Science-Engineering-Technology
Congressional Visits Day
May 10-11, 2005

Participant Briefing Materials

Contents

***** For participants only – not for Hill use *****

About Science-Engineering-Technology Congressional Visits Day

Objective

To underscore the importance of science, engineering, and technology through meetings with congressional decision makers.

Core Message

Federally funded research secures the Nation's future.

Other Messages

All participants will advance the "Core Message." To provide flexibility and to acknowledge the fact that many diverse groups will be participating in this effort, each team will decide which additional specific issues it would like to advance. Briefing materials are provided on a variety of federal agencies and partnership programs.

Participants

Members of the Science-Engineering-Technology Work Group and their colleagues in the science, engineering, and technology enterprise.

Schedule

Tuesday, May 10, 2005

2:30 - 5:00 pm
Views from the Administration and Congress
Smithsonian Baird Auditorium, National Museum of Natural History (Metro: Federal Triangle)

5:30- 7:30 pm
Reception and Awards Ceremony
Rayburn Cafeteria, Rayburn House Office Bldg. (Metro: Capitol South)

Wednesday, May 11, 2005

8:00 a.m. – 9:00 a.m.
Congressional Breakfast
B-339 Rayburn House Office Building (Metro: Capitol South)

9:00 a.m. – 5:00 p.m.
Congressional Visits

The **Science-Engineering-Technology Work Group** is an information network comprising professional, scientific, and engineering societies, higher education associations, institutions of higher learning, and trade associations. The Work Group is concerned about the future vitality of the U.S. science, mathematics, and engineering enterprise. Contacts: Debbie Rudolph (Phone 202-785-0017, Fax 202-785-0835, E-Mail d.rudolph@ieee.org) and Dave Cooper (Phone 202-662-8700, E-Mail cooper@aps.org).

Briefings Schedule

Preliminary Schedule (as of April 19, 2005)

Tuesday, 2:30 - 5:00 pm
Smithsonian Baird Auditorium
National Museum of Natural History
Metro Stop: Federal Triangle

Views from the Administration and Congress

David Evans, Under Secretary for Science,
Smithsonian Institution (invited)

Kathie Olsen, Associate Director, Office of Science & Technology Policy

Hratch G. Semerjian, Acting Director, NIST

David Goldston, Chief of Staff, House Science Committee

Bill Bonvillian, Legislative Director,
Senator Joseph Lieberman (invited)

Kei Koizumi, American Association for the Advancement of Science

Tuesday, 5:30 - 7:30 pm
Cafeteria, Rayburn
House Office Building
Metro Stop: Capitol South

Reception and Award Ceremony

8:00 - 9:00 am
B-339, Rayburn
House Office Building
Metro Stop: Capitol South

Congressional Breakfast

The Science-Engineering-Technology Work Group

SETWG is an information network comprising professional, scientific, and engineering societies, higher education associations, institutions of higher learning, and trade associations. The Work Group is concerned about the future vitality of the U.S. science, mathematics, and engineering enterprise. The **Science-Engineering-Technology Work Group** contacts are Debbie Rudolph (Phone 202-785-0017, Fax 202-785-0835, email d.rudolph@ieee.org) and Kevin Marvel (Phone 202-328-2010, email marvel@aas.org).

Alliance for Science & Technology Research in America
American Association for the Advancement of Science
American Association of Physicists in Medicine
American Astronomical Society
American Institute of Biological Sciences
American Chemical Society
American Geological Institute
American Geophysical Union
American Mathematical Society
American Meteorological Society
American Physical Society
American Phytopathological Society
American Society of Agronomy
American Society for Horticultural Science
American Society for Microbiology
American Society of Civil Engineers
American Society of Limnology & Oceanography
American Society of Plant Biologists
AVS - The Science & Technology Society
Association of American Universities
ASTM International
Biophysical Society
Botanical Society of America
Coalition for Funding Agricultural Research Missions
Council for Chemical Research
Crop Science Society of America
Ecological Society of America
Federation of Materials Societies
Geological Society of America
IBM Corporation
Institute of Food Technologists
The Institute of Electrical & Electronics Engineers - United States of America
Massachusetts Institute of Technology
Materials Research Society
Mathematical Association of America
National Association of Manufacturers
National Science Teachers Association
North Carolina State University
Optical Society of America
Society of Manufacturing Engineers
Soil Science Society of America
SPIE - The International Society for Optical Engineering
University of California
University of Central Florida

Organizing your Visit

Before going into a Congressional Office, choose a leader who will be the focal point of the group. It is best to choose someone from the Member's state or district.

Use the "3" Rule:

Structure your visit into 3 main parts

1. Who*

- Thank the ***congress/staff person*** for taking the time to meet with your group
- Introduce ***the meeting participants –*** Both name and organization
- Mention the broader scientific community, making note of the more than 250 scientists participating in the ***SET Congressional Visits Day*** effort, who represent more than 2 million US scientists.

2. What

- **Science, engineering, and technology** are crucial to the nation, as well as the Member's state/district.
- Give examples of ***national SET importance*** (e.g., use CVD leave-behind materials)
- Give examples of ***state/district importance*** (e.g., use information about your own work/organization).

3. How

- ***Ask*** your senator/representative/staffer to maintain a commitment to science, engineering, and technology funding in this year's budget
- ***Offer*** to serve as a resource on SET-related issues.
- Follow-up: ***invite*** the legislator/staff to visit your facility. Seeing is believing!

✳ Be sure to acknowledge the legislator's past support for SET, and be specific. If the legislator is already a champion – ask how you can help him or her advance SET among their congressional colleagues.

Rules "of the Game" for your Meeting

1. Be on time and be prepared to wait. Changes in the legislative calendar and office activity often mean Members and staff must deal with other things.

2. You must be prepared and succinct. *If you do not know the answer, be honest! Always commit to finding out the answer and follow up*

3. Explain how what you are talking about affects the Senator's or Representative's state or district with a **short anecdote** or facts about the district. (e.g., how many people work for your company/university and their economic impact)

4. Limit the presentation; not everyone needs to speak to get the point across.

5. Never be negative about politicians; do not whine or lecture to Members or staffers; do not imply that R&D funding is or should be an entitlement.

After the meeting, follow up! Send a letter of thanks to the Member and staffer offering to be a source of information in the future.

How Congress Works

Members and staff are very busy and deal with many other issues in addition to your main issue of concern. They are "jacks of all trades, masters of few or none." Acknowledging the limitations on their time and resources and offering to be a source of information is vital and helps to build a strong working relationship.

1. The legislative process is designed to be complex and deliberative, ensuring that all parties have an opportunity to comment on legislation. Legislation is considered in subcommittees, committees, and on the floor of both the Senate and House, and must be signed by the President. Most proposed laws are never acted upon and few ever become law.

2. Members look to their colleagues for guidance; influencing one may, in fact, influence many.

3. Staffers are often very influential in advising Members on votes.

4. All government is political and, in the immortal words of former House Speaker Thomas P. "Tip" O'Neill, "all politics is local."

5. Legislative proposals are weighed subjectively. Members of Congress not only consider proposals on their merits but also on these basic political questions:

    - How will the bill affect the legislator's re-election prospects?
    - Is this issue consistent with the legislator's previous votes/positions on related matters, and with his/her political and economic philosophies?
    - What would be the impact on the Member's local economy and jobs?
    - What are the constituents saying, the news media and local interest groups recommending?
    - What are the legislative staff and advisors recommending?

The Legislative Process

There are essentially two types of legislation, both of which follow the same route into law:

1) ***Authorization bills*** -- establish programs and policies, also set recommended budget levels.
2) ***Appropriations bills*** -- provide the actual funding for government programs and agencies on an annual basis

Step 1 - Committees

Most legislative activity occurs in Committee, thus giving Committee members greater influence on specific legislation. Most legislation is given public hearings by subcommittees and full committees of both the House and Senate. Amendments to legislation can be made to the bill in subcommittee and/or full committee during special Committee meetings called "mark ups."

Step 2 - The Floor

Once a bill passes through the committee process, it may be amended further on the floor of either the House or Senate.

Step 3 - Conference Committee

When both the House and Senate have passed versions of the same legislation that are different, a "Conference Committee" of both Representatives and Senators meets to work out the differences -- often additional changes are made during Conference. Both chambers must approve the new version of the legislation.

Step 4 - The President

The President can sign or veto any piece of legislation. The Congress can attempt to override a veto with a 2/3 vote. Congress can also try to amend the legislation in a manner to the President's liking or send it back through the entire committee process. Only if the President signs a bill or a veto is overridden does the legislation become law.

Members of Congress and staff often note how little people know about the legislative process. Showing that you have some knowledge will impress them, leaving a positive impact.

Building Relationships with Legislators

Before academe and industry address legislators and their staff about a particular issue, it is helpful if a professional relationship has already been established. Strong personal relationships are the best means of influencing legislative decision-making. Personal visits, letters, phone calls, and other forms of communication also are important, especially when they come from constituents who are well-known, highly regarded, and have gone out of their way to be helpful in a variety of ways in the past. Building relationships takes time and careful effort, but it is the most effective way to shape the thinking of those who decide public policy.

How do you go about building such relationships? In much the same way as you cultivate friendships: by being friendly and personally helpful, by being a useful and trustworthy source of sound information and insight, and contributing your personal time to professional and political needs and interests. Your own party affiliation should not restrict you. Every elected officeholder represents an entire state, legislative district, or local government--Republicans, Democrats, and independents alike. You do not have to be a member of the legislator's political party to work together and even to become friends.

You will need to do some homework about the key issues, economic facts, employment, industry, etc. that are important to the interests and viewpoint you represent. At the same time, familiarize yourself about the legislators with whom you want to build relationships.

Become a fountain of facts. Know the number of employees you represent in the official's state or district, the annual payroll and taxes paid, expenditures for local supplies, materials and services, investments, and philanthropic contributions and corporate sponsorships. Also, be aware of the community improvement projects that your company/university or employees support, environmental investments, contributions and activities, and facts about local safety and health standards and performance.

Some relationship-building activities are:

1. Write and/or call legislators on current issues.
2. Make personal visits either in Washington, D.C. or in the home district offices to discuss current issues or broad problems.
3. Organize group visits on issues of mutual importance.
4. Invite legislators to tour local plants and facilities, research and teaching laboratories, and meet with management and employees for discussion of problems and issues.
5. Get personally involved in legislators' campaigns and the activities of your political party.

Here are some ways you can work with your organization's government relations staff to build relationships at the federal level:

1. Develop resource relationships which officeholders can call upon at will for reliable and authoritative economic/technical information.
2. Leverage legislative influence through effective coalitions and third-party activities.
3. Provide financial support for legislators' campaigns, through individual contributions or through your organization's political action committee.

These steps will progressively build your credibility with the officeholder. Establishing a reputation as an objective data source, for example, builds credibility for subsequent communications expressing opinions on issues. Political activity establishes you as a friend whose views are likely to receive more weight than someone who writes from time to time.

Using Economic Data

Economic data and technical information are often essential to support your case on key issues. Use the data you have about operating in your area or state to illustrate how much your organization contributes in terms of wages and benefits, local purchases, taxes, and other concerns. The data can be presented as a sentence or two in a letter to a legislator, as a brief paragraph in position papers, press releases and personal visits, or in a brochure for the public or government audiences.

If scientific data are necessary to address specific issues, they must be used with sophistication. Technical experts on the staffs of policymakers may comprehend and delight in complex charts and tables, but the decision makers themselves have very low tolerance for such detail. When using charts to convey information, avoid using scientific jargon. If such terms are required, you should explain them so that a non-technical audience can understand.

When using economic and technical data, use exactly the information you need to build credibility and make the case, and then stop. Stretching data to fit the need would strain your credibility. Test the presentation by showing it to a few friends or neighbors beforehand. If they find it tiresome or confusing, there is a good chance that your target audience would, too.

Personal Visits

There is no better way to effectively make your case on issues with legislators and staff than personal visits. Such visits also are a good way to introduce yourself as a constituent. Personal meeting can be difficult to accomplish with the policymaker's busy schedule, but remember that you are offering an important business contact. You can arrange the meeting with the policymaker directly or through staff aides.

The following suggestions will help make the best use of your time and the legislator's:

1. Always make an appointment. Arranging the first meeting may require patience on your part, but be persistent. Later, as you become known as a resource, gaining appointments will be less difficult. This will occur especially if you also become known as a campaign contributor, political activist, or civic leader who can muster support on the issues from a wide variety of groups through your coalition activities.

2. Be prepared to meet with key legislative personnel or committee staff members if the legislator is unavailable at the last moment. Briefing these people before your visit also may be useful so that they can prepare the legislator. Staff aides are often more knowledgeable about details of a specific issue than lawmakers themselves.

3. If several individuals join you in the visit, decide in advance who will be the principal spokesperson. That individual, of course, should encourage others to participate in the discussion to share particular expertise or experiences.

4. If you want to discuss a specific issue, make sure you are thoroughly familiar with all aspects of it before going into the meeting.

5. When talking to legislators, try to be concise, well organized, and mindful of the other person's time. State your view firmly, but be attentive to the policy-maker's position also.

6. Open the discussion by reminding the legislators who you are, whom you represent (i.e., the Coalition for Technology Partnerships or the SET Work Group), and why you are there. Know the issue and the bill number. State your concern about the issue, how it will affect you and your organization, and the community.

7. Always be truthful and never mislead. Your personal credibility and that of the organization you represent is at stake. If you do not have the answer to a question, do not improvise. Promise to get back to the questioner with the necessary information, and be sure to do so promptly.

8. Come prepared with a brief (one-page) position paper that summarizes your points with facts, and leave it behind with the legislators or staff aides. If a lengthier document or answers to questions is relevant, send it later with a "thank-you" note.

9. To gain a favorable vote, follow up with letter(s) and calls to legislators and their key staff advisors at appropriate points as the issue progresses.

10. Maintain the relationship. Get your name on legislative mailing lists. Find occasions to see the legislators again in appropriate circumstances, and write to them on the issues from time to time. If you obtain reports or data that will be useful to legislators and their aides and that you can share with them, send those documents with a brief personal cover note. Eventually, you may even find policymakers coming to you for information, help, or your point of view on new issues.

R&D is an Investment

Federally funded research secures the Nation's future.

Our core message packs a big idea into a small number of words, but it sums up the common denominator between all of the organizations participating in Congressional Visits Day. *Research should be viewed as an investment, not an expense.*

Our groups recognize that federal support for basic research in a wide variety of scientific and technological disciplines has led to the economic success our Nation enjoys today. Federal expenditure in this area is not an expense, but an investment in the future. Research takes time and only the Federal government can maintain the levels and stability of funding necessary to perform the very basic R&D efforts that lead to long-term national benefits.

Although some legislators and their staff are aware of the long-term nature of federally funded R&D efforts, many are not. This is the single most important message for all CVD participants to convey, that long term, steady investment is required for the Nation's research enterprise.

The federal government supports a unique research and education enterprise that fuels the American economy. This enterprise provides the underpinning of high-technology industries, expands the frontiers of knowledge, and trains future generations of scientists, engineers, and mathematicians.

Despite these facts, funding cuts loom on the horizon. It is up to the scientific and R&D community to carry the investment message to Congress. Be sure to highlight this important message in your visit with our Nation's legislators.

Federally funded research secures the Nation's future.

The Return on Federal R&D Investment

More than 50 percent of all industrial innovation and growth in the United States since World War II can be attributed to advances pioneered through scientific research.

The list of achievements is long and increases every day. Results happen -- sometimes through serendipity and sometimes by design, sometimes in a few years and sometimes not for decades. We do not know *when* they will occur, but we do know that they will.

Whether the applications are broad and enabling, or part of a new product or process, publicly funded science is at the core of our society's progress to date. Most federal agencies require research to achieve their goals for our government and taxpayers. The nation's scientists and engineers produce those research results, ensuring our national strength, security, health, economy and workforce development.

Achievements such as computer modeling of chemical structures to design drugs, the Internet, lasers, magnetic resonance imaging, and global environmental monitoring and management are well known.

> A 1997 study prepared for the National Science Foundation by CHI Research found that 73% of scientific articles cited in patent applications are based on research funded by government or foundations, showing industry's dependence on public science in developing the next generation of products and processes.[1]
>
> A five-year study released in 1997 showed that technology transfer from academic research added more than $21 billion – supporting 180,000 jobs – to the American economy each year.[2]

Although some in Congress are aware of these important facts, many are not. It is up to CVD participants to help carry this concept to policy makers. Remember our Core Message:

Federally funded research secures the Nation's future.

[1] The Increasing Linkage between US Technology and Public Science, by Francis Narin, et al., CHI Research (March 1997).

[2] Association of University Technology Managers Licensing Survey, FY 1991– FY 1995 (February 1997).

The Cycle of Innovation

Basic research, applied research, and development constitute a cycle which gives rise to new products and processes, new ideas and understanding, and new researchers and teachers. Each part of this cycle depends on every other. Basic research produces fundamental discoveries which underpin applied research and the development process. The resulting innovations drive economic growth, leading to new jobs and a higher quality of life. These latter stages of the cycle, in turn, stimulate questions and provide advances in instrumentation which produce new avenues for basic research. In addition, research performed at universities and colleges serves to educate the scientific and technical workforce, on which every stage of the cycle depends. This cycle of innovation is a positive-feedback loop, constantly expanding the frontiers of knowledge. Examples of innovations that followed this pattern abound:

Fiber Optics • Electronic mail, the World Wide Web, and better international telephone communications all depend on the use of tightly focused laser beams channeled through tiny strands of glass – optical fibers thinner than a human hair yet stronger than steel. These world-shrinking developments came from fundamental discoveries into the nature of light nearly a century ago.

GPS • Basic research into atomic clocks combined with satellite navigation technology led to development of the global positioning system (GPS). The ability to locate an object with pinpoint accuracy gives GPS a wide range of civilian and military uses, including aircraft navigation and collision-avoidance systems, rescue of ships lost at sea, and monitoring forest fires. This new technology has also become an important tool for basic research into earthquakes and volcanoes.

Human Genome • The sequencing and analysis of the human genome, which promises major advances in human health, has involved huge amounts of data-processing made possible only by recent advances in information technology (IT). The dramatic release of a draft sequence of the human genome earlier this year thus could not have occurred without the revolution in IT that has at its roots discoveries in basic physics.

Federal Investment in R&D

Federal funding of research and development comes in many forms. Most federal R&D funding is mission-oriented. That is, it serves to advance the goals and objectives of the agency that provides the funds. NASA, for example, funds basic research, applied research, and development as part of its broad goal of exploring space. The only federal agency that funds R&D that is not mission-oriented is the National Science Foundation, whose mission is to support basic and applied research, research facilities, and education across a wide range of science and engineering disciplines.

The federal investment of public funds in the early stages of the innovation cycle stands out as a vitally important element of the nation's scientific enterprise. While federal funding accounts for only about a quarter of total R&D in the U.S., it pays for nearly half of basic research. Similarly, just nine percent of industry R&D funding goes to basic research, while nearly a quarter of federal R&D does.[3]

[3] *AAAS Report XXVI: Research & Development FY 2002*, pp. 31, 58 (http://www.aaas.org/spp/dspp/rd/xxvi/rd02main.htm).

Industry Leaders & Security Experts Speak Out

Recently, industry leaders have become more outspoken about the urgent need to strengthen the federal investment in research. The Task Force on the Future of American Innovation, a broad coalition that includes several prominent industry groups such as Intel and the National Association of Manufacturers, released a February 2005 report which found that:

> "For more than half a century, the United States has led the world in scientific discovery and innovation. … However, in today's rapidly evolving competitive world, the United States can no longer take its supremacy for granted. Nations from Europe to Eastern Asia are on a fast track to pass the United States in scientific excellence and technological innovation. … But in recent years federal investments in the physical sciences, math and engineering have not kept pace with the demands of a knowledge economy, declining sharply as a percentage of the gross domestic product. This has placed future innovation and our economic competitiveness at risk."
>
> *—"The Knowledge Economy: Is the U.S. Losing Its Competitive Edge? … Benchmarks of Our Innovation Future." The Task Force on the Future of American Innovation. February 16, 2005. www.futureofinnovation.org*

The National Innovation Initiative of the Council on Competitiveness, led by a group of university presidents and corporate chief executives such as Sam Palmisano of IBM and Richard Wagoner of General Motors, recommended in a December 2004 report that the federal government:

> "Increase significantly the research budgets of agencies that support basic research in the physical sciences and engineering, and complete the commitment to double the NSF budget. These increases should strive to ensure that the federal commitment of research to all federal agencies totals one percent of U.S. GDP."
>
> *—"Innovate America." Council on Competitiveness. December 2004. www.compete.org*

National security experts have also emphasized the importance of research. The U.S. Commission on National Security for the 21st Century (the Hart-Rudman Commission) reported in January 2001 that:

> "…[T]he U.S. government has seriously underfunded basic scientific research in recent years… [T]he inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine. American national leadership must understand these deficiencies as threats to national security. If we do not invest heavily and wisely in rebuilding these two core strengths, America will be incapable of maintaining its global position long into the 21st century."
>
> *—"Road Map for National Security: Imperative for Change." Phase III Report of the U.S. Commission on National Security/21st Century. January 2001. p. ix. www.au.af.mil/au/awc/awcgate/nssg*

Federally funded research secures the Nation's future.

Department of Agriculture R&D

Budgetary Issues

The President's fiscal year 2006 budget proposes $129.322 billion for the U.S. Department of Agriculture (USDA), which is a $4.5 billion decrease from FY 2005.

The Research, Education, and Economics (REE) mission area of USDA is assigned federal leadership for the discovery, application, and dissemination of information and technologies spanning the biological, physical, and social sciences through agricultural research, education, extension activities, and economic and statistical analysis. The three REE agencies with research responsibilities and the respective FY 2006 budget requests are:

- Agricultural Research Service (ARS): **$1,079 million**
- Cooperative State Research, Education & Extension Service (CSREES): **$1,041 million**
- Economic Research Service (ERS): **$81 million**

CSREES is responsible for administering USDA's primary competitive research grants program - The National Research Initiative (NRI). The NRI supports investigator-initiated research with strong potential to contribute to major breakthroughs in agricultural science. The President's FY 2006 budget proposed $250 million for the National Research Initiative, which, if approved by Congress, would represent a 38% increase over the $180 funding level set in the recently passed FY 2005 Omnibus**; however, USDA research funding will see an overall decrease of 15%, down to $2,346 million from the FY 2005 estimate of $2,692 million.**

Background

Agricultural Research Service (ARS)
ARS is the principal intramural biological and natural sciences research agency within USDA. Research conducted helps to develop new scientific knowledge, provides access to scientific data, and transfers technology to the private sector to solve technical agricultural problems of broad scope and high national priority.

Cooperative State Research, Education, and Extension Service (CSREES)
CSREES has primary responsibility for linking the federal and state components of the U.S. agricultural research, extension, and higher education system. CSREES provides funding for projects conducted in partnership with the State Agricultural Experiment Stations, State Cooperative Extension Systems, land grant universities and colleges, and other research and education institutions. Federal funds are distributed to universities and institutions by statutory formula funding, competitive awards, and special grants.

Economic Research Service (ERS)
ERS provides economic and social science analysis on agriculture, food, environment, and rural development. The information and analyses are used by the general public and to help policymakers develop, administer and appraise agricultural and rural policies and programs.

Supporting Arguments

The agricultural science community recommends that the current budget for agricultural research be significantly increased. A significant increase in research funding is required to help ensure a continued supply of affordable, safe, wholesome food produced in an environmentally responsible manner. Long-term research must be encouraged in order to provide a balanced portfolio that includes increases in competitive, peer-reviewed grants as well as formula funds that address broader public issues. The National Research Initiative (NRI), specifically, has a unique mission within the USDA to fund, in a competitive, peer-reviewed fashion, investigator-initiated, fundamental research related to

agriculture. A major concern raised in a recent National Research Council (NRC, 2000) report, and shared by the agricultural research community, is that the NRI has long been significantly under funded.

Increased funding will also address important issues outside the realm of pure research, such as, bioterrorism and renewable bioenergy, environmental issues, recycling waste into food and fiber, and encourage and promote cross-agency colobaration. Genomics and nanotechnology promise to revolutionize research on beneficial and harmful microbes, plants, and animals that are important to the health and well-being of the U.S. and its inhabitants. Without dramatically increased funding, these scientific and technological advances will be diminished or not occur at all.

For these reasons we recommend increased funding across USDA's entire research portfolio as an investment that will lead to a more healthy and secure nation. The Administration's FY 2006 request to fund the NRI at $250 million is a critical component of addressing the challenges facing agriculture. Additionally, it is imperative that any increase in research funding not come at the expense of existing agricultural research programs.

Players and Champions

Senate Agriculture, Nutrition and Forest Committee	
Saxby Chambliss (R-GA), Chair	Tom Harkin (D-IA), Ranking Member
Senate Appropriations Subcommittee on Agriculture, Rural Development and Related Agencies	
Robert Bennett (R-UT), Chair	Herbert Kohl (D-WI), Ranking Member
House Agriculture Committee	
Bob Goodlatte (R-VA), Chair	Collin Peterson (D-MN), Ranking Member
House Appropriations Subcommittee on Agriculture, Rural Development, FDA, and Related Agencies	
Henry Bonilla (R-TX), Chair	Rosa DeLauro (D-CT), Ranking Member

Our Core Message

Federally funded research secures the Nation's future.

Department of Commerce R&D

National Institute of Standards and Technology

Budgetary Issues

The National Institutes of Standards and Technology (NIST) budget is part of the Bush Administration Technology Administration (TA) initiative, composed of the Office of the Undersecretary/Office of Technology Policy (US/OTP) and NIST. The US/OTP portion would receive a $2.2 million cut in the President's FY2006 budget proposal, lowering its budget to $4.2 million. The overall FY2006 NIST budget would total just $536.2 million, a drop of $165.5 million, or nearly 25 percent, from FY2005 levels.

NIST has two parts, the Scientific & Technical Research & Services portion (STRS) consisting of the NIST laboratories and the Baldridge National Quality Program, and the Industrial Technology Services portion (ITS), which includes the Manufacturing Extension Partnership (MEP), and the Advanced Technology Program (ATP). As in the FY2005 budget proposal, the Administration proposes to cut out ATP entirely, a total of $140.4 million, and shift some of that money over to the STRS side of NIST. The termination of ATP is needed "to shift resources to best meet national needs," according to the President's proposed NIST budget.

The Baldridge National Quality Program would see a 5 percent increase to $5.7 million, giving the STRS portion of NIST a $426.3 million budget, approximately 12.5 percent above FY2005 levels. The ITS portion of NIST would not fare so well, being cut drastically to $46.8 million. All funding in this account would be allocated to MEP, which would receive just 40 percent of its $107.5 million allocated in the FY2005 budget. Also within NIST, the Construction of Research Facilities budget would be reduced by about $14 million in FY2006 to total $58.9 million.

Supporting Arguments and Background Information

In previous budget cycles, the Administration has attempted to eliminate or reduce both MEP and ATP, and traditionally, Congress has restored, and even increased, funding to the programs. Last year President Bush proposed to terminate ATP, yet Congress appropriated $136.5 million. The Administration sought to fund MEP at $39.2 million for FY2005, and Congress nearly tripled it, appropriating $107.5 million. This year, the President's budget would deliver a significant cut to MEP. It remains unclear what fate the program will suffer, as its founder and longtime champion Ernest Hollings (D-SC) has retired from the Senate.

Of its constituent parts, the US/OTP portion of the TA program within Commerce funds the office of the Undersecretary for Technology and his Office of Technology Policy. The Undersecretary serves as the technology advisor to the Secretary of Commerce, and acts as the interagency leader on the President's National Science and Technology Council. NIST's mission is to "develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life." NIST employs about 3,000 scientists, engineers, technicians, and support and administrative personnel. About 1,600 guest researchers complement the staff. NIST has two locations in Gaithersburg, Maryland and Boulder, Colorado.

National Oceanic and Atmospheric Administration (NOAA)

Budgetary and Other Issues

The largest single component of the Department of Commerce is the National Oceanic and Atmospheric Administration (NOAA). For FY2006, the Administration is requesting a total of $3.59 billion for NOAA, a decrease of $332.41 million, or 8.5 percent, from the $3.92 billion appropriated for FY2005. As in the FY2005 budget, the Administration notes that the current request is a distinct increase over the last budget cycle. While true, the more important comparison exists between the amount NOAA was appropriated for FY2005 and the amount in the President's budget request for FY2006.

NOAA is comprised of five line offices: the National Ocean Service (NOS), the office of Oceanic and Atmospheric Research (OAR), the National Weather Service (NWS), the National Environmental Satellite, Data and Information Service (NESDIS) and the National Marine Fisheries Service (NMFS).

NOS, which is responsible for the research and preservation of America's coastlines, faces a 38 percent cut from FY2005. NOS would receive $414.7 million in the FY2006 budget, $254.6 million below the final appropriation for FY2005. Of those cuts, $147.0 million would be subtracted from the Operations, Research, and Facilities (ORF) account. Within ORF, cuts to specific programs are as follows: Navigation Services (4.5 million), Ocean Resources Conservation and Assessment ($116.5 million), Ocean and Coastal Management ($26.0 million). In addition, the budget proposal cuts the NOS Construction/Acquisition account by nearly 90 percent from FY2005 levels.

For FY2006, the Administration is requesting a total of $372.2 million for OAR, a decrease of $41.6 million, or 10 percent, from the $413.8 million appropriated in FY2005. OAR's Climate Research would be flat-funded in the President's request. Increases in Climate Observations and Services offset reductions in the Climate and Global Change Program. However, Weather and Air Quality Research would see all partnership programs terminated, as well as the elimination of the US Weather Research Program (USWRP), as it moves to the jurisdiction of NWS. All partnership programs would also be removed from the Ocean, Coastal and Great Lakes Research Program, resulting in a cut of $28.3 million.

NWS is requesting total funding of $839.3 million for FY2006, an increase of $56.3 million over FY2005 as contained in Congress' November 2004 omnibus appropriation bill. Both the PAC and ORF accounts would see increases, of $15.1 million and $30.9 million, respectively. Included in the NWS ORF increase would be nearly $6 million for the US Tsunami Warning Network and an additional $3 million for the USWRP, funding it at nearly $7.5 million for FY2006. Local Warnings and Forecasts as a whole would see an increase of $31.3 million, or 5.5 percent, to $602.4 million.

For NESDIS, the President's request contains a total of $963.9 million for FY2006, a $56.4 million increase over FY2005 appropriations. In the ORF account, Environmental Satellite Observing Systems would see a slight decrease, just under 1 percent. Data Centers and Information Services would be hit harder, receiving a cut of $20.9 million, or 28 percent. The total requested decrease in ORF would be $22.1 million, leaving a total FY2006 request of approximately $154.0 million. NESDIS' PAC account would fare better, receiving an increase of $78.5 million, or 10.7 percent, to $810.0 million.

There has been much talk of a NOAA reorganization lately on Capitol Hill. On 15 March 2005, the House Science Subcommittee on Environment, Technology, and Standards approved H.R. 50, a bill to reorganize NOAA and authorize it as one entity, rather than as part of the Department of Commerce, for the first time.

In 2004, the US Commission on Ocean Policy recommended a reorganization, as it found that the fragmented legislative and regulatory apparatus under which NOAA currently operates has weakened coastal protection efforts. H.R. 50 would create a deputy assistant secretary for science and technology to coordinate science activities across the agency, and create the position of chief operating officer, who would manage NOAA's daily operations. NOAA would be restructured around four areas: the National Weather Service, Research and Education, Operations and Services, and Resources Management.

Players and Champions

Senate Appropriations Subcommittee on Commerce, Justice, and Science	
Richard Shelby (R-AL), Chair	Barbara Mikulski (D-MD), Ranking Member
Senate Commerce, Science and Transportation Committee	
Ted Stevens (R-AK), Chair	Daniel Inouye (D-HI), Ranking Member
Senate Commerce, Science, and Transportation Subcommittee on Ocean Policy	
John Sununu (R-NH), Chair	Barbara Boxer (D-CA), Ranking Member
Senate Environment and Public Works Subcommittee on Clean Air, Climate Change, and Nuclear Safety	
George Voinovich (R-OH), Chair	Thomas Carper (D-DE), Ranking Member
Senate Environment and Public Works Subcommittee on Fisheries, Wildlife, and Water	
Lincoln Chafee (R-RI), Chair	Hillary Rodham Clinton (D-NY), Ranking Member
House Appropriations Subcommittee on Science, State, Justice, Commerce, and Related Agencies	
Frank Wolf (R-VA), Chair	Alan Mollohan (D-WV), Ranking Member
House Science Subcommittee on Environment, Technology, and Standards	
Vernon Ehlers (R-MI), Chair	David Wu (D-OR), Ranking Member
House Resources Subcommittee on Fisheries Conservation, Wildlife and Oceans	
Wayne Gilchrest (R-MD), Chair	Frank Pallone (D-NJ), Ranking Member

A House Oceans Caucus aimed at increasing House of Representative awareness about ocean policy is co-chaired by Rep. Curt Weldon (R-PA), Rep. Sam Farr (D-CA), and Rep. Tom Allen (D-ME).

Our Core Message

Federally funded research secures the Nation's future.

Department of Defense R&D

Budgetary Issues

The FY06 Presidential Budget Request provides $10.5 billion for Defense S&T (defined as the 6.1 basic research, 6.2 applied research, and 6.3 advanced technology development accounts). This is a reduction of $2.54 billion, or 19.5 percent, from the final appropriated FY05 funding level of $13.1 billion. It is also approximately $28 million less than what the President requested for Defense S&T in FY05.

The FY 06 Budget Request falls short of the 3 percent QDR target – As a percentage of the Administration's proposed $419.3 FY06 Defense budget, S&T represents only 2.5 percent of the total. This falls well short of the 3 percent recommended by both the Defense Science Board in 1998 and endorsed by the Defense Department's own 2001 Quadrennial Defense Review (QDR). States the QDR: "A robust research and development effort is imperative to achieving the Department's transformation objectives. DOD must maintain a strong S&T program that supports evolving military needs and ensures technological superiority over potential adversaries." The 3 percent target put forth in the QDR has also been embraced by the research community and by several members of Congress.

Cut in S&T is proposed while weapons system development, testing and evaluation grows-- Despite the significant reductions proposed for the Defense S&T categories in the PBR, total funding for Research, Development, Test and Evaluation (RDT&E) is proposed at $69.4 billion, an increase of $157 million, or 0.2 percent from the FY05 funding level of $69.2 billion. The increase in total RDT&E funding is due to substantial funding increases proposed in the budget request for non-S&T funding categories that focus on the development, testing and evaluation of weapons systems. Thus, the budget put forward by the President continues the trend towards devoting a greater share of Defense R&D funding to development of specific weapons systems, while the proportion going to support defense research is slated to decline. In fact, the President's FY 2005 budget request would decrease basic research (6.1) funding by $195 million, or 12.9% from last year's congressionally appropriated levels. Applied research (6.2) would decrease by $711 million, or 14.7% under the President's proposal.

Shift away from support for defense basic research continues – The shift by the military services and the Defense Advance Research Projects Agency away from support of fundamental, long-term, and high risk basic research toward meeting more immediate short-term defense objectives has caused concern within the research community. In the early 1980s, basic research accounted for nearly 20 percent of total S&T funding. This level has declined to less than 12 percent today. According to an assessment of DOD basic research released earlier this year, the decline in funding for DOD basic research in real terms from 1993 to 2004 alone was 10 percent according to the inflation indexes used by the DOD and 18 percent using the Consumer Price Index (CPI). In response to these trends, the Council on Competitiveness – a national consortium of industrial, university and labor leaders – has called upon the Pentagon to restore its historic commitment to knowledge creation and pioneering discoveries. In its 2004 *Innovate America* report, the Council recommended that DOD devote not less than one-fifth of the Defense S&T budget to long-term basic research performed at the nation's universities and national laboratories.

Funding for a new National Defense Education Program – Also included in the Council on Competitiveness recommendations was a strong statement about the need to create new scholarship, traineeship and fellowship programs aimed at attracting and retaining students in key areas of science and technology. These efforts, suggests the Council, should be similar to those launched as a part of the National Defense Education Act (NDEA) of 1958. The NDEA inspired generations of U.S. students to pursue study in fields critical to our national security and enabled the U.S. to establish dominance in science and technology for civilian and military purposes. The Pentagon has responded favorably to this recommendation by proposing $10.3 million for a new National Defense Education Program (NDEP) that would support students specifically entering fields of science, engineering, and languages critical to national security in return for a commitment of national defense service after completion of their studies. While a good start to

address future U.S. S&T talent needs, some in the research community believe that more funding for the newly established NDEP is warranted.

Supporting Arguments and Background Information

The primary objective of DOD basic and applied research programs is to provide the means to develop new technologies and capabilities that can be used by the military to maintain a technologically superior military force.

During the Cold War, DOD provided robust support for breakthrough research performed at the nation's universities and national laboratories. This support resulted in many of the highly-effective technologies currently fielded in the war on terrorism today, such as global navigation, precision-guided munitions, composite materials, the internet, and stealth technology. This funding was also critical to supporting some of the nation's top scientific talent.

New dangers facing the military, such as cyber terrorism, information warfare, biological and chemical weapons, roadside bombs and our inability to detect them, and the proliferation of weapons of mass destruction, require new and more sophisticated technologies**.** The knowledge required to generate these technologies is critically dependent upon the sustained investments in long-term, high-risk, defense-oriented research and will require new fundamental knowledge.

While the budgetary emphasis on the later stages of DOD R&D is understandable in an effort to move research into the field for soldiers' use, shortchanging the investment in today's defense S&T program could mean that tomorrow's armed services won't have access to the most cutting-edge technology. By making an investment in scientific research, DOD is able to better understand the fundamentals of the areas of science relevant to the military and help cultivate the scientific and engineering human resources needed by the Nation. *If we shortchange basic defense research, the nation will feel the results not only now but 10-20 years from now.*

DOD is the third largest federal sponsor of university research. More than 300 universities and colleges conduct DOD-funded research and development. Universities receive more than 50 percent of basic (6.1) defense research funding. They also receive substantial funding for applied (6.2) defense research. The Defense Department provides 71 percent of federal funding for university based electrical engineering research, 46 percent for materials engineering research, 38 percent for academic computer sciences, and 30 percent for ocean sciences. DOD also sponsors fellowships and provides a significant amount of support for graduate students in critical defense fields such as computer science, aerospace and electrical engineering.

Players and Champions

House Appropriations Subcommittee on Defense	
C.W. Bill Young (R-FL), Chair	John Murtha (D-PA), Ranking Member
House Armed Services Committee	
Duncan Hunter (R-CA), Chair	Ike Skelton (D-MO), Ranking Member
House Armed Services Subcommittee on Terrorism, Unconventional Threats and Capabilities	
Jim Saxton (R-NJ), Chair	Marty Meehan (D-MA), Ranking Member
Senate Appropriations Subcommittee on Defense	
Ted Stevens (R-AK), Chair	Daniel Inouye (D-HI), Ranking Member
Senate Armed Services Committee	
John Warner (R-VA), Chair	Carl Levin (D-MI), Ranking Member
Senate Armed Services Subcommittee on Emerging Threats and Capabilities	
John Cornyn (R-TX), Chair	Jack Reed (D-RI), Ranking Member

Department of Energy R&D

Budgetary Issues

The President's FY 2006 budget request includes $8.39 billion for R&D at the Department of Energy (DOE), a 2.6 percent cut from the FY 2005 total of $8.61 billion. The Office of Science would see its R&D programs decline by 4.5 percent to $3.18 billion. The presidential request would prolong the deterioration of the DOE research programs, which account for more than 40 percent of federal funding of the physical sciences and which have suffered budgetary erosion for more than a decade. The request fails to provide funding to support DOE's 20-year facilities plan, and runs counter to the policy recommendations of the President's Council of Advisors on Science and Technology (PCAST), which called on the White House in October 2002 to increase support for the physical sciences and engineering.

On the civilian side of the DOE ledger, only four R&D activities would see increases beyond inflation: Hydrogen R&D, a presidential initiative; Nuclear Energy, except for university reactors and education assistance; Fusion Energy Sciences, principally funding for the International Thermonuclear Experimental Reactor (ITER); and Coal Research—another presidential initiative—dominated by Sequestration. Elsewhere, shortfalls in the national laboratory operations budgets, estimated by DOE to be approximately $100 million, would wreak havoc with running schedules at a number of user facilities, among them the Relativistic Heavy Ion Collider (RHIC), a jewel in the DOE's physics portfolio, that would suffer a 61 percent reduction in utilization. Construction of some new facilities and planned upgrades of some existing facilities would also be cancelled or delayed indefinitely. And university research funding might fall by as much as 10 percent.

Further reflecting the stringency of the Department's budget, the defense side of DOE's ledger—usually a favorite of the Bush Administration—would receive an increase only for Nonproliferation and Verification activities and Stockpile Services. Total defense R&D would be cut 2.6 percent to $4.03 billion.

Within the Office of Science, most activities would be cut: High Energy Physics would fall 3.1 percent to $714 million, Nuclear Physics would fall 8.4 percent to $371 million, Advanced Scientific Computing Research would fall 10.9 percent to $207 million, and (mostly due to the proposed elimination of congressional earmarks) Biological and Environmental Research would fall 21.7 percent to $456 million. Two accounts would increase: Fusion Energy Sciences would rise 6.1 percent to $291 million and Basic Energy Sciences (BES) would rise 3.7 percent to $1.15 billion. However, these increases would go entirely to ITER and to increased operations support for the brand new Spallation Neutron Source; funding for other fusion and BES programs would decline.

The 20-year facilities plan[4], released in November 2003 at a major address by then-Secretary of Energy Spencer Abraham, examines the large-scale facilities that will be required in the coming years across all fields of science, and identifies 28 new user facilities that the Office of Science hopes to build. This priority-setting process assumed a funding "envelope" determined by the substantial budget increases for the Office of Science authorized by the Biggert Bill (H.R. 34), introduced during the 108th Congress. Language similar to H.R. 34 was included in the versions of the comprehensive energy bill passed by the House and Senate, but the energy bill has foundered on other issues

The President's FY 2006 request would increase DOE's energy R&D programs by 3.2 percent to $1.18 billion. This total encompasses nondefense R&D programs outside the Office of Science on renewable energy sources, fossil fuels, nuclear power, and energy conservation. The increase would go to nuclear, coal, and hydrogen energy research, with other areas, including oil, gas, renewable energy, and energy conservation, sharply cut.

[4] *Facilities for the Future of Science: A Twenty-Year Outlook*, www.sc.doe.gov/Sub/Facilities_for_future/facilities_future.htm

Supporting Arguments and Background Information

DOE is the third largest federal sponsor of basic research and the largest supporter, by far, of research in the physical sciences. It supports more than 15,000 Ph.D. scientists, graduate students and post-doctoral researchers in universities and national laboratories. It also maintains major research facilities—widely considered jewels in the nation's science and technology enterprise—that are used by 18,000 scientists and engineers from academia, industry and other federal agencies, including the National Institutes of Health, National Science Foundation, NASA, and National Institute of Standards and Technology.

DOE's research programs help demonstrate the connection between medical advances and the physical sciences. The human genome project, for example, was initiated by the Office of Science. Many of today's medical technologies—from magnetic resonance imaging, ultrasound and laser surgery, to CAT and PET scans—are derived from work in the physical sciences, such as that supported by DOE.

DOE is also charged with studying and developing clean, reliable and affordable fuel sources, as well as technologies that improve energy efficiency and conservation. And primarily through its three defense laboratories—Lawrence Livermore, Los Alamos, and Sandia—DOE has prime responsibility for maintaining and safeguarding the reliability of the nation's nuclear weapons stockpile. These missions, which are central for safeguarding national security, sustaining a high quality of life, increasing productivity, improving economic competitiveness, and protecting the environment, require strong support of the underlying sciences. These include biological and environmental research, physics, chemistry, computer science, and materials research.

Players and Champions

Senate Appropriations Subcommittee on Energy & Water Development	
Pete V. Domenici (R-NM), Chair	Harry Reid (D-NV), Ranking Member
House Appropriations Subcommittee on Energy & Water Development	
David Hobson (R-OH), Chair	Peter J. Visclosky (D-IN), Ranking Member
Senate Energy and Natural Resources Committee	
Pete V. Domenici (R-NM), Chair	Jeff Bingaman (D-NM), Ranking Member
House Science Committee	
Sherwood Boehlert (R-NY), Chair	Bart Gordon (D-TN), Ranking Member
House Science Subcommittee on Energy	
Judy Biggert (R-IL), Chair	Michael M. Honda (D-CA), Ranking Member
House Energy and Commerce Committee	
Joe Barton (R-TX), Chair	John D. Dingell (D-MI), Ranking Member

Our Core Message

Federally funded research secures the Nation's future.

Department of Homeland Security S&T

Budgetary Issues

The Department of Homeland Security (DHS) officially began operations on March 1, 2003. The President's FY06 budget provides $41.1 billion for the DHS, a 7 percent increase from FY05. DHS is composed of five major divisions, or "directorates": Border & Transportation Security; Emergency Preparedness & Response; Science & Technology; Information Analysis & Infrastructure Protection; and Management. A majority of the R&D work conducted by the DHS is done within the S&T Directorate.

Commensurate with the priority the Bush Administration places on the war on terror, DHS continues to defy downward budget pressures felt by other agencies. The FY06 budget proposal contains $1.37 billion for the DHS's S&T Directorate, an increase of $253 million over the FY05 level of $1.11 billion. Out of the S&T total, $1.29 million is designated for Research, Development, Acquisition and Operations programs and its portfolios, with the remainder allocated for Management and Administration.

Within the DHS S&T Directorate, the Homeland Security Advanced Research Projects Agency (HSARPA) has primary responsibility for funding extramural research activities, while the Office of Research and Development (ORD) is responsible for a majority of the Department's intramural research activities. For the near future, HSARPA's efforts are expected to focus primarily upon the identification and development of technologies that have immediate homeland security applications in areas such as protecting critical infrastructure and securing our nation's boarders. It is expected that a small but growing proportion of HSARPA's funds will be made available for longer-term, basic and applied research, in the coming year. Meanwhile, several existing DOE laboratories are working closely with ORD to help conduct research in support of DHS's homeland security mission.

One program included in DHS's S&T portfolio is the ***University and Fellowships Program***. This program is overseen by ORD and supports University Research Centers of Excellence and a Scholarship/Fellowship program for undergraduate and graduate students. The President has proposed $63.6 million for the University and Fellowships Program in FY06, $6.4 million less than the $70 million provided by Congress in FY05.

The President's FY06 budget proposes the following funding levels for the other DHS S&T portfolios: ***Bio Countermeasures*****:** $362.3 million, down 0.1 percent from $362.7 million, its FY05 funding level; ***Chemical and High Explosives Countermeasures:*** $102 million, up $49 million (92.5perecent) from FY05; ***Radiological and Nuclear Countermeasures****:* $246.4 million, up $123.8, double the amount provided in FY05 (a large portion of this funding increase is for the creation of a new Domestic Nuclear Detection Office); ***Threat and Vulnerability, Testing and Assessment (TVTA):*** $47 million, down $18.8 million (28.6 percent) from FY05; ***Critical Infrastructure Protection*****:** $20.8 million, down $6.2 million (23 percent) from FY05; ***Cyber Security:*** $16.7 million, down $1.3 million (9.4 percent) from FY05; ***Standards:*** $35.5 million, down $1.3 million (9.4 percent) from FY05; ***Emerging Threats:*** $10.5 million, down 0.3 million (2.3 percent) from FY05; ***Rapid Prototyping:*** $20.9 million, down $55.1 million (72.5 percent) from FY05; ***Counter MANPADS:*** $110 million, up $49 million (80.3 percent) from FY05. This activity is focused on identifying, developing, and testing a cost-effective means of protecting commercial aircraft from man-portable air defense systems (MANPADS), commonly called anti-aircraft missiles; and ***R&D Funding Consolidation and Transfers*****:** $116.8 million is transferred into the DHS S&T Directorate to support in-house research efforts formerly performed by agencies now housed in DHS. These agencies include the U.S. Coast Guard, the Transportation Security Administration, Customs and Boarder Protection, and the Information Analysis and Infrastructure/National Cyber Security Division.

Supporting Arguments and Background Information

Past federal investments in science are the foundation for many of the technologies currently being deployed to prevent, detect, and treat victims of chemical, biological, radiological, nuclear and conventional terrorist attacks. As has been the case with defense S&T research programs, trained personnel, fundamental knowledge, and groundbreaking research generated at universities will serve as the "seed corn" from which future homeland security technologies -- further advanced and developed by industry -- will grow and thrive.

When the anthrax attacks occurred on Capitol Hill, researchers were called upon to help Americans better understand the threat posed by biological agents and to provide critical information to federal agencies and Congress used to craft an effective response. And both universities and industry have played a critical role in quickly examining how existing knowledge and technology can be redeployed to help us to fight and win the war on terror. The work supported by the DHS S&T directorate will continue to play an important role in our nation's homeland security. Recognizing the huge spectrum of potential homeland security threats, universities and industrial researchers are actively exploring new methods to safeguard our nation, including detection of and response to domestic biological, chemical and radiological attack; risk assessment; protection of critical infrastructure; cybersecurity; and, developing a better understanding of the behaviors and motivations of those who engage in terrorist activities.

To assist in the nation's fight against terror, it is critical that ample support be provided to the Department of Homeland Security S&T directorate. It is also important that this new agency be provided with the funding required to effectively staff and implement all S&T programs to ensure DHS funds are fairly and competitively awarded to projects based on scientific and technical merit.

Champions and Players

House Appropriations Subcommittee on Homeland Security	
Harold Rogers (R-KY), Chair	Martin Olav Sabo (D-MN), Ranking Member
House Committee on Homeland Security*	
Christopher Cox (R-CA), Chair	Bennie G. Thompson (D-MS), Ranking Member
House Committee on Homeland Security Emergency Preparedness, Science, and Technology Subcommittee*	
Peter King (R-NY), Chair	Bill Pascrell (D-NJ), Ranking Member
House Committee on Science*	
Sherwood L. Boehlert (R-NY), Chair	Bart Gordon (D-TN), Ranking Member
Senate Appropriations Subcommittee on Homeland Security	
Judd Gregg (R-NH), Chair	Robert C. Byrd (D-WV), Ranking Member
Senate Committee on Homeland Security and Governmental Affairs	
Susan Collins (R-ME), Chair	Joseph Lieberman (D-CT), Ranking Member

*The House Committee on Homeland Security and the House Science Committee share jurisdiction over the DHS S&T related activities.

Our Core Message

Federally funded research secures the Nation's future.

Department of the Interior R&D

Budgetary Issues

The U.S. Geological Survey (USGS) conducts the vast majority of research within the Department of the Interior (DOI). Overall, this year's budget request for the USGS proposes a 0.2% cut over FY 2005. In real dollars, this roughly translates to a 2% cut. In a marked departure from steeper cuts over the previous two years, the President's budget would fully fund all fixed costs within the USGS. However, funding for the USGS has been steadily declining since FY 2002. This year, the administration requests deep cuts to the mineral resources and water resources programs. The total request is $933.5 million, a decrease of $1.9 million from FY 2005 enacted.

A USGS budget document quotes its director, Charles Groat, stating:

> *Our 2006 budget continues our ever-growing quest for knowledge to answer today's questions by ensuring our continued ability to provide Landsat imagery of the Earth, strengthening our volcanic monitoring, and by allowing us to enhance our earthquake detection and notification systems to assist in warning U.S. residents in the event of a tsunami in the Pacific or the Caribbean.*

USGS has released a fairly comprehensive outline of its FY 2005 budget request, categorized by activity/subactivity/program element, that can be viewed at http://www.usgs.gov/budget/2006/fy06_justification.html. The following are the percentage and dollar changes between the current year and FY 2006.

- Mapping, Remote Sensing, and Geographic Investigations: Up 11% or $14.7 million from $118.8 million to $133.5 million.
- Geologic Hazards, Resources and Processes: Down 9.2% or $21.1 million from $229.2 million to $208.1 million.
- Water Resources Investigations: Down 3.3% or $1.2 million from $211.2 million to $204.1 million.
- Biological Research: Up 0.5% or $1.2 million from $171.7 million to $172.9 million.
- Science Support: Up 10% or $6.7 million from $65.6 million to $72.3 million. (Down 20% from $90.8 million in FY 2004)
- Facilities: Up 0.1% or $100,000 from $94.6 million to $94.7 million
- Enterprise Information: A new line item as of last year for which $47.8 million is requested, a 7% increase up from $45.2 million.

Overall, **mapping programs** would receive $133.5 million, an 11% increase above last year's allocation. This increase includes $19.5 million in land remote sensing to maintain and bolster U.S. Landsat archives and capabilities. Due to a technical failure, the USGS has suffered a funding shortfall in this program, and the President requests $12 million to cover this shortfall for 2005 and 2006. The request also includes $7.5 million to begin building ground station capabilities to download and archive data from the Landsat 7 follow-on mission. Both the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA) also propose funding in their 2006 budgets for their roles in this Landsat data continuity mission.

Proposed funding for mappint programs also includes a $250,000 increase for a science impact program designed to improve and expand the use of USGS science information both within and outside the Department of the Interior.

Geologic programs would receive a total of $208.1 million, a 9.2% decrease from last year. The biggest hit in the geologic discipline goes to the Mineral Resources Program, which would receive a 53% cut, leaving the program with only $25 million in FY06. This reduction would terminate the collection of nation-wide basic geologic and mineral deposit data, the internationally coordinated global mineral resource assessment, many mineral commodity reports. Additionally, this cut would eliminate approximately 240 full time positions within the USGS at facilities in Reston, Reno, Tucson, Denver and Menlo Park, among others. The $25 million remaining in the program would continue funding for minerals surveys and studies relevant to ongoing land management by the Department of Interior

Overall, **water programs** would receive $204 million, down 3.3% from last year's allocation. The funding proposed would expand upon the water availability work currently being done in the Great Lakes with an increase of $400,000. The Water Resources Research Institutes, which were zeroed out in the president's FY03, FY04 and FY05 requests would be cut again by $6.4 million this year.

The funding for **biological research** is marked for a small increase from last year's allocation. Totaling $172.9 million, biology programs would receive increases for finding solutions and assisting the mitigation of biological resource problems facing Federal agencies and State, local and tribal governments. The budget proposes increases of $750,000 to expand on science needed by Interior bureaus, $750,000 to expand research in the Grand Canyon, $252,000 for deepwater fisheries research in the Great Lakes, $300,000 for invasive species research, and $250,000 for ecological systems mapping.

Although USGS is the sole science-oriented agency within DOI, other Interior agencies, such as the Minerals Management Service and the National Park Service do fund small amounts of R&D. Resource Stewardship at the National Park Service supports a few R&D projects related to the Natural Resources Challenge, a five-year action plan for improving resource management at parks. Funding for that plan is to be held flat at $2.6 million.

Supporting Arguments

With no regulatory or management functions, the USGS is the principal source of independent scientific data on the nation's fresh water, natural hazards, and natural resources. Research conducted by USGS helps find solutions to challenging environmental problems ranging from drinking water quality to invasive species. USGS research is critical to proper management of the 650 million acres of land managed by the U.S. Fish and Wildlife Service, National Park Service, U.S. Forest Service, and Bureau of Land Management, and is increasingly used by state and local planners across the country.

Players and Champions

House Appropriations Subcommittee on Interior & Related Agencies	
Charles Taylor (R-NC), Chair	Norm Dicks (D-WA), Ranking Member
Senate Appropriations Subcommittee on Interior & Related Agencies	
Conrad Burns (R-MT), Chair	Byron Dorgan (D-ND), Ranking Member
House Resources Committee	
Richard Pombo (R-CA), Chair	Nick Rahall II (D-WV), Ranking Member
Senate Energy and Natural Resources Committee	
Pete Domenici (R-NM), Chair	Jeff Bingaman (D-NM), Ranking Member
Senate Environment and Public Works Committee	
James Inhofe (R-OK), Chair	James M. Jeffords (I-VT), Ranking Member

Environmental Protection Agency R&D

Budgetary Issues

The President's FY 2006 budget would slightly decrease research and development at the Environmental Protection Agency (EPA). EPA's Science and Technology budget is slated for a $4 million (0.7 percent) cut to a total of $568 million. A significant amount of EPA's research budget is for biological and ecological research. The agency's Human Health and Ecosystems program would decline by 4 percent to $169.6 compared with last year's request.

The ecosystem protection research program would be reduced to $88 million, a drop of $5.8 million. In addition, the funding levels of the western Environmental Monitoring and Assessment Program (EMAP), the National Coastal Assessment, the Regional Vulnerability Assessment tools and watershed modeling research would all decrease. The EPA budget proposal also would cut in half the agency's exploratory grants program, which supports investigator-initiated research projects that address environmental issues.

The agency's fellowships programs would see no increase, remaining funded at the current $8.3 million. These include the Science to Achieve Results (STAR), Greater Research Opportunities (GRO), Environmental Science and Technology (EST) and Environmental Public Health (EPH) fellowship programs.

Players and Champions

House Appropriations Subcommittee on Interior, Environment, and Related Agencies	
Charles Taylor (R-NC), Chair	Norman Dicks (D-WA), Ranking Member
House Science Committee	
Sherwood Boehlert (R-NY), Chair	Bart Gordon (D-TN), Ranking Member
Senate Appropriations Subcommittee on Interior and Related Agencies	
Conrad Burns (R-MT), Chair	Byron Dorgan (D-ND)
Senate Committee on Environment and Public Works	
James Inhofe (R-OK), Chair	James Jeffords (I-VT), Ranking Member

Our Core Message

Federally funded research secures the Nation's future.

National Aeronautics and Space Administration

Issues to Know About

The FY 2006 budget for NASA represents the ongoing process of rebalancing the efforts of the agency to support the President's Vision for space exploration and absorbing the impact of the full-cost accounting scheme introduced by the now-former Administrator Sean O'Keefe (the new administrator is Michael Griffin, formerly director of the Applied Physics Lab at Johns Hopkins University).

Former NASA Administrator Sean O'Keefe made the decision to cancel the planned servicing mission #4 (SM-4) to the Hubble Space Telescope. Citing safety issues and integrated risk assessment, O'Keefe signed the do-not-fly order on two already completed instruments, the Cosmic Origins Spectrograph (COS) and the Wide-Field Camera – 3 (WFC-3), which were to be installed on the orbiting telescope along with new gyroscopes and batteries. These additional instruments and infrastructural repairs would keep the Hubble operating through at least 2010, with improved capabilities.

Senator Barbara Mikulski (D-MD) demanded that an independent review of the decision take place, which resulted in a National Research Council committee reviewing the options for extending the life of the telescope. The committee, chaired by Lou Lanzerotti, released their report calling for a manned servicing mission as the least risky option for servicing the telescope. Currently, NASA is reviewing its various options and the costs of implementing various solutions. The astronomy community has endorsed a servicing mission as long as existing high-priority science activities are not impacted. No matter what, the aging telescope must ultimately be safely de-orbited by robot to prevent the massive parts from potentially hitting populated areas as they will not burn up completely upon reentry.

Details

NASA has reinvented its internal structure, placing the much of the science portion of their budget in the Science Mission Directorate (SMD), which has three divisions: The Universe, Earth-Sun Systems and the Solar System. The FY 2006 total NASA budget of $16.456 billion would be 2.4% more than FY2005. The FY 2006 budget is a mixed bag for NASA, with a number of programs seeing increases, while others decline. Within the Science account, the new Universe and Earth-Sun System divisions decline slightly while Solar System exploration increases from $1.858 billion to $1.9 billion. Looking at the top-level, the SMD would grow from $5.527 billion to $5.476 billion. Aeronautics research continues to decline in the FY 2006 budget, dropping to $852.3 million from $906.2 million in FY 2005. Education programs, an area that regularly receives a number of earmarks during the appropriations process, are also slated to decline from $216.7 million to $166.9 million.

Of direct concern to the astronomy community, the Universe Research program, which directly funds astronomy and space science researchers, would decline from $331.6 million to $315.7 million. This program supports fundamental research that has led to both technology development as well as new ideas for large-scale NASA missions. Declines in this budget line are of great concern to US astronomers. Other key programs facing declines include the Navigator program, which seeks to discover and understand planets beyond our solar system (decline of $34.3 million to $199.4 million), the Stratospheric Observatory for Infrared Astronomy (SOFIA) (from $50.9 million to $48.3 million), HST (from $215.7 million to $190.7 million), the Gamma Ray Large Area Space Telescope (GLAST) (from $107 million to $99.4 million) and the important Discovery program, which supports innovative proposals from researchers for major NASA missions (from $125.5 million to $117.9 million). A few programs receive increases under the proposed budget, including the James Webb Space Telescope[5] (from $311.8 million to $371.6 million).

[5] http://www.jwst.nasa.gov/

Full NASA Budget details are available at http://www.nasa.gov/about/budget/ .

Supporting Arguments

NASA's support for basic scientific research has stretched the vistas of imagination, expanding our knowledge of the solar system and the universe — answering questions and creating new ones. NASA has developed a strong strategic plan that continues to guide the agency in fulfilling its mission. This strategic plan has resonated with OMB and Congress and is heavily focused on science and technology research.

A well-balanced and vigorous civil aeronautics and space program is critical for advancing science and technology and for improving economic competitiveness. Investments in civil aerospace R&D help to maintain our leadership in the modern world. Support for Earth Science programs has allowed us to improve our understanding of our own planet, including its weather, atmospheric, oceanic and geophysical processes. NASA is one of the most liked Federal agencies by the American public.

Players and Champions

House Science Committee	
Sherwood Boehlert (R-NY), Chair	Bart Gordon (D-TN), Ranking Member
House Science Subcommittee on Space and Aeronautics	
Dana Rohrabacher (R-CA), Chair	Mark Udall (D-CO), Ranking Member
House Appropriations Subcommittee on Science, State, Justice, and Commerce, and Related Agencies	
Frank R. Wolf, (R-VA), Chair	Alan Mollohan (D-WV), Ranking Member
Senate Appropriations Subcommittee on Commerce, Justice and Science	
Richard Shelby (R-AL), Chair	Barbara Mikulski (D-MD), Ranking Member*

* Sen. Mikulski remains one of the strongest voices for NASA and especially the Goddard Space Flight Center, which is the center for all earth-science programs, including ESE.

Our Core Message

Federally funded research secures the Nation's future.

National Institutes of Health

Budgetary Issues

The NIH received $28.59 billion in FY 2005, 2% more than in FY 2004. The President has requested $28.74 million for FY 2006, a 0.5% increase over FY 2005. The biomedical research community, by contrast, is recommending an increase of 6%.

- National Cancer Institute (NCI) received $4.83 billion for FY 2005. The President has requested $4.84 billion for FY 2006.

- National Institute of Biomedical Imaging and Bioengineering (NIBIB) received $298 million for FY 2005. The President has requested $300 million for FY 2006.

Supporting Arguments and Background Information

The National Institutes of Health is one of the world's foremost medical research centers. NIH has trained a host of scientists in its intramural programs and supported the training of hundreds of thousands of scientists at universities and medical schools around the country through research grants. These scientists have gone on to become leaders in biomedical research at universities and companies, fueling many advances in the understanding and treatment of human diseases. Past investments in NIH-supported scientists have yielded new cancer drugs, HIV vaccines, and therapeutic agents for type 2 diabetes, that are now in clinical trials. Scientists are on the brink of developing cures that will add to the quality of life for all Americans.

"NIH is the steward of medical and behavioral research for the Nation. The mission of the National Institutes of Health (NIH) is to expand fundamental knowledge about the nature and behavior of living systems and to improve and develop new strategies for the diagnosis, treatment, and prevention of disease and communicate the results of research with the goal of improving health. The 27 Institutes and Centers, which comprise the NIH, support research and researchers working in universities, medical centers, hospitals, and research institutions in every State and territory in the Nation and in many countries around the world. The NIH also conducts research in its own laboratories. In order to help ensure that there is a continuing cadre of outstanding scientists for the future and that there are facilities in which to conduct this research, the Agency supports research training, career development, and some buildings and facilities programs."

Players and Champions

Senate Appropriations Subcommittee on Labor, Health & Human Services, Education	
Arlen Specter (R-PA), Chair	Tom Harkin (D-IA), Ranking Member
House Appropriations Subcommittee on Labor, Health & Human Services, Education	
Ralph Regula (R-OH), Chair	David R. Obey (D-WI), Ranking Member

National Science Foundation

Budget Background

For FY 2006 the President has requested $5.605 billion for the NSF, a $132 million or 2.4 percent increase over the FY 2005 budget estimate. This increase includes a $48 million transfer for U.S icebreaking operations in polar regions, formerly the responsibility of the U. S. Coast Guard. This brings the actual increase to NSF programs down to $84 million, only a 1.5 percent increase.

The FY 2005 NSF budget is 2 percent less than the FY 2004 budget ($5.578 billion) and the FY 2006 Request is only 0.5 percent above the FY 2004 level. The NSF Authorization Act, signed into law in December of 2002, authorizes a $8.54 billion NSF budget for FY 2006.

The FY 2006 Request focuses on four funding priorities: strengthening core disciplinary research; providing broadly accessible cyberinfrastructure and world-class research facilities; broadening participation in the science and engineering workforce; sustaining organizational excellence in NSF management practices. Investments will foster discovery at the frontiers of research to the development of products, processes, and technologies that fuel the economy.

NSF invests in core research and education activities through disciplinary and multidisciplinary programs. These programs support individual investigators, small groups, research institutes, major research equipment and facilities, instrumentation, as well as junior faculty and students. The NSF has several agency-wide investment areas that will accelerate progress in important emerging science and engineering. In FY 2006, major investments will be made in: the National Nanotechnology Initiative ($344 million); Networking and Information Technology Research and Development ($803 million); Cyberinfrastructure ($509 million); Human and Social Dynamics ($39 million).

NSF has ten major Research and Related Activities program areas: Biological Sciences; Computer and Information Science and Engineering; Geosciences, Mathematical and Physical Sciences; Social, Behavioral, and Economic Sciences; Office of International Science and Engineering; U.S. Polar Programs; U.S. Antarctic Logistical Support Activities; and Integrative Activities. The FY 2006 Budget Request for six of these areas is below the corresponding FY 2004 budget level; one area has the same budget as in FY 2004; and three areas are increased over FY 2004. The Education and Human Resources (EHR) Directorate is decreased by 12.4 percent. Every EHR program is decreased from its FY 2004 budget level.

A political development that will affect the NSF is the abolishment of the VA-HUD and Independent Agencies Appropriations subcommittees in the House and Senate. The NSF was under the jurisdiction of these subcommittees and Members and staff of these committees understood the mission of the NSF. NSF will now be under the jurisdiction of the Science, State, Justice, and Commerce, and Related Agencies Appropriations subcommittee in the House, and the State, Justice, and Science Appropriations subcommittee in the Senate. Frank Wolf (R-VA) is the chair of the House subcommittee and Richard Shelby (R-Al) is the chair of the Senate subcommittee. At this time it is not clear what kind of support the NSF will receive in these new committees. Each of these committees has jurisdiction over NASA, NIST, and NOAA, as well as the FBI and other parts of Justice.

Supporting Arguments

Over the past half century the NSF has had monumental impact on our society. The NSF investment has paid dividends in building the infrastructure of the individual scientific disciplines, as well as laid the groundwork for innovative interdisciplinary research to meet modern-day scientific and technical challenges. Many new methods and products arise from the NSF investment in research, such as geographic information systems, World Wide Web search engines,

automatic heart defibrillators, product bar codes, retinal implants, optical fibers, magnetic resonance imaging technology, and composite materials used in aircraft. NSF-sponsored research has triggered huge advances in understanding our planet's natural processes, which lead to providing a sound scientific framework for better decision-making about earth's natural environment. These methods, products, and advances in understanding accrue from basic research performed over many years, not always from planned research aimed at specific technological outcomes. In today's environment of conflict, many of the technologies used to protect and defend the U.S. can be traced to science supported by the NSF.

Background Information

The NSF is the sole federal agency tasked with maintaining the health of basic research and science, engineering, and mathematics education. The Foundation provides twenty percent of the federal funding for basic research done at academic institutions and fifty percent of non-medical academic basic research. NSF competitively reviewed over 40,000 proposals in FY 2004, and 10,400 received funding. Approximately 50,000 scientists and engineers evaluate proposals for the NSF each year, providing over 200,000 proposal reviews. Forty thousand students have been supported by NSF Graduate Fellowships since 1952 and NSF supports over 200,000 people directly each year.

Players and Champions

Most members of Congress readily acknowledge that federal support for basic research and education is important, particularly for the programs supported through the NSF. In the past Senators Christopher "Kit" Bond (R-MO) and Barbara Mikulski (D-MD) have been vocal advocates for doubling the NSF budget. Lately they have not spoken out as much, but remain supportive. Representatives James Walsh (R-NY) and Alan Mollohan (D-WV) have worked, "behind the scenes," on behalf of the NSF. Congressman Vernon Ehlers (R-MI) has for the last several years initiated a "Dear Colleague" letter to the chair and ranking member of the House appropriations subcommittee which has jurisdiction over the NSF. Congressman Rush Holt (D-NJ) has joined him as a co-sponsor and together they have recruited over 150 of their fellow Members to sign the letter. Congressmen Ehlers and Holt will again sponsor a "Dear Colleague" letter for the FY 2006 NSF budget this year.

House Appropriations Subcommittee on Science, State, Justice, and Commerce, and Related Agencies	
Frank R. Wolf, (R-VA), Chair	Alan Mollohan (D-WV), Ranking Member
Senate Appropriations Subcommittee on Commerce, Justice and Science	
Richard Shelby (R-AL), Chair	Barbara Mikulski (D-MD), Ranking Member
House Science Committee	
Sherwood Boehlert (R-NY), Chair	Bart Gordon (D-TN), Ranking Member
House Science Subcommittee on Research	
Bob Inglis (R-SC), Chair	Darlene Hooley (D-OR), Ranking Member

Our Core Message

Federally funded research secures the Nation's future.

STEM Education Programs

K-12 Science, Technology, Engineering, and Mathematics Education

National Science Foundation, Education and Human Resources

Budgetary Issues

The President's FY 2006 budget recommends a 12 percent reduction in funds to the budget for the National Science Foundation's Education and Human Resources (EHR) Directorate. Programs under this directorate are designed to improve and support STEM education at all levels and in all settings (both formal and informal). Specific K-12 programs targeted for spending cuts include the NSF Math and Science Partnerships (24% cut from $79 million to $60 million) and programs under the Elementary, Secondary, and Informal Education division (22% cut from $181 million to $140 million).

Background Information and Supporting Arguments

Strengthening science and math education is a core mission of the NSF. The NSF has the mandate, depth of experience, and well-established relationships to build the partnerships for excellence in K-12 STEM education. Programs in the NSF EHR directorate are unique in their capacity to move promising ideas from research into practice to develop new and improved materials and assessments, to explore new uses of technology to enhance K-12 instruction, and to create better teaching techniques. NSF's highly regarded peer review system that enlists leading scientists, mathematicians, engineers, and academicians to improve K-12 STEM education programs is at the center of this education improvement infrastructure. A funding reduction would adversely affect K-12 STEM programs in curriculum development, pre-service and in-service teacher education, the informal science infrastructure, and uses of technology to enhance K-12 instruction.

Funding for the NSF Math and Science Partnerships support a limited number of large, innovative partnership programs which can be widely replicated by the state-based math and science partnerships under No Child Left Behind (NCLB). The goals of the NSF MSP program are to ensure that all students have access to, are prepared for, and are encouraged to participate and succeed in challenging and advanced math and science courses; to enhance the quality, quantity, and diversity of the K-12 mathematics and science teacher workforce; and to develop evidence-based outcomes that contribute to our understanding of how students effectively learn math and science.

Department of Education, Math & Science Partnerships

Budgetary Issues

FY 2005 funding for the Math & Science Partnerships (MSP) program at the U. S. Department of Education (part of No Child Left Behind) was $179 million. The Administration is seeking $269 million for FY2006 MSP programs at the Department of Education. These funds go to states via a formula grant; state departments of education issue funds to local partnerships between high-need school districts and the STEM faculty in institutions of higher education for STEM improvement efforts. This year the Administration is requesting that $120 million of these funds be directed away from the states and used to create a new federally administered competitive grant program targeted to high school mathematics programs.

Background Information and Supporting Arguments

The MSP program is intended to increase the academic achievement of students in these areas by enhancing the content knowledge and teaching skills of classroom teachers. Successful Math and Science Partnerships funded by the NSF serve as models that are replicated by the state math and science partnerships under NCLB. These programs are not duplicative; in fact, without one program, the other program is significantly weakened. In addition to K-12 districts and STEM faculty in institutions of higher education, partnership partners can include state education agencies, charter schools, business, and other organizations concerned with math and science education.

Research, education, the technical workforce, scientific discovery, innovation and economic growth are intertwined. To remain competitive on the global stage, we must ensure that each remains vigorous and healthy. That requires sustained investments and informed policies. If NSF ceases to fulfill its educational mission of stimulating innovations and building capacity in our education systems, then that withdrawal would leave a critical gap in applied research and development and the infrastructure necessary to effect changes to K-12 STEM education. An adequate level of funding is necessary for the Math and Science Partnership program at the U. S. Department of Education so that funding continues to be provided to every state for local math and science education reform initiatives.

Players and Champions

In the House, Reps. Vernon Ehlers (R-MI) and Mark Udall (D-CO) have created the Science, Technology, Engineering, and Mathematics (STEM) Education Caucus. A similar caucus in the Senate has been established by Senator Norm Coleman (R-MN) and Senator Dick Durbin (D-IL). Other champions for K-12 STEM education include Rep. Rush Holt (D-NJ), Rep. Judy Biggert (R-IL), Senator Jay Rockefeller (D-WV), and Senator Pat Roberts (R-KS).

House Science Committee	
Sherwood Boehlert (R-NY), Chair	Bart Gordon (D-TN), Ranking Member
House Appropriations Subcommittee on Science, State, Justice, and Commerce, and Related Agencies	
Frank R. Wolf, (R-VA), Chair	Alan Mollohan (D-WV), Ranking Member
House Appropriations Subcommittee on Labor, Health & Human Services, Education	
Ralph Regula (R-OH), Chair	David R. Obey (D-WI), Ranking Member
Senate Appropriations Subcommittee on Commerce, Justice and Science	
Richard Shelby (R-AL), Chair	Barbara Mikulski (D-MD), Ranking Member
Senate Appropriations Subcommittee on Labor, Health & Human Services, Education	
Arlen Specter (R-PA), Chair	Tom Harkin (D-IA), Ranking Member

Our Core Message

Federally funded research secures the Nation's future.

APPENDIX: AAAS Budget Analysis

AAAS
Advancing science • Serving society

R&D Programs Face Another Rough Year in 2006; Cuts for Many, Gains for Space and Homeland Security

AAAS Analysis of R&D in the FY 2006 Budget

(All figures in this analysis are **revised estimates of R&D in the FY 2006 budget**, different from the figures in the preliminary analysis of February 10. The figures were revised again on March 22. This analysis is a preview of the forthcoming *AAAS Report XXX: Research and Development FY 2006*, a comprehensive look at the President's budget for R&D in FY 2006. More materials on R&D in the FY 2006 budget can be found on the AAAS R&D Web site at www.aaas.org/spp/rd.)

On February 7, President Bush released his proposed budget for fiscal year (FY) 2006. Against a backdrop of record-breaking federal budget deficits, a continuing and costly war in Iraq, an expansion of Medicare to pay for prescription drugs, and expensive proposals to introduce private accounts for Social Security in the future, the federal investment in research and development (R&D) would barely grow in FY 2006, with cuts to R&D programs outnumbering increases. In order to restrain the budget deficit, the President proposes to hold nondefense discretionary spending flat for the third year in a row; after factoring in increases for international aid and homeland security, domestic non-security spending overall would fall in FY 2006 by 1 percent. Defense spending would increase modestly compared to previous years, but the true picture is uncertain because the budget excludes funding for the Iraq war. Federal R&D investment mirrors these overall trends, with flat funding for defense R&D and increases for homeland security and space exploration R&D, offset by cuts for most other R&D programs.

R&D in the FY 2006 Budget: Cuts for Most Areas, Modest Gains for Space and Homeland Security

The past few years have seen record-breaking totals for the federal investment in R&D because of enormous increases for defense weapons development, the creation of new homeland security R&D programs, and the now-completed campaign to double the National Institutes of Health (NIH) budget. The federal R&D investment hit an all-time high this year because of defense and homeland security increases, but in completing FY 2005 appropriations last December Congress went along with the President's proposals to freeze most domestic discretionary spending at FY 2004 levels. As a result, the nondefense, non-homeland security R&D portfolio stagnates this year, with modest increases in some areas offset by cuts in others. The FY 2006 budget for next year would continue this austerity, and extend it to defense R&D. As a result, growth in the federal R&D portfolio would fail to keep pace with inflation for the first time in a decade, and most R&D programs would suffer cuts in real terms. (Figures in this analysis have been revised since the February 10 preliminary analysis based on revised agency data.)

- **The proposed federal R&D portfolio in FY 2006 is $132.3 billion, just barely an increase of 0.1 percent or $84 million above this year**, and far short of the 2.0 percent increase needed to keep pace with expected inflation (see Table 1). In real terms, the total federal R&D portfolio would decline for the first time since 1996. Increases for space exploration R&D in the National Aeronautics and Space Administration (NASA; up $508 million) would far exceed the $84 million increase, leaving all other R&D programs (including defense) with less money next year. **Total federal**

support of research (basic and applied) would fall 1.4 percent to $55.2 billion, especially after factoring out NASA's expanding research efforts (see Table 2).

- **The nondefense R&D investment would barely increase 0.2 percent to $56.9 billion** (see Table 1 and Figure 3). While NASA would continue to receive additional resources for the International Space Station and moon-and-Mars missions, nearly all other nondefense R&D agencies would see their funding decline.

- **The National Science Foundation (NSF), after a cut in its budget in 2005, would see a modest increase of 2.8 percent to $4.2 billion for its R&D portfolio**, but most of the increase would go to R&D facilities. As a result, the average NSF research grant would shrink for the second year in a row. NSF's education funding would fall steeply. **The National Institutes of Health (NIH) budget, after doubling in the five years between 1998 and 2003, would see an increase of just 0.5 percent in FY 2006 to $28.7 billion** (see Table 1 and Figure 1). NIH projects a decline in the number of research project grants for the second year in a row and a decline in the research project grants (RPG) success rate for the fifth year in a row down to 21 percent.

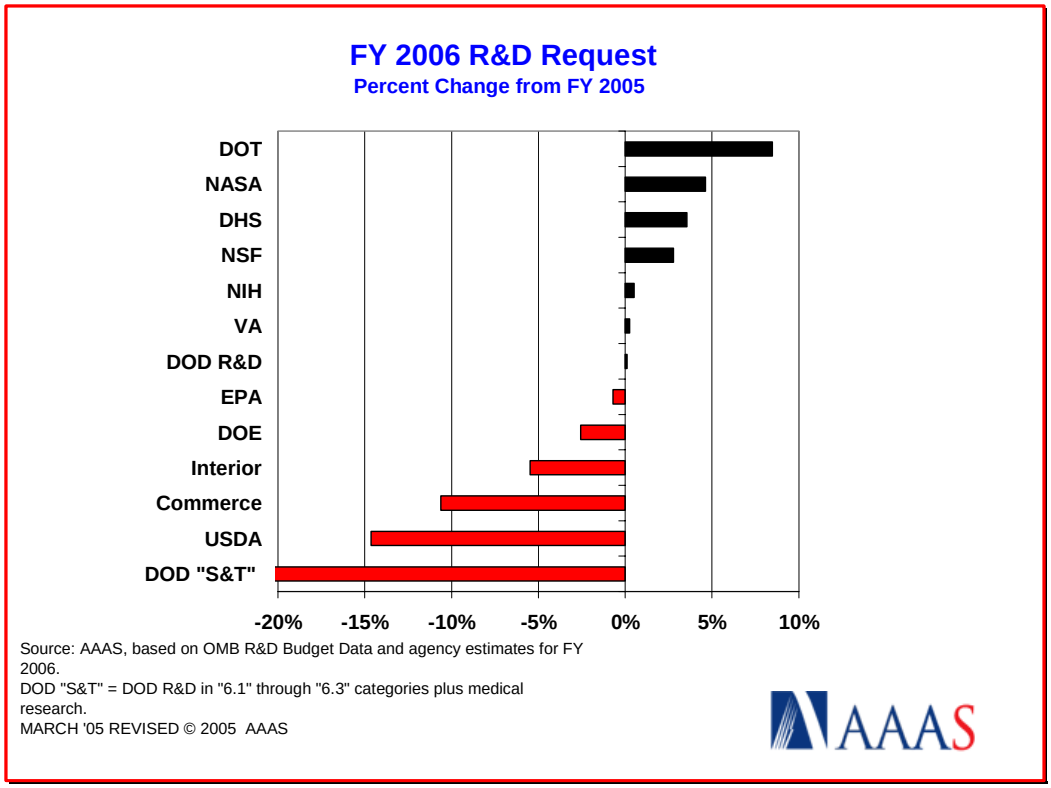

Figure 1.

- **Other agencies in the federal R&D portfolio would see cuts in 2006, consistent with Administration plans to cut nondefense, non-homeland security spending** (see Figure 1 and Table 1). The Department of Energy's (DOE) Office of Science would see its R&D funding fall 4.5 percent to $3.2 billion. Environmental R&D would decline across the board, including cuts to R&D in the U.S. Geological Survey (USGS; down 4.8 percent to $515 million), the National Oceanic and Atmospheric Administration (NOAA; down 11.2 percent to $565 million), and the Environmental Protection Agency (EPA; down 0.7 percent to $568 million). The U.S. Department of Agriculture (USDA), enjoying a record R&D portfolio in 2005, would see its R&D funding decline 14.6 percent to $2.1 billion. Some, but not all, of the cuts would be due to the proposed elimination of congressional earmarks.

- **There would be tough budgetary choices even in agencies with increasing budgets**. At NASA, a 4.6 percent boost in R&D funding to $11.5 billion would still require steep cuts in aeronautics and earth sciences research and the cancellation of a Hubble servicing mission to pay for NASA's ambitious space exploration plans and resumed

construction of the Space Station. Although DOE's energy R&D portfolio would increase 3.2 percent to $1.2 billion because of increased investments in hydrogen, nuclear energy, fuel cells, and coal, DOE would eliminate R&D on gas and oil technologies and sharply reduce funding for other areas. R&D at the National Institute of Standards and Technology (NIST) laboratories would climb 12.7 percent to $357 million, but the budget proposes to eliminate NIST's Advanced Technology Program (ATP) and halve the budget of the Hollings Manufacturing Extension Partnership (MEP).

- For the first time in a decade, defense R&D would be subject to fiscal restraints. **Defense R&D would fall slightly by $16 million to $75.4 billion**, after multi-billion dollar increases for each of the past five years (see Table 1 and Figure 2). Department of Defense (DOD) weapons development would see a modest increase overall, but there would be a $1.0 billion cut to missile defense. There would be steep cuts to DOD's S&T (DOD "6.1" through "6.3" plus medical research) programs. DOD S&T would plummet 21 percent down to $10.7 billion, falling far short of the goal of 3 percent of the overall DOD budget at just 2.54 percent. DOE's weapons-related R&D would fall 2.6 percent, including cuts to inertial confinement fusion and advanced computing research.

- **Congress will tackle the FY 2006 appropriations process in a newly reorganized committee structure (see Table 3).** Both the House and the Senate recently approved separate restructurings of their Appropriations Committees; instead of 13 subcommittees in each chamber writing 13 appropriations bills, the House shuffled subcommittee jurisdictions to consolidate into 10 subcommittees. The Senate chose 12 subcommittees with jurisdictions similar to, but not identical to, the House. The result could be an appropriations process more protracted and confusing than normal. The federal R&D portfolio would be divided among all 10 House appropriations bills, and 10 of the 12 Senate bills (see Table 3). As before, four appropriations bills would fund 95 percent of all federal R&D, and the major R&D funding agencies of DOD, NIH, NASA, and DOE would continue to be funded in separate bills. NASA and NSF would move together from the eliminated VA-HUD bill to a Commerce, Justice, and Science bill in the Senate (Science, Commerce, and Justice in the House) to join the Commerce R&D portfolio, while EPA would move from VA-HUD to the Interior bill to join the Department of the Interior.

- **Federal homeland security-related R&D would total $4.4 billion in FY 2006**, a gain of $208 million or 4.9 percent that represents a leveling off of the federal investment after dramatic recent increases (see Table 4). The majority of the multi-agency portfolio would remain outside the Department of Homeland Security (DHS), with the largest part of funding coming from the National Institutes of Health (NIH) for its biodefense research portfolio. NIH's portfolio, mostly in the National Institute of Allergy and Infectious Diseases (NIAID), would total $1.8 billion in FY 2006, up 0.4 percent but with room for an 8 percent increase for biodefense research because of a drop in laboratory construction funding. After annual increases greater than 20 percent in the first few years of its existence, growth in the DHS R&D portfolio would level off with an FY 2006 request of $1.3 billion, up $44 million or 3.6 percent.

- The **total federal investment in research (basic and applied research) would fall 1.4 percent to $55.2 billion because of cuts in both defense and nondefense research** (see Table 2). Although NASA (up 11.6 percent to $5.4 billion) plans a large increase in its research portfolios, other agencies would face steep cuts. DOD support of basic and applied research would fall 18.1 percent down to $5.6 billion because of the proposed elimination of earmarks and cuts in core research. USDA, DOE, Interior, and Commerce support of research would all fall. NIH would support the majority of the federal research effort for the first time in FY 2006, but its research portfolio of $27.8 billion would increase only 1.2 percent, far below increases in previous years. NSF research funding would increase 1.2 percent to $3.7 billion next year, but would remain below FY 2004 funding levels.

- **Funding for all three multi-agency R&D initiatives would decline in FY 2006** (see Table 5). After a nearly $100 million increase this year, funding for the **National Nanotechnology Initiative** would fall 2.8 percent to $1.1 billion, well short of amounts authorized in the Nanotechnology R&D Act signed into law in December 2003. Funding for the **Networking and Information Technology R&D** initiative would decline 4.5 percent to $2.2 billion. The **Climate Change Science Program (CCSP)** would see its funding fall 1.4 percent to $1.9 billion, primarily because of steep cuts in NASA's contributions in space-based observations of the environment.

The FY 2006 R&D Budget in Historical Context

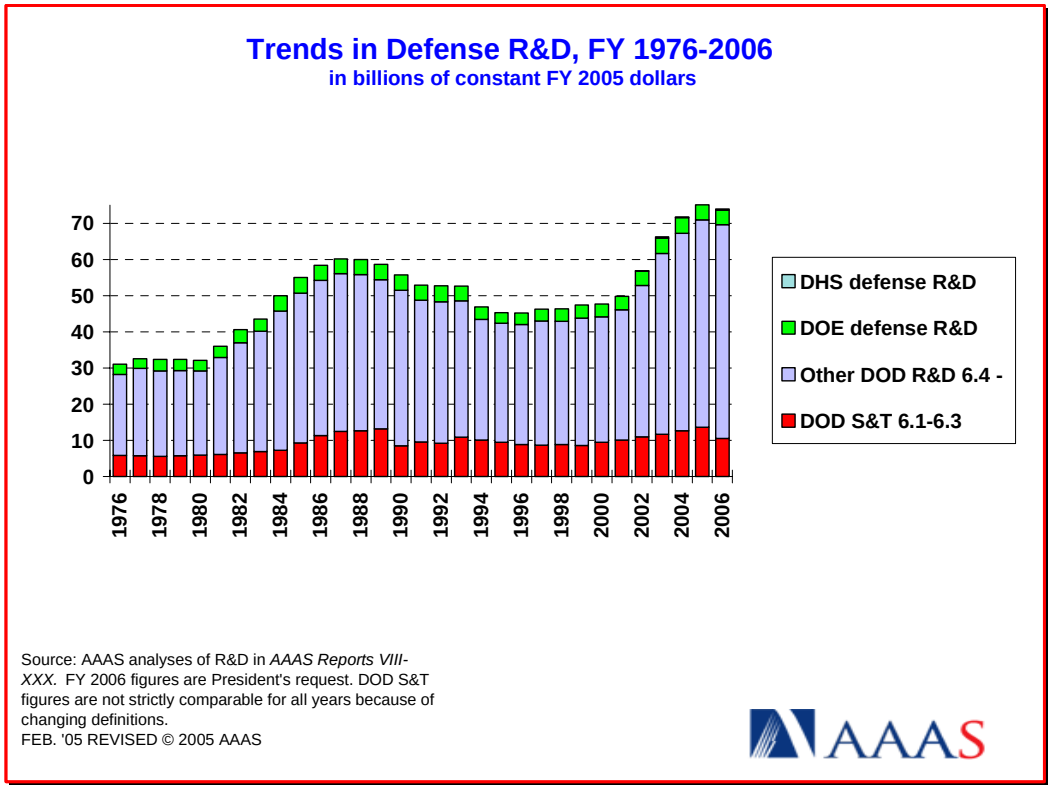

Figure 2.

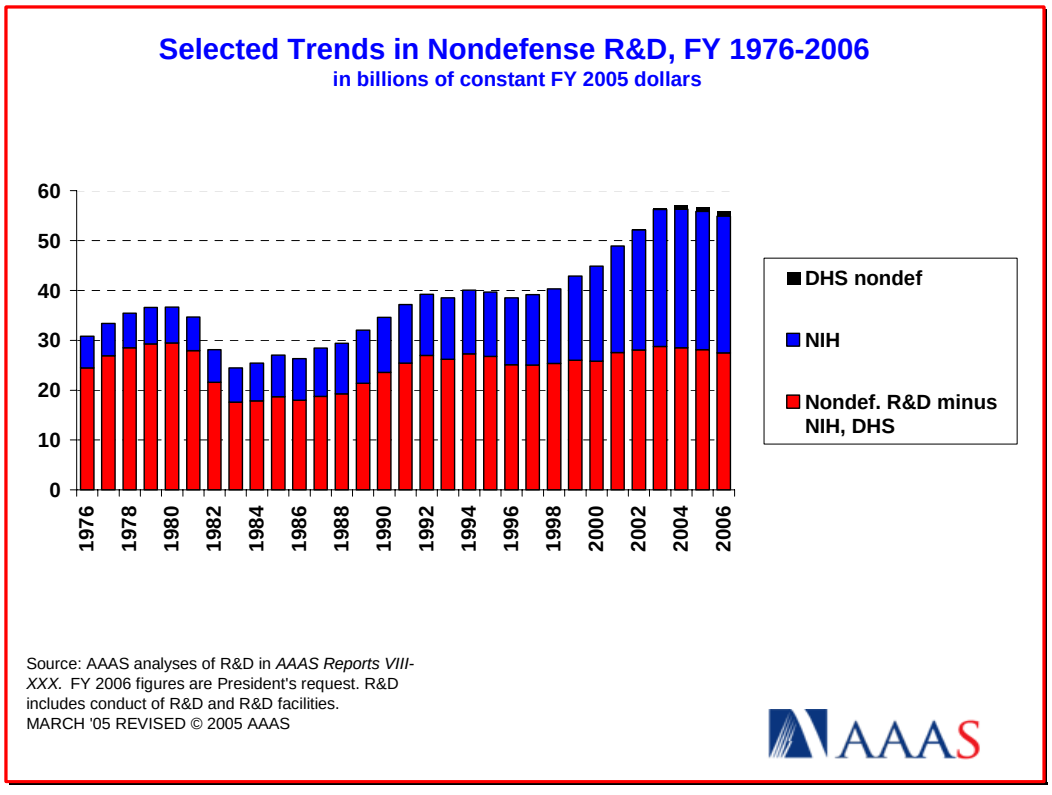

Figure 3.

The FY 2006 budget would cut funding for key R&D programs and leave federal R&D investments in several areas with flat or declining funding for the last 15 years. As Figure 2 and Figure 3 show, both the defense and nondefense R&D investments are at or near record levels in 2005 (in inflation-adjusted terms), but both defense and nondefense would fall behind inflation in FY 2006. For many areas, however, budget cuts would follow cuts in previous years.

For defense R&D, Figure 2 shows that nearly all of the increases in the past few years 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, barely hit a record high in 2005 after taking 16 years to return to Cold War funding levels. But the FY 2006 budget proposes to cut these S&T investments 21 percent in just one year, and reverse four years' worth of 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.

In nondefense R&D, the record investments of 2004 and 2005 are primarily a legacy of the recently completed campaign to double the NIH budget between 1998 and 2003, as shown in Figure 3. Both NIH and non-NIH R&D funding have stagnated since then. The FY 2006 budget would be the first time in 24 years that NIH R&D funding would fail to keep pace with inflation. All the other nondefense R&D funding agencies collectively have seen their budgets remain flat over the past 15 years, after factoring out the recent creation of the DHS. For these nondefense agencies, the FY 2006 budget would be the third year in a row of real cuts. These non-NIH agencies, combined with DOD's research, fund nearly all of the federal investment in the non-biomedical sciences, including the physical sciences, non-medical life sciences, environmental sciences, engineering, mathematics, computer sciences, and social sciences. Federal support for these disciplines has remained stagnant for 15 years, and would decline further in 2006.

Highlights of the Major R&D Funding Agencies
(Complete coverage of the major R&D funding agencies is now available on the AAAS R&D web site in individual agency updates, and also in the forthcoming *AAAS Report XXX: R&D FY 2006*.)

- The **National Institutes of Health (NIH)** would receive $28.7 billion for its total budget in FY 2006, an increase of $146 million or 0.5 percent. NIH R&D would rise 0.5 percent to $27.9 billion, failing to keep pace with economy-wide inflation for the first time in 24 years. NIH has already fallen behind its own calculations of biomedical research inflation, estimated at 3.3 percent this year and 3.2 percent in 2006. Most NIH institutes would receive increases in a narrow range between 0.3 and 0.7 percent. The National Institute of Allergy and Infectious Diseases (NIAID), home to NIH's biodefense effort, would do only slightly better with a 1.3 percent boost to $4.5 billion. The largest percentage increase would go to the Office of the Director (OD; up 7.6 percent) to boost OD funding for clinical research, high-risk basic research, and collaborative research in the NIH Roadmap for Biomedical Research. The Roadmap would receive $333 million in FY 2006 (up 41 percent), with $250 million coming from institute budgets. NIH projects a decline in the number of Research Project Grants (RPGs) for the second year in a row, no inflation adjustment for most new or continuing grants, and a decline in the RPG success rate for the fifth year in a row down to 21 percent. Biodefense research grants would be a bright spot with an 8 percent boost in FY 2006 to $1.7 billion.

- **The Department of Defense (DOD),** the largest federal sponsor of R&D, would see its R&D budget grow only slightly by 0.1 percent to $71.0 billion in FY 2006, an increase of just $80 million compared to multi-billion dollar increases the past five years. On the research side, there would be steep cuts. **DOD "Science and Technology" (S&T)**, which includes research, medical research, and early technology development, would plummet 21.3 percent down to $10.7 billion (see Table 3); at 2.54 percent of the regular DOD budget, this would fall far short of the Pentagon-endorsed target of 3 percent and the 3.39 percent ratio Congress appropriated in 2005. Within S&T, DOD funding for basic and applied research would both decline steeply. Basic research ("6.1") would fall 12.9 percent to $1.3 billion, while applied research ("6.2") would fall 14.7 percent to $4.1 billion in FY 2006, after large increases for both in this year's budget. DOD weapons development would see a modest increase overall, but there would be some steep cuts. Missile Defense Agency (MDA) funding for the development, testing, and evaluation of missile defenses would fall $1 billion to $7.8 billion (see Table 2). Including procurement funds and R&D in other DOD agencies, the

total missile defense investment would be $8.8 billion, down from $9.9 billion this year. The Defense Advanced Research Projects Agency (DARPA) would be a winner among research-oriented programs, with a request of $3.1 billion in FY 2006, a 3.6 percent increase.

- The **National Science Foundation (NSF)** budget, after declining in 2005, would receive a modest increase of 2.4 percent to $5.6 billion, far short of the $8.5 billion authorized in law. NSF R&D would increase 2.8 percent to $4.2 billion (see Table 1 and Figure 1), but most of the increase would go to R&D facilities funding. Most research directorates would receive modest increases of about 1 percent, but the increases would still leave most research programs at or below 2004 funding levels. NSF's education and training programs would suffer steep cuts for the second year in a row, especially pre-college education programs. The Major Research Equipment and Facilities Construction account would enjoy a sizeable increase, going from $174 million to $250 million despite the lack of new starts. The small increases for the research directorates would squeeze NSF funding of competitively awarded research grants. The total number of research grants would increase to 6,310 in FY 2006, but would remain below 2004 numbers. Competition for grants would remain difficult: NSF expects to make awards to just one in five applications.

- The **National Aeronautics and Space Administration (NASA)** continues to face daunting challenges**,** even as it receives favored treatment in the federal budget. The total NASA budget of $16.5 billion would be a 1.6 percent increase after a much larger boost in 2005, but NASA's R&D would increase 4.6 percent to $11.5 billion in FY 2006 because of money freed up by the Space Shuttle's expected return to flight in 2005. While the agency would receive additional resources for its ambitious plans to finish construction of the International Space Station, explore the solar system, and develop the technologies needed for planned moon and Mars missions, the FY 2006 request would still require tough budget choices. NASA would cancel a previously proposed robotic servicing mission for the Hubble Space Telescope and continue to rule out a human servicing mission. The FY 2006 budget also proposes to cut aeronautics research by 5.9 percent down to $852 million, and proposes steep cuts in environmental, biological, and physical sciences research in order to shift resources toward solar system exploration and R&D on moon and Mars mission technologies. There would be large boosts for robotic moon and Mars exploration (up 17 percent to $858 million) and development of a Crew Exploration Vehicle within a new Constellation Systems program (up 113 percent to $1.1 billion). The International Space Station would receive $1.9 billion, up 10.8 percent, in anticipation of the Space Shuttle's return to flight.

- The **Department of Energy (DOE)** would see its R&D funding decline 2.6 percent or $221 million to $8.4 billion in FY 2006, after a smaller cut in 2005. R&D funding for the Office of Science (OS) would decline 4.5 percent to $3.2 billion, leaving OS R&D funding at levels not seen since 2000. The cuts would be spread across a broad portfolio of programs in physics, fusion, biology, and energy sciences. Operation times at OS scientific user facilities would be reduced. Energy-related R&D would be a winner with a 3.2 percent gain to $1.2 billion because of proposed increases for hydrogen, nuclear energy, fuel cells, and coal R&D. DOE would invest $257 million (up from $224 million) in a Hydrogen Fuel Initiative to develop technologies for hydrogen-powered cars. But DOE would eliminate R&D on gas and oil technologies and sharply reduce funding for several renewable energy technologies. DOE's defense R&D investments would fall 2.6 percent to $4.0 billion, including cuts to advanced scientific computing and inertial confinement fusion. Although Congress eliminated the controversial Robust Nuclear Earth Penetrator program in FY 2005, DOE would try again in FY 2006 with a request of $4 million.

- Recent growth in **Department of Homeland Security (DHS)** R&D funding would slow in FY 2006, but would still gain ground in an era of tight budgets. DHS R&D would increase $44 million or 3.6 percent to $1.3 billion, after increases of more than $200 million in each of the past three years. The top priorities in the DHS R&D portfolio would be $246 million for radiological and nuclear countermeasures (double this year's investment) to establish a Domestic Nuclear Detection Office (DNDO), $102 million for chemical countermeasures (up 93 percent) and $110 million for R&D to counter portable anti-aircraft missiles (up 80 percent). Large increases for the top priorities would be offset by cuts in other areas of the DHS R&D portfolio, including explosives countermeasures (down a quarter to $15 million), threat and vulnerability assessments (down 29 percent to $47 million), standards development (down 11 percent to $36 million), and rapid prototyping (down two-thirds to $21 million. The largest part of the DHS R&D portfolio would

continue to be biological countermeasures with an investment of $362 million, down slightly. The budget proposes to finish consolidating all DHS R&D into the Directorate of Science and Technology (S&T).

- The **U.S. Department of Agriculture (USDA),** enjoying a record R&D portfolio in 2005, would see its R&D funding decline 14.6 percent in 2006 down to $2.1 billion. Most of the decline is due to the proposed elimination of R&D earmarks. USDA would dramatically restructure its extramural research portfolio: the National Research Initiative (NRI) of competitively awarded research grants would increase $70 million to a record $250 million, while earmarked Special Research Grants would plummet from $120 million down to $3 million. Hatch Act formula funding for land-grant colleges would be cut in half to $89 million, but USDA would create a new $75 million competitive research grants program for these institutions. USDA intramural research would decline 9.6 percent, but the proposed elimination of earmarks would make room for a nearly three-fold increase in homeland security-related research.

- Once again, the Bush Administration proposes to eliminate the Advanced Technology Program (ATP) at the **Department of Commerce**. The ATP has a budget of $140 million in FY 2005. The budget would also reduce funding for the non-R&D Hollings Manufacturing Extension Partnership by 57 percent to $47 million. The savings would allow for a 12.7 percent boost for intramural research at the **National Institute of Standards and Technology (NIST) laboratories** and a doubling of Construction of Research Facilities (CRF) investments in NIST laboratory facilities. **National Oceanic and Atmospheric Administration (NOAA**) R&D would decline by 11.2 percent to $565 million, mostly from the elimination of earmarks. Most NOAA research programs would stay at or slightly above current funding levels.

- The **Department of Veterans Affairs (VA)** once again proposes to reorganize its budget to fully report all costs associated with its R&D portfolio, including support and personnel costs. VA federal R&D would be $786 million in FY 2006, up slightly by 0.3 percent, but projected increases in funding from other sources would result in an increase in the overall VA R&D portfolio to $1.7 billion.

- R&D in the **Department of the Interior** would fall 5.5 percent to $581 million, with a similar 4.8 percent cut to $515 million for R&D in Interior's lead science agency, the **U.S. Geological Survey (USGS).** The cuts would be concentrated in USGS' mineral resources and water resources R&D, with modest increases or flat funding for other R&D priorities.

- The **Environmental Protection Agency (EPA)** overall budget would fall a steep 5.7 percent down to $7.6 billion in FY 2006. EPA R&D would fare better with a 0.7 percent cut to $568 million. Homeland security-related R&D would be the big winner in the R&D portfolio, with large increases for decontamination research and drinking water security. The proposed elimination of R&D earmarks would allow for modest increases to core EPA R&D programs in areas such as global change, particulate matter, drinking water, and water quality.

- Department of Transportation (DOT) R&D funding would rise 8.5 percent to $807 million. There would be a big boost in highway R&D, due in part to a perennial proposal to shift some resources away from state highway grants to highway research; similar proposals have been rejected by Congress in past years. R&D in the Federal Aviation Administration (FAA) would decline 11.4 percent to $233 million, mirroring similar cuts to aeronautics research in NASA and aviation security R&D in DHS.

The Budgetary Context for FY 2006: Tough Times for Domestic Programs

The FY 2006 Bush budget proposes **discretionary spending of $840 billion** in FY 2006, a 2.1 percent increase over FY 2005. But regular defense spending would get a 4.2 percent boost, leaving nondefense discretionary spending exactly even at $402 billion. Factoring out increases for homeland security and international aid would leave other domestic programs collectively with a nearly 1 percent cut, after similar austerity in the just-completed 2005 budget.

For discretionary programs, the budget includes proposals for a future of shrinking resources. 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 four years by Iraq and Afghanistan costs. The FY 2006 budget proposes a sharp drop in defense spending beginning in FY 2006 by assuming war spending will end this year. On the nondefense side, there have been large increases in homeland security spending and reconstruction support for Iraq and Afghanistan over the past four years along with increases in domestic spending until 2003; the FY 2006 budget assumes that non-homeland security domestic spending will be frozen at the FY 2004 level through FY 2010, resulting in dramatic erosions in purchasing power after inflation.

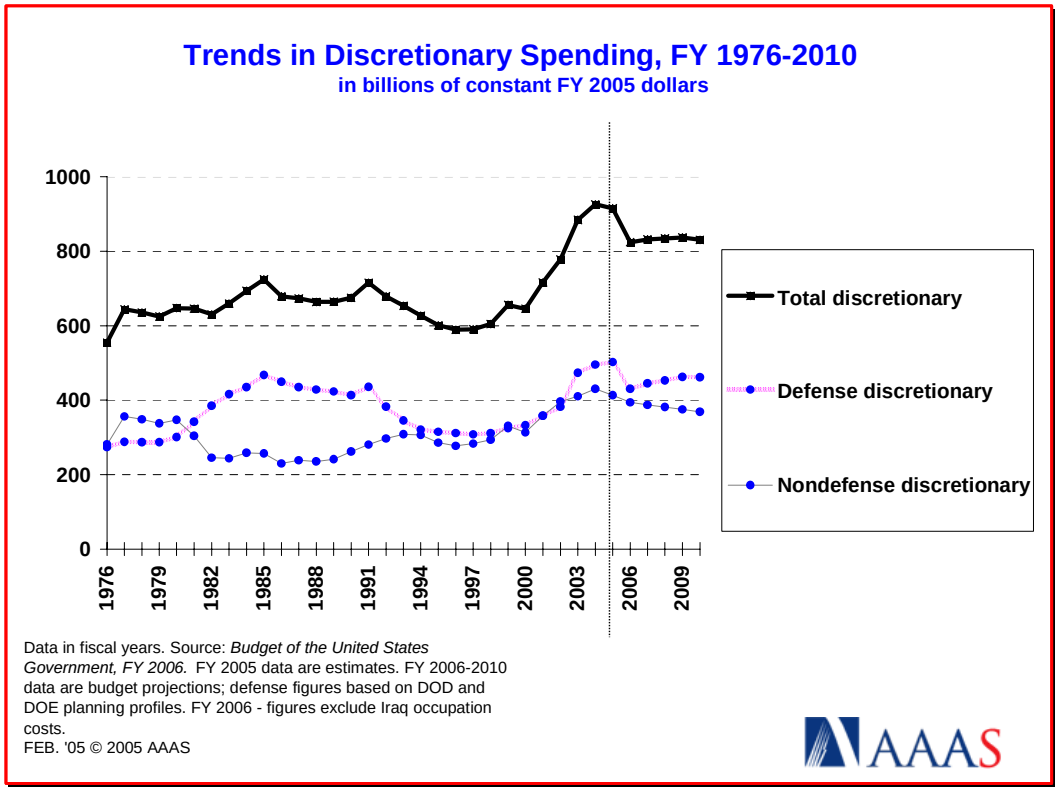

Figure 4.

These broader trends have a dramatic impact on the federal R&D portfolio. The trends in Figure 4 for overall discretionary spending mirror the trends in Figure 2 and Figure 3 for federal R&D, with steady growth to 2003 giving away to restraint in 2004 and 2005 and further restraint in 2006. Federal R&D investments have always tracked discretionary spending. Thus, the proposals to trim discretionary spending over the next five years could result in similar cuts to most agencies in the federal R&D portfolio.

- March 9, 2005 (revised March 22)
(More materials on R&D in the FY 2006 budget, historical data and charts, and information on *AAAS Report XXX: R&D FY 2006*, can be found on the AAAS R&D Web site at www.aaas.org/spp/rd.)

AAAS R&D Budget and Policy Program
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AAAS Analysis of R&D in the FY 2006 Budget

Table 1. R&D in the FY 2006 Budget by Agency
(budget authority in millions of dollars)

	FY 2004 Actual	FY 2005 Estimate	**FY 2006 Budget**	Change FY 05-06 Amount	Change FY 05-06 Percent
Total R&D (Conduct and Facilities)					
Defense (military)	65,948	70,929	**71,009**	80	0.1%
S&T (6.1-6.3 + medical)	*12,377*	*13,578*	***10,691***	*-2,886*	*-21.3%*
All Other DOD R&D	*53,572*	*57,351*	***60,318***	*2,967*	*5.2%*
Health and Human Services	28,521	29,084	**29,139**	55	0.2%
Nat'l Institutes of Health	*27,248*	*27,784*	***27,925***	*141*	*0.5%*
NASA	10,803	10,989	**11,497**	508	4.6%
Energy	8,713	8,614	**8,393**	-221	-2.6%
Atomic Energy Defense R&D	*4,198*	*4,138*	***4,031***	*-107*	*-2.6%*
Office of Science	*3,229*	*3,334*	***3,184***	*-150*	*-4.5%*
Energy R&D	*1,285*	*1,141*	***1,179***	*37*	*3.2%*
Nat'l Science Foundation	4,123	4,057	**4,170**	113	2.8%
Agriculture	2,222	2,403	**2,051**	-352	-14.6%
Commerce	1,139	1,134	**1,013**	-121	-10.6%
NOAA	*640*	*636*	***565***	*-71*	*-11.2%*
NIST	*457*	*461*	***416***	*-45*	*-9.7%*
Interior	627	615	**581**	-34	-5.5%
U.S. Geological Survey	*553*	*541*	***515***	*-26*	*-4.8%*
Transportation	665	744	**807**	63	8.5%
Environ. Protection Agency	662	572	**568**	-4	-0.7%
Veterans Affairs	866	784	**786**	2	0.3%
Education	299	297	**261**	-36	-12.1%
Homeland Security	1,028	1,243	**1,287**	44	3.6%
All Other	724	727	**713**	-14	-1.9%
Total R&D	126,340	132,192	**132,276**	84	0.1%
Defense R&D	70,344	75,395	**75,379**	-16	0.0%
Nondefense R&D	55,996	56,797	**56,898**	100	0.2%
Nondefense R&D excluding NIH	*28,748*	*29,014*	***28,973***	*-41*	*-0.1%*
Basic Research	26,528	26,840	**26,536**	-305	-1.1%
Applied Research	28,814	29,179	**28,682**	-497	-1.7%
Total Research	55,342	56,019	**55,218**	-801	-1.4%
Development	66,593	71,353	**72,484**	1,131	1.6%
R&D Facilities and Equipment	4,404	4,820	**4,574**	-246	-5.1%

Source: AAAS, based on OMB data for R&D for FY 2006, agency budget justifications, and information from agency budget offices.
Note: The projected inflation rate between FY 2005 and FY 2006 is 2.0 percent.

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AAAS Analysis of R&D in the FY 2006 Budget

Table 2. Research in the FY 2006 Budget
(budget authority in millions of dollars)

	FY 2004 Actual	FY 2005 Estimate	**FY 2006 Budget**	Change FY 05-06 Amount	Change FY 05-06 Percent
BASIC RESEARCH					
Defense (military)	1,358	1,513	**1,319**	-195	-12.9%
Health and Human Services	14,850	15,114	**15,235**	122	0.8%
Nat'l Institutes of Health	*14,842*	*15,111*	***15,235***	*125*	*0.8%*
NASA	2,473	2,368	**2,199**	-169	-7.1%
Energy	2,722	2,824	**2,712**	-112	-4.0%
Nat'l Science Foundation	3,515	3,416	**3,464**	48	1.4%
Agriculture	829	851	**788**	-63	-7.4%
Commerce	46	61	**74**	13	22.1%
NOAA	*0*	*0*	***0***	*0*	*- -*
NIST	*45*	*60*	***73***	*13*	*22.5%*
Interior	37	36	**30**	-5	-15.2%
Transportation	20	37	**42**	5	13.5%
Environ. Protection Agency	114	66	**70**	4	5.3%
Smithsonian	114	115	**121**	6	5.2%
Veterans Affairs	347	315	**315**	0	0.0%
Homeland Security	68	85	**112**	27	31.8%
All Other	35	40	**54**	14	35.0%
Total Basic Research	26,528	26,840	**26,536**	-305	-1.1%
Basic research excluding NIH	*11,686*	*11,730*	***11,300***	*-429*	*-3.7%*
RESEARCH (basic + applied)					
Defense (military)	6,192	6,870	**5,627**	-1,243	-18.1%
Health and Human Services	28,225	28,702	**28,960**	258	0.9%
Nat'l Institutes of Health	*27,031*	*27,487*	***27,805***	*318*	*1.2%*
NASA	5,479	4,865	**5,430**	565	11.6%
Energy	5,481	5,636	**5,403**	-233	-4.1%
Nat'l Science Foundation	3,780	3,695	**3,741**	46	1.2%
Agriculture	1,884	1,944	**1,730**	-214	-11.0%
Commerce	887	898	**849**	-49	-5.5%
NOAA	*537*	*522*	***487***	*-35*	*-6.7%*
NIST	*342*	*368*	***351***	*-17*	*-4.6%*
Interior	575	566	**525**	-41	-7.3%
Transportation	368	457	**535**	78	17.1%
Environ. Protection Agency	537	431	**455**	24	5.5%
Veterans Affairs	823	745	**748**	3	0.4%
Education	207	186	**176**	-10	-5.4%
Homeland Security	364	493	**511**	18	3.6%
Agency for Int'l Develop.	219	215	**215**	0	0.0%
Smithsonian	114	115	**121**	6	5.2%
All Other	208	201	**192**	-9	-4.5%
Total Research	55,342	56,019	**55,218**	-801	-1.4%
Total research excluding NIH	*28,312*	*28,532*	***27,413***	*-1,119*	*-3.9%*

Source: AAAS, based on OMB data for R&D for FY 2006, agency budget justifications, and information from agency budget offices.
Note: The projected inflation rate between FY 2005 and FY 2006 is 2.0 percent.

REVISED March 22, 2005

AAAS Analysis of R&D in the FY 2006 Budget

Table 3. R&D Funding by Congressional Appropriations Subcommittee
(budget authority in millions of dollars)

	FY 2004 Actual	FY 2005 Estimate	**FY 2006 Budget**	Change FY 05-06 Amount	Change FY 05-06 Percent	Agencies and Programs
Defense	65,410	70,267	**70,790**	523	0.7%	Most DOD
Labor, HHS, Education	28,651	29,190	**29,203**	13	0.0%	Labor, HHS, Education
Commerce, Justice, Science	16,146	16,274	**16,789**	515	3.2%	Commerce, NASA, NSF, DOJ
Energy & Water	8,834	8,734	**8,485**	-249	-2.8%	All DOE, Corps of Eng, NRC
Agriculture	2,052	2,240	**1,882**	-358	-16.0%	Most USDA (ex. Forest Serv.)
Interior	1,787	1,703	**1,680**	-23	-1.4%	Interior, EPA, FS, Smithsonian
Homeland Security	1,028	1,243	**1,287**	44	3.6%	DHS
Military Construction, Veterans	1,404	1,446	**1,005**	-441	-30.5%	Some DOD, VA
Transp., Treasury, Judiciary	763	840	**899**	59	7.0%	DOT, HUD
State and Foreign Operations	264	255	**255**	0	0.0%	AID, Int'l Orgs.
Total R&D	126,340	132,192	**132,276**	84	0.1%	

Source: AAAS, based on estimates for R&D from OMB and agency data.
REVISED March 22, 2005
Based on NEW appropriations subcommittee structures in House and Senate approved in February and March 2005. Names are Senate names; there are some differences in names and jurisdictions between the House and Senate structures, but R&D jurisdictions are the same.
Senate Legislative Branch and DC subcommittees not shown (no R&D funding).

Table 4. Federal Homeland Security-Related R&D by Agency
(budget authority in millions of dollars)

	FY 2004 Actual	FY 2005 Estimate	**FY 2006 Budget**	Change FY 05-06 Amount	Change FY 05-06 Percent
Agriculture	40	161	**172**	11	6.8%
Commerce	23	73	**82**	9	11.9%
Defense	267	362	**394**	32	8.7%
Energy	47	92	**81**	-12	-12.5%
Homeland Security	1,028	1,243	**1,287**	44	3.6%
Environ. Protection Agcy.	52	33	**94**	61	185.1%
Health and Human Services	1,724	1,796	**1,802**	6	0.4%
- *NIH*	1,703	1,774	**1,781**	6	0.4%
NASA	88	88	**92**	4	4.5%
Natl. Science Foundation	321	326	**329**	3	1.0%
Transportation	3	-	**-**	0	- -
All Other	32	42	**92**	50	118.8%
Total HS R&D	3,626	4,216	**4,425**	208	4.9%
(Total HS Spending)	*40,834*	*46,015*	***49,943***	*3,928*	*8.5%*

AAAS, based on Office of Management and Budget data from OMB's *2003 Report to Congress on Combating Terrorism and Budget of the U.S. Government FY 2006.* Figures adjusted from OMB data by AAAS to include conduct of R&D and R&D facilities, and revised estimates of DHS R&D.
Figures do not include non-R&D homeland security activities, nor do they include DOD R&D investments in overseas combating terrorism. **Revised March 9, 2005**

AAAS Analysis of R&D in the FY 2006 Budget

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

	FY 2004 Actual	FY 2005 Estimate	**FY 2006 Budget**	Change FY 05-06 Amount	Change FY 05-06 Percent
National Nanotechnology Initiative (NNI) 2/					
National Science Foundation	256	338	**344**	6	1.8%
Defense 1/	291	257	**230**	-27	-10.5%
Energy	202	210	**207**	-3	-1.4%
NASA	47	45	**32**	-13	-28.9%
Commerce (NIST)	77	75	**75**	0	0.0%
HHS - National Institutes of Health / CDC	108	145	**147**	2	1.4%
Agriculture	2	3	**8**	5	166.7%
Other (EPA, DHS, Justice)	8	8	**8**	0	0.0%
Total Nanotechnology 2/	991	1,081	**1,051**	-30	-2.8%
Networking and Information Technology R&D (NITRD)					
Commerce	47	58	**62**	4	6.9%
Defense	241	278	**299**	21	7.6%
Energy	343	370	**341**	-29	-7.8%
Environ. Protection Agency	2	4	**6**	2	50.0%
Health and Human Services	542	589	**569**	-20	-3.4%
NASA	258	163	**74**	-89	-54.6%
National Science Foundation	773	795	**803**	8	1.0%
Total IT R&D	2,206	2,256	**2,155**	-101	-4.5%
Climate Change Science Program (CCSP) *					
National Science Foundation	215	198	**197**	-1	-0.5%
Energy	133	129	**132**	3	2.3%
Commerce (NOAA)	116	124	**181**	57	46.0%
Agriculture	70	73	**88**	15	20.5%
Interior (USGS)	28	24	**24**	0	0.0%
Environ. Protection Agency	22	20	**21**	1	5.0%
National Institutes of Health	61	65	**65**	0	0.0%
NASA	1,321	1,264	**1,162**	-102	-8.1%
All Other (Smith., AID, DOT, State)	14	16	**16**	0	0.0%
Total CCSP	1,980	1,913	**1,886**	-27	-1.4%

Source: OMB supporting data for FY 2006 Budget.
FY 2006 data are President's request.
REVISED March 11, 2005
* Includes U.S. Global Change Research Program and Climate Change Research Initiative.
1/ Excludes $103 million in FY 2004 and $150 million in FY 2005 for congressionally designated projects.
2/ Other NNI participating agencies are: Bureau of Industry and Security (Commerce); Consumer Product Safety Commission; Department of State; Department of Transportation; Department of Treasury; Food and Drug Administration (HHS); International Trade Commission, Intelligence Technology Innovation Center; Nuclear Regulatory Commission; Technology Administration (Commerce); U.S. Patent and Trademark Office (Commerce).