1	316.0
Office of Director (OD)	253.5	266.2	318.0
Buildings & Facilities (B&F)	295.9	628.7	80.0
Subtotal, (L-HHS Approp + diabetes)	$23,478.1	$27,082.6	$27,814.0
Superfund (VA-HUD Approp to NIEHS) [d]	80.7	83.5	78.8
Total, NIH Program Level [e]	**$23,558.8**	**$27,166.1**	**$27,892.8**
Pre-appropriated Type 1 diabetes funds [f]	-97.0	-100.0	-150.0
Total, NIH Budget Authority	**$23,461.8**	**$27,066.1**	**$27,742.8**

Sources: NIH FY2004 Justification of Estimates for Appropriations Committees, and conference report (H.Rept. 108-10) on H.J.Res. 2, Consolidated Appropriations Resolution for FY2003 (P.L. 108-7).
Note: Columns may not add due to rounding.

a. FY2002 comparable reflects all rescissions and transfers, supplemental funding of $180 million for bioterrorism appropriated to the PHS Emergency Fund (P.L. 107-117), and $1,129,000 NCI breast cancer stamp funds.
b. FY2003 reflects the across-the-board rescission of 0.65% mandated in the consolidated appropriation, and a transfer of $583,000 from NIAID to Department of Homeland Security.
c. FY2004 OD total includes $35million in Roadmap funds for later distribution to ICs.
d. Separate account in the VA-HUD appropriation starting in FY2001, for NIEHS activities mandated in Superfund legislation. In FY2002, includes supplemental of $10.5 million from P.L. 107-117.
e. Does not reflect $8.2 million for NLM in FY2003 funds provided by the conference report from the evaluation set-aside (authorized by sec. 241 of the Public Health Service Act).
f. Funds available for diabetes research in accordance with the Balanced Budget Act of 1997 (FY1998-FY2002) and P.L. 106-554 and P.L. 107-360 (included in NIDDK above).

National Science Foundation (NSF)

The FY2004 request for the National Science Foundation (NSF) is $5,481.2 million, a 3.2% ($171.2 million) increase over the FY2003 level of $5,310 million (see **Table 6**). This requested increase would not sustain the goal of doubling NSF's budget over five years as called for in P.L.107-368, signed by the President on December 19, 2002. The proposed 3.2% budget increase is much lower than the 14% increase NSF received in FY2003, which was aimed at initiating the 5 year doubling objective. The FY2004 request provides support for several interdependent priority areas: biocomplexity in the environment ($99.8 million), information technology research ($302.6 million), workforce for the 21st century ($8.5 million), nanoscale science and engineering ($249 million), mathematical sciences ($89.1 million), and human and social dynamics ($24.3 million). The request provides the third installment of $200 million for the President's Math and Science Partnerships program (MSP). The MSP is a five-year investment to improve the performance of U.S. students in science and mathematics at the precollege level. Additional FY2004 highlights include funding for graduate fellowships and traineeships ($215 million), leading-edge research in cyber infrastructure ($20 million), continued support of plant genome research ($75 million), investments in Climate Change Research Initiative ($25 million), added support for the administration and management portfolio ($291.4 million), and funding for three to five new multi-disciplinary, multi-institutional Science of Learning Centers ($20 million).

Included in the FY2004 request is $4,106.4 million for Research and Related Activities (R&RA), a 1.2% increase ($50 million) over the FY2003 level of $4,056.5 million. R&RA funds research projects, research facilities, and education and training activities. In the FY2004 request, the NSF has placed an emphasis on funding rates for new investigators and on increasing grant size and duration. Partly in response to concerns in the scientific community about the imbalance between support for the life sciences and the physical sciences, the FY2004 request provides increased funding for the physical sciences. Research in the physical sciences often leads to advances in other disciplines. The R&RA includes Integrative Activities (IA), created in FY1999. IA funds major research instrumentation, Science and Technology Centers, Science of Learning Centers, Partnerships for Innovation, disaster response research teams, and the Science and Technology Policy Institute. The FY2004 request for IA is $132.5 million, a decrease of 9.7% from the FY2003 appropriation.

Research project support in the FY2004 request totals $2,696 million. Support is provided individuals and small groups conducting disciplinary and cross-disciplinary research. Included in the total for research projects is support for centers, proposed at$411 million. NSF supports a variety of individual centers and center programs. The request provides $45 million for Science and Technology Centers, $57 million for Materials Centers, $60 million for Engineering Research Centers, $13 million for Physics Frontiers Centers, $32 million for the Plant Genome Virtual Centers, and $74 million for Information Technology Centers.

The Major Research Equipment and Facilities Construction (MREFC) account is funded at $202.3 million in FY2004, a 36.2% increase ($53.8 million) over the FY2003 level. The MREFC supports the acquisition and construction of major research facilities and equipment that extend the boundaries of science, engineering, and technology. Seven projects are supported in this account for FY2004, all ongoing projects—construction of the Atacama Large Millimeter Array ($50.8 million), the Network for Earthquake Engineering Simulation

($8 million), the South Pole Station Modernization Project ($960,000), Terascale Computing Systems ($20 million), Earthscope ($45 million), the High-Performance Instrumented Airborne Platform for Environmental Research, HIAPER, $25.5 million), IceCube R&D project ($60 million), and the National Ecological Observatory Network, Phase I ($12 million).

Table 6. National Science Foundation

($ millions)**a**

	FY2002 Act.	FY2003 Appr.	FY2004 Req.
Res. & Related Act.			
Biological Sciences	$508.4	$571.1	$562.2
Computer & Inform. Sci. & Eng.	514.9	578.5	584.3
Engineering	472.3	530.6	536.6
Geosciences	609.5	684.7	687.9
Math & Physical Sci.	920.5	1,034.4	1,061.3
Social, Behav. & Econ. Sci.	168.8	191.1	211.7
U.S. Res. Prog.	229.7	251.7	261.9
U.S. Antarctic Log. Act.	68.1	68.6	68.1
Integrative Activities	106.5	146.8	132.5
Subtotal Res. & Rel. Act	**3,598.6**	**4,056.5**	**4,106.4**
Ed. & Hum. Resr.	894.3**b**	903.2	938.0
Major Res. Equip. & Facil. Constr.	138.8	148.5	202.3
Salaries & Expenses	170.0	189.1	225.7
Office of Inspector General	6.8	9.2	8.8
National Science Board	0.0	3.5	0.0
Total NSF	**$4,808.5**	**$5,310.0**	**$5,481.2**

a. The totals do not include carry overs or retirement accruals.
b. Includes $57.3 million in FY2002 and an estimated $65.7 million in FY2003 from H-1B Nonimmigrant Petitioner Receipts. There are no projections for FY2004 due to expiration of H-1B legislation in FY2003.

The FY2004 request for the Education and Human Resources Directorate (EHR) is $938 million, a 3.9% increase ($34.8 million) over FY2003. Support at the various educational levels in the FY2004 request is as follows: precollege, $346.9 million; undergraduate, $180.7 million; and graduate, $164.9 million. Support at the precollege level includes $200 million for the MSP directed at funding for states and local school districts to join with colleges and universities to strengthen K-12 science and mathematics education. Support will continue for Systemic Reform Initiatives, Instructional Materials Development, Centers for Learning and Teaching, and Teacher Professional Continuum. Efforts at the undergraduate level include the STEM Talent Expansion Program, the Robert Noyce Scholarship Program, and the National STEM Education Digital Library. Workforce for the 21st Century priority area is supported at the undergraduate activity. It will focus on attracting students to the scientific and technical disciplines. An increase in FY2004 for graduate level programs will allow NSF to raise the stipend of graduate fellows to $30,000 and to increase the number of offers to new fellowships. Graduate Teaching Fellowships in K-12 Education will be increased to $42.5 million. This program links the excellence of U.S. graduate education with the critical needs of school districts. Support for other graduate programs includes the Centers of Research Excellence in Science and Technology, Model

Institutions for Excellence, and Alliances for Graduate Education and the Professoriate. Funding for the Experimental Program to Stimulate Competitive Research (EPSCoR) is $75 million in FY2004. An additional $30 million from R&RA will support the three activities of EPSCoR; research infrastructure improvement, cost sharing, and outreach. It is anticipated that the H-1B nonimmigrant petitioner fees collected in FY2003 will approximate $92.5 million.

Department of Commerce (DOC)

National Oceanic and Atmospheric Administration (NOAA)

For FY2004 President Bush requested a total of $765 million in R&D funding for NOAA, including conduct of R&D, facilities, and major equipment. (See Table 7) This amount is 6% below the estimated $816 million in appropriations for NOAA R&D for FY2003*, and 12% below actual FY2002 appropriations of $868 million, as reported by OMB on Feb. 3, 2003. The President's FY2003 R&D request for NOAA had included a proposal to transfer the National Sea Grant College Program, a large research and development component of NOAA, to NSF, but that was rejected by Congress. That reversal, however, is not reflected in OMB's estimated appropriations for FY2003, although it is accounted for in the President's FY2004 R&D request, which otherwise might have been $26.8 million less. In Feb. 2003, NOAA Financial Administration estimated the FY2004 R&D budget request would increase NOAA Fisheries $39 million, NOAA Research $48.3 million, NOAA Satellite Programs $12.8 million, and Program Support $6.9 million; but decrease the National Weather Service $7.2 million; and level fund the National Ocean Service (NOS). In addition, the NOAA Satellite Program received $65 million for the National Polar Orbiting Environmental Satellite System (NPOESS) in the FY2003 Emergency Supplemental Appropriations Act (P.L. 108-11) for meteorological and environmental monitoring. General information on NOAA funding for FY2003 and the President's request for FY2004, may be found in CRS report RS21460, The National Oceanic and Atmospheric Administration (NOAA): A Brief Review of FY2003 Appropriations and the FY2004 Budget. (*This figure has been adjusted to reflect a 0.65 percent across the board reduction required by P.L. 108-7.)

National Institute of Standards and Technology

The Bush Administration’s FY2004 budget request includes $496.8 million for the National Institute of Standards and Technology (NIST), 30% less than the $712.1 million appropriated for FY2003. The significant decline proposed for NIST’s budget is due to the Administration’s goal of ending federal support for the Advanced Technology Program (ATP) and the Manufacturing Extension Partnership (MEP), after the FY2004 budget cycle.. The $27 million requested for ATP is to cover on-going commitments; no new projects would be funded. The $12.6 million for MEP is to finance the operation of centers that have not experienced 6 years of federal support. The Scientific and Technical Research and Services (STRS) account (which involves intramural research and development) would receive $387.6 million, an increase of 8% over the previous fiscal year. The construction budget would be $69.6 million.

In FY2003, $707.5 million was appropriated for NIST (after the mandated 0.65% rescission mandated by the FY2003 Omnibus Appropriations Act), an increase of almost 5% above the previous fiscal year. Included in this figure is $357.1 million for the STRS account, $178.8 million for ATP, $105.9 million for MEP, and $65.7 million for construction.

Department of Transportation (DOT)

According to the Bush Administration's Budget, the Department of Transportation (DOT) requested $693 million for research and development in FY2004. This is $142 million below the estimated $830 million that was available in FY2003. However, $133 million of the "decrease" can be attributed to the transfer of the Transportation Security Administration ($ 110 million) and the Coast Guard ($23 million) to the Department of Homeland Security. There are four Administrations within DOT that are the primary supporters of research and development—the Federal Highway Administration (FHWA $363 million), the National Highway Traffic Safety Administration (NHTSA $60 million), the Federal Aviation Administration (FAA $298 million), and the Federal Railroad Administration (FRA $31) million. For the third consecutive year, R&D within the FAA is schedule to decline, dropping from $387 million in FY2002 to $298 million FY2004, a 23% decrease.

Department of Interior (DOI)

According to the President's budget, the Administration requested $633 million for R&D in the Department of Interior. This is a slight increase from the $627 million received in FY2003. The U.S. Geological Survey (USGS) is the primary supporter of R&D (about two-thirds of the total) within DOI. Areas of research include mapping, and research in geological, water, and biological resources. The FY2004 budget for R&D within the USGS would decline 4%, from $569 million in FY2003 to $545 million in FY2004. The full House (H.R. 2691) and the Senate Appropriations Committee (S. 1391) rejected the Administration proposal to cut USGS R&D funding approving 6% ($ 577 million) and 5% ($573 million) increases respectively over FY2003 estimated levels.

Environmental Protection Agency (EPA)

The Administration requested $731.5 million in the FY2004 budget for Science and Technology at EPA, including R&D activities under Superfund. The FY2003 appropriation for S&T, including R&D under the Superfund account, is $716.3 million instead of $714.6 million as proposed by the House and $707.2 million as proposed by the Senate. The Administration had requested $670 million. This compares with $735 million enacted in FY2002, which was supplemented by $90.3 million in FY2002 for Homeland Security (for an S&T total of $825.3 million in FY2002). Major continuing congressional concerns are the quality of scientific information which EPA disseminates and information upon which EPA bases its regulations, criteria, and programs, and the degree to which environmental data and information will be available (balancing the need for security and confidentiality). R&D in EPA is also referred to as the "S&T Account," which incorporates elements of the former research and development account (also called extramural research) as well as EPA's in-house R&D and technology efforts.

Department of Homeland Security

For FY2004, the Department of Homeland Security requested $1.0 billion for R&D. About 80% of the total would be in the Directorate of Science and Technology, with the remainder divided among the Directorate of Border and Transportation Security (including the Transportation Security Administration), the Coast Guard, and the Directorate of Information Analysis and Infrastructure Protection. The House (H.R. 2555) approved $1.054 billion for DHS R&D 16% above the Administrations' request, while the Senate Appropriations Committee (H.R. 2555, incorporated) recommended $1.001 billion, 10% above the request. Both the House and Senate approved expenditure of $60 million to develop anti-missile prototypes that could be fitted on commercial airplanes.

The requested FY2004 funding for the Directorate of Science and Technology is $803 million. More than 45% of this sum would fund a program of R&D on biological terrorism countermeasures ($365 million). The remainder would be divided among six other programs: radiological and nuclear countermeasures ($137 million), threat and vulnerability assessment ($90 million), chemical and high explosives countermeasures ($65 million), university programs and the Homeland Security Institute ($62 million), conventional missions ($55 million), and equipment standards ($25 million). The Homeland Security Advanced Research Projects Agency, with a requested FY2004 budget of $350 million, will be part of the Directorate of Science and Technology but will cut across the above programs rather than being a separate item. Although the Directorate incorporates a number of programs that formerly existed in other agencies, the above organization is new, making year-to-year budget comparisons essentially impossible at the program level. Since HLS did not exist in FY2003, it is not possible to calculate the 0.65 reduction. For more information on R&D in the Department of Homeland Security, see CRS Report RL31914.

Table 7. R&D Budgets of Preceding Agencies

($ millions)

	FY2002 Actual	FY2003 Estimate	FY2004 Request
National Oceanic and Atmospheric Administration	$868	$816	$765
National Institute of Standards & Technology	678	712	497
Department of Interior	623	623	633
Department of Transportation	892	830	693
Department of Homeland Security a	266	759	1,001
Environmental Protection Agency	825 **b**	716	732

a. FY2002 figures for the Department of Homeland Security are for programs in other agencies that were transferred into the Department by the Homeland Security Act of 2002 (P.L. 107-296). FY2003 figures are Administration estimates based on the FY2003 requested budgets of the same transferred programs. Most of the program transfers did not actually take place until March 1, 2003, or later, several months into FY2003. Because of this, the FY2002 and FY2003 figures should be considered approximate and may be estimated differently by different sources

b. Includes $90.3 million in supplemental funding for Homeland Security.