

FY 2003 Budget Proposes Large Increases for NIH R&D and DOD Development; Flat Funding Overall for Other R&D Programs

A Preview of AAAS Report XXVII: R&D FY 2003

(This AAAS analysis supersedes previous preliminary analyses of R&D in the FY 2003 budget. It contains **revised AAAS estimates of R&D**, based on agency data obtained after the release of the President's budget. This analysis is a preview of the forthcoming *AAAS Report XXVII: Research and Development FY 2003*, a comprehensive look at the President's budget for R&D in FY 2003. The full report will be released at the AAAS S&T Policy Colloquium (April 11-12, Washington, DC) and will be available online. More tables, the full text of the report, continually updated supplemental materials on R&D in the FY 2003 budget, and information on the Colloquium (including registration materials) can be found on the AAAS R&D Web site at <http://www.aaas.org/spp/R&D>.)

Highlights

Congress begins consideration of the FY 2003 budget this month. Citing the war on terrorism and a weak economy as justification for a return to deficit spending, President Bush's fiscal year (FY) 2003 budget proposal, released last month, calls for large increases in discretionary spending to follow on even larger spending increases in FY 2002. Discretionary spending, the one-third of the budget subject to annual appropriations decisions by Congress and the President, is the part of the budget out of which nearly all federal R&D is funded. The FY 2003 budget calls for overall discretionary spending to rise 6.8 percent or \$49 billion in FY 2003 to \$767 billion, on top of an FY 2002 total already inflated by emergency appropriations approved in the immediate aftermath of September 11. The FY 2003 budget request calls for overall increases for the federal investment in R&D, especially for the high-priority areas of defense, health, and homeland security against terrorism. But in a repeat of last year's request, the increases would be concentrated in the Department of Defense (DOD) and the National Institutes of Health (NIH), leaving all other R&D programs with flat funding overall.

- Because DOD and NIH are the two largest funding sources of federal R&D and are also high priorities for the Bush Administration, **total federal R&D would increase substantially in FY 2003 to a record \$112.0 billion**, \$8.9 billion or 8.6 percent more than FY 2002 (see Table 1).
- As was the case last year, the proposed increases for DOD (\$5.2 billion) and NIH (\$3.7 billion) would make up the entire \$8.9 billion increase, leaving all other R&D funding agencies combined with barely the same amount as FY 2002. Thus, this would further reinforce the "missiles and medicine" profile that federal R&D has assumed in recent years. Unlike last year, when most of the other R&D funding agencies would have seen their R&D funding decline, FY 2003 would see a mix of increases or decreases averaging to zero growth (see Table 1 and Figure 1).
- Nondefense R&D would increase by 7.2 percent to \$53.3 billion. NIH would receive a 16.0 percent increase in its R&D funding to \$26.5 billion to complete the campaign to double the NIH budget between FY 1998 and FY 2003. **Excluding NIH, however, all other nondefense R&D would fall by 0.2 percent to \$26.8 billion**, a loss of \$56 million (see Table 1).
- **Defense R&D** would increase 9.9 percent to reach \$58.8 billion, reflecting increased attention to defense needs in a time of war. The entire \$5.2 billion DOD increase and more would go to development costs of new weapons and missile defense systems; DOD basic and applied research would both decline even as the DOD budget as a whole would increase by a record-breaking amount (see Table 1). Department of Energy (DOE) defense R&D would rise 2.8 percent to \$3.9 billion.

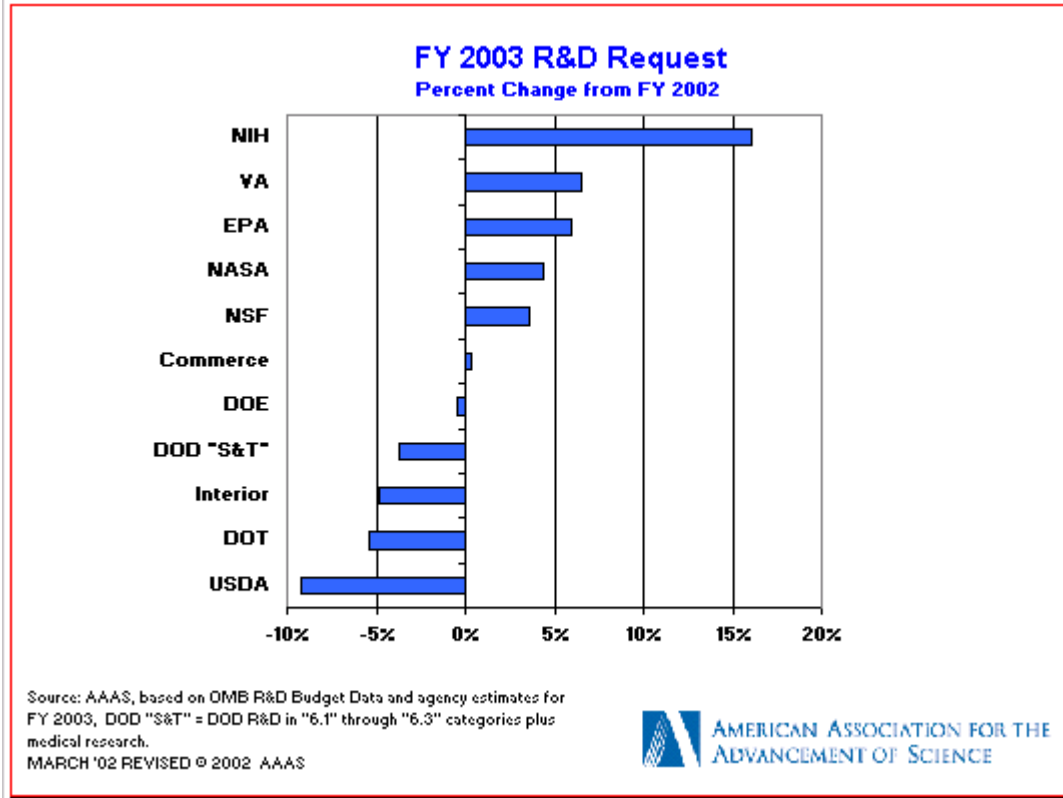


Figure 1.

- The federal investment in **basic research** would grow by 7.9 percent or \$1.9 billion to an all-time high of \$25.5 billion, primarily because of a 9.0 percent requested increase for basic research in NIH (see Table 2). Total federal research (basic and applied) would climb by 6.5 percent to \$51.9 billion because of a large boost in NIH investments in applied research, particularly in the areas of bioterrorism and cancer. **Total research excluding NIH, however, would decline 0.2 percent to \$26.3 billion.**
- The AAAS analysis of the **outyear projections in the FY 2003 budget** shows that nondefense R&D would increase from \$49.7 billion in FY 2002 to \$58.8 billion in FY 2007, a gain of 8.2 percent after adjusting for expected inflation (see Table 3). NIH would be responsible for most of the increase; excluding NIH, nondefense R&D would rise only 1.6 percent in inflation-adjusted terms. Defense R&D would climb to a peak of \$65.9 billion in FY 2005 before declining to \$63.3 billion in FY 2007, still an 8.1 percent inflation-adjusted gain over FY 2002.
- The Bush Administration would once again place a high priority on **defense R&D and health R&D** among national missions. Defense R&D (up 9.9 percent to \$58.8 billion) and health R&D (up 13.8 percent to \$28.3 billion) would together make up more than three-quarters of the federal R&D portfolio, and their shares would increase. R&D funding for most other **national missions** would decline (see Table 4).
- Within flat overall funding for nondefense, non-NIH R&D, federal R&D in three interagency initiatives would increase (see Table 5). Funding for the **National Nanotechnology Initiative** would climb 17.5 percent or \$106 million to \$710 million after an even larger increase last year. The National Science Foundation's (NSF) lead role in the initiative would rise by 11.1 percent to \$221 million, but the largest increase would go to DOE (up 52.9 percent to \$139 million) for nanoscale computing research and for initial funds to construct nanoscale scientific user facilities.

- **Networking and Information Technology R&D** would increase by 2.5 percent to \$1.9 billion across seven agencies (see Table 5). NSF would once again take the largest funding role with \$678 million (up 0.3 percent), mostly in the Computer and Information Science and Engineering (CISE) directorate. And the ongoing **U.S. Global Change Research Program** would see its funding rise 2.6 percent to \$1.7 billion in FY 2003 (see Table 5), split nearly equally between NASA's space-based observations and other agencies' scientific research, including surface-based observations. The Bush Administration would allocate \$40 million to a new Climate Change Research Initiative in FY 2003; this effort, funded by five agencies, would aim to improve the integration of scientific knowledge on climate change, including measures of uncertainty, into decision support systems and information useful to policymakers.
- Another multi-agency effort, on **counter-terrorism R&D**, received an enormous funding boost to \$1.5 billion in FY 2002, nearly triple the FY 2001 funding level. In FY 2003, counter-terrorism R&D would increase again to a preliminary estimate of \$2.8 billion, with NIH taking over the role of lead agency with a \$1.7 billion investment comprising bioterrorism research support, construction funds for biosafety laboratories, and research and procurement on anthrax vaccines.

Agency Highlights

- The **National Institutes of Health (NIH)** would receive \$27.3 billion for its total budget in FY 2003, an unprecedented increase of \$3.7 billion (15.7 percent) that would fulfill the commitment to double the NIH budget between FY 1998 and 2003. NIH R&D would rise 16.0 percent to \$26.5 billion (see Table 1). This would follow 14 to 15 percent increases in each of the last four years. The big budget winner would be the National Institute of Allergy and Infectious Diseases (NIAID) which would receive a boost of 57.3 percent to \$4.0 billion as NIH's lead institute for bioterrorism R&D. NIAID would introduce a new extramural facilities construction program to build bioterrorism research laboratories around the nation and would also fund competitive research grants on bioterrorism. Cancer is another high priority for the Bush Administration; the FY 2003 cancer research budget would be \$5.5 billion, of which \$4.7 billion would go to the largest NIH institute, the National Cancer Institute (NCI; up 12.2 percent). Most of the other institutes would receive increases between 8 and 9 percent.
- The **Department of Defense (DOD)**, the largest federal sponsor of R&D, would receive its second-largest dollar increase in history for its R&D to \$54.8 billion in FY 2003, an increase of \$5.2 billion or 10.5 percent after a record increase of \$7 billion last year (see Table 1). The entire increase would go to the development of weapons systems in the services (the Air Force and Navy in particular) rather than research. Basic and applied research in DOD would decline despite the record \$45 billion (or 13.4 percent) increase in the overall DOD budget to \$379 billion. Basic research ("6.1") would fall 0.8 percent to \$1.4 billion, while applied research ("6.2") would fall 7.5 percent to \$3.8 billion in FY 2003. DOD "Science and Technology" (S&T), which includes research, medical research, and technology development, would fall 3.7 percent to \$10.0 billion, falling well short of the DOD goal of 3 percent of the total DOD budget (see Figure 1). After nearly doubling its budget in FY 2002, the Ballistic Missile Defense Organization (BMDO) would see its R&D budget decline slightly to \$6.7 billion (down 4.0 percent), which would still be 60 percent above the FY 2001 funding level. The Defense Advanced Research Projects Agency (DARPA) and the Chemical and Biological Defense Program (CBDP) would be big winners in FY 2003 with proposed increases of 19.2 percent and 69.7 percent, respectively.
- The **National Science Foundation (NSF)** wins praise from the Bush Administration for its management, and modest increases for its R&D programs. The NSF budget would total \$5.0 billion in FY 2003, an increase of 5.0 percent. Excluding NSF's non-R&D education activities, NSF R&D would total \$3.7 billion, a boost of 3.5 percent. Three programs are proposed to be transferred to the NSF Geosciences directorate from other agencies: Environmental Education (presently at the Environmental Protection Agency); the National Sea Grant program (the National Oceanic and Atmospheric Administration); and Hydrology of Toxic Substances (the U.S.

Geological Survey). Without these transfers, NSF R&D would increase by only 1.4 percent. While mathematical sciences would receive a substantial 20.1 percent increase to \$182 million, other programs in Mathematical and Physical Sciences (MPS) such as chemistry, physics, and astronomy would all decline. Another big winner would be Information Technology Research (up 9.9 percent), though at the expense of other computer sciences research. In the non-R&D education programs, NSF would boost funding for the second year of the Administration's Math and Science Partnerships, from \$160 million to \$200 million, but would cut most other education and human resources programs.

- The **National Aeronautics and Space Administration (NASA)** would see its total budget increase by 0.7 percent to \$15.1 billion in FY 2003, but NASA's R&D (two-thirds of the agency's budget) would climb 4.3 percent to \$10.7 billion. Much of the R&D increase, however, would be due to the transfer of non-R&D support costs to R&D programs. While the much-delayed International Space Station would receive \$1.5 billion for construction, down from \$1.7 billion, most science programs would receive increases. R&D in Science, Aeronautics and Technology (SAT) would climb 9.9 percent to \$8.9 billion, partially due to the transfer of non-R&D costs into SAT. Space Science funding would climb 19.0 percent to \$3.4 billion, including transferred programs. While canceling the Outer Planets program (including Pluto and Europa missions), NASA proposes a New Frontiers program to select promising planetary missions through competitive proposals and would also invest \$126 million in new nuclear propulsion technology development to enable future missions. The Biological and Physical Research program expanded greatly last year to take on all Space Station research; BPR funding would rise 2.8 percent in FY 2003 to \$851 million. Aero-Space Technology would climb 12.3 percent to \$2.9 billion, including \$759 million (up 63 percent) for the Space Launch Initiative to continue efforts to develop new technologies for space launch to replace the Space Shuttle. Earth Science would increase 0.2 percent, but program funding would decline after adjusting for transferred programs.
- The **Department of Energy (DOE)** would see its R&D fall 0.5 percent to \$8.3 billion. Funding for R&D in the Office of Science would remain flat at \$3.1 billion, but most programs (including the physics programs, fusion energy sciences, Basic Energy Sciences, and computing research) would receive modest increases, offset by cuts in R&D earmarks and a planned reduction in Spallation Neutron Source construction. In Fossil Energy R&D (down 17.3 percent to \$416 million), there would be steep cuts of up to half in R&D on natural gas and petroleum technologies, with a continuing shift in emphasis toward coal R&D. In Energy Conservation R&D (down 10.9 percent to \$413 million), DOE would abandon the Partnership for a New Generation of Vehicles (PNGV) to develop high-mileage gas-powered vehicles and would replace it with FreedomCAR, a collaborative effort with U.S. auto companies to develop hydrogen-powered fuel cell vehicles. DOE's defense R&D programs would increase 2.8 percent to \$3.9 billion. Although construction funding for the National Ignition Facility would decline to \$214 million, many other defense R&D areas such as Advanced Simulation and Computing and Stockpile R&D would receive increases.
- R&D in the **U.S. Department of Agriculture (USDA)** would fall \$216 million or 9.3 percent to \$2.1 billion, mostly because of steep cuts to R&D earmarks and the loss of one-time FY 2002 emergency anti-terrorism funds. Funding for competitive research grants in the National Research Initiative (NRI) would double from \$120 million to \$240 million, offsetting steep cuts in earmarked Special Research Grants from \$97 million down to \$3 million. The large NRI increase would partially make up for the Administration's decision to block a \$120 million mandatory competitive research grants program from spending any money in FY 2003, as in FY 2002. In the intramural Agricultural Research Service (ARS) programs, Buildings and Facilities funding would fall from \$119 million down to \$17 million because FY 2002 emergency anti-terrorism security upgrades and congressionally earmarked construction projects would not be renewed; ARS research would fall \$30 million to \$1.0 billion, but selected priority research programs would receive increases, offset by the cancellation of R&D earmarks. Forest Service R&D would decline from \$321 million to \$294 million because of the removal of FY 2002 earmarks.

- **Department of Commerce** R&D would rise 0.3 percent to \$1.1 billion in FY 2003. National Institute of Standards and Technology (NIST) R&D would increase 5.0 percent to \$483 million; In particular, Science & Technology Research and Services (STRS), which provides funding for NIST's laboratories in Maryland and Colorado, would enjoy a 24.2 percent boost to \$348 million in R&D. Conversely, the extramural Industrial Technology Services (ITS) would see yet another dip in funding as Advanced Technology Program (ATP) R&D funding would be cut by 49 percent to \$81 million in FY 2003. National Oceanic and Atmospheric Administration (NOAA) R&D would decrease by 1.1 percent to \$605 million, mostly due to the transfer of the National Sea Grants College Program from NOAA to the National Science Foundation (NSF).
- R&D in the **Department of the Interior** would fall 4.8 percent to \$628 million. Even steeper cuts would fall on Interior's lead science agency, the U.S. Geological Survey (USGS). USGS R&D would fall 7.0 percent to \$542 million, with cuts to all four USGS divisions. A significant portion of the proposed decreases for USGS are in two water-quality programs, one of which—the Toxic Substances Hydrology Program—would be transferred to NSF.
- The **Department of Transportation's** (DOT) R&D funding would drop 5.4 percent to \$736 million. These numbers, however, are provisional because the transfer of some R&D programs from the Federal Aviation Administration (FAA) to the new Transportation Security Administration (TSA) has not yet been finalized. The TSA will take over aviation security R&D responsibilities from the FAA. Much of DOT's funding comes from revenues in the transportation trust funds. However, because these revenues dropped off significantly over the last year as a result of a stagnant economy, highway R&D would decline by \$10 million to \$266 million, a reduction of 3.5 percent.
- The **Environmental Protection Agency's** (EPA) R&D budget would rise 5.9 percent to \$627 million, mostly due to an increased focus on homeland security. EPA would receive \$75 million in new funding from the Superfund program for research towards the cleanup of sites contaminated with biological or chemical agents. An additional \$18 million (up from \$5 million) would be spent on other homeland security research.
- In other agencies, the **Department of Veterans Affairs** VA R&D portfolio has expanded steadily over the past decade. Its R&D budget of \$810 million in FY 2003 (up 6.5 percent or \$49 million) would make it the eighth-largest R&D funding agency. In recent years, VA's medical research has grown in tandem with increasing resources available to veterans medical care in general. The **Smithsonian Institution**, which conducts both scientific-based and collections-based research, would receive \$131 million in R&D for FY 2003. Smithsonian currently does not fund research projects through merit-based competition; as an outside group assesses this situation and future allocations begin to depend on merit-based competition, the Smithsonian research institutes may see some funds transferred to NSF as a result. R&D in the **Department of Education** would increase by 16 percent to \$311 million in FY 2003. This increase is due to a 37 percent boost to \$185 million for R&D in the Office of Educational Research and Improvement. However, all other R&D divisions in the Department of Education would decline or receive flat funding in FY 2003.

The Budgetary Context for FY 2003: Big Increases for Defense, Back to Deficits

The FY 2003 Bush budget proposes **discretionary spending of \$767 billion** in FY 2003, a large increase of \$49 billion or 6.8 percent over FY 2002 (see Figure 2), following an even larger increase in FY 2002, boosted in part by emergency funds to respond to the September 11 terrorist attacks. Much of the emergency spending on homeland security would continue in FY 2003. Nearly all of the increase, however, would go to the Department of Defense (DOD, up \$45 billion). Two other agencies, the National Institutes of Health (NIH, up \$3.7 billion) and the Department of Education (up \$0.5 billion) would also rank as high priorities and would receive increases. Just like last year's budget request, this would leave all other discretionary programs with slightly less than in FY 2002. Non-NIH nondefense R&D joins other programs such as foreign aid, immigration, justice programs, national parks, and environmental protection in a

competition for shrinking resources. Not surprisingly, then, in the FY 2003 R&D request NIH and DOD R&D programs would receive substantial increases while other agencies' R&D programs would be flat overall.

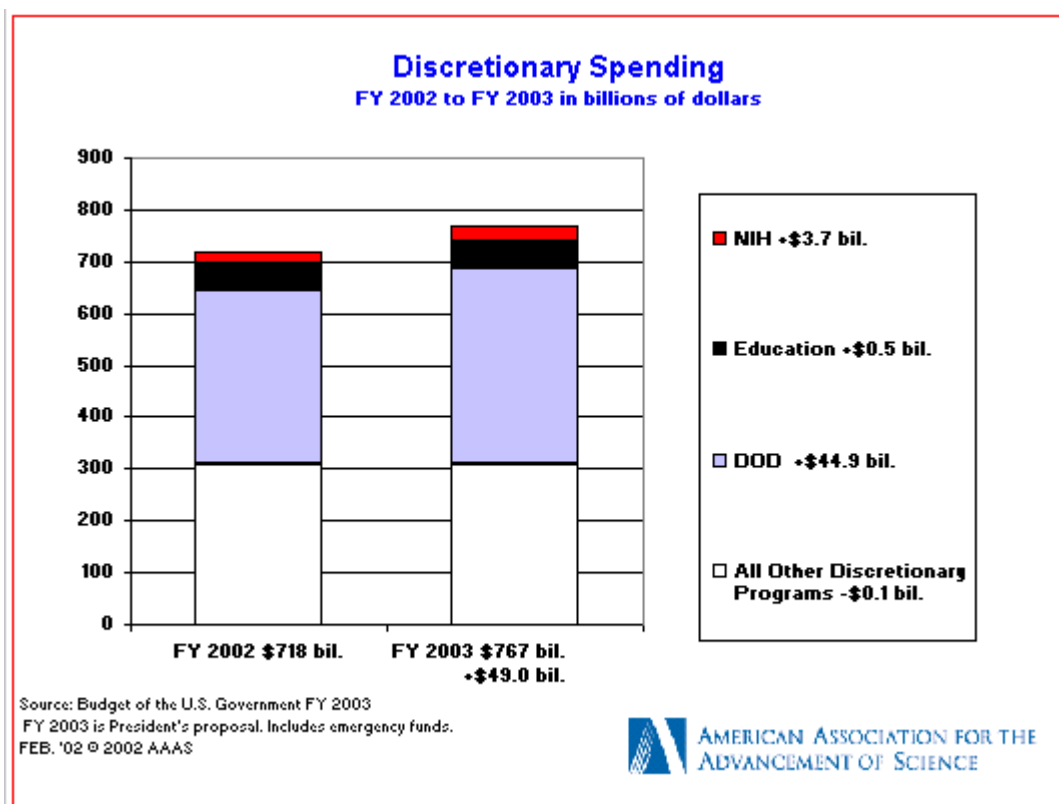


Figure 2.

The federal budget is now back in deficit and looks to stay that way for years to come. Thirty years of deficits gave way to four years of surpluses beginning in FY 1998, but it now seems certain that the federal government will end FY 2002 in deficit. And although both parties committed to balancing the budget even without the Social Security surplus, that commitment was fulfilled only in FY 1999 and FY 2000; the non-Social Security accounts fell into deficit in FY 2001. In a sign of just how much things have changed over the past year, the FY 2002 non-Social Security deficit is now projected to reach \$262 billion. Instead of paying down the national debt, the federal government is again adding to it.

President Bush's FY 2003 budget is the first budget in five years to propose deficit spending for the coming year. Asserting that the first priority of the federal government is to provide for national defense, homeland defense, and economic security, the FY 2003 budget proposals would lead to a unified deficit of \$80 billion (and a non-Social Security deficit of \$259 billion). The fact that the budget proposes a deficit gives Congress and the President more flexibility to reduce taxes or increase spending by whatever amounts they feel are necessary, without the constraint of forcing the budget to balance. Gone for now, of course, are any ideas about balancing the budget without the Social Security surplus.

Outyear Projections for Federal R&D to FY 2007

The FY 2003 budget also contains detailed projections for federal spending to FY 2007. Although these projections are mostly mere extrapolations of current policies, they are a statement of the Bush Administration's budgetary priorities and their implications for the future of federal R&D. The AAAS analysis of these outyear projections reveals that the Bush budget would hold most discretionary programs to inflationary growth over the next several years, allowing most R&D programs to just stay even with

expected inflation; but because NIH and DOD, the two largest federal R&D funding agencies, would continue to be high priorities, the overall federal R&D portfolio would grow strongly in future years.

Federal support for R&D is projected to increase from \$103.2 billion in FY 2002 to \$122.1 billion in FY 2007, an 8.1 percent increase after adjusting for expected inflation (see Table 3). The nondefense R&D portion would climb 8.2 percent over the time period. The Bush Administration would fulfill a campaign pledge to complete the doubling of the NIH budget between FY 1998 and FY 2003; although NIH funding would only stay even with inflation thereafter, the large increase in FY 2003 would allow NIH R&D to increase 15.9 percent ahead of inflation between FY 2002 and FY 2007. The outyear projections in the President's budget call for total NIH funding to reach \$27.3 billion in FY 2003 and then increase only at the rate of inflation thereafter to \$29.9 billion in FY 2007. In other words, after a \$3.7 billion increase in one year (FY 2003) the NIH budget would increase only \$2.5 billion spread out over the next four years, dropping from a 16 percent increase to a series of 2 percent increases. There are concerns, however, that because much of NIH's budget involves multi-year commitments of grant funding, the much-slower projected growth in future years will impede NIH's ability to offer new grants or shift funding to meet emerging research opportunities.

Excluding NIH, nondefense R&D would just stay ahead of inflation with a 1.6 percent gain in inflation-adjusted terms between FY 2002 and FY 2007.

Included in the budget projections are a few increases. NASA R&D would increase from \$10.2 billion in FY 2002 to \$12.2 billion in FY 2007 (up 9.3 percent after inflation). The increase is even larger for key R&D programs because the International Space Station would see its R&D budget nearly halved over the next five years as development and construction wind down, leaving more room for other programs. NASA plans a dramatic expansion of the Space Science program from \$2.9 billion in FY 2002 to \$4.5 billion in FY 2007 (up 43.9 percent after inflation). NASA Aero-Space Technology would jump from \$2.5 billion to \$3.6 billion (up 28.9 percent after inflation) because of efforts to develop a new generation of reusable launch vehicles. Other programs slated for increases include intramural research in NIST, up 23.7 percent after inflation; NSF R&D (up 3.4 percent); and VA R&D on medical topics (up 6.1 percent).

Most other programs' projections generally show modest cuts over the next few years, or a gradual loss of purchasing power to inflation. Some programs would face steep cuts over the next several years, mostly in DOE: energy supply R&D (down 5.2 percent from FY 2002 to FY 2007), fossil energy R&D (down 17.4 percent), and energy conservation R&D (down 11.0 percent) would all fall steeply. The U.S. Geological Survey (USGS) would also lose ground to inflation and see its R&D budget fall 7.5 percent.

Projections, of course, are not predictions. At best, projections are statements of one Administration's current priorities, and priorities always change in the give-and-take process of federal policymaking; nevertheless, they illuminate this Administration's future plans of plenty for DOD and NASA, and relative austerity for most other agencies, even NIH after the doubling process is complete.

Historical Trends and Outlook

Increases for NIH over the past few decades have resulted in a dramatic rearrangement of the federal nondefense R&D portfolio, an expansion which has accelerated in the past few years with the effort to double the NIH budget in five years beginning in FY 1998 (see Figure 3). Other nondefense R&D agencies have not fared as well in recent years; as a result, NIH R&D would grow in FY 2003 to be as large as all the other nondefense R&D agencies' investments combined.

As shown in Figure 3, while NIH R&D has grown steadily, funding for all other nondefense R&D has remained stagnant in real terms for the past decade even during a decade of unprecedented growth in the U.S. economy and growth in the total U.S. budget. So although nondefense R&D (including NIH) would reach an all-time high in FY 2003, investments in non-NIH agencies would decline slightly after adjusting for inflation and remain no higher than eleven years ago.

On the defense side, DOD is by far the largest supporter of R&D in the federal government, accounting for nearly half the total. In the 1980s, DOD supported nearly two-thirds of total federal R&D. Because of defense cutbacks following the end of the Cold War, however, DOD's support for R&D declined by a third since its peak in FY 1987 but has increased dramatically in the past few years. DOE's defense R&D has followed the same pattern, bouncing back from post-Cold War cutbacks to increasing investments in recent years. But as Figure 4 shows, growth has mostly been in development investments rather than basic and applied research. Funding for the DOD S&T accounts (basic and applied research plus some technology development) dropped sharply after the Cold War and has not recovered, despite gains in total R&D and total defense spending.

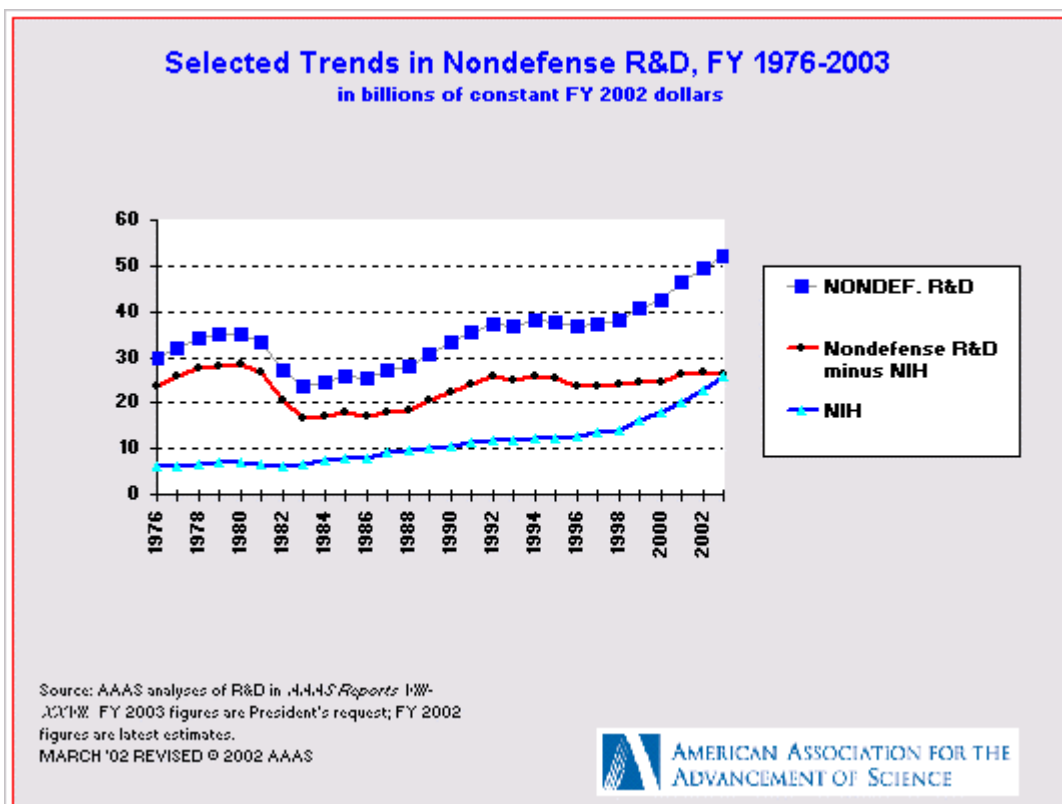


Figure 3.

The FY 2003 budget now moves to Congress. Congress is faced with task of approving an FY 2003 budget resolution, Congress' own blueprint of its budget priorities for FY 2003 and beyond. This task occurs in a far different Congress than last year. With the Senate now under Democratic control, the consensus on balancing the budget shattered, and the temporary partisan truce in the aftermath of September 11 long ended, the process is expected to be lengthy and contentious. Senate Democrats have already criticized the Bush budget for spending too little on domestic programs, while on the other side there are conservative Republicans who criticize the Bush proposals for spending too much and would like to return to a balanced budget in FY 2003. But with President Bush having taken the lead to prepare the public for budget deficits for the next few years, the most likely outcome is that Congress will spend whatever it feels it needs in order to adequately fund defense, domestic programs, homeland security, other priorities, and its electoral hopes in the November 2002 elections. Since the difference between a deficit and a higher deficit is much more politically palatable than the difference between a deficit and a surplus, Congress will treat the Bush request as a base upon which it can add spending for its own priorities.

Normally, what would come next in the budget process that President Bush set in motion in February would be the congressional budget resolution that would set spending totals and functional allocations and would give budget instructions to various House and Senate committees, including the Appropriations Committees. Though legally non-binding, the resolution establishes a framework under which Congress

considers the current budget request and gives the Appropriations Committees targets for discretionary spending that they will have to meet when drafting appropriations bills. This year, however, there are serious doubts about whether a budget resolution will even be adopted, given the convergent circumstances of a divided Congress, an election year and residual resentment in both parties over the previous year's fiscal battles. Though the budget process will still proceed without a budget resolution, the absence of such a framework may presage an exceedingly grueling FY 2003 budget process; without a framework and a bottom line agreed upon in advance, the FY 2003 appropriations process could become a free-for-all, especially in an election year when politicians will be under intense pressure to deliver spending to their states or districts.

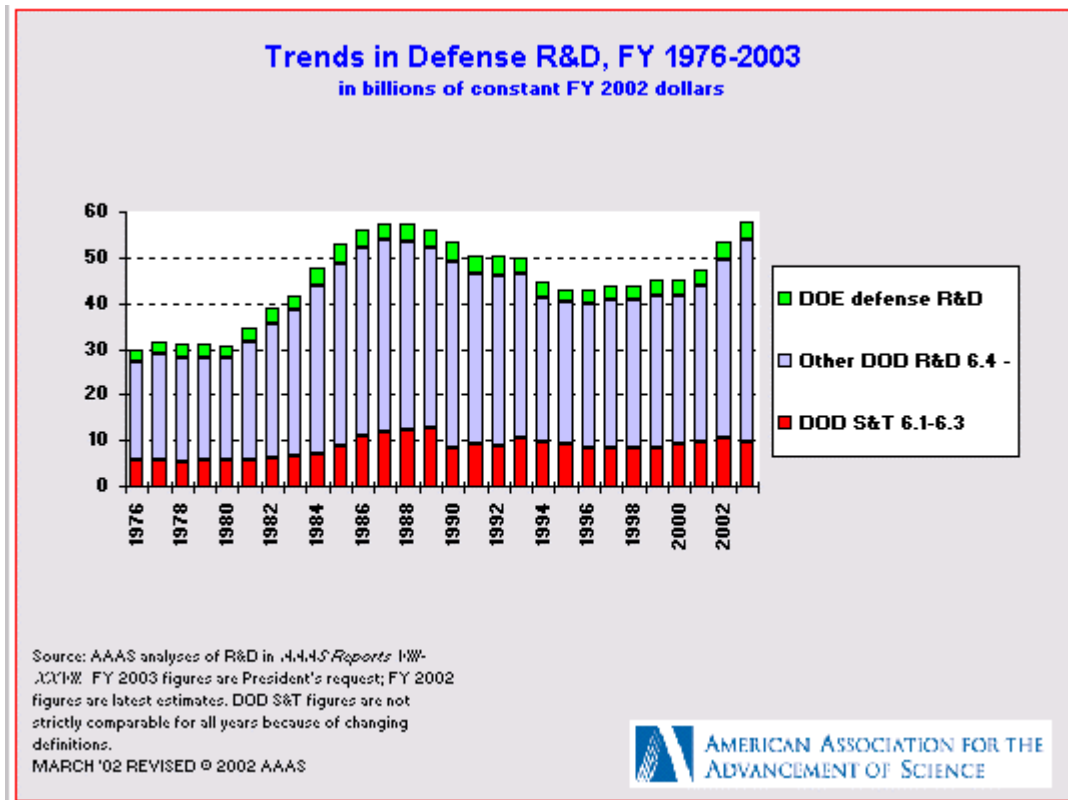


Figure 4.

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AAAS Analysis of R&D in the FY 2003 Budget

Table 1. R&D in the FY 2003 Budget by Agency
(budget authority in millions of dollars)

| | FY 2001 Actual | FY 2002 Estimate | FY 2003 Budget | Change FY 02-03 | |
|---|-------------------|---------------------|-------------------|-----------------|---------|
| | | | | Amount | Percent |
| Total R&D (Conduct and Facilities) | | | | | |
| Defense (military) | 42,740 | 49,639 | 54,827 | 5,188 | 10.5% |
| <i>S&T (6.1-6.3 + medical)</i> | 9,365 | 10,341 | 9,957 | -384 | -3.7% |
| <i>All Other DOD R&D</i> | 33,375 | 39,298 | 44,870 | 5,572 | 14.2% |
| Health and Human Services | 21,045 | 24,141 | 27,551 | 3,410 | 14.1% |
| <i>Nat'l Institutes of Health</i> | 19,807 | 22,795 | 26,452 | 3,657 | 16.0% |
| NASA | 9,887 | 10,232 | 10,676 | 444 | 4.3% |
| Energy | 7,733 | 8,361 | 8,323 | -38 | -0.5% |
| <i>NNSA and other defense</i> | 3,462 | 3,839 | 3,947 | 108 | 2.8% |
| <i>Energy and Science programs</i> | 4,271 | 4,522 | 4,376 | -146 | -3.2% |
| Nat'l Science Foundation | 3,320 | 3,526 | 3,651 | 125 | 3.5% |
| Agriculture | 2,181 | 2,334 | 2,118 | -216 | -9.3% |
| Commerce | 1,030 | 1,096 | 1,100 | 4 | 0.3% |
| <i>NOAA</i> | 561 | 611 | 605 | -6 | -1.1% |
| <i>NIST</i> | 413 | 460 | 483 | 23 | 5.0% |
| Interior | 621 | 660 | 628 | -32 | -4.8% |
| Transportation | 718 | 778 | 736 | -42 | -5.4% |
| Environ. Protection Agency | 574 | 592 | 627 | 35 | 5.9% |
| Veterans Affairs | 719 | 761 | 810 | 49 | 6.5% |
| Education | 264 | 268 | 311 | 43 | 16.0% |
| All Other | 702 | 763 | 689 | -74 | -9.7% |
| Total R&D | 91,534 | 103,150 | 112,047 | 8,897 | 8.6% |
| Defense R&D | 46,202 | 53,478 | 58,774 | 5,297 | 9.9% |
| Nondefense R&D | 45,332 | 49,672 | 53,273 | 3,601 | 7.2% |
| <i>Nondefense R&D excluding NIH</i> | 25,525 | 26,877 | 26,821 | -56 | -0.2% |
| Basic Research | 21,376 | 23,635 | 25,499 | 1,864 | 7.9% |
| Applied Research | 22,451 | 25,050 | 26,370 | 1,320 | 5.3% |
| Development | 42,959 | 49,390 | 55,235 | 5,845 | 11.8% |
| R&D Facilities and Equipment | 4,749 | 5,075 | 4,943 | -132 | -2.6% |

Source: AAAS, based on OMB data for R&D for FY 2003, agency budget justifications, and information from agency budget offices.

All years include homeland security and other emergency appropriations.

All years adjusted to include proposals to fully fund federal retiree costs.

March 14, 2002 - REVISED

AAAS Analysis of R&D in the FY 2003 Budget

Table 2. Research in the FY 2003 Budget
(budget authority in millions of dollars)

| | FY 2001 | FY 2002 | FY 2003 | Change FY 02-03 | |
|-------------------------------------|---------|----------|---------------|-----------------|---------|
| | Actual | Estimate | Budget | Amount | Percent |
| BASIC RESEARCH | | | | | |
| Defense (military) | 1,287 | 1,376 | 1,365 | -11 | -0.8% |
| Health and Human Services | 11,642 | 13,193 | 14,379 | 1,185 | 9.0% |
| <i>Nat'l Institutes of Health</i> | 11,639 | 13,190 | 14,376 | 1,185 | 9.0% |
| NASA | 1,695 | 1,967 | 2,361 | 395 | 20.1% |
| Energy | 2,390 | 2,424 | 2,519 | 94 | 3.9% |
| Nat'l Science Foundation | 2,852 | 3,058 | 3,205 | 147 | 4.8% |
| Agriculture | 801 | 860 | 880 | 20 | 2.3% |
| Commerce (NIST) | 50 | 52 | 73 | 21 | 40.4% |
| Interior | 56 | 58 | 55 | -3 | -4.4% |
| Transportation | 17 | 13 | 25 | 12 | 92.6% |
| Environ. Protection Agency | 104 | 107 | 101 | -6 | -5.3% |
| Smithsonian | 108 | 111 | 114 | 3 | 2.7% |
| Veterans Affairs | 289 | 329 | 351 | 23 | 6.9% |
| All Other | 84 | 87 | 70 | -17 | -19.5% |
| Total Basic Research | 21,376 | 23,635 | 25,499 | 1,864 | 7.9% |
| <i>Basic research excluding NIH</i> | 9,737 | 10,445 | 11,123 | 679 | 6.5% |
| RESEARCH (basic + applied) | | | | | |
| Defense (military; incl. medical) | 5,393 | 5,926 | 5,213 | -713 | -12.0% |
| Health and Human Services | 20,735 | 23,610 | 26,636 | 3,027 | 12.8% |
| <i>Nat'l Institutes of Health</i> | 19,561 | 22,346 | 25,578 | 3,232 | 14.5% |
| NASA | 4,294 | 4,824 | 5,549 | 725 | 15.0% |
| Energy | 4,697 | 5,155 | 5,188 | 32 | 0.6% |
| Nat'l Science Foundation | 3,032 | 3,250 | 3,404 | 154 | 4.7% |
| Agriculture | 1,845 | 1,846 | 1,826 | -20 | -1.1% |
| Commerce | 825 | 887 | 883 | -4 | -0.4% |
| NOAA | 511 | 546 | 546 | 0 | 0.0% |
| NIST | 306 | 334 | 328 | -6 | -1.8% |
| Interior | 590 | 628 | 596 | -32 | -5.1% |
| Transportation | 461 | 517 | 506 | -10 | -2.0% |
| Environ. Protection Agency | 474 | 489 | 531 | 41 | 8.5% |
| Veterans Affairs | 704 | 745 | 794 | 48 | 6.5% |
| Education | 174 | 180 | 213 | 33 | 18.3% |
| Agency for Int'l Develop. | 249 | 268 | 182 | -86 | -32.1% |
| Smithsonian | 108 | 111 | 114 | 3 | 2.7% |
| All Other | 246 | 249 | 235 | -14 | -5.6% |
| Total Research | 43,826 | 48,685 | 51,869 | 3,184 | 6.5% |
| <i>Total research excluding NIH</i> | 24,265 | 26,339 | 26,291 | -48 | -0.2% |

Source: AAAS, based on OMB data for R&D for FY 2003, agency budget justifications, and information from agency budget offices.

All years include homeland security and other emergency appropriations.

All years adjusted to include proposals to fully fund federal retiree costs.

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AAAS Analysis of R&D in the FY 2003 Budget

Table 3. AAAS Analysis of the Outyear Projections for R&D in the FY 2003 Budget
(budget authority in millions of dollars)

| | FY 2002 | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | % Change FY 02-07 | |
|---|----------------|----------------|----------------|----------------|----------------|----------------|-------------------|--------------------|
| | Estimate | Budget | Projected | Projected | Projected | Projected | current \$ | constant \$ |
| Total R&D (Conduct and Facilities) | | | | | | | | |
| Defense (military) * | 49,639 | 54,827 | 58,066 | 61,789 | 60,009 | 59,065 | 19.0% | 8.7% |
| Health & Human Services | 24,141 | 27,551 | 28,136 | 28,761 | 29,431 | 30,104 | 24.7% | 13.9% |
| <i>Nat'l Institutes of Health</i> | 22,795 | 26,452 | 27,009 | 27,610 | 28,254 | 28,916 | 26.8% | 15.9% |
| NASA | 10,232 | 10,676 | 11,144 | 11,370 | 11,815 | 12,240 | 19.6% | 9.3% |
| Energy | 8,361 | 8,323 | 8,470 | 8,627 | 8,798 | 8,974 | 7.3% | -1.9% |
| <i>Defense</i> | 3,839 | 3,947 | 4,003 | 4,062 | 4,127 | 4,192 | 9.2% | -0.2% |
| <i>Nondefense</i> | 4,522 | 4,376 | 4,468 | 4,565 | 4,671 | 4,782 | 5.8% | -3.4% |
| Nat'l Science Foundation | 3,526 | 3,651 | 3,728 | 3,811 | 3,900 | 3,991 | 13.2% | 3.4% |
| Agriculture | 2,334 | 2,118 | 2,286 | 2,273 | 2,319 | 2,373 | 1.7% | -7.1% |
| Commerce | 1,096 | 1,100 | 1,122 | 1,147 | 1,172 | 1,199 | 9.4% | -0.1% |
| Interior | 660 | 628 | 641 | 654 | 668 | 682 | 3.4% | -5.5% |
| Transportation | 778 | 736 | 750 | 763 | 779 | 797 | 2.5% | -6.4% |
| Environ. Protection Agcy. | 592 | 627 | 640 | 653 | 669 | 685 | 15.7% | 5.7% |
| Veterans Affairs | 761 | 810 | 826 | 844 | 863 | 883 | 16.1% | 6.1% |
| All Other | 1,031 | 1,000 | 1,016 | 1,033 | 1,052 | 1,071 | 3.9% | -5.1% |
| Total R&D | 103,150 | 112,047 | 116,824 | 121,726 | 121,476 | 122,065 | 18.3% | 8.1% |
| Defense R&D | 53,478 | 58,774 | 62,069 | 65,851 | 64,136 | 63,257 | 18.3% | 8.1% |
| Nondefense R&D | 49,672 | 53,273 | 54,755 | 55,874 | 57,340 | 58,808 | 18.4% | 8.2% |
| <i>Nondef. R&D minus NIH</i> | <i>26,877</i> | <i>26,821</i> | <i>27,746</i> | <i>28,264</i> | <i>29,086</i> | <i>29,892</i> | <i>11.2%</i> | <i>1.6%</i> |

Source: AAAS analyses of defense and nondefense R&D, based on detailed budget account projections in the Public Budget Database of the *Budget of the United States Government FY 2003*.

FY 2002 figures represent latest agency estimates of R&D. FY 2003 figures represent latest revised agency requests. Constant dollar conversions based on GDP deflators from OMB.

The detailed analysis of nondefense R&D containing agency details and methodology and other outyear projections data are available on the World Wide Web at <http://www.aaas.org/spp/R&D/> in the "Guide to R&D Funding Data" section (see "Outyear Projections").

AAAS Analysis of R&D in the FY 2003 Budget

Table 4. Major Functional Categories of R&D
(budget authority in millions of dollars)

| | FY 2001 | FY 2002 | FY 2003 | Change FY 02-03 | | % Share of Total ('03) |
|--------------------------|---------------|----------------|----------------|-----------------|-------------|---------------------------|
| | Actual | Estimate | Budget | Amount | Percent | |
| Defense ¹ | 46,202 | 53,478 | 58,774 | 5,297 | 9.9% | 52.5% |
| Nondefense ² | 45,332 | 49,672 | 53,273 | 3,601 | 7.2% | 47.5% |
| Space | 8,951 | 9,297 | 9,839 | 542 | 5.8% | 8.8% |
| Health | 21,735 | 24,877 | 28,307 | 3,430 | 13.8% | 25.3% |
| Energy | 1,320 | 1,565 | 1,415 | -150 | -9.6% | 1.3% |
| General Science | 6,353 | 6,574 | 6,710 | 136 | 2.1% | 6.0% |
| Environment ³ | 2,138 | 2,211 | 2,181 | -30 | -1.4% | 1.9% |
| Agriculture | 1,826 | 2,013 | 1,824 | -189 | -9.4% | 1.6% |
| Transportation | 1,654 | 1,713 | 1,573 | -140 | -8.2% | 1.4% |
| Commerce | 468 | 484 | 494 | 10 | 2.1% | 0.4% |
| International | 252 | 268 | 182 | -86 | -32.1% | 0.2% |
| All Other | 634 | 670 | 748 | 78 | 11.6% | 0.7% |
| Total R&D | 91,534 | 103,150 | 112,047 | 8,897 | 8.6% | 100.0% |

Source: Authors' estimates based on data from OMB and agency budget justifications.

Classifications generally follow the government's budget function categories except health (which here includes health R&D in HHS and VA).

All figures are rounded to the nearest million. Changes calculated from unrounded figures.

¹ Includes DOD and defense R&D in DOE.

² Includes all R&D not in defense.

³ Includes natural resources R&D.

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AAAS Analysis of R&D in the FY 2003 Budget

Table 5. Interagency Science and Technology Initiatives
(budget authority in millions)

| | FY 2001 | FY 2002 | FY 2003 | Change FY 02-03 | |
|--|--------------|--------------|--------------|-----------------|--------------|
| | Actual | Estimate | Budget | Amount | Percent |
| Nanoscale Science, Engineering and Technology | | | | | |
| National Science Foundation | 150 | 199 | 221 | 22 | 11.1% |
| Defense | 125 | 180 | 201 | 21 | 11.7% |
| Energy | 88 | 91 | 139 | 48 | 52.9% |
| NASA | 22 | 46 | 51 | 5 | 10.9% |
| Commerce | 33 | 38 | 44 | 6 | 16.5% |
| National Institutes of Health | 40 | 41 | 43 | 2 | 5.9% |
| Other (EPA, DOT, Justice) | 8 | 10 | 11 | 1 | 10.1% |
| Total Nanotechnology | 466 | 604 | 710 | 106 | 17.5% |
| Networking and Information Technology R&D | | | | | |
| Commerce | 38 | 43 | 42 | -1 | -2.3% |
| Defense | 310 | 320 | 306 | -14 | -4.4% |
| Energy | 326 | 312 | 313 | 1 | 0.3% |
| Environ. Protection Agency | 4 | 2 | 2 | 0 | 0.0% |
| Health and Human Services | 277 | 310 | 336 | 26 | 8.4% |
| NASA | 177 | 181 | 213 | 32 | 17.7% |
| National Science Foundation | 636 | 676 | 678 | 2 | 0.3% |
| Total IT R&D | 1,768 | 1,844 | 1,890 | 46 | 2.5% |
| U.S. Global Change Research Program | | | | | |
| National Science Foundation | 181 | 188 | 188 | 0 | 0.0% |
| Energy | 116 | 120 | 126 | 6 | 5.0% |
| Commerce (NOAA) | 93 | 100 | 100 | 0 | 0.0% |
| Agriculture | 51 | 56 | 66 | 10 | 17.9% |
| Interior | 27 | 28 | 28 | 0 | 0.0% |
| Environ. Protection Agency | 23 | 21 | 22 | 1 | 4.8% |
| Health and Human Services | 54 | 60 | 68 | 8 | 13.3% |
| Smithsonian | 7 | 7 | 7 | 0 | 0.0% |
| NASA | 1,176 | 1,090 | 1,109 | 19 | 1.7% |
| Total USGCRP | 1,728 | 1,670 | 1,714 | 44 | 2.6% |

Source: OMB supporting data for FY 2003 Budget.