

NSF Update: ARRA & Budget

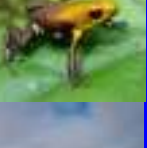
Advisory Committee for Biological Sciences

James P. Collins

Assistant Director for Biological Sciences

National Science Foundation

29 April 2009



➤ Science Priorities

A Time of Change

➤ Impacts on NSF Budget

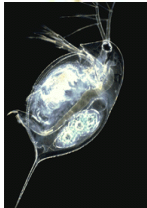
A Time of Opportunity

➤ Biological Sciences at NSF

A shifting Landscape of Ideas

➤ Managing the Biological Sciences at NSF

Sustaining Innovation



Executive Office of the President
Office of Management and Budget

Where we were..... Previous Administration



Executive Office of the President
Office of Science and Technology Policy

Priorities

August 14, 2007

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: JOHN H. MARBURGER, III *John Marburger*
DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

STEPHEN S. MCMILLIN *Steph S. McMillin*
ACTING DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

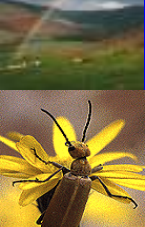
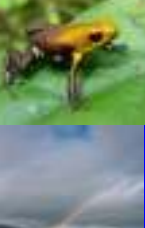
SUBJECT: **FY 2009 Administration Research and Development Budget Priorities**

We have updated the Administration's research and development (R&D) priorities, which reflect input from both the President's Council of Advisors on Science and Technology (PCAST) and the National Science and Technology Council (NSTC). We also emphasize improving management and performance to maintain excellence and leadership in science and technology. The sections that follow:

- highlight the President's American Competitiveness Initiative;
- provide general guidance for setting priorities for agency R&D programs;
- identify interagency R&D efforts that should receive special focus in agency budget requests;
- reiterate the R&D Investment Criteria that agencies should use to improve investment, and for decisions about and management of their R&D programs.

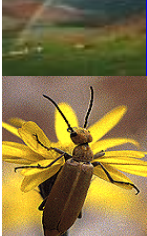
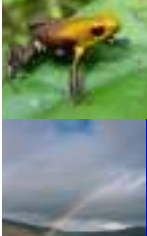
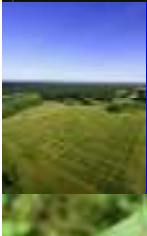
Presidential Priority: American Competitiveness Initiative

The President is committed to the success of the American Competitiveness Initiative (ACI) announced in his 2006 State of the Union address. The ACI doubles investment over 10 years in key Federal agencies supporting basic research in the physical sciences and engineering.



America COMPETES Act

- **Signed into law on August 9, 2007**
 - Doubles authorized NSF Funding from \$5.6 billion in FY2006 to \$11.2 billion in FY 2011
- **Focuses on three primary areas of importance:**
 - Increasing research investment;
 - Strengthening educational opportunities in science, technology, engineering, and mathematics from elementary through graduate school;
 - Developing an innovation infrastructure.



New Faces in Town

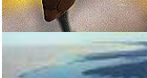


New Priorities for Science



Energy/Environment

“Of all the challenges we face as a nation and as a planet, none is as pressing as the three-pronged challenge of climate change, sustainable development and the need to foster new and cleaner sources of energy.” Office Science Technology and Policy



Policy Shifts

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release March 9, 2009

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

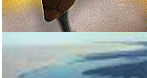
SUBJECT: Scientific Integrity

Science and the scientific process must inform and guide decisions of my Administration on a wide range of issues, including improvement of public health, protection of the environment, increased efficiency in the use of energy and other resources, mitigation of the threat of climate change, and protection of national security.

The public must be able to trust the science and scientific process informing public policy decisions. Political officials should not suppress or alter scientific or technological findings and conclusions. If scientific and technological information is developed and used by the Federal Government, it should ordinarily be made available to the public. To the extent permitted by law, there should be transparency in the preparation, identification, and use of scientific and technological information in policymaking. The selection of scientists and technology professionals for positions in the executive branch should be based on their scientific and technological knowledge, credentials, experience, and integrity.

By this memorandum, I assign to the Director of the Office of Science and Technology Policy (Director) the responsibility for ensuring the highest level of integrity in all aspects of the executive branch's involvement with scientific and technological processes. The Director shall confer, as appropriate, with the heads of executive departments and agencies, including the Office of Management and Budget and offices and agencies within the Executive Office of the President (collectively, the "agencies"), and recommend a plan to achieve that goal throughout the executive branch.

Specifically, I direct the following:



Policy Shifts

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Office of the Press Secretary

For Immediate Release March 9, 2009

EXECUTIVE ORDER

REMOVING BARRIERS TO RESPONSIBLE SCIENTIFIC RESEARCH INVOLVING HUMAN STEM CELLS

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1. Policy. Research involving human embryonic stem cells and human non-embryonic stem cells has the potential to lead to better understanding and treatment of many disabling diseases and conditions. Advances over the past decade in this promising scientific field have been encouraging, leading to broad agreement in the scientific community that the research should be supported by Federal funds.

For the past 8 years, the authority of the Department of Health and Human Services, including the National Institutes of Health (NIH), to fund and conduct human embryonic stem cell research has been limited by Presidential actions. The purpose of this order is to remove these limitations on scientific inquiry, to expand NIH support for the exploration of human stem cell research, and in so doing to enhance the contribution of America's scientists to important new discoveries and new therapies for the benefit of humankind.

Sec. 2. Research. The Secretary of Health and Human Services (Secretary), through the Director of NIH, may support and conduct responsible, scientifically worthy human stem cell research, including human embryonic stem cell research, to the extent permitted by law.

Sec. 3. Guidance. Within 120 days from the date of this order, the Secretary, through the Director of NIH, shall review existing NIH guidance and other widely recognized guidelines on



Policy Shifts

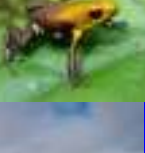
Monday, April 27th, 2009 at 2:15 pm
The Necessity of Science



download [.mp4 \(407.6 MB\)](#) | also available [here](#) | read the [transcript](#)

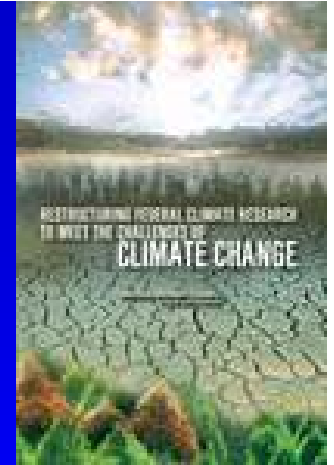
[Speaking at the National Academy of Sciences](#), the President paid due tribute to the wonder, history, and inspiration of science in America. But he also made the connection between science and the news being discussed all across America right now to make clear that science is no afterthought or hobby:

At such a difficult moment, there are those who say we cannot afford to invest in science.



NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES :

RESTRUCTURING FEDERAL CLIMATE RESEARCH TO MEET THE CHALLENGES OF CLIMATE CHANGE



- Reorganize the program around integrated scientific-societal issues to facilitate crosscutting research focused on understanding the interactions among the climate, human, and environmental systems and on supporting societal responses to climate change.
- Establish a U.S. climate observing system, defined as including physical, biological, and social observations, to ensure that data needed to address climate change are collected or continued.
- Develop the science base and infrastructure to support a new generation of coupled Earth system models
- Strengthen research on adaptation, mitigation, and vulnerability.



National Science Board

Building a Sustainable Energy Future

April 10, 2009 DRAFT FOR PUBLIC COMMENT

Priority Guidance: The National Science Foundation should continue to increase emphasis on innovation in sustainable energy technologies and education as a top priority.

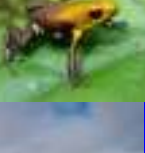


the Board offers the following specific guidance to NSF:

“Strengthen systems approaches in research programs”

“Develop and strengthen interdisciplinary “systems” approaches for research programs in the natural and social sciences that focus on environmental, social, and economic issues fundamental to the future energy economy.”





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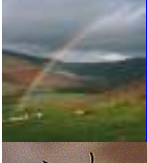
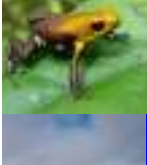
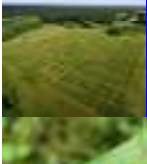
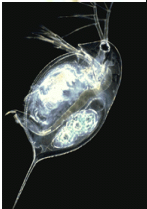
A shifting Landscape of Ideas

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Congress Passes FY09 Omnibus Bill



Account	FY08 Current Plan	FY09 Request	FY09 Final
Research and Related Activities Emergency Appropriations	\$4,821.47 22.50	\$5,593.99	\$5,183.10
Education and Human Resources Emergency Appropriations	725.60 40.00	790.41	845.26
Major Research Equipment and Facilities Construction	220.74	147.51	152.01
Agency Operations and Award Management	281.79	305.06	294.00
National Science Board	3.97	4.03	4.03
Office of Inspector General	11.43	13.10	12.00
Total	\$ 6,094.50	\$ 6,854.10	\$ 6,490.40
Rescission	-33.00		
<i>To compare, rescission and FY08 supp. not included</i>	\$6,065.00		+7% over FY08



American Recovery & Reinvestment Act

The Recovery Act supplements NSF fiscal year 2009 funding by \$3.0 billion!

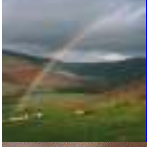
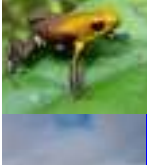
\$2B for R&RA:

NSF is planning to use the majority of the \$2 billion available in Research and Related Activities for proposals that are already in house and will be reviewed and/or awarded prior to September 30, 2009.

\$1B specified for:

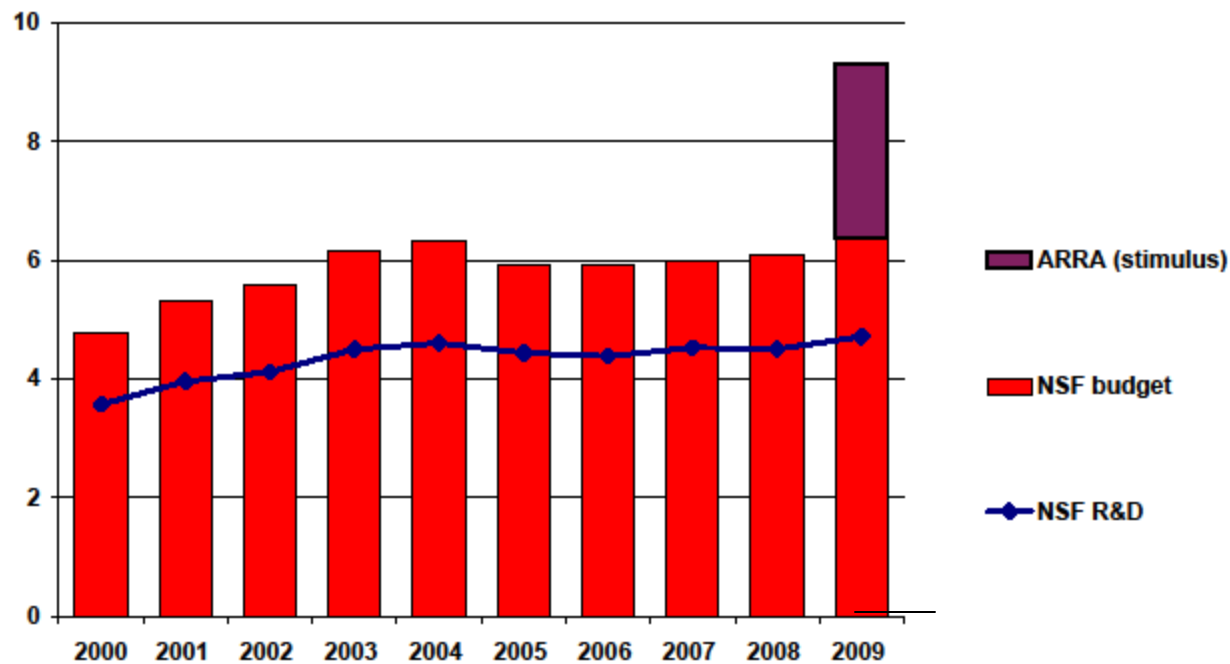
Math and Science Partnership program (\$25 M);
Robert Noyce Teacher Scholarship Program (\$60 M);
Science Masters program (\$15 M)

Academic Research Infrastructure program (\$200 M)
Major Research Instrumentation Program (\$300 M)
Major Research Equipment and Facilities Construction Account (\$400 M)



A Good Year

National Science Foundation Budget, FY 2000-2009 (as of 2/09) *
(budget authority in billions of constant FY 2008 dollars)



Source: National Science Foundation, AAAS, and latest AAAS estimates of FY 2009 appropriations. Includes supplemental (stimulus appropriations) in Public Law 111-5. FY 2009 NSF R&D line excludes stimulus R&D.
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February 26, 2009 The White House www.whitehouse.gov/omb

National Science Foundation budget requests \$7.0 billion for fiscal year 2010

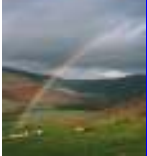
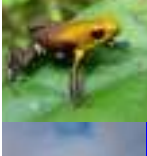
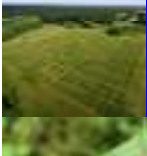
Improve American Competitiveness through investments in science and technology to foster economic growth; improve the quality of life; and strengthen our national security.

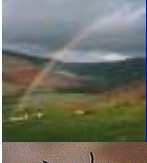
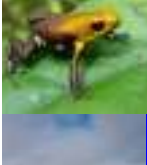
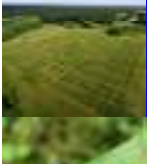
Support researchers at the beginning of their careers through NSF's Graduate Research Fellowship and Faculty Early Career Development programs.

Educate science and engineering technicians through the Advanced Technological Education program, which focuses on two-year colleges

Encourage promising high-risk research that could fundamentally alter our understanding of nature, revolutionize fields of science and lead to radically new technologies.

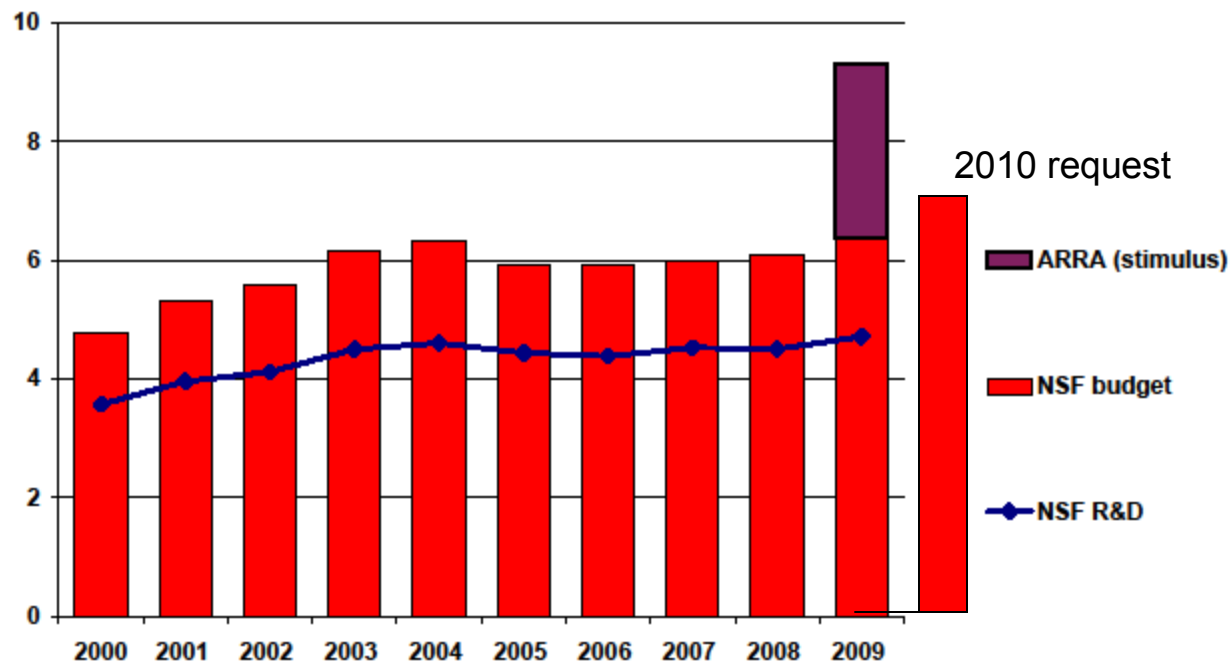
Make climate change research and education a priority. To predict future environmental conditions and to develop strategies for responding to global environmental change. Establish a climate change education program to help develop the next generation of environmentally engaged scientists and engineers.





Back on the Doubling Track

National Science Foundation Budget, FY 2000-2009 (as of 2/09) *
(budget authority in billions of constant FY 2008 dollars)



Source: National Science Foundation, AAAS, and latest AAAS estimates of FY 2009 appropriations. Includes supplemental (stimulus appropriations) in Public Law 111-5. FY 2009 NSF R&D line excludes stimulus R&D.
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Pasteur's Quadrant

Consideration of Use

NO

YES

Donald E. Stokes
Brookings Institute

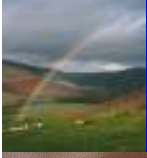
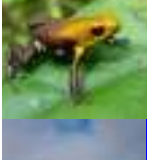
Pure Basic Research (<i>Bohr</i>)	Use-inspired Basic Research (<i>Pasteur</i>)
Environment Energy	
Exploration & Description (<i>Peterson's Field Guides</i>)	Pure Applied Research (<i>Edison</i>)

YES

**Quest for
Fundamental
Understanding**

NO

**Pure basic and use-inspired basic research
are consistent with NSF core values and
evolving practice**



unknown

RISK

known

Research to anticipate and reduce the impact of "surprises"

Precautionary actions to reduce potential risks

Actions to reduce known risks

Use-Inspired Research

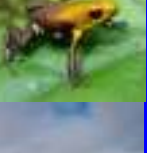
Informs Policy Actions

certain

uncertain

IMPACT

Based on: *Late Lessons from Early Warnings*, European Environment Agency 2001



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Where discoveries begin