

Part 1 – Congressional Action

Highlights

On December 8, 2004, President Bush signed the fiscal year (FY) 2005 omnibus appropriations bill into law and thus completed the FY 2005 federal budget process. The omnibus bill bundled together 9 of the 13 FY 2005 appropriations bills; the other bills providing funding for the Departments of Defense (DOD) and Homeland Security (DHS) were signed into law earlier. The omnibus bill throws together \$388 billion in discretionary spending and is filled with budgetary tricks to fit under congressional budget targets, including a 0.80 percent across-the-board cut for all programs in the bill. In FY 2005, domestic discretionary programs face a new austerity of flat funding overall after several years of generous annual increases.

Because of large increases for defense and homeland security, the FY 2005 budget provides a record-setting \$132.2 billion federal research and development (R&D) investment in FY 2005, a \$6.0 billion or 4.8 percent increase. 80 percent of the increase goes to defense R&D programs, primarily for the development of new weapons systems. The nondefense R&D investment rises by \$1.2 billion or 2.2 percent to \$57.2 billion, better than the 1 percent increase overall for domestic programs but far short of increases in previous years. Most R&D funding agencies see modest increases, but the National Science Foundation (NSF) sees its recent gains reverse with a cut in its R&D funding.

Highlights of Federal R&D in FY 2005

(All figures are adjusted to reflect an across-the-board cut of 0.80 percent for most agencies, and additional across-the-board cuts for selected agencies in the omnibus bill and other bills.)

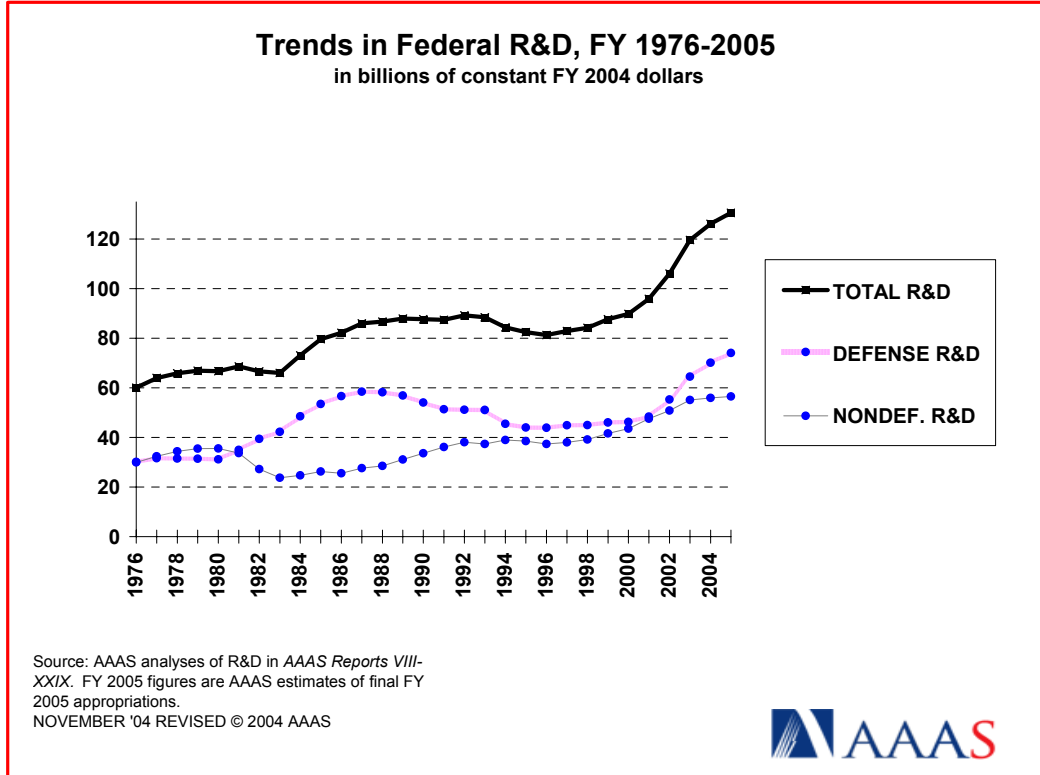


Figure 1.

- **The federal investment in R&D hits a new record of \$132.2 billion in FY 2005**, a \$6.0 billion or 4.8 percent increase over FY 2004 (see Table 1 and Figure 1). Congress provided \$1.5 billion more than the Bush Administration request, entirely on the defense side of the portfolio. This is the ninth year in a row that the federal R&D investment has increased in real (inflation-adjusted) terms (see Figure 1).

- **The nondefense R&D investment rises by \$1.2 billion or 2.2 percent to \$57.2 billion, better than the 1 percent increase overall for domestic programs but far short of increases in previous years** (see Figure 1). After five years of 15 percent increases that ended last year with a 3 percent boost, National Institutes of Health (NIH) budget growth slows down even further to just 2 percent this year. Although the total NASA budget increases by 4.5 percent to \$16.1 billion, the bulk of the increase goes to returning the Space Shuttle to flight, leaving NASA R&D up just 2 percent. But the National Science Foundation (NSF) sees its R&D funding fall by 0.3 percent to \$4.1 billion, for the first cut in its R&D budget since 1996.

- Defense-related R&D in DOD, DHS, and the Department of Energy (DOE) gets 80 percent of the \$6.0 billion increase to federal R&D. **Total defense R&D climbs 6.8 percent or \$4.8 billion to another all-time high of \$75.0 billion** and makes up 56.7 percent of the total federal R&D portfolio (see Table 3). Weapons systems development in DOD once again accounts for nearly all of the increase (up \$3.6 billion to \$56.7 billion), but Congress also rewarded DOD's "S&T" activities in research and early technology development with a nearly \$1 billion or 7.9 percent increase to \$13.6 billion. DOE defense R&D increases a modest 1.2 percent to \$4.3 billion; Congress rejected DOE requests for funds to develop a new generation of nuclear weapons, including 'bunker buster' tactical nuclear weapons.

- **Homeland security R&D, spanning both defense and nondefense activities, received large increases for FY 2005.** The final DHS budget provides \$1.2 billion for DHS R&D activities in FY 2005, a 20 percent boost over last year (see Table 1). Homeland security-related R&D in the U.S. Department of Agriculture (USDA) and the National Institutes of Health (NIH) also received increases to bring total homeland security R&D to an estimated \$4.1 billion in FY 2005.

- **The total federal research investment (basic and applied) increases 2.5 percent to an estimated \$57.0 billion because of large increases in the defense and homeland security research portfolios.** Growth in other agencies' research portfolios slows down considerably or reverses compared to recent years (see Table 2). The federal development investment, however, continues recent trends with another dramatic boost (of 6.5 percent) to \$70.5 billion, almost exclusively in defense. Major construction projects in NASA, USDA, and NIH boost the R&D facilities investment by 7.8 percent to \$4.7 billion.

- **The National Science Foundation's (NSF) budget actually declines in FY 2005 down to \$5.5 billion**, \$105 million or 1.9 percent less than last year. NSF's R&D programs decline 0.3 percent to \$4.1 billion (see Table 1 and Figure 2).

- **There are some winners in the nondefense R&D portfolio.** USDA R&D does far better than expected at \$2.4 billion, a 7.8 percent increase in contrast to a requested cut because of new food safety and animal health R&D investments and \$239 million in unrequested R&D earmarks. National Oceanic and Atmospheric Administration (NOAA) R&D climbs 10.7 percent to \$684 million because of congressional support for the U.S. Commission on Ocean Policy's recommendations to expand federal support of ocean-related R&D. National Institute of Standards and Technology (NIST) support of its intramural laboratory R&D increases 16.2 percent to \$328 million; NIST's Advanced Technology Program (ATP) won another reprieve from Administration plans to eliminate it but endures a 24 percent cut in its budget.

- **Overall, nondefense R&D does better than total domestic spending, with modest increases for many agencies; still, some agencies face cuts in R&D funding** (see Figure 2). The Department of Energy's (DOE) Office of Science receives a boost of 4.3 percent to \$3.3 billion for its R&D programs, but DOE's energy R&D falls to \$1.3 billion. R&D in the U.S. Geological Survey (USGS) falls 0.3 percent to

\$545 million, although Congress reversed most of the Administration's proposed cuts. Congress rejected the Administration's proposal to eliminate the Advanced Technology Program, but R&D in the National Institute of Standards and Technology (NIST) in Commerce still declines 0.5 percent because of cuts to the ATP budget. R&D in the Environmental Protection Agency (EPA) declines 2.8 percent; EPA and NSF are funded through the VA-HUD appropriations bill, where increases for veterans, housing and space priorities squeezed out other funding.

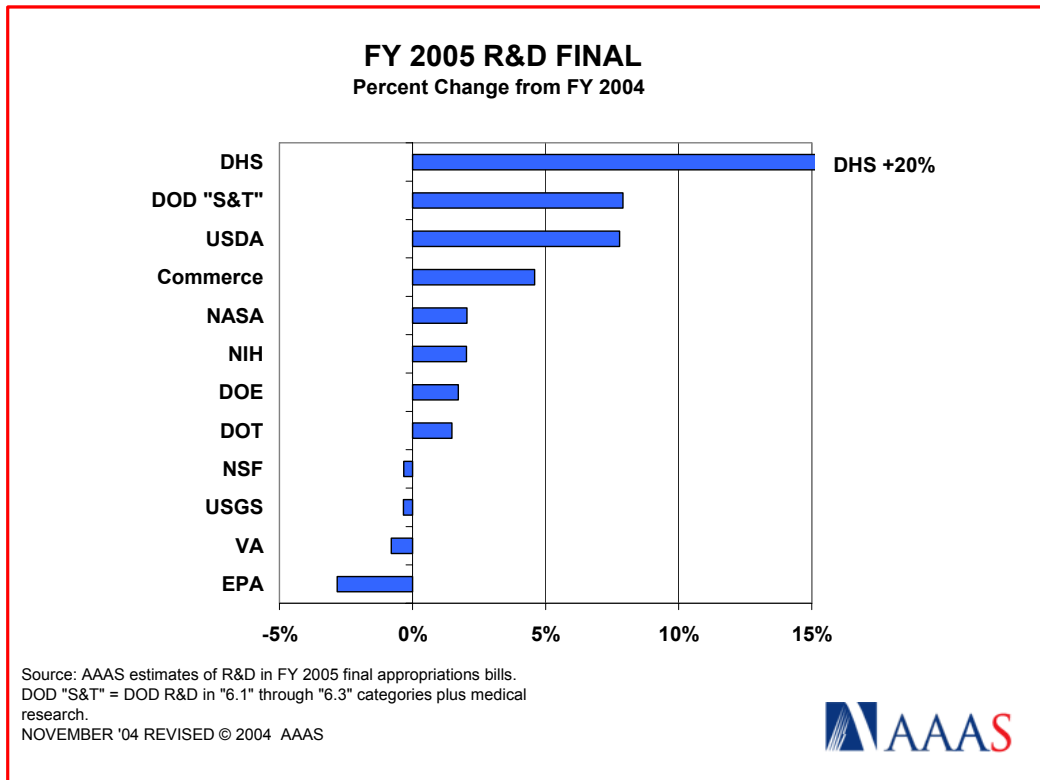


Figure 2.

- **The current focus on defense and homeland security results in large increases for defense and justice R&D, and modest increases or cuts for most of the other national missions** (see Table 3). Defense R&D (including DOD, DOE's defense activities, and a large part of the DHS R&D portfolio) rises \$4.8 billion or 6.8 percent to \$75.0 billion for a record total driven by substantial boosts to defense-related development activities in DOD and DHS. DHS R&D increases dramatically, resulting in a 9.4 percent boost for justice R&D to \$727 million. After several years of near-parity between defense and nondefense R&D around the turn of the century, defense R&D pulls ahead to 56.7 percent of total federal R&D. Because of the tremendous growth in defense and health R&D over the past few years, R&D for all other national missions has steadily shrunk to less than 21 percent of the federal R&D portfolio in FY 2005.

The FY 2005 R&D Budget in Historical Context

The FY 2005 budget leaves key R&D programs with flat budgets for the better part of the past decade. As Figure 3 and Figure 4 show, both the defense and nondefense R&D investments are at record highs in FY 2005, but these totals disguise flat or declining funding for several areas.

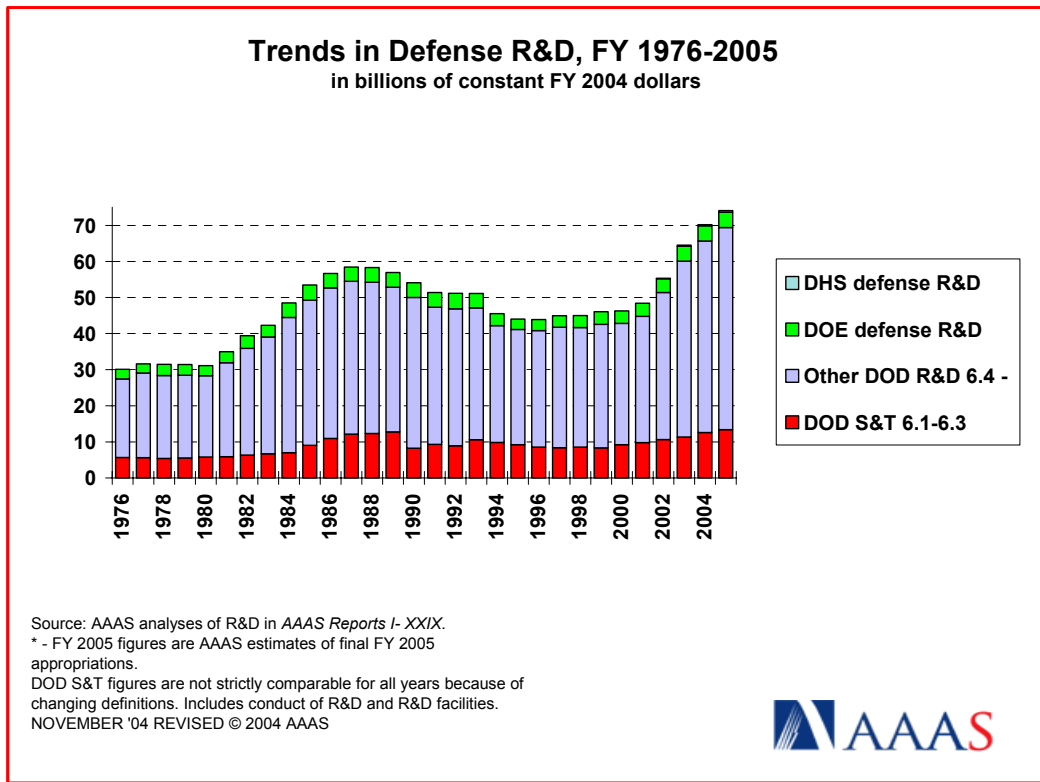


Figure 3.

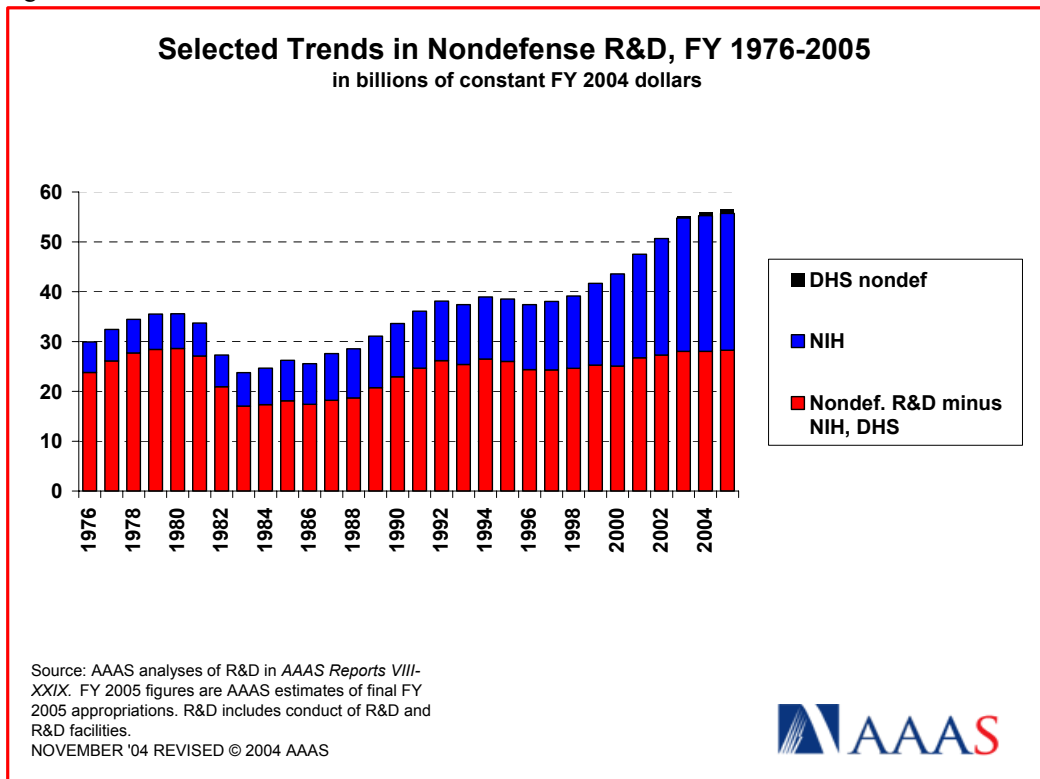


Figure 4.

For defense R&D, Figure 3 shows that nearly all of the increases in the past few years to defense R&D have been in weapons systems development, “6.4” or higher in the DOD classification system. DOD’s S&T investments (“6.1” through “6.3”), comprising basic and applied research and technology development, are just barely at an all-time high in FY 2005, finally returning to late 1980s funding levels after 15 years of post-Cold War cuts and recent increases. The S&T accounts fund all of DOD’s investments in research, including key federal contributions to the support of the physical sciences, engineering, and other research fields. But DOD spending on weapons development has far outpaced S&T budget growth in recent years, both in percentage terms and in dollars.

In nondefense R&D, record-setting funding levels are primarily a legacy of the recently completed campaign to double the NIH budget between 1998 and 2003, as shown in Figure 4, and secondarily the addition of DHS to the R&D portfolio two years ago. All the other nondefense R&D funding agencies collectively have seen their budgets remain flat for more than a decade (see the red bars in Figure 4), even as the U.S. economy, the federal budget, and the U.S. population have all boomed during that time. Recent increases in nondefense R&D have served only to recover the lost ground of the mid-1990s when discretionary spending declined in the push to balance the federal budget. These non-NIH agencies, combined with DOD’s research investments, fund nearly all of the federal investment in non-biomedical research, including the physical sciences, non-medical life sciences, environmental sciences, engineering, mathematics, computer sciences, and social sciences. The addition of DHS to the R&D portfolio has had little impact on federal research support so far since most of the DHS portfolio goes to development.

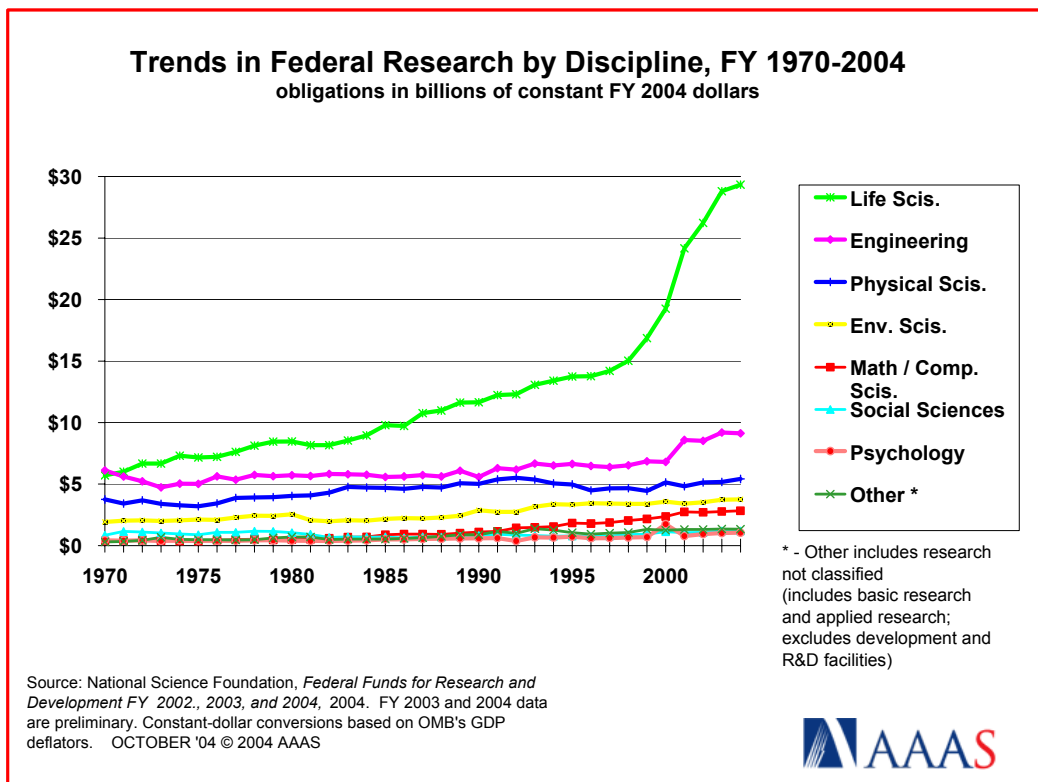


Figure 5.

Because of stagnant funding for DOD research and non-NIH nondefense R&D, **federal support for non-biomedical disciplines has remained stagnant for more than a decade** (see Figure 5), and the FY 2005

budget does little to change the trend.¹ Federal support of research in the physical sciences, engineering, and the environmental sciences in particular has lagged far behind U.S. economic growth, resulting in steady declines in support for these disciplines as a share of the U.S. economy.

R&D Issues: Earmarks

Although the Bush Administration made restraining congressional earmarks a high priority in its first few budgets, this earmark-fighting zeal has dwindled to zero. President Bush has never used his veto power, and has signaled his willingness to accept whatever appropriations bills come his way as long as they meet his overall budget targets. And until recently, his budget targets have left plenty of room for earmarks. The President and the last two Congresses have also presided over some of the largest increases in discretionary spending in history; for the first three years of his term, discretionary spending has increased by more than 10 percent a year. By most accounts, total earmarks have surged dramatically during this time, including R&D earmarks. In FY 2005, discretionary spending growth slows to nearly zero on the domestic side but still surges on the defense side. Not surprisingly, perhaps, R&D earmarks grow dramatically in DOD but fall slightly for all other agencies combined.

R&D earmarks total \$2.1 billion in FY 2005, exceeding \$2 billion for the first time (see Table A). Although these projects amount to only 1.6 percent of total R&D, they are concentrated in a few key agencies and programs (see Table A and Figure 6). Four agencies (the U.S. Department of Agriculture (USDA; \$239 million), the National Aeronautics and Space Administration (NASA; \$217 million), the Department of Energy (DOE; \$274 million) and the Department of Defense (DOD; \$1.0 billion) receive 85 percent of the total R&D earmarks. Because of growth in DOD's share, the ratio is higher than the 80 percent share for these four agencies in FY 2004.

FY 2005 earmarks are up 9 percent from \$1.9 billion in FY 2004, after a 32 percent increase last year compared to 2003 (see Table A and Figure 6). Within a record R&D investment of \$132.2 billion in FY 2005, up 4.8 percent, R&D earmarks grow far faster than R&D spending as a whole. The increase is due to an explosion in R&D earmarks in the Department of Defense (DOD), which sees its earmarked projects top \$1 billion for the first time, up 25 percent from \$825 million in FY 2004.

The share of the R&D portfolio that is earmarked rises to 1.6 percent from 1.5 percent last year. But because these earmarks are highly concentrated, earmarks make up 1 out of every 5 program dollars in some R&D programs and 1 out of 4 in one USDA program.

The **USDA** earmarks include \$148 million, up dramatically from last year, for nearly 240 itemized extramural research projects, mostly in the Special Research Grants program, with another \$11 million allocated in the Agricultural Research Service (ARS) for intramural research projects. R&D earmarks total 24 percent of all extramural R&D in the Cooperative State Research, Education, and Extension Service (CSREES), making these a significant drain on resources that might have gone to competitively awarded research grants. The **NASA** projects totaling \$217 million are up 12 percent from last year, and are found mostly in five programs within the agency's Science, Aeronautics and Exploration (SAE) account. Earmarks make up 20 percent of total R&D in Academic Programs, and smaller percentages in the other four programs. **DOE** R&D earmarks decline slightly from last year but remain at a high \$274 million, double the FY 2003 total. The Office of Science (OS) budget contains \$78 million in R&D earmarks in FY 2005. All of these earmarks are in the Biological and Environmental Research (BER) program; earmarks account for 14 percent of the BER budget and leave core BER R&D programs with little to no increase in FY 2005 even as overall OS R&D increases by 4.3 percent.

¹ A reclassification of some engineering development to research beginning in FY 2001 accounts for the discontinuity in engineering.

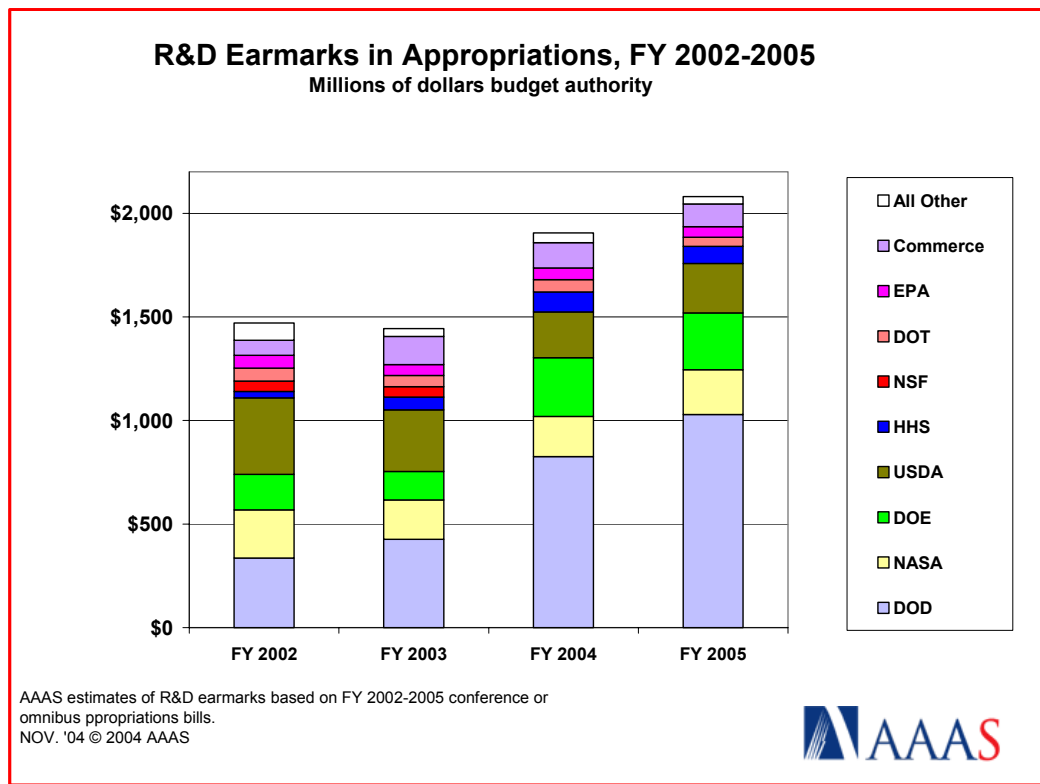


Figure 6.

The **DOD** budget contains \$1.0 billion in R&D earmarks, an enormous increase of 25 percent over last year, but only 1.5 percent of the total R&D budget because of the size of the DOD R&D investment. Clearly, in a fiscal environment where defense spending is half of all discretionary spending and the only mission to receive a large increase, DOD becomes an attractive target for earmarks. The earmarks are mostly small (\$10 million or less) projects, but significantly most are for research rather than development, squeezing basic research and applied research budgets. Earmarks for “6.1” (basic research) programs total \$34 million, or 2 percent of the total; “6.2” (applied research) earmarks are \$270 million, or 5 percent of the total because of a large number of medical research projects; and “6.3” earmarks are \$318 million or 4.7 percent of the total. Earmarks in the “6.4” or higher categories of DOD R&D are \$407 million, a large dollar total but only 0.7 percent of the total portfolio.

Some agencies remain earmark-free. The National Science Foundation (NSF), the National Institutes of Health (NIH), and the new Department of Homeland Security (DHS) all remain earmark-free in FY 2005. Traditionally, NIH and NSF’s research accounts have been free of earmarks, although in some years NSF construction projects are earmarked. FY 2005 is only the second year of appropriations for DHS; so far, Congress has not earmarked R&D projects in DHS, although this year earmarks appear in other parts of the DHS budget.

With the fiscal situation on the nondefense side unlikely to get better in the FY 2006 budget, congressional appropriators will have to square constituent demands for earmarked funds against tight spending targets. With the Bush Administration unlikely to expend political capital against earmarking, the push for earmarking the R&D budget will not abate in the FY 2006 budget; the only constraint appears to be the balance between earmarks and other spending.

(For more agency details of R&D earmarks, please see the special R&D Earmarks in the FY 2005 Budget analysis on the AAAS R&D web site.)

Table A. Congressional Earmarks for FY 2005 R&D by Agency

Table A. Congressional Earmarks for R&D by Agency and Program
Congressional Action on R&D in the FY 2005 Budget
(budget authority in millions of dollars)

	FY 2002 Earmarks	FY 2003 Earmarks	FY 2004 Earmarks	FY 2005		Earmarks % of R&D
				FY 2005 Earmarks	FY 2005 R&D	
Defense (military)	336	426	825	1,029	70,285	1.5%
<i>(Army)</i>	120	152	318	322	10,536	3.1%
<i>(Navy)</i>	68	111	178	247	16,865	1.5%
<i>(Air Force)</i>	43	41	134	142	20,682	0.7%
<i>(Defense Agencies)</i>	90	71	127	246	20,473	1.2%
<i>(Other)</i>	13	52	69	72	1,729	4.1%
National Aeronautics & Space Admin.	233	190	194	217	11,132	1.9%
<i>(Space Science)</i>	30	8	25	17	3,992	0.4%
<i>(Earth Science)</i>	38	49	39	63	1,505	4.2%
<i>(Bio. And Phys. Res.)</i>	15	25	25	27	1,040	2.6%
<i>(Aeronautics)</i>	83	60	50	30	919	3.3%
<i>(Academic Programs)</i>	67	47	55	34	169	20.3%
<i>(Other)</i>	0	0	0	45	3,508	1.3%
Energy	171	138	284	274	8,956	3.1%
<i>(Science programs)</i>	72	50	95	78	3,324	2.4%
<i>(Energy programs)</i>	65	36	114	122	1,339	9.1%
<i>(Defense programs)</i>	35	52	74	73	4,293	1.7%
Health and Human Services	31	62	97	82	29,108	0.3%
<i>(National Institutes of Health)</i>	0	0	0	0	27,771	0.0%
National Science Foundation	50	50	0	0	4,063	0.0%
<i>(Major Research Equipment)</i>	50	50	0	0	174	0.0%
Agriculture	369	297	220	239	2,414	9.9%
<i>(Agricultural Res. Service)</i>	257	166	86	76	1,313	5.8%
<i>(CSREES)</i>	107	129	125	148	643	23.0%
<i>(Forest Service)</i>	5	3	8	12	322	3.6%
Interior	14	18	23	12	672	1.8%
<i>(U.S. Geological Survey)</i>	14	11	20	10	545	1.8%
Transportation	63	54	59	45	718	6.2%
Environmental Protection Agency	62	53	56	51	598	8.5%
Commerce	72	136	122	109	1,183	9.2%
<i>(NOAA)</i>	31	107	97	109	684	15.9%
Homeland Security	0	0	0	0	1,243	0.0%
Education	0	1	0	3	258	1.2%
Agency for Int'l Development	4	4	4	4	243	1.6%
Department of Veterans Affairs	0	0	0	0	813	0.0%
Housing and Urban Development	30	11	15	5	50	11.1%
Department of Justice	29	3	0	0	77	0.0%
All Other	5	2	5	11	385	2.9%
Total	1,470	1,444	1,906	2,080	132,200	1.6%

AAAS estimates of R&D in FY 2005 appropriations bills. Includes conduct of R&D and R&D facilities.

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

"Earmarks" are AAAS interpretations of unrequested, congressionally designated, performer-specific R&D projects contained in legislative language or committee report language in appropriations bills.

Earmarks do not include non-R&D congressionally designated projects.

November 29, 2004 - AAAS estimates of final FY 2005 funding levels.