

Future Gains Projected for NASA and Physical Sciences, Cuts in All Other R&D

AAAS Analysis of the Outyear Projections in the FY 2007 Budget

(This analysis is a preview of the forthcoming *AAAS Report XXXI: Research and Development FY 2007*, a comprehensive look at the President's budget for R&D in FY 2007. More tables and continually updated supplemental materials on R&D in the FY 2007 budget can be found on the AAAS R&D Web site at <http://www.aaas.org/spp/rd>.)

President Bush released his fiscal year (FY) 2007 budget proposal in February. As in previous years, a major focus of the budget is the President's promise to halve the deficit by the time he leaves office in 2009. In order to do so, the President proposes to continue cutting domestic discretionary spending in future years, and also to restrain defense and homeland security spending after large increases until now. But in his FY 2007 budget, President Bush introduced a new American Competitiveness Initiative to boost funding for physical sciences research by setting in motion a plan to double the budgets of the National Science Foundation (NSF), DOE's Office of Science, and the National Institute of Standards and Technology (NIST) laboratories over the next 10 years, and continued to emphasize his Vision for Space Exploration calling on NASA to increase R&D over the next few years to get closer to the goal of returning humans to the moon and going onward to Mars.

In order to accommodate these four agency increases within a shrinking overall budget, this new AAAS analysis shows that funding for all other R&D funding agencies would decline in real terms over the next five years. Nearly every federal R&D program outside the priority areas of physical sciences and space would fall, often sharply. These projections are only projections, but they carry considerable weight because previous years' projections have proved to be accurate guides to current federal R&D funding levels.

Projections for R&D in the FY 2007 Budget:

All R&D Agencies Decline Over Next Five Years Except NASA, NSF, DOE Science, and NIST

The FY 2007 budget contains projections for federal spending and revenues to FY 2011, and provides the assumptions behind the Bush Administration's goal of reducing the budget deficit. As in the past two budgets, there was controversy this February when the Bush Administration did not publish detailed account projections for individual federal programs in the FY 2007 budget, though they were traditionally made public. Instead, only aggregate totals were published showing unspecified future reductions in discretionary spending and detailed projections were given only for selected agencies (namely agencies in line to receive increases in future years such as NASA and DOE). The detailed projections are only available in an unpublished computer printout circulating around Washington, which AAAS has obtained. Although these projections are mostly extrapolations of current policies, they are far from mechanical exercises; as this analysis shows, the projections show widely differing budget trajectories for programs, and show how overall budget goals translate into specific program budgets. More importantly, past projections have proved to foretell the current R&D funding environment. **The AAAS analysis of the latest outyear projections reveals that the Bush budget would cut R&D funding for all major R&D programs over the next five years except for NASA's space exploration programs and the three agencies singled out in the American Competitiveness Initiative.** Even defense and homeland security R&D, recipients of large increases until this year and projected for increases in past budgets, would decline in the latest projections.

- From \$28.6 billion this year and next, Administration plans show the NIH budget declining steadily to \$27.5 billion in 2010 before rebounding slightly to \$27.9 billion in 2011. R&D is 97 percent of the NIH budget; **NIH R&D would fall 12.1 percent in real terms between 2006 and 2011** based on these projections and would end up below the 2002 funding level (see Figure 1), well below the highs reached after the NIH doubling campaign of 1998-2003.

- **Defense and homeland security R&D would reverse recent gains.** After dramatic increases over the past several years, DOD R&D would level off and decline in coming years. Pentagon projections show total DOD R&D falling from \$72.5 billion this year down to \$71.2 billion in 2011, a slight cut even before inflation but an 11.6 percent fall after expected inflation. DHS R&D would also fall after spectacular recent gains, losing ground by 4.6 percent in real terms by 2011 (see Figure 2). Although R&D in the new Domestic Nuclear Detection Office and for biological countermeasures would increase, funding for all other DHS R&D priorities collectively would fail to keep pace with inflation.

- **Other nondefense R&D agencies are projected to see dramatic reductions in their R&D portfolios, falling between 10 and 30 percent over the next five years** (see Table 1 and Figure 1). The U.S. Department of Agriculture (USDA) would be hard hit with a 28 percent real reduction in R&D by 2011, mostly from reductions in facilities and earmarks in 2007 that would be carried forward in future years (see Figure 2). Environmental R&D agencies would lose close to 20 percent of their funding over the next five years, including EPA (down 17 percent), the U.S. Geological Survey (down 18 percent), and the National Oceanic and Atmospheric Administration (NOAA, down 19 percent).

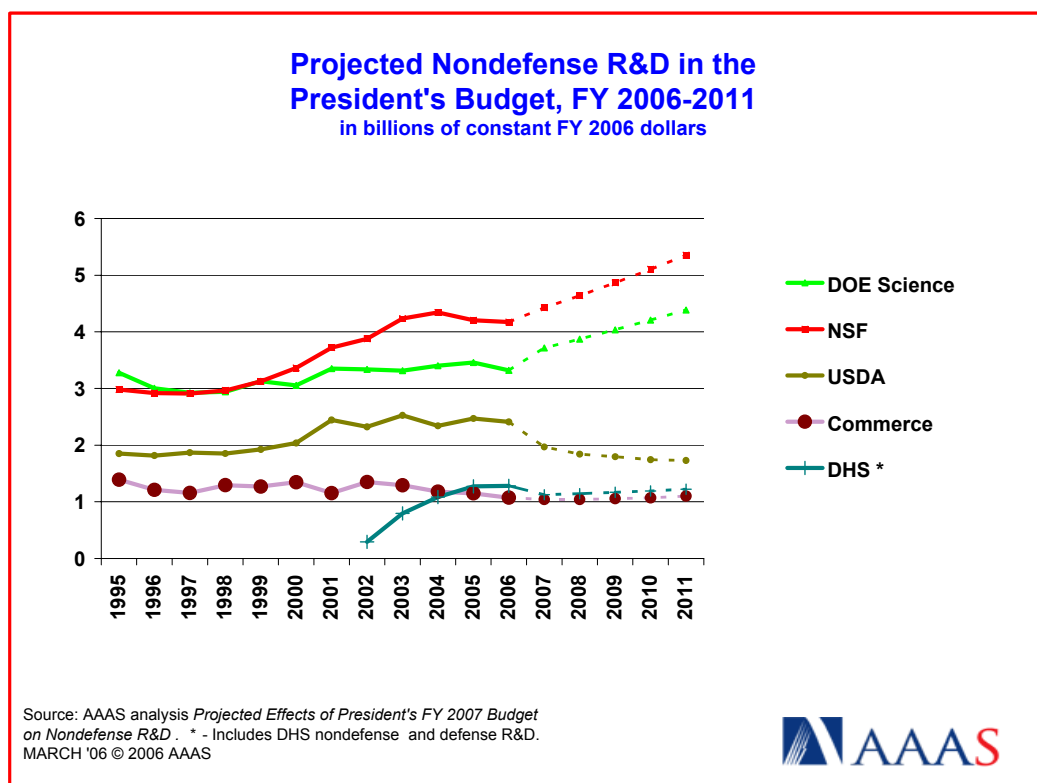


Figure 2. (click on the image for PDF)

- The Bush Administration's recently announced support for some alternative energy R&D technologies could be short-lived. Unlike the situation in DOE Science where there is money set aside for future increases, the Energy Supply and Conservation budget account, which funds R&D on the priorities of solar, biomass, and wind energy, would increase substantially in 2007 but then slide back down in future years, resulting in a slight cut after inflation. Cuts in other areas of energy R&D proposed for 2007 would

continue in future years would leave the DOE energy R&D portfolio at \$1.2 billion by 2011, an 18 percent loss in real terms (see Table 1).

The FY 2007 Outyear Projections in Historical Context: Earlier Projections Became Reality

Although the Bush Administration has done its best to hide these outyear projections and has dismissed them as mechanical exercises carrying no policy weight, **previous projections have been remarkably accurate in foretelling actual appropriations for federal R&D over the last few years** (see Figure 3). Figure 3 compares outyear projections from four previous budgets (FY 2002 through FY 2005; outyear projections were not available in the FY 2006 budget) as reported in previous AAAS analyses to the amounts actually appropriated for the major groupings of NIH R&D, NASA R&D, and all other nondefense R&D. As Figure 3 shows, the outyear projections have been remarkably consistent over the years, and appropriations have matched the projections year after year.

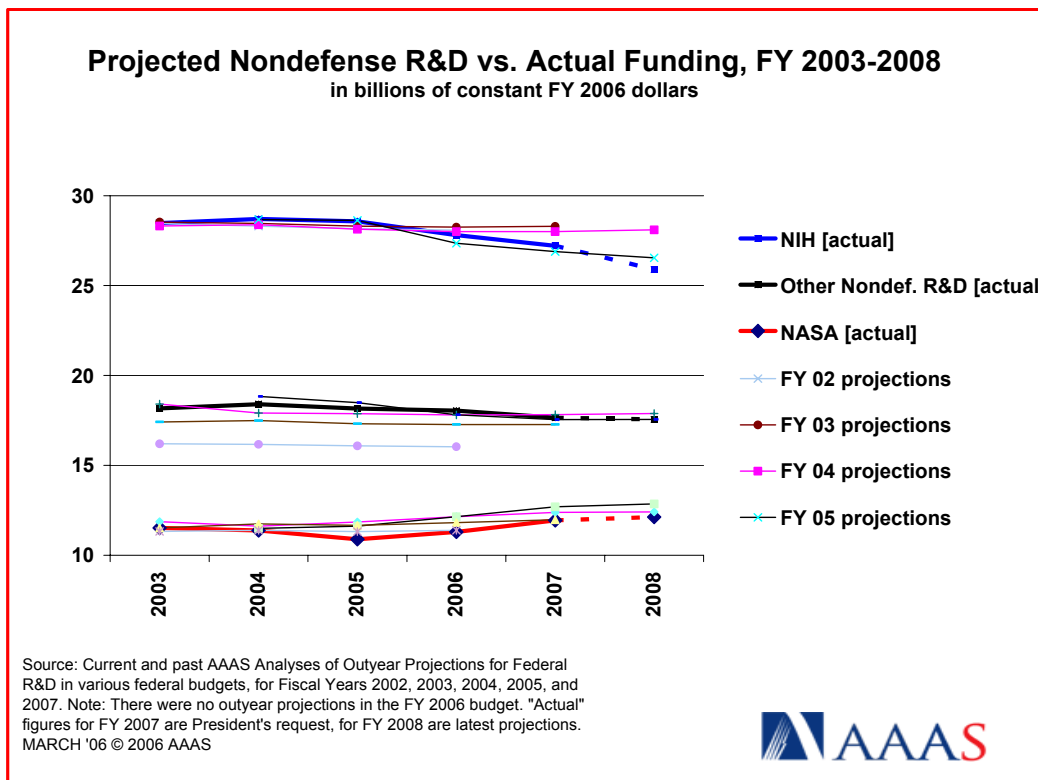


Figure 3. (click on the image for PDF).

Previous projections of the NIH budget flattening out and declining during this decade, considered alarmist and unrealistic at a time when the NIH budget was in the middle of a five-year doubling campaign, have foretold the flattening and now declining NIH budget of recent years with uncanny accuracy (see top lines on Figure 3). If anything, the chart shows that projections for NIH R&D have understated the cuts that have actually happened. Despite all the turmoil and trouble at NASA and the announcement of the Vision for Space Exploration in early 2004, NASA R&D has followed previous projections closely (bottom bars of Figure 3), showing the consistency with which the Bush Administration has pursued a flat funding profile for NASA even as the agency has taken on the mission of returning humans to the moon. Figure 3 shows that NASA R&D has actually fallen short of previous projections, especially in 2005 and 2006, because of responses to the Challenger disaster resulting in the unanticipated transfer of hundreds of millions of dollars from R&D programs to the non-R&D Shuttle program.

The major deviation from the projections is in the Other Nondefense R&D category (middle bars of Figure 3), appropriations for which have turned out to be flat, but significantly above the FY 2001 and FY 2002

projections. But the FY 2001 projections were made before the fall 2001 terrorist attacks and therefore long before the now-substantial DHS R&D portfolio and other homeland security investments were on the drawing board, and the FY 2002 projections were higher than the previous year but were still made a year before DHS was created. Despite the nearly 20 R&D funding agencies contained in this category of Figure 3, actual appropriations and the FY 2007 request have turned out to be remarkably similar to the projections from three years ago and two years ago.

The match of appropriations and requests to earlier projections show the consistency with which the Bush Administration has pursued its budget policies of restraining spending for domestic programs, and the willingness of a Congress controlled by the President's party to go along with his overall budget policies while making only minor adjustments on the details. Unlike outyear projections in the 1990s which turned out to be wildly off the mark for a host of reasons, and unlike recent projections for defense and homeland security R&D which were overtaken by unexpected events, nondefense R&D projections from earlier in the decade have matched eventual reality despite the many twists and turns taken by history this decade.

The Budgetary Context for FY 2007: Reducing the Deficit Through Discretionary Cuts

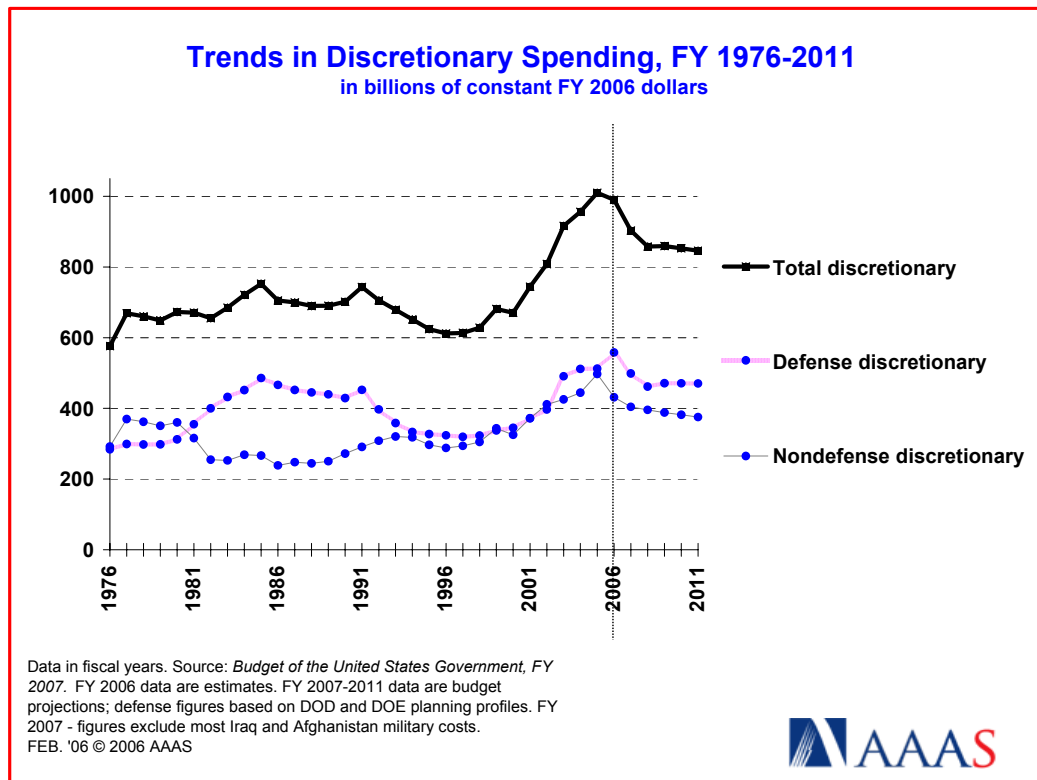


Figure 4. (click on the image for PDF).

The Bush Administration has consistently proposed to reduce the federal budget deficit primarily by reducing discretionary spending, the one-third of the budget subject to the annual control of the President and the Congress, and also the part of the budget from which nearly all federal R&D is funded. Figure 4 shows historical trends in discretionary spending and the latest FY 2007 proposals out to 2011. It clearly shows that the goal of reducing a \$412 billion 2004 deficit to \$208 billion by 2009 depends heavily on cutting discretionary spending sharply over the next few years. To reduce discretionary spending on the defense side, the budget allots nothing for future costs in Iraq and Afghanistan. Figure 4 includes all such war, occupation, and reconstruction costs up to FY 2006 and the first few months of FY 2007, but the apparent cuts on the defense side and thus a great deal of the deficit reduction goal depend on the illusion that war spending will stop early next year.

Figure 4 shows that over the past several years, there have been dramatic increases in both defense and nondefense discretionary spending after nearly a decade of relative restraint in the 1990s. On the defense side, there have been large increases in the regular DOD budget topped off in the last five years by Iraq and Afghanistan costs. On the nondefense side, there have been large increases in the relatively new category of homeland security spending along with some additional funds for foreign aid to Iraq and Afghanistan; the FY 2006 total goes higher still to a new record because of emergency appropriations to respond to Hurricane Katrina. The FY 2007 budget proposes to reduce non-emergency domestic spending by 0.5 percent, following a similar cut in 2006, and to keep reducing domestic spending every year to 2011, while at the same time assuming nothing for further spending on Gulf Coast reconstruction or future disasters.

While discretionary spending is proposed for cuts, spending on entitlement programs would increase dramatically. Even with recent increases, discretionary spending as a share of the U.S. economy is still well below the levels of the 1980s and early 1990s. The real growth in federal spending has been in entitlement and other mandatory programs, now two-thirds of the federal budget. Earlier this year, a prescription-drug benefit for the Medicare program went into effect, which will dramatically increase future Medicare spending; spending on Medicare, Social Security, Medicaid, and other entitlements would continue to grow far faster than the rate of inflation in the FY 2007 budget, despite some proposed minor trims in the proposal. In addition, mandatory payments of interest on the national debt would also climb because the national debt is growing rapidly from the accumulation of record annual deficits.

Even in times of record budget deficits, the FY 2007 budget proposes more tax cuts. As a result of large tax cut laws enacted earlier this decade, the federal government is expected to take in 17.5 percent of the U.S. Gross Domestic Product (GDP) in tax revenues this year, down sharply from nearly 21 percent at the turn of the century. These reduced revenues, primarily from income tax cuts, are the primary reason for record deficits. In order to make the total costs of past tax cut laws appear smaller, nearly all of the tax cut provisions enacted earlier this decade expire over the next several years, with some income tax provisions already expired at the end of 2005. The Congressional Budget Office recently estimated that the Bush Administration FY 2007 budget proposals to extend expiring tax provisions would reduce revenues by \$1.5 trillion over the next decade, with more than 80 percent of the revenue losses in the second five years.

Because appropriations decisions are made annually, projections are always wrong. They are not predictions. The FY 2007 appropriations process is just now getting under way in a Congress with slightly different priorities than the President, and future appropriations will be decided one year at a time. But the projections illustrate the consequences of reducing the budget deficit by restraining domestic discretionary spending rather than a balanced mix of entitlements reductions, increasing revenue, domestic spending cuts, and defense / homeland security cuts. **While the specific reductions contained in these projections are not inevitable, recent experience shows that they are a good guide to what lies ahead, at least as long as the Bush Administration and this Congress continue to pursue current budget policies. And they illustrate the tough trade-offs that must be made between key priorities such as physical sciences research and the rest of the federal R&D portfolio.**

(More materials on R&D in the FY 2007 budget, historical data and charts, and more information on *AAAS Report XXXI: Research and Development FY 2007*, can be found on the AAAS R&D Web site at <http://www.aaas.org/spp/rd>.)

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AAAS R&D Budget and Policy Program
1200 New York Avenue, NW
Washington, DC 20005
(202) 326-6607
AAAS R&D Web site: <http://www.aaas.org/spp/rd>



AAAS Analysis of R&D in the FY 2007 Budget

Table 1. AAAS Analysis of the Outyear Projections for R&D in the FY 2007 Budget
(budget authority in millions of dollars)

	FY 2006 Estimate	FY 2007 Budget	FY 2008 Projected	FY 2009 Projected	FY 2010 Projected	FY 2011 Projected	% Change FY 06-11	
							current \$	constant \$
Total R&D (Conduct and Facilities)								
Defense (military)	72,485	74,076	75,027	75,773	73,862	71,234	-1.7%	-11.6%
Health & Human Services	29,111	29,062	28,259	28,227	27,981	28,392	-2.5%	-12.3%
<i>Nat'l Institutes of Health</i>	27,805	27,810	27,041	27,010	26,774	27,174	-2.3%	-12.1%
NASA	11,295	12,202	12,655	13,283	13,825	17,763	57.3%	41.5%
<i>Constellation Systems</i>	1,734	3,058	3,068	3,613	4,084	7,698	344.1%	299.5%
<i>Space Station</i>	1,753	1,811	2,200	2,256	2,197	2,361	34.6%	21.1%
<i>Science</i>	5,254	5,330	5,383	5,437	5,492	5,546	5.6%	-5.0%
<i>All Other NASA R&D</i>	2,554	2,003	2,004	1,977	2,053	2,157	-15.5%	-24.0%
Energy	8,721	9,047	9,291	9,664	10,008	10,401	19.3%	7.3%
<i>Defense</i>	4,062	3,975	4,054	4,135	4,217	4,301	5.9%	-4.8%
<i>Science</i>	3,320	3,798	4,042	4,303	4,580	4,875	46.8%	32.1%
<i>Energy</i>	1,339	1,274	1,195	1,227	1,210	1,225	-8.5%	-17.7%
Nat'l Science Foundation	4,175	4,523	4,844	5,188	5,556	5,951	42.5%	28.2%
Agriculture	2,411	2,012	1,922	1,916	1,898	1,924	-20.2%	-28.2%
Commerce	1,074	1,064	1,087	1,126	1,165	1,224	13.9%	2.5%
<i>NOAA</i>	617	578	559	556	549	555	-10.0%	-19.1%
<i>NIST</i>	423	450	493	536	582	634	49.9%	34.9%
Interior	635	595	574	571	564	570	-10.2%	-19.2%
Transportation	838	767	760	759	754	759	-9.5%	-18.6%
Environ. Protection Agcy.	600	557	544	545	542	551	-8.2%	-17.4%
Homeland Security	1,281	1,149	1,194	1,246	1,297	1,359	6.1%	-4.6%
Veterans Affairs	765	765	750	746	736	746	-2.5%	-12.3%
Education	302	299	289	288	283	287	-5.1%	-14.6%
All Other	773	767	760	758	751	760	-1.7%	-11.6%
Total R&D	134,465	136,885	137,955	140,088	139,223	141,918	5.5%	-5.1%
Defense R&D	76,900	78,388	79,434	80,280	78,469	75,946	-1.2%	-11.2%
Nondefense R&D	57,565	58,498	58,521	59,809	60,754	65,972	14.6%	3.1%
<i>Nondef. R&D minus NASA</i>	<i>46,270</i>	<i>46,296</i>	<i>45,866</i>	<i>46,526</i>	<i>46,929</i>	<i>48,209</i>	<i>4.2%</i>	<i>-6.3%</i>

Source: AAAS analyses of defense and nondefense R&D, based on detailed budget account projections accompanying the *Budget of the United States Government FY 2007*.

FY 2006 figures represent latest agency estimates of R&D, based on final FY 2006 appropriations.

FY 2007 figures represent latest revised agency requests.

Constant dollar conversions based on GDP deflators from OMB.

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