

Report to the National Science Board  
on the  
National Science Foundation's  
Merit Review System  
Fiscal Year 2000



# FY 2000 Report on the NSF Merit Review System

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## HIGHLIGHTS

1. During FY 2000 NSF took action on 29,407 competitively reviewed proposals, and provided funding to 9,762 of them. This resulted in an overall funding rate of 33 percent. These numbers have changed very little during the past five years. In FY 2000, Directorate funding rates ranged from 25 to 39 percent.
2. In FY 2000, the number of awards to minority Principal Investigators (PIs) increased from 422 to 482, a 14 percent increase over FY 1999. Still, this is only about five percent of the total number of NSF awards. The funding rate for minority PIs is 32 percent, very close to NSF's overall rate of 33 percent.
3. During FY 2000, female PIs received 1,932 awards, a 16 percent increase over FY 1999. The funding rate was 35 percent. Since 1993 the number of proposals received from female PIs has increased by 18 percent and the number of awards has increased by 32 percent.
4. There continues to be a wide disparity in the funding rates of "new PIs" and "prior PIs" (24 percent and 40 percent, respectively in FY 2000). In FY 2000 new PIs submitted 12,320 proposals, up slightly from FY 1999 but down by 15 percent from FY 1993-94 levels.
5. The average annualized award amount in FY 2000 was \$105,839, an increase of 13 percent over FY 1999. The average amount for female PIs was \$95,987, compared to \$108,825 for male PIs. The average amount for minority PIs was \$88,743. In NSF's FY 2001GPRA Performance Plan, a specific goal is to increase the average award size for research projects to \$109,000.
6. Since 1991 the percentage of NSF proposals reviewed by panel-only has increased from 40 to 46 percent of all proposals. During the same period, there has been a steady decline in the use of mail-only review from 30 to 17 percent. The use of mail-plus-panel review increased from 31 to 38 percent during the past ten years.
7. For proposal decisions in FY 2000, 46,897 external reviewers were sent one or more proposals for mail review and 8,708 reviewers served as panelists. In FY 2000, 60 percent of requests for mail reviews produced responses, an increase from the 59 percent response rate in FY 1999, although below the 64 percent response rate that prevailed in the 1990s.
8. There is considerable overlap among the average reviewer ratings of successful and unsuccessful proposals, most notably in the range of "very good" average ratings. This is true for all three proposal review methods (panel-only, mail-only, and mail plus panel). Almost \$2 billion of declined proposals are rated very good or better and almost \$1 billion are rated as high as the average NSF award.
9. The use of preliminary proposals has increased in frequency over the past several years in NSF programs. In FY 2000, NSF acted on 1,281 official preliminary proposals that were logged into the proposal processing system. (Almost all through FastLane.) Of these, NSF encouraged the submission of full proposals in 236 cases and discouraged submission in 1,045 cases.
10. Although NSF did not fully meet its FY 2000 GPRA goal of getting reviewers and program officers to address both merit review criteria, NSF is taking steps to assure that significant progress will be made.
11. In FY 2000, 54% of proposals were processed within six months, falling short of NSF's GPRA Goal of 70%. In FY 2001, NSF staff will work cooperatively to reduce overloads and bottlenecks.

# FY 2000 Report on the NSF Merit Review System

Among the Federal agencies, NSF has a unique mission: to strengthen the overall health of U.S. science and engineering across a broad and expanding research and education frontier. NSF invests in the best ideas from the most capable people, determined by competitive merit review. The merit review system is at the very heart of NSF's selection of the projects through which its mission is achieved. NSF evaluates proposals for research and education projects using two criteria: the intellectual merit of the proposed activity and the broader impacts of the proposed activity on society.

The *FY 2000 Report on the NSF Merit Review System* responds to a National Science Board (NSB) policy endorsed in 1977 and amended in 1984, requesting that the Director of the National Science Foundation (NSF) submit an annual report on the NSF proposal review system. This report provides summary information about levels of proposal and award activity and the process by which proposals are reviewed and awarded.

## 1. Proposals and Awards

### Competitively Reviewed Proposals, Awards and Funding Rates

During FY 2000, NSF took action on 29,407 competitive, merit reviewed research and education proposals, as shown in **Text Figure 1**. The number of proposals reviewed annually by NSF has remained stable over the past decade.

NSF funding was awarded to 9,762 of the proposals, resulting in an overall funding rate of 33 percent. This rate has ranged from 30-34 percent over the past ten years. As shown in **Appendix Table 1**,<sup>1</sup> there are significant differences in the funding rates of the NSF directorate, ranging from 25 percent for the Engineering Directorate (ENG) to 39 percent the Geosciences (GEO) and Mathematical and Physical Sciences Directorates (MPS).

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

	Fiscal Year				
	1996	1997	1998	1999	2000
<b>Proposals</b>	30,230	30,189	28,319	28,501	29,407
<b>Awards</b>	9,070	9,864	9,280	9,112	9,762
<b>Funding Rate</b>	30%	33%	33%	32%	33%

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<sup>1</sup> The term "directorates" as used in this report, refers to NSF's seven programmatic directorates and the Office of Polar Programs.

There are many possible reasons for these differences. For example, since funding rates are lower for new PIs, directorates (such as ENG) with a higher than average proportion of proposals from new PIs will have lower than average funding rates.

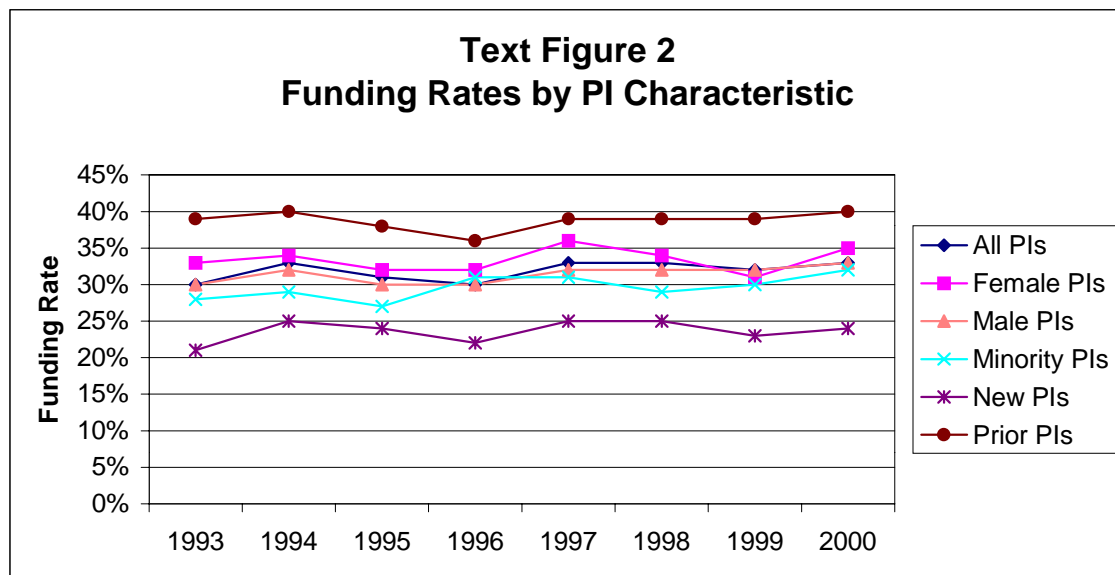
In addition to funding proposals that were competitively reviewed during FY 2000, NSF awarded 6,683 continuing grant increments (CGIs) based on proposals which had been competitively reviewed in earlier years. CGIs are funded in annual increments from current year appropriations. The CGI procedure complements the other major type of NSF award instrument – standard grants – where all funds for a multiple year project are obligated in the initial award. NSF policy limits the amount of next year’s CGI commitments to 65 percent of a program’s current fiscal year operating plan.

Characteristics of Principal Investigators

Trends in funding rate for all Principal Investigators (PIs), female and minority PIs<sup>2</sup>, and prior and new PIs are shown in **Text Figure 2** below. Proposals, awards, funding rates and trends by PI characteristics are presented in **Appendix Table 2**.

During FY 2000, female PIs received 1,932 awards, a 16 percent increase. The funding rate was 35 percent, compared to 33 percent for male PIs. During the past few years, these funding rates have varied within a narrow range.

More significantly, since 1993 the number of proposals received from female PIs has increased by 18 percent and the number of awards has increased by 32 percent. During FY 2000, about 19 percent of competitively reviewed proposals were from female PIs, who received 20 percent of the awards.



<sup>2</sup> Minority includes American Indian or Alaskan Native, Black, Hispanic, and Pacific Islander and excludes Asian and White, not of Hispanic Origin.

In FY 2000, the number of awards to minority PIs increased to 482, a 14% increase over FY 1999. Still, this is only about five percent of the total number of NSF awards. The funding rate for minority PIs is 32%, slightly less than the overall rate of 33%. During the past decade, the minority funding rate has usually been 1-3 percentage points below the overall funding rate. Proposals have remained fairly level while the number of awards has increased only slightly.

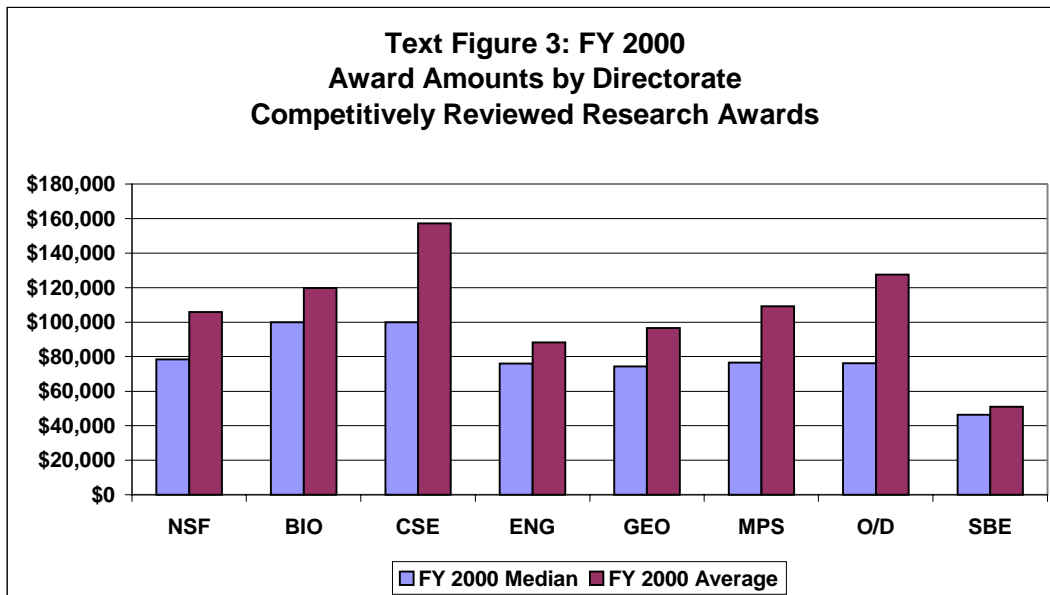
In FY 2000, NSF established a GPRA goal to identify mechanisms to increase the number of women and underrepresented minorities in the proposal applicant pool, and to identify mechanisms to retain that pool (see page 16). In FY 2001, NSF will build on the results of this goal by targeting the reviewer pool.

There continues to be a wide disparity in the funding rates of "new PIs"<sup>3</sup> and "prior PIs" (24 percent and 40 percent, respectively in FY 2000). One possible reason for this trend is that prior PIs are more likely to cite the results of previously funded projects in their subsequent proposals. Reviewers tend to favor PIs with proven track records.

As indicated in Appendix Table 2, in FY 2000 new PIs submitted 12,320 proposals, up slightly from FY 1999 but down by 15 percent from FY 1993-94 levels. In order to encourage the proposal process to be open to new people and ideas, NSF has established an FY 2000 GPRA performance goal of 30 percent of competitive research grants going to new investigators. As discussed on page 16, the FY 2000 result was 27 percent. In FY 2001 NSF will increase its efforts to promote awareness of the research opportunities at NSF open to new investigators.

### Award Amounts

Data on median and average award amounts<sup>4</sup> from FY 1996-2000 are presented by directorate in **Appendix Table 3** and **Text Figure 3**.



<sup>3</sup> A proposal is counted in the New PI subcategory if the PI was not a PI on a previous NSF Award.

<sup>4</sup> The difference between the median and average award amounts reflects the effect of numerous small awards on the median, and a few large awards for centers, facilities, and large systemic initiatives on the average award amount.

The average annualized award amount in FY 2000 was \$105,839, an increase of 13 percent from FY 1999. The average amount for female PIs was \$95,987, compared to \$108,825 for male PIs. The average amount for minority PIs was \$88,743. Although each directorate increased its average award amount in FY 2000, the increase in the Computer and Information Science and Engineering (CISE) directorate was particularly large (\$111K to \$157K). This was due to a very large program solicitation in (Information Technology Research) which had a focus on large projects.

Adequate award size is important both to getting high quality proposals and to ensuring that proposed work can be accomplished as planned. Larger awards will increase the efficiency of the system by allowing scientists and engineers to devote a greater portion of their time to actual research rather than proposal writing and other paperwork. In NSF's FY 2001 Government Performance and Results Act (GPRA) Performance Plan, a specific goal is to increase the average annualized award size for research projects to \$109,000, and the average award duration from 2.8 to 3 years.

## **2. Methods of Proposal Review**

The involvement of knowledgeable peers from outside the Foundation in the review of proposals is the keystone of NSF's proposal review system. Their judgements of the extent to which proposals address established criteria are vital for informing NSF staff and influencing funding recommendations. For this reason, NSF's system of proposal review can accurately be characterized as "merit review with peer evaluation."

### Review Processes Used at NSF

NSF programs obtain external peer review by three principal methods: (1) "mail-only," (2) "panel-only," and (3) "mail-plus-panel" review. In addition, site visits by NSF staff and external peers are often used to review proposals for large facilities, centers, and systemic reform initiatives. NSF program officers are given discretion in the specific use of review methods, subject to supervisory approval.

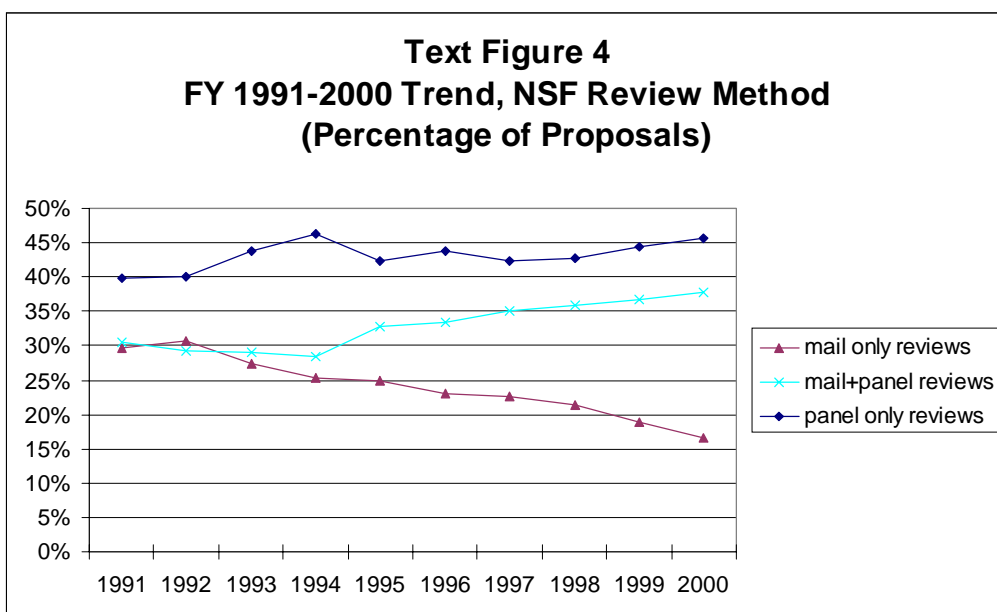
In "mail-only" reviews, peers are sent proposals and asked to submit written comments to NSF through FastLane, NSF's Web-based system for electronic proposal submission and review. These mail reviews are then used by the NSF program officer to support a recommendation for award or decline.

"Panel-only" review refers to the process of soliciting reviews only from those peers who meet in a panel review setting to discuss their reviews and provide advice directly to the program officer. Most programs that use this process provide proposals to panelists and receive their reviews prior to the panel meeting.

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

- A peer is asked to submit a written mail review and also serve as a panelist, in effect contributing two reviews for each proposal; and
- A peer is asked to participate only as a panelist, with responsibility only for reviewing and discussing mail reviews written by others and providing verbal and/or written advice to the program officer.

The use of various review methods has changed markedly over time, as shown in **Text Figure 4**, and the corresponding data in **Appendix Table 4**. Since 1991 the percentage of NSF proposals reviewed by panel-only has increased from 40 to 46 percent of all proposals. During the same period, there has been a steady decline in the use of mail-only review from 30 to 17 percent. The use of mail-plus-panel review increased from 31 to 38 percent during the past ten years.



Directorate-level data on the use of different review processes during FY 2000 are presented in **Appendix Table 5**. For both historical and currently practical reasons, NSD Directorates vary in their use of proposal review methods. Mail-plus-panel review was the predominant review process used in the BIO, GEO, and SBE Directorates. Mail-only review was the most common mode of review in MPS. Panel-only review was the predominant method in CISE, ENG and EHR. These trends have major implications for the way that NSF conducts its business. For example, as indicated in **Text Figure 5**, there is a strong relationship between time to decision and type of review. In FY 2000, 58% of all proposals reviewed by panel-only were processed within six months, compared to 52% for mail-plus-panel and 47% for mail-only.

The increasing trend toward a review process that includes some form of panel review likely results from such factors as: the increasing numbers of proposals that require multidisciplinary reviews (which panels seem better able to provide); the need to reduce proposal processing time (time-to-decision) and the increasing difficulty of obtaining ad-hoc mail reviews.



**Text Figure 5**  
**Time to Decision by Type**  
**FY 1999 – 2000**

FY	Review Method	0-6 Months	>6-9 Months	>9-12 Months	>12 Months
2000	Mail-plus-Panel	52%	37%	8%	3%
	Mail Only	47%	38%	10%	4%
	Panel Only	58%	32%	8%	2%
1999	Mail-plus-Panel	54%	36%	7%	3%
	Mail Only	50%	36%	10%	4%
	Panel Only	65%	27%	6%	1%

Reviews and Reviewers

NSF policy states that each recommendation for final action on a proposal must be accompanied by at least three external reviews, unless the requirement has been waived under special circumstances. The total numbers of reviews and the average numbers of reviews per proposal obtained by the three different review methods are presented in **Text Figure 6**. There is considerable variation among the review methods. Some of this difference may be attributed to the way reviewers are counted in various types of panels. For example, a panel might have 10-12 panelists of whom 4 lead reviewers are assigned to write an individual review. But, if all 10-12 panelists weigh in on the panel consensus, all may be counted as reviewers.

Directorate-level data for FY 2000 are presented in **Appendix Table 6**. The wide variation among directorates in the number of reviews per proposal may possibly reflect: (1) their preferences for the different review methods, and (2) differences in the way directorates count reviewers on the panel review process.

**Text Figure 6**  
**Reviews per Proposal, FY 2000**

	All Methods	Mail-plus-Panel	Mail-Only	Panel-Only
<b># of Reviews</b>	241,879	143,366	22,085	76,428
<b># of Proposals</b>	28,559	10,786	4,758	13,015
<b>Reviews per Proposal</b>	8.5	13.3	4.6	5.9

Diversity of the reviewer pool is an important feature of the merit review system. Reviewers from diverse backgrounds help ensure that a wide range of perspectives is taken into consideration in the review process. NSF emphasizes reviewer diversity through a variety of processes, including use of a large and expanding Foundation-wide reviewer database, explicit policy guidance, mandatory training for all program officers, and directorate-level initiatives.

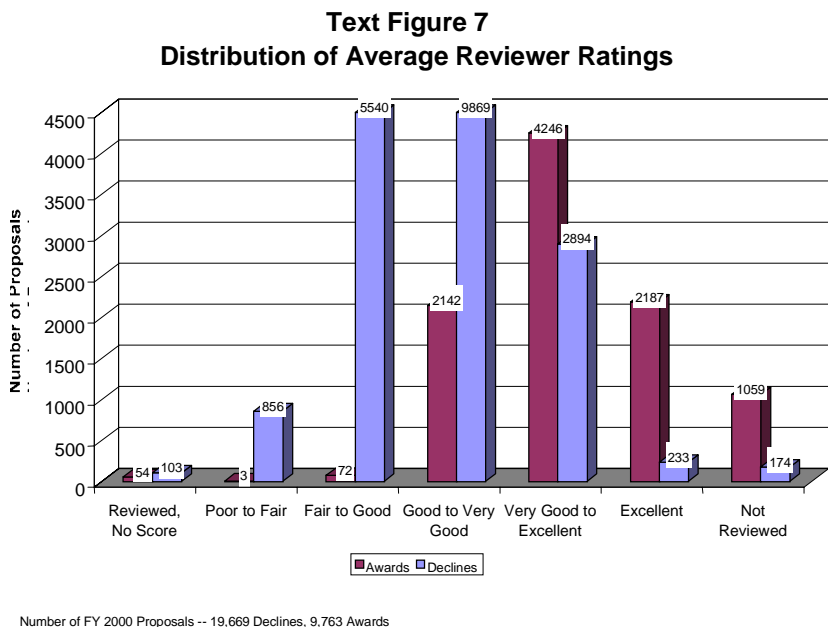
NSF maintains a central electronic database of about 250,000 reviewers. For proposal decisions in FY 2000, 46,897 of these reviewers were sent one or more proposals for mail review and 8,708 reviewers served as panelists. In all, 52,318 individuals served on a panel, were sent a proposal for mail review, or served in both functions.

Potential reviewers are identified from a variety of sources including applicant suggestions, references attached to proposals and published papers, and input from mail reviewers, panelists, and visiting scientists. During FY 2000, approximately 7,000 of the 259,623 records now in the reviewer database were either added or updated. Participation in the peer review process is voluntary. Panelists are reimbursed for expenses; mail reviewers receive no financial compensation. In FY 2000, 60 percent of requests for mail reviews produced responses, which represents an increase from the 59 percent response rate in FY 1999, although it is still not equal to the 64 percent response rate that prevailed in the 1990s.

In FY 2001, NSF will develop systems and policies to enable it to request voluntary demographic data electronically from all reviewers to determine participation levels of members of underrepresented groups in the NSF reviewer pool. A baseline for FY 2002 will be derived from this data.

### Reviewer Proposal Ratings

The distribution of average summary ratings<sup>5</sup> of reviews for awarded and declined proposals is provided in **Text Figure 7**.

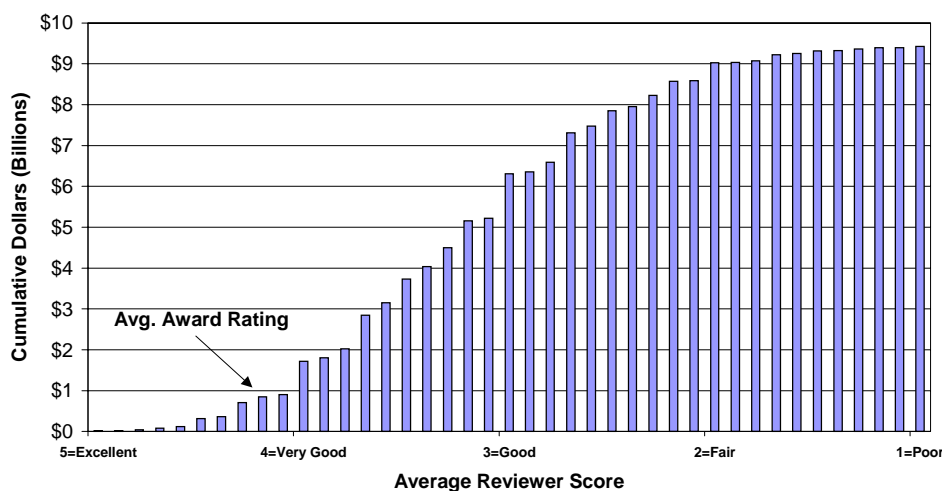


<sup>5</sup> The NSF merit review system emphasizes reviewer narratives over summary ratings. Summary ratings are but one indicator of reviewer judgment of the proposal quality. The written narratives provided by reviewers, the deliberations by panel members, and the expert opinions provided by program officers are all important components of the merit review system. No one component is allowed to dominate over the others.

These data indicate considerable overlap among the average reviewer ratings of successful and unsuccessful proposals, most notably in the range of “very good” average ratings. The judgment and discretion of the NSF professional staff is essential to making this difficult separation between awards and declines. **Appendix Table 7** indicates that this overlap among the average reviewer ratings is present and similar in degree for each of the three proposal review methods used by NSF (panel-only, mail-only, and mail plus panel).

These data also indicates that a large number of potentially fundable proposals are declined each year. **Text Figure 8** indicates that almost \$2 billion of declined proposals are rated very good or better and that almost \$1 billion are rated as high as the average NSF award. These declined proposals represent a rich portfolio of unfunded opportunities – fertile ground for learning and discovery that lies fallow.

**Text Figure 8**  
**Cumulative Requested Amounts for Declined Proposals**  
**by Average Reviewer Score for FY 2000**



### NSF Program Officers

The narrative comments and summary ratings provided by external reviewers are essential inputs that inform the judgment of the program officers who formulate award and decline recommendations to NSF’s senior management. In making these recommendations, highly qualified program officers produce and manage a portfolio of awards, addressing such factors as:

- Contributions to human resource and institutional infrastructure development,
- Support for “risky” proposals with potential for significant advances in a field,
- Encouragement of interdisciplinary activities, and
- Achievement of program-level objectives and initiatives.

The number of program officers employed by NSF has remained stable at around 400 for the past five years, despite increases in proposal complexity and general workload. The distribution of these program officers by characteristics is presented in **Text Figure 9**.

**Text Figure 9**  
**Distribution of NSF Program Officers by Characteristics**  
**As of October 1, 2000**

	Assistant Program Directors	Associate Program Directors	Program Directors	Total
<b>Total</b>	<b>11</b>	<b>25</b>	<b>360</b>	<b>396</b>
<b>Male</b>	<b>3</b> 27%	<b>17</b> 68%	<b>229</b> 64%	<b>249</b> 63%
<b>Female</b>	<b>8</b> 73%	<b>8</b> 32%	<b>131</b> 36%	<b>147</b> 37%
<b>Minority</b>	<b>2</b> 18%	<b>4</b> 16%	<b>69</b> 19%	<b>75</b> 19%
<b>White, Non-Hispanic</b>	<b>9</b> 82%	<b>21</b> 84%	<b>291</b> 81%	<b>321</b> 81%
<b>Permanent</b>	<b>10</b> 91%	<b>22</b> 88%	<b>190</b> 53%	<b>222</b> 56%
<b>VSEE</b>	<b>0</b> 0.0%	<b>1</b> 4%	<b>37</b> 10%	<b>38</b> 10%
<b>Temporary</b>	<b>1</b> 9%	<b>1</b> 4%	<b>40</b> 11%	<b>42</b> 10%
<b>IPA</b>	<b>0</b> 0%	<b>1</b> 4%	<b>93</b> 26%	<b>94</b> 24%
Source: NSF Division of Human Resource Management Notes: VSEE: Individual employed as a Visiting Scientist, Engineer, or Educator (formerly termed "Rotator"). IPA: Individual employed under the Intergovernmental Personnel Act.				

Depending on their professional experience, program officers are classified as assistant program director, associate program director, or program director. They can be permanent NSF employees or temporary employees. Some temporary program officers are "on loan" as visiting scientists, engineers, and educators (VSEEs) for up to three years from their host institutions. Others are employed through grants to the home institutions under the terms of the Intergovernmental Personnel Act (IPA).

The number of minority program directors has increased from 73 to 75, while number of female program directors has decreased from 150 to 147. However, the percentages in text Figure 9 are not significantly different than those reported in the *FY 1999 Report on the Merit Review System*. Of the 222 program directors that have permanent positions at NSF, 23 have reported having a major disability.

#### Assuring Objectivity in the Merit Review Process

NSF program officers carefully check all proposals for potential conflict-of-interest and select expert outside reviewers with no apparent potential conflicts. All reviewers are instructed to declare potential conflicts. All program officers receive conflicts-of-interest training annually.

Every proposer receives from the NSF program officer a description of the context in which the proposal was reviewed, along with an anonymous verbatim copy of each review that was considered in the review process. A declined PI may ask the cognizant program officer for additional clarification of the decision. If after considering this additional information a PI is not satisfied that the proposal was fairly handled and reasonably reviewed, he or she may request formal reconsideration from the cognizant Assistant Director (AD). This request can be based on the PI's perception of procedural errors or on disagreements over the substantive issues dealt with by reviewers. If the AD upholds the original action, the applicant's institution may request a second reconsideration from the Foundation's Deputy Director (O/DD).

On average, NSF annually declines over 20,000 proposals but receives only 40-50 requests for formal reconsideration. Most program-level decisions are upheld in the reconsideration process. Out of the 247 requests for formal reconsideration of declined proposals during the past six years, 10 decisions have been reversed. The number of requests for formal reconsideration and resulting decisions at both the AD and O/DD levels from FY 1995 through FY 2000 are displayed in **Appendix Table 8**.

Each program officer's recommendation to award or decline a proposal is subject to a programmatic review by a higher level reviewing official (usually the division director), and an administrative review by a grants officer in the Office of Budget, Finance, and Award Management (BFA). The Director's Review Board (DRB) must review all award recommendations in excess of \$1.5 million in any one project year or \$6 million over five years.<sup>6</sup>

Changes to the NSB threshold were effective at the start of FY 2000. The new threshold requires NSB approval of awards where the average annual award amount is 1% or more of the awarding directorate's prior year current plan.<sup>7</sup> In FY 2000, the NSB reviewed 16 actions, including six recommended proposals, two RFPs, and eight new programs and major construction projects.

### **3. Government Performance and Results Act (GPRA)**

#### Introduction

Because of its importance to the success of NSF's mission, "*operating a credible, efficient merit review system*" is cited as one of the four critical factors for success in NSF's FY 2001-2006 GPRA Strategic Plan. The NSF Inspector General has also identified merit review in her annual list of management and performance challenges:<sup>8</sup>

“..... NSF should enhance its efforts to expand the peer review community to ensure diversity with respect to race, gender, geography and type of school, providing the chance to participate to all who are qualified.”

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<sup>6</sup> Effective, FY 2001, items subject to DRB review include awards with an average annual award amount of 2.5% or more of a Division's prior year current plan.

<sup>7</sup> Other items requiring NSB prior approval are new programs and major construction projects that meet certain specifications.

<sup>8</sup> Inspector General letter to the NSF Director, "IG's Statement Concerning NSF's Most Serious Management and Performance Challenges," January 4, 2001.

Not surprisingly then, several of the investment process goals in the FY 2000 GPRA Performance Plan are focused on various aspects of the award selection process, such as the use of the merit review criteria, the need to keep the awards system open to new people and new ideas, and the time it takes to process a proposal. NSF's progress in meeting these goals is described below.

#### GPRA Performance Goals and Results

**Investment Process Goal 1:** *At least 90% of NSF funds will be allocated to projects reviewed by appropriate peers external to NSF and selected through a merit-based competitive process.*

**Background:** The Administration and NSF believe that award selections based on a competitive merit review process with peer evaluation ensure those ideas from the strongest researchers and educators will be identified.

**Results:** This goal was achieved in FY 2000. As in FY 1999, NSF allocated 95% of its funds to merit reviewed projects. It will be revised for FY 2001, based on OMB revised definitions.<sup>9</sup>

**Investment Process Goal 2:** *NSF performance in implementation of the new merit review criteria is successful when:*

- *reviewers address the elements of both generic review criteria appropriate to the proposal at hand, and*
- *when program officers take the information provided into account in their decisions on awards, as judged by external independent experts.*

**Background:** New criteria were used for the first time during FY 1999. The use of both criteria (quality and impact) by both expert reviewers and program staff is an important step in the investment process and for the implementation of NSF's broader goals. To evaluate NSF's progress in meeting this goal, external committees are asked to assess the use of the two merit review criteria by reviewers and program officers.

**Results:** *This goal was not achieved.* For FY 2000, a total of 58 out of 64 reports rated programs on their use of both merit review criteria. NSF was judged successful in achieving this goal in *only 20 of the 58 reports*. These results provide a clearer indication that NSF has a long way to go to fully achieve this goal, but that progress has been made.

Full implementation of this goal is a priority for NSF in FY 2001 and beyond. To do so requires information to be included in proposals, addressed by reviewers, and taken into account by program staff. NSF has taken steps to ensure that incoming proposals contain adequate information for reviewers to evaluate.

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<sup>9</sup> During FY 2000, the Office of Management and Budget revised the Federal goal, stating that 70-90% of research and development funds should be awarded to merit reviewed projects. Under the new definition, federally-funded research and development centers (FFRDCs) and merit-reviewed scientific research with competitive selection and internal (program) evaluation will not be considered merit reviewed. Taking into account the new definition, NSF has revised its goal for FY 2001 to 85%.

For FY 2001, different on-screen pages have been provided in FastLane – NSF’s electronic data system - so reviewers can address each merit-review criterion separately. The performance data will be collected from the FastLane database. Program officer reviews of projects will be inspected for use of both criteria.

***Related NAPA Study:*** In response to a directive by the Senate Appropriations Committee that NSF review the procedure and criteria for merit review once the new criteria have been in place for a year, in FY 2000, NSF issued a contract to NAPA to conduct a study of the impact of the new merit review criteria on the nature of the projects NSF supports. In conducting the study, NAPA interviewed key personnel and stakeholders from the S&E community and analyzed a sample of COV reports and proposal documents. The key finding was that it is too soon to make valid judgements about the impact and effectiveness of the new criteria. The NAPA report also highlighted the need to (1) improve the conceptual clarity of the criteria, (2) better communicate with proposers, reviewers and NSF staff about how the criteria are to be used, and (3) improve quantitative measures and performance indicators to track the objectives and implementation of the new criteria. NSF is implementing these suggestions beginning in FY 2001.

***Investment Process Goal 3:*** Identify possible reasons for customer dissatisfaction with NSF’s merit review system and with NSF’s complaint system. (New goal in FY 2000)

**Background:** For the past two years, NSF has participated in a national assessment of customer satisfaction along with about 30 other federal agencies. The mechanism used to assess customer satisfaction is the American Customer Satisfaction Index (ACSI), a cross-industry index of customer satisfaction. The Foundation’s ACSI results (Baseline: 57 on a scale of 0-100 in FY 1999) for that survey indicated that NSF grant applicants generally hold NSF in high regard and give it high marks for accessibility and usefulness of information. However, NSF received only mid-level scores for its merit review process and for its handling of customer complaints.

**Results:** This goal was achieved through meetings with principal investigators and research administrators, and additional surveys including the ACSI\* survey of awardees only and regional grants seminar surveys. The awardee survey results indicate that NSF customers’ primary concern regarding the timeliness and efficiency of the proposal process is the time it takes NSF to reach a funding decision. NSF is striving to improve the time to decision (see Investment Process goal 7). Applicants who stated that they had a specific problem or concern with the quality or fairness of merit review identified two primary concerns: reviews were inappropriate (i.e., reviews did not seem to adequately address the proposed project, in the opinion of the applicant) and reviews were uneven (i.e., the range of review scores included both high and low scores).

***Investment Process Goal 4:*** Identify best practices and training necessary for NSF staff to (1) conduct merit review and answer questions about the review criteria and process, and (2) answer questions from the community and to deal with complaints in a forthright manner. (New goal in FY 2000)

Results: This goal was not achieved. During FY 2000 NSF conducted customer service surveys and solicited other forms of feedback in an effort to pinpoint specific customer issues and to identify effective practices for handling customer complaints within NSF. Further, other Federal agencies were examined to locate a model with similar customer interactions, but no appropriate model was identified. However, models of best practices and NSF staff training are still being developed in FY 2001.

NSF continues to place great importance on these issues and will complete this effort in FY 2001. In addition, NSF will pilot the best of the models in NSF divisions and provide specific customer service training to NSF staff.

***Investment Process Goal 5: Improve NSF's overall ACSI index compared to the FY 1999 index of 57 (on a scale of 0-100).***

Background: (See Goal 3 background.)

Results: This goal was achieved. NSF achieved an ACSI index of 58 in FY 2000. This feedback is helping NSF to focus its efforts to improve customer service. The 2000 ACSI survey indicated that NSF improved slightly in two key areas: 1) timeliness and efficiency of the proposal process and 2) quality and fairness of merit review. These were two of the areas of greatest concern from the FY 1999 survey.

***Investment Process Goal 6: Time to Prepare Proposals: 95% of program announcements and solicitations will be available at least three months prior to proposal deadlines or target dates.***

Background: NSF staff work toward this goal by limiting the number of special competitions requiring individual program announcements and solicitations, planning for such competitions as far in advance as possible, and initiating clearance processes at least six months prior to the anticipated proposal deadlines.

Results: This goal was not achieved. In FY 2000, 89% of program announcements and solicitations were made available at least three months prior to their deadline/target date. Approximately 8 percent of program announcements and solicitations missed the 90-day time limit by fewer than 5 days. This is a significant improvement over FY 1999, when 75% of announcements met the 3-month standard. The Foundation intends to review and revise the timing of clearance procedures, in order to ensure that web posting of announcements will occur in a timely manner.

***Investment Process Goal 7: Maintain the FY 1999 goal to process 70% of proposals within six months of receipt, improving upon the FY 1998 baseline of 58%.***

Background: NSF's long term goal continues to be processing 95% of proposals within six months of receipt. In other words, NSF should be able to tell applicants whether their proposals have been declined or recommended for funding within six months of receiving them.

Results: This goal was not achieved. In FY 2000, 54% of proposals were processed within six months of receipt, while an additional 35% of proposals were processed between six and nine



months of receipt. In FY 2001, NSF staff will work towards shortening the award processing time by making more effective use of electronic mechanisms in conducting the review, working cooperatively to reduce overloads and bottlenecks, and by carefully tracking the stage of processing and age of all proposals.

In addition, some internal organizations are reconsidering the practice of holding over proposals for potential funding until the next fiscal year, while some have added “performance on prompt handling of proposals” to the performance evaluation criteria of their staff. Moreover, NSF is committed to increasing staffing in FY 2001, to accommodate the anticipated increase in proposals associated with the budget increase and the major initiatives.

***Investment Process Goal 8:*** *The percentage of competitive research grants going to new investigators will be at least 30%, 3% over the FY 1998 baseline of 27%.*

Background: NSF believes that it is important that the proposal and award process be open to new people and new ideas, to help ensure that NSF is supporting research at the frontier of science and engineering. NSF is committed to maintaining openness in the system and will strive to increase the percentage of awards to new investigators. This goal will be maintained in FY 2001.

Results: This goal was not achieved. The percentage of competitive research grants to new investigators was 28% in FY 2000, one percent higher than in FY 1999. In the early 1990’s, NSF had percentages approximating 30 percent of all competitive research grants going to new investigators. The percentage dropped over the mid-1990’s, and is now rising slightly.

This is a challenging goal for NSF. NSF will continue to seek creative and innovative proposals from new investigators. Program staff will attend scientific meetings, conferences, and conventions and will conduct site visits to promote awareness of the research opportunities at NSF and to encourage new investigators to submit proposals. NSF will examine trends, such as whether the pool of new investigators is smaller than in previous years or whether they are submitting fewer proposals, and if needed, use this information to modify targets in the future.

***Investment Process Goal 11:*** *NSF will identify mechanisms to increase the number of women and underrepresented minorities in the proposal applicant pool, and will identify mechanisms to retain that pool.*

Background: Recognizing that progress toward all outcome goals for research and education requires maximal diversity of intellectual thought, NSF is emphasizing attention to enhancing the participation of groups currently underrepresented in science and engineering, including women, underrepresented minorities, and persons with disabilities, in all its programs. The long-term objective is to have a science and engineering workforce that mirrors the U.S. population.

Results: This goal was achieved. NSF continues to work toward increasing diversity in its proposal applicant pool through the following means:

- To place the issue on equal footing with the quality of research being supported, NSF issued Important Notice No. 125 to presidents of universities and colleges encouraging PIs to address the merit review criterion – what are the broader impacts of the proposed activity- which embraces integrating diversity into all NSF supported activities;
- Developing and increasing funding for specialized programs designed to promote diversity;
- Recruiting members of underrepresented groups for merit review panels, COVs, and NSF workshops and conferences; and
- Strongly encouraging women, minorities, and persons with disabilities to compete fully in NSF programs.

NSF is revising this goal to extend its efforts as it continues to pursue diversity in the applicant pool. A new goal in FY 2001 will build on the results of this goal by targeting the reviewer pool. NSF will begin to request voluntary demographic data electronically from all reviewers to determine participation levels of members of underrepresented groups in the NSF reviewer pool. A baseline for FY 2002 will be derived from this data.

## 4. Other Issues Related to Merit Review

### Use of Preliminary Proposals

Some programs try to manage proposal pressure by requiring submission of preliminary proposals. The intent of preliminary proposals is to limit the burden imposed on proposers, reviewers and NSF staff. Normally, preliminary proposals require only enough information to make fair and reasonable decisions regarding encouragement/discouragement of a full proposal. Review of preliminary proposals varies widely, ranging from non-binding advice from program officers to proposers, to recommendations from external reviewers.

The use of preliminary proposals has increased in frequency over the past several years in NSF programs. In FY 2000, NSF acted on 1,281 official preliminary proposals that were logged into the proposal processing system. (Almost all through FastLane.) Of these, NSF encouraged the submission of full proposals in 236 cases and discouraged submission in 1,045 cases.

### Small Grants for Exploratory Research (SGER)

Since the beginning of FY 1990, the Small Grants for Exploratory Research (SGER) option has permitted program officers throughout the Foundation to make short-term (one to two years), small-scale grants *without formal external review*. Characteristics of activities that can be supported by an SGER award include: preliminary work on untested and novel ideas; application of new approaches to “old” topics; ventures into emerging research areas; and narrow windows of opportunity for data collection, such as natural disasters and infrequent phenomena.

Potential SGER applicants are encouraged to contact an NSF program officer before submitting an SGER proposal to determine its appropriateness for funding. As potential SGER applicants have become familiar with this practice, the SGER funding rate has steadily increased over the past eight years. Additional details are shown in **Text Figure 10**.

**Text Figure 10**  
**Small Grants for Exploratory Research (SGER)**

	Fiscal Years							
	1993	1994	1995	1996	1997	1998	1999	2000
<b>Proposals</b>	309	258	228	205	244	302	278	317
<b>Awards</b>	213	185	168	144	194	250	224	272
<b>Funding Rate(%)</b>	69	72	74	70	80	83	81	86

NSF received 317 SGER proposals in FY 2000 and made 272 awards. Directorate-level data on SGER proposal pressure and funding rates are presented in **Appendix Table 9**.

The total amount awarded to SGERs in FY 1999 was \$12,293,477. The average SGER award amount in FY 2000 was \$57,813, a 33 percent increase relative to the FY 1997 average award amount of \$43,367. Despite these increases, the total NSF investment in SGERs about 0.6 percent of the operating budget for research and education, far below the five percent that program officers may commit to SGER awards. The history of SGER awards by directorate from FY 1998 to FY 2000 is presented in **Appendix Table 10**.

Accomplishment Based Renewals and Creativity Extensions

In addition to SGERs, NSF program officers may recommend *accomplishment based renewals* and *creativity extensions*. In 2000 there were 39 requests for accomplishment based renewals, 27 of which were awarded. There were also 43 creativity based extensions made to existing NSF grants.

In an accomplishment-based renewal, the project description is replaced by copies of no more than six reprints of publications resulting from the research supported by NSF (or research supported by other sources that is closely related to the NSF-supported research) during the preceding three- to five-year period. In addition, a brief (not to exceed four pages) summary of plans for the proposed support period must be submitted. All other information required for NSF proposal submission remains the same.

A creativity extension is an extension of funding for up to two years for certain research grants. The objective of such extensions is to offer the most creative investigators an extended opportunity to attack "high-risk" opportunities in the same general research area, but not necessarily covered by the original/current proposal. Special Creativity Extensions are initiated by the NSF Program Officer based on progress during the first two years of a three-year grant.

Exemptions to the Merit Review Process

Authorized exemptions to the peer review process are listed in NSF Manual 10, Section 122 and include routine award actions such as continuing grant increments and no-cost extensions. In special circumstances, the Director or designee may waive peer review requirements. In most cases, these waivers are granted for proposals which present extraordinary problems in obtaining external peer reviews or are otherwise not suited for the usual merit review process.

However, NSF staff always closely reviews these proposals. Such waivers of peer review were granted five times during FY 2000, compared to seven times during FY 1999.

#### Committees of Visitors (COV)

NSF regularly assesses performance of all aspects of the merit review system, comparing its efficiency, effectiveness, customer satisfaction and integrity against similar processes run by other organizations. For example, panels of external experts called Committees of Visitors (COVs) are convened to review the technical and managerial stewardship of NSF programs on a three-year cycle.<sup>10</sup> In FY 2000, there were approximately 250 COV members participating in this performance assessment process. This process generated 64 reports covering 78 of NSF's approximately 200 programs (see **Appendix Table 11** for a schedule of program evaluations). COVs report on the integrity and efficiency of the processes for proposal review and the quality of results of NSF's programs.

The recommendations of COVs are reviewed by management and taken into consideration by NSF when evaluating existing programs and future directions for the Foundation. Each COV must operate in accordance with the Federal Advisory Committee Act (FACA) of 1972. In compliance with FACA regulations, virtually all COVs are established as subcommittees of an existing chartered directorate advisory committee, and the COV report is reviewed and approved by the parent advisory committee. The cognizant assistant director (AD) provides the parent advisory committee with a written response to each COV report. The COV's report and the AD's response are public documents; some have been publicized in the professional literature.

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<sup>10</sup> In FY 2000, about 37% of NSF's 200 program portfolio was evaluated by COVs. Approximately 40% of NSF's portfolio was evaluated by COVs in FY 1999. The remaining portions of NSF's portfolio will be evaluated by COVs in FY 2001, to complete the full three-year cycle of assessment of NSF's programs.

FY 2000 Report  
on the Merit Review System

**APPENDICES**

**Appendix Table 1**

**Competitively Reviewed Proposals, Awards and Funding Rates  
By Directorate, FY 1996 – 2000**

		Fiscal Year					Five-	Five-
		1996	1997	1998	1999	2000	year	year
						Total	Average	
NSF	Proposals	30,230	30,189	28,319	28,501	29,407	146,646	29,329
	Awards	9,070	9,864	9,280	9,112	9,762	47,088	9,418
	Funding Rate	30%	33%	33%	32%	33%	32%	32%
BIO	Proposals	5,673	5,206	4,852	4,560	4,860	25,151	5,030
	Awards	1,325	1,413	1,403	1,339	1,424	6,904	1,381
	Funding Rate	23%	27%	29%	29%	29%	27%	27%
CSE	Proposals	1,929	2,010	2,036	2,295	3,012	11,282	2,256
	Awards	645	731	707	763	921	3,767	753
	Funding Rate	33%	36%	35%	33%	31%	33%	33%
EHR	Proposals	3,732	3,369	3,511	2,847	2,710	16,169	3,234
	Awards	1,326	1,191	1,211	819	937	5,484	1,097
	Funding Rate	36%	35%	34%	29%	35%	34%	34%
ENG	Proposals	5,953	6,073	5,535	5,415	6,012	28,988	5,798
	Awards	1,380	1,570	1,382	1,467	1,531	7,330	1,466
	Funding Rate	23%	26%	25%	27%	25%	25%	25%
GEO	Proposals	3,723	3,946	3,318	3,443	3,463	17,893	3,579
	Awards	1,161	1,333	1,228	1,313	1,358	6,393	1,279
	Funding Rate	31%	34%	37%	38%	39%	36%	36%
MPS	Proposals	4,953	5,536	5,264	5,204	5,284	26,241	5,248
	Awards	1,812	1,993	1,834	1,900	2,035	9,574	1,915
	Funding Rate	37%	36%	35%	37%	39%	36%	36%
SBE	Proposals	3,456	3,287	3,093	4,017	3,345	17,198	3,440
	Awards	1,140	1,224	1,264	1,212	1,260	6,100	1,220
	Funding Rate	33%	37%	41%	30%	38%	35%	35%
Other	Proposals	811	762	710	720	721	3,724	745
	Awards	281	409	251	299	296	1,536	307
	Funding Rate	26%	54%	35%	41%	41%	41%	41%

**Notes:** Competitively reviewed" proposals and awards refer to proposal actions for research, education and training which are processed through NSF's external merit review system each year. These figures do not include 6,683 second-year and later incremental awards during FY 2000 for "continuing grants" which are competitively reviewed in the first year of the award. Also excluded are 3,013 supplements, which are not subject to external merit review, and 217 contracts, which are reviewed with special criteria. "Other" organizational units include Office of Polar Programs and Office of Integrative Activities Source: NSF Enterprise Information System, as of December 18, 2000.

**Appendix Table 2  
Competitively Reviewed Proposals, Awards and Funding Rates  
By PI Characteristics, FY 1993 – 2000**

		Fiscal Year							
		1993	1994	1995	1996	1997	1998	1999	2000
All PIs	Proposals	30,003	30,396	30,697	30,230	30,189	28,319	28,501	29,407
	Awards	9,148	9,973	9,560	9,070	9,864	9,280	9,112	9,762
	Funding Rate	30%	33%	31%	30%	33%	33%	32%	33%
Female PIs	Proposals	4,472	4,841	4,954	5,180	5,384	5,600	5,297	5,488
	Awards	1,461	1,649	1,587	1,665	1,937	1,910	1,663	1,932
	Funding Rate	33%	34%	32%	32%	36%	34%	31%	35%
Male PIs	Proposals	25,135	25,035	25,146	24,716	24,475	22,406	22,949	23,589
	Awards	7,562	8,027	7,634	7,295	7,803	7,232	7,368	7,733
	Funding Rate	30%	32%	30%	30%	32%	32%	32%	33%
Minority PIs	Proposals	1,429	1,466	1,518	1,542	1,429	1,384	1,426	1,487
	Awards	401	432	412	483	443	402	422	482
	Funding Rate	28%	29%	27%	31%	31%	29%	30%	32%
New PIs	Proposals	14,280	14,561	14,185	13,619	13,288	12,222	11,809	12,320
	Awards	3,024	3,596	3,362	3,020	3,286	3,060	2,669	2,971
	Funding Rate	21%	25%	24%	22%	25%	25%	23%	24%
Prior PIs	Proposals	15,723	15,835	16,512	16,611	16,901	16,097	16,692	17,087
	Awards	6,124	6,377	6,198	6,050	6,578	6,220	6,443	6,791
	Funding Rate	39%	40%	38%	36%	39%	39%	39%	40%

**Notes :** Competitively reviewed" proposals and awards refer to proposal actions for research, education and training which are processed through NSF's external merit review system each year. "Gender" is based on self-reported information from the PI's most recent proposal. "Minority" is based on the PI's ethnic/racial status as reported to NSF on the most recent proposal. PIs can decline to report their ethnic/racial status. Includes American Indian, Alaskan Native, Black, Hispanic, and Pacific Islander and excludes Asian and White-Not of Hispanic Origin.

**Source:** NSF Enterprise Information System, as of December 18, 2000

**Appendix Table 3**  
**Median and Average Award Amounts by Directorate**  
**Research Grants**  
**FY 1996 – 2000**

		Fiscal Year				
		1996	1997	1998	1999	2000
NSF	Median	\$60,321	\$65,367	\$70,000	\$73,813	\$78,285
	Average	\$74,250	\$80,225	\$88,677	\$93,282	\$105,839
BIO	Median	\$75,741	\$82,500	\$87,833	\$94,039	\$100,000
	Average	\$82,972	\$86,870	\$103,336	\$116,452	\$119,780
CSE	Median	\$56,671	\$72,231	\$74,145	\$82,540	\$100,000
	Average	\$84,680	\$91,235	\$98,380	\$111,523	\$157,247
ENG	Median	\$66,616	\$70,722	\$73,333	\$75,000	\$76,105
	Average	\$71,996	\$76,586	\$85,083	\$87,211	\$88,216
GEO	Median	\$61,046	\$64,328	\$68,323	\$66,863	\$74,462
	Average	\$78,849	\$78,670	\$85,765	\$86,336	\$96,538
MPS	Median	\$60,000	\$63,708	\$72,040	\$78,061	\$76,716
	Average	\$80,882	\$89,074	\$93,367	\$96,914	\$109,185
SBE	Median	\$26,836	\$30,916	\$35,140	\$39,226	\$46,400
	Average	\$36,401	\$45,335	\$49,480	\$52,939	\$50,983
O/D	Median	\$75,554	\$70,452	\$84,440	\$82,059	\$76,228
	Average	\$93,512	\$101,448	\$109,690	\$113,374	\$127,571

**Note:** Median and average are based on competitively reviewed research awards.

**Source:** NSF Enterprise Information System, as of December 18, 2000.



**Appendix Table 4  
Methods of NSF Proposal Review  
FY 1991-2000**

FY	Total		Mail + Panel		Mail-Only		Panel-Only	
	Proposals		Proposals	Percent	Proposals	Percent	Proposals	Percent
2000	28,559		10,786	38%	4,758	17%	13,015	46%
1999	27,724		10,207	37%	5,220	19%	12,297	44%
1998	27,161		9,760	36%	5,808	21%	11,593	43%
1997	29,141		10,230	35%	6,599	23%	12,312	42%
1996	29,244		9,753	33%	6,714	23%	12,777	44%
1995	29,757		9,752	33%	7,391	25%	12,614	42%
1994	29,481		8,407	29%	7,453	25%	13,621	46%
1993	28,491		8,258	29%	7,773	27%	12,460	44%
1992	28,278		8,279	29%	8,703	31%	11,296	40%
1991	27,337		8,347	31%	8,090	30%	10,900	40%

**Note:** "O/D" includes the Office of Polar Programs and the Office of Integrative Activities. Panel-Only includes cases where panelist was mailed proposal for review prior to panel.

**Source:** NSF Enterprise Information System, as of December 18, 2000.

**Appendix Table 5  
Methods of NSF Proposal Review  
By Directorate, FY 2000**

Directorate	Total	Mail + Panel		Mail-Only		Panel-Only	
	Proposals	Proposals	Percent	Proposals	Percent	Proposals	Percent
NSF	28,559	10,786	38%	4,758	17%	13,015	46%
BIO	4,654	3,610	78%	119	3%	925	20%
CSE	2,938	335	11%	152	5%	2,451	83%
EHR	2,846	147	5%	103	4%	2,596	91%
ENG	5,815	435	7%	584	10%	4,796	82%
GEO	3,364	2,569	76%	628	19%	167	5%
MPS	5,098	1,443	28%	2,293	45%	1,362	27%
SBE	3,205	1,991	62%	641	20%	573	18%
Other	639	256	40%	238	37%	145	23%

**Note:** "O/D" includes the Office of Polar Programs and the Office of Integrative Activities. Panel-Only includes cases where panelist was mailed proposal for review prior to panel.

**Source:** NSF Enterprise Information System, as of December 18, 2000.

**Appendix Table 6  
Average Number of Reviews per Proposal  
By Method and Directorate, FY 2000**

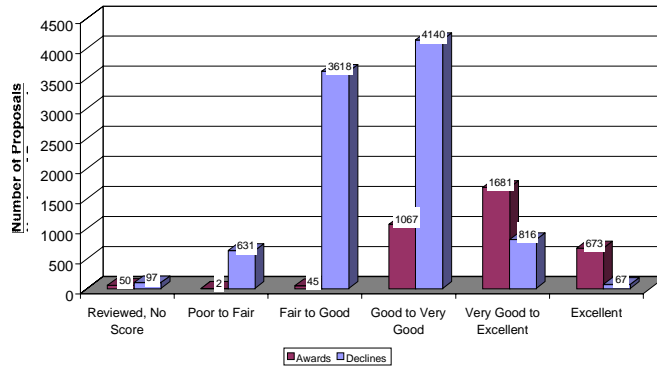
Directorate		Methods Of Review			
		All Methods	Mail + Panel	Mail-Only	Panel-Only
BIO	Reviews	72,921	60,092	619	12,210
	Proposals	4,654	3,610	119	925
	Rev/Prop	15.7	16.6	5.2	13.2
CSE	Reviews	13,654	2,174	589	10,891
	Proposals	2,938	335	152	2,451
	Rev/Prop	4.6	6.5	3.9	4.4
EHR	Reviews	14,473	761	390	13,322
	Proposals	2,846	147	103	2,596
	Rev/Prop	5.1	5.2	3.8	5.1
ENG	Reviews	22,896	2,189	2,592	18,115
	Proposals	5,815	435	584	4,796
	Rev/Prop	3.9	5.0	4.4	3.8
GEO	Reviews	36,291	31,716	3,471	1,104
	Proposals	3,364	2,569	628	167
	Rev/Prop	10.8	12.3	5.5	6.6
MPS	Reviews	43,444	17,111	10,955	15,378
	Proposals	5,098	1,443	2,293	1,362
	Rev/Prop	8.5	11.9	4.8	11.3
SBE	Reviews	34,554	27,277	2,407	4,870
	Proposals	3,205	1,991	641	573
	Rev/Prop	10.8	13.7	3.8	8.5
O/D	Reviews	3,633	2,033	1,062	538
	Proposals	638	255	238	145
	Rev/Prop	5.7	8.0	4.5	3.7

**Notes:** Peers participating as both a mail and panel reviewer for the same proposal are counted as one review in this table.

**Source:** NSF Enterprise Information System, as of December 18, 2000.

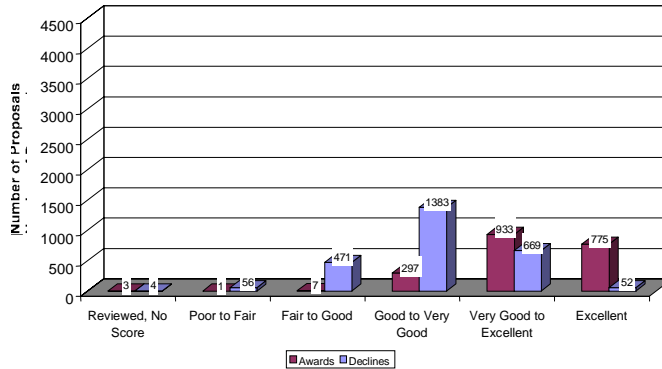
## Appendix Table 7

### Distribution of Average Reviewer Ratings Panel Reviewed



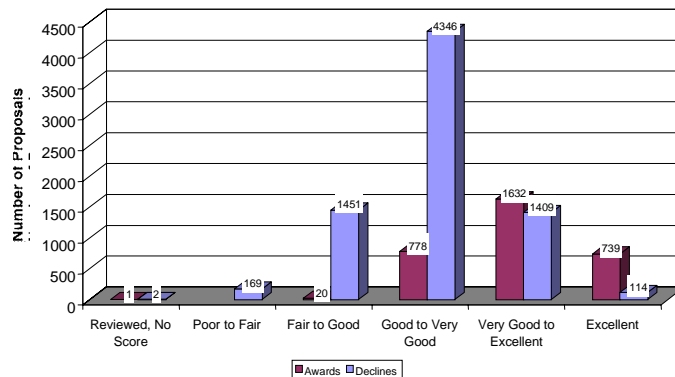
Number of FY 2000 Proposals -- 9,369 Declines, 3,518 Awards

### Distribution of Average Reviewer Ratings Mail Reviewed



Number of FY 2000 Proposals -- 2,635 Declines, 2,016 Awards

### Distribution of Average Reviewer Ratings Mail and Panel Reviewed



Number of FY 2000 Proposals -- 7,491 Declines, 3,170 Awards

**Appendix Table 8**

**Requests for Formal Reconsideration of Declined Proposals  
By Directorate, FY 1995 - 2000**

		Fiscal Year					
		1995	1996	1997	1998	1999	2000
First Level Reviews (by Assistant Directors):							
BIO	Request	4	3	4	6	4	0
	- Upheld	4	3	2	6	4	0
	- Reversed	0	0	2	0	0	0
CISE	Request	3	1	2	3	1	2
	- Upheld	3	1	2	3	1	1
	- Reversed	0	0	0	0	0	0
	- Pending	0	0	0	0	0	1
EHR	Request	3	8	4	6	3	4
	- Upheld	3	8	4	5	3	4
	- Reversed	0	0	0	1	0	0
ENG	Request	3	5	9	5	4	6
	- Upheld	3	5	9	4	4	6
	- Reversed	0	0	0	0	0	0
GEO	Request	5	4	2	2	2	2
	- Upheld	5	4	2	2	1	2
	- Reversed	0	0	0	0	0	0
MPS	Request	18	20	17	25	20	18
	- Upheld	17	19	15	22	19	17
	- Reversed	1	1	2	2	0	1
SBE	Request	2	1	2	3	0	1
	- Upheld	2	1	1	3	1	1
	- Reversed	0	0	0	0	0	0
Other	Request	0	4	0	0	0	0
	- Upheld	0	4	0	0	0	0
	- Reversed	0	0	0	0	0	0
Second Level Reviews (by Deputy Director):							
O/DD	Request	11	7	4	3	2	6
	- Upheld	10	7	4	3	1	5
	- Reversed	0	0	0	0	0	1
<b>Total Reviews First &amp; Second Level:</b>							
<b>NSF</b>	<b>Request</b>	<b>38</b>	<b>46</b>	<b>39</b>	<b>53</b>	<b>36</b>	<b>41</b>
	<b>- Upheld</b>	<b>37</b>	<b>45</b>	<b>34</b>	<b>48</b>	<b>34</b>	<b>38</b>
	<b>- Reversed</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>2</b>
	<b>- Pending</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>

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

Source: Office of the Director

**Appendix Table 9  
Small Grants for Exploratory Research (SGER)  
Proposals, Awards and Funding Rates  
By Directorate, FY 1993 – 2000**

		Fiscal Year								<i>Eight-year</i>	<i>Eight-year</i>
		1993	1994	1995	1996	1997	1998	1999	2000	<i>Total</i>	<i>Average</i>
NSF	Proposals	309	258	228	205	244	302	277	317	2,140	268
	Awards	213	185	168	144	194	250	223	272	1,649	206
	Funding Rate	69%	72%	74%	70%	80%	83%	81%	86%	77%	77%
BIO	Proposals	80	63	56	50	44	59	48	61	461	58
	Awards	57	39	40	28	29	48	36	46	323	40
	Funding Rate	71%	62%	71%	56%	66%	81%	75%	75%	70%	70%
CSE	Proposals	15	11	18	22	23	21	24	28	162	20
	Awards	11	9	18	19	23	20	22	27	149	19
	Funding Rate	73%	82%	100%	86%	100%	95%	92%	96%	92%	92%
EHR	Proposals	9	5	5	1	7	9	15	26	77	10
	Awards	9	5	5	1	6	8	14	26	74	9
	Funding Rate	100%	100%	100%	100%	86%	89%	93%	100%	96%	96%
ENG	Proposals	94	83	65	59	68	95	89	81	634	79
	Awards	67	61	52	45	57	72	75	72	501	63
	Funding Rate	71%	73%	80%	76%	84%	76%	84%	89%	79%	79%
GEO	Proposals	41	36	28	27	40	56	44	51	323	40
	Awards	37	33	22	23	38	54	40	45	292	37
	Funding Rate	90%	92%	79%	85%	95%	96%	91%	88%	90%	90%
MPS	Proposals	44	42	35	27	32	17	33	22	252	32
	Awards	17	25	16	12	13	10	16	12	121	15
	Funding Rate	39%	60%	46%	44%	41%	59%	48%	55%	48%	48%
SBE	Proposals	28	12	15	14	19	30	16	31	165	21
	Awards	17	8	9	11	18	25	12	28	128	16
	Funding Rate	61%	67%	60%	79%	95%	83%	75%	90%	78%	78%
OPP	Proposals	7	11	11	6	11	15	8	17	69	10
	Awards	7	10	11	6	10	13	8	16	65	9
	Funding Rate	100%	91%	100%	100%	91%	87%	100%	94%	94%	94%

**Source:** NSF Enterprise Information System, as of December 18, 2000.

**Appendix Table 10  
Small Grants for Exploratory Research (SGER)  
Funding Trends by Directorate, FY 1998 – 2000**

		Fiscal Year			% of 2000 Current Plan
		1998	1999	2000	
<b>NSF</b>	Total \$	\$12,320,200	\$12,293,477	\$15,725,176	0.6%
	Awards	250	223	272	
	Average \$	\$ 49,281	\$ 55,128	\$ 57,813	
<b>BIO</b>	Total \$	\$2,496,514	\$1,984,457	\$2,553,923	0.6%
	Awards	48	36	46	
	Average \$	\$ 52,011	\$ 55,124	\$ 55,520	
<b>CSE</b>	Total \$	\$1,330,556	\$1,739,513	\$1,634,881	0.4%
	Awards	20	22	27	
	Average \$	\$ 66,528	\$ 79,069	\$ 60,551	
<b>EHR</b>	Total \$	\$597,469	\$971,346	\$2,326,298	0.3%
	Awards	8	14	26	
	Average \$	\$ 74,684	\$ 69,382	\$ 89,473	
<b>ENG</b>	Total \$	\$4,080,144	\$4,371,965	\$4,757,413	1.3%
	Awards	72	75	72	
	Average \$	\$ 56,669	\$ 58,293	\$ 66,075	
<b>GEO</b>	Total \$	\$2,143,438	\$1,464,750	\$1,929,147	0.4%
	Awards	54	40	45	
	Average \$	\$ 39,693	\$ 36,619	\$ 42,870	
<b>MPS</b>	Total \$	\$497,735	\$908,436	\$767,216	0.1%
	Awards	10	16	12	
	Average \$	\$ 49,774	\$ 56,777	\$ 63,935	
<b>SBE</b>	Total \$	\$661,043	\$534,126	\$878,781	0.6%
	Awards	25	12	28	
	Average \$	\$ 26,442	\$ 44,511	\$ 31,385	
<b>O/D</b>	Total \$	\$513,301	\$318,884	\$877,517	0.7%
	Awards	13	8	16	
	Average \$	\$ 39,485	\$ 39,861	\$ 54,845	

**Source:** NSF Enterprise Information System, as of December 18, 2000.

## Appendix Table 11

### Committee of Visitors Meetings By Directorate

(COV meetings held during FY 2000 are highlighted in bold font)

Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
Biological Sciences	
<i>Biological Infrastructure</i>	
<b>Instrumentation &amp; Related Activities</b>	<b>2000</b>
<b>Research Resources (new)</b>	<b>2000</b>
Training (new)	<b>2000</b>
Plant Genome	
<i>Environmental Biology</i>	
Ecological Studies	1999
<b>Systematic &amp; Population Biology</b>	<b>2000</b>
<i>Integrative Biology &amp; Neuroscience</i>	
Neuroscience	1999
<b>Developmental Mechanisms</b>	<b>2000</b>
Physiology & Ethnology	1998
<i>Molecular &amp; Cellular Biosciences</i>	
<b>Biomolecular Structure &amp; Function</b>	<b>2000</b>
<b>Biomolecular Processes</b>	<b>2000</b>
Cell Biology	1998
Genetics	1999



Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
<p>Computer and Information Science and Engineering</p> <p><i>Advanced Computational Infrastructure and Research</i> Advanced Computational Research Partnerships for Advanced Computational Infrastructure Large Scientific and Software Data Set Visualization Terascale Computing System (one time only)</p> <p><i>Computer-Computation Research</i> <b>Communications</b> <b>Computer Systems Architecture</b> <b>Design Automation</b> <b>Numeric, Symbolic &amp; Geometric Computation</b> <b>Operating Systems and Compilers</b> <b>Signal Processing Systems</b> <b>Software Engineering and Languages</b> <b>Theory of Computing</b></p> <p><i>Information and Intelligent Systems</i> <b>Computation and Social Systems</b> Human Computer Interaction Knowledge &amp; Cognitive Systems Robotics &amp; Human Augmentation Information and Data Management Special Projects</p> <p><i>Advanced Networking Infrastructure and Research (was NSFNET)</i> <b>Networking Research</b> Special Projects in Networking Research (new in 1998) <b>Advanced Networking Infrastructure</b></p> <p><i>Experimental and Integrative Activities</i> Experimental Partnerships Research Infrastructure Advanced Distributed Resources for Experiments (new in 1998) Minority Institutions Infrastructure Digital Government (new in 1998) Instrumentation Grants for Research Education Innovation Next Generation Software (new in 1998) **CISE Postdoctoral Research Associates **NSF-CONACyT Collaborative Research ***Collaborative Research on Learning Technologies ***Combined Research-Curriculum Development</p>	<p>1998 1999</p> <p><b>2000</b> <b>2000</b> <b>2000</b> <b>2000</b> <b>2000</b> <b>2000</b> <b>2000</b> <b>2000</b></p> <p><b>2000</b> 1999 1999 1999 1999</p> <p><b>2000</b> <b>2000</b> <b>2000</b></p> <p>1996 1995  1995  1999 1995</p>

\*\*EIA monitored, managed/reviewed by Division in Partnership with Engineering  
 \*\*\*In partnership with EHR

Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
<p>Education and Human Resources</p> <p><i>Educational Systemic Reform</i>            Statewide Systemic Initiatives            Urban Systemic Initiatives            Rural Systemic Initiatives            Urban Systemic Programs  <b>EPSCoR</b></p> <p><i>Elementary, Secondary &amp; Informal Education</i>            Informal Science Education  <b>Teacher Enhancement</b>            Instructional Materials Development  <b>Presidential Awards for Excellence in Mathematics</b></p> <p><i>Undergraduate Education</i>  <b>Teacher Preparation</b>  <b>Advanced Technological Education</b>  <b>Course, Curriculum, and Laboratory Improvement (new in 1997)</b></p> <p><i>Graduate Education</i>            Graduate Research Fellowships            NATO Postdoctorate Fellowships            Presidential Fellowships for Science, Math, Engineering and Technology            Education (new in 1997)            IGERT            GK-12 Fellows</p> <p><i>Human Resource Development</i>            The Louis Stokes Alliances for Minority Participation            Centers for Research Excellence In Science and Technology  <b>Programs for Gender Equity in SMET</b>  <b>Programs for Persons with Disabilities</b>            Alliances for Graduate Education and the Professoriate (AGEP)            Historically Black Colleges and Universities (new in 1998)</p> <p><i>Research, Evaluation &amp; Communication</i>            Research on Education Policy &amp; Practice (new in 1996)  <b>Evaluation</b></p>	<p></p> <p>1997 1999 1997</p> <p><b>1996</b></p> <p>1998 <b>2000</b> 1997 <b>2000</b></p> <p><b>2000</b> <b>2000</b> <b>2000</b></p> <p>1999 1997</p> <p>1998 1997 <b>2000</b> <b>2000</b></p> <p><b>2000</b></p>

Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
<p>Engineering</p> <p><i>Bioengineering &amp; Environmental Systems</i>  Biochemical Engineering  Ocean Systems  Biotechnology  Biomedical Engineering  Research to Aid the Disabled  Environmental Engineering  Environmental Technology</p> <p><i>Civil &amp; Mechanical Systems</i>  Dynamic System Modeling, Sensing and Control  Geotechnical and GeoHazard Systems  Infrastructure and Information Systems  Solid Mechanics and Materials Engineering  Structural Systems and Engineering  Network for Earthquake Engineering Simulation(new in FY 2000)</p> <p><i>Chemical &amp; Transport Systems</i>  <b>Chemical Reaction Processes</b>  <b>Interfacial, Transport &amp; Separation Processes</b>  <b>Fluid, Particulate &amp; Hydraulic Systems</b>  <b>Thermal Systems</b></p> <p><i>Design, Manufacture &amp; Industrial Innovation</i>  <b>Operations Research &amp; Production Systems</b>  <b>Design &amp; Integrated Engineering</b>  <b>Manufacturing Processes &amp; Equipment</b>  Small Business Innovation Research  <b>Innovation &amp; Organizational Change</b>  <b>Grant Opportunities for Academic Liaison with Industry</b>  <b>Small Business Technology Transfer</b></p> <p><i>Electrical &amp; Communications Systems</i>  Electronics, Photonics and Device Technologies  Control, Networks, and Computational Intelligence  Integrative Systems  Resource and Infrastructure</p> <p><i>Engineering, Education &amp; Centers</i>  Engineering Education  Human Resource Development  Engineering Research Centers  Industry/Univ. Cooperative Research Centers</p>	<p>1999</p> <p>2000 2000 2000 2000</p> <p>2000 2000 2000 1998 2000 2000 2000</p> <p>1996 1996 1996 1996</p> <p>1998 1998 1998 1998</p>

Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
Geosciences	
<i>Atmospheric Sciences</i>	
- <i>Lower Atmospheric Research Section</i>	
Atmospheric Chemistry	1998
Climate Dynamics	1998
Meoscale Dynamic Meteorology	1998
Large-scale Dynamic Meteorology	1998
Physical Meteorology	1998
Paleoclimate	
- <i>Upper Atmospheric Research Section</i>	
<b>Magnetospheric Physics</b>	<b>1999</b>
<b>Aeronomy</b>	<b>1999</b>
<b>Upper Atmospheric Research Facilities</b>	<b>1999</b>
<b>Solar Terrestrial Research</b>	<b>1999</b>
UCAR and Lower Atmospheric Facilities Oversight (includes NCAR)	1997
<i>Earth Sciences</i>	
- <i>Research Grants</i>	
Tectonics	1998
Geology & Paleontology	1998
Hydrological Sciences	1998
Petrology & Geochemistry	1998
- <i>Special Projects</i>	
Education & Human Resources	1997
Instrumentation & Facilities	1997
Continental Dynamics	1998
Geophysics	1998
<i>Ocean Sciences</i>	
- <i>Oceanographic Centers &amp; Facilities</i>	
Ship Operations	1994
Oceanographic Facilities	1994
Ocean Drilling	1994
Oceanographic Instrumentation & Technical Service	1994
- <i>Ocean Science Research</i>	
Marine Geology & Geophysics	1998
Biological Oceanography	1998
Chemical Oceanography	1998
Physical Oceanography	1998
Oceanographic Technology & Interdisciplinary Coordination	1998

Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
<p>Mathematical and Physical Sciences</p> <p><i>Astronomical Sciences</i></p> <p><b>Planetary Astronomy</b> 1999</p> <p><b>Stellar Astronomy &amp; Astrophysics</b> 1999</p> <p><b>Galactic Astronomy</b> 1999</p> <p><b>Education, Human Resources and Special Programs</b> 1999</p> <p><b>Gemini Telescopes Project</b> 1999</p> <p><b>National Optical Astronomy Observatories (NOAO)</b> 1999</p> <p><b>Advanced Technologies &amp; Instrumentation</b> 1999</p> <p><b>National Radio Astronomy Observatory (NRAO)</b> 1999</p> <p><b>National Astronomy &amp; Ionosphere Center (NAIC)</b> 1999</p> <p><b>University Radio Facilities</b> 1999</p> <p><b>Electromagnetic Spectrum Management</b> 1999</p> <p><b>Extragalactic Astronomy and Cosmology</b> 1999</p> <p><i>Chemistry</i></p> <p>Special Projects 1998</p> <p>Chemical Instrumentation 1998</p> <p>Organic &amp; Macromolecular Chemistry 1998</p> <p>Organic Dynamics 1998</p> <p>Organic Synthesis 1998</p> <p>Physical Chemistry 1998</p> <p>Theoretical and Computational Chemistry 1998</p> <p>Experimental Physical Chemistry 1998</p> <p>Inorganic, Bioinorganic &amp; Organometallic Chemistry 1998</p> <p>Analytical &amp; Surface Chemistry 1998</p> <p><i>Materials Research</i></p> <p><b>Condensed Matter Physics</b> 1999</p> <p><b>Materials Theory</b> 1999</p> <p><b>Metals, Ceramics &amp; Electronic Materials</b> 1999</p> <p><b>Solid-State Chemistry &amp; Polymers</b> 1999</p> <p>National Facilities &amp; Instrumentation 1999</p> <p><b>Materials Research Science and Engineering Centers</b> 1999</p> <p><i>Mathematical Sciences</i></p> <p>Applied Mathematics 1998</p> <p>Infrastructure 1998</p> <p>Geometric Analysis, Topology &amp; Foundations 1998</p> <p>Analysis 1998</p> <p>Algebra &amp; Number Theory 1998</p> <p>Statistics &amp; Probability 1998</p> <p><i>Physics</i></p> <p>Atomic, Molecular and Optical and Plasma Physics 1997</p> <p>Elementary Particle Physics 1997</p> <p>Theoretical Physics 1997</p> <p>Nuclear Physics 1997</p> <p>Gravitational Physics 1997</p>	

Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
<p>Social, Behavioral and Economic Science</p> <p><b><i>International Programs</i></b></p> <p><i>Science Resource Studies (SRS)</i></p> <p><i>Social, Behavioral &amp; Economic Research</i></p> <ul style="list-style-type: none"> <li>- <i>Economic, Decision &amp; Mgt. Sciences Cluster</i> <ul style="list-style-type: none"> <li>Economics 1997</li> <li>Decision, Risk &amp; Management Sciences 1997</li> <li>Innovation and Organizational Change (new in 1998)</li> </ul> </li> <li>- <i>Anthropology &amp; Geographic Sciences Cluster</i> <ul style="list-style-type: none"> <li><b>Cultural Anthropology 1999</b></li> <li><b>Physical Anthropology 1999</b></li> <li><b>Archeology 1999</b></li> <li><b>Geography 1999</b></li> </ul> </li> <li>- <i>Social &amp; Political Science Cluster</i> <ul style="list-style-type: none"> <li>Sociology 1996</li> <li>Political Science 1997</li> <li>Law &amp; Social Science 1995</li> </ul> </li> <li>- <i>Infrastructure, Methods &amp; Science Studies Cluster</i> <ul style="list-style-type: none"> <li>Ethics &amp; Values Studies 1996</li> <li>Science &amp; Technology Studies 1996</li> <li>Methodology, Measurement &amp; Statistics 1996</li> </ul> </li> <li>- <i>Cognitive, Psych. &amp; Language Sci. Cluster</i> <ul style="list-style-type: none"> <li><b>Linguistics 1999</b></li> <li><b>Human Cognition &amp; Perception 1999</b></li> <li><b>Social Psychology 1999</b></li> </ul> </li> </ul>	

Directorate <i>Division</i> Programs	Fiscal Year of Most Recent COV
Office of Polar Program	
<i>Polar Research Support</i>	
Polar Operations	1998
Science Support	1998
Waste Management	1998
Facilities	1998
Safety & Health	1998
<i>Antarctic Sciences</i>	
Aeronomy and Astrophysics	1997
Biology and Medicine	1997
Geology and Geophysics	1997
Glaciology	1997
Ocean and Climate Systems	1997
<i>Arctic Sciences</i>	
System Sciences	1997
Natural Sciences	1997
Social Sciences	1997

