

**VIEWS AND ESTIMATES
COMMITTEE ON SCIENCE
FISCAL YEAR 2003**

BACKGROUND

Science and technology are the keystones of our economic prosperity and national security.

Economists attribute much of the nation's improvement in productivity in recent years to the fruits of research and development (R&D) – and that productivity improvement fueled the longest period of economic expansion in our nation's history.

Advancements in science and technology were also critical to the nation's ability to triumph in the Cold War. (Indeed, Cold War-era investments in science and technology, especially those made in the wake of the Soviet launch of Sputnik, laid much of the foundation for the broad, successful scientific and engineering enterprise the U.S. boasts today.) New ideas, understandings and technologies spawned by research and development are likely to be just as essential to winning the war against terrorism.

Moreover, science and technology have the potential to cure numerous domestic and global social ills – disease, poverty, hunger, cultural isolation and environmental degradation, to name just a few.

But advances in science and technology do not come cheap or without focused effort; nor are they solely the responsibility of the private sector. Throughout our history, and especially in the years since World War II, the federal government has played a fundamental role in underwriting research and development, especially (but not exclusively) basic research at the nation's universities. This investment, which has a long history of bipartisan support, has paid off with handsome benefits for all Americans.

While the percentage of national R&D sponsored by the federal government has declined in recent years, the federal role remains essential. Indeed, as competitive pressures have led many industrial enterprises to focus research on projects with shorter-term benefits, longer-term research depends more than ever on federal support.

None of these assertions is new or unfounded. They are, for example, discussed in the Committee's report *Unlocking Our Future: Toward a New National Science Policy*, prepared by Congressman Vernon Ehlers, at the request of the Speaker, in the 105th Congress.

INTER-AGENCY ISSUES FOR THE 107TH CONGRESS—Second Session

In the second session of the 107th Congress, the Science Committee will continue to focus on its three top priorities – mathematics and science education, energy policy and the environment -- as well as coming up with new approaches to fighting the war against terrorism and undertaking an in-depth review of the space program. Most of the Committee's concerns and interests in these and other areas are captured in the agency-by-agency discussion in the next section. But three sets of central concerns that cut across agency lines need to be reviewed first.

Presidential Initiatives

The Administration's budget highlights four "multi-agency R&D priorities" – work on anti-terrorism, networking and information technology, nanotechnology, and climate change. (*Analytical Perspectives*, p. 164) The Committee strongly endorses these initiatives, and agrees that they deserve priority in funding.

The Administration is still developing its procedures for developing, managing, prioritizing, and categorizing anti-terrorism R&D. This is understandable given how quickly the United States has had to change its focus since September 11th. The Committee looks forward to working with the Administration in putting together a portfolio of anti-terrorism R&D that addresses a wide range of threats in both the long- and short-term. (The Committee's own initiatives in this area are discussed below.)

The Administration proposes a 3 percent increase for the interagency program on Networking and Information Technology (NITRD). The Committee believes this is the bare minimum the program needs. The Committee, by voice vote, late last year approved H.R. 3400, which would provide the NITRD agencies under our jurisdiction with \$35 million more in Fiscal Year (FY) 03 than the Administration has requested. Under the bill, which is based on the recommendations of the President's Information Technology Advisory Committee (PITAC), spending on the Committee's NITRD agencies would increase from \$1.076 billion in FY02 to \$1.157 billion in FY03 to \$1.688 billion in FY07.

The Administration proposes increasing spending on nanotechnology by 17 percent. This promising, broadly applicable technology field merits the additional spending. The Committee may address nanotechnology R&D in legislation later in the year.

The Administration proposes two new initiatives designed to address climate change, over and above the ongoing U.S. Global Change Research Program -- \$40 million for a Climate Change Research Initiative, designed to address questions most relevant to policy-makers; and \$40 million for a National Climate Change Technology Initiative. While the details of the initiatives remain to be worked out, the Committee supports this new, focused effort. The Committee plans to reauthorize the U.S. Global Change Research Program this year.

Anti-terrorism R&D

Just like the Cold War, the war against terrorism will be won in the laboratory as much as on the battlefield. While some R&D must be devoted to finding short-term solutions to immediate concerns, the nation must invest in long-term R&D to develop new approaches to both current and future threats. The Committee approved two bills last year designed to do just that, and is committed to see the programs created by them receive adequate funding.

The Committee, by voice vote, approved H.R. 3394, the Cyber Security Research and Development Act, in December, and the House passed the bill by a vote of 400-12 in February. The bill would establish new research initiatives at both the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST) designed to come up with innovative approaches to computer security, and to draw more senior researchers and students into the field. For FY03, the bill authorizes \$73 million for NSF and \$32 million for NIST.

The Committee also approved, by voice vote, H.R. 3178, the Water Infrastructure Security and Research Development Act, which the House passed by voice vote. The bill authorizes \$12 million in FY03 for R&D related to water security at the Environmental Protection Agency.

Balance in the Federal Research Portfolio

While the Committee believes that the Administration has chosen the appropriate priorities for the federal R&D budget, it is nonetheless concerned that the biomedical sciences, in general, and the National Institutes of Health (NIH), in particular, are growing out of all proportion to any other element of the R&D budget. Indeed, just the increase proposed for the NIH in FY03 is larger than the entire proposed research budget for NSF. While the Committee supports the doubling of NIH, it is concerned that unless the needs of other agencies are addressed, many scientific opportunities will be missed and even health research itself will be retarded.

Similarly, while Defense Department development programs are critical to our national security, those programs alone cannot create a stable and secure American society or even ensure our protection from enemy attacks over the long-term. Yet while the Pentagon is slated to receive a 12 percent increase, basic and applied research in the Defense Department are flat, and numerous programs in other agencies that unarguably contribute to Homeland Security receive tepid increases.

The Committee will continue to review the balance within the federal research portfolio. The Committee looks forward to working with the Administration and our Congressional colleagues to develop ways to determine whether the current portfolio is

too heavily weighted toward NIH, and, if it is, to figure out what a balanced portfolio would be.

RECOMMENDATIONS FOR AGENCIES

SUBCOMMITTEE ON RESEARCH

National Science Foundation (NSF)

The National Science Foundation funds about 25 percent of the basic research conducted at U.S. universities, and a far higher percentage of the research in selected fields. NSF funds basic research across nearly all disciplines of science and engineering, making NSF-supported research integral to progress in priority areas such as health care and national security, among others. In addition, NSF funds programs to improve K-12 and undergraduate education, and its fellowships and research assistantships support many graduate and post-doctoral students.

The FY03 budget request for NSF is \$5.04 billion, \$239.91 million—or 5 percent—over the FY02 appropriation. However, \$76 million of the increase does not represent new spending, but rather is existing funding associated with three programs the Administration proposes to transfer to NSF – the Sea Grant program, now at the National Oceanographic and Atmospheric Administration (NOAA); hydrology programs now at the U.S. Geological Survey (USGS); and certain environmental education programs, now at the Environmental Protection Agency (EPA).

The transfers are unlikely to occur, and, in any event, none of the transferred money would be available to strengthen existing NSF programs or create new ones. After subtracting the transfers, NSF is left with an actual proposed increase of about 3.4 percent – or about 1 percent above inflation. This is not a significant increase for an agency charged with ensuring the overall health of the nation's university research enterprise – an agency that the Office of Management and Budget (OMB) has held up as a model of good management.

The Committee believes that NSF needs an increase (exclusive of any transfers) of at least \$420 million, or 8.8 percent, over FY02 levels. This request would increase funding for NSF's core science programs, enabling NSF to begin funding highly ranked grant proposals that are turned down solely for lack of funding; fully fund K-12 education programs that have been authorized by the House; and would fund large facility projects that have already been approved by the National Science Board.

Education and Human Resources

The Committee is pleased that the budget request for NSF's education programs reflects a continued commitment to the Mathematics and Science Partnership program, requested at \$200 million. The Committee thus fully supports this request, which was authorized by H.R. 1858, the National Mathematics and Science Partnerships Act, which the House passed by voice vote last year.

The Committee is also pleased to see that two other programs authorized by H.R. 1858, the Noyce Scholarship Program and the Digital Library Program, are included in the budget request, albeit at lower levels than authorized. The Committee will continue to push for full funding of these efforts.

In addition, the Committee is encouraged to see funding for the Tech Talent Program (referred to as the Science Technology, Engineering and Mathematics Talent Expansion (STEP) Program), which would be authorized by H.R. 3130, the Tech Talent Act, which the Committee plans to approve this spring.

The Committee fully supports the proposed increase in graduate fellowship stipends from \$21,500 to \$25,000 in the current budget request.

Federal Emergency Management Agency (FEMA) - United States Fire Administration (USFA)

The U.S. Fire Administration helps localities improve their ability to prevent, control and extinguish fires. The enacted FY03 authorization level (P.L. 106-503) for the Fire Administration's Fire Prevention and Control programs is \$50.0 million; the FY03 budget request is \$40.7 million. This represents a decrease of \$9.6 million from the FY02 Current Estimate of \$50.3 million.

In addition to the Fire Prevention and Control Act programs authorized in P.L. 106-503, the FY01 Defense Authorization Act (P.L. 106-398) authorized the Assistance to Firefighters Grant Program (administered by USFA) to provide direct assistance to local fire departments for training, purchase of equipment, and other purposes. The FY02 Defense Authorization Act (P.L. 107-107) increased the authorization for this program to \$900 million per year through FY04, and expanded its scope to include grants for equipment and training to help firefighters respond to a terrorist attack or an attack using weapons of mass destruction. In FY02, this program received \$150 million through the Veteran's Administration, Housing and Urban Development and Related Agencies Appropriation (P.L. 107-73) and an additional \$210 million through the Department of Defense (supplemental) Appropriations Act (P.L. 107-117), for a total of \$360 million.

In the Administration's FY03 budget request, the Assistance to Firefighters Grant Program is incorporated into a FEMA-wide \$3.5 billion National Preparedness Program. (The grant program is still expected to give out an estimated \$164.8 million in awards in FY03, nonetheless, using unspent FY02 funds.) While the details of the National Preparedness Program are not yet in place, the Committee is concerned that these funds may be distributed in a manner that reduces the dollars that fire departments receive as states take a share of the funds for themselves or focus on other responders. The Committee strongly recommends that the Assistance to Firefighters awards continue to be awarded directly to local career and volunteer fire departments through the current competitive process.

National Earthquake Hazards Reduction Program (NEHRP)

NEHRP is an interagency program led by FEMA and including NSF, the National Institute of Standards and Technology (NIST), and the U.S. Geological Survey (USGS). The program is credited with reducing the loss of life and property from earthquakes through improving emergency response, knowledge of earthquake risks, and earthquake engineering. Most states face at least some risk from earthquakes.

The enacted authorization level (P.L. 106-503) for NEHRP for FY03 is \$122.6 million for the base program, with additional authorizations for multi-year efforts to create and operate the Advanced National Seismic Research and Monitoring System (ANSS, \$44.0 million) and to build the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES, authorized at \$4.5 million for FY03).

The FY03 budget request for NEHRP is \$115.7 million, a decrease of \$10.6 million, or 8.4 percent. This decrease reflects a planned reduction from FY02 levels of \$10.8 million for NEES construction. All NEHRP agencies are flat funded in the President's request: NSF, \$33.8 million; FEMA, \$14.7 million; USGS, \$47.6 million; and NIST, \$2.5 million. The Committee is concerned that the request for the ANSS is only \$3.9 million, a fraction of the authorized level.

SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY & STANDARDS

Environmental Protection Agency (EPA)

The proposed FY03 budget for the EPA's science and technology functions calls for a 6 percent increase over the FY02 appropriation, excluding funds provided in the Supplemental Appropriation. The Committee supports the EPA's request for funding to help communities meet the new arsenic drinking water standards and improve the science of cumulative risk assessment. It also supports the additional funding for research related to homeland security, such as the detection and remediation of biological and chemical contamination in buildings.

The Committee is concerned, however, that the proposed budget for EPA's core science and technology activities (excluding the funding for new homeland security research) will decline by 4 percent from FY02. More troubling still, the EPA's core funding for the Office of Research and Development, which carries out more than 80 percent of EPA's R&D activities is lower than it was in FY99. In real dollars, this represents a decline in funding over the last four years. In addition, the Committee recommends restoring funding for the Science to Achieve Results (STAR) Fellowships, which have supported hundreds of graduate and undergraduate students in the environmental sciences.

National Oceanic and Atmospheric Administration (NOAA)

The proposed budget would reduce NOAA funding by \$142 million (or about 4 percent) below FY02 levels. The gross figure is somewhat misleading, though, as the Administration's budget fully funds the critical functions of the Agency and provides significant, needed increases for the National Weather Service.

(Most of the reduction reflects the proposed elimination of Congressional earmarks and the proposed transfer of the Sea Grant College Program to NSF. The Committee does not support the proposed transfer of the Sea Grant program, which needs some reform, but is integrally connected to NOAA's mission.)

The Committee is pleased that the Administration would provide \$18 million in new money for NOAA's portion of the President's Climate Change Research Initiative, and \$171 million for overall climate research. The Committee looks forward to working with the Administration to shape and focus this new Initiative.

The Committee supports the Administration's request of \$237 million for NOAA's new satellite program (NPOESS) – an increase of \$79 million. This project, which is jointly funded by the Air Force, is vital to our future ability to forecast extreme weather. However, the Committee is concerned that despite the estimated \$6.5 billion total cost of the project, NOAA has no plan to ensure that it will have the capability to process, assimilate and distribute all of the new data that NPOESS will generate. The Committee has asked the General Accounting Office to analyze the new project and report on current and future NOAA satellite data management needs.

Department of Commerce --Technology Administration

The bulk of the Technology Administration's funding goes to the National Institute of Standards and Technology (NIST), the nation's oldest federal laboratory and still a leader in science and technology as reflected by the Nobel Prize awarded last year to one of its scientists. The Administration budget proposes to spend \$389 million for the core NIST laboratory functions (the Scientific and Technical Research and Services account) in FY03 – an increase of \$68 million over FY02. The Committee is pleased with this generous request, but believes that in light of the focus on homeland security, additional funding could be provided for NIST's computer security efforts and for its investigation into the World Trade Center collapse, which could yield new ways to strengthen buildings to withstand terrorist attacks and natural disasters.

The Committee is also pleased that the budget request provides funding to complete the construction of the Advanced Measurement Lab in Gaithersburg and to undertake much needed improvements at NIST's laboratory in Boulder, Colorado.

The Committee takes issue with the proposal to sharply reduce funding for the Manufacturing Extension Partnership (MEP), which helps smaller manufacturers modernize to remain competitive.

In FY00 alone (the most recent year for which data is available), the program contributed \$700 million in new or retained sales, \$480 million in cost savings, and \$900 million in new capital investments. The proposed budget would end federal support for almost all state MEP centers. This change would force most centers to shut their doors just as they could be contributing to economic recovery.

The Committee looks forward to working with the Administration on its proposed reforms to the Advanced Technology Program (ATP), which may at last help put the program on a path to stable funding.

National Technical Information Service (NTIS)

The Committee looks forward to working with the Administration to determine the best method of enabling NTIS to inform the public as a self-sustaining entity.

SUBCOMMITTEE ON ENERGY

Department of Energy (DOE)

The Committee has jurisdiction over DOE's civilian energy research, development, and demonstration programs and commercial application of energy technology activities.

The Committee is concerned that the proposed budget would cut programs under the Committee's jurisdiction by 2.4 percent. The proposed funding levels fall well below those that would be authorized under H.R. 4, the Securing America's Future Energy Act of 2001, which passed the House on August 2, 2001, by a vote of 240-184. To take just two examples, H.R. 4 would authorize \$45 million for hydrogen R&D in FY03, but the request is \$39.9 million. H.R. 4 would authorize \$113.9 million for biofuels and biomass (excluding an additional \$49 million for integrated bioenergy R&D), while the request is \$86 million.

The Committee is particularly concerned about the future of the Office of Science, which funds user facilities and academic research. In recent years, funding limitations have forced many user facilities to restrict the number of hours they are available to researchers, causing investments that have cost taxpayers billions to sit idle. In addition, many DOE facilities are deteriorating and staff are nearing retirement, producing a looming problem that the Committee believes must be addressed with increased resources.

The Committee continues to closely monitor the construction of the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory, especially in light of a recent report by DOE's Inspector General indicating that capabilities and facilities have been pared back to keep the program under budget.

The Committee awaits further details on several of DOE's initiatives, including the Clean Coal program and FreedomCAR. While the Committee supports the goals of these programs (and has authorized the 10-year Clean Coal program with strict environmental goals), it needs additional details on these programs to assess their ability to achieve their goals. Similarly, the Committee awaits further details on the way the Administration applied its new performance criteria to the fossil fuel accounts that it proposes to cut.

The Administration's request for the Fusion Energy Sciences Program is \$257.3 million, far short of the \$335 million approved by the House in H.R. 4. Fusion's potential to wean the Nation from fossil fuels is tremendous, but much research remains to be done before that potential can be realized. The Committee notes with approval that the Administration is reassessing the potential U.S. role in the International Thermonuclear Experimental Reactor (ITER), which may significantly advance the science by achieving sustained-burning plasma. The Committee believes that U.S. participation in such important international research endeavors deserves serious consideration.

Finally, the Committee supports the Administration's proposal to spend \$40 million in DOE on a National Climate Change Technology Initiative. The Committee is concerned, however, that DOE has not highlighted this proposal in its budget presentations and seems unable to provide any detail on how or where it will be carried out. This important initiative needs to become a focus within DOE if it is to be successful.

SUBCOMMITTEE ON SPACE AND AERONAUTICS

National Aeronautics and Space Administration (NASA)

The Administration proposes to increase funding for NASA by 0.7 percent in FY03, from \$14.9 billion in FY02 to \$15 billion in FY03. The Committee supports the level of the Administration's request.

The item of greatest concern in the NASA budget is the future of the International Space Station (ISS). The Committee continues to support development of the Space Station within the \$25 billion cost cap enacted during the 106th Congress (P.L. 106-391). The Committee applauds the Administration for reviewing the costs of the Space Station and for its commitment to solving the financial and program management problems as outlined by the ISS Management and Cost Evaluation (IMCE) Task Force.

However, many critical decisions regarding the ISS remain to be made. NASA has not yet implemented many of the management reforms the IMCE recommended, and NASA has not yet identified the criteria that will be used to evaluate the Space Station program. In addition, the Research Maximization and Prioritization (REMAP) Task

Force NASA established to evaluate ISS research priorities will not announce its findings until August.

Despite the uncertainty, the budget assumes \$560 million in unspecified savings over the next five years; without those savings the three-person “Core Complete” Space Station cannot be assembled within the \$25 billion cost cap.

The Committee agrees with the Administration that safety must be the highest priority in the operation of the Space Shuttle. The Committee applauds the Administration for examining competitive sourcing and privatization of the Space Shuttle, and awaits the results of the Administration’s reviews, which are expected to be complete by late September. The Committee is concerned about the proposal to cut the Shuttle safety and supportability upgrades program by about \$500 million between FY03 and FY07 to absorb unexpected increases in Shuttle operations and maintenance costs. The proposed cut is especially ill-timed as NASA told Congress last year that at least some of the safety upgrades were essential. The Committee expects NASA to develop more rigorous and realistic estimates of what it will cost to operate, maintain, and upgrade the Shuttle fleet. Estimates must not be based on unrealistic assessments of when the Shuttle might be replaced with a second-generation launch vehicle. The Committee supports increased funds to modernize the launch infrastructure at Kennedy Space Center to support planned mission needs.

The Committee appreciates the Administration’s commitment to space and Earth science. The Committee, noting the cancellation of the Pluto-Kuiper mission and the deferment of the Europa mission, agrees that NASA should develop an integrated science strategy for exploring the outer planets. The Committee believes that investments in new technology, such as the Nuclear Systems Initiative, could significantly reduce spacecraft travel time and enable a more robust planetary exploration program.

The Committee supports the Administration’s restructuring of NASA’s Aerospace Technology Enterprise budget to more clearly link the budget and management structure to strategic goals. However, the Committee is concerned that the aeronautics program, once a core NASA program, does not have sufficient funds to usefully address the problems facing our aeronautics and aviation system. Moreover, the Committee urges the Administration to work to strengthen collaboration between NASA and FAA on aeronautics research and technology development.

Federal Aviation Administration (FAA)

The Committee looks forward to working with the Administration to develop an integrated R&D strategy for aeronautics. This will require increased investment in R&D, both to ensure the safety and security of the U.S. air traffic control system and to maintain the competitiveness of the U.S. aeronautics industry.

The Committee urges the Administration to increase coordination between the FAA’s Office of Commercial Space Transportation and the U.S. Air Force regarding

streamlining safety regulations for launch site operations. U.S. commercial launch providers face significant challenges from international competition. The U.S. government must develop policies and procedures that promote and encourage this key industry.

Department of Commerce – Office of Space Commercialization

The Committee urges continued funding of this office, which has played a useful role in promoting the commercialization of space, working with private industry, and making the best use of the Global Positioning System. P.L. 106-405 authorizes \$626,000 for the Office in FY03.