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Report to the National Science Board  
on the  
National Science Foundation's  
Merit Review Process  
Fiscal Year 2007



June 2008

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# FY 2007 Report on the NSF Merit Review Process

## I. Executive Summary

This annual report to the National Science Board includes data on proposals and awards and other pertinent information, as well as descriptions of special activities that NSF has undertaken in support of the merit review process. Longitudinal data are given to provide a long-term perspective.

In FY 2007, NSF received a total of 44,577 proposals, the highest number of proposals to date. This is a 5 percent increase over the number of proposals received in FY 2006 and a 50 percent increase from the 29,508 received in FY 2000.

The Foundation made 11,463 awards in FY 2007 resulting in a 26 percent proposal funding rate. The current funding rate is a significant decrease from the FY 2000 funding rate of 33 percent, but the current rate has been approximately unchanged over the last five years. However, as indicated by data in Appendix 1, the average funding rate varies by NSF Directorate. Although not included in this report, there is an even greater variation of funding rate by program.

The average annualized research award size was \$146,270 in FY 2007, which continues the gradual annual increase in award size that was interrupted in FY 2006 with a drop to \$134,565. The average award duration remains approximately three years.

The Foundation continues to exceed its “time to decision” goal of informing at least 70 percent of Principal Investigators (PIs) of funding decisions within six months of receipt of the proposal. In FY 2007, 77 percent of all proposals were processed within six months.

In FY 2007, NSF completed the Impact of Proposal and Award Management Mechanisms (IPAMM) study of the trends, impacts, and causal factors associated with the recent declines in proposal funding rates and the simultaneous increases in proposal submissions. An update on this study is included in Section V. Also, as a result of the study several graphs have been added to this report to provide longitudinal information relative to PI submissions. These data, which are provided in Section III-E, show that about 14 percent of investigators submit four or more proposals during a three year period and on average, an investigator submits 2.2 proposals before receiving an award. The funding rates for PIs (number of awards received by an investigator divided by the number of submissions from that investigator) have decreased from 43 percent in FY 2000-02 to 36 percent in FY 2005-07.

In March 2007, the National Science Board released its report *Enhancing Support of Transformative Research at the National Science Foundation* (NSB-07-32), which provided recommendations to the Foundation for promoting transformative research. On September 24, 2007, NSF released an Important Notice regarding the support of potentially transformative research. The notice was sent to presidents of universities, colleges, and heads of other NSF awardee organizations. It announced a change in the

Intellectual Merit review criteria to include specific reference to potentially transformative research. Furthermore, NSF formed a working group responsible for developing a framework and implementation plan for new funding mechanisms to facilitate potentially transformative research. The working group is also charged to recommend policies and best practices that will facilitate potentially transformative and interdisciplinary research. Additional information on these activities is provided in Section V.

The National Science Board also conducted a review of the NSF merit review process. In the resulting September 2005 report to Congress, the Board concluded that the NSF merit review process is fair and effective, and “remains an international ‘gold standard’ for review of science and engineering research proposals.” The Board did provide several recommendations to improve the quality and transparency of the process. Section V provides an update on the activities the Foundation has undertaken in response to the Board recommendations.

## II. Introduction

The National Science Foundation Act of 1950 directs the Foundation "to initiate and support basic scientific research and programs to strengthen scientific research potential and science education programs at all levels."<sup>1</sup> NSF achieves its unique mission by making merit-based awards to researchers, educators, and students at approximately 1,900 U.S. colleges, universities and other institutions.

All proposals are evaluated using the two NSB approved criteria: *intellectual merit* and *broader impacts*. As stated in the *NSF Grant Proposal Guide*<sup>2</sup>, consideration is also given to how well the proposed activity 1) fosters the integration of research and education, and 2) broadens opportunities to include a diversity of participants, particularly from underrepresented groups. Additional criteria, as stated in the program announcement or solicitation, may be required to highlight the specific objectives of certain programs or activities. About 97 percent of NSF's proposals are evaluated by external reviewers as well as by NSF staff. The remaining proposals are internally reviewed only, such as Small Grants for Exploratory Research (see **Appendix 8**).

This *FY 2007 Report on the NSF Merit Review Process* responds to a National Science Board (NSB) policy endorsed in 1977 and amended in 1984, requesting that the NSF Director submit an annual report on the NSF merit review process. Section III of this report provides summary data about proposals, awards, and funding rates. Section IV provides information about the process by which proposals are reviewed and awarded. Section V provides information regarding special activities related to the merit review process; in particular, A) quality and transparency of the review process; B) impact of proposal and award management mechanisms; and C) potentially transformative and interdisciplinary research.

## III. Proposals and Awards

### A. Proposals, Awards and Funding Rates

During FY 2007, NSF received 44,577 proposals, as shown in **Figure 1**. This resulted in 11,463 awards for a funding rate of 26 percent. **Appendix 1** provides proposal, award, and funding rate data by NSF directorate and office.

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<sup>1</sup> 42 CFR 16 §1862, available at [http://www4.law.cornell.edu/uscode/html/uscode42/usc\\_sec\\_42\\_00001862----000-.html](http://www4.law.cornell.edu/uscode/html/uscode42/usc_sec_42_00001862----000-.html)

<sup>2</sup> NSF Grant Proposal Guide (GPG) available at: [http://www.nsf.gov/pubs/policydocs/pappguide/nsf08\\_1/gpg\\_index.jsp](http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_index.jsp)

**Figure 1**  
**NSF Proposal, Award, and Funding Rate Trends**

	2000	2001	2002	2003	2004	2005	2006	2007
<b>Proposals</b>	29,508	31,942	35,165	40,075	43,851	41,722	42,352	44,577
<b>Awards</b>	9,850	9,925	10,406	10,844	10,380	9,757	10,425	11,463
<b>Funding Rate</b>	33%	31%	30%	27%	24%	23%	25%	26%

Source: NSF Enterprise Information System 10/2/07.

In addition to the full proposals in Figure 1, NSF also received a total of 2,842 preliminary proposals, which are required for some NSF programs. See **Appendix 2** for additional data and information on preliminary proposals.

**Figure 2** provides data on proposal, award, and funding rates by PI characteristics (gender, minority status, new and prior PI status).

**Figure 2**  
**Proposals, Awards and Funding Rates**  
**By PI Characteristics**

		Fiscal Year							
		2000	2001	2002	2003	2004	2005	2006	2007
All PIs	Proposals	29,508	31,942	35,165	40,075	43,851	41,722	42,352	44,577
	Awards	9,850	9,925	10,406	10,844	10,380	9,757	10,425	11,463
	Funding Rate	33%	31%	30%	27%	24%	23%	25%	26%
Female PIs	Proposals	5,509	5,839	6,704	7,335	8,427	8,266	8,510	9,197
	Awards	1,949	1,894	2,012	2,090	2,118	2,107	2,233	2,493
	Funding Rate	35%	32%	30%	28%	25%	25%	26%	27%
Male PIs	Proposals	23,671	25,510	27,500	31,238	33,300	31,456	31,482	32,650
	Awards	7,778	7,867	8,203	8,495	7,923	7,305	7,765	8,451
	Funding Rate	33%	31%	30%	27%	24%	23%	25%	26%
Minority PIs	Proposals	1,480	1,728	1,906	2,141	2,551	2,468	2,608	2,798
	Awards	472	509	548	569	597	569	638	713
	Funding Rate	32%	29%	29%	27%	23%	23%	24%	25%
New PIs	Proposals	12,327	13,280	15,085	17,584	19,052	17,660	18,061	18,971
	Awards	3,024	3,136	3,329	3,390	3,256	3,001	3,240	3,660
	Funding Rate	25%	24%	22%	19%	17%	17%	18%	19%
Prior PIs	Proposals	17,181	18,662	20,080	22,511	24,799	24,062	24,294	25,606
	Awards	6,826	6,789	7,077	7,478	7,124	6,756	7,185	7,803
	Funding Rate	40%	36%	35%	33%	29%	28%	30%	30%
PIs with Disabilities	Proposals	402	409	466	494	525	454	434	448
	Awards	131	115	128	124	121	95	107	104
	Funding Rate	33%	28%	27%	25%	23%	21%	25%	23%

Source: NSF Enterprise Information System 10/2/07

Gender and minority status is based on self-reported information in proposals, with about 91 percent of PIs providing this information. Minority status includes American Indian, Alaska Native, Black, Hispanic, and Pacific Islander and excludes Asian and White-Not of Hispanic Origin. New principal investigators are PIs who have not previously been awarded an NSF grant. **Appendix 3** provides proposal, award, and funding rate information by minority PI status.

## B. Types of Awards

In general, NSF uses three kinds of funding mechanisms: grants, cooperative agreements, and contracts. Most of NSF's projects support or stimulate scientific and engineering research and education, and are funded using grants or cooperative agreements. A grant is the primary funding mechanism used by NSF. A grant can be funded as either a standard award (in which funding for the full duration of the project, generally 1-5 years, is awarded in a single fiscal year) or a continuing award (in which funding of a multi-year project is usually provided in annual increments). For continuing grants, the initial funding increment is accompanied by a statement of intent to continue funding the project in yearly increments (called "continuing grant increments" or CGIs)<sup>3</sup> until the project is completed. The continued funding is subject to NSF's judgment of satisfactory progress, availability of funds, and receipt and approval of required annual reports. Cooperative agreements are used when the project requires substantial agency involvement during the project performance period (e.g., research centers, multi-user facilities). Contracts are used to acquire products, services and studies (e.g., program evaluations) required primarily for NSF or other government use.

As shown below in **Figure 3**, in FY2007, NSF devoted 26 percent of its total budget to new standard grants and 14 percent to new continuing grants. The use of standard and continuing grants allows NSF flexibility in balancing current and future obligations.

**Figure 3**  
**Percentage of NSF Awards by Funding Mechanism**

CATEGORY	2002	2003	2004	2005	2006	2007
<b>Standard Grants</b>	27%	25%	25%	23%	25%	26%
<b>New Continuing</b>	16%	16%	14%	14%	13%	14%
<b>CGIs<sup>3</sup> and Supplements</b>	26%	26%	28%	29%	28%	26%
<b>Cooperative Agreements</b>	22%	25%	24%	24%	23%	22%
<b>Other*</b>	9%	9%	9%	10%	11%	11%

Source: NSF Enterprise Information System 10/2/07.

Percentages may not sum to 100 due to rounding.

\*Includes contracts, fellowships, interagency agreements, and IPA agreements.

<sup>3</sup> While the original award is a competitive action, the Continuing Grant Increment (CGI) is a non-competitive renewal grant. Continued incremental funding is based on NSF review of annual project reports and additional oversight mechanisms established by specific programs.

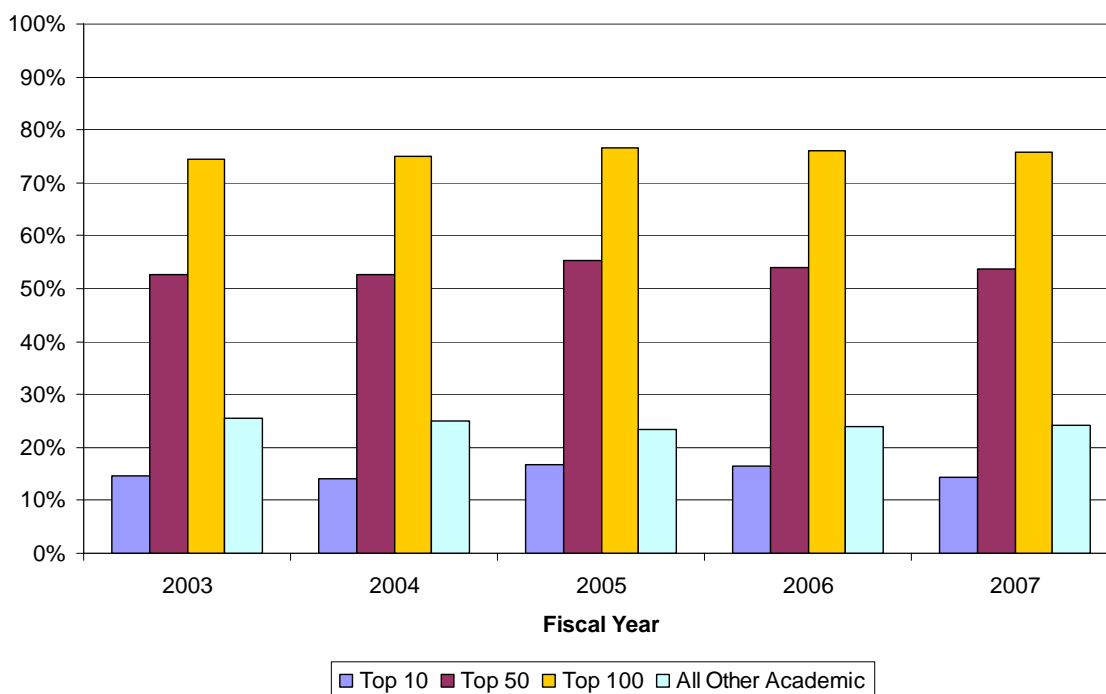


### C. Awards by Sector/Institution

In FY 2007, NSF awarded 76 percent of its budget to academic institutions, 15 percent to non-profit and other organizations, 7 percent to for-profit businesses, and 3 percent to Federal agencies and laboratories. This overall distribution of funds by type of organization has remained fairly constant over the past five years.

For **Figure 4**, academic institutions are categorized according to the proportion of NSF funding received (i.e. those receiving the largest proportion of NSF funding – the top 10, 50, and 100 academic institutions). An NSF performance goal for FY 2007 was to increase or maintain the percentage of proposals received from academic institutions not in the top 100 of NSF funding recipients.<sup>4</sup>

**Figure 4**  
**Percentage of Awards to Academic Institutions**  
**(By Proportion of Funds Received)**



Source: NSF Enterprise Information System 10/2/07.

The Foundation also tracks funding rates for different types of academic institutions. For FY 2007, the funding rate was 28 percent for the top 100 Ph.D. granting institutions according to the amount of FY 2007 funding received. In comparison, the rate was 18 percent for the Ph.D. granting institutions that are not in the top 100 NSF-funded category. The funding rates for two and four-year institutions were 21 percent and 26

<sup>4</sup> See NSF's FY 2007 Annual PART (Performance Assessment Rating Tool) Performance Goals, available on the web at [http://www.nsf.gov/about/performance/perf\\_goals07.pdf](http://www.nsf.gov/about/performance/perf_goals07.pdf).

percent, respectively for FY 2007. For minority-serving institutions, the FY 2007 funding rate was 20 percent.

The Foundation also promotes geographic diversity of the participants in its programs. For example, the mission of the Experimental Program to Stimulate Competitive Research (EPSCoR) is to assist the National Science Foundation in its statutory function “to strengthen research and education in science and engineering throughout the United States and to avoid undue concentration of such research and education.” The EPSCoR program was designed for those jurisdictions that have historically received lesser amounts of NSF Research and Development (R&D) funding. Twenty-five states, the Commonwealth of Puerto Rico and the U. S. Virgin Islands currently participate. **Appendix 7** has data on proposals, awards, and funding rates for the EPSCoR jurisdictions.

In the past year, NSF made a number of outreach presentations to diverse institutions across the country in an effort to increase awareness and improve the transparency of the NSF merit review process:

- Two Regional Grants Conferences were held in FY 2007. These conferences were organized by the NSF Policy Office, and hosted by the University of Maryland at College Park and Oklahoma State University.
- Two outreach workshops focused on Hispanic Serving Institutions, one of which was webcast.
- Eight ‘NSF Days,’ organized by the Office of Legislative and Public Affairs, were held throughout the year in California, Illinois, Louisiana, Mississippi, Montana, Pennsylvania, Tennessee, and Washington.

Representatives from most of NSF’s directorates and offices attended each of these conferences. They held separate focus sessions for faculty in specific disciplines in addition to providing general information about proposal preparation and the merit review process.

NSF also hosted several informational booths at scientific meetings such as the annual meeting of the American Association for the Advancement of Science (AAAS). In addition to these larger NSF-wide organized efforts, outreach workshops were sponsored by several of the individual directorates, as well as EPSCoR and other NSF-wide programs. Finally, program officers frequently conduct outreach on an individual basis, when visiting institutions or participating in scientific meetings. NSF outreach to scientists and engineers from underrepresented groups includes efforts such as workshops for tribal colleges and minority-serving institutions, including historically black colleges and universities.

#### **D. Time to Decision (Proposal Dwell Time)**

It is important for applicants to receive a timely funding decision. The Foundation’s FY 2007 GPRA performance goal calls for informing at least 70 percent of PIs of funding decisions (i.e. award or decline) within six months of receipt. As indicated in **Figure 5**,

NSF is surpassing this goal. The achievement of this goal is particularly significant in light of major increases in the number of proposal submissions and increased workload for program staff.

**Figure 5**  
**Proposal Dwell Time**  
**Percentage of Proposals Processed Within 6 Months**

FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
63%	74%	77%	77%	76%	78%	77%

Source: NSF Enterprise Information System 10/2/07

## E. Data on Research Grants

Research grant is a term used by NSF to represent what may be considered a typical research award, particularly with respect to the award size. Education research grants are included in this category. Excluded are large awards such as centers and facilities, as are equipment and instrumentation grants. Also excluded are grants for conferences and symposia, grants in the Small Business Innovation Research Program, Small Grants for Exploratory Research, and education and training grants.

### E1. Research Grant Proposal, Award, & Funding Rate Trends

**Figure 6** provides the proposal, award, and funding rate trends for NSF research grants. Since FY 2000, there has been a large increase in the number of research proposals received by NSF. The number of research awards, however, was relatively constant from FY 2000 through FY 2006 with a modest increase in FY 2007. The funding rate decreased through FY 2005, but has risen in the past two fiscal years to 22%. **Figure 1** (page 7) provides data on all NSF proposals and awards.

**Figure 6**  
**Research Grant Proposal, Award & Funding Rate Trends**

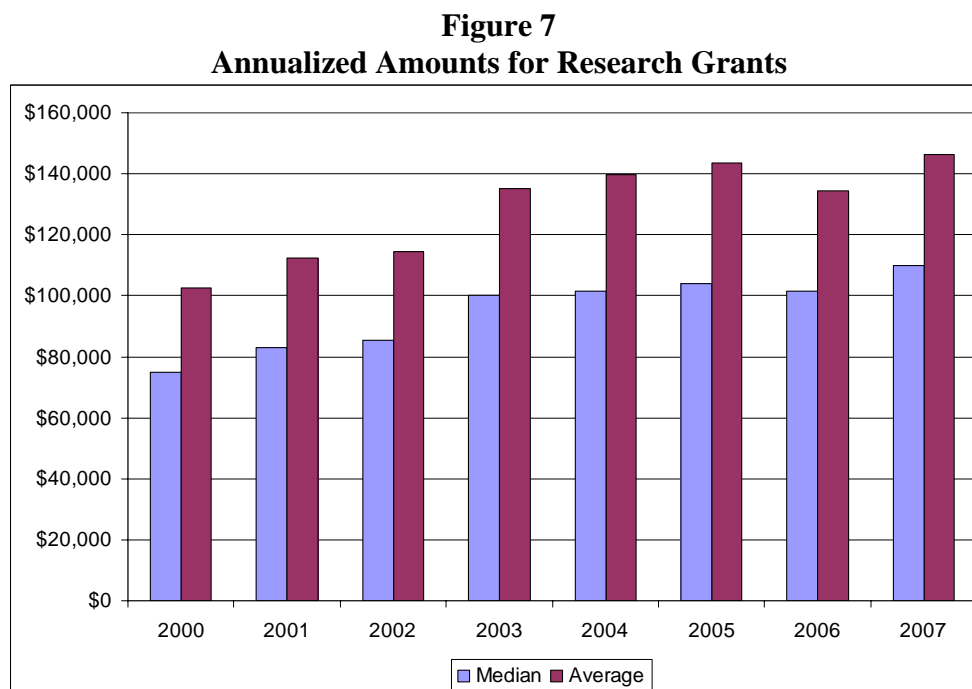
	2000	2001	2002	2003	2004	2005	2006	2007
<b>Proposals</b>	21,442	23,096	25,241	28,676	31,553	31,574	31,514	33,705
<b>Awards</b>	6,498	6,218	6,722	6,846	6,509	6,258	6,708	7,415
<b>Funding Rate</b>	30%	27%	27%	24%	21%	20%	21%	22%

Source: NSF Enterprise Information System 10/2/07

### E2. Research Grant Size and Duration

Adequate award size and duration are important for attracting high-quality proposals and ensuring that proposed work can be accomplished as planned. Larger award size and longer award duration may also permit the participation of more students and allow investigators to devote a greater portion of their time to conducting research.

Both the average annualized and median award amount for research grants had been increasing until FY 2006, during which time there was a decrease in both average and median award amounts, as displayed in **Figure 7**. In FY 2007, however, the increase continued for both indicators. Data by NSF directorate for the last five years are presented in **Appendix 4**.



Source: NSF Enterprise Information System 10/2/07

As indicated in **Figure 8**, the average award duration has remained relatively constant.<sup>5</sup> Program directors must balance competing requirements, such as increasing award size, increasing duration of awards, and/or making more awards.

**Figure 8**  
**Average Award Duration for Research Grants**

	2001	2002	2003	2004	2005	2006	2007
<b>Duration (Years)</b>	2.9	2.9	2.9	3.0	3.0	2.9	2.9

Source: NSF Enterprise Information System 10/2/07

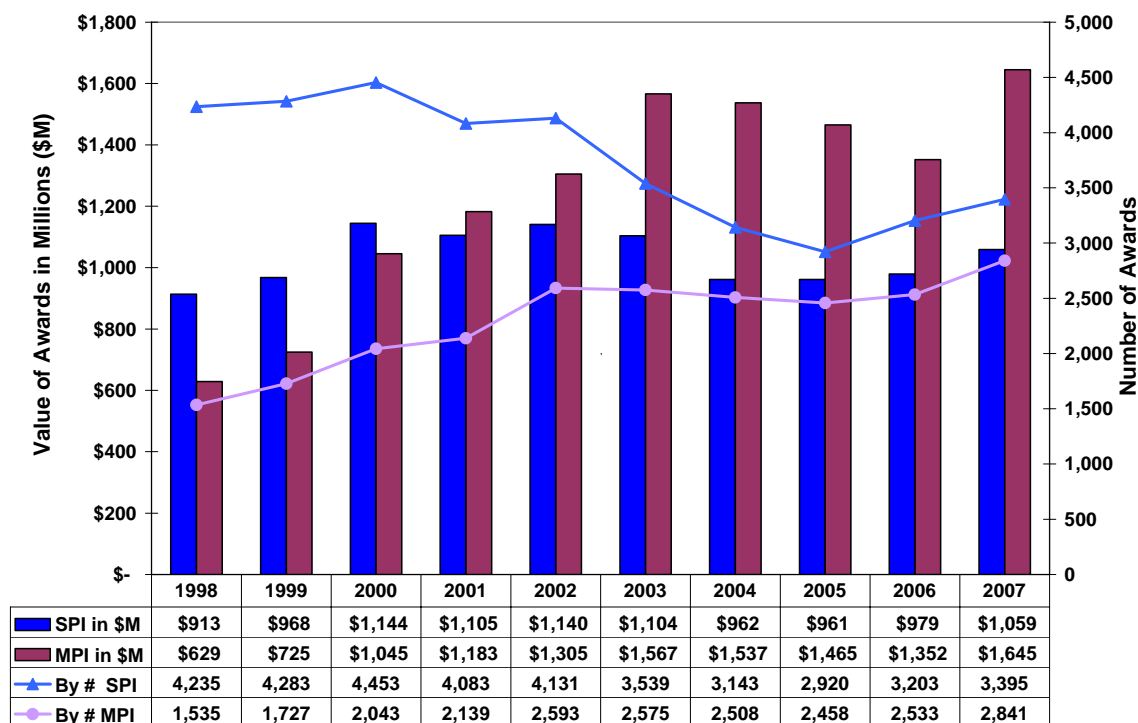
### E3. Number of Investigators Per Research Grant

**Figure 9** indicates the number of grants to research proposals with a single PI in comparison to the number of grants to proposals with multiple PIs. The number of single PI grants remains greater than the number of multiple PI grants, although the gap between these two categories of grants has generally been narrowing over time.

<sup>5</sup> Although the number of years is rounded to one decimal place, the variations do not indicate significant changes since 0.1 years represents only about five weeks. In addition, this duration rate is the initial duration for new awards made in FY 2007. The rate does not take into account no-cost extensions.

In addition, **Figure 9** indicates the total amount of funds awarded to single PI research grants in comparison to the amount of funds awarded to multiple PI research grants. This figure shows that the amount of funds to multiple PI grants is now greater than single PI grants, a reversal of the trend prior to FY 2000.

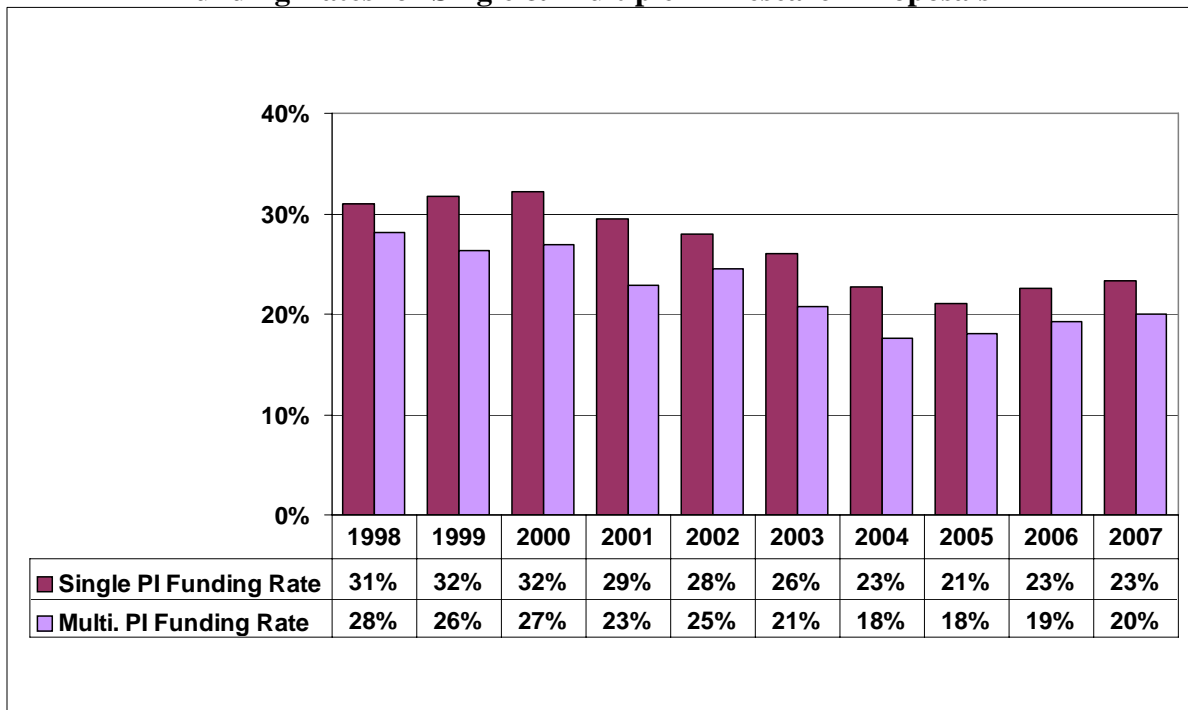
**Figure 9**  
**Research Grants for Single Primary Investigators (SPI) & Multiple PIs (MPI) by Dollar Amount & Number of Grants**



Source: NSF Enterprise Information System 10/2/07.

**Figure 10** indicates the funding rates for single primary investigators (SPI) and multiple PIs (MPI) research proposals. The difference between the SPI and MPI funding rate has varied over the last ten years, but the SPI funding rate has been consistently higher.

**Figure 10**  
**Funding Rates for Single & Multiple PI Research Proposals**



Source: NSF Enterprise Information System 10/2/07.

#### E4. Number of Research Grants per PI

**Figure 11** indicates the number of research grants per PI. The number of grants per PI has remained relatively unchanged during the fiscal years indicated below.

**Figure 11**

Fiscal Years	Number of Grants per PI			
	One	Two	Three	Four or More
1998-2000	84%	13%	2%	1%
2005-2007	83%	13%	3%	1%

Source: NSF Enterprise Information System 10/2/07

## E5. Number of People Supported on Research Grants

**Figure 12** provides the number of graduate students, postdoctoral associates, and senior personnel supported on NSF research grants. These data are from the budgets of research grants that are active in the indicated year.

**Figure 12**  
**Number of People Supported on NSF Research Grants**

	2000	2001	2002	2003	2004	2005	2006	2007	% Change, 2000 - 2007
<b>Senior Personnel Supported</b>	15,910	17,443	18,643	19,864	21,711	22,255	23,186	26,176	64.53%
<b>Postdocs Supported</b>	3,743	4,367	4,320	4,629	4,399	4,068	4,023	4,034	7.77%
<b>Graduate Students Supported</b>	15,650	18,717	19,303	20,384	21,105	20,442	20,949	22,777	45.54%

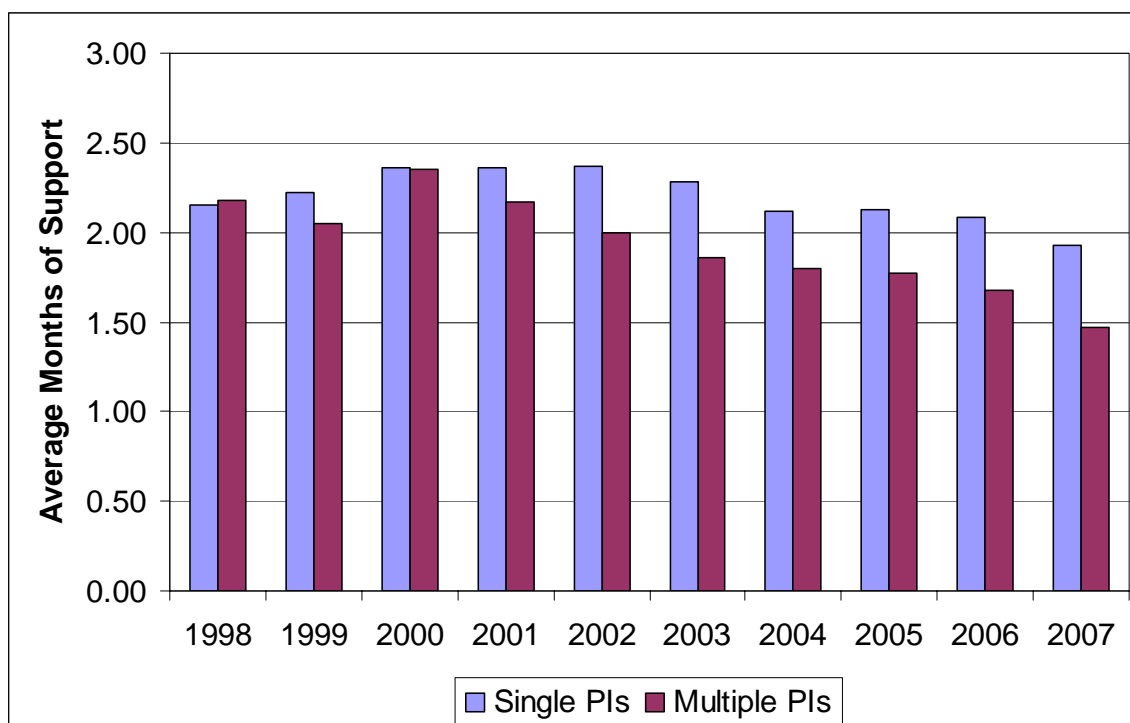
Source: NSF Enterprise Information System 10/2/07

**Appendix 6** provides data on the estimated number of individuals involved in NSF activities supported by all NSF awards, including senior researchers, postdoctoral associates, teachers, and students across all educational levels.

## E6. Average Number of Months of Salary Support for Single & Multiple PI Research Grants

**Figure 13** indicates the average number of months of salary support per individual on single and multiple PI research grants. Months of salary support are for PIs and CO-PIs only. Since FY 2000, the average number of months of support has generally decreased for both single and multiple PIs. The gap between these cohorts continues to increase and from FY 2001 through FY 2007, multiple PIs consistently averaged fewer months of support than single PIs (see **Appendix 5** for Directorate or Office level data on months of support).

**Figure 13**  
Average Number of Months of Salary Support for Single & Multiple PI Research Grants



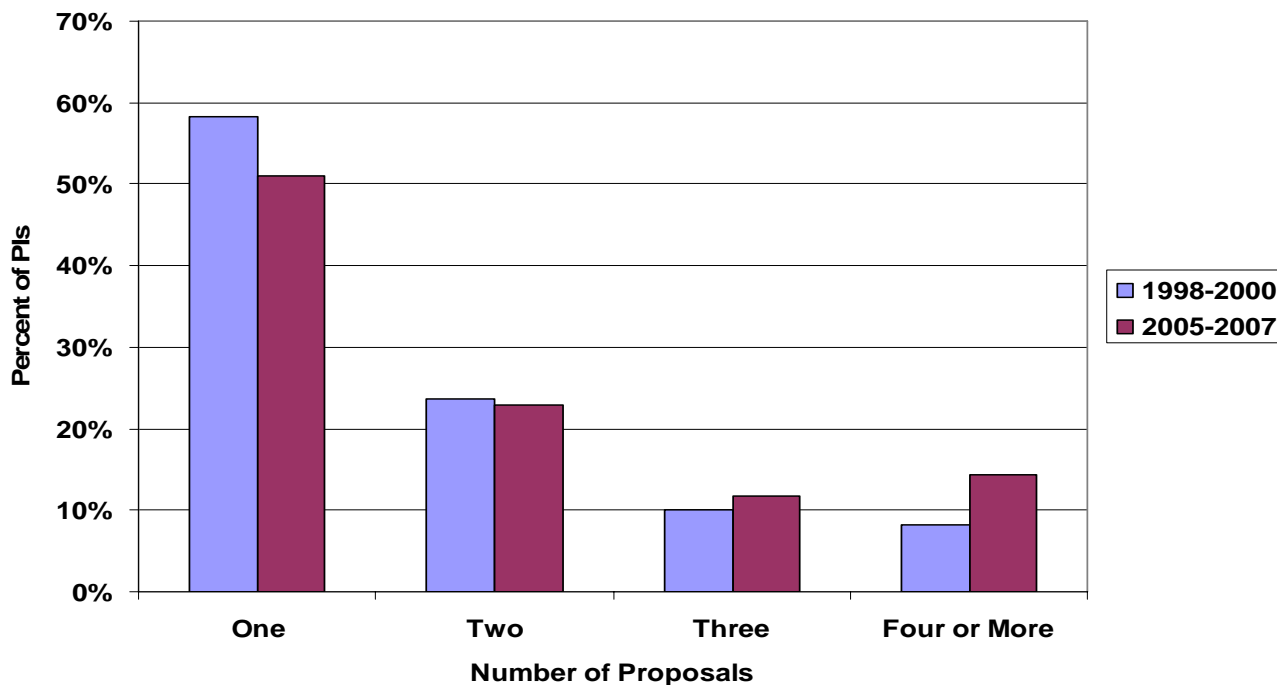
Source: NSF Enterprise Information System 10/2/07



## E7. Investigator Submission and Funding Rates

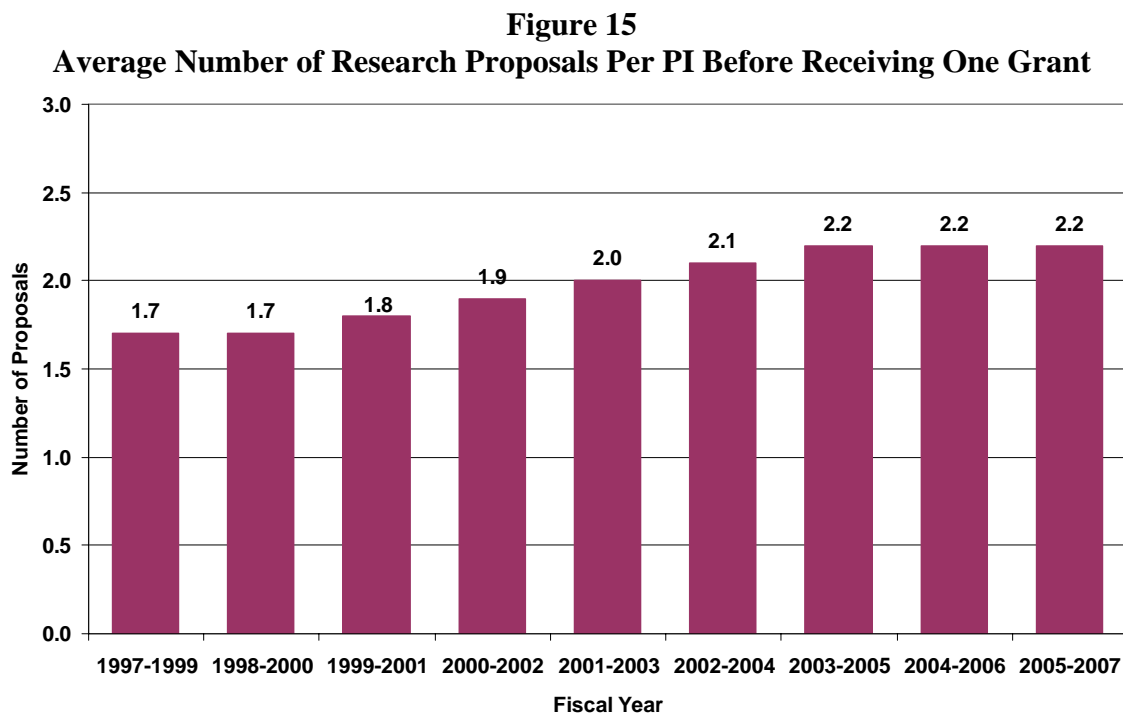
The purpose of this section is to indicate trends in the average number of proposals investigators submit over a three year period and their subsequent success in obtaining funding. **Figure 14** indicates that there is an increase in the percentage of investigators submitting multiple proposals during the interval FY 2005-2007 over FY 1998-2000.

**Figure 14**  
**Distribution of Single vs. Multiple Submissions Per PI for Research Proposals**



Source: NSF Enterprise Information System 10/2/07

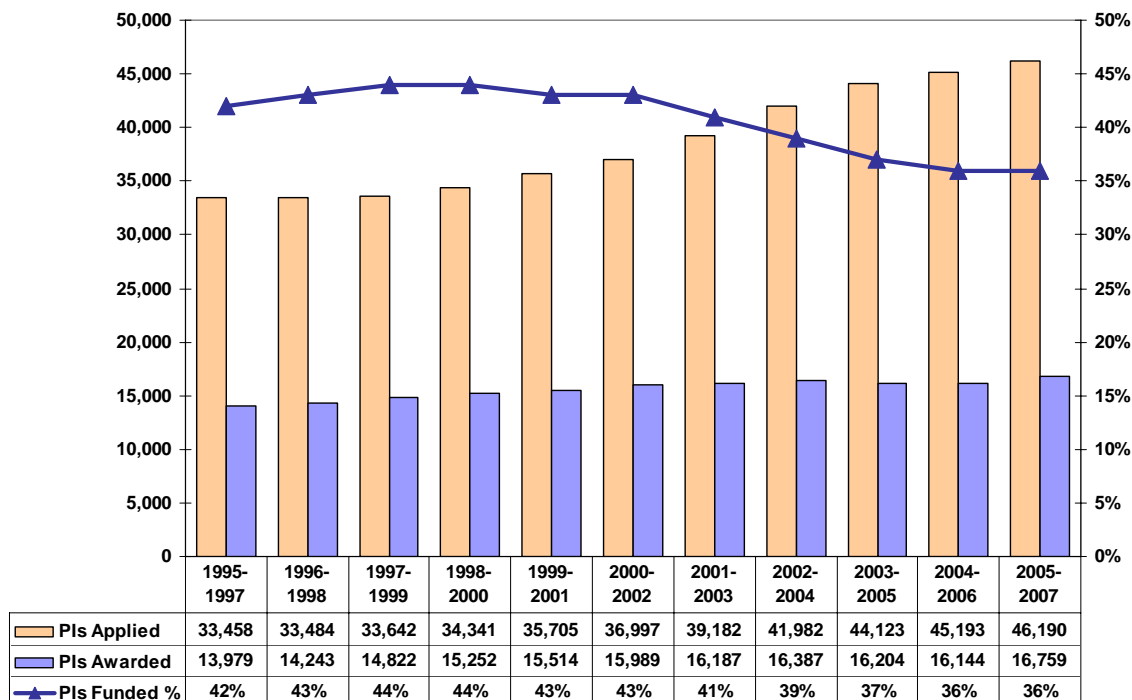
**Figure 15** shows that on average the number of proposals an investigator submits before receiving a grant has stayed constant at 2.2 proposals for the past five years.



Source: NSF Enterprise Information System 10/2/07

However, as shown in **Figure 16**, the funding rate for investigators (the number of investigators receiving a grant divided by the number of investigators submitting proposals) has been decreasing.

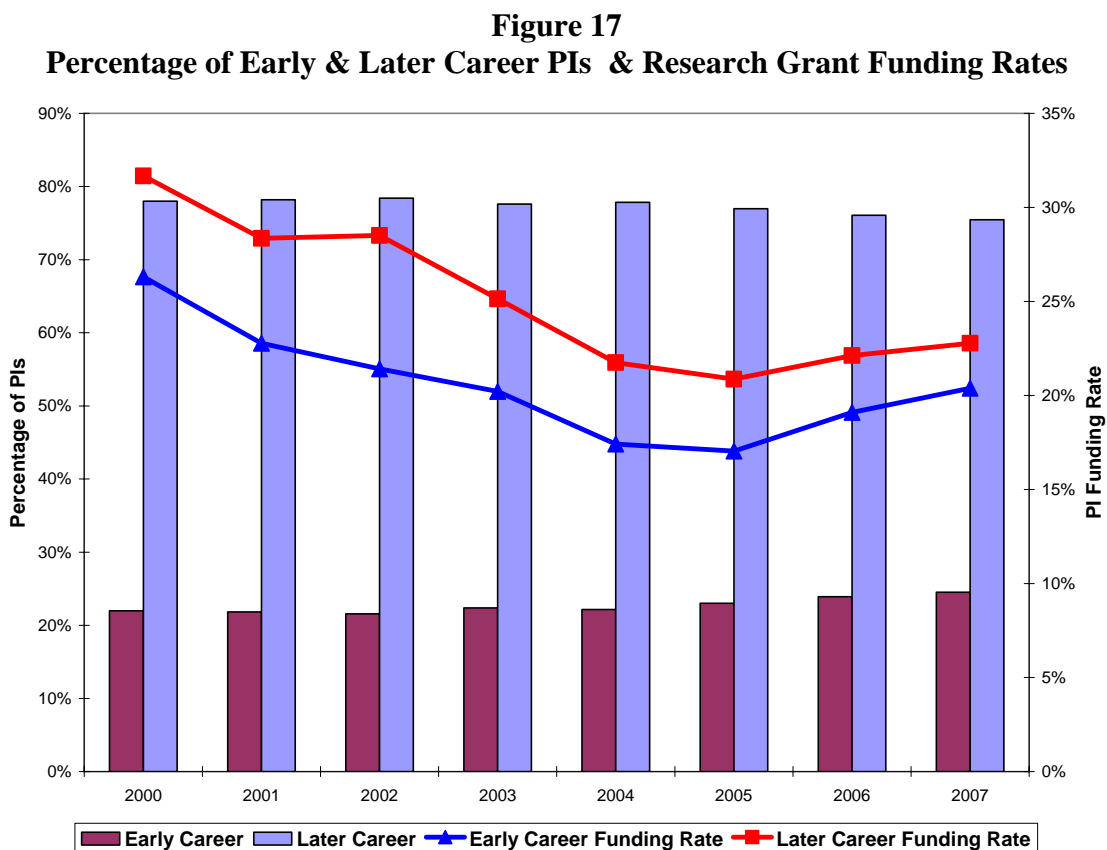
**Figure 16**  
**NSF PI Funding Rates for Research Grants**



Source: NSF Enterprise Information System 10/2/07

## E8. Early and Later Career PIs

**Figure 17** indicates the percentage of NSF PIs that are in the early or later stage of their career. An early career PI is within seven years of receiving their last degree at the time of the award. Since FY 2000, the percentage of early career PIs has remained relatively constant at about 22% and the percentage of later career PIs has also remained constant at about 78%. This figure indicates the funding rates for early and later career PIs, which tend to shift in tandem. These rates generally decreased through 2005, but increased in FY 2006 and 2007.



## IV. The NSF Merit Review Process

### A. Merit Review Criteria

In FY 1998 the National Science Board approved the use of the two current NSF merit review criteria, and, in FY 2007, modified the criteria to promote potentially transformative research. The two criteria now in effect are:

**Intellectual Merit.** What is the intellectual merit of the proposed activity? How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

**Broader Impacts.** What are the broader impacts of the proposed activity? How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Careful consideration is also given to the following in making funding decisions: 1) *Integration of Research and Education* and 2) *Integrating Diversity into NSF Programs, Projects, and Activities*, as is indicated in the Grant Proposal Guide<sup>6</sup>. Programs may have additional review criteria specific to the goals and objectives of the program. All relevant review criteria are described in the program announcement or solicitation.

Effective October 1, 2002, NSF returned without review proposals that failed to address separately both merit review criteria within the Project Summary. The number of proposals returned without review for failing to address both NSF merit review criteria has been steadily decreasing since 2003.

**Figure 18**  
**Proposals Returned Without Review for Failing to**  
**Address both Merit Review Criteria**

Fiscal Year	2003	2004	2005	2006	2007
Number of Proposals	276	236	176	134	117

Source: NSF Enterprise Information System 10/2/07

<sup>6</sup>The National Science Foundation Grant Proposal Guide can be accessed online at: [http://www.nsf.gov/pubs/policydocs/pappguide/nsf08\\_1/gpg\\_index.jsp](http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_index.jsp).

## B. Description of NSF Merit Review Process

The NSF merit review process includes the steps listed below and is depicted in **Figure 19**:

- The proposal arrives electronically and is assigned to the appropriate program(s) for review. Some programs also include preliminary proposals as part of the application process. See **Appendix 2** for more information about preliminary proposals. Proposals that do not comply to NSF regulations, as stated in the Grant Proposal Guide, may be returned without review.
- The program officer (or team of program officers) reviews the proposal and assigns it to at least three experts from outside the Foundation. NOTE: some proposals do not require external review. These include, for example, Small Grants for Exploratory Research (SGER) and proposals for small conferences, workshops, or symposia. See **Appendix 8** for more information about SGER proposals.

The review process is overseen by a Division Director, or other appropriate NSF official. The program officer or team:

- selects reviewers and panel members, based on program officer's knowledge, references listed in proposal, recent publications in science, engineering, or education journals, presentations at professional meetings, reviewer recommendations, bibliographic and citation databases, and proposal author's suggestions.
- checks for conflicts of interest. In addition to checking proposals and selecting reviewers with no apparent potential conflicts, NSF staff provide reviewers guidance and instruct them how to identify and declare potential conflicts. All program officers receive annual conflict of interest training.
- synthesizes the comments of the reviewers and panel (if reviewed by a panel), as provided in the individual reviewer analyses and panel summaries.
- makes a recommendation to award or decline the proposal, taking into account external reviews, panel discussion, and other factors such as portfolio balance and amount of funding available.

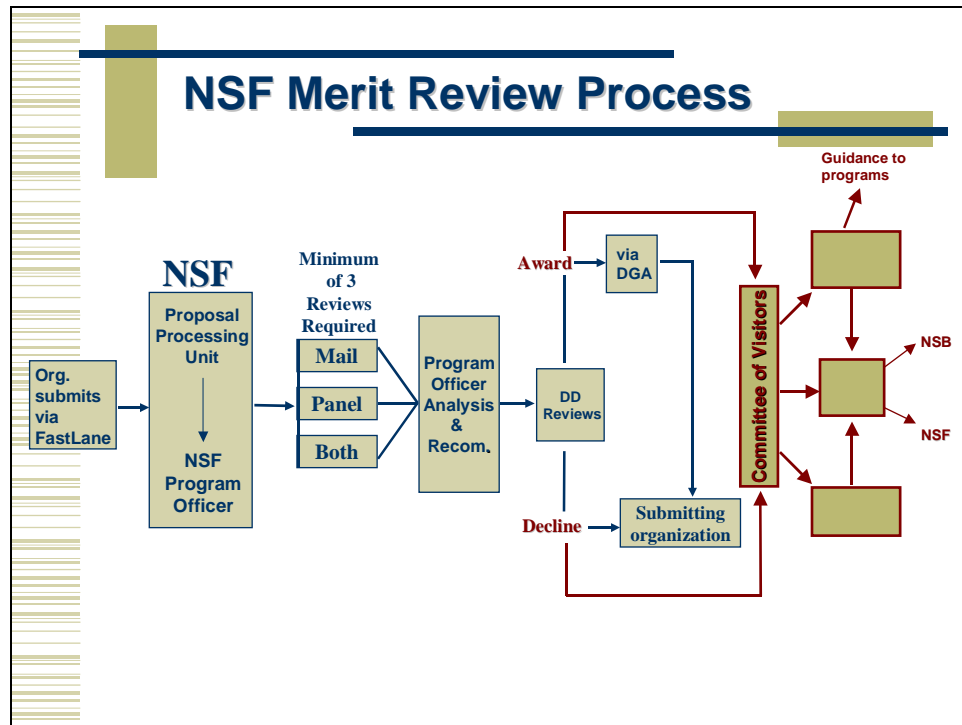
The Division Director, or other appropriate NSF official, reviews all program officer recommendations. Large awards may receive additional review. The Director's Review Board reviews award recommendations with an average annual award amount of 2.5 percent or more of the awarding Division's annual budget. The National Science Board reviews recommended awards with an annual award amount of one percent or more of the awarding Directorate's annual budget.<sup>7</sup> In FY 2007, NSB approved 11 funding items including 5 awards, 3 supplements, extending 2 co-operative agreements, and made

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<sup>7</sup> Other items requiring NSB prior approval include new programs, major construction projects that meet certain specifications, as well as programs and awards involving policy issues.

budgetary provisions for a future facility. Once approved, a grants officer in the Office of Budget, Finance, and Award Management performs an administrative review of award recommendations.

**Figure 19**  
**Diagram of the NSF Merit Review Process**



The Foundation has a variety of mechanisms in place to ensure the integrity of the merit review process:

- An external Committee of Visitors (COVs), whose membership is comprised of scientists, engineers, and educators, assesses each program every 3-5 years. COVs examine the integrity and efficiency of merit review processes and the results from the programmatic investments.
- NSF directorates and offices have Advisory Committees (comprised of scientists, engineers, and educators). One of the tasks of these Advisory Committees is to review COV reports and responses in order to provide guidance to the Foundation. The COV reports and NSF responses are publically available on the NSF website.
- The Government Performance and Results Act of 1993 (GPRA) was established to provide strategic planning and performance measurement in the Federal Government. The NSF-wide Advisory Committee for GPRA Performance Assessment (AC/GPA), a committee of external experts convened yearly to assess results, evaluates the Foundation's portfolios and their linkages to strategic outcome goals. The AC/GPA uses Committee of Visitors reports, internal and external directorate assessments of particular programs, investigator project reports, and directorate/division collections of outstanding accomplishments from awards in order to perform the evaluation.

- An external contractor performs an independent verification and validation of the Foundation's performance measurements, which include aspects of the merit review process.
- One role of the National Science Board's Audit and Oversight Committee is to review the findings presented by the AC/GPA.
- The Program Assessment Rating Tool (PART), developed by the Office of Management and Budget, is used to assess program performance of federal agencies in four areas: Program Purpose and Design, Strategic Planning, Program Management, and Program Results/Accountability.

Additional information about COVs, NSF Advisory Committees, and AC/GPA is provided in **Appendix 9**.

Section V describes special activities NSF has been conducting regarding the implementation of several aspects of the merit review process.

### **C. Program Officer Award/Decline Recommendations**

As noted above, the narrative comments and summary ratings provided by external reviewers are essential inputs for program officers who formulate award and decline recommendations to NSF senior management.

NSF program officers are experts themselves in the scientific areas that they manage. They have advanced educational training (e.g., a Ph.D. or equivalent credentials) in science or engineering and relevant experience in research, education, and/or administration. They are expected to produce and manage a balanced portfolio of awards that addresses a variety of considerations and objectives. When making funding recommendations, in addition to information contained in the external proposal reviews, NSF program officers evaluate proposals in the larger context of their overall portfolio and consider issues such as:

- Support for potentially transformative advances in a field;
- Novel approaches to significant research questions;
- Capacity building in a new and promising research area;
- Potential impact on the development of human resources and infrastructure;
- NSF core strategies, such as 1) the integration of research and education and 2) broadening participation;
- Achievement of special program objectives and initiatives;
- Other available funding sources; and
- Geographic distribution.



## D. Review Information to Proposer and Appeal Process

Proposers receive notification of the award/decline decision, copies of all reviews used in the decision with reviewer-identifying information redacted, and a copy of the panel summary (if panel review was conducted). A "context statement" is also sent that explains the broader context under which any given proposal was reviewed. Program Officers are also expected to provide additional communication (either in writing or by phone) to proposers in the case of a decline recommendation if the basis for the decision is not provided in the panel summary.

If, after receiving the reviews and other documentation of the decision, an unsuccessful proposer would like additional information, he or she may ask the program officer for further clarification. If, after considering the additional information, the applicant is not satisfied that the proposal was fairly handled and reasonably reviewed, he or she may request formal reconsideration. Information about the reconsideration process is included in all decline notifications.<sup>8</sup> A reconsideration request can be based on the applicant's perception of procedural errors or on disagreements over the substantive issues dealt with by reviewers. If the relevant NSF Assistant Director or Office Director upholds the original action, the applicant's institution may request a second reconsideration from the Foundation's Deputy Director.

NSF declines approximately 30,000 proposals a year but receives only 30-50 annual requests for formal reconsideration. The number of requests for formal reconsideration and resulting decisions at both the Assistant Director and Director levels from FY 2002 through FY 2007 are displayed in **Appendix 10**. NSF received 34 formal reconsideration requests in FY 2007; 33 decline decisions were upheld and one was reversed.

## E. Methods of External Review

The Foundation's merit review process relies on extensive use of knowledgeable experts from outside NSF. As stated in the Grant Proposal Guide (GPG), proposals usually receive at least three external reviews. Under certain circumstances the requirement for external review can be waived.<sup>9</sup>

NSF programs obtain external peer review by three principal methods: (1) "mail-only," (2) "panel-only," and (3) "mail-plus-panel" review. The total numbers of reviews and the average numbers of reviews per proposal obtained by the three different review methods are presented in **Figure 20**. The mail-plus-panel method had the highest number of reviews per proposal, averaging nearly seven, while the mail-only method averaged around four. Directorate-level data for FY 2007 are presented in **Appendix 11**.

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<sup>8</sup> Please note that certain types of proposals are not eligible for reconsideration. See NSF Grant Proposal Guide (GPG) at [http://www.nsf.gov/pubs/policydocs/pappguide/nsf08\\_1/gpg\\_4.jsp#IVD](http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_4.jsp#IVD)

<sup>9</sup> Exemptions, for example, include proposals for Small Grants for Exploratory Research (SGER) and workshop and symposia proposals. For workshop and symposia proposals, however, the program officer may obtain external reviews whenever he or she deems that such review is appropriate. See Appendix 7 for more information about SGER proposals.

**Figure 20**  
**Reviews per Proposal, FY 2007**

	<b>All Methods</b>	<b>Mail + Panel</b>	<b>Mail-Only</b>	<b>Panel-Only</b>
Reviews	248,355	98,293	15,974	134,088
Proposals	43,164	14,292	3,737	25,135
Rev/Prop	5.8	6.9	4.3	5.3

Source: NSF Enterprise Information System 10/2/07

In addition, site visits (on-site and reverse-site) by NSF staff and external members of the community are often used to review proposals for facilities and centers. NSF program officers are given discretion in the specific use of review methods, subject to approval by the Division Director or other NSF official.

In the ‘mail-only’ review method, reviewers are sent proposals and asked to submit written comments to NSF through FastLane, NSF’s web-based system for electronic proposal submission and review.

‘Panel-only’ refers to the process of soliciting reviews from panelists who convene to discuss their reviews and provide advice to the program officer.

Many proposals submitted to NSF are reviewed using some combination of these two processes. Those programs that employ the ‘mail + panel’ review process have developed several different configurations, such as:

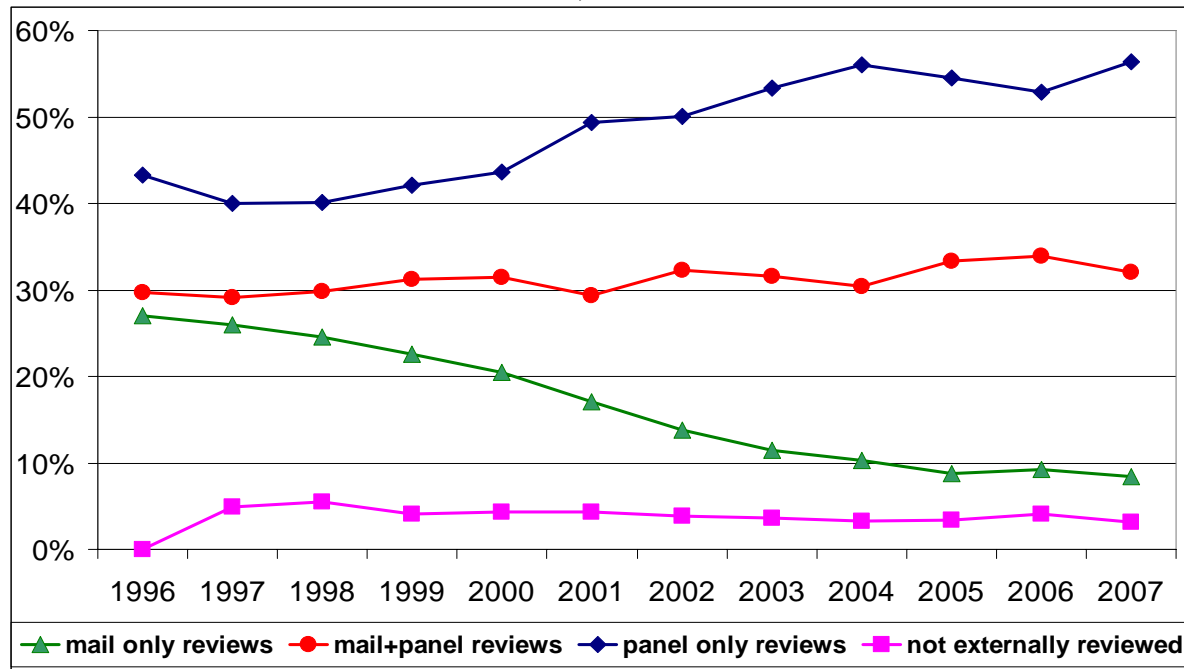
- A reviewer submits a mail review and also serves as a panelist.
- A reviewer submits a mail review, but does not serve on the panel.
- A reviewer does not submit a mail review, but participates as a panelist. Panelists discuss the proposal and mail reviews to formulate advice for the program officer.

The use of various review methods has changed markedly over time, as shown in **Figure 21**. The data for **Figure 21** are provided in **Appendix 12** and **Appendix 12.1** provides data on review methods by directorate and office.

There are a number of reasons for the trend away from mail-review only. Panels allow reviewers to discuss and compare proposals. Panels tend to be used for programs that have deadlines and target dates, as opposed to unrestricted submission windows. The panel review process has the advantage that different perspectives can be discussed and integrated if appropriate. Also, using panels in the review process tends to reduce proposal processing time (time-to-decision), compared to mail-only reviews. For example, in FY 2007, 81 percent of all proposals reviewed by panel-only were processed within six months, compared to 72 percent for mail + panel and 70 percent for mail-only. A chief advantage of mail review is that the expertise of the reviewers can be more

precisely matched to the proposal. The mail + panel review process is used frequently because it combines the in-depth expertise of mail review with the comparative analysis of panel review.

**Figure 21**  
**FY 1996-2007 Trend, NSF Review Method**



Source: NSF Enterprise Information System 10/2/07

Some programs use “virtual panels”. In virtual panels, panelists participate from their offices or homes and interact using NSF’s Interactive Panel System (IPS), accompanied by a teleconference. Around 95 percent of panels, whether they assemble at NSF, offsite at a common location, or virtually, are using IPS. A part of FastLane, IPS permits the viewing of proposals, reviews, basic panel discussions, collaboration on panel summaries, and approval of the draft panel summary through the web. Some programs are making use of NSF’s videoconferencing facilities to enhance the participation of panelists whose schedules do not permit them to be physically present at the time of the panel. Videoconferencing is also employed in award management and oversight for large center-type projects. The Foundation is continuing its efforts to improve web-based and electronic means of communication to contribute to the quality of the merit review and award oversight processes.

## F. Data on Reviewers

The Foundation maintains a central electronic database of more than 300,000 reviewers (which includes both mail reviewers and panelists). Program officers identify potential reviewers using a variety of sources including their own knowledge of the discipline, applicant suggestions, references attached to proposals, published papers, scientific citation indexes and other similar databases, and input from other reviewers. During FY

2007, approximately 45,000 individuals served on panels, conducted a mail review for one or more proposals, or served in both functions. About 15,000 of these reviewers had never reviewed an NSF proposal before. The reviewers were from all 50 states in addition to the District of Columbia, Puerto Rico, Virgin Islands, and other U.S. jurisdictions. More than 6,000 reviewers were from outside of the United States. Moreover, reviewers were from a range of institutions, including two-year and four-year colleges and universities, Master's level and Ph.D.-granting universities, industry, profit and non-profit institutions, K-12 systems, informal science institutions, and government. NSF also maintains data on numbers of reviewers from each state, territory, and country as well as by type of institution.

In FY 2001, NSF developed systems and policies to request demographic data electronically from all reviewers to determine the participation of underrepresented groups in the NSF reviewer pool. The goal was to establish a baseline for participation of underrepresented groups in NSF proposal review activities. In FY 2007, out of a total of 42,399 distinct reviewers who returned reviews, 11,951 – about 28 percent -- provided demographic information. Out of the 11,951 who provided information, 4,384 (37%) indicated they were members of an underrepresented group.

During FY 2004, NSF altered the FastLane reviewer module to make it more convenient for reviewers to provide demographic information and, as a result, NSF has seen a slight increase in the proportion of reviewers providing demographic information. In FY 2007, 28 percent provided information in comparison to 25 percent in FY 2006, and 22 percent in FY 2005. However, provision of demographic data is voluntary and given the low response rate, there is not enough information to establish a baseline. This remains a challenge that the Foundation continues to address. For example, there are revisions planned for the NSF reviewer data system.

The NSF library continually updates its resources to help NSF staff identify reviewers. This includes the collection and sharing of potential reviewer data from associations that work with underrepresented groups in science and engineering. Frequent tutorials on finding reviewers are also available for program officers.

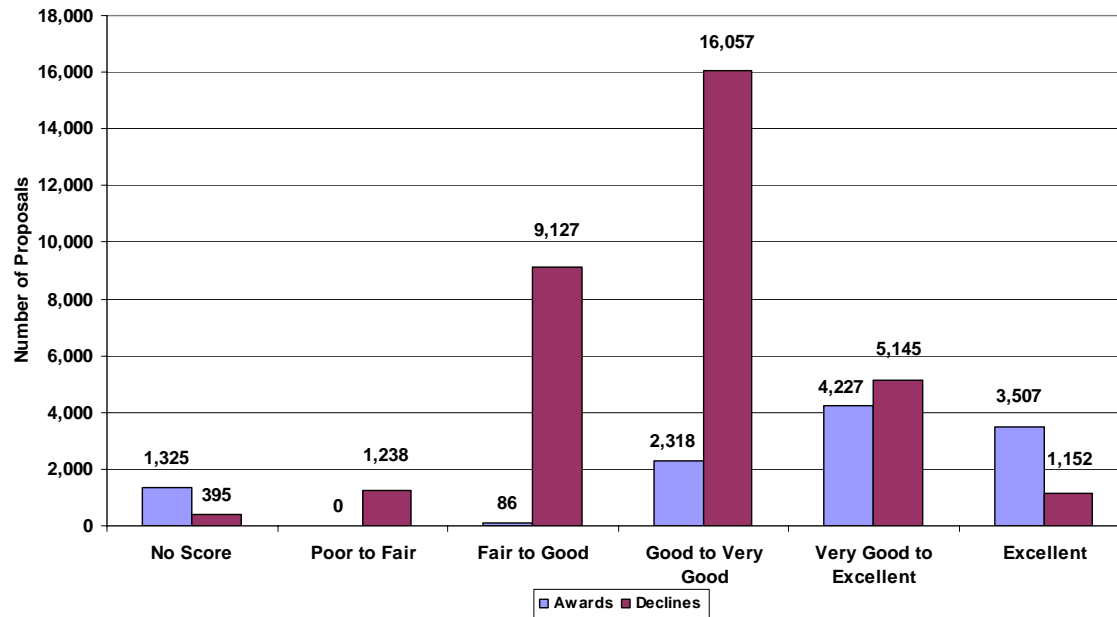
Reviewers are also identified through literature searches and professional activities such as workshops and conferences. Some NSF divisions actively solicit new reviewers through their web pages and outreach activities. To increase transparency, Chapter III.B of the *Grant Proposal Guide* describes how reviewers are selected by the NSF program officers.

Participation in the peer review process is voluntary. Panelists are reimbursed for expenses, but mail reviewers receive no financial compensation. In FY 2007, NSF requested 56,449 mail reviews, of which there were 34,704 positive responses. This 61 percent response rate in FY 2007 is unchanged from FY 2006 and up slightly from 60 percent in FY 2005 and 59 percent in FY 2004.

## G. Reviewer Proposal Ratings and Impact of Budget Constraints

The NSF merit review system emphasizes reviewer narratives in addition to numerical ratings. The written comments provided by reviewers, the summary of panel discussions, and the expert opinions of program officers and division directors are important components of the merit review system. The distribution of average summary ratings of reviews for awarded and declined proposals is provided in **Figure 22**.

**Figure 22**  
**Distribution of Average Reviewer Ratings FY2007**



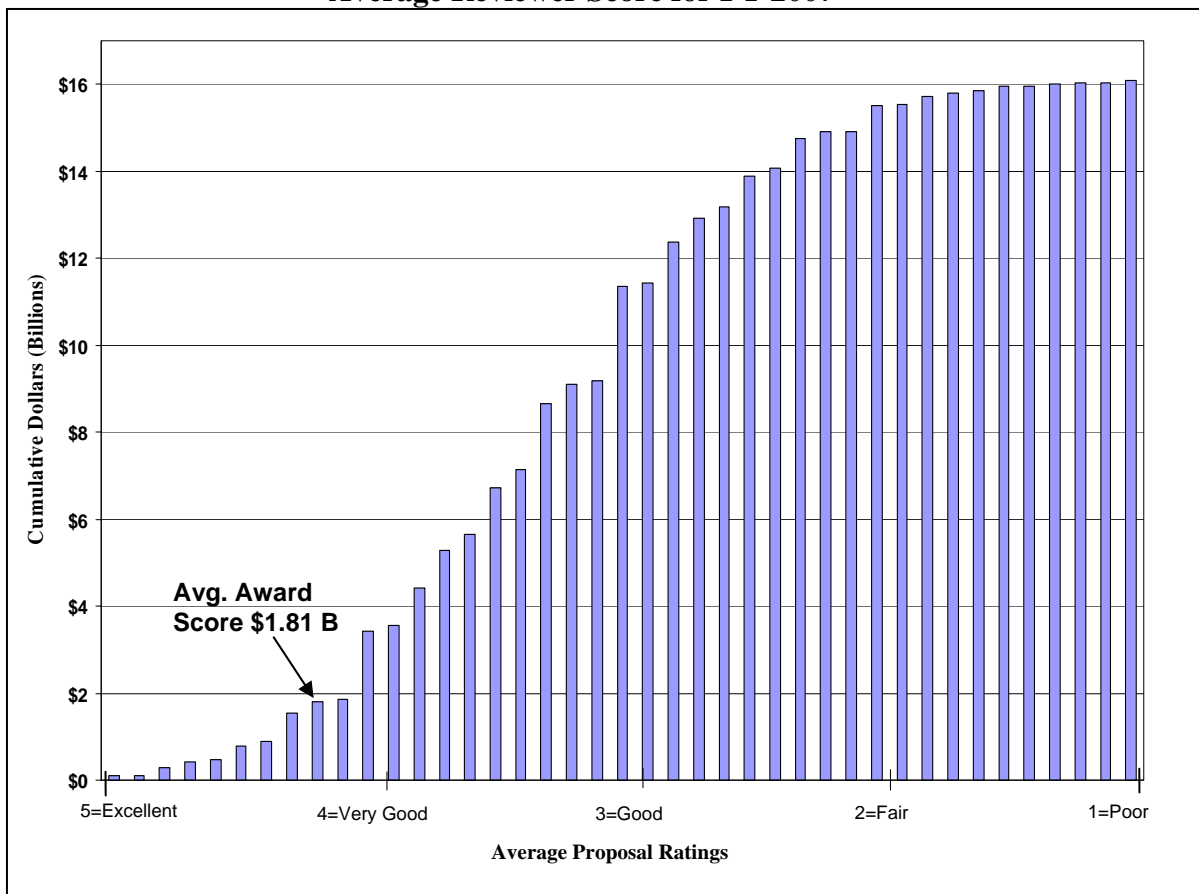
Source: NSF Enterprise Information System 10/2/07

These data indicate considerable overlap among the average reviewer ratings of successful and unsuccessful proposals, most notably in the range of ‘very good’ average ratings.<sup>10</sup> **Appendices 13-13.2** indicate that this overlap among the average reviewer ratings is present and similar in degree for each of the three proposal review methods used by NSF (panel-only, mail-only, and mail plus panel).

<sup>10</sup> The corresponding numerical ratings, on a five-point scale, are as follows: Excellent (4.5 – 5.0); Very Good – Excellent (4.0 - <4.5); Good – Very Good (3.0 - <4.0); Fair – Good (2.0 - <3.0); and Poor – Fair (<2.0). Proposals with “No Score” are those that are not externally reviewed.

A large number of potentially fundable proposals are declined each year. As shown in **Figure 23**, approximately \$1.8 billion was requested for declined proposals that had received ratings at least as high as the average rating (4.2 out of 5.0) for all awarded proposals. Over the last ten years, NSF's capacity to fund these highly rated proposals has diminished. In FY 1997, the ratio of awards to highly rated declines was 5:1; in FY 2007, that ratio had dropped to less than 2:1. NSF is thus supporting a smaller proportion of potentially fundable proposals. These declined proposals represent a rich portfolio of unfunded opportunities, proposals that if funded may have produced substantial research and education benefits.

**Figure 23**  
**Cumulative Requested Amounts for Declined Proposals by**  
**Average Reviewer Score for FY 2007**



Source: NSF Enterprise Information System 10/2/07

## H. Program Officer Characteristics and Workload

The number of program officers increased from 438 in FY 2006 to 452 in FY 2007, a 3 percent increase. Program Officers can be permanent NSF employees or non-permanent employees. As indicated in **Figure 24**, 48 percent are permanent program officers and 52 percent are in the non-permanent category. Some non-permanent program officers are “on loan” as visiting scientists, engineers, and educators (VSEEs) for up to three years from their host institutions. Others are supported through grants to the home institutions under the terms of the Intergovernmental Personnel Act (IPA). Whether they are hired as temporary or permanent, incoming NSF program officers receive training in the merit review process.

**Figure 24**  
**Distribution of NSF Program Officers by Characteristics**  
**As of October 1, 2007**

<b>Program Officers</b>	<b>Total</b>	<b>Percent*</b>
<b>Total</b>	<b>452</b>	<b>100%</b>
<b>Gender</b>		
Male	293	65%
Female	159	35%
<b>Race</b>		
Minority	103	23%
White, Non-Hispanic	349	77%
<b>Employment</b>		
Permanent	216	48%
Visiting Scientists, Engineers & Educators (VSEE)	46	10%
Temporary	52	12%
Intergovernmental Personnel Act (IPA)	138	31%

Source: NSF Division of Human Resource Management

\* Percents do not add to 100% due to rounding

The number of proposals that the program officers handle has increased significantly over the last several years. In addition to the growing emphasis on interdisciplinary and cross-directorate programs, program officers are also tasked with an increasing number of programmatic activities. While NSF was able to increase the number of program officers in FY 2007, workload concerns are still present and frequently highlighted by NSF's Committees of Visitors (see **Appendix 9**).

NSF has revitalized its professional development opportunities for program staff, offering in-house courses in project management, leadership, and communication through the NSF Academy. New NSF program staff attend the NSF Program Manager Seminar, which is a four day off-site orientation to NSF and the merit review process.

## V. Special Activities on Merit Review Process

### A. Quality and Transparency

The National Science Board was requested by Congress to conduct a review of the NSF merit review process. The Board issued its report in September 2005, concluding that the NSF merit review process is fair and effective, and “remains an international ‘gold standard’ for review of science and engineering research proposals.” The Board provided several recommendations for NSF to improve the transparency and effectiveness of the NSF merit review process, while preserving the ability of the program officers to identify the most innovative proposals and effectively diversify and balance NSF's research and education portfolio.<sup>11</sup>

In response to the Board's recommendations, NSF has undertaken an agency-wide effort to address quality of reviews, transparency of the award/decline decision, and support of potentially transformational research. The FY 2007 NSF Budget Request specifically identifies the operation of a credible, efficient merit review system as a strategic goal. A merit review performance indicator was added to the Senior Executive Service (SES) annual personal performance plans.

The FY 2006 Merit Review Report provided an update of the activities undertaken in that fiscal year. Many of those activities can be characterized as gathering input from NSF staff and the community to inform how NSF would proceed.

The activities listed below provide an update of accomplishments and additional activities.

- An external NSF web page was completed and posted to inform the research and education community of the NSF merit review process. The site can be accessed directly from the NSF Home Page or at <http://www.nsf.gov/bfa/dias/policy/meritreview/>.
- An internal NSF web page has been designed to provide merit review process information to NSF staff. The website includes the standards expected, effective practices, examples of reviews, panel summaries, program officer analyses, and program officer communications to principal investigators. The final review of the site is underway.
- In FY 2007, the NSF Senior Management decided to initiate a seminar to promote quality and transparency in the merit review process. The seminar will be required of all NSF staff involved in the merit review of proposals (e.g., program officers and division directors). It is anticipated the staff will be required to take the seminar every year or every other year. The development of the seminar has been completed and is being piloted.

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<sup>11</sup> *Report of the National Science Board on the National Science Foundation's Merit Review System*, NSB-05-119. Available on the web at [http://www.nsf.gov/nsb/documents/2005/0930/merit\\_review.pdf](http://www.nsf.gov/nsb/documents/2005/0930/merit_review.pdf).



- An important charge of an NSF-wide working group (see Section V.C) is to consider issues in the merit review of potentially transformative and interdisciplinary research.
- The Director's Award for Merit Review Excellence, which was initiated in FY 2006, continued in FY 2007 with the awardees recognized at the Annual Director's Award Ceremony in June 2007.

## **B. Impact of Proposal and Award Management Mechanisms (IPAMM)**

In March 2006, NSF charged the Impact of Proposal and Award Management Mechanisms (IPAMM) working group to perform a detailed study of the trends, impacts, and causal factors associated with the recent declines in proposal funding rates and the simultaneous growth in proposal submission rates.

In conducting its analysis, IPAMM used both quantitative data from internal NSF databases and attitudinal data collected through a survey of all NSF principal investigators (PIs) who submitted research proposals during FY 2004-2006. IPAMM published its final report (NSF 07-45) in August 2007; the report and the results of the survey can both be found on the IPAMM web page (<http://www.nsf.gov/od/ipamm/ipamm.jsp>).

Major findings of the IPAMM report include:

- NSF proposal funding rates declined due to a significant increase in proposal submissions. Concurrently, increases in the overall NSF budget were being absorbed by the growth in the average award size.
- A variety of different factors contributed to the overall growth in proposal submissions. All factors were important components of the increasing pressure to compete for research funds. These factors included:
  - Increased size and capacity of the S&E enterprise (both infrastructure and workforce)
  - Loss of funding from other sources
  - Increased use of targeted solicitations by NSF
  - Increase in the external institutional pressures being exerted on the PIs

Some factors resulted in an increase in the applicant pool and some resulted in an increase in the number of proposals submitted per applicant. IPAMM also found that the relative importance of these factors varied for different communities, which impacts directorate portfolio management.

- With respect to impacts, IPAMM found that:
  - Declining funding rates had affected the entire NSF proposer community, and that there had been no disparate effect on beginning investigators, underrepresented groups, or different institution types.
  - The quality of the proposals being submitted had not deteriorated, although more high-quality proposals were being declined.
  - The increased number of proposals being submitted has put stress on NSF's merit review process. Analysis of NSF data showed that individual reviewers are reviewing an increased number of proposals. The attitudinal data from the survey indicated that some reviewers are spending less time

on their reviews and/or are simply declining to review proposals or serve on panels.

A challenge facing NSF and the community is to find the level of competition that results in funding quality research with the minimum amount of time spent in the propose-review-decline-resubmit cycle. IPAMM identified a variety of options for addressing this challenge, which balance trade-offs between keeping the proposal workload to a manageable and productive level (for both NSF and the community) and encouraging the free flow of ideas to NSF. The report also recommended that the directorates and research offices be given the responsibility and flexibility to meet this challenge, recognizing the possible need for different strategies based on the different communities they serve.

### C. Transformative and Interdisciplinary Research

At its October 2007 meeting, the NSF Director informed the NSB of a three prong approach to promote the support of potentially transformative research:

- *Infuse* support of potentially transformative research throughout NSF and all its programs
- *Learn* how to facilitate potentially transformative research
- *Lead* the community through opportunities for potentially transformative research proposal submissions

On September 24, 2007, NSF sent an Important Notice regarding the support of potentially transformative research to presidents of universities, colleges, and heads of other NSF awardee organizations. The notice informed the community of an NSB approved change in the Intellectual Merit Review Criteria to include specific reference to potentially transformative research.

The NSF Director and Deputy Director also formed and charged an NSF-wide Working Group on Facilitating Transformative and Interdisciplinary Research. The Working Group is charged to 1) develop new funding mechanisms to facilitate potentially transformative research, and 2) recommend policies and best practices to facilitate transformative and interdisciplinary research. The Working Group is expected to develop additional award mechanisms for implementation in FY 2008 and complete its work in FY 2009.

These activities will build upon on-going efforts at NSF. Through its program solicitations, NSF explicitly calls for proposals with the potential for transformative research. Furthermore, NSF Program Officers provide guidance to reviewers and panels to encourage their identification of potentially transformative research. In addition to its programs, NSF has several other mechanisms to promote the submission and support of potentially transformative research proposals. These include: Small Grants for Exploratory Research (SGER), Creativity Extensions, and Accomplishment Based Renewals. See **Appendices 8 and 14** for information about these mechanisms.

## VI. Appendices

### Appendix 1 Proposals, Awards and Funding Rates By Directorate & Office

		Fiscal Year					
		2002	2003	2004	2005	2006	2007
NSF	Proposals	35,165	40,075	43,851	41,722	42,352	44,577
	Awards	10,406	10,844	10,380	9,757	10,425	11,463
	Funding Rate	30%	27%	24%	23%	25%	26%
BIO	Proposals	5,143	5,591	6,063	6,475	6,617	6,728
	Awards	1,400	1,448	1,432	1,355	1,202	1,303
	Funding Rate	27%	26%	24%	21%	18%	19%
CSE	Proposals	4,317	5,270	6,276	5,238	4,843	5,744
	Awards	1,039	1,175	1,017	1,088	1,280	1,631
	Funding Rate	24%	22%	16%	21%	26%	28%
EHR	Proposals	3,966	4,111	4,644	3,699	3,254	4,248
	Awards	1,044	890	925	736	824	903
	Funding Rate	26%	22%	20%	20%	25%	21%
ENG	Proposals	6,883	9,076	8,994	8,692	9,423	9,574
	Awards	1,726	1,945	1,753	1,493	1,730	1,955
	Funding Rate	25%	21%	19%	17%	18%	20%
GEO	Proposals	4,114	4,230	4,267	4,676	4,603	4,367
	Awards	1,450	1,515	1,419	1,315	1,418	1,341
	Funding Rate	35%	36%	33%	28%	31%	31%
MPS	Proposals	5,996	6,694	7,184	7,083	7,466	7,315
	Awards	2,105	2,268	2,175	2,071	2,221	2,360
	Funding Rate	35%	34%	30%	29%	30%	32%
OCI	Proposals	223	342	220	116	130	304
	Awards	54	56	47	75	42	68
	Funding Rate	24%	16%	21%	65%	32%	22%
OISE	Proposals	608	670	851	822	712	776
	Awards	334	373	386	333	319	353
	Funding Rate	55%	56%	45%	41%	45%	45%
OPP	Proposals	572	557	689	816	775	1,200
	Awards	264	241	268	281	238	370
	Funding Rate	46%	43%	39%	34%	31%	31%
SBE	Proposals	3,279	3,491	4,619	4,089	4,520	4,284
	Awards	931	894	939	1,004	1,144	1,143
	Funding Rate	28%	26%	20%	25%	25%	27%
Other*	Proposals	64	12	44	16	9	37
	Awards	59	12	19	6	7	36

Source: NSF Enterprise Information System 10/2/07

\* The majority of the proposals included in the 'Other' category are managed by the Office of Integrated Activities (OIA). Note: In FY2007, management of the EPSCoR program was transferred from EHR to OIA.

The following are not included in the above statistics: 8,044 Continuing Grant Increments, 3,355 Supplements, and 383 Contracts.

## Appendix 2 Preliminary Proposals

Several NSF programs utilize preliminary proposals in an effort to limit the workload of PIs and to increase the quality of full proposals. The annual number of preliminary proposals varies considerably as a result of competitions being held in a given year. For some programs, preliminary proposals are externally reviewed; other programs provide internal review only.

Decisions regarding preliminary proposals may be non-binding or binding. Non-Binding decisions regarding preliminary proposals are recommendations. A PI may choose to submit a full proposal even if it has been discouraged. Binding decisions, however, are restrictive in that non-invited PIs are not allowed to submit a full proposal.

### Number of Preliminary Proposals and Subsequent Actions

Fiscal Year	2004	2005	2006	2007
Total # Preliminary Proposals	2,310	2,120	1,874	2,842
Non-Binding (NB) Total*	1,412	1,302	1,279	1,540
NB Encouraged:	544	512	509	662
NB Discouraged:	868	790	770	878
Binding Total*	892	816	594	1301
Binding Invite:	221	246	136	252
Binding Non-invite:	671	570	458	1049

\*Non-binding and binding totals do not include withdrawn preliminary proposals

Source: NSF Enterprise Information System 10/2/07

**Appendix 3**  
**Proposals, Awards and Funding Rates by PI Characteristics**

		Fiscal Year								
		1999	2000	2001	2002	2003	2004	2005	2006	2007
American Indian/Alaska Native	Proposals	58	90	118	100	112	93	94	93	80
	Awards	19	34	52	30	28	23	24	30	28
	Funding Rate	33%	38%	44%	30%	25%	25%	26%	32%	35%
Black/ African American	Proposals	539	522	668	748	822	900	813	881	992
	Awards	146	169	180	207	192	208	193	197	234
	Funding Rate	27%	32%	27%	28%	23%	23%	24%	22%	24%
Hispanic or Latino	Proposals	807	854	955	1,041	1,191	1,432	1,436	1,483	1,591
	Awards	245	258	285	300	342	347	322	374	418
	Funding Rate	30%	30%	30%	29%	29%	24%	22%	25%	26%
Native Hawaiian/ Pacific Islander	Proposals	37	41	23	32	37	47	21	25	24
	Awards	13	19	6	7	12	4	4	7	4
	Funding Rate	35%	46%	26%	22%	32%	9%	19%	28%	17%
Asian	Proposals	3,892	4,218	4,582	5,509	6,895	7,618	7,253	7,821	8,622
	Awards	1,012	1,101	1,077	1,195	1,445	1,382	1,278	1,507	1,776
	Funding Rate	26%	26%	24%	22%	21%	18%	18%	19%	21%
White, Not of Hispanic Origin	Proposals	22,162	22,634	23,886	25,288	28,081	30,251	28,752	28,645	29,318
	Awards	7,329	7,856	7,814	7,985	8,130	7,713	7,305	7,568	8,103
	Funding Rate	33%	35%	33%	32%	29%	25%	25%	26%	28%

Source: NSF Enterprise Information System 10/2/07.

**Appendix 4**  
**Median and Average Award Amounts for Research Grants**  
**By Directorate or Office**

		Fiscal Year						
		2001	2002	2003	2004	2005	2006	2007
<b>NSF</b>	Median	\$84,387	\$85,839	\$100,000	\$101,566	\$103,965	\$101,698	\$109,900
	Average	\$113,833	\$115,656	\$135,609	\$139,522	\$143,669	\$134,565	\$146,270
<b>BIO</b>	Median	\$108,333	\$110,000	\$126,000	\$133,191	\$140,000	\$139,972	\$141,929
	Average	\$143,512	\$136,509	\$177,305	\$171,074	\$183,939	\$190,585	\$182,246
<b>CSE</b>	Median	\$92,000	\$93,511	\$113,333	\$113,333	\$112,431	\$116,667	\$115,300
	Average	\$130,289	\$135,788	\$158,899	\$166,517	\$150,523	\$145,863	\$139,000
<b>ENG</b>	Median	\$80,946	\$83,965	\$99,997	\$96,677	\$97,054	\$90,000	\$99,768
	Average	\$99,506	\$102,060	\$119,470	\$119,704	\$117,456	\$110,031	\$115,860
<b>GEO</b>	Median	\$76,667	\$80,168	\$102,667	\$114,730	\$116,492	\$110,394	\$119,713
	Average	\$98,917	\$103,439	\$146,475	\$150,181	\$147,690	\$148,520	\$153,922
<b>MPS</b>	Median	\$86,243	\$83,319	\$100,000	\$100,000	\$100,000	\$100,000	\$105,912
	Average	\$114,421	\$111,617	\$128,585	\$130,043	\$135,423	\$119,637	\$130,459
<b>OCI</b>	Median	\$75,000	\$125,000	\$134,333	\$365,408	\$160,522	\$253,153	\$450,000
	Average	\$82,882	\$176,289	\$160,262	\$401,828	\$315,044	\$287,458	\$511,682
<b>OISE</b>	Median	\$8,784	\$9,800	\$10,000	\$10,000	\$14,996	\$32,500	\$46,800
	Average	\$17,429	\$16,441	\$20,869	\$15,003	\$90,980	\$59,006	\$156,673
<b>OPP</b>	Median	\$77,789	\$81,517	\$126,143	\$141,452	\$122,106	\$132,234	\$167,025
	Average	\$113,164	\$130,343	\$144,392	\$204,126	\$180,487	\$150,488	\$238,398
<b>SBE</b>	Median	\$63,377	\$62,950	\$77,388	\$77,948	\$84,050	\$85,164	\$93,851
	Average	\$80,709	\$78,035	\$89,488	\$90,373	\$110,184	\$102,560	\$115,337

Source: NSF Enterprise Information System 10/2/07

Note: EHR is not included in this appendix since the number of awards included in the 'research grant' category is small relative to the number of education awards managed by that directorate.

**Appendix 5**  
**Average Number of Months of Salary Support for Single and Multi PI Grants**  
**by Directorate or Office**

Directorate or Office	Type of Award	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
BIO	Multi-PI Grants	5.0	4.6	4.7	4.0	4.1	4.3	3.8	3.7	3.6	3.5
	Single PI Grants	2.8	2.9	3.3	3.0	3.8	3.7	3.6	3.7	3.5	3.3
	BIO Average	3.3	3.4	3.6	3.3	3.9	3.9	3.6	3.7	3.6	3.3
CSE	Multi-PI Grants	1.9	2.1	2.0	2.6	1.9	1.8	1.8	1.7	1.6	1.6
	Single PI Grants	2.2	2.5	2.6	2.6	2.4	2.3	2.1	1.9	2.0	2.0
	CSE Average	2.1	2.4	2.4	2.6	2.2	2.0	1.9	1.8	1.8	1.8
EHR	Multi-PI Grants	2.0	3.3	5.9	4.2	5.1	3.7	3.0	3.0	3.0	2.9
	Single PI Grants	9.0	5.8	4.3	4.2	4.4	3.8	3.5	3.4	3.0	2.4
	EHR Average	6.1	4.9	4.9	4.2	4.7	3.8	3.2	3.1	3.0	2.7
ENG	Multi-PI Grants	1.4	1.5	1.9	2.1	2.0	1.9	1.8	1.8	1.7	1.7
	Single PI Grants	1.7	1.9	2.1	2.2	2.5	2.6	2.7	2.6	2.6	3.2
	ENG Average	1.6	1.8	2.0	2.2	2.3	2.3	2.3	2.2	2.1	2.4
GEO	Multi-PI Grants	2.4	2.7	2.8	2.8	3.0	3.1	3.1	3.0	2.9	2.9
	Single PI Grants	2.2	2.6	2.7	2.9	3.1	3.2	3.1	2.9	2.7	2.8
	GEO Average	2.3	2.6	2.7	2.9	3.1	3.2	3.1	2.9	2.8	2.9
MPS	Multi-PI Grants	2.0	1.9	2.1	2.0	2.1	2.1	2.2	2.2	2.2	2.0
	Single PI Grants	1.8	2.1	2.5	2.9	2.8	2.7	2.7	2.7	2.6	2.4
	MPS Average	1.9	2.1	2.4	2.8	2.7	2.6	2.6	2.6	2.5	2.3
SBE	Multi-PI Grants	2.3	2.5	2.5	2.6	2.8	2.5	2.2	2.1	1.9	1.8
	Single PI Grants	2.7	3.0	3.5	3.5	3.7	3.3	3.1	3.0	2.9	2.5
	SBE Average	2.6	2.8	3.2	3.2	3.4	3.0	2.7	2.6	2.4	2.2
OCI	Multi-PI Grants	1.8	1.7	1.5	1.7	5.3	4.4	5.0	3.9	2.9	3.4
	Single PI Grants	1.2	1.5	1.9	2.0	3.6	4.0	5.9	4.8	3.9	5.6
	OCI Average	1.5	1.6	1.7	1.9	4.6	4.3	5.2	4.1	3.1	3.7
OISE	Multi-PI Grants	1.7	2.2	6.6	7.6	7.0	1.6	2.7	2.6	2.3	1.3
	Single PI Grants	2.1	5.9	4.6	4.5	4.4	4.6	4.8	5.2	3.3	2.3
	OISE Average	2.1	5.1	5.2	5.5	5.3	3.5	4.1	3.6	2.7	1.4
OPP	Multi-PI Grants	2.4	2.5	3.0	3.3	3.5	3.2	3.4	3.3	3.6	3.3
	Single PI Grants	2.5	2.4	2.6	2.7	2.8	2.9	3.2	3.5	3.3	3.3
	OPP Average	2.4	2.4	2.8	2.9	3.1	3.1	3.3	3.4	3.5	3.3
NSF	Multi-PI Grants	2.4	2.5	2.6	2.7	2.6	2.6	2.5	2.4	2.4	2.3
	Single PI Grants	2.1	2.4	2.7	2.8	3.0	2.9	2.9	2.8	2.7	2.6
	NSF Average	2.2	2.4	2.7	2.8	2.9	2.8	2.7	2.6	2.6	2.5

Source: NSF Enterprise Information System 10/2/07

Note: The NSF, directorate, or office average is weighted by the number of single and multiple PI awards.

## Appendix 6 Number of People Involved in NSF Activities

In FY 2007, an estimated 191,245 senior researchers, post-doctoral associates, teachers and students across all levels were directly involved in NSF research and education programs and activities.

	FY 2007 Estimate
Senior Researchers	41,270
Other Professionals	13,095
Postdoctoral Associates	6,070
Graduate Students	35,415
Undergraduate Students	22,745
K-12 Students	11,415
K-12 Teachers	61,235
<b>Total, Number of People</b>	<b>191,245</b>

Source: NSF FY 2009 Budget Request

In addition, NSF programs indirectly impact many millions of people. These programs reach K-12 students, K-12 teachers, the general public, and researchers. Outreach activities including workshops, activities at museums, television, educational videos, journal articles, and dissemination of improved curriculum and teaching methods.

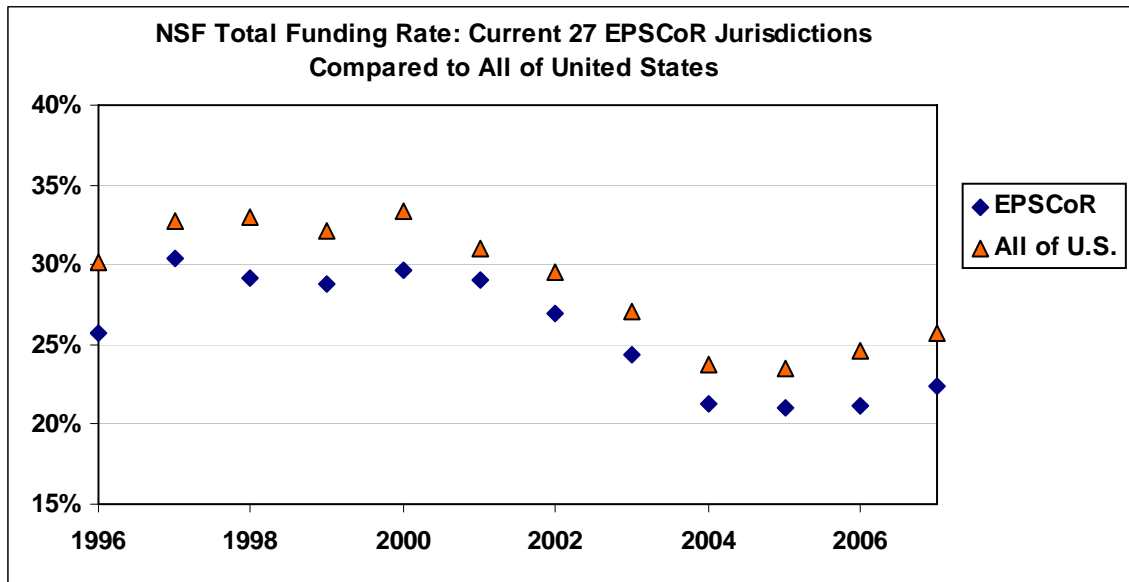
## Appendix 7 EPSCoR: Jurisdictions, Proposal, Award, and Funding Data

Twenty-five states, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands are currently eligible to compete in the NSF EPSCoR program. The states are: Alabama, Alaska, Arkansas, Delaware, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, West Virginia, and Wyoming.

The figure in **Appendix 7.1** shows the change over time for the funding rate of EPSCoR jurisdictions relative to the overall funding rate for all of the US. The figure in **Appendix 7.2** indicates, as a percentage of the overall NSF budget, the change in funding received by each of the EPSCoR jurisdictions, comparing their first three years in EPSCoR to the most recent three-year time period (FY 2005-2007). The table in **Appendix 7.3** shows the funding data for each EPSCoR jurisdiction (the year the jurisdiction joined EPSCoR is shown in parentheses below the name of that jurisdiction).

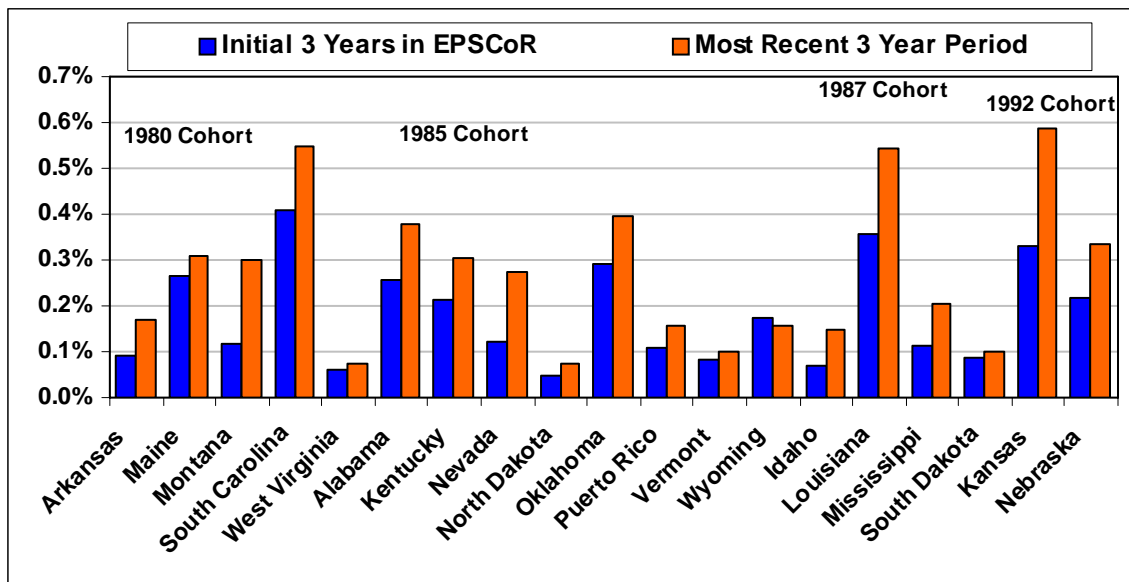


### Appendix 7.1 Overall Funding Rates for EPSCoR Jurisdictions



Source: NSF Budget Internet Information System (BIIS)

### Appendix 7.2 Funding to EPSCoR Jurisdictions as Percentage of the NSF Budget: Initial 3 Years in EPSCoR and Most Recent (FY 2005-07) 3 Year Period



Sources: NSF Budget Internet Information System (BIIS) and NSF Report Database

\* NSF Research Support data are adjusted in cases where a single large award or facility skew the data

### Appendix 7.3: Funding Rates by EPSCoR Jurisdiction

		2003	2004	2005	2006	2007
<b>All NSF</b>	Awards	10,798	10,367	9,772	10,450	11,484
	Proposals	40,084	43,816	41,723	42,374	44,593
	Funding Rate	27%	24%	23%	25%	26%
<b>All EPSCoR Jurisdictions</b>	Awards	1,567	1,454	1,433	1,489	1,653
	Proposals	6,418	6,815	6,802	7,037	7,392
	Funding Rate	24%	21%	21%	21%	22%
<b>Alabama (1985)</b>	Awards	81	99	78	84	86
	Proposals	443	488	483	530	508
	Funding Rate	18%	20%	16%	16%	17%
<b>Alaska (2000)</b>	Awards	74	63	52	63	75
	Proposals	200	211	203	209	246
	Funding Rate	37%	30%	26%	30%	30%
<b>Arkansas (1980)</b>	Awards	43	45	29	47	58
	Proposals	201	236	191	209	244
	Funding Rate	21%	19%	15%	22%	24%
<b>Delaware (2003)</b>	Awards	64	50	54	50	67
	Proposals	239	266	254	247	283
	Funding Rate	27%	19%	21%	20%	24%
<b>Hawaii (2001)</b>	Awards	71	66	89	77	74
	Proposals	247	252	265	240	276
	Funding Rate	29%	26%	34%	32%	27%
<b>Idaho (1987)</b>	Awards	33	24	31	29	34
	Proposals	153	148	140	148	161
	Funding Rate	22%	16%	22%	20%	21%
<b>Kansas (1992)</b>	Awards	79	70	88	76	78
	Proposals	338	388	367	393	404
	Funding Rate	23%	18%	24%	19%	19%
<b>Kentucky (1985)</b>	Awards	66	72	62	52	60
	Proposals	298	337	307	293	330
	Funding Rate	22%	21%	20%	18%	18%
<b>Louisiana (1987)</b>	Awards	98	107	100	117	96
	Proposals	455	517	514	548	495
	Funding Rate	22%	21%	19%	21%	19%
<b>Maine (1980)</b>	Awards	53	41	50	36	58
	Proposals	190	197	192	181	200
	Funding Rate	28%	21%	26%	20%	29%
<b>Mississippi (1987)</b>	Awards	33	43	32	48	40
	Proposals	181	238	226	293	251
	Funding Rate	18%	18%	14%	16%	16%
<b>Montana (1980)</b>	Awards	67	54	43	52	61
	Proposals	189	194	193	242	238
	Funding Rate	35%	28%	22%	21%	26%
<b>Nebraska (1992)</b>	Awards	44	52	41	59	51
	Proposals	233	242	226	238	250
	Funding Rate	19%	21%	18%	25%	20%
<b>Nevada (1985)</b>	Awards	45	31	40	42	50
	Proposals	160	159	203	200	231

<b>Nebraska</b>	Awards	44	52	41	59	51
<b>(1992)</b>	Proposals	233	242	226	238	250
	Funding Rate	19%	21%	18%	25%	20%
<b>Nevada</b>	Awards	45	31	40	42	50
<b>(1985)</b>	Proposals	160	159	203	200	231
	Funding Rate	28%	19%	20%	21%	22%
<b>New Hampshire</b>	Awards	67	53	64	53	60
<b>(2004)</b>	Proposals	244	232	280	243	240
	Funding Rate	27%	23%	23%	22%	25%
<b>New Mexico</b>	Awards	117	90	80	91	104
<b>(2001)</b>	Proposals	406	378	352	348	401
	Funding Rate	29%	24%	23%	26%	26%
<b>North Dakota</b>	Awards	29	20	19	22	15
<b>(1985)</b>	Proposals	127	140	154	170	139
	Funding Rate	23%	14%	12%	13%	11%
<b>Oklahoma</b>	Awards	61	65	55	74	66
<b>(1985)</b>	Proposals	302	338	327	342	338
	Funding Rate	20%	19%	17%	22%	20%
<b>Puerto Rico</b>	Awards	20	20	16	19	32
<b>(1985)</b>	Proposals	115	106	119	140	153
	Funding Rate	17%	19%	13%	14%	21%
<b>Rhode Island</b>	Awards	105	128	117	140	127
<b>(2004)</b>	Proposals	291	340	334	353	390
	Funding Rate	36%	38%	35%	40%	33%
<b>South Carolina</b>	Awards	110	80	90	86	122
<b>(1980)</b>	Proposals	472	452	453	464	523
	Funding Rate	23%	18%	20%	19%	23%
<b>South Dakota</b>	Awards	23	12	21	14	21
<b>(1987)</b>	Proposals	86	93	101	97	97
	Funding Rate	27%	13%	21%	14%	22%
<b>Tennessee</b>	Awards	111	102	113	99	145
<b>(2004)</b>	Proposals	521	540	585	564	642
	Funding Rate	21%	19%	19%	18%	23%
<b>U.S. Virgin Islands</b>	Awards	0	2	2	1	0
<b>(2002)</b>	Proposals	1	6	5	6	4
	Funding Rate	0%	33%	40%	17%	0%
<b>Vermont</b>	Awards	24	21	22	16	26
<b>(1985)</b>	Proposals	113	111	129	119	129
	Funding Rate	21%	19%	17%	13%	20%
<b>West Virginia</b>	Awards	18	17	16	19	21
<b>(1980)</b>	Proposals	111	105	100	121	128
	Funding Rate	16%	16%	16%	16%	16%
<b>Wyoming</b>	Awards	31	27	29	23	26
<b>(1985)</b>	Proposals	102	101	99	99	91
	Funding Rate	30%	27%	29%	23%	29%

Source: NSF Budget Internet Information System (BIIS)

## **Appendix 8**

### **Small Grants for Exploratory Research (SGER)**

Since the beginning of FY 1990, the Small Grants for Exploratory Research (SGER) option has permitted program officers throughout the Foundation to make small-scale grants without formal external review. Characteristics of activities that can be supported by an SGER award include:

- preliminary work on untested and novel ideas;
- ventures into emerging and potentially transformative research ideas;
- application of new expertise or new approaches to "established" research topics;
- having a severe urgency with regard to availability of, or access to data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events; or
- efforts of similar character likely to catalyze rapid and innovative advances.

The maximum SGER award size is \$200,000, and program officers may obligate up to five percent of their program budget per fiscal year for SGER awards.

Potential SGER applicants are encouraged to contact an NSF program officer before submitting an SGER proposal to determine its appropriateness for funding. Directorate-level data on SGER proposals and awards are presented in the table in **Appendix 8.1** (below). The number of SGER proposals may be impacted significantly by a major disaster. For example, the increase of SGER proposals in FY 2006 is in large part due to the number of SGERs awarded to collect ephemeral data immediately following Hurricane Katrina.

NSF initiated a study of the SGER portfolio in FY 2006 to determine the effectiveness and impact of the SGER mechanism. Preliminary results of the study were provided in FY 2007 and the final results are expected in FY 2008.

**Appendix 8.1**  
**Small Grants for Exploratory Research (SGER)**  
**Funding Trends by Directorate or Office**

		Fiscal Year			
		2004	2005	2006	2007
<b>NSF</b>	Proposals	640	504	697	469
	Awards	382	387	472	410
	Total \$	\$29,493,932	\$26,980,122	\$40,022,729	\$34,830,516
	% of Obligations	0.5%	0.5%	0.7%	0.6%
	Average \$	\$77,209	\$69,716	\$84,794	\$84,952
<b>BIO</b>	Proposals	65	55	55	29
	Awards	52	38	49	26
	Total \$	\$5,392,558	\$3,020,321	\$5,366,962	\$2,715,405
	% of Obligations	0.9%	0.5%	0.9%	0.4%
	Average \$	\$103,703	\$79,482	\$109,530	\$104,439
<b>CSE</b>	Proposals	51	82	89	136
	Awards	48	71	88	136
	Total \$	\$3,170,389	\$6,678,905	\$10,249,890	\$14,601,606
	% of Obligations	0.6%	1.4%	2.0%	2.7%
	Average \$	\$87,814	\$94,069	\$116,476	\$107,365
<b>EHR</b>	Proposals	17	15	16	7
	Awards	16	11	16	7
	Total \$	\$2,092,916	\$1,498,645	\$818,176	\$879,282
	% of Obligations	0.2%	0.2%	0.1%	0.1%
	Average \$	\$130,807	\$136,240	\$51,136	\$125,612
<b>ENG</b>	Proposals	127	176	180	134
	Awards	119	126	145	89
	Total \$	\$8,147,351	\$6,708,778	\$11,210,530	\$5,767,069
	% of Obligations	1.4%	1.1%	1.8%	0.9%
	Average \$	\$68,465	\$53,244	\$77,314	\$64,799
<b>GEO</b>	Proposals	68	62	83	85
	Awards	64	59	79	81
	Total \$	\$3,508,457	\$3,414,557	\$4,393,904	\$4,777,922
	% of Obligations	0.4%	0.5%	0.5%	0.6%
	Average \$	\$54,820	\$57,874	\$55,619	\$58,987

### Appendix 8.1 Continued

		Fiscal Year			
		2004	2005	2006	2007
<b>MPS</b>	Proposals	272	21	39	39
	Awards	45	18	31	34
	Total \$	\$4,423,294	\$1,663,544	\$2,636,865	\$3,522,749
	% of Obligations	0.4%	0.1%	0.2%	0.3%
	Average \$	\$98,295	\$92,419	\$85,060	\$103,610
<b>OCI</b>	Proposals	0	11	2	1
	Awards	0	11	2	1
	Total \$	\$1,044,683	\$1,458,472	\$182,371	\$249,119
	% of Obligations	0.8%	1.2%	0.1%	0.1%
	Average \$	N/A	132588.364	91185.5	\$249,119
<b>OISE</b>	Proposals	0	0	0	0
	Awards	0	0	0	0
	Total \$	\$62,200	\$102,000	\$147,753	\$65,000
	% of Obligations	0.2%	0.2%	0.3%	0.2%
	Average \$	N/A	N/A	N/A	N/A
<b>OPP</b>	Proposals	18	24	16	23
	Awards	16	24	16	23
	Total \$	\$695,961	\$1,197,306	\$483,973	\$1,234,698
	% of Obligations	0.2%	0.3%	0.1%	0.3%
	Average \$	\$43,498	\$49,888	\$30,248	\$53,683
<b>SBE</b>	Proposals	22	58	217	15
	Awards	22	29	46	13
	Total \$	\$820,999	\$1,237,594	\$4,532,305	\$1,017,666
	% of Obligations	0.4%	0.6%	2.0%	0.4%
	Average \$	\$37,318	\$42,676	\$98,528	\$78,282

Source: NSF Enterprise Information System 10/2/07

Note: OCI and OISE have obligations from split-funding awards that are managed by other directorates or offices.

### Appendix 9 Merit Review Process Oversight Mechanisms

Performance evaluation of the operation of the merit review system is supported with information from the following activities:

- Program Evaluation by Committees of Visitors.** To ensure the highest quality in processing and recommending proposals for awards, NSF convenes external groups of experts, called Committees of Visitors (COVs), to review each program approximately every three to five years. This includes disciplinary programs in the various directorates and offices, and the cross-disciplinary programs managed across directorates. The COVs (comprised of scientists, engineers and educators from academia, industry, and government) convene at NSF for a two to three day assessment. These experts evaluate the integrity and efficiency of the processes used for proposal review and program decision-making. In addition, the COVs provide a retrospective assessment of the quality of results of NSF's programmatic investments. The COV reports, written as answers and commentary to specific questions, are submitted for review through Advisory Committees to the directorates and the NSF

Director. Questions include aspects of the program portfolio, such as the balance of high-risk, multidisciplinary, and innovative projects. The recommendations of COVs are reviewed by management and taken into consideration by NSF when evaluating existing programs and future directions for the Foundation.<sup>12</sup>

- **Advisory Committee (AC) Reporting on Directorate/Office Performance.**  
Advisory committees regularly provide community perspectives to the research and education directorates, Office of Cyberinfrastructure, Office of International Science and Engineering, and Office of Polar Programs. They are typically composed of 15-25 experts who have experience relevant to the programs under review and are broadly drawn from academia, industry, and government.
- **Advisory Committee for GPRA Performance Assessment.**  
The Advisory Committee for GPRA Performance Assessment (AC/GPA) was established in June 2002 to provide advice and recommendations to the NSF Director regarding NSF's performance under the Government Performance and Results Act (GPRA). This is the only Foundation-wide external advisory committee that conducts an assessment of the entire portfolio of NSF investments in science, engineering, and education. The Committee, which is comprised of about 20 scientists, engineers, and educators, is drawn from academic, government research institutions, and private industry. Each year the Committee reviews the Foundation's investments in *Discovery*, *Learning*, and *Research Infrastructure* to determine if NSF demonstrated significant achievement under these strategic goals. The AC/GPA annual report is publically available on the NSF website.

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<sup>12</sup> The COV reports and directorate responses are available electronically as a link from the NSF GPRA web page, <http://www.nsf.gov/about/performance/>.

**Appendix 10**  
**Requests for Formal Reconsideration of Declined Proposals**

		Fiscal Year					
		2002	2003	2004	2005	2006	2007
First Level Reviews (Assistant Directors):							
BIO	Request	4	4	3	2	4	2
	- Upheld	4	4	3	2	4	2
	- Reversed	0	0	0	0	0	0
CISE	Request	1	1	2	3	1	1
	- Upheld	0	0	2	3	1	1
	- Reversed	0	1	0	0	0	0
EHR	Request	2	3	2	7	4	6
	- Upheld	2	3	2	7	4	6
	- Reversed	0	0	0	0	0	0
ENG	Request	2	2	3	3	6	3
	- Upheld	2	2	3	3	6	3
	- Reversed	0	0	0	0	0	0
GEO	Request	1	4	4	0	0	2
	- Upheld	1	4	4	0	0	2
	- Reversed	0	0	0	0	0	0
MPS	Request	15	4	24	15	16	16
	- Upheld	15	4	24	15	15	15
	- Reversed	0	0	0	0	1	1
SBE	Request	1	2	3	3	4	0
	- Upheld	0	2	3	3	4	0
	- Reversed	1	1	0	0	0	0
Other*	Request	0	0	0	0	0	3
	- Upheld	0	0	0	0	0	3
	- Reversed	0	0	0	0	0	0
Second Level Reviews (Deputy Director):							
O/DD	Request	4	5	7	2	0	1
	- Upheld	4	4	7	2	0	1
	- Reversed	0	1	0	0	0	0
Total Reviews First & Second Level							
NSF	Request	30	26	49	35	35	34
	- Upheld	29	24	48	35	34	33
	- Reversed	1	2	1	0	1	1

Source: Office of the Director

Note:

\*Other category includes OCI, OIA, OPP, and OISE.

The number of decisions (upheld or reversed) may not equal the number of requests in each year due to the carryover of the pending reconsideration request.



**Appendix 11**  
**Average Number of Reviews Per Proposal**  
**By Method and Directorate or Office, FY 2007**

		All Methods	Mail + Panel	Mail-Only	Panel-Only	Not Reviewed *	Returned without Review	Withdrawn Proposals
<b>NSF</b>	Reviews	248,355	98,293	15,974	134,088			
	Proposals	43,164	14,292	3,737	25,135	1,413	1,405	301
	Rev/Prop	5.8	6.9	4.3	5.3			
<b>BIO</b>	Reviews	41,602	35,974	268	5,360			
	Proposals	6,574	5,301	47	1,226	154	249	62
	Rev/Prop	6.3	6.8	5.7	4.4			
<b>CSE</b>	Reviews	28,668	1,912	308	26,448			
	Proposals	5,443	317	81	5,045	301	83	13
	Rev/Prop	5.3	6.0	3.8	5.2			
<b>EHR</b>	Reviews	26,513	710	220	25,583			
	Proposals	4,217	123	61	4,033	31	70	10
	Rev/Prop	6.3	5.8	3.6	6.3			
<b>ENG</b>	Reviews	46,160	2,608	653	42,899			
	Proposals	9,320	451	175	8,694	254	604	16
	Rev/Prop	5.0	5.8	3.7	4.9			
<b>GEO</b>	Reviews	28,210	22,885	2,961	2,364			
	Proposals	4,223	3,157	649	417	144	41	32
	Rev/Prop	6.7	7.2	4.6	5.7			
<b>MPS</b>	Reviews	41,661	11,210	9,120	21,331			
	Proposals	7,022	1,448	2,086	3,488	293	240	92
	Rev/Prop	5.9	7.7	4.4	6.1			
<b>OCI</b>	Reviews	1,537	114	48	1,375			
	Proposals	294	16	13	265	10	5	6
	Rev/Prop	5.2	7.1	3.7	5.2			
<b>OISE</b>	Reviews	2,699	563	976	1,160			
	Proposals	646	77	281	288	130	46	31
	Rev/Prop	4.2	7.3	3.5	4.0			
<b>OPP</b>	Reviews	6,328	4,405	747	1,176			
	Proposals	1,161	727	171	263	39	4	4
	Rev/Prop	5.5	6.1	4.4	4.5			
<b>SBE</b>	Reviews	24,840	17,825	623	6,392			
	Proposals	4,240	2,666	158	1,416	44	32	35
	Rev/Prop	5.9	6.7	3.9	4.5			
<b>Other</b>	Reviews	137	87	50	0			
	Proposals	24	9	15	0	13	31	0
	Rev/Prop	5.7	9.7	3.3	N/A			

Source: NSF Enterprise Information System 10/2/07

Notes:

- The “Not Reviewed” category includes award and decline actions on proposals for which external reviews are not required, e.g., SGER and certain workshop proposals. The “Returned without Review” (proposals returned for failing to comply with submission requirements) and “Withdrawn Proposals” categories include proposals that were neither awarded nor declined.
- The proposal totals shown in the “All Methods” category do not include the proposals shown in the “Not Externally Reviewed” category.
- There were 41,719 panel summaries in FY 2007. The review counts in the “all methods”, “mail + panel” and “panel-only” columns include both individual reviews and panel summaries.
- Withdrawn proposals include only those that underwent merit review.

**Appendix 12**  
**Methods of NSF Proposal Review**

FY	Total	Mail + Panel		Mail Only		Panel Only		Not Externally Reviewed	
	Proposals	Proposals	Percent	Proposals	Percent	Proposals	Percent	Proposals	Percent
2007	44,577	14,292	32%	3,737	8%	25,135	56%	1,413	3%
2006	42,352	14,349	34%	3,895	9%	22,384	53%	1,724	4%
2005	41,722	13,919	33%	3,656	9%	22,735	54%	1,412	3%
2004	43,851	13,345	30%	4,496	10%	24,553	56%	1,457	3%
2003	40,075	12,683	32%	4,579	11%	21,391	53%	1,388	3%
2002	35,164	11,346	32%	4,838	14%	17,616	50%	1,364	4%
2001	31,942	9,367	29%	5,460	17%	15,751	49%	1,364	4%
2000	29,507	9,296	32%	6,048	20%	12,886	44%	1,277	4%
1999	28,579	8,918	31%	6,452	23%	12,046	42%	1,163	4%
1998	28,422	8,486	30%	6,974	25%	11,396	40%	1,566	6%
1997	30,258	8,812	29%	7,855	26%	12,109	40%	1,482	5%
1996	30,199	8,562	28%	7,812	26%	12,490	41%	1,335	4%

Source: NSF Enterprise Information System 10/2/07

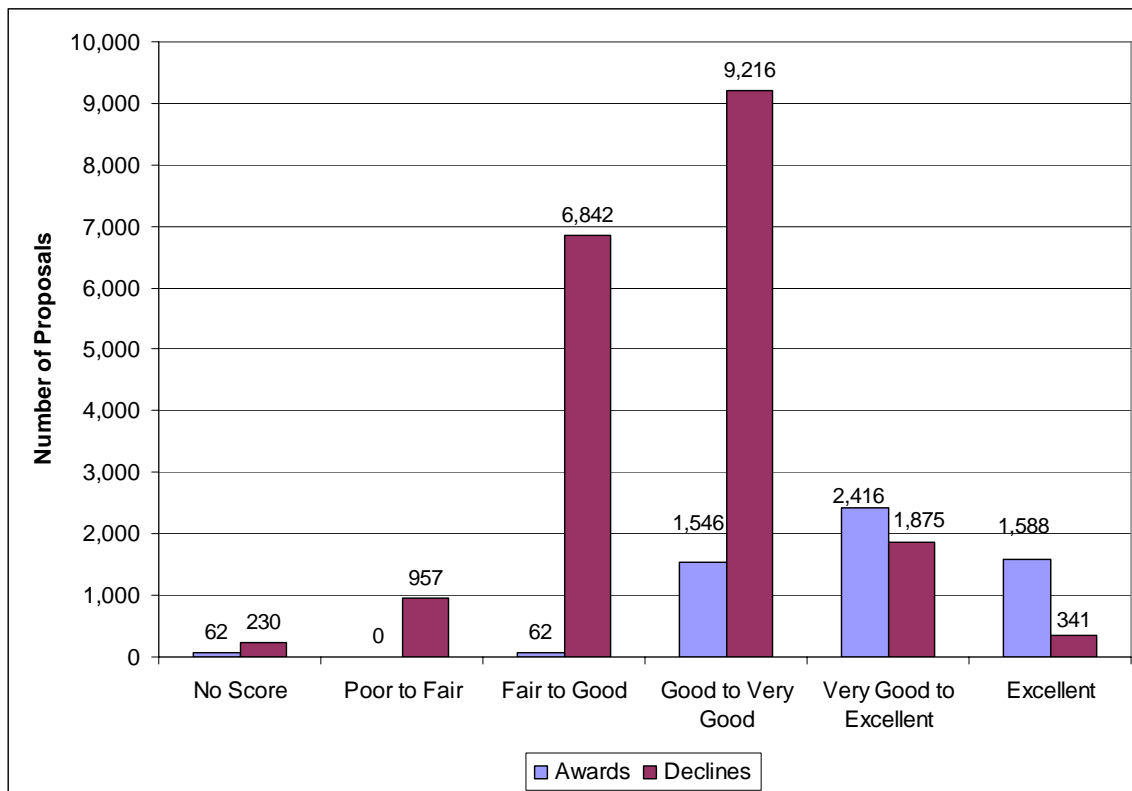
Panel-Only includes cases where panel was mailed proposal for review prior to panel.

**Appendix 12.1**  
**Methods of NSF Proposal Review by Directorate or Office**  
**FY 2007**

Directorate	Total	Mail + Panel		Mail-Only		Panel-Only		Not Reviewed	
	Proposals	Proposals	Percent	Proposals	Percent	Proposals	Percent	Proposals	Percent
<b>NSF</b>	<b>44,577</b>	<b>14,292</b>	<b>32%</b>	<b>3,737</b>	<b>8%</b>	<b>25,135</b>	<b>56%</b>	<b>1,413</b>	<b>3%</b>
BIO	6,728	5,301	79%	47	1%	1,226	18%	154	2%
CSE	5,744	317	6%	81	1%	5,045	88%	301	5%
EHR	4,248	123	3%	61	1%	4,033	95%	31	1%
ENG	9,574	451	5%	175	2%	8,694	91%	254	3%
GEO	4,367	3,157	72%	649	15%	417	10%	144	3%
MPS	7,315	1,448	20%	2,086	29%	3,488	48%	293	4%
OCI	304	16	5%	13	4%	265	87%	10	3%
OISE	776	77	10%	281	36%	288	37%	130	17%
OPP	1,200	727	61%	171	14%	263	22%	39	3%
SBE	4,284	2,666	62%	158	4%	1,416	33%	44	1%
Other	37	9	24%	15	41%	0	0%	13	35%

Source: NSF Enterprise Information System 10/2/07

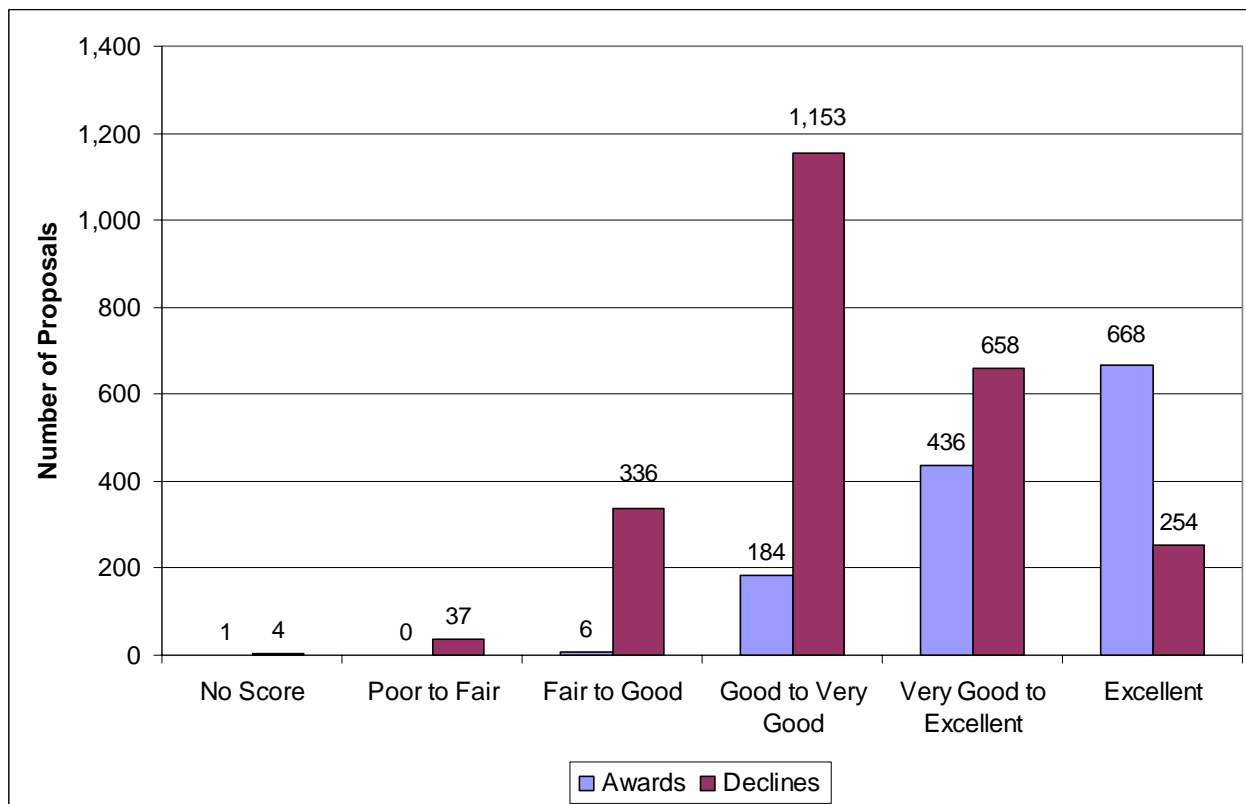
**Appendix 13**  
**Distribution of Average Reviewer Ratings**  
**Panel-Only Reviewed, FY 2007**



Source: NSF Enterprise Information System 10/2/07

Note: Number of FY 2007 Proposals – 19,461 Declines, 5,674 Awards

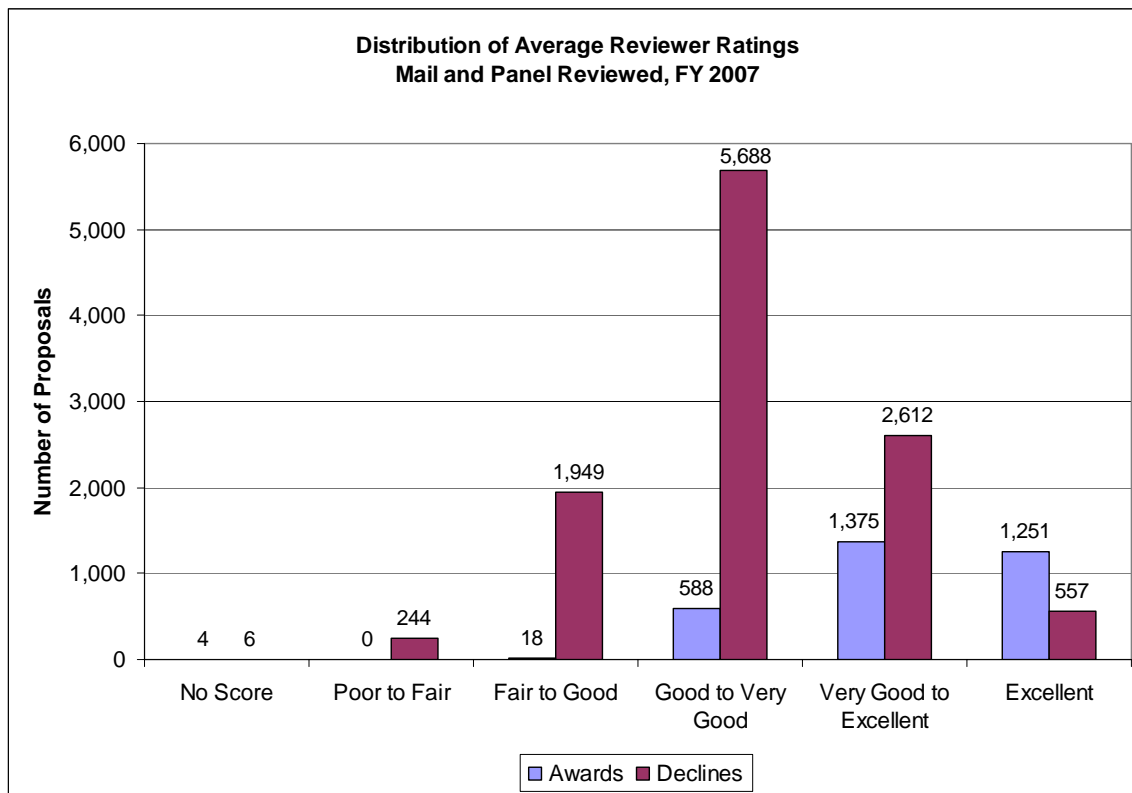
**Appendix 13.1**  
**Distribution of Average Reviewer Ratings**  
**Mail-Only Reviewed, FY 2007**



Source: NSF Enterprise Information System 10/2/07

Note: Number of FY 2007 Proposals – 2,442 Declines, 1,295 Awards

**Appendix 13.2**  
**Distribution of Average Reviewer Ratings**  
**Mail and Panel Reviewed, FY 2007**



Source: NSF Enterprise Information System 10/2/07

Note: Number of FY 2007 Proposals – 11,056 Declines, 3,236 Awards

## **Appendix 14**

### **Accomplishment Based Renewals and Creativity Extensions**

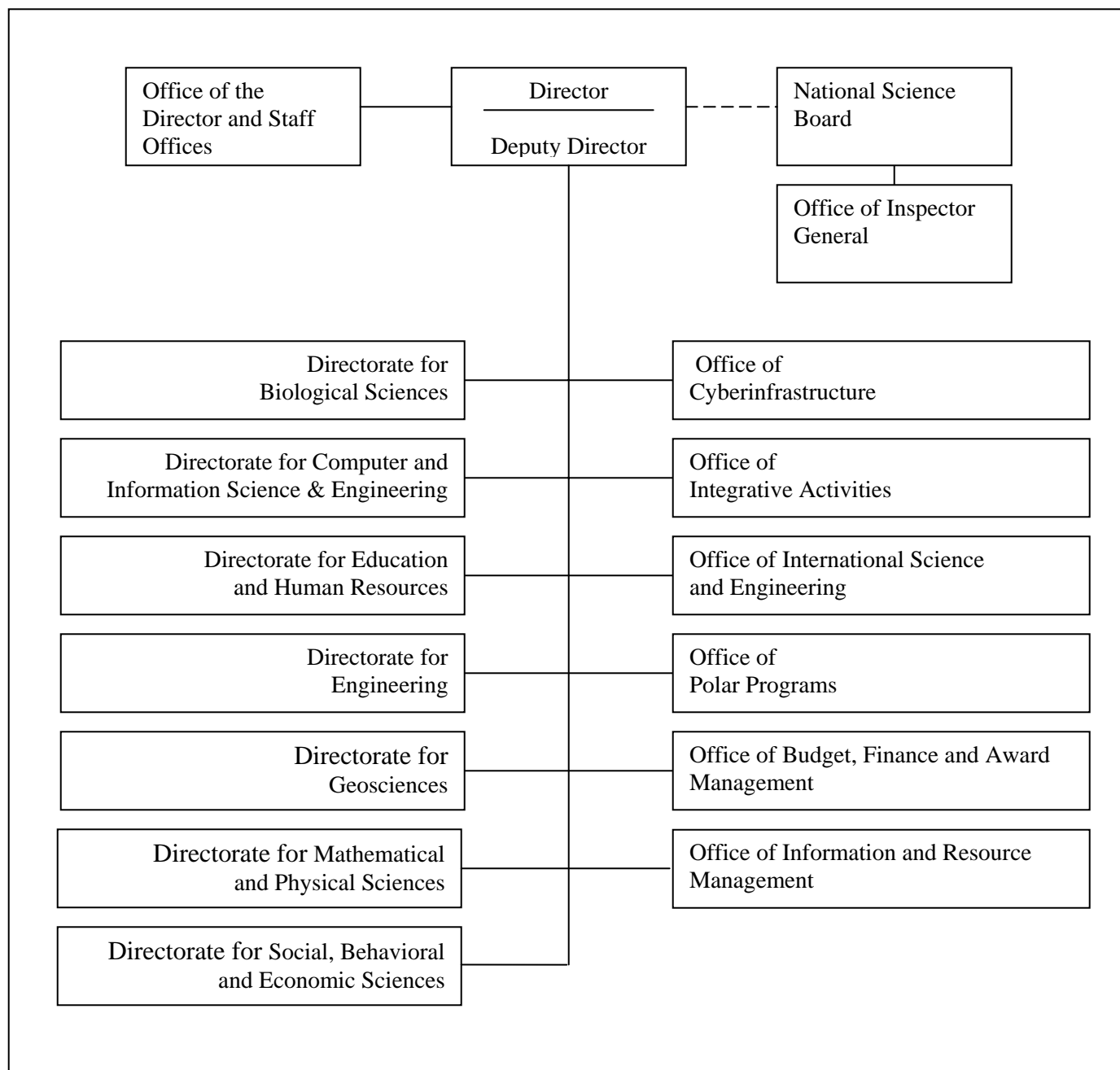
#### **Accomplishment Based Renewals**

In an accomplishment based renewal, the project description is replaced by copies of no more than six reprints of publications resulting from the research supported by NSF (or research supported by other sources that is closely related to the NSF-supported research) during the preceding three to five year period. In addition, a brief (not to exceed four pages) summary of plans for the proposed support period must be submitted. All other information required for NSF proposal submission remains the same. The proposals undergo merit review in the tradition of the specific program. In 2007 there were 100 requests for accomplishment based renewals, 28 of which were awarded.

#### **Creativity Extensions**

A program officer may recommend the extension of funding for certain research grants beyond the initial period for which the grant was awarded for a period of up to two years. The objective is to offer the most creative investigators an extension to address opportunities in the same general research area, but not necessarily covered by the original/current proposal. Awards eligible for such an extension are generally three-year continuing grants. Special Creativity Extensions are usually initiated by the NSF program officer based on progress during the first two years of a three-year grant.

**Appendix 15**  
**National Science Foundation Organization Chart**



## Appendix 16 Terms & Acronyms

<u>Acronym</u>	<u>Definition</u>
AC	Advisory Committee
AC/GPA	Advisory Committee for GPRA Performance Assessment
AD	NSF Assistant Director
BFA	Office of Budget, Finance and Award Management
BIO	Directorate for Biological Sciences
BIIS	NSF Budget Internet Information System
CAREER	Faculty Early Career Development Program
CGI	Continuing Grant Increments
CISE	Directorate for Computer and Information Science and Engineering
COV	Committee of Visitors
EHR	Directorate for Education and Human Resources
EIS	Enterprise Information System
ENG	Directorate for Engineering
EPSCoR	Experimental Program to Stimulate Competitive Research
FTE	Full-Time Equivalent
FY	Fiscal Year
GEO	Directorate for Geosciences
GPRA	Government Performance and Results Act
IPAs	Temporary employees hired through Intergovernmental Personnel Act
IPAMM	Impact of Proposal & Award Management Mechanisms
IPS	Interactive Panel System
MPS	Directorate for Mathematical and Physical Sciences
NSB	National Science Board
NSF	National Science Foundation
OCI	Office of Cyberinfrastructure
OD	Office of the Director
ODS	Online Document System
OIA	Office of Integrative Activities
OIG	Office of Inspector General
OISE	Office of International Science & Engineering
OMB	Office of Management and Budget
OPP	Office of Polar Programs
PARS	Proposal, PI and Reviewer System
PART	Program Assessment Rating Tool
PI	Principal Investigator
R&RA	Research and Related Activities
SBE	Directorate for Social, Behavioral and Economic Sciences
SGER	Small Grants for Exploratory Research
VSEE	Visiting Scientists, Engineers and Educators