Introduction and NSF Overview

NSF Regional Grants Conference

April 4 - 5, 2005

Oakland, CA

Hosted by: MESA, University of California Office of the President

Main Topics

- Origins of NSF
- The National Science Foundation
- FY 2005 Federal Budget
- The NSF FY 2006 Budget Request
  - NSF Initiatives
- Current Proposal, Award and Funding Trends

Origins of NSF

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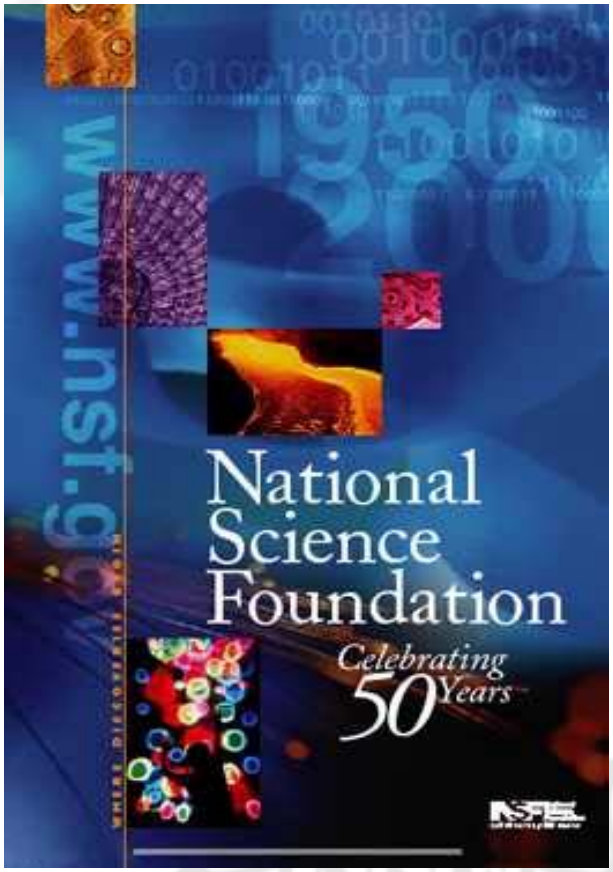
- "The Government should accept new responsibilities for promoting the flow of scientific knowledge and the development of scientific talent in our youth."
  - Science, The Endless Frontier, 1945
- 1947: Congress Approves, Truman Vetoes: Agencies created in the meantime
- 1950: Compromise Bill Approved & Signed by Truman



NSF Act of 1950

- “To promote the progress of science...”
- NSB (24) and 1 Director, appointed by the President
- Encourage & develop a national policy for the promotion of basic research and education in the math, physical, medical,biological, engineering and other sciences
- Initiate & support basic scientific research in the sciences
- Evaluate the science research programs undertaken by agencies of the Federal government
- Provide information for S&E policy formation

NSF Vision

Enabling the nation's future through discovery, learning and innovation.

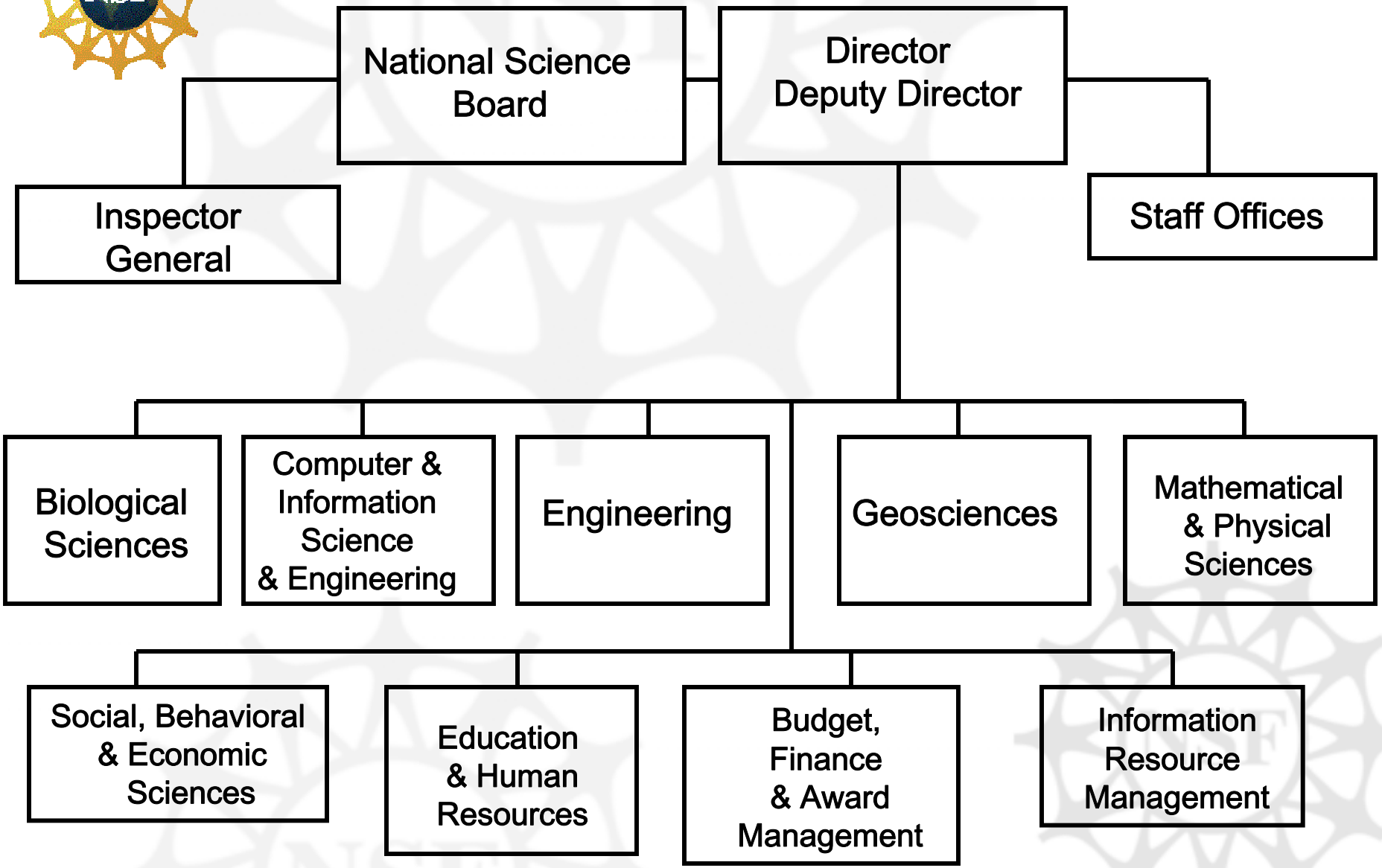
NSF in a Nutshell

- Independent Agency
- Supports basic research & education
- Uses grant mechanism
- Low overhead; highly automated
- Discipline-based structure
- Cross-disciplinary mechanisms
- Use of Rotators/IPAs
- National Science Board

National Science Board (NSB)

- 24 members + Director; President appoints; Senate confirms
- 6 year terms; rotation every 2 years at May NSB meeting
- Authority to make awards delegated through NSB to Director and flows down to grant and contract officers

National Science Foundation



NSF: Recent Personnel Changes

- Arden Bement appointed as NSF Director in November 2004
- David Lightfoot named Assistant Director of Social, Behavioral and Economic Sciences (SBE) – will begin in June 2005. Currently Dean of Georgetown University's Graduate School for Arts and Sciences
- Two Assistant Director recruitments active: Education and Human Resources (EHR), and Biological Sciences (BIO)
- Office on International Science & Engineering moved to the Office of the Director; Office Head recruitment ongoing

NSF: Recent Personnel Changes (Cont'd)

- Budget, Finance and Award Management Realignment
  - Mary Santonastasso heads up the newly formed Division of Institution & Award Support
  - Gerry Glaser is the new director of the Division of Grants & Agreements
  - Donna Fortunat heads up the newly formed Division of Contracts & Complex Agreements

NSF: Special Responsibilities

- Polar Programs
  - U.S. Antarctic Program
- Science Resources Statistics
  - Data collection and analysis
  - Science and Engineering Indicators
- International (close cooperation with the Department of State)

NSF by the Numbers

$5.61B	FY 2006 Budget Request
4%	NSF share of total annual Federal spending for research and development
50%	NSF share of Federal funding for non-medical basic research at academic institutions
44,000	Proposals evaluated in FY 2004 through a competitive process of merit review
10,400	New awards funded in FY 2004

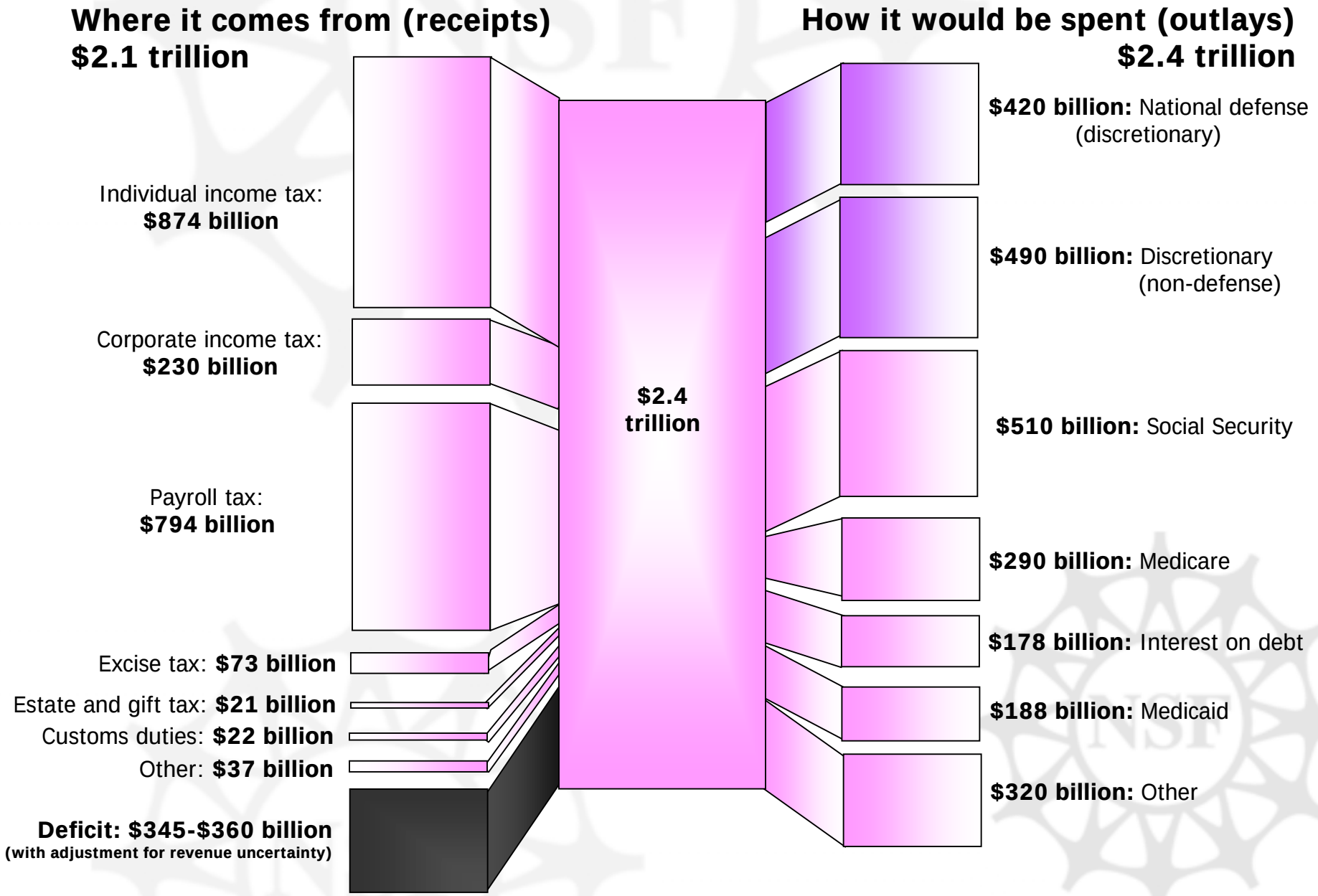
NSF by the Numbers (cont'd)

50,000	Scientists & engineers who evaluate proposals for NSF each year
200,000	Proposal reviews done each year
40,000	Students supported by NSF Graduate Research Fellowships since 1952
216,000	People (researchers, postdoctoral fellows, trainees, students) NSF directly supports

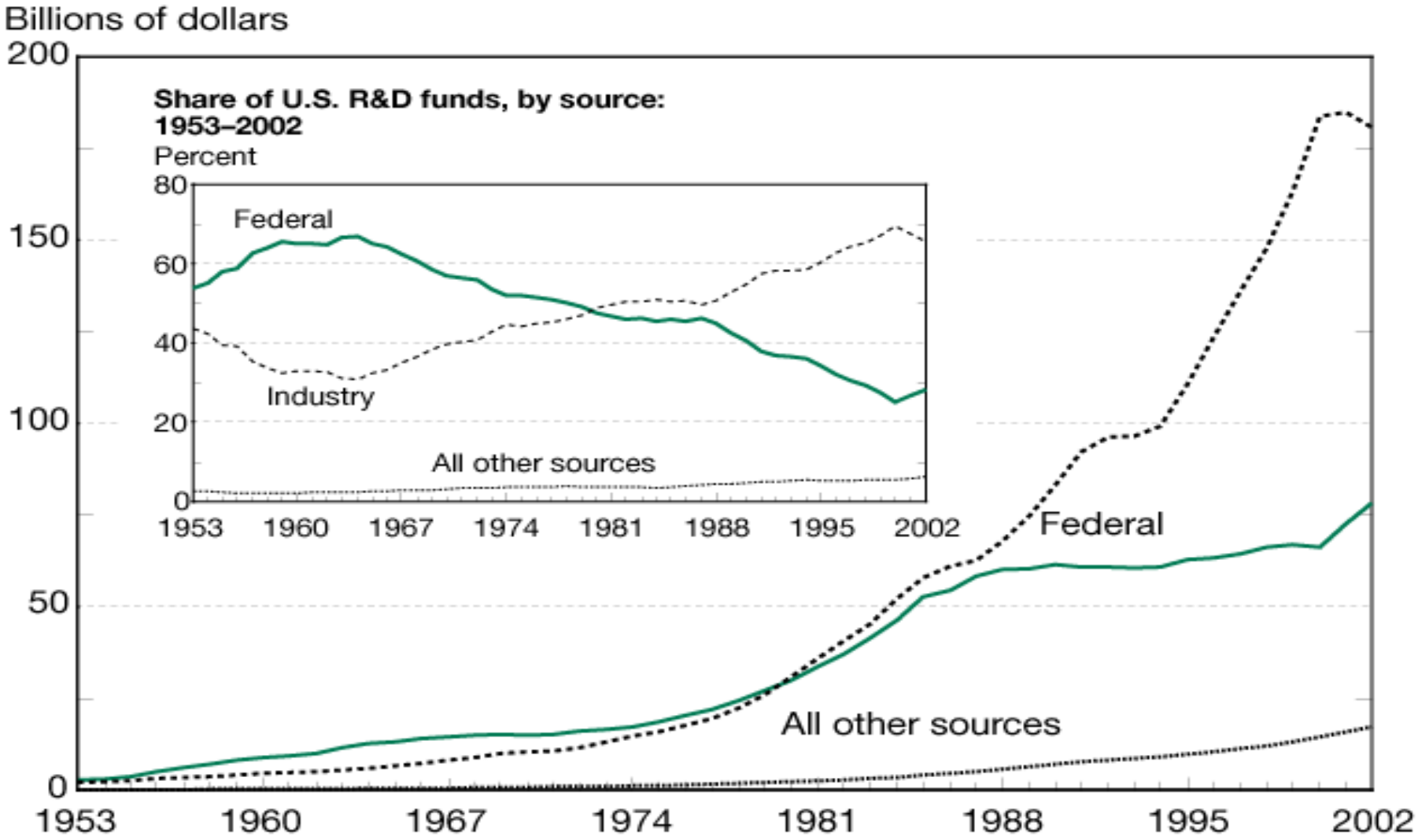
FY 2005 Federal Budget

Spending America's Income

Broad revenue and spending categories in President Bush's fiscal 2005 budget:

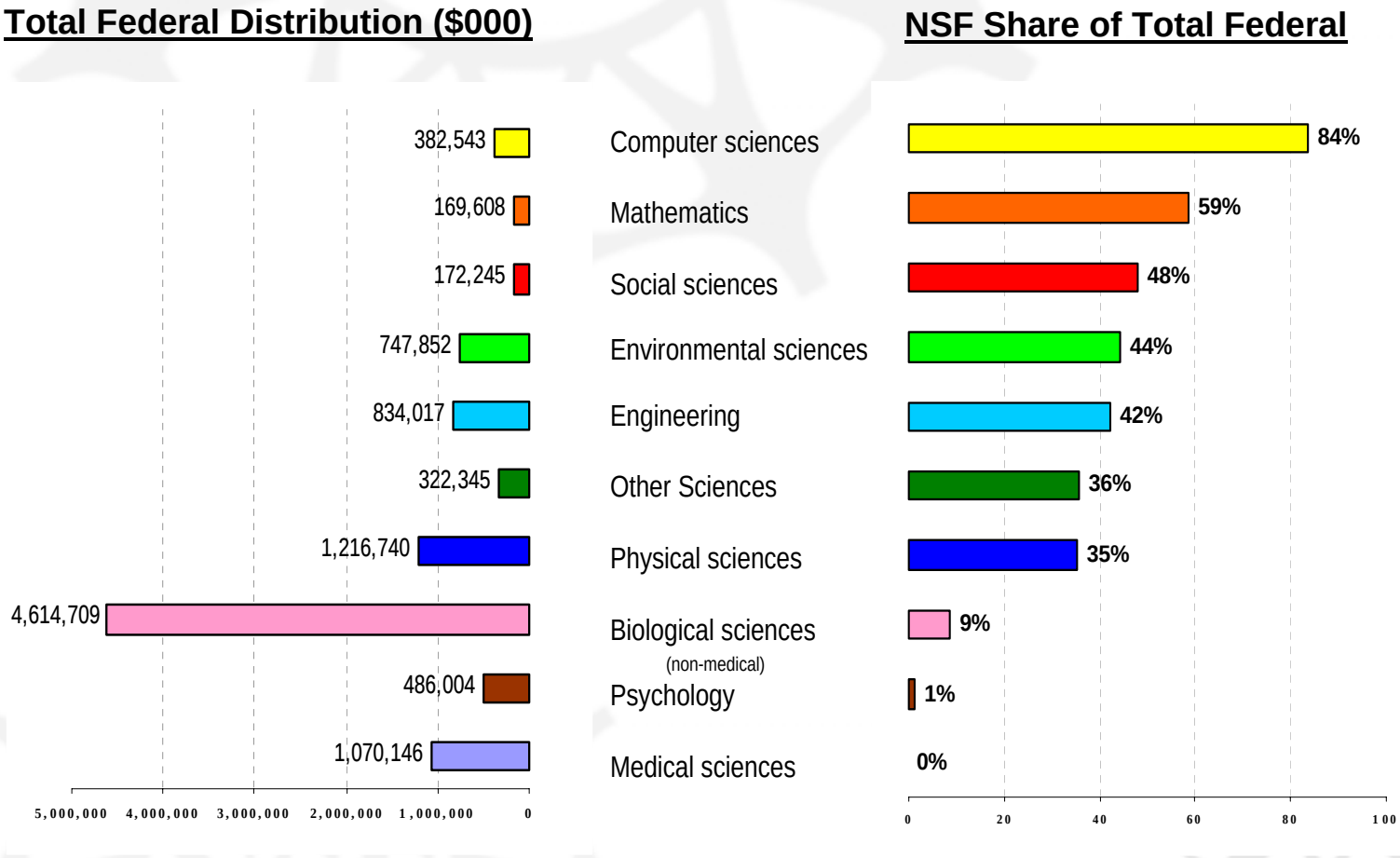


U.S. R&D, by source of funds: 1953–2002



NOTE: Other sources include nonprofit, academic, and non-Federal government.

Federal Obligations for Basic Research at Academic Institutions, FY 2002



The NSF FY 2006 Budget

NSF FY 2006 Request by Account
(Dollars in Millions)

	FY 2005 Current	FY 2006 Request	Amount Change	Percent Change
Research & Related Activities	$4,220.55	$4,333.49	$112.94	2.7%
Major Research Equipment & Facilities Construction	173.65	250.01	76.36	44.0%
Education & Human Resources	841.42	737	-104.42	-12.4%
Salaries & Expenses	223.20	269.00	45.8	20.5%
National Science Board	3.97	4	0.03	0.8%
Office of Inspector General	10.03	11.5	1.47	14.7%
Total, NSF	$5,472.82	$5,605.00	$132.18	2.4%

NSF FY 2006 Research & Related Activities Request by Directorates (Dollars in Millions)

	FY 2005 Current	FY 2006 Request	Amount Change	Percent Change
Biological Sciences	$576.61	$581.79	$5.18	0.9%
Computer & Information Science & Engineering	613.72	620.56	6.84	1.1%
Engineering	561.3	580.68	19.38	3.5%
Geosciences	694.16	709.1	14.94	2.2%
Mathematical & Physical Sciences	1,069.86	1086.23	16.37	1.5%
Social, Behavioral & Economic Sciences	196.9	198.79	1.89	1.0%
Office of International Science & Engineering	33.73	34.51	0.78	2.3%
U.S. Polar Research Programs	276.84	319.41	42.57	15.4%
U.S. Antarctic Logistical Support Activities	67.52	67.52	0	0.0%
Integrative Activities	129.91	134.9	4.99	3.8%
Total, R&RA	$4,220.55	$4,333.49	$112.94	2.7%

NSF Priority Areas

Biocomplexity in the Environment

http://www.nsf.gov/news/priority_areas/biocomplexity/index.jsp

Fiscal year 2005 priorities include:

- Understand the dynamics of coupled natural and human systems on a wide range of scales
- Design and synthesis of new materials with environmentally benign impacts on biocomplex systems and maximize efficient use of individual materials throughout their life cycles
- Use of genomic and information-technology approaches to gain novel insights into environmental questions and problems
- Genomic sequencing of microorganisms of fundamental biological interest; importance to agriculture, forestry, food and water quality; and value in understanding transmission of infectious agents
- Innovative approaches to education about complexity in environmental systems

Human & Social Dynamics

http://www.nsf.gov/news/priority_areas/humansocial/index.jsp

Fiscal Year 2005 priorities include:

- **Agents of change** – focusing on large-scale changes in humanity and society in areas such as industrial globalization and disease epidemics, and how we influence technological change

- **Dynamics of human behavior** – applying state-of-the-art methods and cross-disciplinary approaches to better understand the dynamics that influence human behavior and action

- **Decision-making and risk** – improving decision-making in an uncertain world by studying risk perception and response to stimuli such as hazards and extreme events and the role of educational systems in that response

Mathematical Sciences

http://www.nsf.gov/news/priority_areas/mathematics/index.jsp

Fiscal Year 2005 priorities include:

- Fundamental research in areas such as dynamic systems and partial differential equations, geometry and topology, probability, number theory, algebraic and quantum structures, the mathematics of computation, statistics and multi-scale and multi-resolution analysis
- Development of new analytical, statistical, computational and experimental tools to tackle a broad range of scientific and technological challenges long considered intractable.
- Advancement of mathematical sciences education, including the introduction of new ideas across the K-16 spectrum and research on how mathematics is learned, particularly in light of new learning technologies and emerging mathematical fields

Nanoscale Science & Engineering

http://www.nsf.gov/news/priority_areas/nano/index.jsp

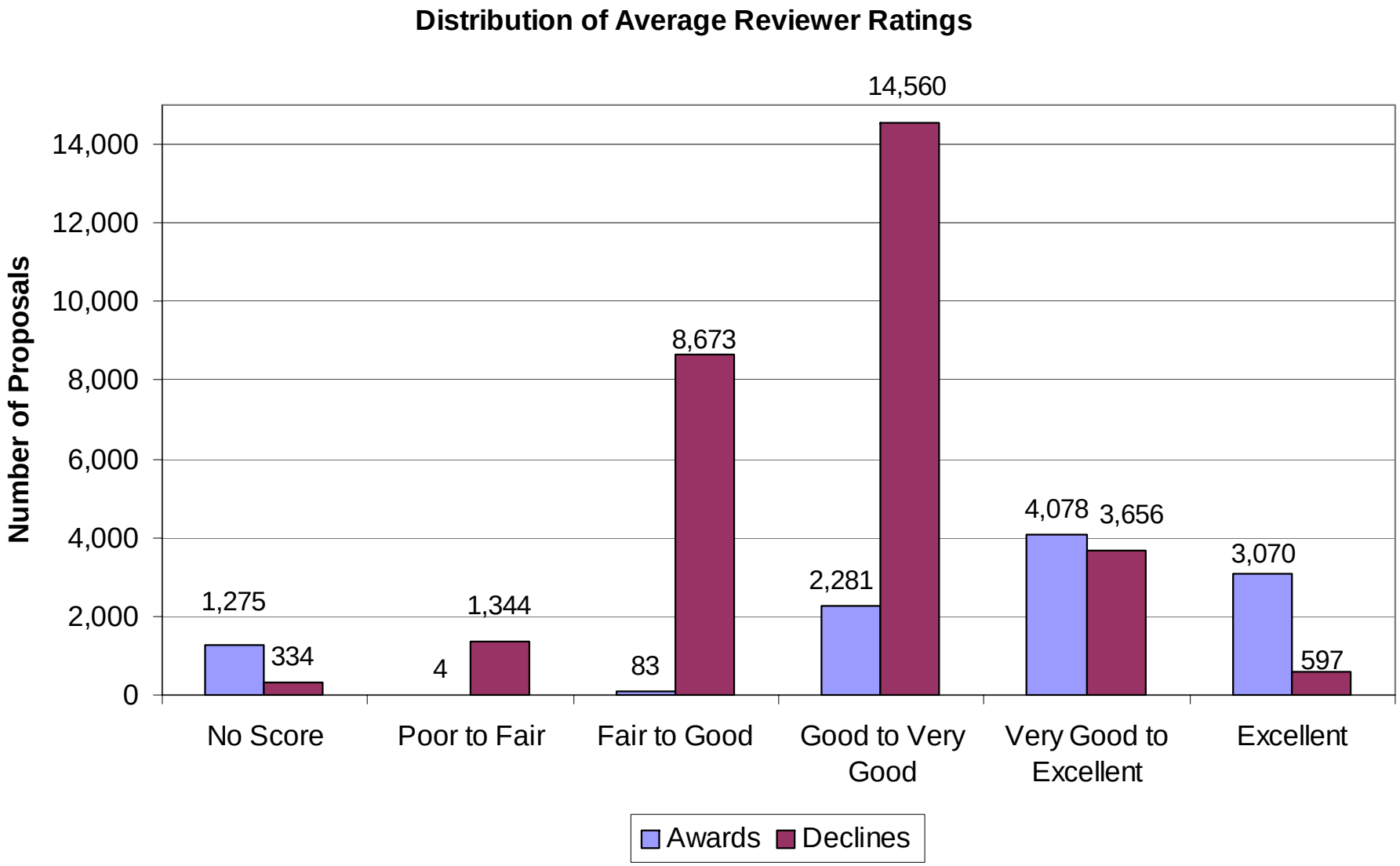
Fiscal Year 2005 priorities include:

- **Manufacturing** - Research enabling the nanoscale as the most efficient manufacturing domain, including fabrication of nanostructured materials, nanosystems and nanoscale catalysts
- **Human performance** - Nanobiotechnology and nanobiology for improving human performance
- **Nanoscale phenomena** - Discovery, understanding and potential application of phenomena specific to the nanoscale
- **New instrumentation and standards** - Development of new instrumentation and standards, particularly for imaging, characterization and manipulation of materials and systems in three dimensions at the nanoscale
- **Education and training** - Education and training of a new generation for future industries, including high school, undergraduate, graduate and informal education
- **National Nanotechnology Infrastructure Network (NNIN)** - For user facilities, development of new instrumentation and training

Current Proposal, Award and Funding Trends

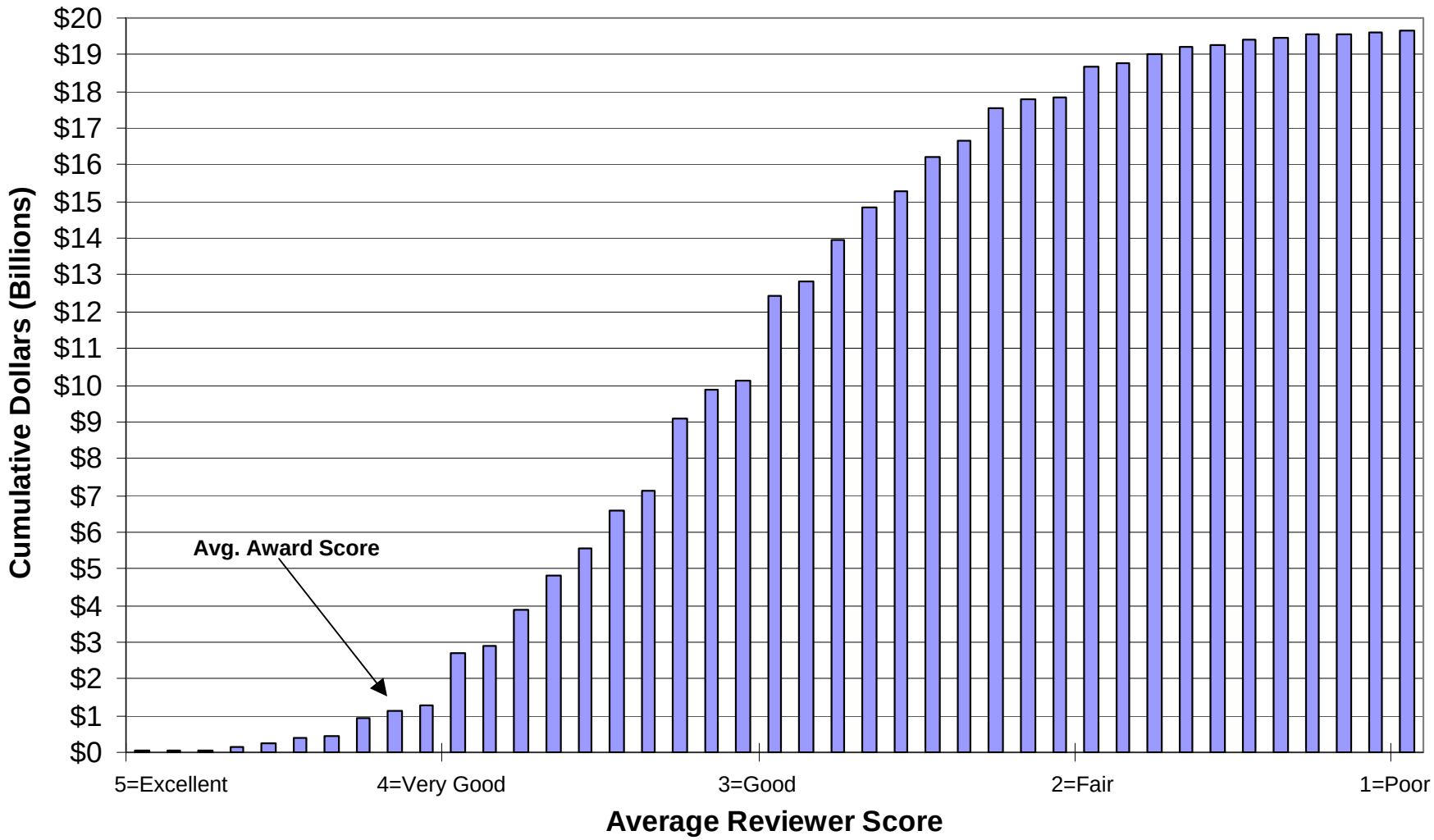
NSF Recent Trends - FY 2000 to FY 2004

	FY00	FY01	FY02	FY03	FY04	Change from FY00 to FY04
Budget Obligations (Millions of Dollars)	$3,948	$4,532	$4,774	$5,369	$5,656	43%
Admin & Mgmt	$189	$214	$231	$251	$291	54%
# of Employees	1,200	1,220	1,242	1,244	1,301	8%
# of Competitive Proposals	29,508	31,942	35,164	40,075	$43,759	48%
# of Competitive Awards	9,850	9,925	10,406	10,844	$10,380	5%
Aver. Annual Res. Grant Size	$105,800	$113,601	$115,666	$135,609	$139,000	31%
Aver. Research Grant Duration (years)	2.8	2.9	2.9	2.9	2.9	4%

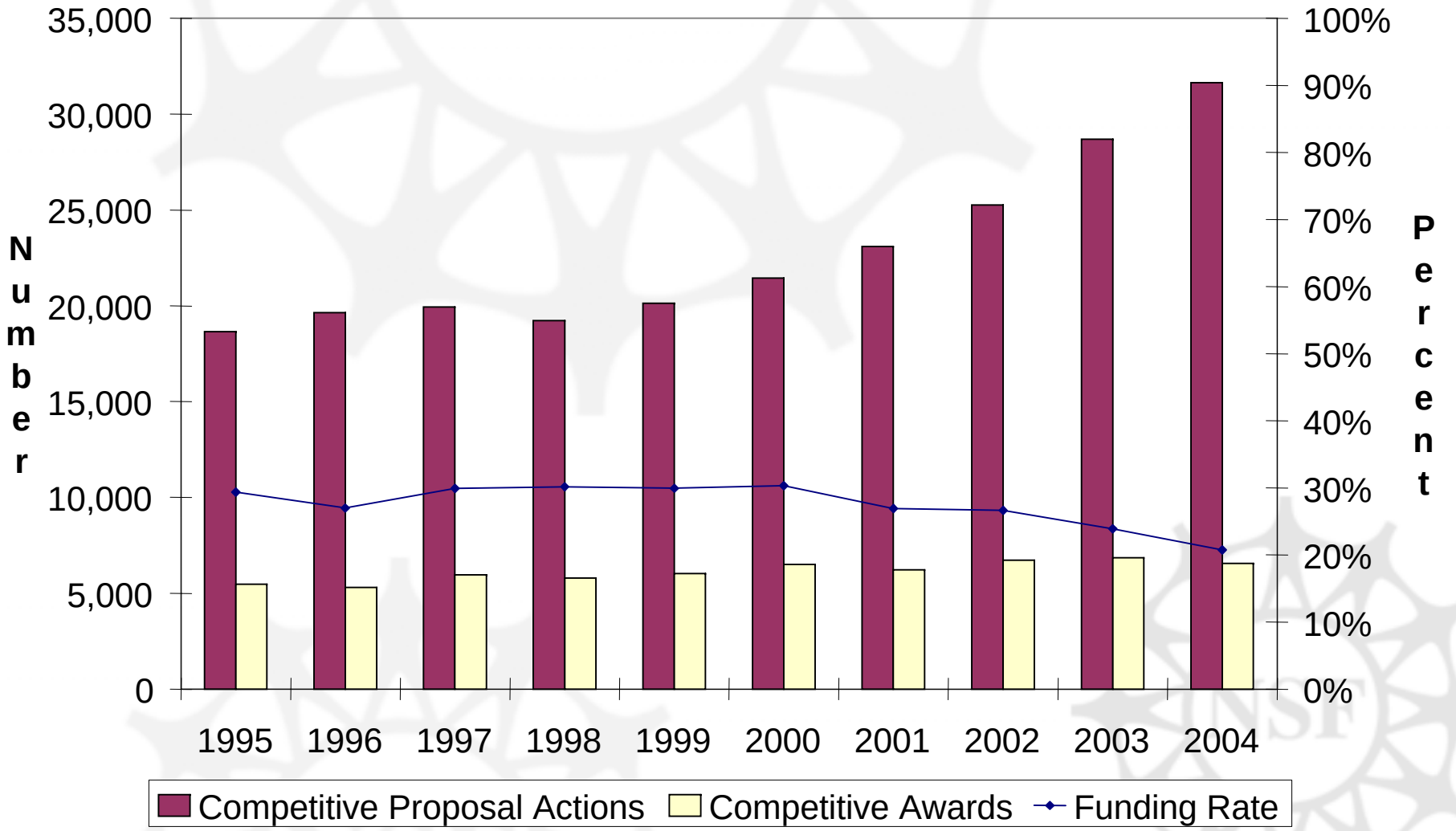


Number of FY 2003 Proposals – 29,164 Declines, 10,791 Awards

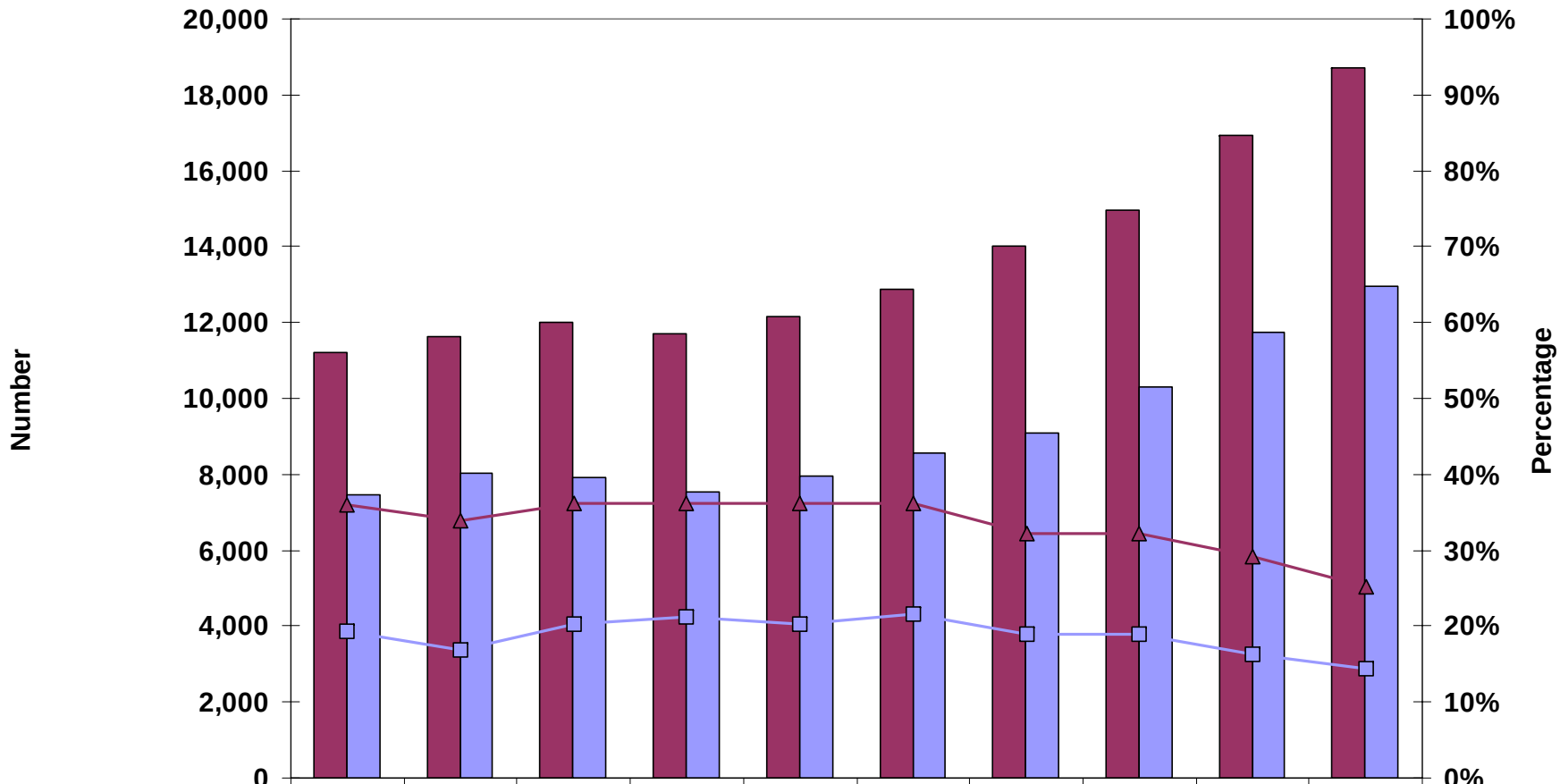
Cumulative Requested Amounts for Declined Proposals by Average Reviewer Score for FY 2003



NSF Funding Rate for Competitive Awards - Competitive Research Grants

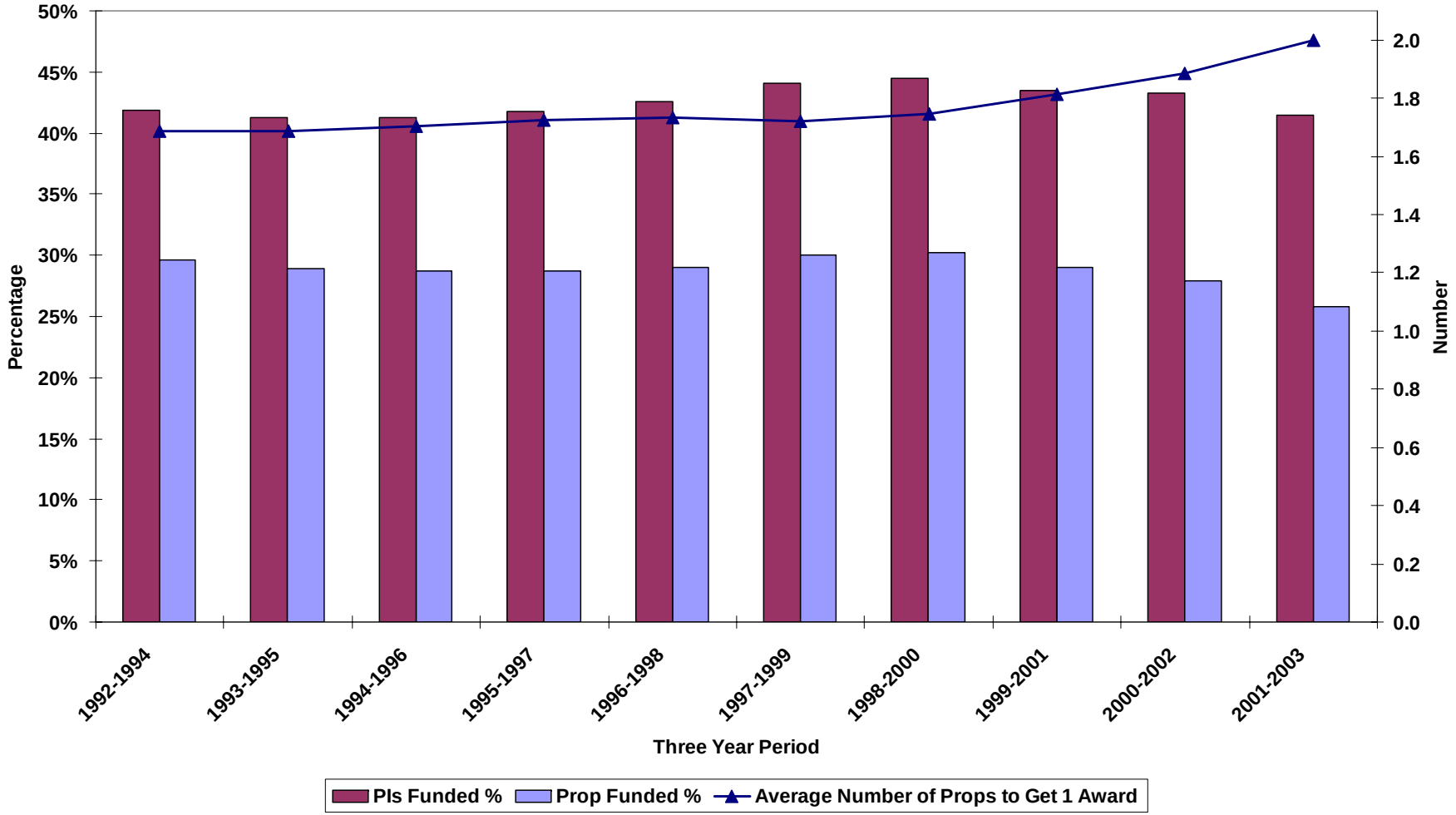


Research Grant Proposals by PI Type

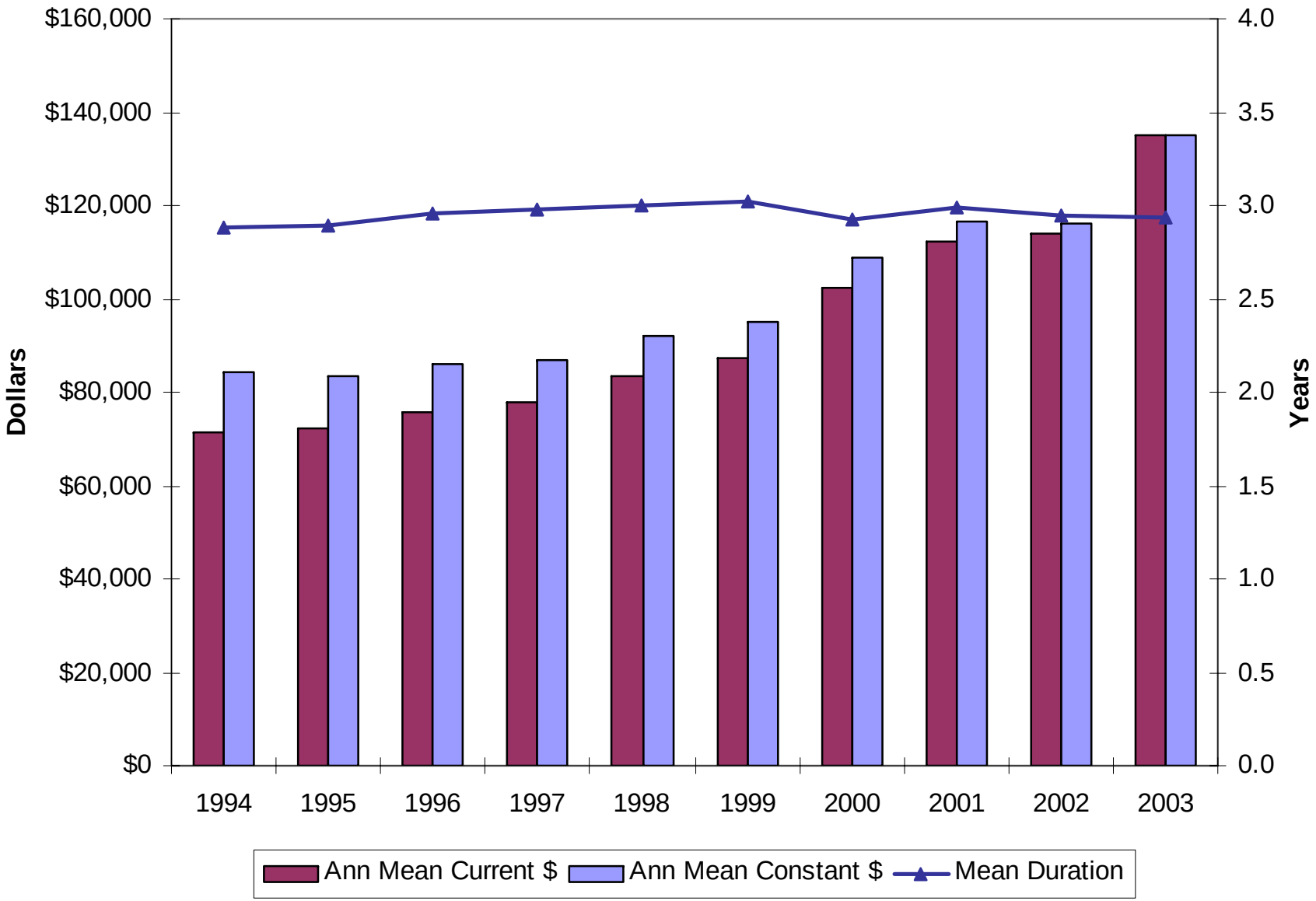


	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Proposals - Prior PI	11,203	11,635	12,026	11,693	12,172	12,885	14,013	14,965	16,944	18,700
Proposals - New PI	7,446	8,013	7,910	7,526	7,951	8,561	9,084	10,286	11,752	12,941
Funding Rate - Prior PI	36%	34%	36%	36%	36%	36%	32%	32%	29%	25%
Funding Rate - New PI	19%	17%	20%	21%	20%	22%	19%	19%	16%	14%

PI vs Proposal Funding Rate - Research Grants
Based on 3 Year Intervals



NSF Competitive Award Size and Duration - Research Grants



*Based on estimated 2002-2003 GDP Deflators

Key Documents

- FY 2005 Federal Budget
  - http://www.whitehouse.gov/omb/budget/fy2005/
- FY 2006 NSF Budget Request
  - http://www.nsf.gov/about/fy06/
- Grant Proposal Guide (NSF 04-23)
  - http://www.nsf.gov/publications/pub_summ.jsp?ods_key=GPG
- Science and Engineering Indicators
  - http://www.nsf.gov/sbe/srs/seind04/start.htm
- When in doubt –
  - http://www.nsf.gov/