



# Impact of Proposal and Award Management Mechanisms Report

## Advisory Committee Discussions

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# What is the Context?

- Between FY 2000-2005:
  - The NSF budget increased by 44%.
  - The average size of research awards increased by 41%.
  - Research proposal submissions increased by nearly 50%.
- NSF budget increases were absorbed by the growth in the average award size. As a result, the research proposal funding rate decreased by 29%, from 30% to 21%.
- Directorate level trends show significant variability in rate of change, degree of change, and starting and end points of change.

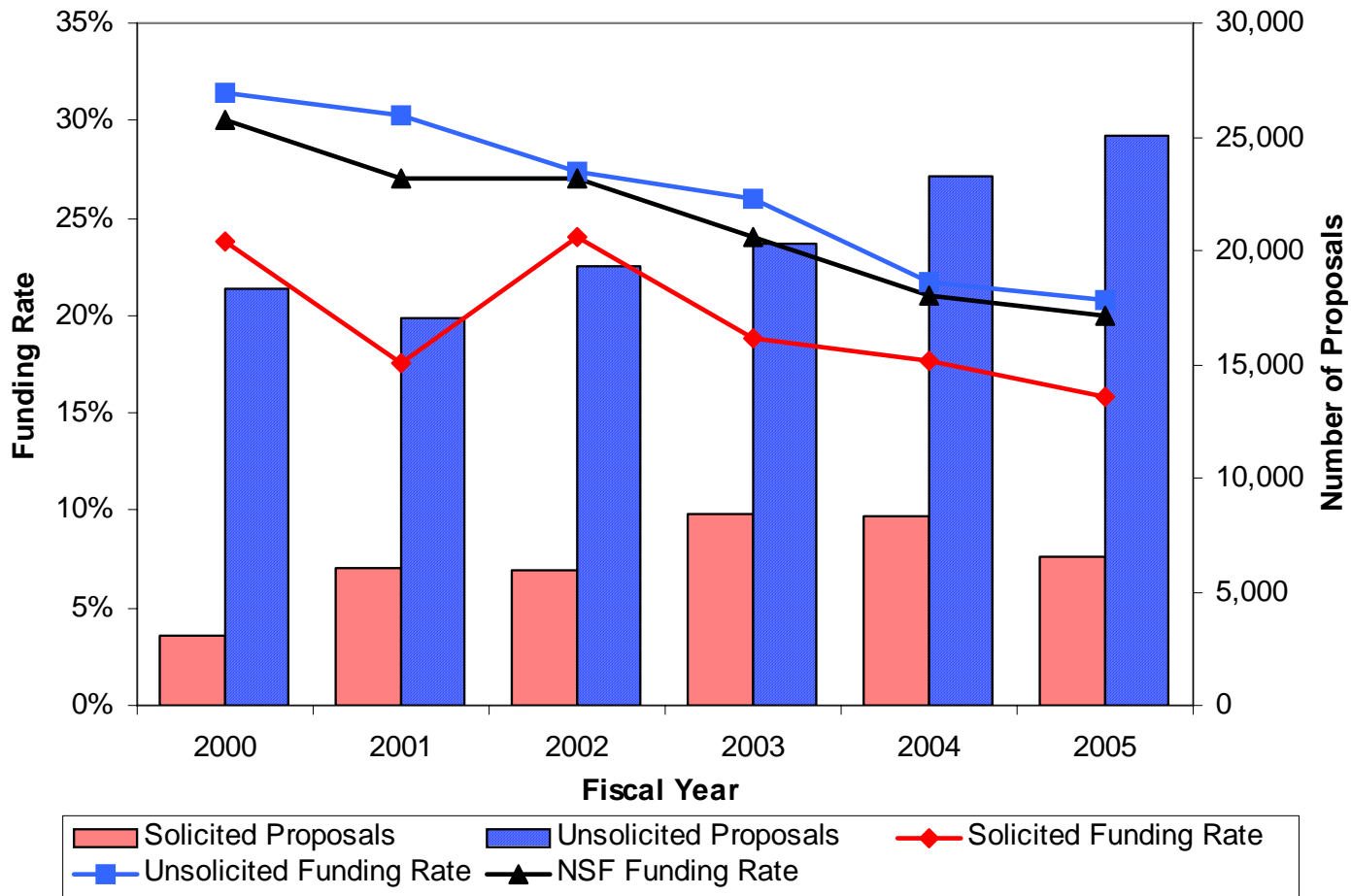


# Findings: Causal Factors

- The increase in proposal submissions was due to an **increased applicant pool** and to an **increased number of proposals per applicant**.
  - Increased size and capacity of the research community
  - Loss of funding from other sources
  - Increased use by NSF of targeted solicitations in new areas
  - External institutional pressures



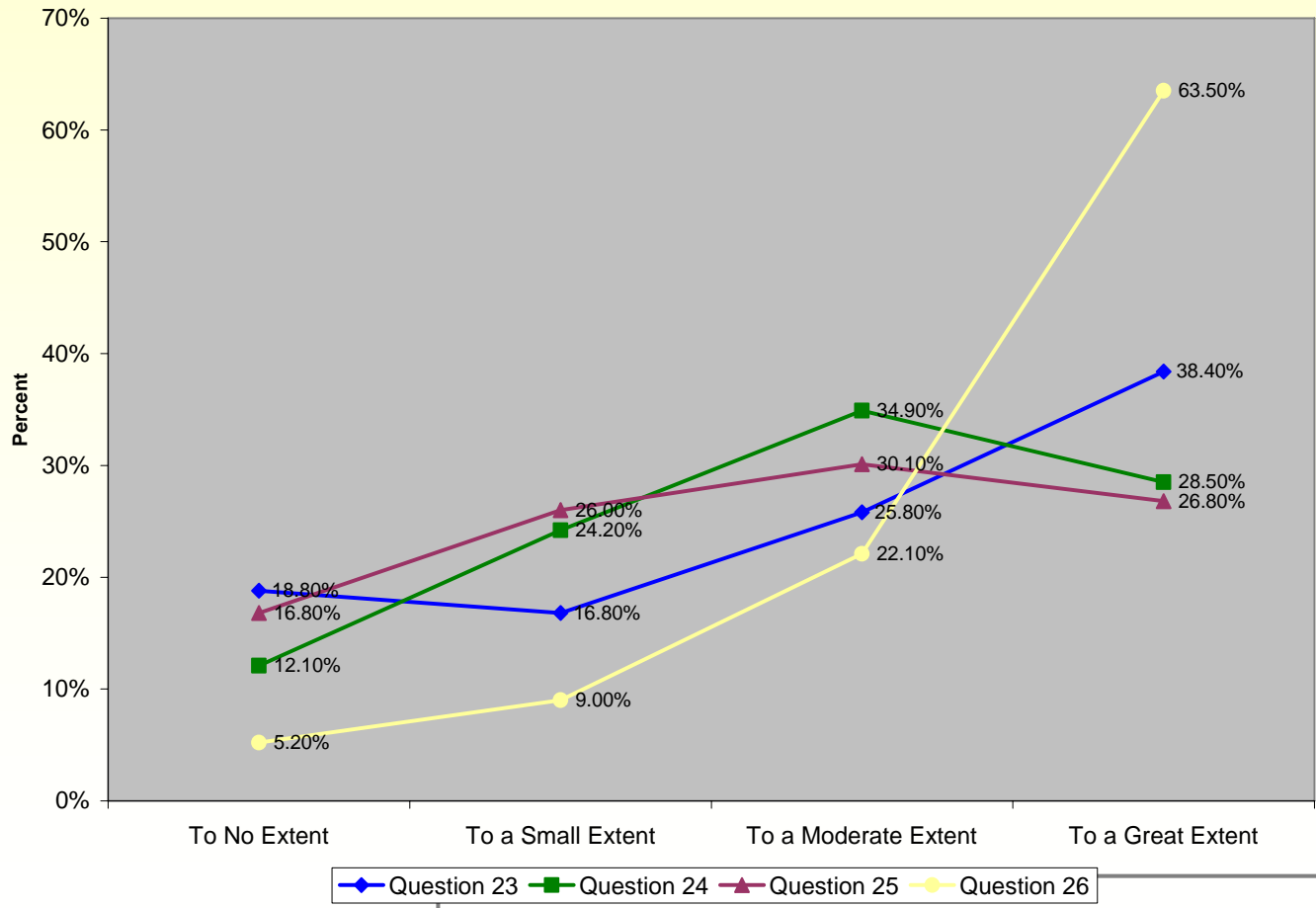
# Solicited vs. Unsolicited Proposal Trends





# External Institutional Pressures

**Beyond the goal of making contributions to your area of science, to what extent do the following factors motivate you to submit research proposals to any funding source?**



**Question 23:**  
*Building/maintaining a grant record for academic tenure/promotion*

**Question 24:**  
*Contributing to the institution's research status/reputation*

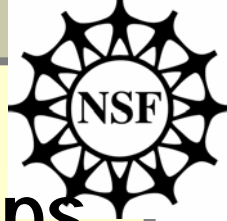
**Question 25:**  
*Supplementing or paying my own salary*

**Question 26:**  
*Building/maintaining a research infrastructure*



# Findings: Impacts on Quality and Nature of Proposed Research

- Proportion of highly-rated proposals has not declined. Funding rate of highly-rated proposals has decreased.
- Analyzed attitudinal data to assess community perceptions about transformative research:
  - 56% believe to a great or moderate extent that NSF welcomes transformative research
  - NSF is the predominant choice for submitting proposals with transformative research ideas
  - Significant disconnect between proposer and reviewer perceptions about prevalence of transformative projects



## Findings: Impacts on Specific Groups

- The decrease in funding rate has not had a disproportionate effect on women, minorities, beginning PIs, or PIs at particular types of institutions.
  - Funding rates
  - Share of proposal and award portfolios
  - Maintaining funding beyond first award
  - Years between degree and first award



# Findings: Impacts on Merit Review

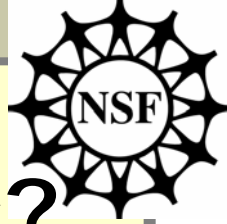
- NSF's peer review system is overstressed
  - Reviewer workloads have increased
    - Reviewer pool increased 15%, proposal load increased 50%
  - Increased use of panel-only review
  - Time spent on each review, as well as the thoroughness and quality of reviews, may be diminishing (based on survey data)
- Timeliness of proposal decisions did not decline, however PIs are increasingly dissatisfied with turnaround time





# Community Perceptions About Funding Rates

- More than 60% of survey respondents perceive that the level of competition at NSF is more intense than at other agencies.
- Most survey respondents underestimated actual funding rates.
  - Nearly 49% of respondents estimate funding rates at 10% or lower.



# How to Improve Funding Rates?

- Limit Proposal Submissions
- Increase Number of Awards



# Limit Proposal Submissions

- Most funding opportunities do not limit submissions
- Of those that do, three primary mechanisms are used:
  - Preliminary proposals
  - Limiting proposals submitted by an institution
  - Limiting proposals by individual



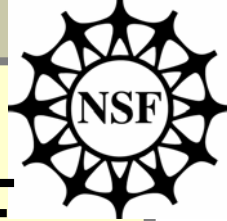
# Limit Proposal Submissions

- Institution limits primarily used for solicitations focused on infrastructure and instrumentation, centers and facilities, or education and training.
- When submission limits are used by research programs, primarily limit submissions by PI.



# Increase Number of Awards

- Primarily accomplished by increasing availability of funds:
  - Two fiscal years of funds used for a single competition
  - Adjustments made to the balance of standard and continuing grants
    - Provides some flexibility in responding to increased proposal submissions, but can only be employed for a limited time, and with discretion



# IPAMM Recommendations to NSF

- Focus on developing strategies that are appropriate within the context of each unit, that balance long-term planning with the ability to respond to changing needs, and that help break the decline-revise-resubmit cycle for highly fundable proposals
- Improve communications with internal and external communities
  - When implementing new management practices
  - About sources of accurate NSF data
- Update the IPAMM trends analyses annually, and periodically reassess the practices and policies of the directorates/research offices.



# Current Status

- NSF Senior Management currently engaged in discussions of recommendations
  - Implementation initiated on some recommendations
- Reaching out to NSF staff to discuss the findings of the report
- Reaching out to external communities to begin a dialogue on the implications of the report
  - Alerted the NSF community about the report
  - Discussed issues with the Federal Demonstration Partnership
  - Engaging the Advisory Committees this Fall





YOU ARE HERE

*"When we try to pick out anything  
by itself, we find it hitched to  
everything else in the universe."*

--John Muir





# Acknowledgements

## *IPAMM Members*

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## *Booz Allen Hamilton Survey Team:*

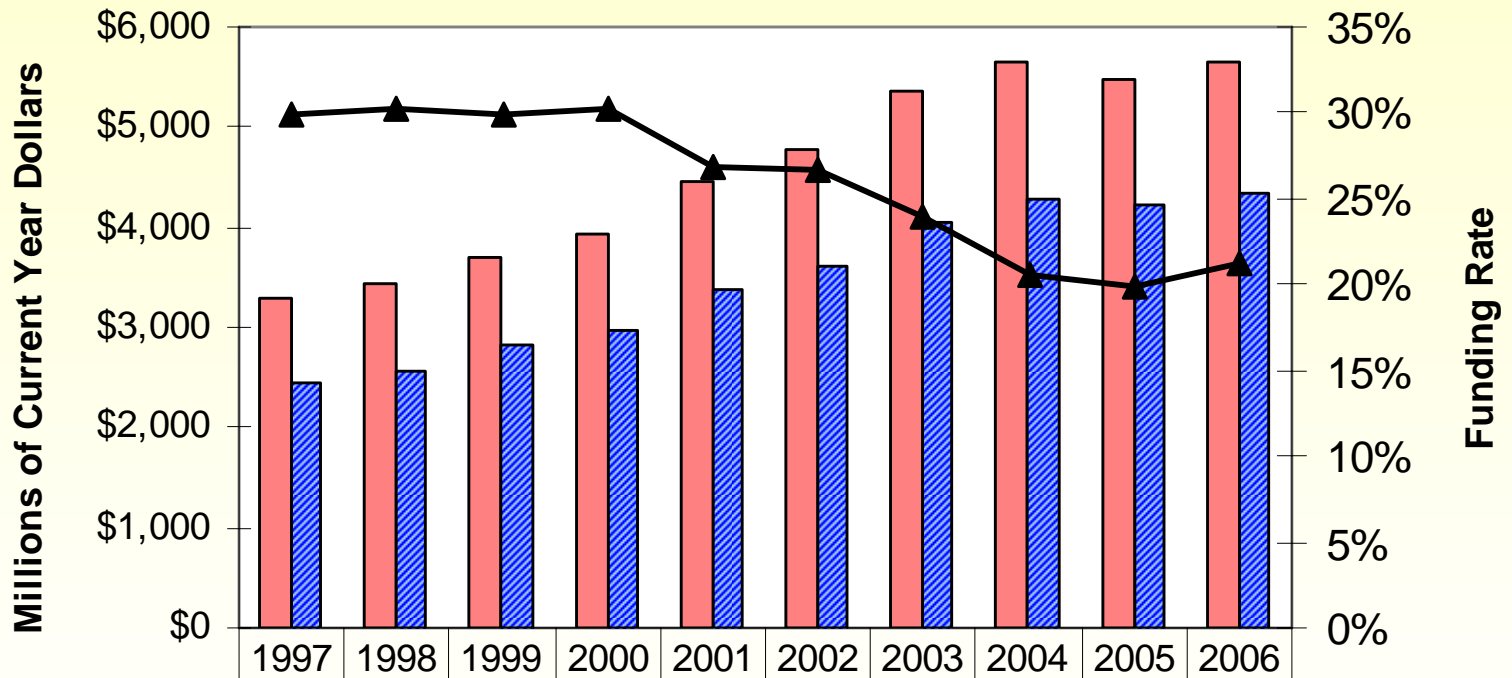
George Angerbauer, Michael  
Carrieri, Pat Corrigan, Mary Kay  
Gibbons, Chris Johnson, Keisha  
Kelly, and Luke Monck



# Back-Up Slides



# Research Proposal Funding Rate Drops as NSF Budget Increases



NSF Budget	3,298.	3,425.	3,690.	3,923.	4,459.	4,774.	5,369.	5,652.	5,480.	5,645.
R&RA Budget	2,433.	2,572.	2,821.	2,979.	3,372.	3,616.	4,054.	4,293.	4,234.	4,351.
Funding Rate	30%	30%	30%	30%	27%	27%	24%	21%	20%	21%

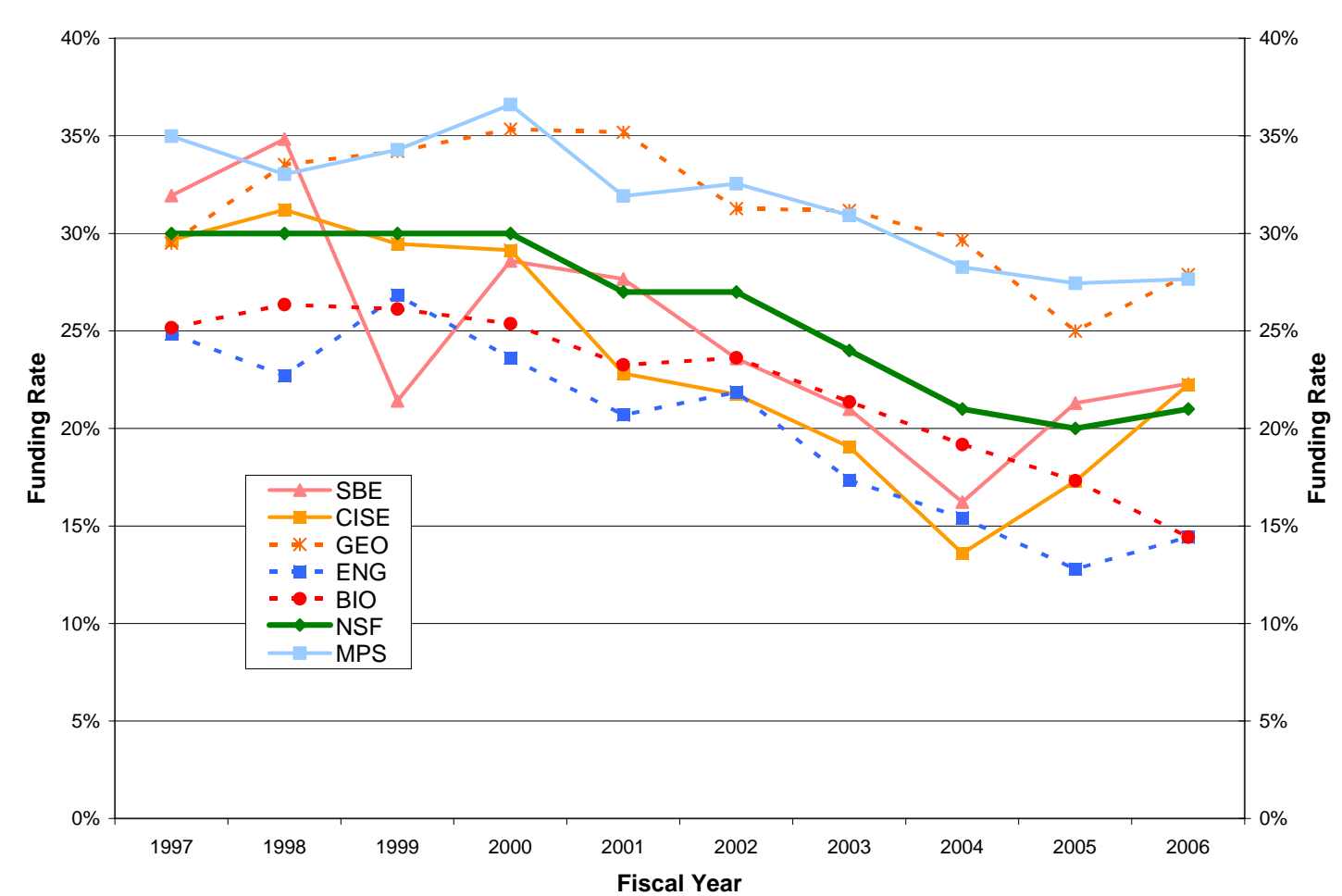


# Data Sources

- Statistical data
  - NSF data on proposal funding rates, PI success rates, budget data, demographic data
  - Science and Engineering Indicators
- Attitudinal data
  - 2007 NSF Proposer Survey developed with Booz Allen Hamilton
- Other input
  - Focus groups of new rotators, COV reports, discussions with Advisory Committees and the National Science Board

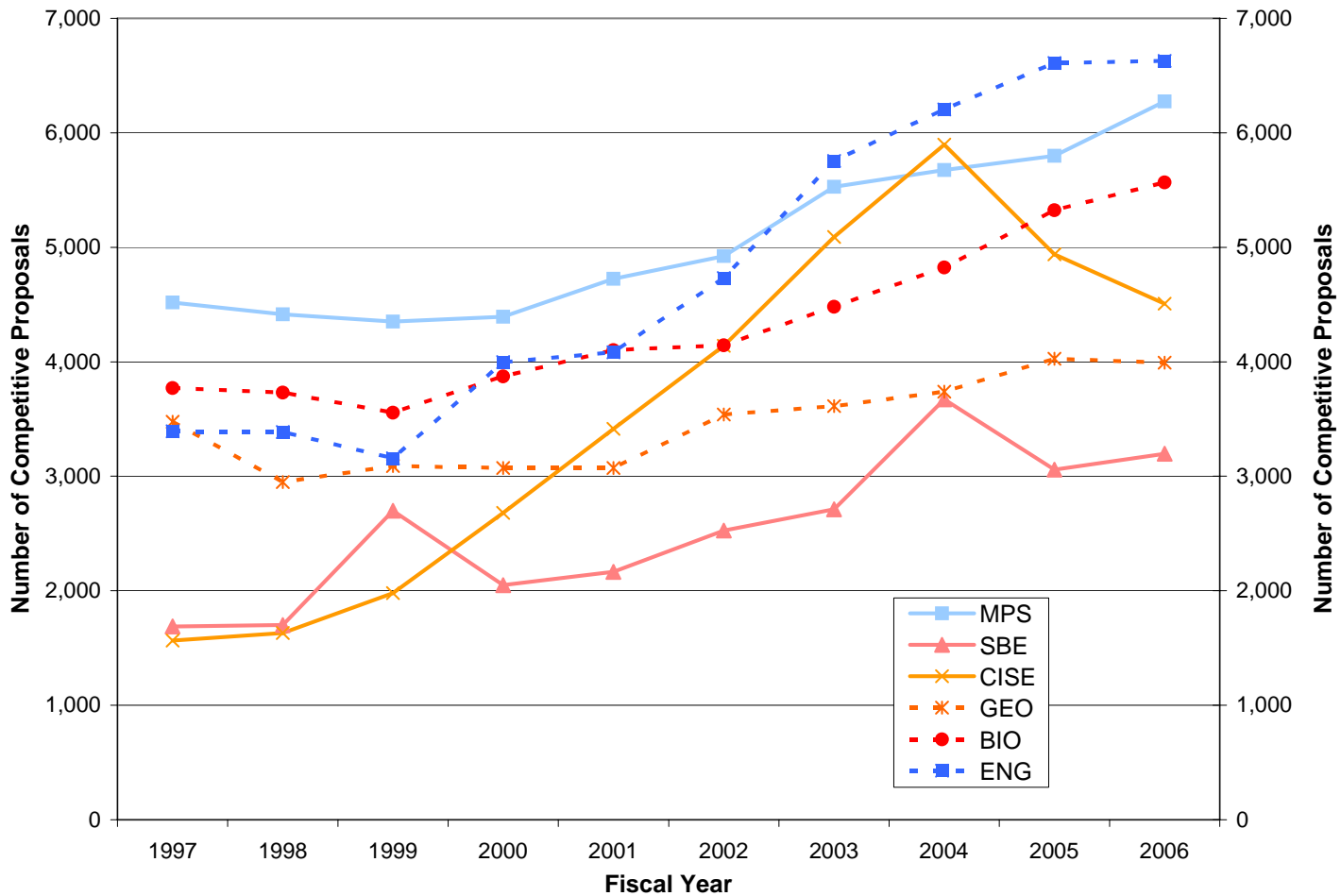


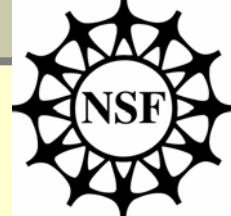
# Directorate Funding Rate Trends



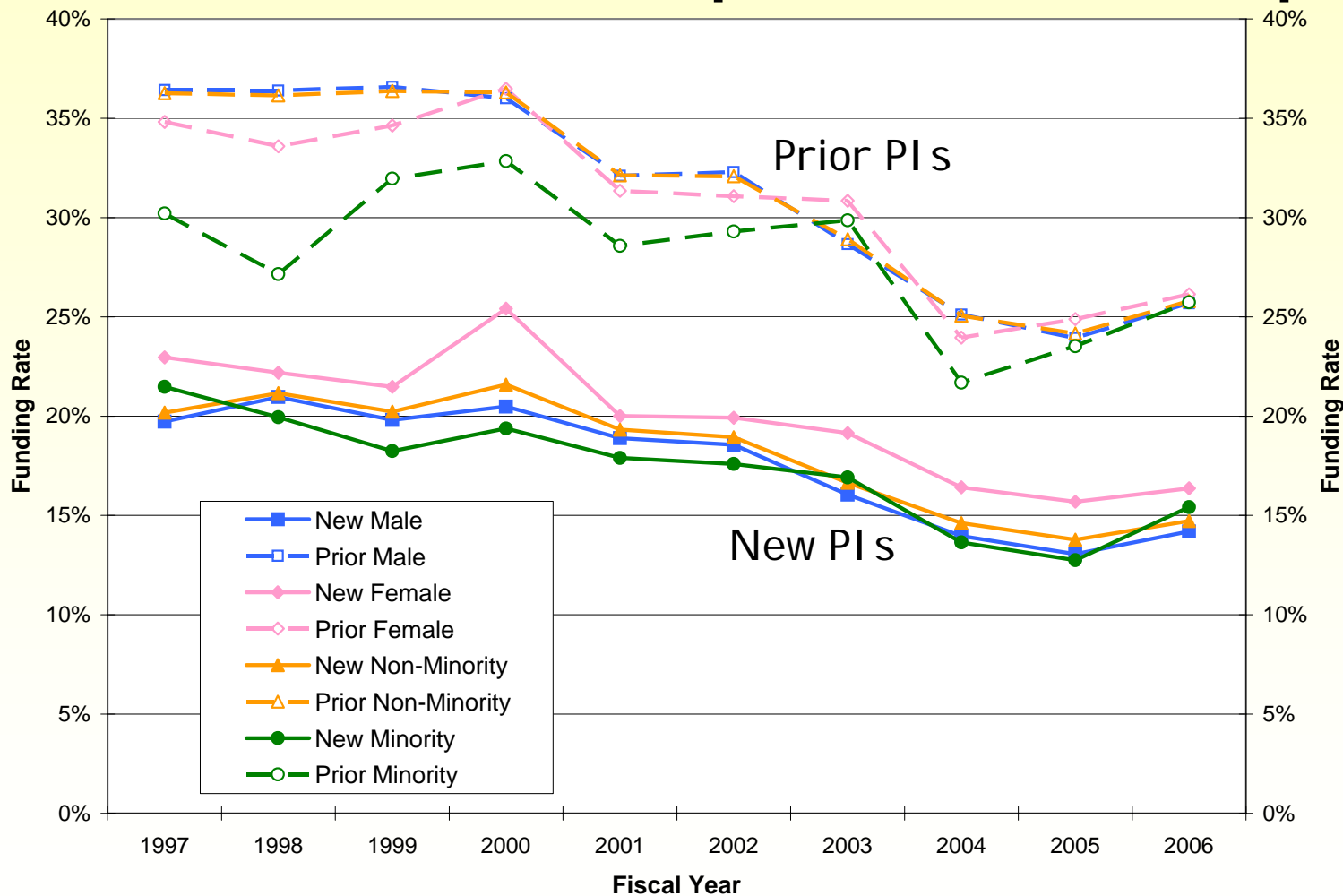


# Directorate Proposal Submission Trends





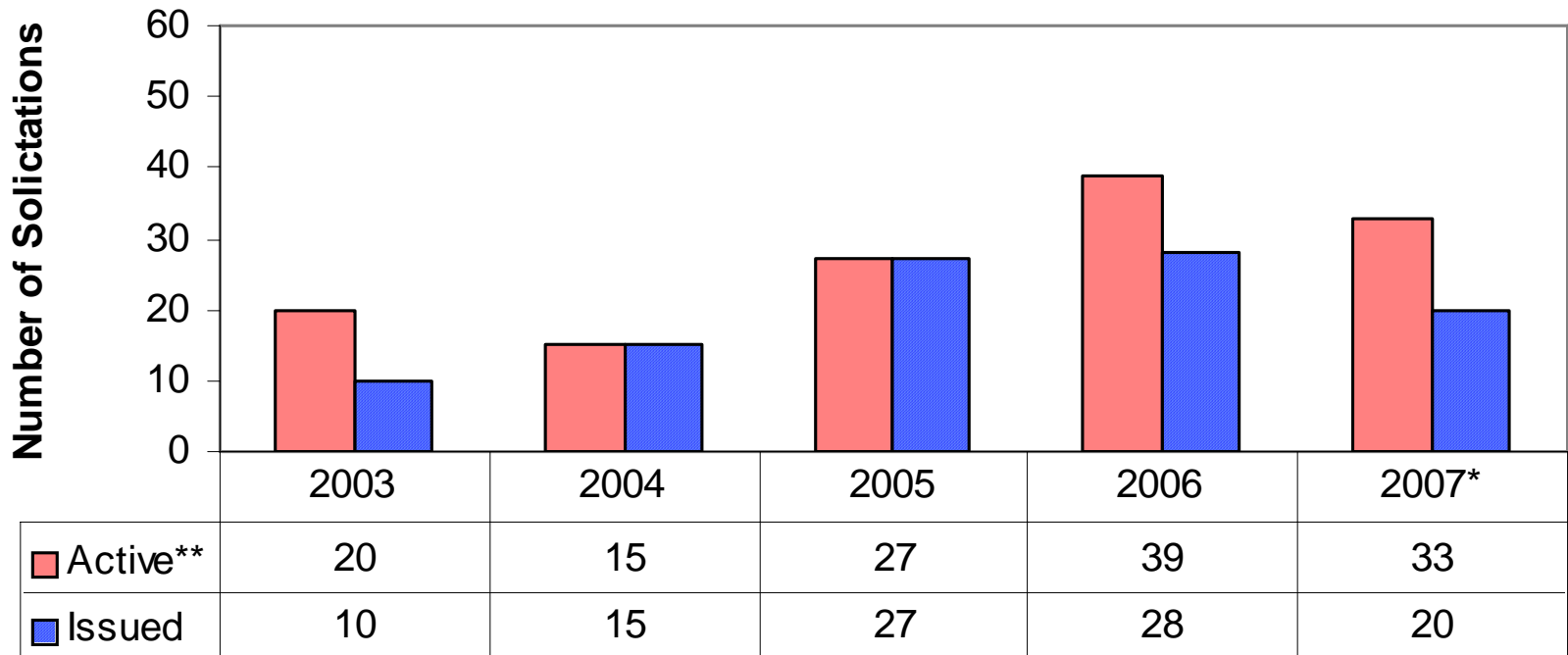
# Funding Rate Trends for New and Prior PIs in Underrepresented Groups





# Trends in Use of Submission Limitations

## A. Trends in the Use of Submission Limitations by Institution







# Trends in Use of Submission Limitations

## B. Trends in the Use of Submission Limitations by PI

