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Report to the National Science Board
on the
National Science Foundation's
Merit Review Process
Fiscal Year 2013



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FY 2013 Report on the NSF Merit Review Process

I. Executive Summary

This annual report to the National Science Board (NSB) includes data and other information about the National Science Foundation (NSF or the Foundation) Merit Review Process for fiscal year (FY) 2013.

In FY 2013, NSF acted on 48,999 competitively reviewed full proposals. This is a small increase of about 0.8% from the number of proposals acted on in FY 2012, but an increase of over 53% from the number of proposals acted on in FY 2001. In FY 2012, two large divisions began requiring the submission of preliminary proposals for most programs within the divisions. The total number of full proposals and preliminary proposals acted on by NSF in FY 2013 (53,690) was 0.1% less than the total number of full proposals and preliminary proposals acted on in FY 2012 (53,748), but an increase of 57% from the total number of full and preliminary proposals acted on in FY 2001.

The Foundation made 10,829 awards in FY 2013, 695 (6%) fewer than in FY 2012 and 15 fewer than in FY 2003. This corresponds to a 22% success rate for competitively reviewed proposals. As indicated by data in **Appendix 1**, the average funding rate varies by NSF directorate, from a low of 18% in Education and Human Resources to a high of 26 % in Geosciences.¹

In FY 2013, 81% of program funds awarded went to academic institutions.

FY 2013 saw a continuation of the recent balance between standard and continuing grants with 35% of funds being awarded as new standard grants compared to 12% as new continuing grants and 22% as continuing grant increments and supplements. In FY 2005, these numbers were 23%, 14%, and 29%, respectively.

The average number of months of salary support for individual Principal Investigators (PIs) or Co-PIs per research grant per year continued its decadal downward trend and is now just over 0.8 months. The running three-year mean number of research proposals a PI submitted before receiving an award remained 2.4 over the three-year period FY 2011 – FY 2013 and the moving three-year average PI success rate remained at 35%, its lowest level over the past decade. The percentage of early-career PIs improved slightly to 22% in FY 2013, from 21% in FY 2012.

Among proposals from PIs who provided information on their gender, race, ethnicity, or disability status, the proportion of proposals from PIs who identified themselves as female was 25.3%. The proportion of proposals from under-represented racial or ethnic minorities was 8.1% and the proportion from PIs with a disability was 1.4%.

¹ The Office of International and Integrative Activities is not included in this comparison.

The Foundation exceeded its “time to decision” goal of informing at least 70% of PIs of funding decisions within six months of receipt of their proposals. In FY 2013, 76% of all proposals were processed within six months.

Proposals that are externally reviewed are reviewed by three methods: panel only, mail + panel, and mail only. In FY 2013, 63% of proposals were reviewed by panel only, 27% by mail + panel, and 6% by mail only. These percentages are consistent with the trend over the last 15 years towards greater reliance on panels. In addition, about 4% of proposals were not reviewed externally. The latter include, for example, proposals for travel, symposia, Early Concept Grants for Exploratory Research, Grants for Rapid Response Research, and Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) Track 1 proposals. This is a decrease from 5% in FY 2012.

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."² NSF achieves its unique mission by making merit-based awards to researchers, educators, and students at just over 1,900 U.S. colleges, universities and other institutions.

All proposals are evaluated using the two NSB-approved criteria: *intellectual merit* and *broader impacts*. These are stated in the *NSF Grant Proposal Guide*. The language describing the merit review criteria in the *Grant Proposal Guide* was revised in October 2012 to incorporate new recommendations from the National Science Board.³ This revised language applied to proposals submitted on or after January 14, 2013, or in response to deadlines that were on or after January 14, 2013. Additional criteria, as stated in the program announcement or solicitation, may be required to highlight the specific objectives of certain programs or activities. About 96% of NSF's proposals are evaluated by external reviewers as well as by NSF staff. The remaining proposals fall into special categories that are, by NSF policy, exempt from external review and may be internally reviewed only, such as proposals for small workshops, Early-concept Grants for Exploratory Research (EAGERs), Grants for Rapid Response Research (RAPIDs), and proposals to the Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) activity⁴ (see **Section III.F9** and **Appendix 10**).

This *FY 2013 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 the report provides summary data about proposals, awards, and funding rates. Longitudinal data are given to provide a perspective over time. **Section IV** provides information about the process by which proposals are reviewed and awarded.

NSF's annual portfolio of funding actions (award or decline) is associated with proposals, requests for supplements, Intergovernmental Personnel Act agreements, and contracts. The bulk of this report deals with two overlapping subsets of these actions. Most of **Section III.A – E** looks at competitively reviewed proposals. **Section III.F** primarily discusses research proposals. The research proposal category includes proposals for what could be considered a typical research project and consists of a large subset (80%) of the competitively reviewed proposals.

In this document, two types of average are reported, the median and the arithmetic mean. The latter will be referred to simply as the mean. Funding rate and proposal success rate are used

² 42 CFR 16 §1862, available at http://www4.law.cornell.edu/uscode/html/uscode42/usc_sec_42_00001862----000-.html. [Accessed 10.26.2012.]

³ The *NSF Grant Proposal Guide* (GPG) applicable for the first quarter of FY 2013 is available at: http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_index.jsp. The version of the GPG applicable for the remainder of FY 2013 may be found at http://www.nsf.gov/pubs/policydocs/pappguide/nsf13001/gpg_index.jsp.

⁴ In FY 2012, NSF inaugurated the Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) activity. See **Section III.F9.2**.

interchangeably to refer to the proportion of proposals acted on in a fiscal year that resulted in awards.

Directorates are often referred to by their acronyms BIO (Biological Sciences), CISE or CSE (Computer and Information Science and Engineering), EHR (Education and Human Resources), ENG (Engineering), GEO (Geosciences), MPS (Mathematical and Physical Sciences), and SBE (Social, Behavioral and Economic Sciences). Some tables and figures include data pertaining to the Office of International and Integrative Activities, abbreviated as IIA. Acronyms for three units that existed prior to FY 2013 are mentioned in the text of the report: OPP (Office of Polar Program), OCI (Office of Cyberinfrastructure), and OISE or ISE (Office of International Science and Engineering). A list of acronyms may be found in **Appendix 20**.

III. Proposals and Awards

A. Proposals, Awards, and Proposal Success Rates

Table 1 shows the change in the number of proposals, number of awards, and proposal success rates through time. These data are for all competitively reviewed proposals.⁵ The reader may also be interested in success rates for research proposals which may be found in **Section III.F**. Note that a proposal is included in a given year based on whether the action (division director's recommendation to award or decline⁶) was taken that year, not whether the proposal was received in that year.

In this, and many subsequent tables, results for FY 2009 and FY 2010 include funding actions made possible by the \$3 billion additional appropriation that NSF received under the American Recovery and Reinvestment Act (ARRA). Approximately \$2.5 billion of the ARRA appropriation was obligated in FY 2009. The remainder was obligated in FY 2010, primarily as facilities awards.

NSF completed action on 48,999 proposals in FY 2013, a 0.8% increase from FY 2012, resulting in 10,829 awards, a 6% decrease from FY 2012. Consequently, in FY 2013 the proposal success rate was 22%. **Appendix 1** provides proposal, award, and success rate data by NSF directorate and office.

Table 1 - NSF Proposal, Award, and Proposal Success Rate Trends

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Proposals | 31,942 | 35,165 | 40,075 | 43,851 | 41,722 | 42,352 | 44,577 | 44,428 | 45,181 | 55,542 | 51,562 | 48,613 | 48,999 |
| Awards | 9,925 | 10,406 | 10,844 | 10,380 | 9,757 | 10,425 | 11,463 | 11,149 | 14,595 | 12,996 | 11,192 | 11,524 | 10,829 |
| Success Rate | 31% | 30% | 27% | 24% | 23% | 25% | 26% | 25% | 32% | 23% | 22% | 24% | 22% |

Source: NSF Enterprise Information System 10/01/13.

In addition to the full proposals in **Table 1**, in FY 2013 NSF also received 4,691 preliminary proposals, which are required for some NSF programs. See **Appendix 2** for additional data and information on preliminary proposals.

⁵ The category of actions associated with "competitively reviewed proposals," excludes actions on preliminary proposals, contracts, IPA agreements, continuing grant increments, Graduate Research Fellowships, and similar.

⁶ The merit review process is managed by NSF's program units (divisions and offices) and is completed when the division director or office head concurs with a program officer's recommendation to award or decline a proposal. For simplicity, this step will be referred to as completion of an award or decline action on a proposal. If that action is to recommend that an award be made, further processing takes place within the Office of Budget and Financial Administration before an award is issued by NSF. More details may be found in **Section IV.B**.

B. Diversity of Participation

To advance the goals described in NSF's Strategic Plan (FY 2011 – 2016), one of the core strategies described is broadening the participation in NSF's activities by members of groups that are currently under-represented in STEM disciplines. This includes ensuring the participation of researchers, educators and students from under-represented groups in NSF's programs as well as preparing and engaging a diverse STEM workforce, motivated to participate at the frontiers of research and education.

Table 2 provides data on proposal, award, and success rates by PI characteristics (gender, under-represented ethnic or racial group, disability, new and prior PI status). Gender, disability, and ethnic or racial data are based on self-reported information in proposals. About 88% of PIs provided gender information and 87% provided ethnic/racial information. (90% of proposals were from PIs who provided gender information⁷, 91% were from PIs who provided race or ethnicity information⁸, and 70% were from PIs who provided information about disability status.) The under-represented ethnic/racial PIs category in **Table 2** includes American Indian /Alaska Native, Black/African American, Hispanic or Latino, and Native Hawaiian/Pacific Islander but excludes Asian and White-Not of Hispanic Origin.

Table 2 - Competitively Reviewed Proposals, Awards and Proposal Success Rates by PI Characteristics

| | | 2001 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|--|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| All PIs | Proposals | 31,942 | 41,722 | 42,352 | 44,577 | 44,428 | 45,181 | 55,542 | 51,562 | 48,613 | 48,999 |
| | Awards | 9,925 | 9,757 | 10,425 | 11,463 | 11,149 | 14,595 | 12,996 | 11,192 | 11,524 | 10,829 |
| | <i>Omnibus</i> | | | | | | 9,975 | 12,547 | | | |
| | ARRA | | | | | | 4,620 | 449 | | | |
| | Funding Rate | 31% | 23% | 25% | 26% | 25% | 32% | 23% | 22% | 24% | 22% |
| Female PIs | Proposals | 5,839 | 8,266 | 8,510 | 9,197 | 9,431 | 9,727 | 11,903 | 11,488 | 10,795 | 11,152 |
| | Awards | 1,894 | 2,107 | 2,233 | 2,493 | 2,556 | 3,297 | 2,982 | 2,602 | 2,775 | 2,556 |
| | <i>Omnibus</i> | | | | | | 2,247 | 2,887 | | | |
| | ARRA | | | | | | 1,050 | 95 | | | |
| | Funding Rate | 32% | 25% | 26% | 27% | 27% | 34% | 25% | 23% | 26% | 23% |
| Male PIs | Proposals | 25,510 | 31,456 | 31,482 | 32,650 | 32,074 | 32,091 | 38,695 | 35,211 | 32,932 | 32,866 |
| | Awards | 7,867 | 7,305 | 7,765 | 8,451 | 7,986 | 10,437 | 9,080 | 7,739 | 7,816 | 7,316 |
| | <i>Omnibus</i> | | | | | | 7,169 | 8,760 | | | |
| | ARRA | | | | | | 3,268 | 320 | | | |
| | Funding Rate | 31% | 23% | 25% | 26% | 25% | 33% | 23% | 22% | 24% | 22% |
| PIs from under-represented racial or ethnic groups | Proposals | 1,728 | 2,468 | 2,608 | 2,798 | 2,762 | 2,945 | 3,613 | 3,441 | 3,291 | 3,303 |
| | Awards | 509 | 569 | 638 | 713 | 670 | 889 | 812 | 735 | 718 | 651 |
| | <i>Omnibus</i> | | | | | | 649 | 790 | | | |
| | ARRA | | | | | | 240 | 22 | | | |
| | Funding Rate | 29% | 23% | 24% | 25% | 24% | 30% | 22% | 21% | 22% | 20% |

⁷ As a group, the success rate for PIs who do not indicate their gender tends to be consistently lower than PIs that do. For example, in FY 2013, the success rate for PIs whose gender was not known was 19%.

⁸ However, for only 83% was the information sufficient to determine whether or not the PI belonged to an under-represented racial or ethnic group. (E.g., some report only one of race or ethnicity; some report "Unknown.")

| | | 2001 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|--|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| New PIs <i>Former Definition</i> | Proposals | 13,280 | 17,660 | 18,061 | 18,971 | 18,989 | 19,044 | 24,116 | 21,703 | 20,174 | 19,905 |
| | Awards | 3,136 | 3,001 | 3,240 | 3,660 | 3,622 | 4,706 | 4,024 | 3,322 | 3,408 | 3,327 |
| | <i>Omnibus ARRA</i> | | | | | | 2,967 | 3,868 | | | |
| | Funding Rate | 24% | 17% | 18% | 19% | 19% | 1,739 | 156 | 25% | 17% | 15% |
| New PIs <i>Revised Definition⁹</i> | Proposals | 11,872 | 15,467 | 15,877 | 16,445 | 16,483 | 16,840 | 21,545 | 19,238 | 17,943 | 17,635 |
| | Awards | 2,702 | 2,687 | 2,842 | 3,151 | 3,132 | 4,174 | 3,620 | 2,976 | 3,063 | 3,013 |
| | <i>Omnibus ARRA</i> | | | | | | 2,613 | 3,487 | | | |
| | Funding Rate | 23% | 17% | 18% | 19% | 19% | 1,561 | 133 | 25% | 17% | 15% |
| Prior PIs <i>Former Definition</i> | Proposals | 18,662 | 24,062 | 24,294 | 25,606 | 25,439 | 26,137 | 31,426 | 29,835 | 28,439 | 29,094 |
| | Awards | 6,789 | 6,756 | 7,185 | 7,803 | 7,527 | 9,889 | 8,972 | 7,849 | 8,116 | 7,502 |
| | <i>Omnibus ARRA</i> | | | | | | 7,008 | 8,679 | | | |
| | Funding Rate | 36% | 28% | 30% | 30% | 30% | 2,881 | 293 | 38% | 29% | 26% |
| Prior PIs <i>Revised Definition</i> | Proposals | 19,569 | 26,130 | 26,172 | 27,660 | 27,424 | 28,341 | 33,997 | 32,324 | 30,670 | 31,364 |
| | Awards | 6,947 | 7,070 | 7,475 | 8,202 | 7,892 | 10,421 | 9,376 | 8,216 | 8,461 | 7,816 |
| | <i>Omnibus ARRA</i> | | | | | | 7,362 | 9,060 | | | |
| | Funding Rate | 36% | 27% | 29% | 30% | 29% | 3,059 | 316 | 37% | 28% | 25% |
| PIs with Disabilities | Proposals | 409 | 454 | 434 | 448 | 448 | 470 | 545 | 543 | 483 | 488 |
| | Awards | 115 | 95 | 107 | 104 | 109 | 149 | 108 | 107 | 134 | 122 |
| | <i>Omnibus ARRA</i> | | | | | | 105 | 105 | | | |
| | Funding Rate | 28% | 21% | 25% | 23% | 24% | 44 | 3 | 32% | 20% | 20% |

Source: NSF Enterprise Information System, as of October 1, 2013.

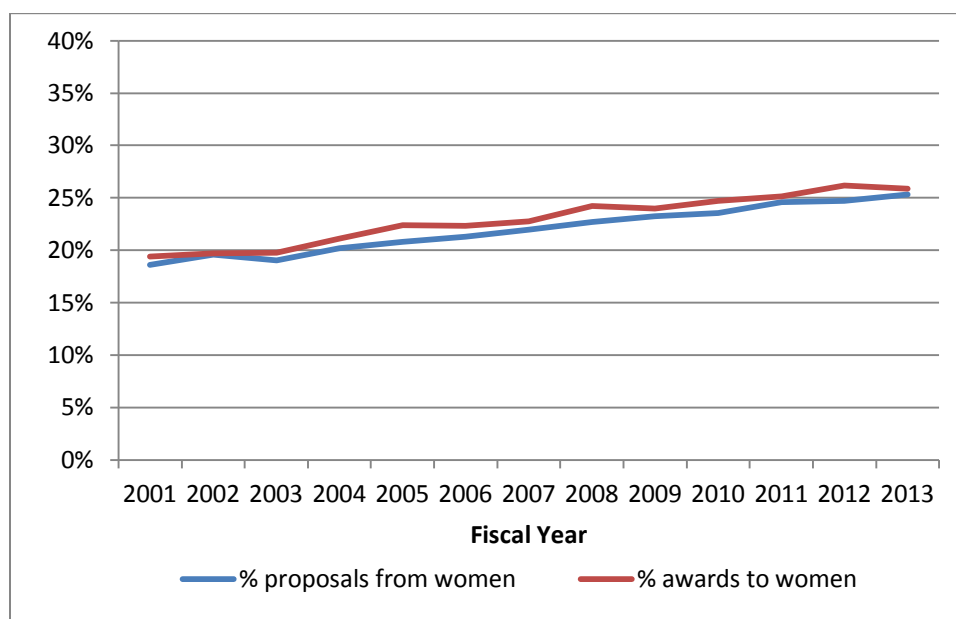
Gender

In general, while fewer proposals are received from women than men, the success rate for female PIs is slightly higher than that for male PIs. The proportion of proposals from female PIs was 25.3% in FY 2013.¹⁰ As may be seen in **Figure 1**, over the past decade, there has been a relatively steady rate of increase in the proportion of proposals that are submitted by women and a corresponding upward trend in the proportion of awards that are made to women. Since the success rate for women exceeds that for men, the proportion of awards to women is always slightly higher than the proportion of proposals from women.

⁹ In FY 2009, in conjunction with NSF's implementation of the American Recovery and Reinvestment Act, NSF revised its definition of a new PI which became, "A new PI is an individual who has not served as the PI or Co-PI on any award from NSF (with the exception of doctoral dissertation awards, graduate or post-doctoral fellowships, research planning grants, or conferences, symposia and workshop grants.)" Previously, a new PI was considered to be any individual who had not previously been a PI on any NSF award.

¹⁰ This is calculated as a percentage of the number of proposals from PIs who provided information about gender. The proportions for PIs from other under-represented groups are calculated similarly except that, in **Figure 2**, the number of PIs who provided information sufficient to determine whether they belong to an under-represented racial or ethnic group has been estimated for the years FY 2001 – FY 2009, by using the same fraction of PIs as was found in FY 2010. Based on fluctuations seen in FY 2010 – FY 2013, it is estimated that this may introduce errors in the percentages of proposals and awards from under-represented racial or ethnic groups that have an absolute magnitude of less than 0.05%, much less than the variation seen in **Figure 2**. Data in **Figure 3** are treated in a similar way.

Figure 1 - Percentage of Proposals from and Awards to Women

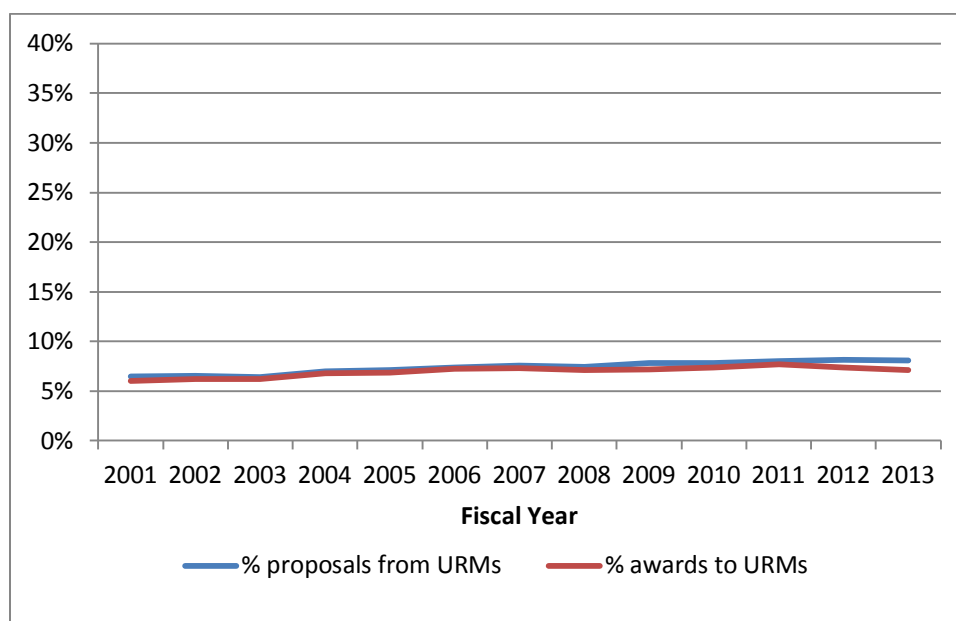


Source: NSF Enterprise Information System 10/01/13.

Under-represented Racial or Ethnic Groups

The success rate for PIs from under-represented racial or ethnic groups (URMs) is slightly lower than the average success rate over all PIs. The number of proposals from PIs from under-represented racial or ethnic groups remains low but has grown more rapidly than the total number of proposals submitted to NSF (see **Figure 2**).

Figure 2 - Percentage of Proposals from and Awards to Researchers from Under-represented Racial or Ethnic Groups



Source: NSF Enterprise Information System 10/01/13.

Figure 2 shows that, since FY 2003, there has been a relatively steady rate of increase in the proportion of proposals that are submitted by PIs who identify themselves as belonging to under-represented racial or ethnic groups with only slight decreases going from 2002 to 2003, 2007 to 2008, 2009 to 2010 and 2012 to 2013. The proportion has increased from 6.4% in FY 2003 to 8.1% in FY 2013. The increase in the proportion of awards that are made to under-represented racial and ethnic groups has been more uneven than was seen for women, and has reversed since FY 2011, falling from 7.7% in FY 2011 to 7.1% in FY 2013 after increasing from 6.2% in FY 2003.

Table 3 provides data on proposal, award and success rates by PI race and ethnicity.

Table 3 – Competitively Reviewed Proposals, Awards and Success Rates, by PI Race and Ethnicity¹¹

| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| American Indian/Alaska Native | Proposals | 112 | 112 | 97 | 91 | 88 | 118 | 129 | 83 | 113 |
| | Total Awards | 30 | 32 | 32 | 23 | 29 | 28 | 36 | 18 | 28 |
| | <i>Omnibus</i> | | | | | 20 | 28 | | | |
| | <i>ARRA</i> | | | | | 9 | 0 | | | |
| | Funding Rate | 27% | 29% | 33% | 25% | 33% | 24% | 28% | 22% | 25% |
| Black/ African American | Proposals | 842 | 915 | 1,034 | 997 | 1,022 | 1,280 | 1,201 | 1,154 | 1,124 |
| | Total Awards | 199 | 201 | 240 | 246 | 298 | 270 | 243 | 263 | 203 |
| | <i>Omnibus</i> | | | | | 233 | 262 | | | |
| | <i>ARRA</i> | | | | | 65 | 8 | | | |
| | Funding Rate | 24% | 22% | 23% | 25% | 29% | 21% | 20% | 23% | 18% |
| Native Hawaiian/ Pacific Islander | Proposals | 27 | 28 | 26 | 30 | 23 | 38 | 42 | 40 | 32 |
| | Total Awards | 5 | 9 | 6 | 8 | 8 | 10 | 11 | 6 | 5 |
| | <i>Omnibus</i> | | | | | 5 | 8 | | | |
| | <i>ARRA</i> | | | | | 3 | 2 | | | |
| | Funding Rate | 19% | 32% | 23% | 27% | 35% | 26% | 26% | 15% | 16% |
| Asian | Proposals | 7,368 | 7,916 | 8,801 | 8,952 | 9,550 | 11,626 | 10,829 | 10,382 | 10,511 |
| | Total Awards | 1,302 | 1,530 | 1,801 | 1,780 | 2,465 | 2,124 | 1,907 | 1,914 | 1,887 |
| | <i>Omnibus</i> | | | | | 1,691 | 2,071 | | | |
| | <i>ARRA</i> | | | | | 774 | 53 | | | |
| | Funding Rate | 18% | 19% | 20% | 20% | 26% | 18% | 18% | 18% | 18% |
| White | Proposals | 29,928 | 29,861 | 30,676 | 30,217 | 29,975 | 36,153 | 33,200 | 30,596 | 30,766 |
| | Total Awards | 7,564 | 7,885 | 8,499 | 8,153 | 10,499 | 9,306 | 7,826 | 8,020 | 7,372 |
| | <i>Omnibus</i> | | | | | 7,144 | 8,958 | | | |
| | <i>ARRA</i> | | | | | 3,355 | 348 | | | |
| | Funding Rate | 25% | 26% | 28% | 27% | 35% | 26% | 24% | 26% | 24% |

¹¹ This table differs from a similar one included in reports for years up to FY 2011. Before FY 2012, individuals who identified a race and indicated that they were Hispanic or Latino were only counted in the Hispanic or Latino category. Beginning in FY 2012, such individuals are included in both the appropriate racial group and in Hispanic or Latino. Previously, except for those who were Hispanic or Latino, individuals who identified multiple races were not included in the table. A “multiracial” category has been added to the table.

| | | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|--------------------------|-------------------------------|-------|-------|-------|-------|------------|-----------|-------|-------|-------|
| Multiracial | Proposals | 322 | 301 | 279 | 284 | 337 | 512 | 433 | 448 | 439 |
| | Total Awards | 87 | 78 | 81 | 76 | 112 | 118 | 99 | 113 | 110 |
| | Omnibus ARRA | | | | | 80 32 | 112 6 | | | |
| | Funding Rate | 27% | 26% | 29% | 27% | 33% | 23% | 23% | 25% | 25% |
| Hispanic or Latino | Proposals | 1,471 | 1,525 | 1,639 | 1,611 | 1,755 | 2,092 | 2,019 | 1,934 | 1,956 |
| | Total Awards | 324 | 378 | 433 | 382 | 533 | 476 | 438 | 412 | 401 |
| | <i>Omnibus</i> <i>ARRA</i> | | | | | 373 160 | 465 11 | | | |
| | Funding Rate | 22% | 25% | 26% | 24% | 30% | 23% | 22% | 21% | 21% |

Source: NSF Enterprise Information System, 10/01/13.

Very few PIs identify themselves as belonging to the categories American Indian/Alaska Native or Native Hawaiian/Pacific Islander. Because of the small numbers involved, the year-to-year fluctuations in success rates for these groups tend to be greater than for other ethnic groups. The proportion of submissions from under-represented racial and ethnic groups in FY 2013 (8.1%¹²) is smaller than their representation in the U.S. population but is similar to their representation in the full-time faculty of Ph.D. granting institutions (7.5%¹³). Among racial and ethnic groups that submitted more than 1,000 proposals in FY 2013, the success rate is highest for the groups White (24%) and Hispanic or Latino (21%). It is lowest for Asian (18%) and Black/African American (18%). **Appendix 3** provides proposal, award, and funding rate information by PI race, ethnicity and gender, by directorate.

PIs with a Disability

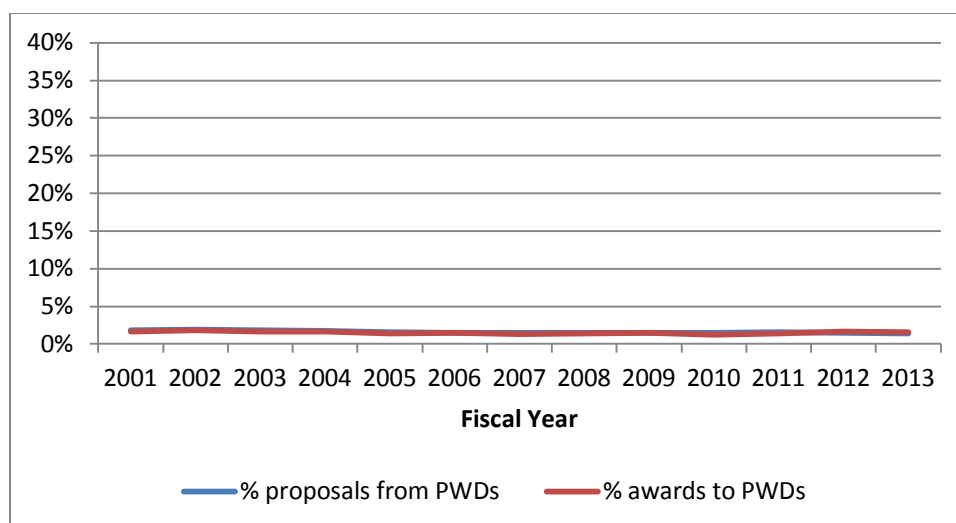
The proposal success rate for PIs identifying themselves as having a disability has remained comparable to the overall success rate for all PIs (**Table 2**), being slightly lower than the all-PI success rate for most of FY 2005 - FY 2011 and higher in FY 2012 and FY 2013. Unlike women and under-represented racial and ethnic groups, the proportion of proposals that come from researchers with disabilities has not grown from FY 2001 – FY 2013 (**Figure 3**). Instead it has declined from approximately 1.9% in FY 2002 to approximately 1.4%¹⁴ in FY 2013. In FY 2013, as in FY 2012, the success rate for proposals from PIs with disabilities, approximately 25%, was slightly higher than the overall NSF success rate. However, the proportion of proposals that are from PIs with disabilities is low.

¹² The ratio of the number of PIs in an under-represented racial or ethnic minority to the total number of PIs who provided sufficient information to determine whether or not they belonged to such a minority.

¹³ Based on 2008 data reported in: “Science and Engineering Indicators 2012.” (NSB 12-01).

¹⁴ In FY 2013, approximately 70% of competitively reviewed proposals were from PIs who indicated whether or not they had a disability. Of these, 1.4% reported that they did have a disability.

Figure 3 - Percentage of Proposals from and Awards to PIs with a Disability (PWDs)

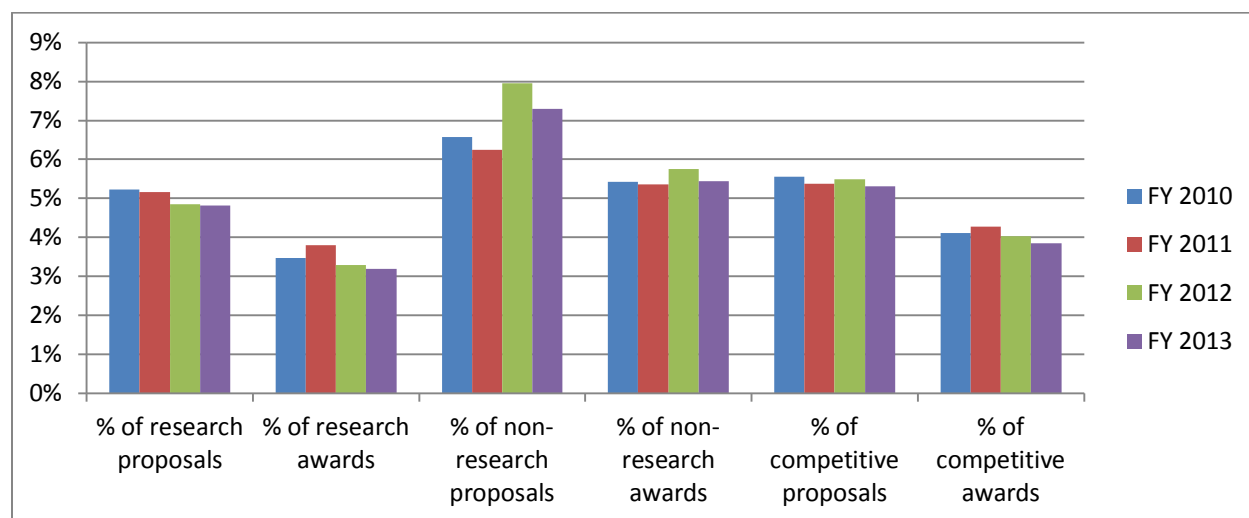


Source: NSF Enterprise Information System 10/01/13.

Minority-Serving Institutions

Figure 4 shows the proportion of proposals from and awards to minority-serving institutions¹⁵ (MSIs) in recent years.

Figure 4 –Proposals from and Awards to MSIs, by Fiscal Year and Proposal Category¹⁶



Source: NSF Report Server 4/13/14.

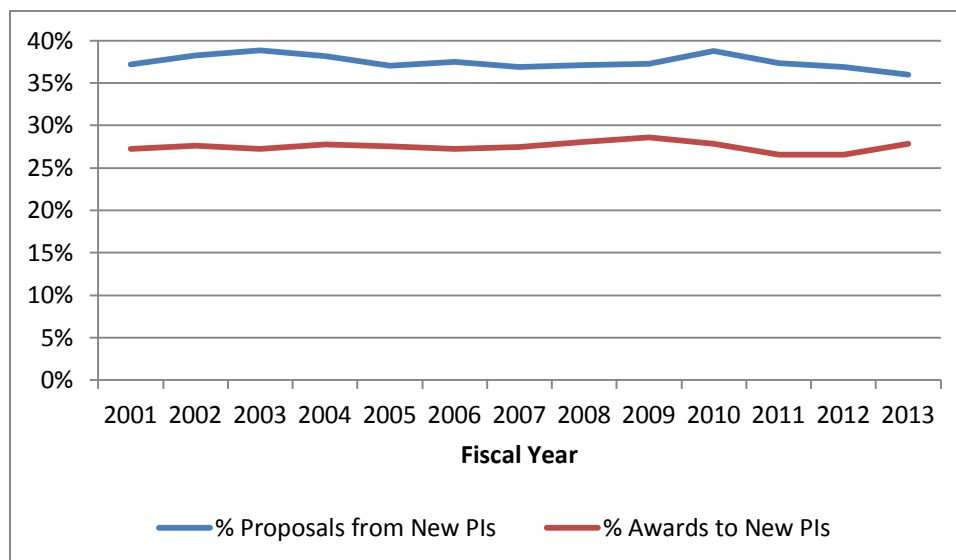
¹⁵ These are institutions reported as Historically Black Colleges and Universities, Hispanic-Serving Institutions, or Tribal Colleges and Universities.

¹⁶ Research proposals are defined at the beginning of **Section III.F**. Non-research proposals are those competitive proposals that are not research proposals.

New PIs

The success rate for PIs who have not previously had an NSF award is lower than that for PIs who have previously submitted a successful NSF proposal (17% compared to 25%; see **Table 2**). In FY 2013, the proportion of proposals from new PIs was 36% (**Figure 5**). Since FY 2001, this number has fluctuated between approximately 36% and 39%. Since FY 2010, the proportion of proposals from new PIs declined from 38.8% to 36%. **Appendix 4** provides funding rate information by new PI and prior PI status, by directorate.

Figure 5 - Percentage of Proposals from and Awards to New PIs



Source: NSF Enterprise Information System 10/01/13.

There is a slight uptick in the proportion of awards going to new PIs in FY 2013 (**Figure 5**). This is primarily due to a decline in the success rate of prior PIs from FY 2012 to FY 2013. The success rate of new PIs remained relatively constant at 17% in both years.

C. Types of Awards

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 may 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 provided in, usually annual, increments).

The use of standard and continuing grants allows NSF flexibility in balancing current and future obligations, and managing funding rates. For continuing grants, the initial funding increment is accompanied by a statement of intent to continue funding the project in subsequent increments (called "continuing grant increments" or CGIs)¹⁷ until the project is completed. The continued

¹⁷ While the original award is a competitive action, the continuing grant increment is a non-competitive grant.

funding is subject to NSF’s judgment of satisfactory progress, availability of funds, and receipt and approval of required annual reports. As shown below in **Table 4**, in FY 2013, NSF devoted 35% of its total budget to new standard grants and 12% to new continuing grants. Cooperative agreements are used when the project requires substantial agency involvement during the project performance period (e.g., research centers and multi-user facilities). Contracts are used to acquire products, services and studies (e.g., program evaluations) required primarily for NSF or other government use.

Table 4 - Percentage of NSF Funding by Type of Award

| CATEGORY | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-------------------------------|------|------|------|------|------|------|------|------|------|
| Standard Grants | 23% | 25% | 26% | 28% | 44% | 37% | 34% | 35% | 35% |
| New Continuing | 14% | 13% | 14% | 13% | 8% | 13% | 11% | 11% | 12% |
| CGIs and Supplements | 29% | 28% | 26% | 26% | 18% | 18% | 23% | 22% | 22% |
| Cooperative Agreements | 24% | 23% | 22% | 23% | 21% | 23% | 23% | 23% | 23% |
| Other | 10% | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 8% |

Source: NSF Enterprise Information System. Percentages may not sum to 100 due to rounding. ARRA awards were generally made as standard grants. “Other” includes contracts, fellowships, interagency agreements, and IPA agreements.

D. Awards by Sector/Institution

In FY 2013, of the program funds awarded by NSF, approximately 81% went to academic institutions, 11% to non-profit and other organizations, 6% to for-profit businesses, and 3% to Federal agencies and laboratories. As shown in **Table 5**, the proportion awarded to academic institutions is at its highest level in the past nine years.

Table 5 - Distribution of Funds by Type of Organization

| Sector/Institution | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|------|------|------|------|------|------|------|------|------|
| Academic Institutions | 76% | 76% | 76% | 76% | 76% | 77% | 77% | 80% | 81% |
| Non-Profit and Other Organizations | 15% | 15% | 15% | 13% | 13% | 11% | 13% | 12% | 11% |
| For-Profit | 7% | 7% | 7% | 8% | 6% | 6% | 6% | 5% | 6% |
| Federal Agencies and Laboratories | 2% | 2% | 3% | 3% | 4% | 5% | 5% | 3% | 3% |

Source: NSF Enterprise Information System 10/01/13. Percentages may not sum to 100 due to rounding.

Figure 6 shows how funds to academic institutions are distributed. Academic institutions are categorized according to the proportion of NSF funding received (i.e., grouping those receiving the largest proportion of NSF funding – the top 10, 50, and 100 academic institutions).

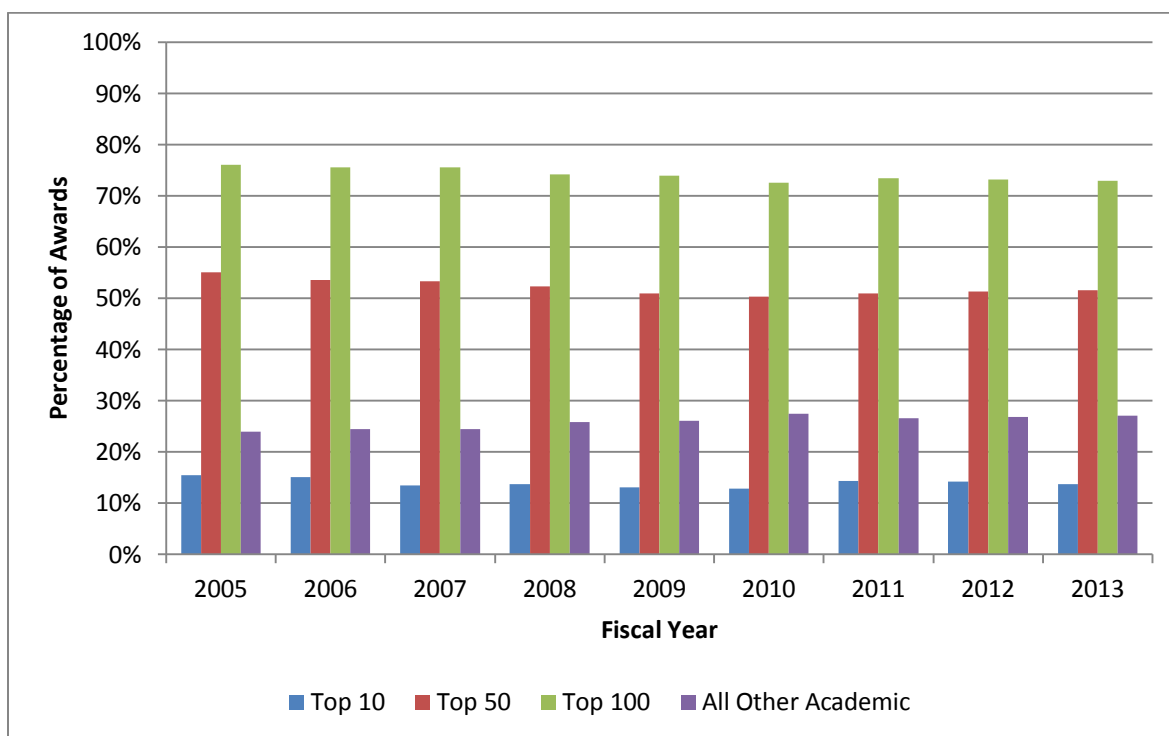
The Foundation tracks proposal success rates¹⁸ for different types of academic institutions. For FY 2013, the average proposal success rate was 24% for the top 100 Ph.D.-granting institutions (classified according to the amount of FY 2013 funding received). In comparison, the rate was

¹⁸ This report uses the term “proposal success rate” to refer to the rate at which submitted proposals are successful in obtaining funding. For example, if a program processed 200 proposals in the year, making 50 awards and declining the remaining 150, then the “proposal success rate” for that program in that year would be 25%.

13% for Ph.D.-granting institutions that are not in the top 100 NSF-funded category. The proposal success rate for four-year institutions was 22% and for two-year institutions it was 16% in FY 2013. For minority-serving institutions, the FY 2013 proposal success rate was 16%.

The Foundation promotes geographic diversity in its programs. For example, the mission of the Experimental Program to Stimulate Competitive Research (EPSCoR) is to assist the NSF 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.”¹⁹

Figure 6 - Percentage of Awards to Academic Institutions (By Amount Received)



Source: NSF Enterprise Information System 10/01/13.

The EPSCoR program was designed for those jurisdictions that have historically received lesser amounts of NSF Research and Development (R&D) funding. In FY 2013, 28 states, the Commonwealth of Puerto Rico, the U.S. Virgin Islands and Guam were eligible to participate in aspects of the program. For three of the 28 states, Iowa, Tennessee, and Utah, the prior 3-year rolling average of NSF research funds received was over 0.75% of NSF’s Research and Related Activities budget and these jurisdictions were not eligible to participate in new Research Infrastructure Improvement initiatives in FY 2013. **Appendix 5** provides data on proposals, awards, and proposal success rates for the EPSCoR jurisdictions.

¹⁹ 42 CFR 16 §1862, http://www4.law.cornell.edu/uscode/html/uscode42/usc_sec_42_00001862----000-.html.

NSF made numerous outreach presentations to institutions across the country in an effort to help increase their participation and success in NSF programs:

- Two Grants Conferences were held in FY 2013. These conferences were organized by the NSF Policy Office. Both were held in Arlington, Virginia. One was hosted by George Mason University and the other was hosted by Howard University.
- 5 “NSF Days,” organized by the Office of Legislative and Public Affairs, were held throughout FY 2013 in Nebraska, Mississippi, Indiana, California, and Virginia.

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

NSF 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 by EPSCoR and other NSF-wide programs. Some programs and offices, for example, the NSF Innovation Corps (I-Corps), the Major Research Instrumentation (MRI) program, the INSPIRE program, and the EHR directorate, held webinars for people interested in learning more about the programs involved. Finally, program officers frequently conduct outreach when visiting institutions or participating in scientific meetings. NSF outreach to scientists and engineers from under-represented groups also includes activities such as attendance at workshops for tribal colleges and other minority-serving institutions.

E. Time to Decision (Proposal Dwell Time)

It is important for applicants to receive a timely funding decision. The Foundation’s FY 2013 Government Performance and Results Act performance goal calls for informing at least 70% of PIs of funding decisions (i.e. award or decline) within six months of the proposal deadline, target date, or receipt date, whichever is later. In 2013, NSF exceeded the dwell time goal with 76% of applicants informed within 6 months.²⁰ NSF has consistently exceeded this goal with the exception of FY 2009. In FY 2009, the NSF dwell time performance measure was suspended for the last three quarters to delay processing proposals that would have been declined due to lack of funding. This enabled some of these proposals to be funded with the ARRA appropriation.

Table 6 - Proposal Dwell Time: Percentage of Proposals Processed Within 6 Months

| 2005 | 2006 | 2007 | 2008 | 2009* | 2010 | 2011 | 2012 | 2013 |
|------|------|------|------|-------|------|------|------|------|
| 76% | 78% | 77% | 78% | 61% | 75% | 78% | 78% | 76% |

Source: NSF Enterprise Information System 10/01/13. * Dwell-time goal suspended in FY 2009.

²⁰ The dwell-time goal was exceeded by 79% of proposals that went through panel-only review and by 54% of proposals that went through mail-only review.

F. Data on Research Grants

The purpose of this section is to provide data on what are referred to as “research grants.” The term research grant is used by NSF to represent what could be considered a typical research award, particularly with respect to the award size. Education research grants are included. Excluded are large awards such as centers and facilities, equipment and instrumentation grants, grants for conferences and symposia, grants in the Small Business Innovation Research program, Small Grants for Exploratory Research, and education and training grants.

F1. Research Proposal, Award, & Success Rate Trends

Table 7 provides the proposal, grant, and success rate trends for NSF research grants. The number of new awards made in FY 2013 (7,652) was 5% lower than what was possible in FY 2012 (8,061), due partly to a reduction in the amount of funds available for new awards as a result of the Budget Control Act of 2011 and the American Taxpayer Relief Act of 2012²¹, and partly to an increase in mean award size. These factors, together with the increase in the number of research proposals, contributed to a drop in the success rate for research proposals of 7%.^{22,23}

Table 7 - Research Proposals, Award and Success Rate Trends

| | 2001 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Proposals | 23,096 | 31,574 | 31,514 | 33,705 | 33,643 | 35,609 | 42,225 | 41,840 | 38,490 | 39,249 |
| Awards | 6,218 | 6,258 | 6,708 | 7,415 | 6,999 | 10,011 | 8,639 | 7,759 | 8,061 | 7,652 |
| Omnibus | | | | | | 6,346 | 8,613 | | | |
| ARRA | | | | | | 3,665 | 26 | | | |
| Success Rate | 27% | 20% | 21% | 22% | 21% | 28% | 20% | 19% | 21% | 19% |

Source: NSF Enterprise Information System 10/01/13.

F2. Research Grant Size and Duration

Adequate award size and duration are important for enabling science of the highest quality and ensuring that the 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.

As indicated in **Figure 7**, in FY 2013 the annualized median award size was \$129,970 and the annualized mean award amount was \$169,107, a 2% increase from FY 2012. The inflation adjusted average annual award sizes are shown in **Figure 8**. The mean annual award size increased by 17.7% from FY 2005 to FY 2013. The mean annual award size in *constant* dollars fluctuated but remained relatively steady over the same period.²⁴ The ARRA appropriation

²¹ These Acts reinstated and adjusted discretionary spending limits on budget authority and had the effect of imposing an approximately 5% sequestration of discretionary spending appropriated for FY 2013. The net result was that NSF’s FY 2013 budget was approximately 2% lower than in FY 2012.

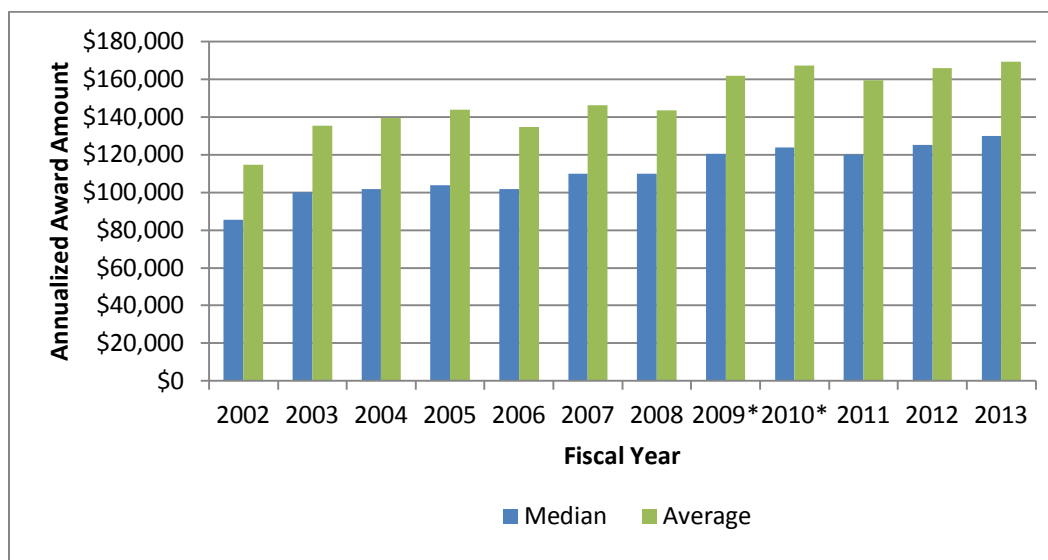
²² I.e. the ratio of success rates between FY 2013 and FY 2012 is 0.93 [= (7,652/39,249) ÷ (8,061/38,490)].

²³ EAGER and RAPID proposals, which have a high success rate, are approximately 1.4% of the research proposals. If these are removed from the total, then the success rate for research proposals is reduced from 19.5% to 18.4%.

²⁴ Constant dollars were calculated using the Gross Domestic Product (GDP) (chained) Price Index. This deflator is updated by the Office of Management and Budget and is based on the U.S. Government fiscal year, October 1 to September 30. For this chart, FY 2005 is the reference year (one FY 2005 dollar equals one constant dollar).

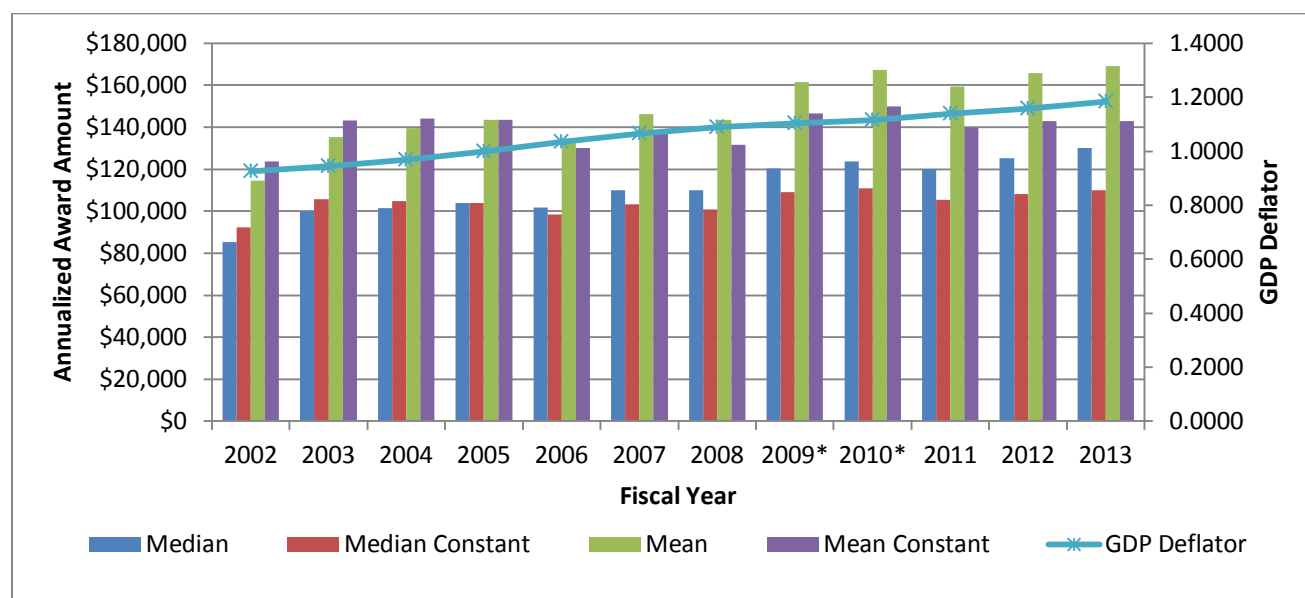
made possible an increase in average annual award size in FY 2009 and FY 2010, relative to FY 2008. The ARRA appropriation also helped to reduce out-year commitments, allowing the higher annual award size to be sustained temporarily after FY 2010.

Figure 7 - Annualized Award Amounts for Research Grants



*FY 2009 and FY 2010 include ARRA funding. Source: NSF Enterprise Information System 10/01/13.

Figure 8 - Annualized Award Amounts for Research Grants in Actual and Constant Dollars



*FY 2009 and FY 2010 include ARRA funding.

Source: Annualized award sizes from NSF Enterprise Information System 10/01/13 and Gross Domestic Product (GDP) deflator from <https://obamawhitehouse.archives.gov/sites/default/files/omb/budget/fy2014/assets/hist10z1.xls> accessed 01/23/2014. Constant dollars use FY 2005 as a baseline.

Data on award size and duration organized by NSF directorate for the last ten years are presented in **Appendix 6**. There is considerable variation between directorates; for example, BIO and CISE award larger grants on average, while ENG, MPS and SBE award smaller grants.

As **Table 8** shows, the average award duration has remained relatively constant.²⁵ Program officers must balance competing requirements, such as increasing award size, increasing duration of awards, or striving to maintain proposal success rates.

Table 8 - Mean Award Duration for Research Grants

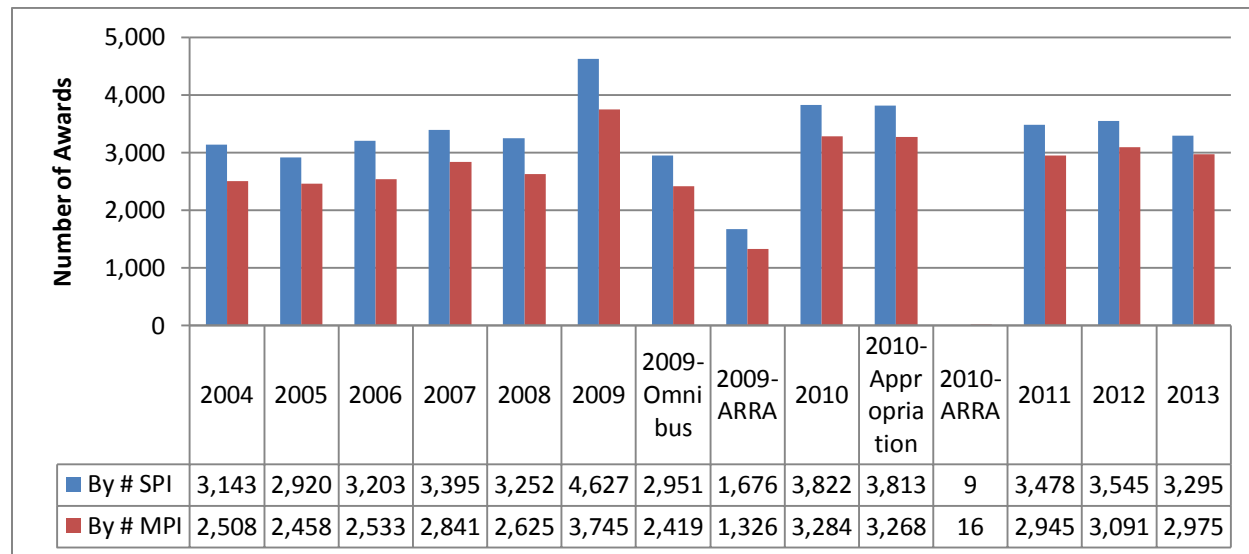
| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Duration (Years) | 2.9 | 2.9 | 3.0 | 3.0 | 2.9 | 2.9 | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 | 3.0 |

Source: NSF Enterprise Information System 10/01/13.

F3. Number of Investigators per Research Grant

Figure 9 shows the number of research grants made to single PIs (SPI) compared to the number of research grants to projects with multiple PIs (MPI). The number of SPI grants remains greater than the number of MPI grants. **Figure 10** indicates the total amount of funds awarded to SPI research grants in comparison to the amount of funds awarded to MPI research grants.

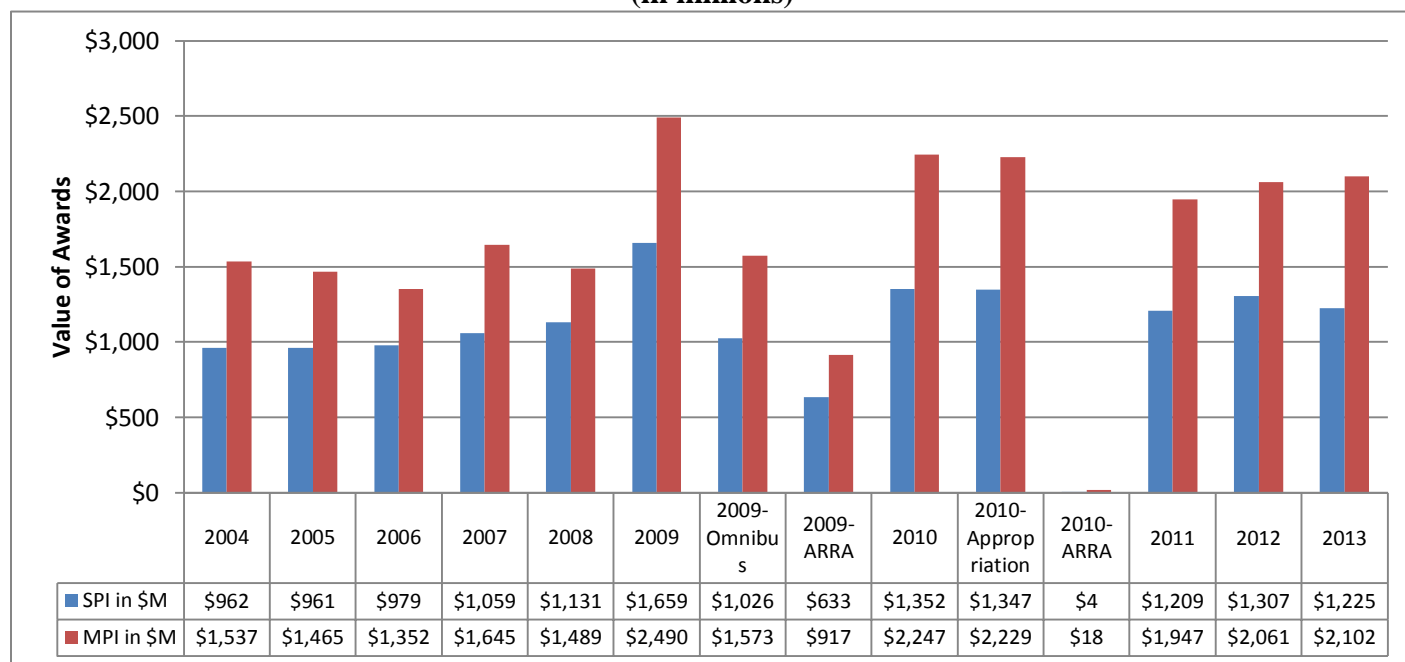
Figure 9 - Research Grants to Single PIs (SPI) & Multiple PIs (MPI), by Number



Source: NSF Enterprise Information System 10/01/13. Note: In FY2010, a total of only 25 research projects were funded from the ARRA appropriation (including one collaborative project). These are barely visible in the figure.

²⁵ The number of years is rounded to one decimal place. 0.1 years represents about five weeks. This duration is the initial duration for new awards in each year and does not take into account no-cost extensions.

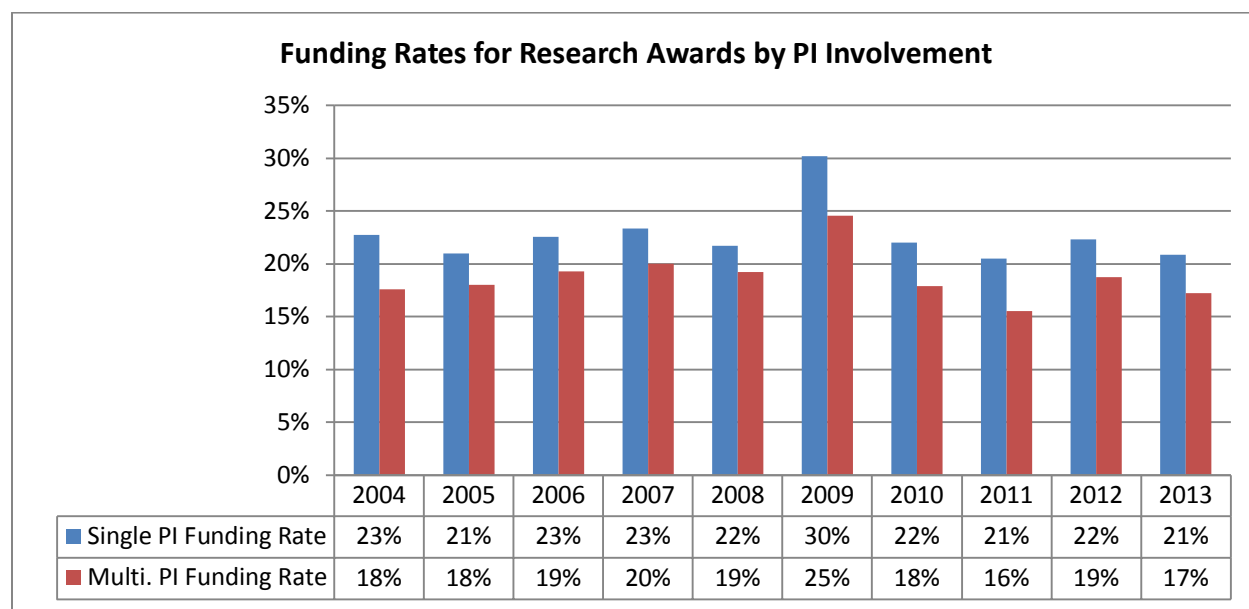
Figure 10 - Research Grants for Single PIs (SPI) & Multiple PIs (MPI), by Dollar Amount (in millions)



Source: NSF Enterprise Information System 10/01/13. Note: In FY2010, a total of only 25 research projects were funded from the ARRA appropriation (including one collaborative project). These are barely visible in the figure.

Figure 11 shows the success rates for SPI and MPI research proposals. The difference between the SPI and MPI success rates has varied over the last ten years, but the SPI success rate has been consistently higher.

Figure 11 - Success Rates for Single-PI & Multiple-PI Research Proposals



Source: NSF Enterprise Information System 10/01/13.

F4. Number of Research Grants per PI

Table 9 indicates the number of active research grants per PI averaged over the three-year period 2011 - 2013.

Table 9 - Number of Grants per PI

| | One | Two | Three | Four or More |
|------------------------|-----|-----|-------|--------------|
| Fiscal Years 2011-2013 | 82% | 14% | 3% | 1% |

Source: NSF Enterprise Information System 10/01/13.

F5. Number of People Supported on Research Grants

Table 10 shows the number of graduate students, post-doctoral associates, and senior personnel supported on NSF research grants. These data were extracted from the budget details of research grants active in the year indicated. The absolute numbers of post-doctoral associates and graduate students supported peaked in FY 2009, as a result of NSF policy on the use of ARRA funding, but have subsequently declined. From FY 2012, the number of post-doctoral associates supported by research grants declined by 3.2%, and the number of graduate students decreased by 1.5%.²⁶

Table 10 - Number of People Supported on NSF Research Grants, by Recipient Type

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | % Change, 2005 - 2013 |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------------------|
| Senior Personnel Supported | 22,255 | 23,186 | 26,176 | 26,494 | 33,536 | 33,650 | 35,523 | 39,862 | 32,829 | 48% |
| Postdocs Supported | 4,068 | 4,023 | 4,034 | 3,909 | 5,580 | 4,653 | 4,751 | 4,596 | 4,447 | 9% |
| Graduate Students Supported | 20,442 | 20,949 | 22,777 | 22,936 | 33,371 | 24,554 | 24,855 | 25,550 | 25,161 | 23% |

Source: NSF Enterprise Information System 10/01/13.

Appendix 7 provides data on the estimated number of individuals involved in NSF activities supported by all NSF active awards, including senior researchers, post-doctoral associates, teachers, and students across all educational levels. In comparison to FY 2012, the numbers of undergraduate students, K-12 students, and K-12 teachers involved in NSF awards all declined.²⁷

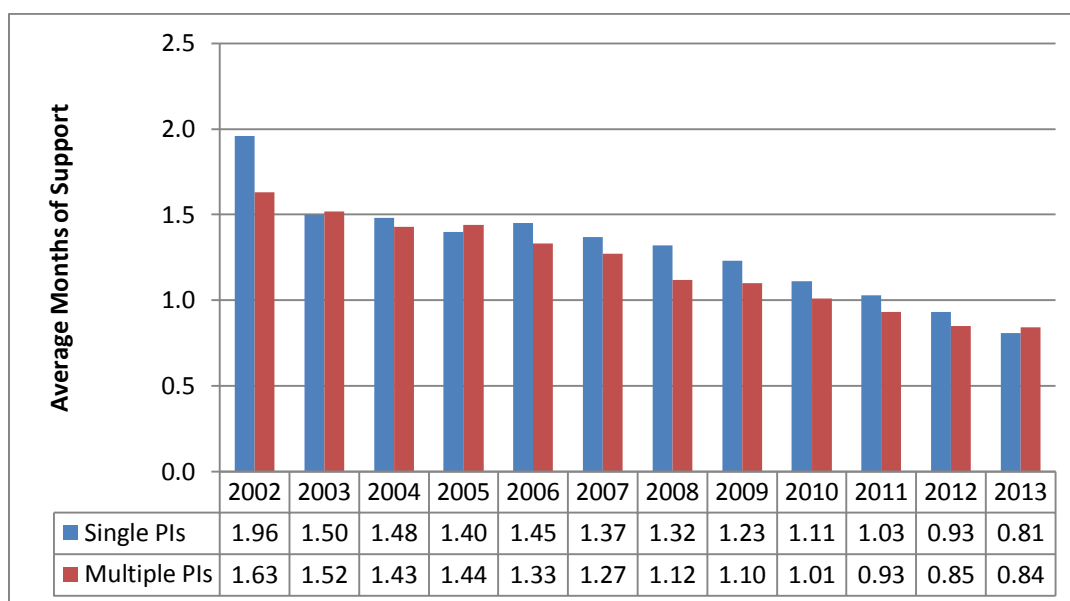
²⁶ The research grant category does not include most individual post-doctoral fellowships and graduate student fellowship grants. However, the majority of NSF-supported post-doctoral associates and graduate students are supported as part of research grants.

²⁷ Beginning with Fiscal Year 2011, the methodology used to produce estimates of K-12 students involved was changed. See NSF FY2012 Agency Financial Report, Chapter 2, p. II-40&41 for more information.

F6. Average Number of Months of Salary Support for Single- & Multiple-PI Research Grants

Figure 12 indicates the mean number of months of salary support per individual on single PI and multiple PI research grants. Months of salary support are for PIs and Co-PIs only. There has been a dramatic change in the past decade. Since FY 2002, the average number of months of support has generally decreased for both single and multiple-PI awards. The per-person numbers for single and multiple-PI grants were comparable in 2003-2005, but since then, PIs on multiple-PI awards consistently averaged fewer months of support than single PIs until FY 2013. (See **Appendix 8** for directorate or office level data on months of support.) The per-individual months of support per grant has dropped considerably since the period prior to 2003, with the 2013 numbers being 41% of the 2002 number for single PIs and 52% for PIs and Co-PIs on multiple PI awards. The data by directorate in **Appendix 8** show that, in comparison to NSF as a whole, CISE and ENG awards tend to provide fewer months of salary support for PIs and Co-PIs.

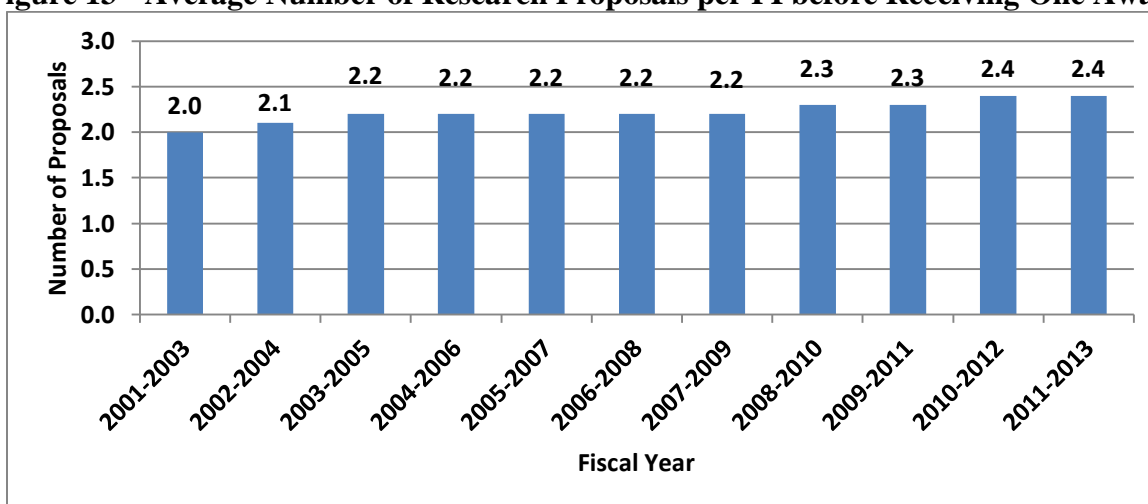
Figure 12 - Average Number of Months of Salary for Single- & Multi-PI Research Grants



Source: NSF Enterprise Information System 11/27/13.

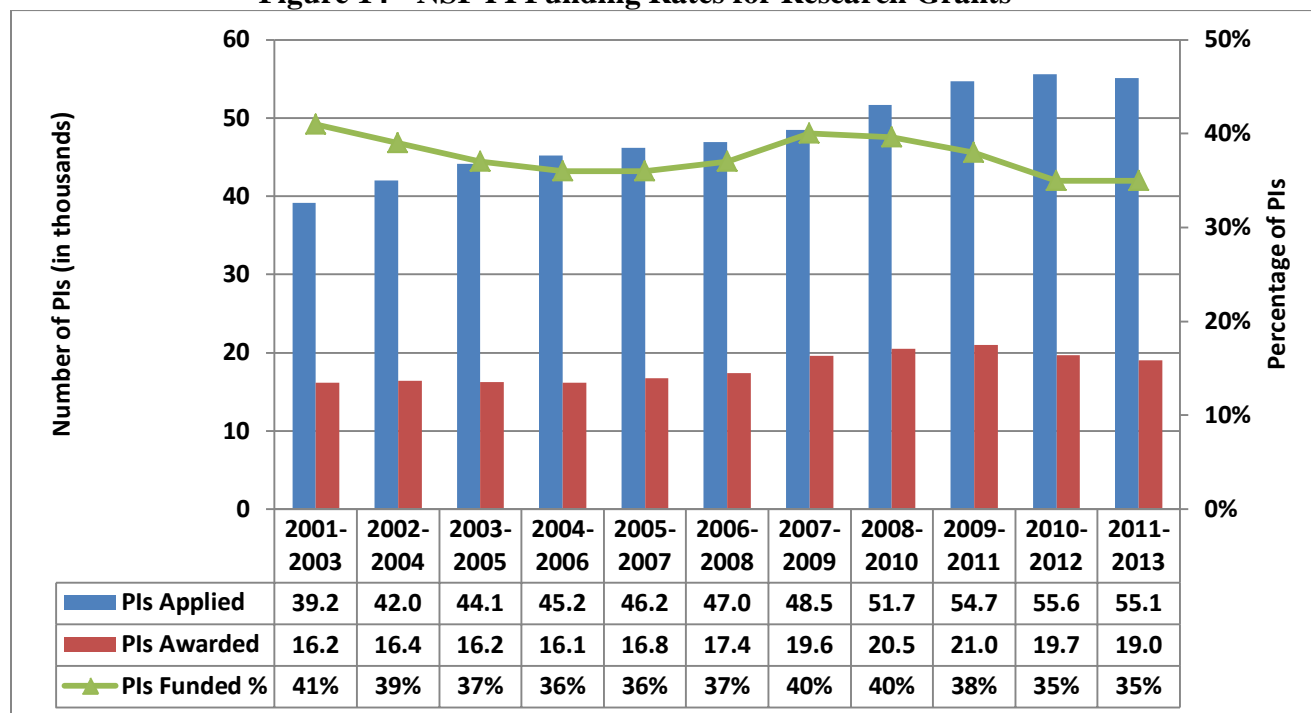
F7. Investigator Submission and Funding Rates

Figure 13 shows that, on average, the number of proposals an investigator submits before receiving an award has gradually increased over the past decade. This average is calculated across all PIs, including both new and previous PIs. **Appendix 9** provides a directorate-level breakout of the average number of research proposals per PI before receiving one award. This metric is largest for CISE and ENG.

Figure 13 - Average Number of Research Proposals per PI before Receiving One Award

Source: NSF Enterprise Information System 11/23/13.

Figure 14 provides the funding rate for investigators in a three-year period (the number of investigators receiving a grant divided by the number of investigators submitting proposals in the same three-year window). The number of investigators submitting proposals grew over the past decade at a rate that exceeded the rate of growth of NSF's normal appropriation in inflation adjusted dollars. Consequently, the success rate of PIs declined. The decline in PI success rate was temporarily halted by the funds appropriated under ARRA but resumed after this. In the latest three-year window, however, the growth in number of PIs submitting proposals leveled off and the decline of the per-PI success rate slowed.

Figure 14 - NSF PI Funding Rates for Research Grants

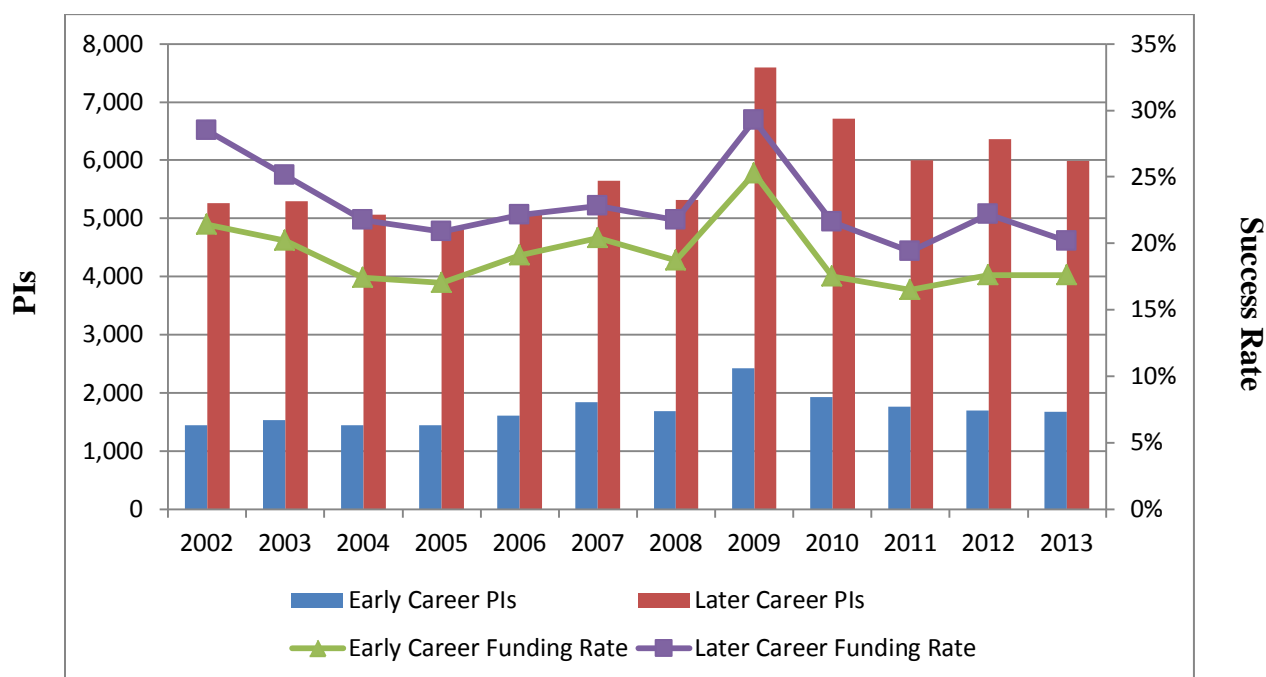
Source: NSF Enterprise Information System 11/23/13.

In 2011-2013, 65% of PIs who submitted proposals during that three-year period did not receive any research award. The number of PIs who submitted proposals in 2011-2013 was 41% higher than the number in 2001-2003.

F8. Early and Later Career PIs

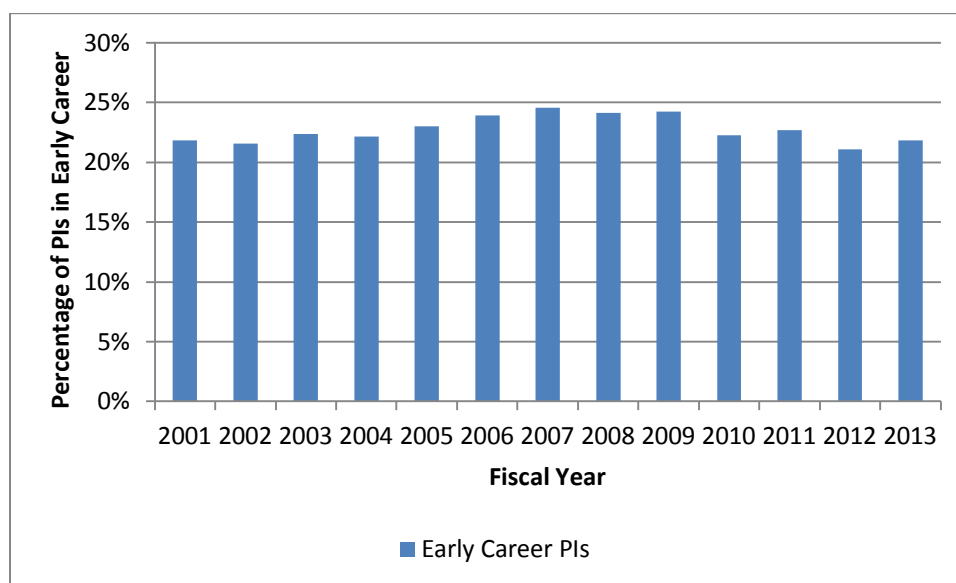
Figure 15 and **Figure 16** indicate the number and percentage of NSF PIs of research awards that are in the early or later stages of their careers. An early career PI is defined as someone within seven years of receiving their last degree at the time of the award. For the purposes of this report, PIs who received their last degree more than seven years before the time of their first NSF award are considered later career PIs.

Figure 15 - Number of PIs in Early & Later Stages of Career and Research Proposal Success Rates



Source: NSF Enterprise Information System 10/01/13.

The gap in success rates narrowed in 2013 (**Figure 15**) and the percentage of research awards to early career PIs was 22% (**Figure 16**).

Figure 16 - Relative Proportions of PIs in Early and Later Stages of Careers

Source: NSF Enterprise Information System 10/01/13.

F9. Mechanisms to Encourage Transformative Research

The March 2007 NSB report, *Enhancing Support of Transformative Research at the National Science Foundation* (NSB 07-32), has been instrumental in informing NSF's efforts to promote and support potentially transformative research. The statement of the Intellectual Merit review criterion was modified, effective January 5, 2008, to make explicit reference to transformative research. An Important Notice, No. 130, was sent on September 24, 2007 from the NSF Director to presidents of universities and colleges, and heads of other NSF grantee organizations, to inform the community of the change in the merit review criteria and NSF's effort to promote and support potentially transformative concepts.

All NSF programs encourage and support potentially transformative research proposals. NSF also has several mechanisms particularly developed to encourage the submission of certain types of potentially transformative research proposals. These include EARly-concept Grants for Exploratory Research (EAGER), Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE), Creativity Extensions, and Accomplishment-Based Renewals. Information on the latter two types of awards may be found in **Appendix 18**.

F9.1 Small Grants for Exploratory Research (SGER), Early-concept Grants for Exploratory Research (EAGER) and Grants for Rapid Response Research (RAPID).

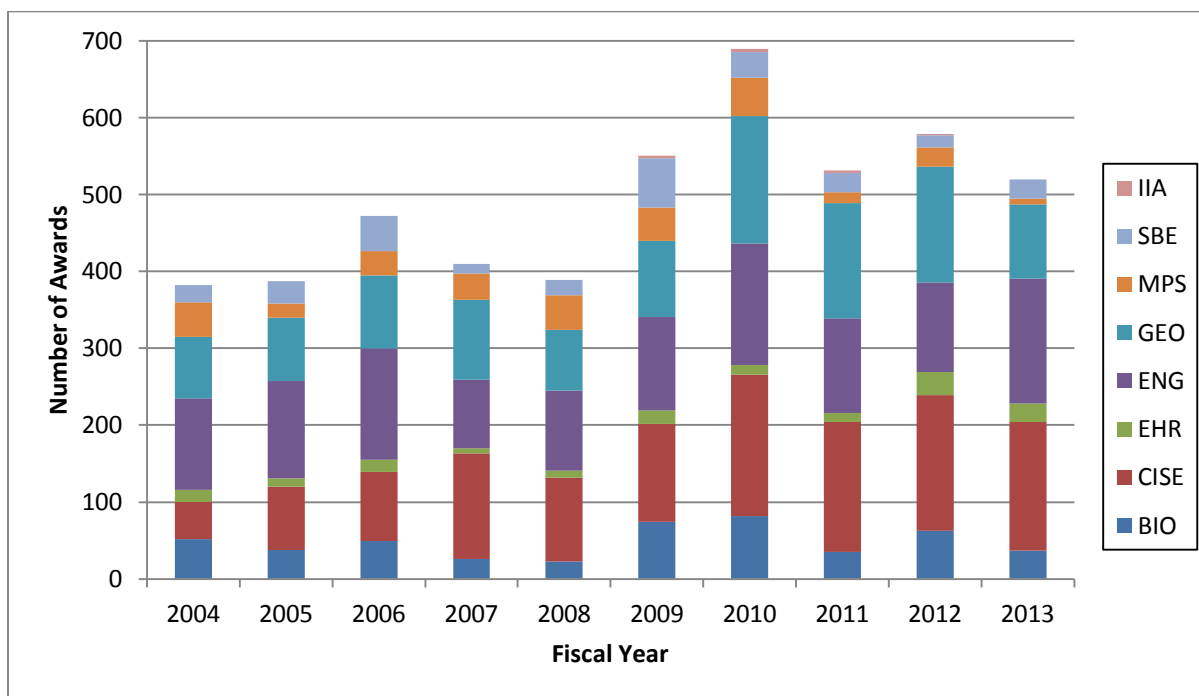
Since FY 1990, the Small Grants for Exploratory Research (SGER) option permitted program officers throughout the Foundation to make small-scale grants without formal external review. Effective January 2009, the SGER funding mechanism was replaced by two separate funding mechanisms EAGER and RAPID, in part to emphasize the importance of funding both potentially transformative research and research requiring an urgent response:

- Early-concept Grants for Exploratory Research (EAGER)**
 The EAGER funding mechanism is used to support exploratory work in its early stages on untested, but potentially transformative, research ideas or approaches. The work may be considered especially "high-risk/high-payoff" in the sense that it, for example, involves radically different approaches, applies new expertise, or engages novel disciplinary or interdisciplinary perspectives. Requests may be for up to \$300,000 and up to two years duration.
- Grants for Rapid Response Research (RAPID)**
 The RAPID funding mechanism is used for proposals 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. Requests may be for up to \$200,000 and of one year duration.

Only internal merit review is required for EAGER and RAPID proposals. Program officers may elect to obtain external reviews to inform their decision. If external review is to be obtained, then the PI is informed of this in the interest of maintaining the transparency of the review and recommendation process.

Figure 17 Shows the change in SGERs, EAGERs and RAPIDs from 2004 to 2013 by Directorate. Additional information on SGERs, RAPIDs, and EAGERs can be found in **Appendix 10**. For years prior to FY 2013, OPP and OCI data are included in the numbers for GEO and CISE. OISE data are included in those for IIA.

Figure 17 - SGER, EAGER and RAPID Awards, by Directorate or Office



Source: NSF Enterprise Information System.

In FY 2009, the total number of SGER, RAPID and EAGER awards was 550, slightly higher than in previous years (see **Appendix 10** for a comparison with SGERs since FY 2004).

FY 2010 saw an increase in the total, to 689, primarily because of RAPIDs awarded to enable researchers to respond to unusual events (earthquakes in Haiti and Chile, and the Gulf of Mexico oil spill). The total number of EAGER and RAPID awards decreased to 531 in FY 2011 and fluctuated in the two subsequent years. Notwithstanding the year-to-year fluctuations, the number of these awards in each year of the period FY 2009 – FY 2013 (annual mean = 574) was larger than anytime during the period FY 2004 – FY 2008 (annual mean = 408), before EAGER and RAPID awards were introduced. There is a considerable variation across directorates in the use of EAGER and RAPID awards. (See **Appendix 10**.) For example, in FY 2013, CISE received more than five times as many EAGER proposals as BIO and nineteen times as many as MPS. RAPID proposals are proportionally more common in GEO than in other units.

In their use of EAGER and RAPID awards, the directorates fall into two clusters (see **Table 11**). Since their introduction, CISE, ENG and GEO have made 29%, 24% and 23% of the EAGER and RAPID awards, respectively, accounting for three-quarters of these awards. BIO, SBE, MPS and EHR have made 10%, 5%, 5% and 3%. However, with the exception of SBE, the average award size is larger for this second group of directorates than for the first group.

Table 11 – Investments in EAGER and RAPID awards since inception, by directorate

| | CISE | ENG | GEO | BIO | SBE | MPS | EHR |
|----------------------------------|-------|-------|-------|-------|------|------|------|
| % of FY 09-13 awards | 29.3% | 23.9% | 22.9% | 10.0% | 5.3% | 4.7% | 3.4% |
| FY 09-13 investment (\$ million) | 126 | 67 | 53 | 49 | 13 | 22 | 21 |
| Average FY13 award (\$ thousand) | 166 | 112 | 85 | 204 | 77 | 331 | 236 |

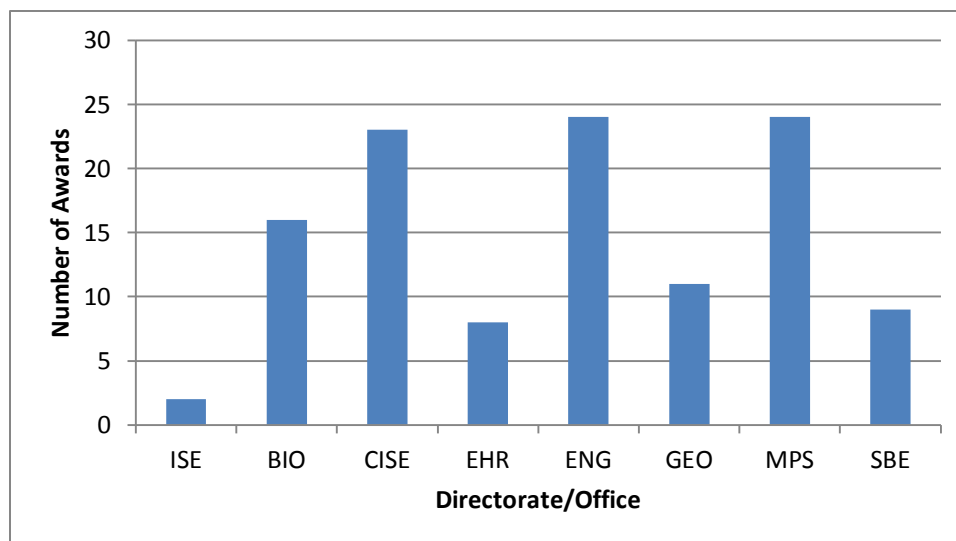
F9.2 Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) Awards.

FY 2012 saw the inauguration of the **Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE)** program. INSPIRE is intended to support transformative, cross-disciplinary science, creating a new type of funding opportunity. INSPIRE is designed to attract unusually creative, high-risk / high-reward interdisciplinary proposals. No favored topics are designated, and the funding opportunity is open to innovative, interdisciplinary proposals that fall within the overall span of NSF-supported areas of science, engineering, and education research. Program managers are encouraged to use new tools, collaboration modes and techniques in the merit review process to widen the pool of prospective discoveries. The program creates new interdisciplinary research opportunities. In FY 2013, the naming of the awards changed slightly from FY 2012. All FY 2013 awards were called INSPIRE Track 1 awards.

In FY 2013, 53 INSPIRE Track 1 awards were made; up from 40 INSPIRE awards made in FY 2012. Reflecting the interdisciplinary nature of these projects, all were co-funded from different units within NSF. **Figure 18** shows the number of INSPIRE awards co-funded by each directorate in FY2013. (By virtue of the way in which the INSPIRE program is organized internally, nearly all INSPIRE awards also included co-funding by the Office of International and Integrative Activities that was separate from any ISE contribution. This is not shown in **Figure 18**.) In 3 instances, the awards were co-funded by units wholly within a single directorate (CISE, ENG and GEO). In 38 cases, the awards were co-funded by units in two

directorates and in 12 cases three directorates co-funded each award. Two awards also had co-funding from the International Science and Engineering section of IIA.

Figure 18 – INSPIRE Awards Co-funded by NSF Directorates in FY2013



Source: NSF INSPIRE Program 1/3/14.

F10. Multi-Panel Review and Inter-Divisional Co-Funding.

NSF does not ask PIs to identify formally whether or not a proposal is interdisciplinary, and it is not possible currently to make a direct count of the number of interdisciplinary proposals NSF receives. Indeed, a precise definition of interdisciplinarity is elusive²⁸ and likely to be time-dependent. For example, a research area that, when it emerges, straddles the boundary of two different disciplines may, over time, come to be recognized as a new discipline. However, one can examine a number of characteristics of proposals, awards and the review process that may have operational utility by providing information on proposals that cross the boundaries of NSF's established program areas. This section of the report describes two such characteristics.

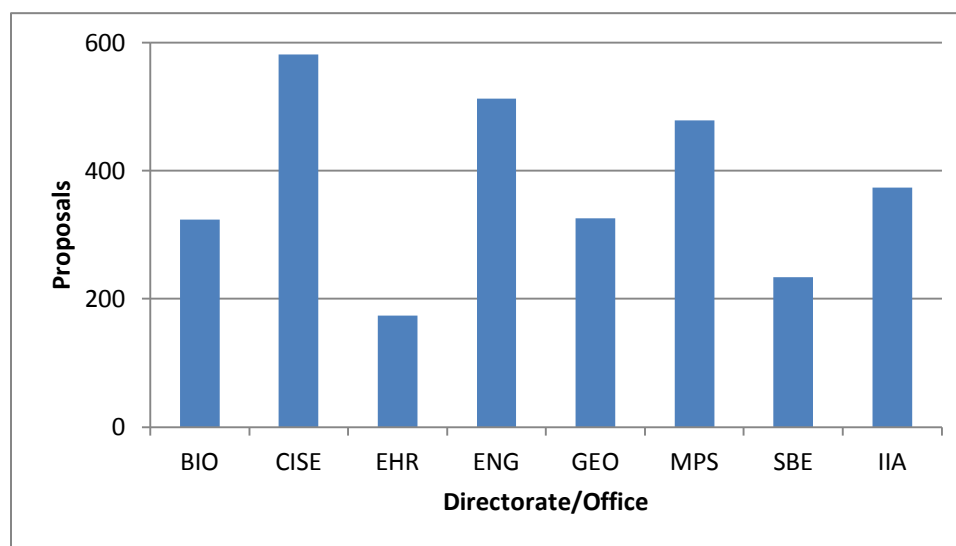
Inter-Divisional Co-funding

One indicator of the number of interdisciplinary awards is the number of awards that are funded by more than one part of NSF. **Figure 19** shows the distribution of co-funding for competitive awards that received funding from more than one division at NSF in FY 2013.

²⁸ Multiple definitions of interdisciplinarity appear in the literature as well as debate over the distinction between multidisciplinary, interdisciplinary and transdisciplinary. Nor is there a universally accepted definition of "discipline." In a 2005 report, the National Research Council noted that, "No single definition is likely to encompass the diverse range of activities that have been described under the heading of IDR [Interdisciplinary Research]." The report provided the following description: "Interdisciplinary research (IDR) is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or field of research practice." (From "Facilitating Interdisciplinary Research," National Academies Press, 2005.)

The total number of unique, co-funded awards included in **Figure 19** is 1,332, which is approximately 12.3% of FY 2013 competitive awards. The average number of divisions contributing to a co-funded award is 2.3.²⁹ IIA is included separately in this figure. In FY 2013, its EPSCoR office provided co-funding for 212 awards. IIA also co-funded 52 of the 53 INSPIRE Track 1 awards.

Figure 19 - FY 2013 Awards Co-funded



Source: NSF Report Server 1/22/13.

Co-funding associated with EPSCoR or international activities does not, of itself, imply interdisciplinary proposal content. If we remove awards in which co-funding is between IIA/ISE or IIA/EPSCoR and a single other division, then the number of co-funded awards is approximately 1,055 or 9.7% of FY 2013 competitive awards and the average number of divisions contributing to a co-funded award is again 2.3. Of these awards, 338 are co-funded wholly within a directorate.

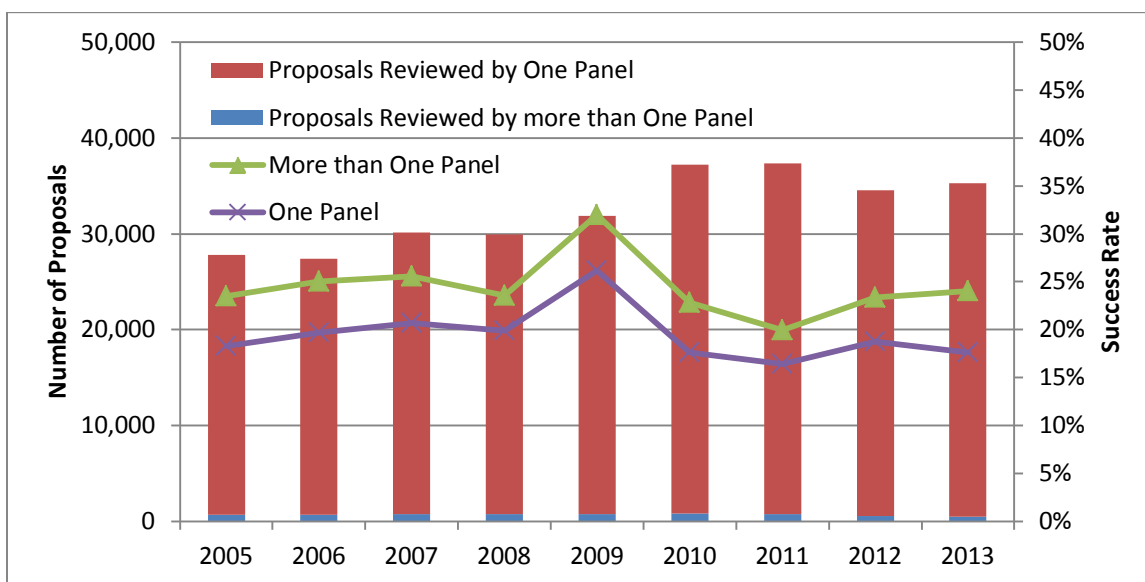
Multi-Panel Review

Interdisciplinary proposals are reviewed in a variety of ways. A relatively small fraction of them are reviewed by multiple panels. One question of interest is whether review by more than one panel leads to a lower success rate than review by a single panel.

²⁹ In **Figure 19**, awards appear once for each distinct funding source. Awards that receive co-funding from distinct divisions within the same directorate are included. (E.g. an award co-funded by the Division of Physics and the Division of Chemistry would be counted twice in the MPS total.) The figure does not include co-funding by different programs within the same division. In general, co-funding from Directorate front offices is not counted as a separate co-funding source for **Figure 19** unless the front office is the only part of the directorate co-funding an inter-directorate award.

Among proposals reviewed by panels, **Figure 20** shows the number of research proposals that were considered by one panel (red bars), the number reviewed by more than one panel (blue bars), the success rate for single-panel review (purple line), and the success rate for multi-panel review (green line).

Figure 20 – Proposals Undergoing Single- and Multi-Panel Reviews and their Success Rates

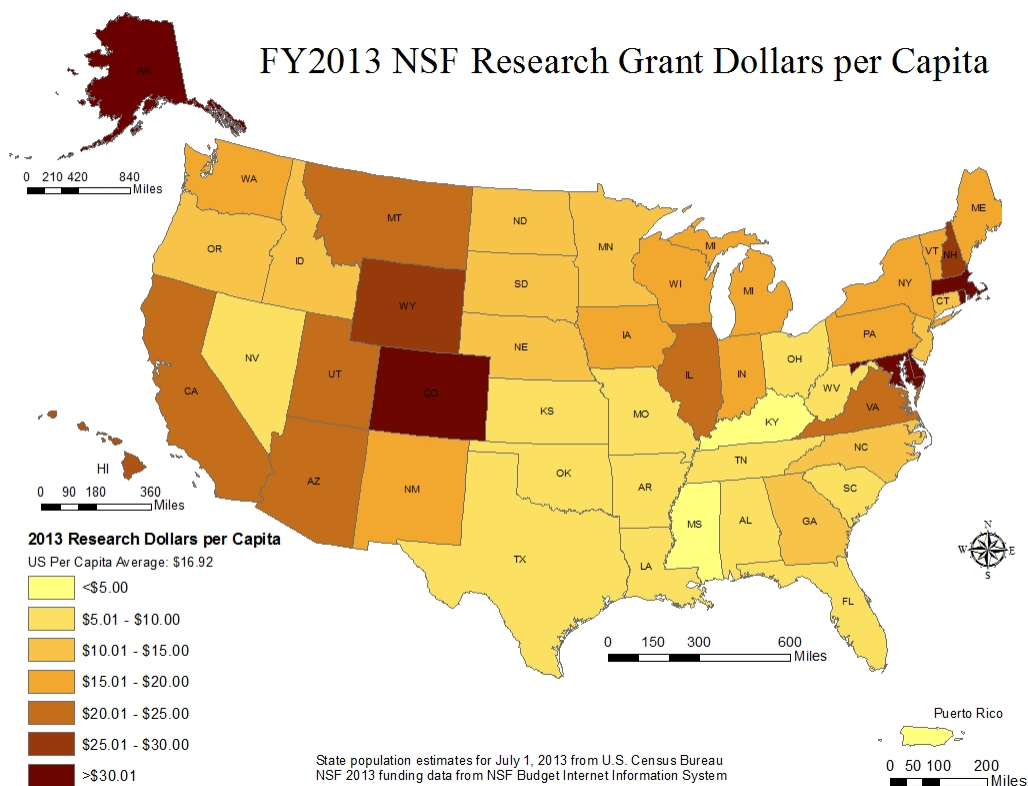


The proportion of empanelled proposals going through multi-panel review is small (1.5% of the total in FY 2013). This number was 2.7% in FY 2006 and has declined every year since then. Most multidisciplinary proposals are not reviewed by multiple panels. However, the success rate for proposals reviewed by more than one panel is consistently 4 to 6 percentage points higher than the rate for proposals that are only reviewed by a single panel.

F11. Geographic Distribution of Research Awards

Figure 21 shows the distribution of the total value of NSF research funds awarded in FY 2013 by state.³⁰ In **Figure 21**, the shading indicates the NSF research funding by state for FY 2013 normalized by population based on state population estimates for July 1, 2013 from the U.S. Census Bureau. The darker colors indicate a higher amount of funding per capita. The national average (mean) amount per capita is \$16.92. The median of FY 2013 funding per capita in the various states is \$14.75 per capita.

Figure 21 – NSF Research Funding per Capita



³⁰ Data on research funding was accessed from the NSF Budget Internet Information System on 3/1/2013. The data include both new awards and the FY 2013 annual increments for continuing grants and cooperative agreements. This is a different approach from the one used in the FY 2012 Merit Review report in which only data for new awards were shown. Data for the District of Columbia are not shown.

IV. The NSF Merit Review Process

A. Merit Review Criteria

In FY 1998, the National Science Board approved the use of the two NSF merit review criteria. In 2007, the NSB modified the criteria to promote potentially transformative research. These criteria were in effect for proposals submitted in the first part of FY 2013. In December 2011, the NSB completed a review of the merit review criteria. The outcome of that review was to retain the existing two NSF merit review criteria but to revise the elements to be considered by reviewers in the application of those criteria.³¹ In addition, the NSB articulated principles upon which the two Merit Review Criteria are based. The language in the *Grant Proposal Guide* describing the merit review criteria and the principles on which they are based was revised in October 2012 to incorporate the recommendations from the National Science Board.³² This revised language applied to proposals submitted on or after January 14, 2013, or in response to deadlines that were on or after January 14, 2013 and is reproduced in **Appendix 11**.

The two NSF-wide merit review criteria are Intellectual Merit and Broader Impacts. The Intellectual Merit criterion encompasses the potential to advance knowledge. The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes. Programs may have additional review criteria particular 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 separately address both merit review criteria within the Project Summary. Since 2006, the number of proposals returned without review for failing to address both NSF merit review criteria has been 1 in 300 or fewer. (See **Table 12**.)

Table 12 - Proposals Returned Without Review for Failing to Address both Merit Review Criteria

| Fiscal Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Number of Proposals | 176 | 134 | 117 | 124 | 147 | 131 | 116 | 159 | 84 |
| Percent of all Proposal Decisions | 0.42% | 0.32% | 0.26% | 0.28% | 0.33% | 0.24% | 0.22% | 0.33% | 0.17% |

Source: NSF Enterprise Information System 10/01/13.

B. Description of the Merit Review Process

The NSF merit review process includes the steps listed below and is depicted in **Figure 22**:

- 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

³¹ “The National Science Foundation’s Merit Review Criteria: Review and Revisions.” (2011) NSB/MR-11-22.

³² The NSF *Grant Proposal Guide* (GPG) applicable for the first quarter of FY 2013 is available at: http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_index.jsp. The version of the GPG applicable for the remainder of FY 2013 may be found at http://www.nsf.gov/pubs/policydocs/pappguide/nsf13001/gpg_index.jsp.

Appendix 2 for more information about preliminary proposals. Proposals that do not comply with NSF regulations, as stated in the *Grant Proposal Guide*, may be returned without review.

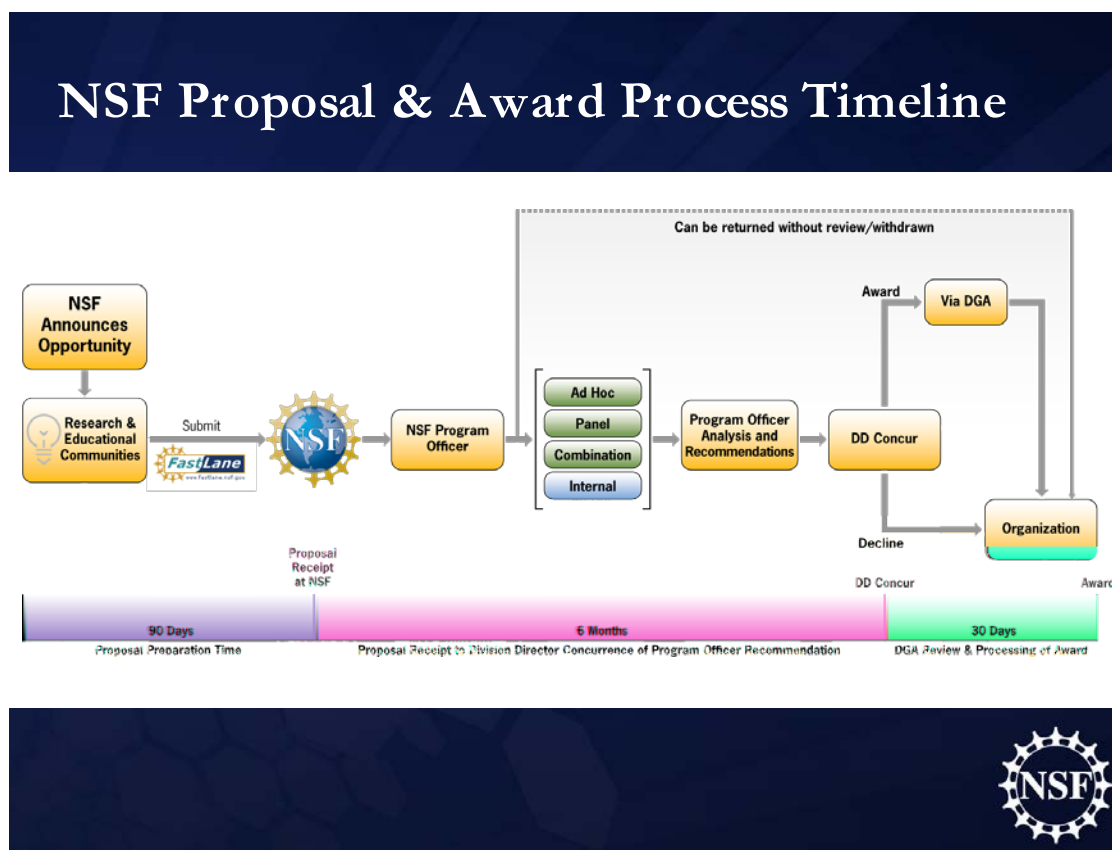
- The review process is overseen by a division director, or other appropriate NSF official.
- The program officer (or team of program officers) is responsible for the following:
 - Reviewing the proposal and determining the appropriate level of merit review. (Some proposals do not require external review. These include, for example, EAGERs, RAPIDs, INSPIRE Track 1s, and proposals for small conferences, workshops, or symposia.)
 - Selecting reviewers and panel members. Selection may be based on the program officer's knowledge, references listed in the proposal, individuals cited in recent publications or relevant journals, presentations at professional meetings, reviewer recommendations, bibliographic and citation databases, or proposal authors' suggestions.
 - Checking for conflicts of interest. In addition to checking proposals and selecting reviewers with no apparent potential conflicts, NSF staff members provide reviewers guidance and instruct them how to identify and declare potential conflicts of interest. All NSF program officers receive annual conflict of interest training.
 - Synthesizing the comments of the reviewers and review panel (if reviewed by a panel), as provided in the individual reviews and panel summaries.
 - Recommending action to award or decline the proposal, taking into account external reviews, panel discussion, and other factors such as portfolio balance and the 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 examines award recommendations with an average annual award amount of 2.5% or more of the awarding division's annual budget (prior year current plan). The National Science Board (NSB) reviews recommended awards with an annual award amount at or above 1% of the awarding directorate's prior year current plan or 0.1% of NSF's prior year total budget, whichever is greater.³³ In FY 2013, NSB authorized 9 funding items: 7 awards and 2 increases in funding.³⁴

³³ 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.

³⁴ One of the increases in funding authorization did not include an increase in spending U.S. funds but enabled the awardee to increase the expenditure of funds from foreign partners.

Figure 22 -Diagram of the NSF Merit Review Process



After a division forwards an award recommendation to the Office of Budget, Finance, and Award Management (BFA), a grants and agreements officer performs an administrative review of the recommendation. If the results of this review are satisfactory, BFA makes the award.

NSF has several oversight and advisory mechanisms relevant to the merit review process:

- External Committees of Visitors (COV), the membership of which is comprised of scientists, engineers, and educators, assess each major NSF program every 3-5 years. COVs examine the integrity and efficiency of merit review processes and the structure of the award portfolio.
- NSF directorates and offices have Advisory Committees comprised of scientists, engineers, administrators, and educators, from academia, other non-profit organizations, and industry. One of the tasks of these Advisory Committees is to review COV reports and responses from directorates and offices in order to provide guidance to the Foundation. The COV reports and NSF responses are publicly available on the NSF website.
- An external contractor performs an independent verification and validation of programmatic performance measurements, which include aspects of the merit review process.

Additional information about COVs, and NSF Advisory Committees, is given in **Appendix 12**.

C. Program Officer Award/Decline Recommendations

As noted above, the narrative comments and summary ratings provided by external reviewers are essential inputs to program officers who use their professional judgment to make 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 or professional training (e.g., a Ph.D., P.E., 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 high-risk proposals with potential for transformative advances in a field;
- Novel approaches to significant research and education questions;
- Capacity building in a new and promising research area;
- Potential impact on 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 for Proposers and the 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 a panel review was conducted). A "context statement" is also sent that explains the broader context within which any given proposal was reviewed. Program officers are 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.³⁵ 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 head upholds the original action, the applicant's institution may request a second reconsideration from the Foundation's Deputy Director.

³⁵ Certain types of proposal actions are not eligible for reconsideration. See NSF *Grant Proposal Guide* (GPG) at http://www.nsf.gov/pubs/policydocs/pappguide/nsf13001/gpg_4.jsp#IVD.

NSF declines approximately 38,000 proposals per year but usually receives only 30-50 requests for formal reconsideration annually. The number of requests for formal reconsideration and resulting decisions at both the Assistant Director and Deputy Director levels from FY 2004 through FY 2013 are displayed in **Appendix 13**. NSF received 28 formal reconsideration requests in FY 2013; 25 decline decisions were upheld and 2 were reversed. One reconsideration request was returned to the PI for failing to follow the procedure described in the Grant Proposal Guide.

E. Methods of External Review

The Foundation's merit review process relies on the use of knowledgeable experts from outside NSF. As stated in the *Grant Proposal Guide* (GPG), proposals usually receive at least three external reviews. Under some circumstances, the requirement for external review can be waived.³⁶

NSF programs obtain external peer review by three principal methods: (1) "mail-only," (2) "panel-only," and (3) "mail + panel" review.

In the "mail-only" review method, reviewers are sent links to 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 as a group 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:

- Mail reviewers submit reviews before the panel convenes and the panel's discussion is informed by the mail reviews.
- A panel meets to discuss proposals. The panel and/or program staff may identify proposals where additional reviewing expertise would be helpful. After the panel, appropriate reviewers are asked to submit mail reviews to supplement the panel's advice.

The total numbers of individual, narrative reviews and the average numbers of reviews per proposal obtained by the three different review methods are presented in **Table 13**.³⁷

³⁶ Exemptions that program officers may choose to exercise, for example, include proposals for EAGER, RAPID, and INSPIRE grants, and certain categories of workshop and symposia proposals. See **Appendix 10** for more information about EAGER and RAPID proposals.

³⁷ The table only shows reviews written by individuals. Panel discussions may, and often do, include the input of reviewers who have read the proposal but have not been asked to provide a separate written review. A panel summary therefore often represents a review perspective that is larger than that which is captured in the written reviews. The number of reviews per proposal in the last line of the table therefore underestimates the amount of reviewer input when a panel is part of the review process.

Table 13 - Reviews per Proposal, FY 2013

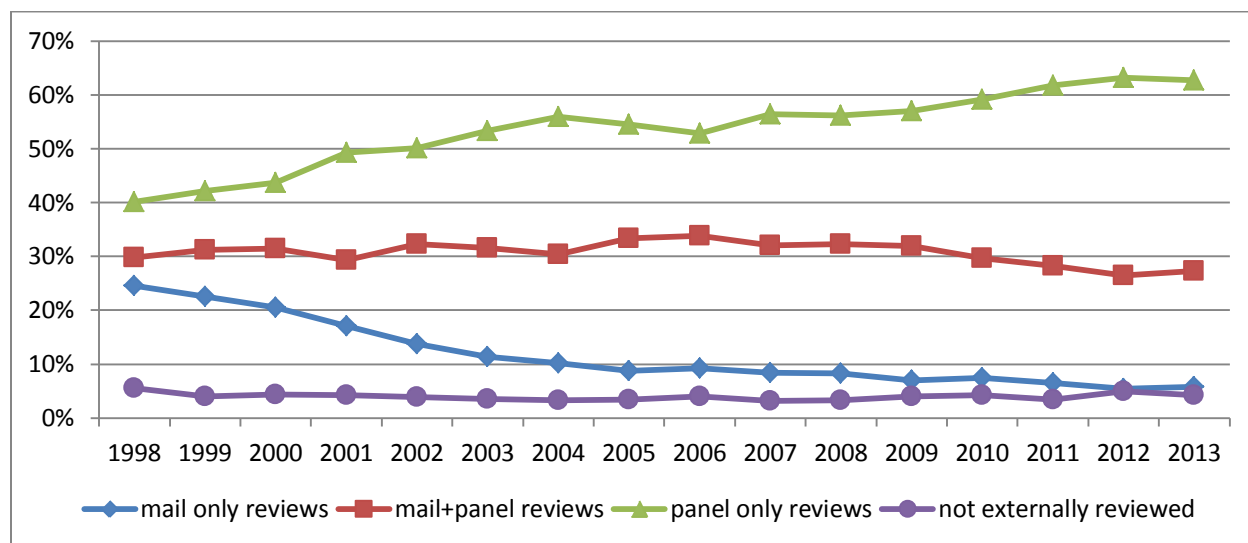
| | All Methods | Mail + Panel | Mail-Only | Panel-Only |
|-----------|-------------|--------------|-----------|------------|
| Reviews* | 187,512 | 65,006 | 11,184 | 111,322 |
| Proposals | 46,918 | 13,394 | 2,814 | 30,710 |
| Rev/Prop | 4.0 | 4.9 | 4.0 | 3.6 |

Source: NSF Enterprise Information System 10/01/13.

The mail-plus-panel method had the highest number of reviews per proposal, averaging 4.9, while the panel-only method averaged 3.6. Directorate-level data for FY 2013 are presented in **Appendix 14**.

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 appropriate NSF official.

The use of various review methods has changed markedly over time, as shown in **Figure 23**. The data for FY 2002 - 2013 are provided in **Appendix 15**, and **Appendix 16** provides FY 2013 data on the review methods used by directorates and offices. **Appendix 17** shows the average review ratings that result from the different methods of review.

Figure 23 - FY 1998-2012 Trend, NSF Review Method

Source: NSF Enterprise Information System, 10/01/13.

There are a number of reasons for the trends in **Figure 23**. Panels allow reviewers to discuss and compare proposals. The panel review process has the advantage that different perspectives can be discussed and integrated, if appropriate. Panels tend to be used for programs that have

* As in the FY 2012 report, we have only counted written reviews prepared by individuals, whether a mail reviewer or a panelist.

deadlines and target dates, as opposed to unrestricted submission windows. Using only panels in the review process tends to reduce proposal processing time (time-to-decision), compared to mail-only reviews. For example, in FY 2013, 79% of all proposals reviewed by panel-only were processed within six months, compared to 69% for mail + panel and 54% for mail-only.³⁸

One 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.

In-person review panels also have some drawbacks. For example, some qualified individuals may find it difficult to be absent from home or work for the several days that might be required to travel to NSF and participate in a panel. In addition, the average number of proposals that a panelist is asked to review in a funding cycle is considerably higher than the number of reviews asked of a mail reviewer. This high workload may deter some individuals who would otherwise be willing to participate in the review process.

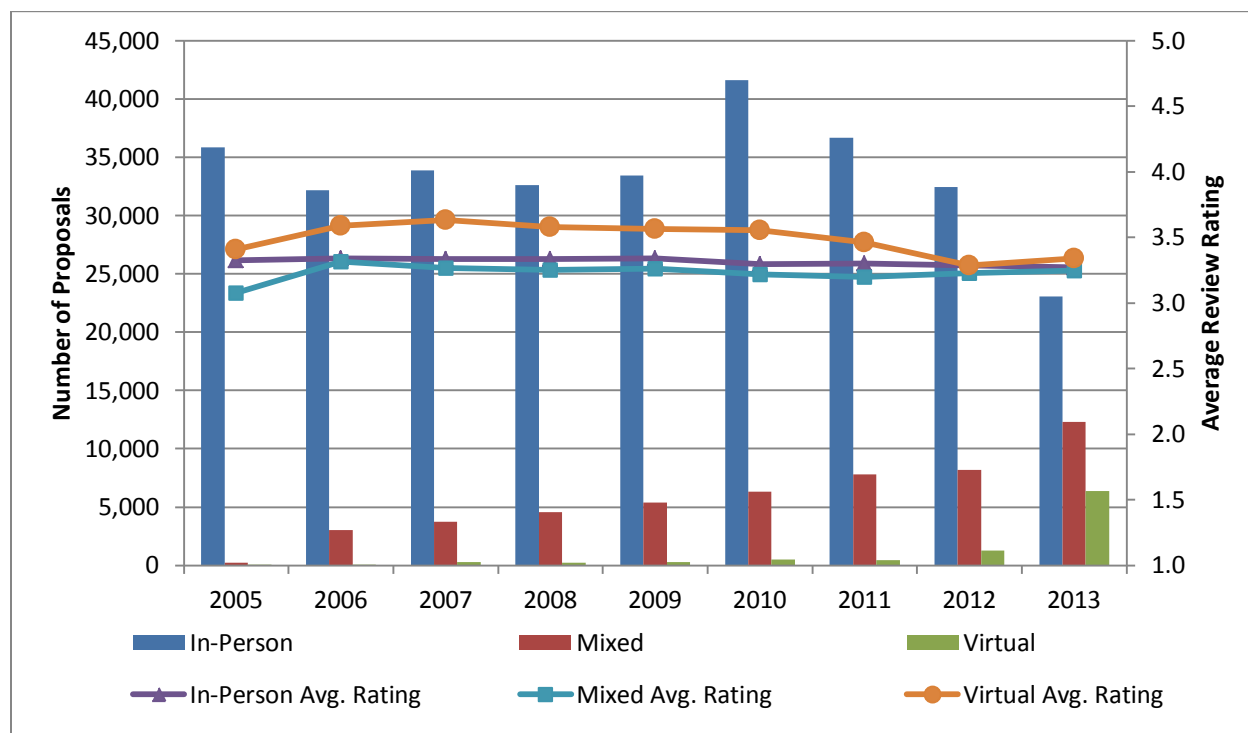
In recent years, “virtual panels” have emerged as an alternative to in-person review panels. In FY2013, approximately 28%³⁹ of panels at NSF were held virtually. Virtual panels can help address some of the drawbacks noted with in-person panels, while retaining the comparative analysis provided by a panel review. In addition, virtual panels offer NSF staff and panelists greater flexibility in structuring the panel review. In virtual panels, panelists participate from their remote locations and interact using NSF’s Interactive Panel System (IPS), accompanied by a teleconference, videoconference, or a virtual world system such as Second Life. Use of virtual panels supports NSF’s efforts to improve career-life balance and broaden the participation of highly qualified individuals in the review process. Examples of groups who may face difficulties participating in in-person review panels include: researchers with young children or who provide elder care; researchers with disabilities that make travel difficult or whose home environment provides special assistive technologies; and researchers with heavy teaching commitments or other work commitments that would make a two-day or three-day absence difficult. **Figure 24** shows the number of proposals reviewed by different types of panels since FY 2005 and the proposal ratings by panel review type (in-person, virtual, and mixed).⁴⁰ Mixed panels are panels in which some reviewers participate in person and some use a telephone or video connection to participate from a remote location. Mixed panels tend to have more complicated social dynamics and can be more difficult to moderate; however, they can be useful in broadening participation in the review process or when unforeseen events prevent a reviewer from travelling to an in-person panel.

The fundamental mode of operation of panels is the same whether they are virtual, in-person or mixed; however, for a number of reasons, NSF believes that the use of a virtual panel approach works best when the size of the panel and the number of proposals considered are relatively small. This is reflected in the statistics of the three types of panels shown in **Table 14**.

³⁸ The lower value for mail-only may be a reflection of the fact that a number of the programs that use this method do not have submission deadlines, rather than a direct consequence of the method of obtaining reviews.

³⁹ Data provided by NSF’s Division of Administrative Services.

⁴⁰ For consistency with prior years’ reports, we repeat the practice of basing this figure on a subset of the competitively reviewed proposals from which certain proposals, such as fellowship proposals, have been excluded.

Figure 24 - FY 2005-2013 Usage and Proposal Rating by Panel Review Type⁴¹

Source: NSF Enterprise Information System 10/01/13.

Because virtual panels, on average, review fewer proposals per panel than in-person panels (averaging 14.5 and 31.9, respectively), only 14.5% of proposals that were reviewed by panels went through virtual panels in FY 2013.

Table 14 - Data on Virtual, Mixed and In-Person Panels held in FY 2013⁴²

| | Virtual | Mixed | In-Person | TOTAL |
|-----------------------------|---------|--------|-----------|--------|
| Panels | 506 | 502 | 821 | 1,829 |
| Proposals* | 7,327 | 17,013 | 26,189 | 50,529 |
| % of Total Panels | 27.7% | 27.4% | 44.9% | 100% |
| % of Total Proposals | 14.5% | 33.7% | 51.8% | 100% |
| Proposals/Panel | 14.5 | 33.9 | 31.9 | 27.6 |
| Panelists | 2,982 | 5,006 | 7,471 | 15,459 |
| Panelists/Panel | 5.9 | 10.0 | 9.1 | 8.5 |
| Proposals/Panelist | 2.5 | 3.4 | 3.5 | 3.3 |

* Proposals that were reviewed by more than one panel are counted once for each panel to which they went. In general, collaborative projects are only included once for each panel in which they are reviewed. Individual reviewers are counted once for each panel on which they serve.

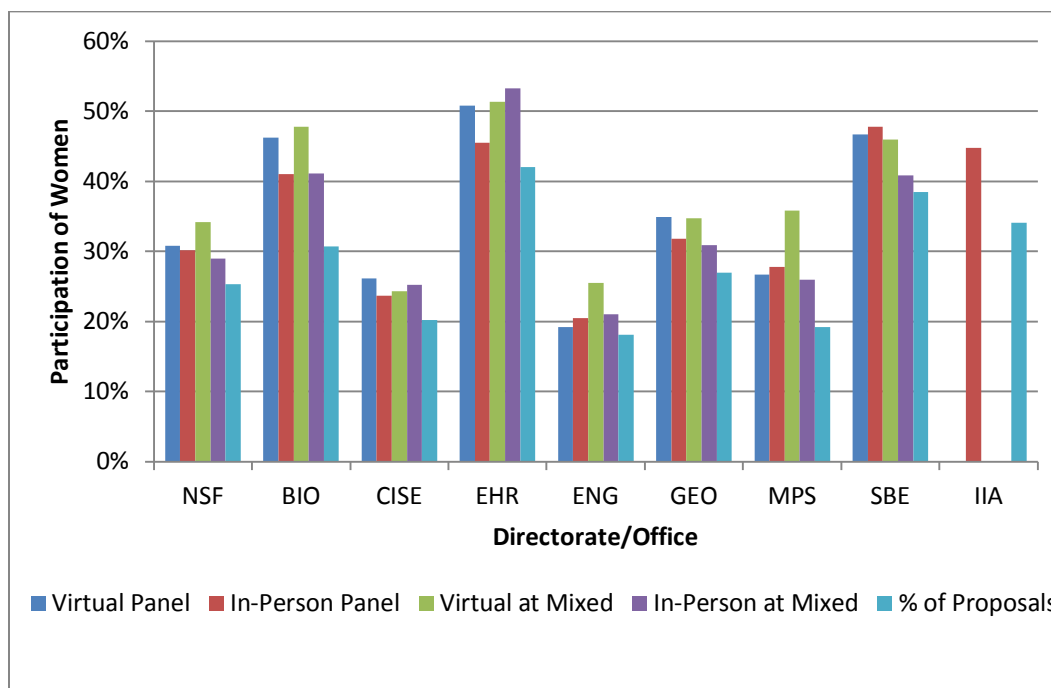
⁴¹ As in previous years, the data in **Figure 24** correspond to panels that reviewed proposals that were recommended for award or decline by division directors in the stated fiscal year. Thus, for example, some of the panels associated with FY 2013 occurred prior to the beginning of FY 2013 and some of the panels that occurred late in FY 2013 are not associated with FY 2013 because proposals from these panels were not recommended until FY 2014.

⁴² Unlike **Figure 24**, the data in this table include only those panels that took place in the given fiscal year, FY 2013.

In addition to avoiding the burden of travel to NSF, virtual panelists are also, on average, assigned a smaller workload than in-person panelists.

As noted earlier, demographic data for reviewers is relatively sparse. This is particularly true for race, ethnicity and disability status. However, information on the gender of panelists is more complete and is summarized in **Figure 25**.

Figure 25 – Participation of Female Reviewers in Virtual, In-Person, and Mixed Panels during FY 2013⁴³



Source: NSF Enterprise Information System 1/17/14.

Of the 15,459 panelists⁴⁴ in FY 2013, gender information was available for 82.7%. This permitted an examination of whether there was any significant difference between the ratio of male and female panelists in virtual panels and that in in-person panels. Amongst panelists for whom gender information was recorded, 30.14% of panelists on in-person panels and 30.84% of panelists on virtual panels were women. The small difference is not statistically significant. However, for both types of panels, women participate at a higher rate (just over 30%) than their representation amongst proposers (25% for competitive proposals and 24% of research proposals).

In FY 2012, there was a greater difference between the participation of women in in-person and wholly virtual panels (29.39% and 31.92%, respectively) than was seen in FY 2013; however,

⁴³ The reviewer participation data include only those panels that took place in the given fiscal year, FY 2013. Also shown is the percentage of competitively reviewed proposals with award or decline actions approved by division directors in FY 2013 that came from female PIs. IIA only held in-person panels during FY 2013.

⁴⁴ Because some reviewers serve on more than one panel, this number represents 13,054 distinct individuals.

the number of virtual panels in FY 2012 was only 25% of the number in FY 2013 and the difference in the participation of women in in-person and wholly virtual panels in FY 2012 was still not statistically significant.⁴⁵

Mixed panels do exhibit a difference between the demographics of those panelists who attend in-person and of those that participate virtually. Averaging across all of the mixed panels in FY 2013, 75.6% of panelists attended in person and 24.4% attended virtually. Looking only at those panelists for whom gender information was available, 29% of the panelists who attended in-person were women while 34.2% of panelists who participated virtually were women. This difference is statistically significant.⁴⁶

The difference seen in the demographics of in-person and virtual participation in mixed panels in FY 2013 is similar to what was seen in FY 2012 when 27.8% of the panelists who attended in-person were women while 33.4% of panelists who participated virtually were women.⁴⁷

Both in-person and virtual panels use the Interactive Panel System (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.

As noted above, videoconferencing is used by some programs to enhance the participation of virtual panelists. 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. Merit Review Pilots

In addition to the forms of merit review used above, in FY 2012 – 2014, NSF is conducting several pilot activities incorporating different variations of the more familiar approaches to merit review. **Table 15** lists these pilots. A brief description of each pilot follows. Proposals for pilot activities that involve deviations from established NSF policies undergo an internal review process established in FY 2012. Pilot activities that can be implemented within existing NSF policies do not require such formal review although programs are encouraged to engage the research community in advance of beginning the pilot and to notify prospective proposers of the forthcoming changes. Examples in this latter category include the use of preliminary proposals for core programs and the elimination of the use of program deadlines.

Virtual Panels

For several years, NSF has experimented with having reviewers participate “virtually” in review panel discussions, using technologies like teleconferencing, videoconferencing or “virtual worlds.”⁴⁸ In each of FY 2010 and FY 2011, approximately 1% of proposals were reviewed by

⁴⁵ The probability that such a difference would arise at random is greater than 0.1.

⁴⁶ The probability that such a difference would arise at random is $p < 0.005$.

⁴⁷ The probability that such a difference would arise at random is $p < 0.01$.

⁴⁸ An example of a virtual world technology used for panel review is the Second Life system.

wholly virtual panels. Based on that experience, NSF began planning a pilot activity to look at the challenges and impacts associated with expanding the use of virtual panels. Motivations for this included: an opportunity to attract potentially untapped reviewer pool resources by removing barriers that might prevent panelists who may not be able to travel due to physical limitations, family responsibilities, or other travel restrictions; greater opportunities to utilize international panelists who are often faced with large travel times and other restrictions; greater flexibility in how virtual panels are structured; enhanced opportunities for reviewer training; and reducing the potential impacts of inclement weather. However, there are challenges such as matching technology to the size and purpose of the panel, technology stability and acceptance, as well as security and policy issues. Assessing these challenges and testing approaches to them were among the reasons for implementing a pilot activity.

Table 15 – Merit Review Pilots

| Pilot | Nature of pilot | Units participating |
|---|--|--|
| Virtual Panels | The expanded use of review panels in which all panelists participate electronically from distributed locations such as their offices or homes. | NSF-wide |
| Preliminary Proposals for Core Programs | Core programs move from semi-annual deadlines for full proposals to an annual deadline for preliminary proposals. | BIO/DEB, BIO/IOS |
| One-Plus | Investigators with promising but unfunded proposals may revise and resubmit their ideas for possible funding in the second half of the annual funding cycle, but only if invited to do so. | SBE/BCS's Geography and Spatial Sciences program |
| Asynchronous Reviewer Discussions | The use of an access-controlled, program director-moderated message board, open to reviewers over a specified period, to enable the sharing of comments and discussion of a set of proposals. | CISE/CNS, MPS/PHY |
| Mechanism Design | A review mechanism in which techniques from game theory are used to allow investigators who submit proposals also to take part in the review process. | ENG/CMMI's Sensors and Sensing Systems program |
| Umbrella-Amendment Solicitation | A proposal-generating mechanism that is designed to implement a community-developed infrastructure. A flexible solicitation mechanism that accommodates both overarching, long-term goals and the ability to be responsive to changing community requirements. | GEO's & CISE/ACI's EarthCube program |
| Elimination of Program Deadline | A core program that has traditionally had two proposal deadlines per year switched to accepting proposals at any time to see if proposal pressure would be affected. | GEO/EAR's Instrumentation and Facilities Program |

The virtual panel pilot activity began in FY 2012 with an assessment of several technological and organizational approaches to virtual meetings, the development of training modules for NSF staff and reviewers, and outreach activities with NSF staff. In FY 2013 and FY 2014, information would be collected about virtual panels and the experiences of participants so that an assessment could be made in FY 2015. The expectation was that at least 5% of review panels in

FY 2013 would be wholly virtual.⁴⁹ As it turned out, NSF programs embraced virtual panels to a greater degree than anticipated; 28% of panels held in FY 2013 were wholly virtual. One contributing factor may have been guidance from the Office of Management and Budget which encouraged NSF and other agencies to reduce spending on travel.

Preliminary Proposals for Core Programs

Faced with increasing proposal numbers, reviewer requirements, and declining success rates, in January 2012, two divisions in the Directorate for Biological Sciences, the Division of Environmental Biology (DEB) and the Division of Integrated Organismal Systems (IOS), embarked on a three-year pilot activity to mitigate the stresses involved. This activity replaced semi-annual, full proposal deadlines with an annual proposal submission and review process accomplished in two stages. The first stage requires 4 or 5-page preliminary proposals to be submitted each January. These are reviewed in panels and then, informed by the reviewers' input, program officers invite 15-30% of the proposers to submit full proposals by a second deadline in late summer. In the second stage, full proposals submitted in response to these invitations are reviewed in the fall by a combination of panels and ad hoc reviewers; award/decline decisions are made based on the reviews of the full proposals. This process has decreased the number of ad hoc reviewers required.

One-Plus

One of the goals of this pilot was to accelerate support for highly significant, potentially transformative research. Starting in Fall 2012, the Geography and Spatial Sciences program (GSS) moved from a semi-annual proposal deadline to accepting core research proposals only once each year, with a deadline in early September. However, reviewers were asked to explicitly comment separately on the potential larger-scale, longer-term significance of a project (as outlined in the proposal) if the project *were* to be conducted successfully, as well as the likelihood that the project (as outlined in the proposal) *would* be conducted successfully.

After funding decisions were made, program officers invited a limited number of PIs whose proposals had been declined to revise and resubmit a proposal roughly two months after they received the decline notification. This opportunity was provided based on the identification of projects whose significance and potentially transformative character were evaluated as being high. All other declined PIs had to wait until the next annual deadline for unsolicited proposals before submitting a new or revised proposal.

Proposals submitted for the secondary deadline were evaluated with ad hoc reviews complementing a panel review of the revised proposals.

Asynchronous Reviewer Discussions

This activity pilots an approach to merit review in which, after submitting written individual reviews of their assigned proposals, reviewers use an access-controlled online message board to

⁴⁹ See NSF's discussion of Merit Review Process Improvements in the President's FY 2014 budget, submitted to Congress in February, 2013.

participate in an asynchronous discussion of the merits of the proposals. The online discussion is moderated by program staff.

The approach is well known to some research communities, such as some areas of computer science that have used it extensively in the review of submissions to research conferences.

For the pilot in FY 2013, asynchronous panel discussions were used as a pre-cursor to face-to-face or virtual panel meetings. They served to identify those proposals on which there was consensus about their merit (either high or low) and to explore the reasons for divergence when individual reviewers had very different perspectives on proposals. This enabled the subsequent panel meetings to focus their time more effectively.

One division, Computer and Network Systems, used asynchronous discussions in conjunction with nine panels, and a second division, Physics, used asynchronous discussions for two panels. Using feedback from the reviewers and the program staff involved, these divisions concluded that the approach showed promise but that the technology used was too cumbersome in comparison to other platforms for asynchronous discussion used by the research community. NSF's Division of Information Services is examining whether the required capabilities can be incorporated into NSF's Interactive Panel System.

Mechanism Design

The Sensors and Sensing Systems program developed a merit review pilot to test the efficacy of using techniques from game theory to create a review mechanism in which the investigators who submit proposals also take part in the review process.

The mechanism design approach to proposal review is based on the mathematical theory of games, or more precisely reverse game theory, namely how the rules of the game should be designed in order to obtain certain desired goals. This method of review relies on ad hoc mail review of proposals with the reviewers assigned from among the set of PIs whose proposals are being reviewed. Proposals are assembled into relatively homogeneous groups of about 40 proposals per group. Each proposal is assigned for review to seven otherwise non-conflicted PIs from the same group. The reviewers remain anonymous within their group and do not communicate with one another. The reviewers must provide both a written review and an ordering of the seven proposals to which they are assigned. The written review summarizes the strengths and weaknesses of the proposal as perceived by the reviewer. Based on their interpretation of the proposals they have reviewed, each reviewer is asked to provide an ordering of the proposals in what they anticipate will be the consensus ordering of the group. The score of the PI's own proposal is then supplemented with "bonus points" depending upon the degree to which their ranking agrees with the consensus ranking. The award of bonus points is the step that game theory suggests should provide an incentive to each reviewer to give a fair and thorough rating and ranking of the proposals to which he or she is assigned. The NSF program officer then uses the reviewers' comments, ratings and rankings as the primary input for his or her funding recommendations.

Some of the potential benefits of such an approach are:

- To reduce the submission of multiple proposals and repeated resubmission of previously declined proposals;
- To reduce the overall burden on the reviewer community;
- To improve the overall quality of the proposals submitted to the program;
- To make it easier to maintain multiple proposal submission windows per year; and
- To reduce the costs of proposal review.

The main part of this pilot activity will occur in FY 2014 with the first cohort of proposals being those submitted in October 2013. Because of the unconventional nature of this approach, the program undertook a considerable amount of outreach to and discussion with the research community in FY 2013. 131 projects were proposed and the program officer conducting the pilot has been pleased with the quality of the reviews received. One result of this approach is that proposals have received a more comprehensive review than had been previously been the norm for this program.

Umbrella-Amendment Solicitation

The EarthCube Umbrella-Amendment Solicitation is a pilot between GEO and CISE/ACI. It implements a flexible solicitation mechanism that accommodates both overarching, long-term goals, like a program announcement, and the ability to quickly respond to changing community requirements. The umbrella part of the solicitation describes the vision and reasons for the program and does not change over time. This facilitates the tracking of submissions and awards associated with the umbrella theme, and subsequent portfolio analysis, since the solicitation number remains the same. The amendment section of the solicitation specifies the funding mechanism(s) to be employed for the call, proposal due dates or submission windows, and any special review criteria and/or reporting conditions. As the EarthCube design develops with community guidance, new amendments replace old amendments. The pilot began with the EarthCube solicitation (NSF 13-529), released in December 2012. This included the Umbrella portion of the solicitation and the first Amendment section. The second Amendment was released in February 2013 and the third Amendment was released in December 2013 for a March 2014 deadline date.

Elimination of Program Deadline

It has been conjectured that, in some programs, the existence of recurring proposal deadlines may increase the number of proposals submitted to the program. There are a few core programs that accept proposals at any time and their proposal load has seen less dramatic increases than is the average for NSF programs in recent years. The Division of Earth Sciences undertook an experiment in which one of its programs, which had been using two proposal deadlines per year, switched to accepting proposals without deadlines or target dates to see how proposal pressure would be affected. The final regular deadline was in July 2011. Beginning in late July 2012, proposals were accepted at any time. The year between, FY 2012, was a transition year and atypical in that, for budgetary reasons, proposals for equipment acquisition were not solicited in FY 2012. The annual numbers of proposals received before and after the transition year are shown in **Table 16**.

Table 16 – Proposals received by EAR/IF before and after a transition to no deadlines

| Fiscal Year⁵⁰ | Proposals received |
|---------------------------------|---------------------------|
| 2007 | 177 |
| 2008 | 198 |
| 2009 | 176 |
| 2010 | 172 |
| 2011 | 173 |
| 2013 | 85 |

G. Data on Reviewers

The Foundation maintains a central electronic database of several hundred thousand reviewers who can potentially be drawn on to participate in mail or panel reviews. Program officers frequently add new reviewers to this database. 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 indices and other similar databases, as well as input from other reviewers.

Type of Review

Approximately 36,475 individuals served on panels, conducted a mail review for one or more proposals, or served in both functions for proposals for which an award or decline decision was made within FY 2013. Of these individuals, approximately 13,544 (37%) served as panelists (of whom about 3,005 also served as mail reviewers) and 22,931 (63%) served as mail reviewers only. Approximately 6,825 (19%) of these reviewers had never reviewed an NSF proposal before.

Demographics

Reviewers were from all 50 states as well as the District of Columbia, Guam, Palau, Puerto Rico and the US Virgin Islands. Approximately 4,500 reviewers were from outside the United States by address of record.⁵¹ 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, for-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 2013, out of a total of 36,475 distinct reviewers who returned reviews, 13,268 (36%) provided information about some aspect of gender, race, ethnicity and disability status. Of those

⁵⁰ In the transition year, FY 2012, proposals for Acquisition or Upgrade of Research Equipment were not accepted. These normally form a large part of the IF program portfolio. Other types of proposals were accepted, including: Development of New Instrumentation, Analytical Techniques or Software, Support of National or Regional Multi-User Facilities, and Support for Early Career Investigators. Consequently, only 125 proposals were received in FY 2012.

⁵¹ In recent years, there has been a steady decline in the proportion of reviewers from outside the United States. From FY 2010, the proportion of such reviewers varied as follows: FY 2010 – 15.6%; FY 2011 – 14.3%; FY 2012 – 12.7%; FY 2013 – 12.3%.

reporting these data, 5,183 (39%) indicated that they are members of a group under-represented in science and engineering. Specifically, of the reviewers who reported some demographic data, 4,312 (32.5%) reported being female, 1,331 (10%) reported being from an under-represented race or ethnic minority, and 214 (1.6%) reported a disability. Of the 1,331 reviewers that reported they are from an under-represented race or ethnic group, 775 (58%) reported Hispanic or Latino, 507 (38%) reported Black or African American, 59 (4.4%) reported American Indian or Alaskan Native, and 10 (0.8%) reported Hawaiian or Pacific Islander. (Some individuals indicated that they belonged to more than one under-represented demographic group.) By regulation, the provision of demographic data is voluntary and the low response rate remains a challenge. Many more panelists than ad hoc reviewers provide this information.

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 under-represented groups in science and engineering. Frequent tutorials on finding reviewers are 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 promote transparency, Chapter III.B of the *Grant Proposal Guide* describes how reviewers are selected by NSF program officers.

Participation in the peer review process is voluntary. It brings with it increased familiarity with NSF programs, knowledge of the state of research and education nationally, and increased awareness of the elements of a competitive proposal. Panelists are reimbursed for expenses, but mail reviewers receive no financial compensation. For proposals received in FY 2013, NSF requested 74,178 mail reviews, of which there were 48,976 positive responses.⁵² This 66% response rate in FY 2013 is similar to FY 2012's 67% rate. The response rate varies by program.

H. Reviewer Proposal Ratings and the Impact of Budget Constraints

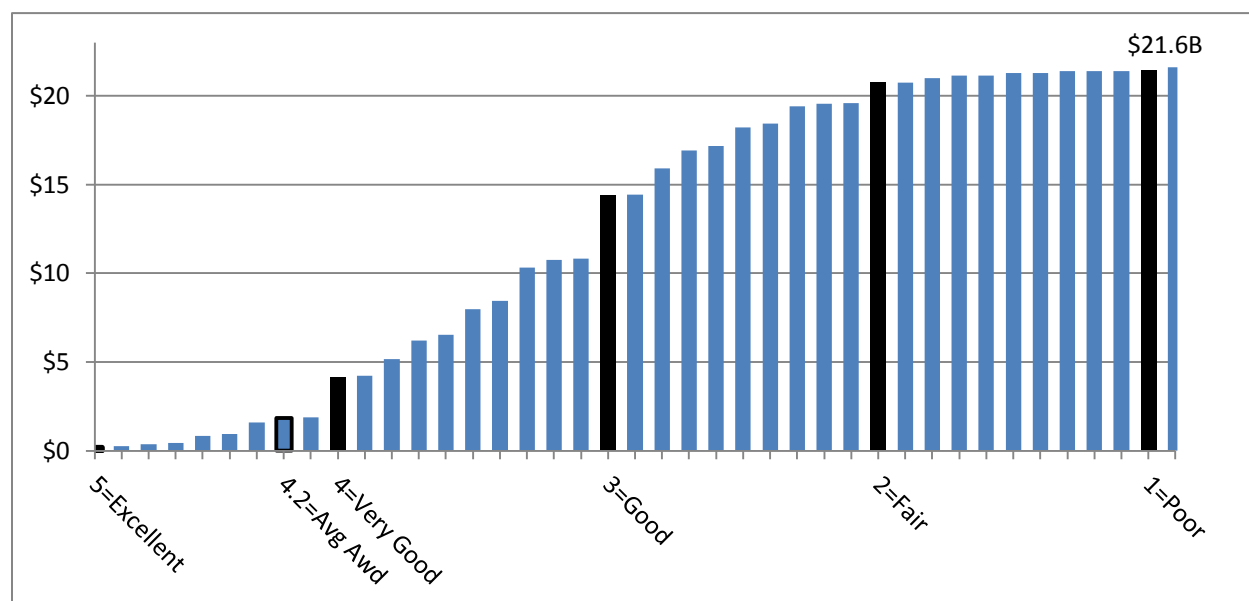
All funded proposals are determined to be highly meritorious based on a combination of individual reviews, panel deliberations and program officer evaluations. On average, NSF proposals are reviewed by 3-5 reviewers, depending on the type of review mechanism used, although there is variation between programs. Each of the reviewers is chosen for specific types of expertise and adds different points of view to the decision-making process. The reviewers provide written reviews that describe the strengths and weaknesses of proposals in the context of the NSB merit review criteria. As explained in the previous section, many proposals are reviewed by a panel of experts. The panel ranks proposals into groups based on a discussion of the proposals. These in-depth discussions can uncover weaknesses that might not have been reflected in the initial reviews or identify strengths in proposals that might not have been rated highly by the initial reviewers.

⁵² This number tracks requests that are recorded in the Proposal and Reviewer System (PARS). For example, when potential reviewers are sent a formal invitation via eCorrespondence, the reviewer is entered in PARS. Some potential reviewers are first invited informally by email or telephone. If they decline this initial invitation, there is usually no follow-up in eCorrespondence. Numbers given here reflect the rate of positive responses to formal invitations and overestimate the practical positive response rate.

The expertise of the NSF program officer making the final recommendation is an important voice in the process. Reviewers' numeric ratings of proposals, while a useful indicator, are not, by themselves, a robust metric of the relative merits of proposals. Program officers look not only at the ratings provided by reviewers but also weigh the *comments* that reviewers provide on the intrinsic merits of proposals. Program officers also take into consideration other factors that might not have been considered by expert reviewers. For example, proposals for innovative new ideas often use methods or techniques that might be considered risky by reviewers and panelists. Such "risky" proposals may result in transformative research that accelerates the pace of discovery. Although program officers consider concerns about risk expressed by panels, they also see the value of funding potentially transformative research. Even if the program officer decides not to fully fund the proposal, proposals that do not review well at panel due to methods that are unproven or risky, can be given small awards to allow enough work for a "proof of concept." Program officers will also consider broader impacts that might not be obvious to reviewers, such as an infrastructure need that will serve a large number of people. There are many dimensions of portfolio balance that may influence the final recommendation. Program officers strive to fund proposals from diverse institution types across all 50 states, from both young and experienced investigators.

A large number of potentially fundable proposals are declined each year. As shown in **Figure 26**, approximately \$1.84 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. In FY 2003, the ratio of awards to such highly rated declines was 6.1:1; in FY 2013, that ratio was 4.0:1. Approximately \$4.15 billion was requested for declined proposals that were rated Very Good or higher in the merit review process. These declined proposals represent a rich portfolio of unfunded opportunities, proposals that, if funded, may have produced substantial research and education benefits.

Figure 26 - Cumulative Requested Amounts for Declined Proposals by Average Reviewer Rating for FY 2013 (dollars in billions)



Source: NSF Enterprise Information System, 10/01/13

I. Program Officer Characteristics and Workload

The number of program officers decreased from 503 in FY 2012 to 490 in FY 2013, a 2.6% decrease.⁵³ Program officers can be permanent NSF employees or non-permanent employees. As shown in **Table 17**, 54.5% are permanent program officers and 45.5% are temporary. 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 their home institutions under the terms of the Intergovernmental Personnel Act (IPA). In FY 2013, the number of permanent program officers increased by 5 relative to FY 2012 while the number of IPAs decreased by 11. Whether they are hired as temporary or permanent, incoming NSF program officers receive training in the merit review process.

In comparison to FY 2012, the number of male program officers decreased by 2% and the number of female program officers decreased by 3.4%. The number of program officers who are White, Non-Hispanic decreased by 1.6% and the number that are from other racial or ethnic groups decreased by 5.5%. As a result of these changes, at the end of FY 2013, approximately 40.6% of the program officers were female and approximately 24.5% were from a racial or ethnic minority.

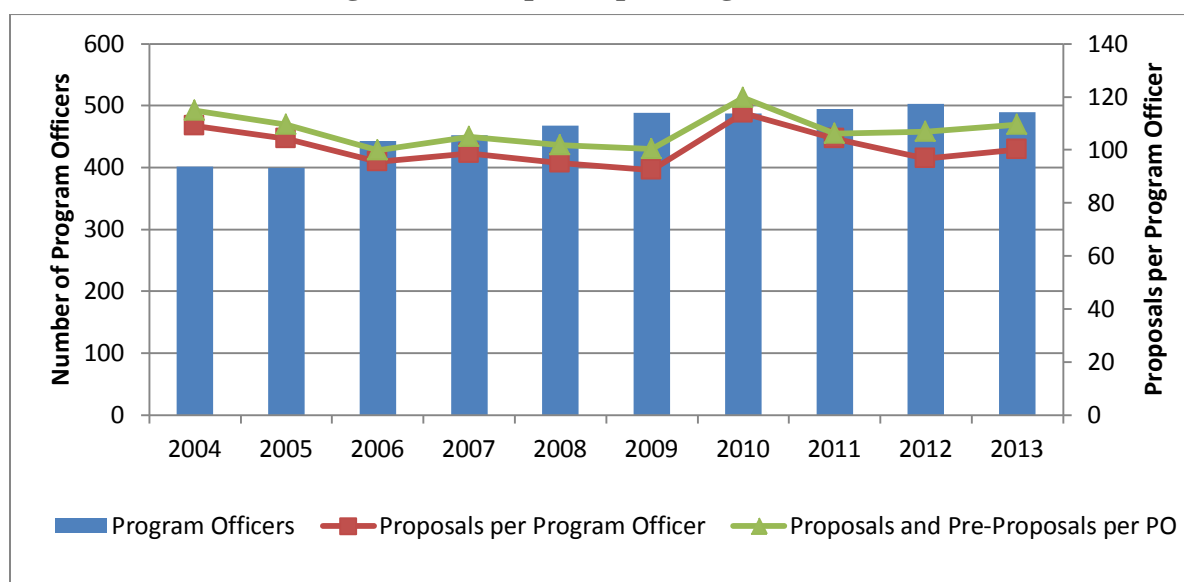
Table 17 - Distribution of NSF Program Officers by Characteristics

| Program Officers | Total | Percent |
|---|--------------|----------------|
| Total | 490 | 100% |
| <i>Gender</i> | | |
| Male | 291 | 59% |
| Female | 199 | 41% |
| <i>Race</i> | | |
| Other than White, Non-Hispanic | 120 | 24% |
| White, Non-Hispanic | 370 | 76% |
| <i>Employment</i> | | |
| Permanent | 267 | 54% |
| Visiting Scientists, Engineers & Educators (VSEE) | 34 | 7% |
| Temporary | 37 | 8% |
| Intergovernmental Personnel Act (IPA) | 152 | 31% |

Source: NSF Division of Human Resource Management 10/25/13.

The annual fluctuations in the ratio of proposals to program officers are shown in **Figure 27**.

⁵³ The Division of Human Resource Management revised its methodology for counting program officers. The revised counts for FY 2012 are: Total = 503; Female = 206; Male = 297; White, Non-Hispanic = 376; Permanent = 262; VSEE = 39; Temporary = 39; IPA = 163.

Figure 27 - Proposals per Program Officer

Source: NSF Division of Human Resource Management 10/25/13.

There was a decrease in the number of program officers in FY 2013 and a small increase from FY 2012 in the number of full proposals that were submitted. This resulted in a 3.5% increase in proposals processed per program officer. If preliminary proposals are included in the workload, then the workload per program officer increased by 2.5% from FY 2012 to FY 2013.

Not all individuals listed as program officers in **Table 17** process proposals, so the average proposal workload shown in **Figure 27** is an underestimate. The growing emphasis on interdisciplinary and cross-directorate programs, together with innovative approaches to encouraging transformative research proposals, has led to a growth in coordination activities. Program officers are also tasked with an increasing number of programmatic activities, e.g., increased program accountability, training, outreach, and mentoring new staff.

In recent years, NSF has revitalized its professional development opportunities for program staff, offering in-house courses in project management, leadership, and communication through the NSF Academy. Effective August 1, 2013 (OD 13-15 Merit Review Training Requirements for New Program Officers) NSF policy requires that all new NSF program officers take Merit Review Basics Sessions I and II within 90 days of beginning work at NSF and encourages them to take the other elements of program management training, including the Program Management Seminar, within the first six months to one year. These provide an orientation to NSF and training in the merit review process.

Appendices

Appendix 1 - Proposals, Awards and Funding Rates, by Directorate or Office

| | | Fiscal Year | | | | | | | | | |
|-------------------|----------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| NSF ⁵⁴ | Proposals | 43,851 | 41,722 | 42,352 | 44,577 | 44,428 | 45,181 | 55,542 | 51,562 | 48,613 | 48,999 |
| | Awards | 10,380 | 9,757 | 10,425 | 11,463 | 11,149 | 14,595 | 12,996 | 11,192 | 11,524 | 10,829 |
| | <i>Omnibus</i> | | | | | | 9,975 | 12,547 | | | |
| | <i>ARRA</i> | | | | | | 4,620 | 449 | | | |
| | Funding Rate | 24% | 23% | 25% | 26% | 25% | 32% | 23% | 22% | 24% | 22% |
| BIO | Proposals | 6,063 | 6,475 | 6,617 | 6,728 | 6,598 | 6,578 | 8,059 | 7,439 | 5,269 | 5,934 |
| | Awards | 1,432 | 1,355 | 1,202 | 1,303 | 1,291 | 1,823 | 1,556 | 1,310 | 1,293 | 1,250 |
| | <i>Omnibus</i> | | | | | | 1,261 | 1,476 | | | |
| | <i>ARRA</i> | | | | | | 562 | 80 | | | |
| | Funding Rate | 24% | 21% | 18% | 19% | 20% | 28% | 19% | 18% | 25% | 21% |
| CISE | Proposals | 6,496 | 5,354 | 4,973 | 6,048 | 6,067 | 6,001 | 7,317 | 6,702 | 7,703 | 7,821 |
| | Awards | 1,064 | 1,163 | 1,322 | 1,699 | 1,449 | 1,926 | 1,755 | 1,527 | 1,749 | 1,616 |
| | <i>Omnibus</i> | | | | | | 1,452 | 1,723 | | | |
| | <i>ARRA</i> | | | | | | 474 | 32 | | | |
| | Funding Rate | 16% | 22% | 27% | 28% | 24% | 32% | 24% | 23% | 23% | 21% |
| EHR | Proposals | 4,644 | 3,699 | 3,254 | 4,248 | 3,887 | 3,699 | 5,055 | 4,660 | 4,281 | 4,501 |
| | Awards | 925 | 736 | 824 | 903 | 1,111 | 1,009 | 930 | 807 | 889 | 793 |
| | <i>Omnibus</i> | | | | | | 919 | 908 | | | |
| | <i>ARRA</i> | | | | | | 90 | 22 | | | |
| | Funding Rate | 20% | 20% | 25% | 21% | 29% | 27% | 18% | 17% | 21% | 18% |
| ENG | Proposals | 8,994 | 8,692 | 9,423 | 9,574 | 9,643 | 10,611 | 13,226 | 12,314 | 11,338 | 10,738 |
| | Awards | 1,753 | 1,493 | 1,730 | 1,955 | 1,966 | 2,688 | 2,375 | 2,064 | 2,065 | 2,212 |
| | <i>Omnibus</i> | | | | | | 1,771 | 2,321 | | | |
| | <i>ARRA</i> | | | | | | 917 | 54 | | | |
| | Funding Rate | 19% | 17% | 18% | 20% | 20% | 25% | 18% | 17% | 18% | 21% |
| GEO | Proposals | 4,956 | 5,492 | 5,378 | 5,567 | 5,101 | 4,991 | 5,614 | 5,187 | 5,243 | 6,087 |
| | Awards | 1,687 | 1,596 | 1,656 | 1,711 | 1,563 | 2,226 | 1,970 | 1,705 | 1,637 | 1,565 |
| | <i>Omnibus</i> | | | | | | 1,152 | 1,917 | | | |
| | <i>ARRA</i> | | | | | | 1,074 | 53 | | | |
| | Funding Rate | 34% | 29% | 31% | 31% | 31% | 45% | 35% | 31% | 31% | 26% |

⁵⁴ Several organizational changes occurred over the decade. Data from prior years have been realigned with the organizational structure in effect for FY 2013 in order to show historical trends. The Office of Cyberinfrastructure (OCI) was created in July 2005 from what had previously been the Division of Shared Cyberinfrastructure (SCI) in CISE. In FY 2007, management of the EPSCoR program was transferred from EHR to OIA. A realignment was implemented in FY 2013 that moved the Office of Polar Programs (OPP) and OCI from the Office of the Director to GEO and CISE, respectively, preserving their identity as separate divisions. Additionally, the Office of International Science & Engineering (OISE) and Office of Integrative Activities (OIA) became the Office of International and Integrative Activities (IIA). See **Appendix 19**.

| | | Fiscal Year | | | | | | | | | |
|---------------------|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| IIA | Proposals | 895 | 838 | 721 | 803 | 931 | 890 | 1,242 | 1,352 | 995 | 582 |
| | Awards | 405 | 339 | 326 | 379 | 374 | 464 | 484 | 429 | 347 | 272 |
| | <i>Omnibus</i> | | | | | | 360 | 424 | | | |
| | <i>ARRA</i> | | | | | | 104 | 60 | | | |
| | Funding Rate | 45% | 40% | 45% | 47% | 40% | 52% | 39% | 31% | 35% | 47% |
| MPS | Proposals | 7,184 | 7,083 | 7,466 | 7,315 | 7,837 | 7,883 | 9,411 | 8,796 | 9,006 | 8,903 |
| | Awards | 2,175 | 2,071 | 2,221 | 2,360 | 2,269 | 3,122 | 2,669 | 2,352 | 2,523 | 2,201 |
| | <i>Omnibus</i> | | | | | | 2,004 | 2,529 | | | |
| | <i>ARRA</i> | | | | | | 1,118 | 140 | | | |
| | Funding Rate | 30% | 29% | 30% | 32% | 29% | 40% | 28% | 27% | 28% | 25% |
| SBE | Proposals | 4,619 | 4,089 | 4,520 | 4,284 | 4,364 | 4,525 | 5,618 | 5,112 | 4,776 | 4,433 |
| | Awards | 939 | 1,004 | 1,144 | 1,143 | 1,126 | 1,337 | 1,257 | 998 | 1,019 | 920 |
| | <i>Omnibus</i> | | | | | | 1,056 | 1,249 | | | |
| | <i>ARRA</i> | | | | | | 281 | 8 | | | |
| | Funding Rate | 20% | 25% | 25% | 27% | 26% | 30% | 22% | 20% | 21% | 21% |
| Other ⁵⁵ | Proposals | | | | 10 | | 3 | | | 2 | |
| | Awards | | | | 10 | | 0 | | | 2 | |
| | <i>Omnibus</i> | | | | | | | | | | |
| | <i>ARRA</i> | | | | | | | | | | |
| | Funding Rate | | | | 100% | | 0% | | | 100% | |

Source: NSF Enterprise Information System 10/01/13.

⁵⁵ The 'Other' category includes, for example, non-contract awards made on behalf of the Office of the Inspector-General. The following are not included in the FY 2013 statistics: 5,984 Continuing Grant Increments, 3,101 Supplements, and 536 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 full proposals are only accepted from PIs that are invited to submit them. In general, programs obtain advice from external peer reviewers before making binding decisions about preliminary proposals.

Number of Preliminary Proposals and Subsequent Actions

| Fiscal Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| Total # Preliminary Proposals | 2,310 | 2,120 | 1,874 | 2,842 | 3,203 | 3,856 | 2,883 | 965 | 5,135 | 4,691 |
| Non-Binding (NB) Total* | 1,412 | 1,302 | 1,279 | 1,540 | 669 | 1,140 | 1,384 | 357 | 459 | 457 |
| NB Encouraged | 544 | 512 | 509 | 662 | 333 | 519 | 636 | 128 | 222 | 296 |
| NB Discouraged | 868 | 790 | 770 | 878 | 336 | 621 | 748 | 229 | 237 | 161 |
| Binding Total* | 892 | 816 | 594 | 1,301 | 2,534 | 2,500 | 1,273 | 572 | 4,484 | 4,087 |
| Binding Invite | 221 | 246 | 136 | 252 | 572 | 685 | 372 | 245 | 1,236 | 942 |
| Binding Non-invite | 671 | 570 | 458 | 1,049 | 1,962 | 1,815 | 901 | 327 | 3,248 | 3,145 |

Source: NSF Enterprise Information System 10/01/13.

In FY 2012, the Directorate for Biological Sciences instituted a new requirement that PIs who wished to submit full proposals to the Divisions of Environmental Biology and Integrative Organismal Systems, in response to core program solicitations, the Research at Undergraduate Institutions (RUI) solicitation, or the Long-term Research in Environmental Biology (LTREB) solicitation, must first submit a preliminary proposal.

* Non-binding and binding totals do not include preliminary proposals that have been withdrawn or returned without review.

Appendix 3 – Proposals, Awards and Success Rates, by PI Demographics*

Table 3.1 - FY2013 Competitive Proposals, Awards and Success Rates, by PI Gender

| Directorate | | Total | Female | Male | Unknown |
|-------------|--------------|--------|--------|--------|---------|
| NSF | Proposals | 48,999 | 11,152 | 32,866 | 4,981 |
| | % of Total | | 23% | 67% | 10% |
| | Awards | 10,829 | 2,556 | 7,316 | 957 |
| | Funding Rate | 22% | 23% | 22% | 19% |
| BIO | Proposals | 5,934 | 1,683 | 3,803 | 448 |
| | % of Total | | 28% | 64% | 8% |
| | Awards | 1,250 | 390 | 799 | 61 |
| | Funding Rate | 21% | 23% | 21% | 14% |
| CSE | Proposals | 7,821 | 1,429 | 5,659 | 733 |
| | % of Total | | 18% | 72% | 9% |
| | Awards | 1,616 | 278 | 1,180 | 158 |
| | Funding Rate | 21% | 19% | 21% | 22% |
| EHR | Proposals | 4,501 | 1,620 | 2,235 | 646 |
| | % of Total | | 36% | 50% | 14% |
| | Awards | 793 | 317 | 389 | 87 |
| | Funding Rate | 18% | 20% | 17% | 13% |
| ENG | Proposals | 10,738 | 1,743 | 7,896 | 1,099 |
| | % of Total | | 16% | 74% | 10% |
| | Awards | 2,212 | 386 | 1,599 | 227 |
| | Funding Rate | 21% | 22% | 20% | 21% |
| GEO | Proposals | 6,087 | 1,529 | 4,134 | 424 |
| | % of Total | | 25% | 68% | 7% |
| | Awards | 1,565 | 391 | 1,077 | 97 |
| | Funding Rate | 26% | 26% | 26% | 23% |
| IIA | Proposals | 582 | 165 | 319 | 98 |
| | % of Total | | 28% | 55% | 17% |
| | Awards | 272 | 91 | 125 | 56 |
| | Funding Rate | 47% | 55% | 39% | 57% |
| MPS | Proposals | 8,903 | 1,552 | 6,531 | 820 |
| | % of Total | | 17% | 73% | 9% |
| | Awards | 2,201 | 392 | 1,635 | 174 |
| | Funding Rate | 25% | 25% | 25% | 21% |
| SBE | Proposals | 4,433 | 1,431 | 2,289 | 713 |
| | % of Total | | 32% | 52% | 16% |
| | Awards | 920 | 311 | 512 | 97 |
| | Funding Rate | 21% | 22% | 22% | 14% |

Source: NSF Enterprise Information System 10/1/13.

*Demographic data are voluntarily self-reported by the PI. In FY2013, approximately 88% of PIs provided gender information and approximately 87% provided information on ethnicity or race.

Table 3.2 – FY 2013 Competitive Proposals, Awards and Success Rates, by PI Race and Ethnicity

| | | Total* | Hispanic | American Indian/ Alaskan | Asian | Black/ African-American | Multi-Racial | Native Hawaiian/ Pac Island | White | Unknown |
|-----|--------------|--------|----------|-----------------------------|--------|----------------------------|--------------|--------------------------------|--------|---------|
| NSF | Proposals | 48,999 | 1,956 | 113 | 10,511 | 1,124 | 439 | 32 | 30,766 | 6,014 |
| | % of Total | | 4% | 0% | 21% | 2% | 1% | 0% | 63% | 12% |
| | Awards | 10,829 | 401 | 28 | 1,887 | 203 | 110 | 5 | 7,372 | 1,224 |
| | Funding Rate | 22% | 21% | 25% | 18% | 18% | 25% | 16% | 24% | 20% |
| BIO | Proposals | 5,934 | 305 | 16 | 711 | 82 | 64 | 3 | 4,491 | 567 |
| | % of Total | | 5% | 0% | 12% | 1% | 1% | 0% | 76% | 10% |
| | Awards | 1,250 | 66 | † | 105 | 13 | 14 | † | 1,017 | 95 |
| | Funding Rate | 21% | 22% | † | 15% | 16% | 22% | † | 23% | 17% |
| CSE | Proposals | 7,821 | 230 | 6 | 2,700 | 165 | 67 | 1 | 3,889 | 993 |
| | % of Total | | 3% | 0% | 35% | 2% | 1% | 0% | 50% | 13% |
| | Awards | 1,616 | 44 | † | 464 | 29 | 19 | † | 890 | 212 |
| | Funding Rate | 21% | 19% | † | 17% | 18% | 28% | † | 23% | 21% |
| EHR | Proposals | 4,501 | 188 | 28 | 562 | 291 | 46 | 6 | 2,866 | 702 |
| | % of Total | | 4% | 1% | 12% | 6% | 1% | 0% | 64% | 16% |
| | Awards | 793 | 31 | † | 100 | 49 | 10 | † | 519 | 107 |
| | Funding Rate | 18% | 16% | † | 18% | 17% | 22% | † | 18% | 15% |
| ENG | Proposals | 10,738 | 476 | 21 | 3,599 | 252 | 83 | 8 | 5,450 | 1,325 |
| | % of Total | | 4% | 0% | 34% | 2% | 1% | 0% | 51% | 12% |
| | Awards | 2,212 | 91 | † | 634 | 32 | 25 | † | 1,231 | 288 |
| | Funding Rate | 21% | 19% | † | 18% | 13% | 30% | † | 23% | 22% |
| GEO | Proposals | 6,087 | 194 | 8 | 634 | 49 | 52 | 6 | 4,803 | 535 |
| | % of Total | | 3% | 0% | 10% | 1% | 1% | 0% | 79% | 9% |
| | Awards | 1,565 | 40 | † | 124 | 18 | 13 | † | 1,285 | 120 |
| | Funding Rate | 26% | 21% | † | 20% | 37% | 25% | † | 27% | 22% |
| IIA | Proposals | 582 | 29 | 1 | 63 | 26 | 12 | 3 | 377 | 100 |
| | % of Total | | 5% | 0% | 11% | 4% | 2% | 1% | 65% | 17% |
| | Awards | 272 | 13 | † | 24 | 6 | 8 | † | 180 | 52 |
| | Funding Rate | 47% | 45% | † | 38% | 23% | 67% | † | 48% | 52% |
| MPS | Proposals | 8,903 | 344 | 16 | 1,835 | 158 | 69 | 3 | 5,841 | 981 |
| | % of Total | | 4% | 0% | 21% | 2% | 1% | 0% | 66% | 11% |
| | Awards | 2,201 | 86 | † | 364 | 37 | 15 | † | 1,561 | 220 |
| | Funding Rate | 25% | 25% | † | 20% | 23% | 22% | † | 27% | 22% |
| SBE | Proposals | 4,433 | 190 | 17 | 407 | 101 | 46 | 2 | 3,049 | 811 |
| | % of Total | | 4% | 0% | 9% | 2% | 1% | 0% | 69% | 18% |
| | Awards | 920 | 30 | † | 72 | 19 | 6 | † | 689 | 130 |
| | Funding Rate | 21% | 16% | † | 18% | 19% | 13% | † | 23% | 16% |

Source: NSF Enterprise Information System 10/1/13. * "Total" is count of unique proposals. Columns are counts of proposals from PIs in the corresponding category. Hispanic individuals are also included in one of the racial categories. † indicates that data are omitted to reduce the likelihood of identifying individual investigators.

Table 3.3 - FY2013 Research Proposals, Awards and Success Rates, by PI Gender

| Directorate | | Female | Male | Unknown | Total |
|-------------|--------------|--------|--------|---------|--------|
| NSF | Proposals | 8,706 | 26,996 | 3,547 | 39,249 |
| | % of Total | 22% | 69% | 9% | |
| | Awards | 1,703 | 5,352 | 597 | 7,652 |
| | Funding Rate | 20% | 20% | 17% | 19% |
| BIO | Proposals | 1,332 | 3,152 | 365 | 4,849 |
| | % of Total | 27% | 65% | 8% | |
| | Awards | 278 | 557 | 42 | 877 |
| | Funding Rate | 21% | 18% | 12% | 18% |
| CSE | Proposals | 1,367 | 5,403 | 714 | 7,484 |
| | % of Total | 18% | 72% | 10% | |
| | Awards | 229 | 1000 | 144 | 1,373 |
| | Funding Rate | 17% | 19% | 20% | 18% |
| EHR | Proposals | 818 | 805 | 277 | 1,900 |
| | % of Total | 43% | 42% | 15% | |
| | Awards | 104 | 90 | 31 | 225 |
| | Funding Rate | 13% | 11% | 11% | 12% |
| ENG | Proposals | 1,430 | 6,345 | 595 | 8,370 |
| | % of Total | 17% | 76% | 7% | |
| | Awards | 277 | 1141 | 86 | 1,504 |
| | Funding Rate | 19% | 18% | 14% | 18% |
| GEO | Proposals | 1,400 | 3,834 | 380 | 5,614 |
| | % of Total | 25% | 68% | 7% | |
| | Awards | 326 | 930 | 79 | 1,335 |
| | Funding Rate | 23% | 24% | 21% | 24% |
| IIA | Proposals | 90 | 216 | 50 | 356 |
| | % of Total | 25% | 61% | 14% | |
| | Awards | 19 | 33 | 8 | 60 |
| | Funding Rate | 21% | 15% | 16% | 17% |
| MPS | Proposals | 1,339 | 5,740 | 706 | 7,785 |
| | % of Total | 17% | 74% | 9% | |
| | Awards | 305 | 1296 | 147 | 1,748 |
| | Funding Rate | 23% | 23% | 21% | 22% |
| SBE | Proposals | 930 | 1501 | 460 | 2,891 |
| | % of Total | 32% | 52% | 16% | |
| | Awards | 165 | 305 | 60 | 530 |
| | Funding Rate | 18% | 20% | 13% | 18% |

Source: NSF Enterprise Information System 10/1/13.

Table 3.4 – FY 2013 Research Proposals, Awards and Success Rates, by PI Race and Ethnicity

| | | Total* | Hispanic | American Indian/Alaskan | Asian | Black/African-American | Multi-Racial | Native Hawaiian/Pac Island | Unknown | White |
|-----|--------------|--------|----------|-------------------------|-------|------------------------|--------------|----------------------------|---------|-------|
| NSF | Proposals | 39,249 | 1552 | 74 | 9126 | 791 | 338 | 26 | 4448 | 24446 |
| | % of Total | | 4% | 0% | 23% | 2% | 1% | 0% | 11% | 62% |
| | Awards | 7,652 | 283 | 18 | 1460 | 100 | 68 | 3 | 806 | 5197 |
| | Funding Rate | 19% | 18% | 24% | 16% | 13% | 20% | 12% | 18% | 21% |
| BIO | Proposals | 4,849 | 229 | 12 | 649 | 61 | 47 | 2 | 463 | 3615 |
| | % of Total | | 5% | 0% | 13% | 1% | 1% | 0% | 10% | 75% |
| | Awards | 877 | 40 | † | 81 | 9 | 7 | † | 72 | 704 |
| | Funding Rate | 18% | 17% | † | 12% | 15% | 15% | † | 16% | 19% |
| CSE | Proposals | 7,484 | 221 | 6 | 2607 | 152 | 63 | 1 | 969 | 3686 |
| | % of Total | | 3% | 0% | 35% | 2% | 1% | 0% | 13% | 49% |
| | Awards | 1,373 | 38 | † | 402 | 19 | 16 | † | 189 | 745 |
| | Funding Rate | 18% | 17% | † | 15% | 13% | 25% | † | 20% | 20% |
| EHR | Proposals | 1,900 | 79 | 9 | 164 | 131 | 25 | 4 | 292 | 1275 |
| | % of Total | | 4% | 0% | 9% | 7% | 1% | 0% | 15% | 67% |
| | Awards | 225 | 11 | † | 11 | 13 | 4 | † | 38 | 157 |
| | Funding Rate | 12% | 14% | † | 7% | 10% | 16% | † | 13% | 12% |
| ENG | Proposals | 8,370 | 392 | 14 | 3046 | 195 | 64 | 6 | 818 | 4227 |
| | % of Total | | 5% | 0% | 36% | 2% | 1% | 0% | 10% | 51% |
| | Awards | 1,504 | 68 | † | 494 | 16 | 18 | † | 142 | 833 |
| | Funding Rate | 18% | 17% | † | 16% | 8% | 28% | † | 17% | 20% |
| GEO | Proposals | 5,614 | 177 | 7 | 594 | 37 | 46 | 6 | 485 | 4439 |
| | % of Total | | 3% | 0% | 11% | 1% | 1% | 0% | 9% | 79% |
| | Awards | 1,335 | 33 | † | 103 | 11 | 10 | † | 104 | 1103 |
| | Funding Rate | 24% | 19% | † | 17% | 30% | 22% | † | 21% | 25% |
| IIA | Proposals | 356 | 21 | 1 | 49 | 22 | 4 | 2 | 55 | 223 |
| | % of Total | | 6% | 0% | 14% | 6% | 1% | 1% | 15% | 63% |
| | Awards | 60 | 6 | † | 10 | 2 | 0 | † | 7 | 40 |
| | Funding Rate | 17% | 29% | † | 20% | 9% | 0% | † | 13% | 18% |
| MPS | Proposals | 7,785 | 294 | 14 | 1686 | 121 | 59 | 3 | 859 | 5043 |
| | % of Total | | 4% | 0% | 22% | 2% | 1% | 0% | 11% | 65% |
| | Awards | 1,748 | 67 | † | 308 | 21 | 9 | † | 181 | 1226 |
| | Funding Rate | 22% | 23% | † | 18% | 17% | 15% | † | 21% | 24% |
| SBE | Proposals | 2,891 | 139 | 11 | 331 | 72 | 30 | 2 | 507 | 1938 |
| | % of Total | | 5% | 0% | 11% | 2% | 1% | 0% | 18% | 67% |
| | Awards | 530 | 20 | † | 51 | 9 | 4 | † | 73 | 389 |
| | Funding Rate | 18% | 14% | † | 15% | 13% | 13% | † | 14% | 20% |

Source: NSF Enterprise Information System 10/1/13. * “Total” is count of unique proposals. Columns are counts of proposals from PIs in the corresponding category. Hispanic individuals are also included in one of the racial categories. † indicates that data are omitted to reduce the likelihood of identifying individual investigators.

Appendix 4 – Proposal Success Rates of New PIs and Prior PIs, by Directorate or Office

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|------|------|------|------|------|------|------|------|------|------|------|
| New PIs <i>Former Definition</i> | BIO | 18% | 15% | 14% | 14% | 15% | 23% | 14% | 12% | 18% | 16% |
| | CISE | 13% | 15% | 19% | 22% | 18% | 25% | 18% | 18% | 16% | 15% |
| | EHR | 15% | 16% | 21% | 17% | 23% | 21% | 14% | 13% | 16% | 13% |
| | ENG | 15% | 13% | 15% | 17% | 16% | 21% | 14% | 13% | 13% | 17% |
| | GEO | 27% | 24% | 23% | 23% | 23% | 33% | 26% | 24% | 21% | 20% |
| | IIA | 35% | 40% | 43% | 44% | 36% | 55% | 38% | 29% | 34% | 54% |
| | MPS | 21% | 20% | 19% | 20% | 19% | 29% | 17% | 17% | 17% | 15% |
| | SBE | 15% | 18% | 18% | 20% | 20% | 21% | 16% | 14% | 16% | 15% |
| New PIs <i>Revised Definition*</i> | BIO | 17% | 15% | 14% | 14% | 15% | 23% | 14% | 12% | 18% | 16% |
| | CISE | 13% | 16% | 18% | 21% | 18% | 26% | 19% | 18% | 17% | 16% |
| | EHR | 14% | 15% | 20% | 16% | 22% | 20% | 13% | 12% | 16% | 12% |
| | ENG | 15% | 14% | 15% | 17% | 16% | 21% | 13% | 13% | 14% | 18% |
| | GEO | 27% | 22% | 23% | 22% | 22% | 32% | 26% | 25% | 20% | 21% |
| | IIA | 36% | 40% | 43% | 44% | 35% | 55% | 38% | 29% | 34% | 56% |
| | MPS | 21% | 20% | 19% | 20% | 19% | 29% | 18% | 17% | 18% | 16% |
| | SBE | 15% | 18% | 18% | 21% | 20% | 22% | 17% | 14% | 16% | 16% |
| Prior PIs <i>Former Definition</i> | BIO | 28% | 25% | 21% | 24% | 23% | 32% | 23% | 21% | 29% | 25% |
| | CISE | 19% | 26% | 32% | 32% | 27% | 35% | 27% | 25% | 26% | 23% |
| | EHR | 23% | 24% | 29% | 25% | 35% | 34% | 23% | 22% | 26% | 22% |
| | ENG | 23% | 20% | 21% | 23% | 24% | 29% | 22% | 20% | 22% | 23% |
| | GEO | 36% | 31% | 34% | 34% | 34% | 49% | 39% | 37% | 36% | 28% |
| | IIA | 55% | 47% | 52% | 56% | 57% | 47% | 42% | 39% | 37% | 32% |
| | MPS | 36% | 35% | 37% | 40% | 35% | 47% | 36% | 33% | 35% | 32% |
| | SBE | 26% | 32% | 32% | 35% | 32% | 39% | 30% | 26% | 27% | 27% |
| Prior PIs <i>Revised Definition*</i> | BIO | 28% | 25% | 21% | 23% | 23% | 31% | 23% | 21% | 28% | 24% |
| | CISE | 18% | 25% | 31% | 31% | 26% | 34% | 26% | 24% | 25% | 22% |
| | EHR | 23% | 24% | 28% | 24% | 34% | 33% | 22% | 21% | 24% | 21% |
| | ENG | 23% | 19% | 21% | 23% | 23% | 28% | 21% | 19% | 21% | 23% |
| | GEO | 36% | 31% | 33% | 33% | 33% | 49% | 38% | 35% | 35% | 27% |
| | IIA | 54% | 44% | 52% | 54% | 57% | 48% | 41% | 38% | 35% | 31% |
| | MPS | 35% | 34% | 36% | 39% | 34% | 46% | 35% | 32% | 33% | 29% |
| | SBE | 25% | 32% | 32% | 33% | 32% | 38% | 29% | 25% | 28% | 27% |

Source: NSF Enterprise Information System 10/01/13.

* In FY 2009, in conjunction with NSF's implementation of the American Recovery and Reinvestment Act, NSF revised its definition of a new PI to, "A new PI is an individual who has not served as the PI or Co-PI on any award from NSF (with the exception of doctoral dissertation awards, graduate or postdoctoral fellowships, research planning grants, or conferences, symposia and workshop grants.)" Previously, a new PI was considered to be any individual who had not previously been a PI on any NSF award.

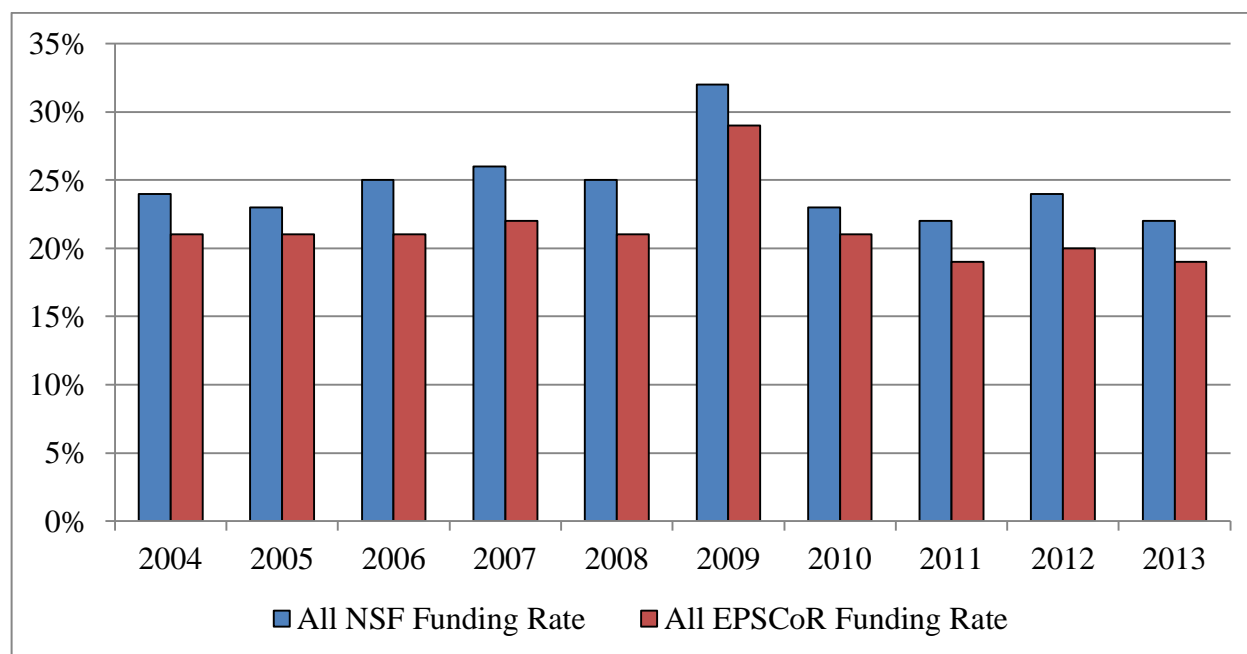
Appendix 5 - EPSCoR: Jurisdictions, Proposal, Award, and Funding Data

Twenty-eight states, the Commonwealth of Puerto Rico, Guam and the U.S. Virgin Islands were eligible to participate in aspects of the NSF Experimental Program to Stimulate Competitive Research (EPSCoR) program in FY 2013. The states are: Alabama, Alaska, Arkansas, Delaware, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, West Virginia, and Wyoming. For three of the 28 states, Iowa, Tennessee, and Utah, the prior 3-year rolling average of NSF research funds received was over 0.75% of NSF's Research and Related Activities budget and these jurisdictions were not eligible to participate in new Research Infrastructure Improvement initiatives in FY 2013.

In FY 2013, the NSF EPSCoR program invested \$30 million⁵⁶ in co-funding 212 NSF awards. This investment was leveraged with \$49 million from NSF Directorates and other Offices for a total investment of \$79 million. Since 1998, when the co-funding initiative was formally established, approximately 3760 co-funded awards were made. The latter represent a total NSF investment of about \$1.4 billion of which \$544 million was co-funding provided by the EPSCoR program.

Figure 5.1 shows the change over time for the proposal success rate of EPSCoR jurisdictions relative to the overall proposal success rate for all of the United States.

Figure 5.1 - Overall Proposal Success Rates for EPSCoR Jurisdictions and Overall NSF Proposal Success Rates



Source: EPSCoR Office 2/21/14.

⁵⁶ Numbers in millions are rounded to the nearest million.

Table 5.2 shows the number of proposals, awards, and proposal success rates for EPSCoR jurisdictions. Below the name of the EPSCoR jurisdiction is the year in which the jurisdiction joined EPSCoR.

Table 5.2 – Proposal Success Rates, by EPSCoR Jurisdiction
(Date under the state name is year state joined EPSCoR)

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------------------------|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| All NSF | Awards | 10,367 | 9,772 | 10,450 | 11,484 | 11,162 | 14,641 | 12,996 | 11,192 | 11,524 | 10,829 |
| | Proposals | 43,816 | 41,723 | 42,374 | 44,593 | 44,438 | 45,181 | 55,542 | 51,562 | 48,613 | 48,999 |
| | Funding Rate | 24% | 23% | 25% | 26% | 25% | 32% | 23% | 22% | 24% | 22% |
| All EPSCoR Jurisdictions | Awards | 1,454 | 1,433 | 1,489 | 1,653 | 1,564 | 2,474 | 2,181 | 1,846 | 1,960 | 1,893 |
| | Proposals | 6,815 | 6,802 | 7,037 | 7,392 | 7,349 | 8,476 | 10,513 | 9,640 | 9,680 | 9,769 |
| | Funding Rate | 21% | 21% | 21% | 22% | 21% | 29% | 21% | 19% | 20% | 19% |
| Alabama -1985 | Awards | 99 | 78 | 84 | 86 | 85 | 148 | 119 | 98 | 110 | 95 |
| | Proposals | 488 | 483 | 530 | 508 | 489 | 606 | 708 | 614 | 669 | 648 |
| | Funding Rate | 20% | 16% | 16% | 17% | 17% | 24% | 17% | 16% | 16% | 15% |
| Alaska -2000 | Awards | 63 | 52 | 63 | 75 | 52 | 77 | 65 | 71 | 65 | 60 |
| | Proposals | 211 | 203 | 209 | 246 | 204 | 186 | 235 | 213 | 199 | 221 |
| | Funding Rate | 30% | 26% | 30% | 30% | 25% | 41% | 28% | 33% | 33% | 27% |
| Arkansas -1980 | Awards | 45 | 29 | 47 | 58 | 36 | 41 | 60 | 40 | 33 | 46 |
| | Proposals | 236 | 191 | 209 | 244 | 197 | 194 | 276 | 246 | 229 | 260 |
| | Funding Rate | 19% | 15% | 22% | 24% | 18% | 21% | 22% | 16% | 14% | 18% |
| Delaware -2003 | Awards | 50 | 54 | 50 | 67 | 68 | 77 | 80 | 70 | 79 | 70 |
| | Proposals | 266 | 254 | 247 | 283 | 283 | 244 | 295 | 292 | 278 | 287 |
| | Funding Rate | 19% | 21% | 20% | 24% | 24% | 32% | 27% | 24% | 28% | 24% |
| Guam -2012 | Awards | N/A | N/A | 1 | 0 | 2 | 0 | 2 | 2 | 2 | 1 |
| | Proposals | N/A | N/A | 1 | 2 | 5 | 3 | 7 | 5 | 8 | 7 |
| | Funding Rate | N/A | N/A | 100% | 0% | 40% | 0% | 29% | 40% | 25% | 14% |
| Hawaii -2001 | Awards | 66 | 89 | 77 | 74 | 73 | 109 | 99 | 80 | 60 | 54 |
| | Proposals | 252 | 265 | 240 | 276 | 276 | 277 | 379 | 285 | 281 | 282 |
| | Funding Rate | 26% | 34% | 32% | 27% | 26% | 39% | 26% | 28% | 21% | 19% |
| Idaho -1987 | Awards | 24 | 31 | 29 | 34 | 44 | 44 | 35 | 37 | 47 | 41 |
| | Proposals | 148 | 140 | 148 | 161 | 201 | 168 | 199 | 202 | 185 | 214 |
| | Funding Rate | 16% | 22% | 20% | 21% | 22% | 26% | 18% | 18% | 25% | 19% |
| Iowa -2009 | Awards | 118 | 106 | 109 | 99 | 132 | 142 | 136 | 114 | 116 | 113 |
| | Proposals | 545 | 501 | 524 | 491 | 524 | 564 | 661 | 613 | 558 | 566 |
| | Funding Rate | 22% | 21% | 21% | 20% | 25% | 25% | 21% | 19% | 21% | 20% |

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|--------------------------------------|--------------|------|------|------|------|------|------|------|------|------|------|
| Kansas -1992 | Awards | 70 | 88 | 76 | 78 | 82 | 88 | 92 | 88 | 91 | 65 |
| | Proposals | 388 | 367 | 393 | 404 | 387 | 399 | 464 | 423 | 402 | 393 |
| | Funding Rate | 18% | 24% | 19% | 19% | 21% | 22% | 20% | 21% | 23% | 17% |
| Kentucky -1985 | Awards | 72 | 62 | 52 | 60 | 62 | 78 | 81 | 64 | 63 | 54 |
| | Proposals | 337 | 307 | 293 | 330 | 300 | 356 | 429 | 437 | 434 | 387 |
| | Funding Rate | 21% | 20% | 18% | 18% | 21% | 22% | 17% | 15% | 15% | 14% |
| Louisiana -1987 | Awards | 107 | 100 | 117 | 96 | 98 | 132 | 149 | 102 | 88 | 91 |
| | Proposals | 517 | 514 | 548 | 495 | 471 | 583 | 715 | 621 | 484 | 463 |
| | Funding Rate | 21% | 19% | 21% | 19% | 21% | 27% | 21% | 16% | 18% | 20% |
| Maine -1980 | Awards | 41 | 50 | 36 | 58 | 65 | 60 | 58 | 42 | 46 | 52 |
| | Proposals | 197 | 192 | 181 | 200 | 199 | 172 | 190 | 209 | 182 | 211 |
| | Funding Rate | 21% | 26% | 20% | 29% | 33% | 35% | 31% | 20% | 25% | 25% |
| Mississippi -1987 | Awards | 43 | 32 | 48 | 40 | 34 | 76 | 72 | 42 | 43 | 28 |
| | Proposals | 238 | 226 | 293 | 251 | 271 | 301 | 358 | 287 | 264 | 262 |
| | Funding Rate | 18% | 14% | 16% | 16% | 13% | 25% | 20% | 15% | 16% | 11% |
| Missouri -2012 | Awards | 166 | 137 | 150 | 146 | 160 | 180 | 144 | 135 | 136 | 139 |
| | Proposals | 760 | 702 | 693 | 742 | 699 | 713 | 795 | 727 | 715 | 716 |
| | Funding Rate | 22% | 20% | 22% | 20% | 23% | 25% | 18% | 19% | 19% | 19% |
| Montana -1980 | Awards | 54 | 43 | 52 | 61 | 57 | 78 | 51 | 35 | 50 | 50 |
| | Proposals | 194 | 193 | 242 | 238 | 232 | 207 | 251 | 222 | 204 | 214 |
| | Funding Rate | 28% | 22% | 21% | 26% | 25% | 38% | 20% | 16% | 25% | 23% |
| Nebraska -1992 | Awards | 52 | 41 | 59 | 51 | 54 | 64 | 56 | 60 | 40 | 59 |
| | Proposals | 242 | 226 | 238 | 250 | 255 | 248 | 324 | 309 | 258 | 305 |
| | Funding Rate | 21% | 18% | 25% | 50% | 21% | 26% | 17% | 19% | 16% | 19% |
| Nevada -1985 | Awards | 31 | 40 | 42 | 50 | 43 | 61 | 39 | 37 | 29 | 33 |
| | Proposals | 159 | 203 | 200 | 231 | 261 | 232 | 295 | 263 | 236 | 217 |
| | Funding Rate | 19% | 20% | 21% | 22% | 16% | 26% | 13% | 14% | 12% | 15% |
| New Hampshire -2004 | Awards | 53 | 64 | 53 | 60 | 58 | 108 | 76 | 61 | 75 | 64 |
| | Proposals | 232 | 280 | 243 | 240 | 230 | 251 | 311 | 282 | 280 | 273 |
| | Funding Rate | 23% | 23% | 22% | 25% | 25% | 43% | 24% | 22% | 27% | 23% |
| New Mexico -2001 | Awards | 90 | 80 | 91 | 104 | 102 | 115 | 105 | 91 | 69 | 81 |
| | Proposals | 378 | 352 | 348 | 401 | 444 | 389 | 506 | 416 | 399 | 404 |
| | Funding Rate | 24% | 23% | 26% | 26% | 23% | 30% | 21% | 22% | 17% | 20% |
| North Dakota -1985 | Awards | 20 | 19 | 22 | 15 | 19 | 31 | 35 | 23 | 18 | 21 |
| | Proposals | 140 | 154 | 170 | 139 | 158 | 141 | 171 | 161 | 161 | 179 |
| | Funding Rate | 14% | 12% | 13% | 11% | 12% | 22% | 20% | 14% | 11% | 12% |

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|--|--------------|------|------|------|------|------|------|------|------|------|------|
| Oklahoma -1985 | Awards | 65 | 55 | 74 | 66 | 67 | 112 | 74 | 79 | 68 | 59 |
| | Proposals | 338 | 327 | 342 | 338 | 378 | 420 | 457 | 460 | 384 | 393 |
| | Funding Rate | 19% | 17% | 22% | 20% | 18% | 27% | 16% | 17% | 18% | 15% |
| Puerto Rico -1985 | Awards | 20 | 16 | 19 | 32 | 24 | 37 | 34 | 19 | 9 | 8 |
| | Proposals | 106 | 119 | 140 | 153 | 148 | 183 | 203 | 163 | 153 | 105 |
| | Funding Rate | 19% | 13% | 14% | 21% | 16% | 20% | 17% | 12% | 6% | 8% |
| Rhode Island -2004 | Awards | 128 | 117 | 140 | 127 | 129 | 176 | 148 | 131 | 146 | 127 |
| | Proposals | 340 | 334 | 353 | 390 | 357 | 350 | 442 | 400 | 393 | 399 |
| | Funding Rate | 38% | 35% | 40% | 33% | 36% | 50% | 33% | 33% | 37% | 32% |
| South Carolina -1980 | Awards | 80 | 90 | 86 | 122 | 87 | 152 | 136 | 108 | 117 | 115 |
| | Proposals | 452 | 453 | 464 | 523 | 470 | 527 | 671 | 650 | 562 | 594 |
| | Funding Rate | 18% | 20% | 19% | 23% | 19% | 29% | 20% | 17% | 21% | 19% |
| South Dakota -1987 | Awards | 12 | 21 | 14 | 21 | 20 | 31 | 33 | 24 | 20 | 28 |
| | Proposals | 93 | 101 | 97 | 97 | 116 | 132 | 184 | 162 | 150 | 164 |
| | Funding Rate | 13% | 21% | 14% | 22% | 17% | 23% | 18% | 15% | 13% | 17% |
| Tennessee -2004 | Awards | 102 | 113 | 99 | 145 | 124 | 183 | 133 | 138 | 144 | 144 |
| | Proposals | 540 | 585 | 564 | 642 | 633 | 608 | 759 | 709 | 687 | 667 |
| | Funding Rate | 19% | 19% | 18% | 23% | 20% | 30% | 18% | 19% | 21% | 22% |
| U.S. Virgin Islands -2002 | Awards | 2 | 2 | 1 | 0 | 2 | 0 | 1 | 3 | 2 | 0 |
| | Proposals | 6 | 5 | 6 | 4 | 5 | 1 | 3 | 11 | 5 | 8 |
| | Funding Rate | 33% | 40% | 17% | 0% | 40% | 10% | 33% | 27% | 40% | 0% |
| Utah -2009 | Awards | 105 | 106 | 94 | 95 | 111 | 135 | 129 | 115 | 118 | 134 |
| | Proposals | 444 | 474 | 466 | 449 | 492 | 464 | 595 | 596 | 532 | 568 |
| | Funding Rate | 24% | 22% | 20% | 21% | 23% | 29% | 22% | 19% | 21% | 24% |
| Vermont -1985 | Awards | 21 | 22 | 16 | 26 | 27 | 42 | 23 | 22 | 24 | 21 |
| | Proposals | 111 | 129 | 119 | 129 | 144 | 120 | 126 | 121 | 90 | 89 |
| | Funding Rate | 19% | 17% | 13% | 20% | 19% | 35% | 18% | 18% | 27% | 24% |
| West Virginia -1980 | Awards | 17 | 16 | 19 | 21 | 25 | 33 | 27 | 21 | 32 | 22 |
| | Proposals | 105 | 100 | 121 | 128 | 119 | 130 | 160 | 151 | 163 | 158 |
| | Funding Rate | 16% | 16% | 16% | 16% | 21% | 25% | 17% | 14% | 20% | 14% |
| Wyoming -1985 | Awards | 27 | 29 | 23 | 26 | 27 | 44 | 35 | 31 | 20 | 18 |
| | Proposals | 101 | 99 | 99 | 91 | 121 | 123 | 146 | 122 | 105 | 115 |
| | Funding Rate | 27% | 29% | 23% | 29% | 22% | 36% | 24% | 25% | 19% | 16% |

Source: NSF Enterprise Information System, 10/1/13.

**Appendix 6 - Median and Mean Award Amounts for Research Grants,
by Directorate or Office (Dollars in Thousands)***

| | | Fiscal Year | | | | | | | | | |
|------------|--------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| NSF | Median | \$102 | \$104 | \$102 | \$110 | \$110 | \$120 | \$124 | \$120 | \$125 | \$130 |
| | Mean | \$140 | \$144 | \$135 | \$146 | \$143 | \$162 | \$167 | \$159 | \$166 | \$169 |
| BIO | Median | \$133 | \$140 | \$140 | \$142 | \$150 | \$161 | \$171 | \$178 | \$177 | \$182 |
| | Mean | \$171 | \$184 | \$191 | \$182 | \$180 | \$200 | \$222 | \$226 | \$214 | \$228 |
| CSE | Median | \$95 | \$88 | \$90 | \$92 | \$94 | \$110 | \$118 | \$141 | \$150 | \$161 |
| | Mean | \$135 | \$120 | \$114 | \$120 | \$131 | \$169 | \$172 | \$174 | \$206 | \$204 |
| ENG | Median | \$97 | \$97 | \$90 | \$100 | \$100 | \$100 | \$100 | \$100 | \$107 | \$103 |
| | Mean | \$120 | \$117 | \$110 | \$116 | \$112 | \$120 | \$122 | \$119 | \$125 | \$122 |
| GEO | Median | \$88 | \$90 | \$87 | \$93 | \$89 | \$101 | \$100 | \$116 | \$125 | \$141 |
| | Mean | \$126 | \$126 | \$113 | \$137 | \$122 | \$153 | \$134 | \$162 | \$170 | \$193 |
| IIA | Median | \$7 | \$14 | \$24 | \$37 | \$25 | \$20 | \$50 | \$45 | \$47 | \$58 |
| | Mean | \$16 | \$85 | \$71 | \$135 | \$30 | \$46 | \$272 | \$71 | \$190 | \$135 |
| MPS | Median | \$100 | \$100 | \$100 | \$106 | \$105 | \$113 | \$115 | \$111 | \$117 | \$116 |
| | Mean | \$130 | \$135 | \$120 | \$130 | \$133 | \$138 | \$150 | \$141 | \$143 | \$130 |
| SBE | Median | \$78 | \$84 | \$85 | \$94 | \$100 | \$101 | \$100 | \$98 | \$98 | \$101 |
| | Mean | \$90 | \$110 | \$103 | \$115 | \$116 | \$114 | \$116 | \$113 | \$120 | \$139 |

Source: NSF Enterprise Information System 10/1/13.

*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 7 - Number of People Involved in NSF-funded Activities⁵⁷

In FY2013, approximately 299,000 senior researchers, post-doctoral associates, teachers and students across all levels were directly involved in NSF research and education programs and activities.

| | FY 2013 |
|-------------------------------|----------------|
| Senior Researchers | 44,000 |
| Other Professionals | 14,000 |
| Post-doctoral Associates | 6,000 |
| Graduate Students | 42,000 |
| Undergraduate Students | 29,000 |
| K-12 Students | 124,000 |
| K-12 Teachers | 40,000 |
| Total Number of People | 299,000 |

Source: NSF FY2013 Agency Financial Report, Chapter 2, p. II-43.

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 include workshops, activities at museums, television, educational videos, journal articles, and the dissemination of improved curricula and teaching methods.

⁵⁷ These data are estimates based on the budget details of awards active in the year indicated, with modifications made, as appropriate, based on additional information provided by the managing directorates or offices. The numbers for senior researchers, other professionals, post-doctoral associates, and graduate students are more directly informed by data from award budgets than the other three categories.

**Appendix 8 - Mean Number of Months of Salary Support for Single- and Multi-PI
Research Grants, by Directorate or Office**

| Directorate or Office | Type of Award | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------|------------------|------|------|------|------|------|------|------|------|------|------|
| NSF | Single PI Grants | 1.5 | 1.4 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.9 | 0.8 |
| | Multi-PI Grants | 1.4 | 1.4 | 1.3 | 1.3 | 1.1 | 1.1 | 1.0 | 0.9 | 0.9 | 0.8 |
| | NSF Average | 1.5 | 1.4 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 0.9 | 0.8 |
| BIO | Single PI Grants | 1.8 | 1.9 | 1.6 | 2.0 | 1.8 | 1.3 | 1.2 | 1.3 | 1.1 | 1.0 |
| | Multi-PI Grants | 1.7 | 2.3 | 2.0 | 2.0 | 1.7 | 1.6 | 1.2 | 1.1 | 1.1 | 1.3 |
| | BIO Average | 1.7 | 2.0 | 1.7 | 2.0 | 1.8 | 1.4 | 1.2 | 1.2 | 1.1 | 1.1 |
| CSE | Single PI Grants | 1.0 | 1.0 | 1.1 | 0.9 | 0.7 | 0.8 | 0.8 | 0.9 | 0.7 | 0.7 |
| | Multi-PI Grants | 0.9 | 0.8 | 0.6 | 0.7 | 0.5 | 0.6 | 0.6 | 0.8 | 0.7 | 0.6 |
| | CSE Average | 1.0 | 0.9 | 0.9 | 0.8 | 0.6 | 0.7 | 0.7 | 0.9 | 0.7 | 0.6 |
| EHR | Single PI Grants | 3.0 | 2.0 | 1.5 | 1.6 | 2.0 | 1.6 | 1.9 | 1.7 | 1.4 | 1.4 |
| | Multi-PI Grants | 1.9 | 2.0 | 1.8 | 1.5 | 1.2 | 1.6 | 1.8 | 2.2 | 1.7 | 1.0 |
| | EHR Average | 2.2 | 2.0 | 1.7 | 1.5 | 1.5 | 1.6 | 1.8 | 2.1 | 1.6 | 1.1 |
| ENG | Single PI Grants | 1.1 | 1.0 | 1.2 | 1.2 | 0.9 | 0.9 | 0.4 | 0.4 | 0.6 | 0.4 |
| | Multi-PI Grants | 0.9 | 0.9 | 0.7 | 0.8 | 0.7 | 0.7 | 0.4 | 0.3 | 0.3 | 0.3 |
| | ENG Average | 1.0 | 1.0 | 1.0 | 1.0 | 0.8 | 0.8 | 0.4 | 0.4 | 0.5 | 0.4 |
| GEO | Single PI Grants | 1.6 | 1.4 | 1.4 | 1.3 | 1.1 | 1.0 | 1.1 | 1.0 | 1.0 | 0.9 |
| | Multi-PI Grants | 1.5 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 | 1.3 | 1.3 |
| | GEO Average | 1.6 | 1.4 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 | 1.0 | 1.1 | 1.0 |
| IIA | Single PI Grants | 0.8 | 2.4 | 1.9 | 2.5 | 3.3 | 0.6 | 1.5 | 1.8 | 0.4 | 1.0 |
| | Multi-PI Grants | 3.1 | 1.0 | 1.5 | 1.0 | 1.0 | 1.0 | 1.1 | 0.5 | 0.7 | 0.9 |
| | IIA Average | 1.6 | 1.2 | 1.8 | 1.2 | 2.2 | 0.9 | 1.2 | 1.0 | 0.6 | 1.0 |
| MPS | Single PI Grants | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.5 | 1.3 | 1.3 | 1.1 | 1.0 |
| | Multi-PI Grants | 2.0 | 1.4 | 1.5 | 1.5 | 1.4 | 1.5 | 1.2 | 1.2 | 0.9 | 0.9 |
| | MPS Average | 1.6 | 1.4 | 1.4 | 1.3 | 1.4 | 1.5 | 1.3 | 1.3 | 1.0 | 1.0 |
| SBE | Single PI Grants | 1.7 | 1.7 | 1.9 | 1.6 | 2.0 | 1.5 | 1.7 | 1.2 | 1.2 | 1.1 |
| | Multi-PI Grants | 1.1 | 1.3 | 1.4 | 1.4 | 1.1 | 1.0 | 1.3 | 0.9 | 0.9 | 1.2 |
| | SBE Average | 1.5 | 1.6 | 1.7 | 1.5 | 1.7 | 1.4 | 1.6 | 1.1 | 1.1 | 1.1 |

Source: NSF Enterprise Information System 11/27/13.

Appendix 9 - Mean Number of Research Proposals per PI before Receiving One Award, by Directorate or Office, by Fiscal Year Triads.

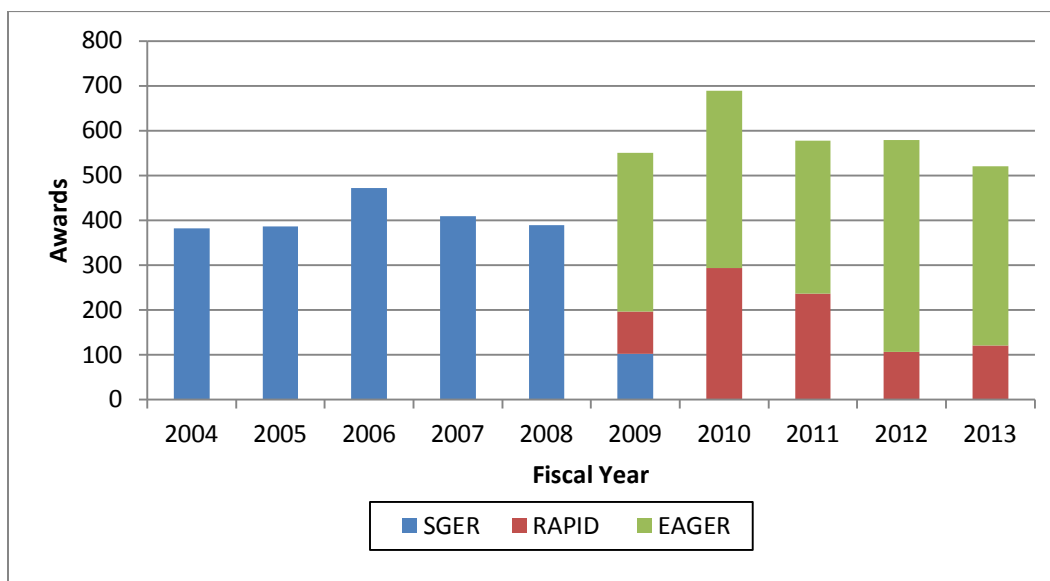
| | 2002- 2004 | 2003- 2005 | 2004- 2006 | 2005- 2007 | 2006- 2008 | 2007- 2009 | 2008- 2010 | 2009- 2011 | 2010- 2012 | 2011- 2013 |
|------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| NSF | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.4 | 2.4 |
| BIO | 1.8 | 2.0 | 2.0 | 2.2 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 1.9 |
| CISE | 2.5 | 2.6 | 2.6 | 2.4 | 2.4 | 2.4 | 2.6 | 2.5 | 2.6 | 2.6 |
| EHR | 1.2 | 1.3 | 1.3 | 1.4 | 1.3 | 1.4 | 1.4 | 1.4 | 1.5 | 1.7 |
| ENG | 2.2 | 2.3 | 2.4 | 2.6 | 2.5 | 2.5 | 2.6 | 2.7 | 2.8 | 2.6 |
| GEO | 2.1 | 2.2 | 2.2 | 2.3 | 2.2 | 2.1 | 2.0 | 2.0 | 2.1 | 2.2 |
| MPS | 1.5 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| O/D | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 |
| SBE | 1.6 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.7 | 1.6 |

Source: NSF Enterprise Information System 12/27/13.

Appendix 10 - Small Grants for Exploratory Research (SGER), Early-concept Grants for Exploratory Research (EAGER) and Grants for Rapid Response Research (RAPID)

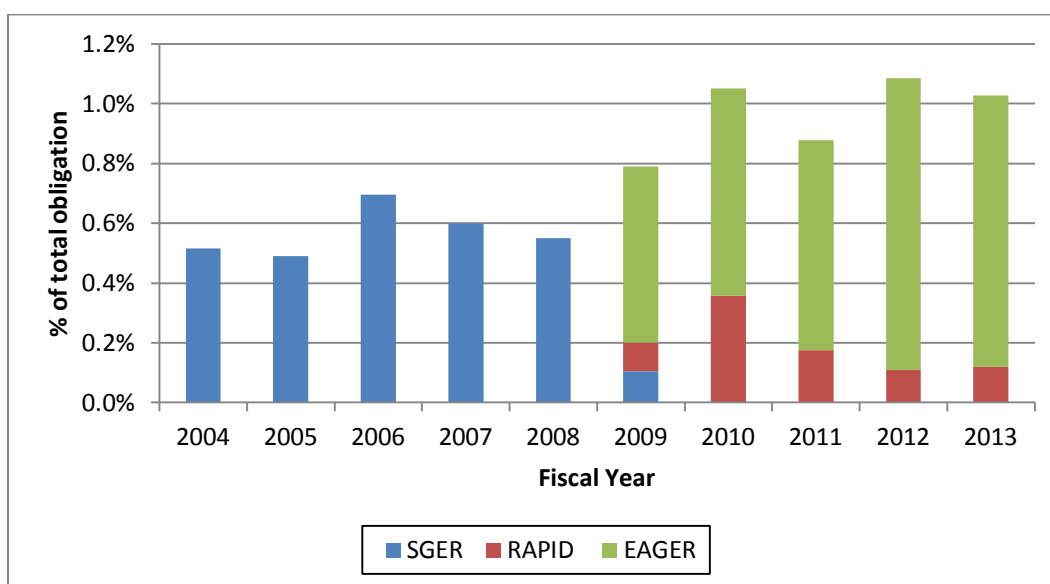
Figures 10.1, 10.2 and Table 10.1 provide funding trends for EAGERS, RAPIDs, and SGERs. Effective January 2009, the SGER funding mechanism was replaced by two separate funding mechanisms EAGER and RAPID so FY 2009 included all three types of awards.

Figure 10.1 – Numbers of SGER, EAGER and RAPID Awards



Source: NSF Enterprise Information System 12/4/13.

Figure 10.2 – Investments in SGER, EAGER and RAPID Awards



Source: NSF Enterprise Information System 12/4/13.

Table 10.1 - Early-concept Grants for Exploratory Research (EAGER) and Grants for Rapid Response Research (RAPID): Funding Trends, by Directorate or Office

| | | 2010 | | 2011 | | 2012 | | 2013 | |
|------------|------------------------|--------|--------|--------|--------|-------|--------|-------|--------|
| | | RAPID | EAGER | RAPID | EAGER | RAPID | EAGER | RAPID | EAGER |
| NSF | Proposals | 341 | 440 | 237 | 360 | 114 | 519 | 123 | 441 |
| | Awards | 294 | 395 | 190 | 341 | 107 | 472 | 121 | 399 |
| | Funding Rate | 86% | 90% | 80% | 95% | 94% | 91% | 98% | 90% |
| | Total \$ (Millions) | \$27.4 | \$53.2 | \$12.3 | \$49.3 | \$7.9 | \$70.3 | 8 | 64 |
| | % of Obligations | 0.4% | 0.7% | 0.2% | 0.7% | 0.1% | 1.0% | 0.1% | 0.9% |
| | Average \$ (Thousands) | \$93 | \$135 | \$65 | \$145 | \$74 | \$149 | \$70 | \$161 |
| BIO | Proposals | 52 | 45 | 10 | 34 | 14 | 54 | 13 | 32 |
| | Awards | 41 | 41 | 8 | 27 | 13 | 50 | 12 | 25 |
| | Funding Rate | 79% | 91% | 80% | 79% | 93% | 93% | 92% | 78% |
| | Total \$ (Millions) | \$5.1 | \$8.3 | \$0.9 | \$5.8 | \$1.2 | \$9.0 | \$1.5 | \$6.1 |
| | % of Obligations | 0.7% | 1.1% | 0.1% | 0.8% | 0.1% | 1.2% | 0.2% | 0.8% |
| | Average \$ (Thousands) | \$124 | \$202 | \$107 | \$214 | \$89 | \$181 | \$124 | \$243 |
| CSE | Proposals | 13 | 197 | 28 | 148 | 11 | 173 | 2 | 171 |
| | Awards | 12 | 172 | 24 | 145 | 10 | 166 | 2 | 165 |
| | Funding Rate | 92% | 87% | 86% | 98% | 91% | 96% | 100% | 96% |
| | Total \$ (Millions) | \$1.4 | \$23.1 | \$1.5 | \$22.6 | \$1.2 | \$28.1 | \$0.1 | \$27.6 |
| | % of Obligations | 0.2% | 2.7% | 0.2% | 2.4% | 0.1% | 3.0% | 0.0% | 3.0% |
| | Average \$ (Thousands) | \$115 | \$134 | \$61 | \$156 | \$116 | \$169 | \$45 | \$168 |
| EHR | Proposals | 13 | 2 | 9 | 4 | 5 | 48 | 5 | 33 |
| | Awards | 12 | 0 | 8 | 4 | 5 | 25 | 5 | 19 |
| | Funding Rate | 92% | 0% | 89% | 100% | 100% | 52% | 100% | 58% |
| | Total \$ (Millions) | \$1.9 | \$0.2 | \$1.5 | \$1.2 | \$0.7 | \$6.3 | \$0.8 | \$4.9 |
| | % of Obligations | 0.2% | 0.0% | 0.2% | 0.1% | 0.1% | 0.6% | 0.1% | 0.5% |
| | Average \$ (Thousands) | \$162 | N/A | \$184 | \$303 | \$146 | \$252 | \$153 | \$258 |
| ENG | Proposals | 95 | 96 | 62 | 92 | 12 | 109 | 38 | 134 |
| | Awards | 66 | 92 | 35 | 88 | 10 | 107 | 38 | 125 |
| | Funding Rate | 69% | 96% | 56% | 96% | 83% | 98% | 100% | 93% |
| | Total \$ (Millions) | \$5.0 | \$9.1 | \$1.9 | \$8.9 | \$0.4 | \$12.7 | \$1.8 | \$16.4 |
| | % of Obligations | 0.6% | 1.1% | 0.2% | 1.1% | 0.1% | 1.5% | 0.2% | 2.0% |
| | Average \$ (Thousands) | \$76 | \$99 | \$53 | \$101 | \$42 | \$119 | \$49 | \$131 |
| GEO | Proposals | 119 | 49 | 99 | 60 | 63 | 93 | 47 | 51 |
| | Awards | 118 | 48 | 93 | 57 | 61 | 89 | 47 | 49 |
| | Funding Rate | 99% | 98% | 94% | 95% | 97% | 96% | 100% | 96% |
| | Total \$ (Millions) | \$10.3 | \$4.8 | \$5.2 | \$6.8 | \$3.8 | \$8.2 | \$3.1 | \$5.0 |
| | % of Obligations | 0.7% | 0.3% | 0.4% | 0.5% | 0.3% | 0.6% | 0.2% | 0.4% |
| | Average \$ (Thousands) | \$87 | \$99 | \$56 | \$120 | \$62 | \$92 | \$66 | \$103 |
| MPS | Proposals | 19 | 41 | 2 | 14 | 2 | 29 | 2 | 9 |
| | Awards | 16 | 34 | 2 | 12 | 1 | 24 | 2 | 6 |
| | Funding Rate | 84% | 83% | 100% | 86% | 50% | 83% | 100% | 67% |
| | Total \$ (Millions) | \$1.6 | \$6.7 | \$0.2 | \$2.2 | \$0.0 | \$4.3 | \$0.3 | \$2.3 |
| | % of Obligations | 0.1% | 0.4% | 0.0% | 0.2% | 0.0% | 0.3% | 0.0% | 0.2% |
| | Average \$ (Thousands) | \$98 | \$197 | \$125 | \$183 | \$23 | \$181 | \$163 | \$386 |

| | | 2010 | | 2011 | | 2012 | | 2013 | |
|------------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | RAPID | EAGER | RAPID | EAGER | RAPID | EAGER | RAPID | EAGER |
| SBE | Proposals | 30 | 5 | 26 | 6 | 7 | 11 | 16 | 11 |
| | Awards | 29 | 4 | 19 | 6 | 7 | 9 | 15 | 10 |
| | Funding Rate | 97% | 80% | 73% | 100% | 100% | 82% | 94% | 91% |
| | Total \$ (Millions) | \$1.6 | \$0.6 | \$0.9 | \$1.0 | \$0.6 | \$1.2 | \$0.6 | \$1.3 |
| | % of Obligations | 0.6% | 0.2% | 0.4% | 0.4% | 0.2% | 0.5% | 0.2% | 0.5% |
| | Average \$ (Thousands) | \$56 | \$139 | \$50 | \$172 | \$80 | \$130 | \$40 | \$132 |
| IIA | Proposals | 0 | 5 | 1 | 2 | 0 | 2 | 0 | 0 |
| | Awards | 0 | 4 | 1 | 2 | 0 | 2 | 0 | 0 |
| | Funding Rate | N/A | 80% | 100% | 100% | N/A | 100% | N/A | N/A |
| | Total \$ (Millions) | \$0.7 | \$0.6 | \$0.3 | \$0.8 | \$0.1 | \$0.4 | \$0.2 | \$0.5 |
| | % of Obligations | 0.2% | 0.1% | 0.1% | 0.4% | 0.0% | 0.2% | 0.1% | 0.1% |
| | Average \$ (Thousands) | N/A | \$150 | \$261 | \$376 | N/A | \$196 | N/A | N/A |

Source: NSF Enterprise Information System 12/4/13. No distinction is made between funds obligated by a directorate to awards managed by that directorate and funds obligated by a directorate as co-funding for awards managed by other directorates. IIA totals include co-funding by its EPSCoR and International Science and Engineering sections.

Appendix 11 – Description of Merit Review Principles and Criteria.⁵⁸

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These broader impacts may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the activities that the PI intends to do, and [to have] a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through [the] use of two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. Both criteria are to be given full consideration during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (GPG Chapter II.C.2.d.(i) contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including GPG Chapter II.C.2.d.(i), prior to the review of a proposal.

⁵⁸ From NSF *Grant Proposal Guide*, http://www.nsf.gov/pubs/policydocs/pappguide/nsf13001/gpg_index.jsp (GPG). Effective from January 14th, 2013.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge;
- and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to:
 - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Appendix 12 - Oversight and Advisory Mechanisms

- **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 major 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 examine program management and portfolio balance. The COV reports, written as answers and commentary to specific questions, are reviewed by Advisory Committees and then submitted 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.⁵⁹

- **Advisory Committee Reporting on Directorate/Office Performance.**

Advisory Committees regularly provide community perspectives to the research and education directorates as well as on cross-cutting NSF topics such as cyberinfrastructure, international science and engineering, environmental research and education, business and operations, and equal opportunities in science and engineering. They are typically composed of 15-25 experts who have experience relevant to the programs or topics and are broadly drawn from academia, industry, and government. Advisory Committees, as part of their mission, review COV reports and staff responses.

⁵⁹ The COV reports and directorate responses are available electronically at <http://www.nsf.gov/od/iaa/activities/cov/covs.jsp>.

Appendix 13 - Requests for Formal Reconsideration of Declined Proposals

| | | Fiscal Year | | | | | | | | | |
|---|------------|-------------|------|------|------|------|------|-----------------|------|------|------|
| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| First Level Reviews (Assistant Directors): | | | | | | | | | | | |
| BIO | Request | 3 | 2 | 4 | 2 | 5 | 3 | 1 | 4 | 2 | 2 |
| | - Upheld | 3 | 2 | 4 | 2 | 5 | 3 | 1 | 3 | 0 | 2 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| CISE | Request | 2 | 3 | 1 | 1 | 0 | 0 | 2 | 3 | 5 | 1 |
| | - Upheld | 2 | 3 | 1 | 1 | 0 | 0 | 2 | 3 | 5 | 1 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EHR | Request | 2 | 7 | 4 | 6 | 7 | 2 | 2 | 2 | 3 | 4 |
| | - Upheld | 2 | 7 | 4 | 6 | 7 | 2 | 2 | 2 | 3 | 4 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENG | Request | 3 | 3 | 6 | 3 | 3 | 3 | 11 | 8 | 5 | 7** |
| | - Upheld | 3 | 3 | 6 | 3 | 3 | 3 | 9 | 7 | 5 | 5 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 |
| GEO | Request | 4 | 0 | 0 | 2 | 0 | 2 | 3 | 2 | 2 | 1 |
| | - Upheld | 4 | 0 | 0 | 2 | 0 | 1 | 3 | 2 | 2 | 1 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| MPS | Request | 24 | 15 | 16 | 16 | 14 | 9 | 14 [^] | 11 | 22 | 12 |
| | - Upheld | 24 | 15 | 15 | 15 | 14 | 7 | 12 | 11 | 21 | 11 |
| | - Reversed | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 |
| SBE | Request | 3 | 3 | 4 | 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| | - Upheld | 3 | 3 | 4 | 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other * | Request | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 |
| | - Upheld | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Second Level Reviews (Deputy Director): | | | | | | | | | | | |
| O/DD | Request | 7 | 2 | 0 | 1 | 3 | 2 | 3 | 3 | 6 | 1 |
| | - Upheld | 7 | 2 | 0 | 1 | 3 | 2 | 3 | 1 | 6 | 1 |
| | - Reversed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Total Reviews First & Second Level | | | | | | | | | | | |
| NSF | Request | 48 | 35 | 35 | 34 | 34 | 23 | 37 [^] | 33 | 46 | 28 |
| | - Upheld | 48 | 35 | 34 | 33 | 34 | 19 | 33 | 29 | 43 | 25 |
| | - Reversed | 0 | 0 | 1 | 1 | 0 | 4 | 2 | 4 | 3 | 2 |

Source: Office of the Director.

* From 2005 to 2012, the "Other" category includes OCI, OIA, OPP, and OISE. For FY 2013, it includes IIA.

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

** One reconsideration request was returned to the PI for failure to follow the procedure described in the Grant Proposal Guide.

**Appendix 14 - Mean Number of Reviews per Proposal, by Method
and Directorate or Office, FY 2013**

| | | Methods of Review | | | | Not Reviewed | Returned without Review | Withdrawn Proposals |
|------------|-----------|-------------------|--------------|-----------|------------|--------------|-------------------------|---------------------|
| | | All Methods | Mail + Panel | Mail-Only | Panel-Only | | | |
| NSF | Reviews | 187,512 | 65,006 | 11,184 | 111,322 | | | |
| | Proposals | 46,918 | 13,394 | 2,814 | 30,710 | 2,081 | 35 | 283 |
| | Rev/Prop | 4.0 | 4.9 | 4.0 | 3.6 | | | |
| BIO | Reviews | 24,147 | 14,908 | 229 | 9,010 | | | |
| | Proposals | 5,791 | 2,986 | 53 | 2,752 | 143 | 5 | 25 |
| | Rev/Prop | 4.2 | 5.0 | 4.3 | 3.3 | | | |
| CSE | Reviews | 29,828 | 4,902 | 561 | 24,365 | | | |
| | Proposals | 7,431 | 981 | 148 | 6,302 | 387 | 5 | 49 |
| | Rev/Prop | 4.0 | 5.0 | 3.8 | 3.9 | | | |
| EHR | Reviews | 19,682 | 950 | 388 | 18,344 | | | |
| | Proposals | 4,432 | 197 | 104 | 4,131 | 69 | 4 | 9 |
| | Rev/Prop | 4.4 | 4.8 | 3.7 | 4.4 | | | |
| ENG | Reviews | 37,230 | 1,985 | 324 | 34,921 | | | |
| | Proposals | 10,401 | 428 | 98 | 9,875 | 337 | 7 | 25 |
| | Rev/Prop | 3.6 | 4.6 | 3.3 | 3.5 | | | |
| GEO | Reviews | 26,865 | 22,009 | 3,258 | 1,598 | | | |
| | Proposals | 5,842 | 4,554 | 790 | 498 | 245 | 4 | 52 |
| | Rev/Prop | 4.6 | 4.8 | 4.1 | 3.2 | | | |
| IIA | Reviews | 1,307 | 187 | 347 | 773 | | | |
| | Proposals | 310 | 34 | 97 | 179 | 275 | 1 | 3 |
| | Rev/Prop | 4.2 | 5.5 | 3.6 | 4.3 | | | |
| MPS | Reviews | 29,483 | 7,234 | 5,034 | 17,215 | | | |
| | Proposals | 8,346 | 1,697 | 1,240 | 5,409 | 557 | 5 | 105 |
| | Rev/Prop | 3.5 | 4.3 | 4.1 | 3.2 | | | |
| SBE | Reviews | 18,970 | 12,831 | 1,043 | 5,096 | | | |
| | Proposals | 4,365 | 2,517 | 284 | 1,564 | 68 | 4 | 15 |
| | Rev/Prop | 4.3 | 5.1 | 3.7 | 3.3 | | | |

Source: NSF Enterprise Information System 10/01/13.

The proposals totals shown in the “All Methods” category do not include the proposals shown in the “Not Reviewed” category. Proposals which are not reviewed include RAPIDs, EAGERS, INSPIRE Track 1s, and small grants for travel and symposia.

The “Not Reviewed” category includes award and decline actions for proposals that were not reviewed, while the “Returned without Review” and “Withdrawn Proposal” categories reflect proposals which were neither awarded nor declined.

The counts of panel reviews do not include panel summaries. There were 45,604 panel summaries in FY 2013.

Withdrawn proposals include only those that underwent merit review.

Appendix 15 - 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 |
| 2013 | 48,999 | 13,394 | 27% | 2,814 | 6% | 30,710 | 63% | 2,081 | 4% |
| 2012 | 48,613 | 12,851 | 26% | 2,639 | 5% | 30,700 | 63% | 2,423 | 5% |
| 2011 | 51,562 | 14,594 | 28% | 3,352 | 7% | 31,878 | 62% | 1,738 | 3% |
| 2010 | 55,542 | 16,483 | 30% | 3,853 | 7% | 32,859 | 59% | 2,347 | 4% |
| 2009 | 45,181 | 14,262 | 32% | 3,370 | 7% | 25,835 | 57% | 1,714 | 4% |
| 2008 | 44,428 | 14,355 | 32% | 3,662 | 8% | 24,966 | 56% | 1,445 | 3% |
| 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% |

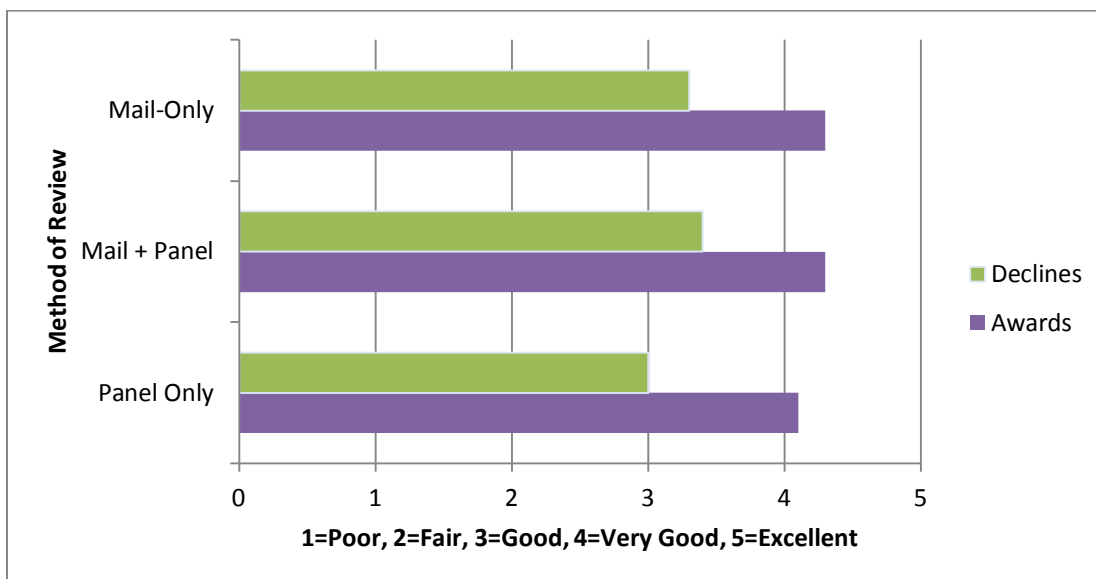
Source: NSF Enterprise Information System 10/01/13.

* "Panel Only" includes cases where panel members were given access to proposals for review prior to panel.

Appendix 16 - Methods of NSF Proposal Review, by Directorate or Office – FY 2013

| Directorate | Total Proposals | Mail + Panel | | Mail-Only | | Panel-Only | | Not Reviewed | |
|-------------|-----------------|---------------|------------|--------------|-----------|---------------|------------|--------------|-----------|
| | | Proposals | Percent | Proposals | Percent | Proposals | Percent | Proposals | Percent |
| NSF | 48,999 | 13,394 | 27% | 2,814 | 6% | 30,710 | 63% | 2,081 | 4% |
| BIO | 5,934 | 2,986 | 50% | 53 | 1% | 2,752 | 46% | 143 | 2% |
| CSE | 7,818 | 981 | 13% | 148 | 2% | 6,302 | 81% | 387 | 5% |
| EHR | 4,501 | 197 | 4% | 104 | 2% | 4,131 | 92% | 69 | 2% |
| ENG | 10,738 | 428 | 4% | 98 | 1% | 9,875 | 92% | 337 | 3% |
| GEO | 6,087 | 4,554 | 75% | 790 | 13% | 498 | 8% | 245 | 4% |
| MPS | 8,903 | 1,697 | 19% | 1,240 | 14% | 5,409 | 61% | 557 | 6% |
| SBE | 4,433 | 2,517 | 57% | 284 | 6% | 1,564 | 35% | 68 | 2% |
| IIA | 585 | 34 | 6% | 97 | 17% | 179 | 31% | 275 | 47% |

Source: NSF Enterprise Information System 10/01/13.

Appendix 17 - Mean Reviewer Ratings, by Method of Review - FY 2013

Source: NSF Enterprise Information System 10/01/13.

Appendix 18 - 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, together with information on human resources development at the post-doctoral, graduate and undergraduate levels. All other information required for NSF proposal submission remains the same. The proposals undergo merit review in the tradition of the specific program. In FY 2013, there were 71 requests for accomplishment-based renewals, 19 of which were awarded. **Table 18.1** shows the number of accomplishment-based renewals by directorate or office.

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 within the scope 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. In FY 2013, there were 30 Special Creativity Extensions awarded.

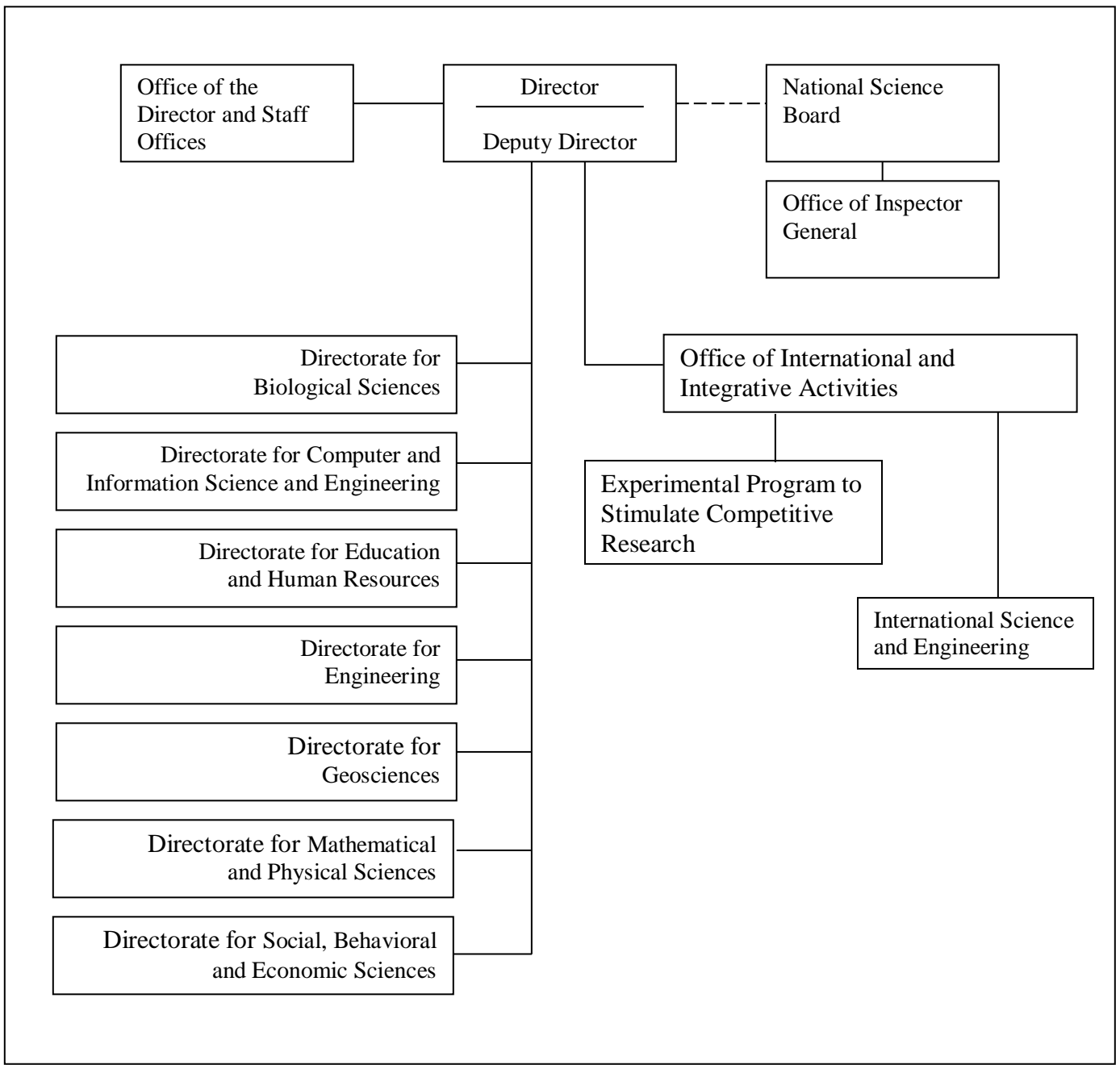
Table 18.1 - Accomplishment-Based Renewals, by Directorate or Office

| Directorate or Office | Award vs. Decline | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| NSF | Award | 32 | 27 | 28 | 40 | 34 | 19 | 30 | 19 |
| | Decline | 70 | 70 | 51 | 54 | 52 | 43 | 41 | 52 |
| | Mean Annual Award | \$106,188 | \$146,658 | \$164,211 | \$225,438 | \$150,171 | \$253,026 | \$255,959 | \$414,467 |
| BIO | Award | 5 | 4 | 3 | 5 | 8 | 3 | 2 | 4 |
| | Decline | 20 | 25 | 13 | 16 | 11 | 6 | 3 | 6 |
| | Mean Annual Award | \$109,684 | \$82,697 | \$62,444 | \$123,533 | \$151,999 | \$344,742 | \$78,815 | \$835,142 |
| CISE | Award | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 2 |
| | Decline | 2 | 3 | 1 | 0 | 2 | 2 | 2 | 1 |
| | Mean Annual Award | \$62,500 | \$37,500 | \$60,010 | \$267,851 | \$272,833 | N/A | N/A | \$819,996 |
| EHR | Award | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 0 |
| | Decline | 14 | 6 | 3 | 7 | 6 | 5 | 4 | 4 |
| | Mean Annual Award | \$154,495 | \$117,877 | \$390,611 | \$361,873 | \$304,579 | \$33,352 | \$530,633 | N/A |
| ENG | Award | 3 | 2 | 1 | 1 | 1 | 2 | 4 | 3 |
| | Decline | 14 | 13 | 6 | 13 | 7 | 5 | 7 | 10 |
| | Mean Annual Award | \$49,997 | \$83,542 | \$54,117 | \$124,977 | \$152,483 | \$121,725 | \$194,881 | \$207,017 |
| GEO | Award | 8 | 8 | 8 | 10 | 8 | 4 | 12 | 5 |
| | Decline | 3 | 4 | 3 | 3 | 8 | 4 | 3 | 6 |
| | Mean Annual Award | \$134,802 | \$74,091 | \$113,891 | \$343,864 | \$144,094 | \$143,699 | \$234,306 | \$222,092 |
| MPS | Award | 7 | 10 | 12 | 16 | 11 | 8 | 10 | 5 |
| | Decline | 13 | 16 | 19 | 12 | 13 | 15 | 18 | 21 |
| | Mean Annual Award | \$126,032 | \$253,195 | \$219,868 | \$188,219 | \$115,657 | \$354,936 | \$297,020 | \$155,611 |
| SBE | Award | 6 | 0 | 1 | 3 | 1 | 1 | 0 | 0 |
| | Decline | 4 | 3 | 6 | 3 | 3 | 5 | 4 | 4 |
| | Mean Annual Award | \$52,954 | N/A | \$76,993 | \$67,808 | \$75,789 | \$82,187 | N/A | N/A |
| IIA | Award | | | | | 1 | 0 | | |
| | Decline | | | | | 2 | 1 | | |
| | Mean Annual Award | | | | | \$50,000 | N/A | | |

Source: NSF Enterprise Information System 10/01/13. "N/A" = No accomplishment-based renewals awarded.

Mean annual award size is based on the annualized award size of each award. The latter is the total awarded, including supplements, divided by the award duration, including extensions. Since supplements and extensions occur post-award, the mean annual award amount for each directorate in prior years may change with time.

Appendix 19 - National Science Foundation Organization Chart*



*In September 2012, the Director announced a realignment of program offices that reported directly to the Office of the Director. The figure shows the new organizational structure.

Appendix 20 - Acronyms

| <u>Acronym</u> | <u>Definition</u> |
|----------------|---|
| ACI | Division of Advanced Cyberinfrastructure |
| ARRA | American Recovery and Reinvestment Act |
| BFA | Office of Budget, Finance and Award Management |
| BIO | Directorate for Biological Sciences |
| CGI | Continuing Grant Increment |
| CISE | Directorate for Computer and Information Science and Engineering |
| COV | Committee of Visitors |
| EAGER | Early-concept Grants for Exploratory Research |
| EHR | Directorate for Education and Human Resources |
| ENG | Directorate for Engineering |
| EPSCoR | Experimental Program to Stimulate Competitive Research |
| FY | Fiscal Year (October 1 – September 30) |
| GEO | Directorate for Geosciences |
| IIA | Office of International and Integrative Activities |
| IPAs | Temporary employees hired through the Intergovernmental Personnel Act |
| IPS | Interactive Panel System |
| MPS | Directorate for Mathematical and Physical Sciences |
| MRI | Major Research Instrumentation |
| MSI | Minority-Serving Institution |
| NSB | National Science Board |
| NSF | National Science Foundation |
| OCI | Office of Cyberinfrastructure |
| OD | Office of the Director |
| ODD | Office of the Deputy Director |
| OIA | Office of Integrative Activities |
| OISE | Office of International Science & Engineering |
| OPP | Office of Polar Programs |
| PARS | Proposal, PI and Reviewer System |
| PI | Principal Investigator |
| RAPID | Grants for Rapid Response Research |
| SBE | Directorate for Social, Behavioral and Economic Sciences |
| SGER | Small Grants for Exploratory Research |
| VSEE | Visiting Scientists, Engineers and Educators |