

# Presentation Outline

- I. NSF CAREER program info (overview)
- II. Broader Impacts Criterion What does it mean?
- III. Developing a CAREER proposal Some tips
- IV. Educational Plan
- V. Crafting the proposal budget

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# I. NSF CAREER Program Info

overview

# CAREER Award Program

NSF's program for new faculty

- ◆ Awardees are selected on the basis of their plans to develop highly integrative and effective research and education careers
- ◆ Proposal needs to incorporate both research and education and should be a departure from PhD and/or postdoc work

# CAREER Award Program

- ◆ Excerpts from the Program Solicitation:
  - “NSF established the CAREER program in recognition of the critical roles played by faculty members in **integrating research and education**, and in fostering the natural connections between the processes of learning and discovery.”
  - “The CAREER program embodies NSF’s commitment to encourage faculty to practice, and academic institutions to value, **integration of research and education**.”
  - “This **integration of research and education** requires close collaboration between the CAREER principal investigator and his/her organization throughout the award, laying the groundwork for fostering sustainability of integration efforts for both the PI and the organization.”

# CAREER Award Program

- ◆ Duration: 5 years
- ◆ Total Budget: “minimum” \$400K
- ◆ Eligibility:
  - Have a PhD as of submission date
  - Untenured, holding tenure-track Asst. Prof. position as of October 1 following submission
  - Have not competed in CAREER more than two times previously
  - Have not won a CAREER award
- ◆ Most recent solicitation:
- ◆ <http://www.nsf.gov/pubs/2008/nsf08557/nsf08557.htm>
- ◆ Highly competitive

# Components of a CAREER Proposal

- ✓ Cover Sheet
- ✓ Project Summary
- ✓ Project Description
- ✓ References
- ✓ Biographical Sketch
- ✓ Budget and Justification
- ✓ Current and Pending Support
- ✓ Facilities/Equipment/Other Resources
- ✓ Supplementary Documentation
  - ✓ Departmental Support Letter
  - ✓ Collaboration Letters

# Project Summary

- ◆ A single page that provides a self-contained description of the integrated research and education activities that are planned
- ◆ Clearly define your research hypothesis/hypotheses and how it/they will be tested
- ◆ Include a statement of objectives and methods
- ◆ MUST address in separate statements:
  - Intellectual Merit
  - Broader Impacts

**This may be the only page a reviewer reads if it is not impeccable!**

# Project Description

**The heart of your proposal** – fifteen pages to fully describe your integrated 5-year research and education plan.

**This plan should**

*“build a firm foundation for a lifetime of integrated contributions to research and education”*



# Project Description

## Components of the Project Description

- ◆ Proposed research project
  - Discussion of current state of the field
  - Preliminary supporting data
  - Specific objectives
  - Methods and procedures
  - Expected significance of results
- ◆ Proposed educational activities and plans to evaluate their impact
- ◆ Discussion of how research and educational activities are integrated
- ◆ Clearly defined sections addressing *Intellectual Merits* and *Broader Impacts*
- ◆ Results from Prior NSF support

***These can either be fully integrated or presented in two separate sections***

**The overall scope of the proposed activities should be something you can humanly accomplish in five years<sub>9</sub>..**

# Biographical Sketch

- ◆ Two pages that should list:
  - Professional Preparation
  - Appointments
  - Publications – only 10 can be listed
    - 5 closely related to proposal
    - 5 other significant
  - Synergistic Activities – broader impacts
  - Collaborators and Other Affiliations

◆ To help in selecting/eliminating reviewers  
*This will be reviewed to ensure you have the background required to conduct your proposed research!*

# Budget and Justification

- ◆ Roughly \$80K per year
  - 1-2 months of your salary
  - 1-2 graduate students
  - Typically no major equipment
- ◆ Contact your pre-award administrator for institutional requirements
- ◆ Justification – 3 pages, explain your budget in words
- ◆ Budget should align with and support research plan

# **CAREER: Award Duration and Size**

**5-year duration**

**Minimum award size of \$400,000**

**BIO minimum award size of  
\$500,000 for FY03**

**No maximum award size**

# Supplementary Documentation

1. Departmental Letter
2. Collaborator Letters

No reference letters allowed

These need to be scanned and uploaded to the Supplementary Documents section, not the Single Copy Documents Section.

**DO NOT SEND ORIGINALS TO NSF!**

# Departmental Letter

The departmental letter is an important component of the CAREER proposal package. This letter should indicate to the reviewers and NSF that your department supports your proposed research and educational activities.

- ◆ The letter should provide a description of how your CAREER project meshes with your career goals and the goals of the department
- ◆ The letter should clearly indicate how the department will support your efforts (reduced class loads, financial support, mentoring)
- ◆ This letter should provide verification that the PI is eligible for the CAREER program.

**Talk with your department head well in advance of the proposal submission date to ensure that he will write a good letter!**

# Why the departmental letter is required

- ◆ This **integration of research and education** requires close collaboration between the CAREER principal investigator and his/her organization throughout the award, laying the groundwork for fostering sustainability of integration efforts for both the PI and the organization

# Letter of Collaboration

- ◆ Short letters
- ◆ Commitment from collaborators
- ◆ Collaborators support activities described in proposal
  
- ◆ These should not be recommendation or reference letters!



# Logistics of Proposal Submission

- ◆ Proposals should be submitted using either Fastlane or Grants.gov
- ◆ Familiarize yourself with the proposal submission process at your institution
- ◆ About 1% of proposals returned un-reviewed
- ◆ CAREER proposal deadline is typically mid-July (July 18 this year)

# Proposal Review Process

- ◆ Proposals submitted to NSF are directed to a program officer.
- ◆ Proposals are sorted by topic area and based upon the range of topics, the project officer puts together a review panel.
- ◆ Typical review panel composition:
  - Faculty of all ranks
  - A wide range of areas of expertise
  - Each reviewer is usually assigned 10-12 proposals
  - Typically a reviewer will have technical expertise that closely matches ~50-60% of the proposals they are assigned
- ◆ **Expect that the 3-4 individuals who review your proposal to have variable levels of expertise in your research area**

# NSF merit review criteria

Intellectual merit  
Broader impacts

# Proposal Review Process

Proposals are evaluated using NSF's two merit review criteria:

- What is the *intellectual merit* of the proposed activity?
- What are the *broader impacts* of the proposed activity?

Reviewers are also asked to consider the capability of the applicant to make an **integrative contribution to both education and research** and to **integrate diversity** in all program activities.

# Intellectual Merit

- ◆ Importance in advancing understanding in a field
- ◆ Creativity and novelty of approach
- ◆ Qualifications of investigators
- ◆ Completeness of research plan
- ◆ Access to resources

# *What are the intellectual merits?*

- ◆ How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- ◆ How well qualified is the individual to conduct the project?
- ◆ To what extent does the proposed activity suggest & explore creative & original concepts?
- ◆ How well conceived and organized is the proposed activity?
- ◆ Is there sufficient access to resources?

# Broader Impacts

- ◆ Promotion of teaching and training
- ◆ Inclusion of under-represented minorities
- ◆ Enhancement of infrastructure and partnerships
- ◆ Dissemination of results
- ◆ Benefits to society

# *What are the broader impacts?*

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



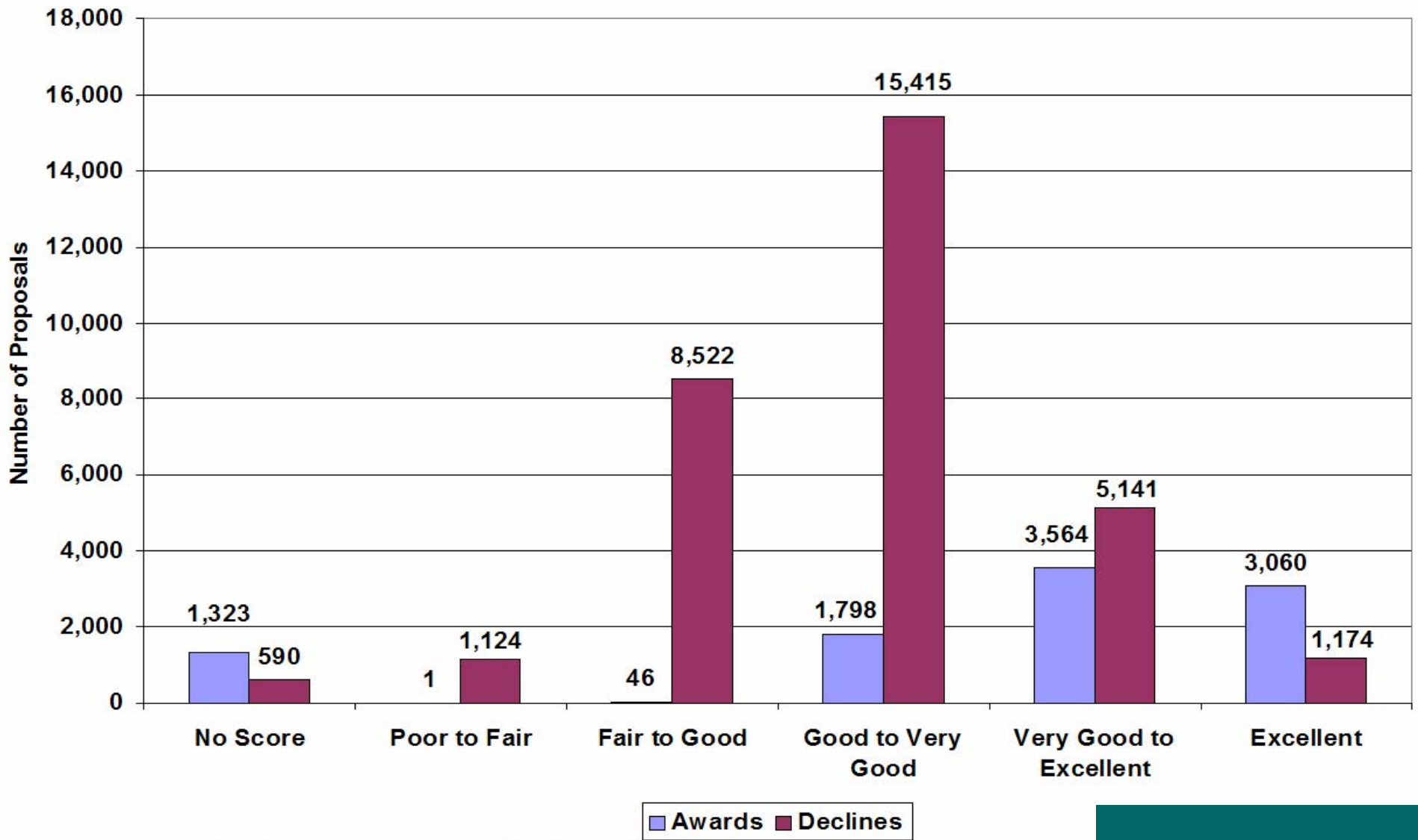
# Resources

- ◆ NSF web site: [www.nsf.gov](http://www.nsf.gov)
  - Info on divisions and programs
    - ◆ <http://www.nsf.gov/staff/orglist.jsp>
  - Tip to search within web site go to google and search: "keyword site:www.nsf.gov"
- ◆ NSF Grant Proposal Guide
  - <http://www.nsf.gov/pubsys/ods/getpub.cfm?gpg>
  - Gives requirements, formats, etc.
- ◆ Examples of Broader Impacts:  
[http://www.nsf.gov/pubs/2002/nsf022/bic\\_examples.pdf](http://www.nsf.gov/pubs/2002/nsf022/bic_examples.pdf)
- ◆ CAREER Web page
  - <http://www.nsf.gov/home/crssprgm/career/guide.htm>
  - Awards search and abstracts of funded proposals
  - <http://www.nsf.gov/awardsearch/tab.do?dispatch=4> for awards search
  - FAQs: <http://www.nsf.gov/pubs/2005/nsf05027/nsf05027.jsp><sub>25</sub>

# SUCCESS RATES

- ◆ Awards vs. “average grades”
- ◆ New PI vs. recently funded (renewal)
- ◆ New PI vs. CAREER
- ◆ CAREER various Directorates

# Distribution of Average Reviewer Ratings



# Award Statistics

## Distribution by experience

Approximately 30% new investigators

70% recently funded by NSF

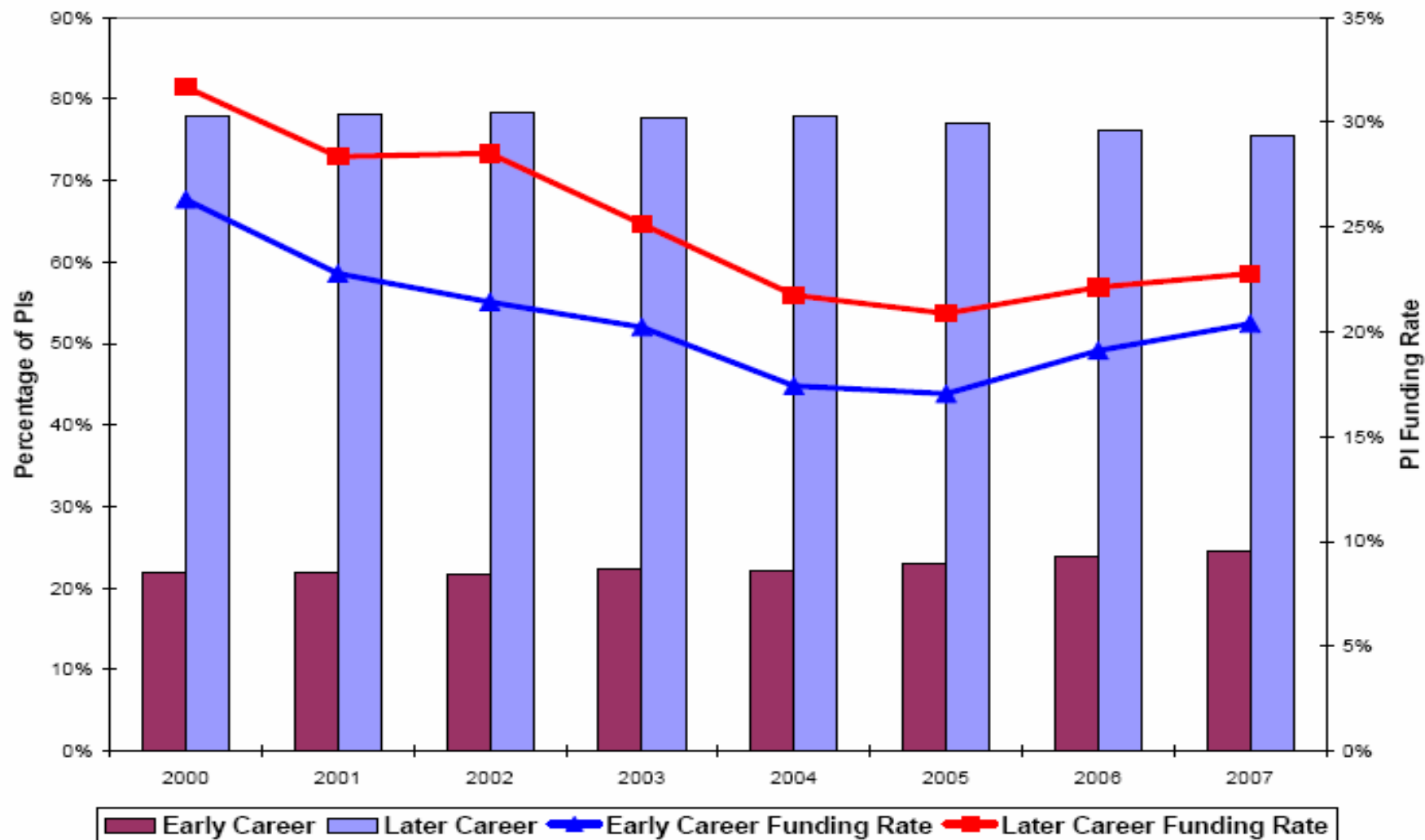
## Success rates

Unsolicited proposals about 10%

CAREER about 15%

Initiatives about 10% (varies widely)

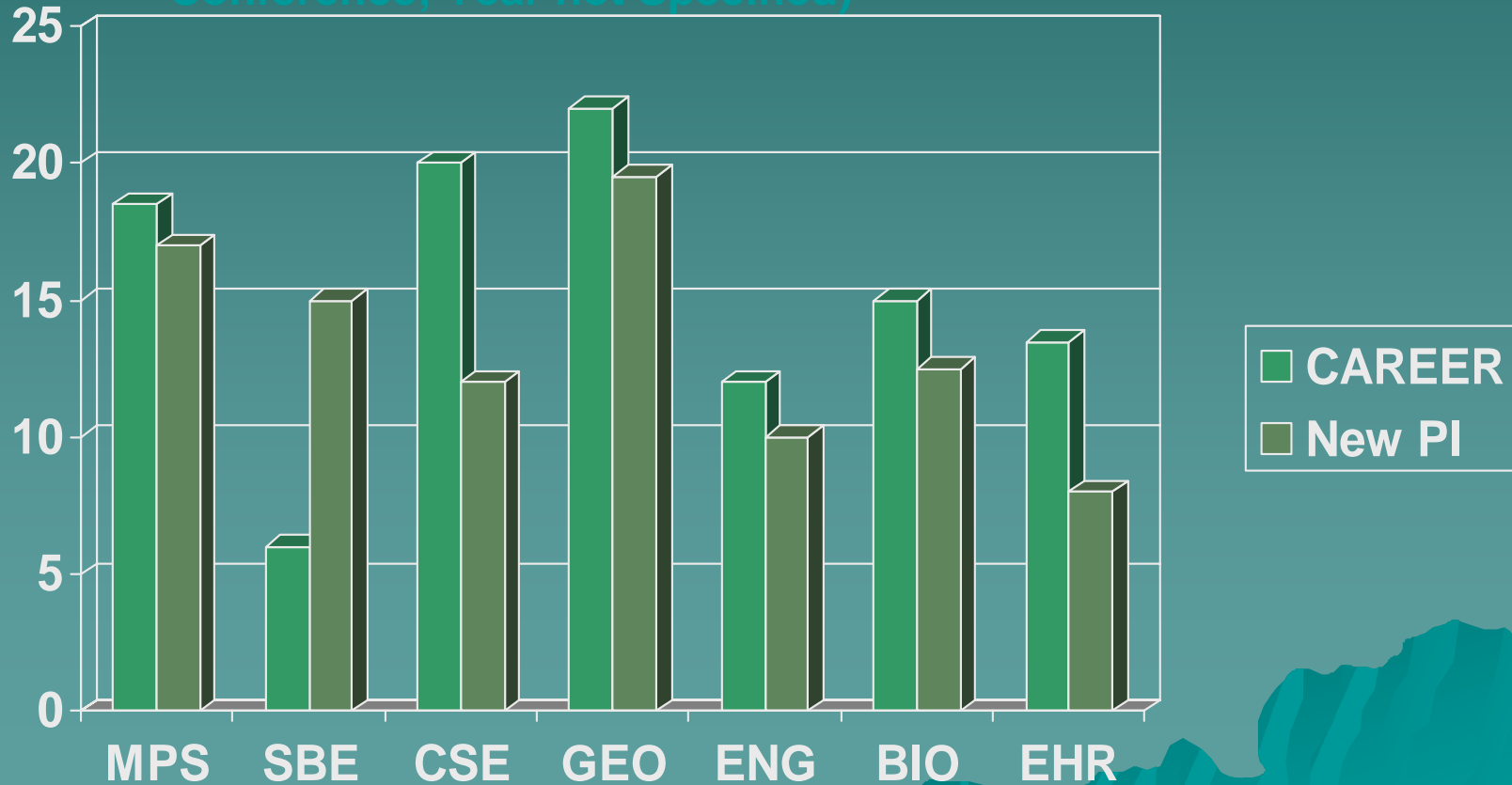
**Figure 17**  
**Percentage of Early & Later Career PIs & Research Grant Funding Rates**



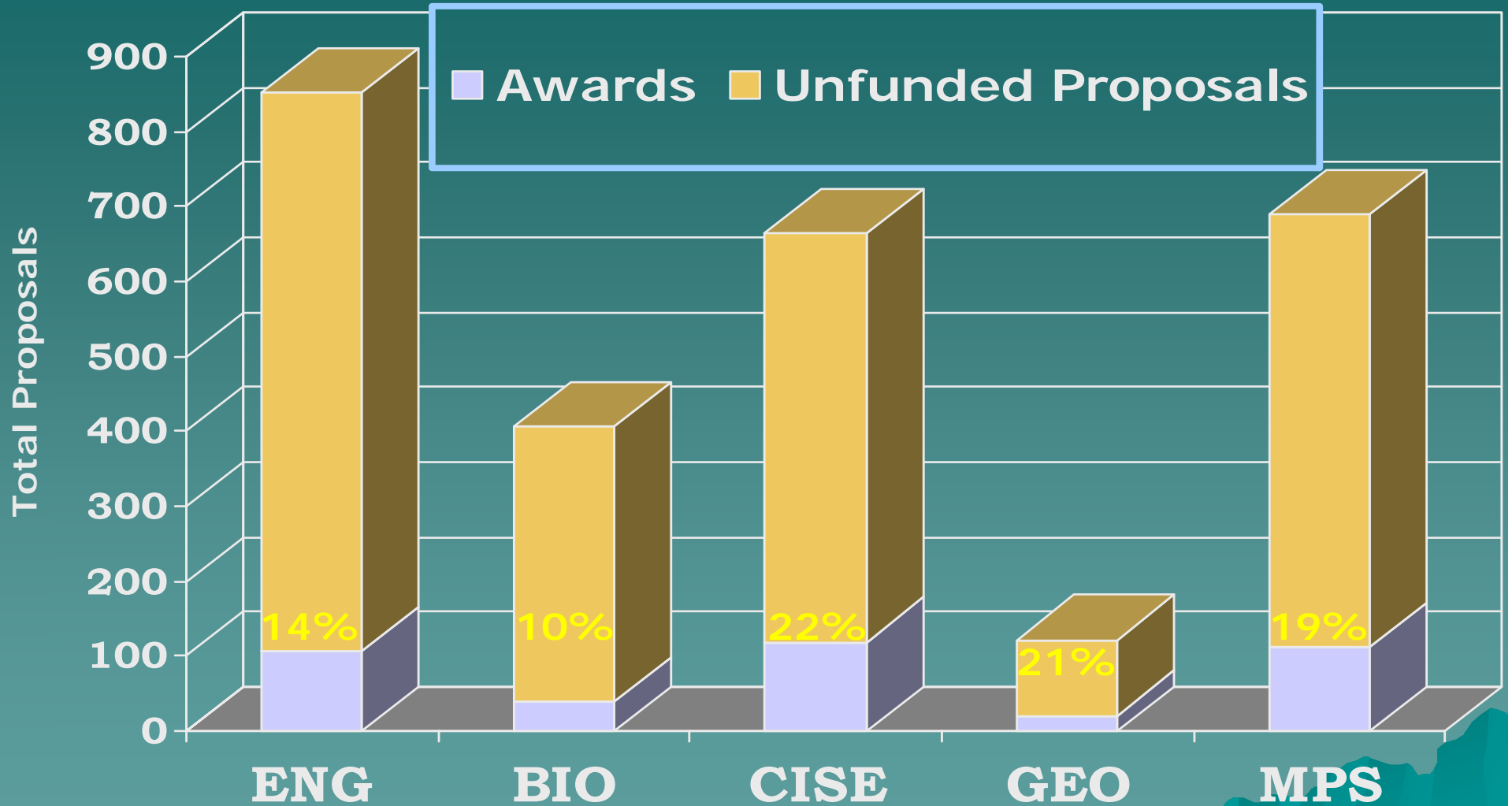
Source: NSF Enterprise Information System 10/2/07

# Success Rate for New Investigators: CAREER Compared to Other Awards

(From presentation at Fall 2007 NSF Regional Grants Conference; Year not Specified)



# CAREER Program Awards by Directorate FY 2006



Awards  
Declines

106  
747

38  
368

119  
545

21  
101

112  
577

# CAREER Success Rates and # of Awards

wards	Success Rates 2003	Numbers of Awards 2003	Numbers of Awards 2005 / 2006
MPS	24%	122	95 / 118
SBE	7%	14	/ 13
CISE	22%	119	110 / 128
GEO	29%	22	20 / 21
ENG	15%	104	81 / 121
BIO	17%	51	44 / 42
EHR	20%	10	/ 5

To search under particular program go to

<http://www.nsf.gov/awardsearch/tab.do?dispatch=4>



# Most recent NSF CAREER Statistics

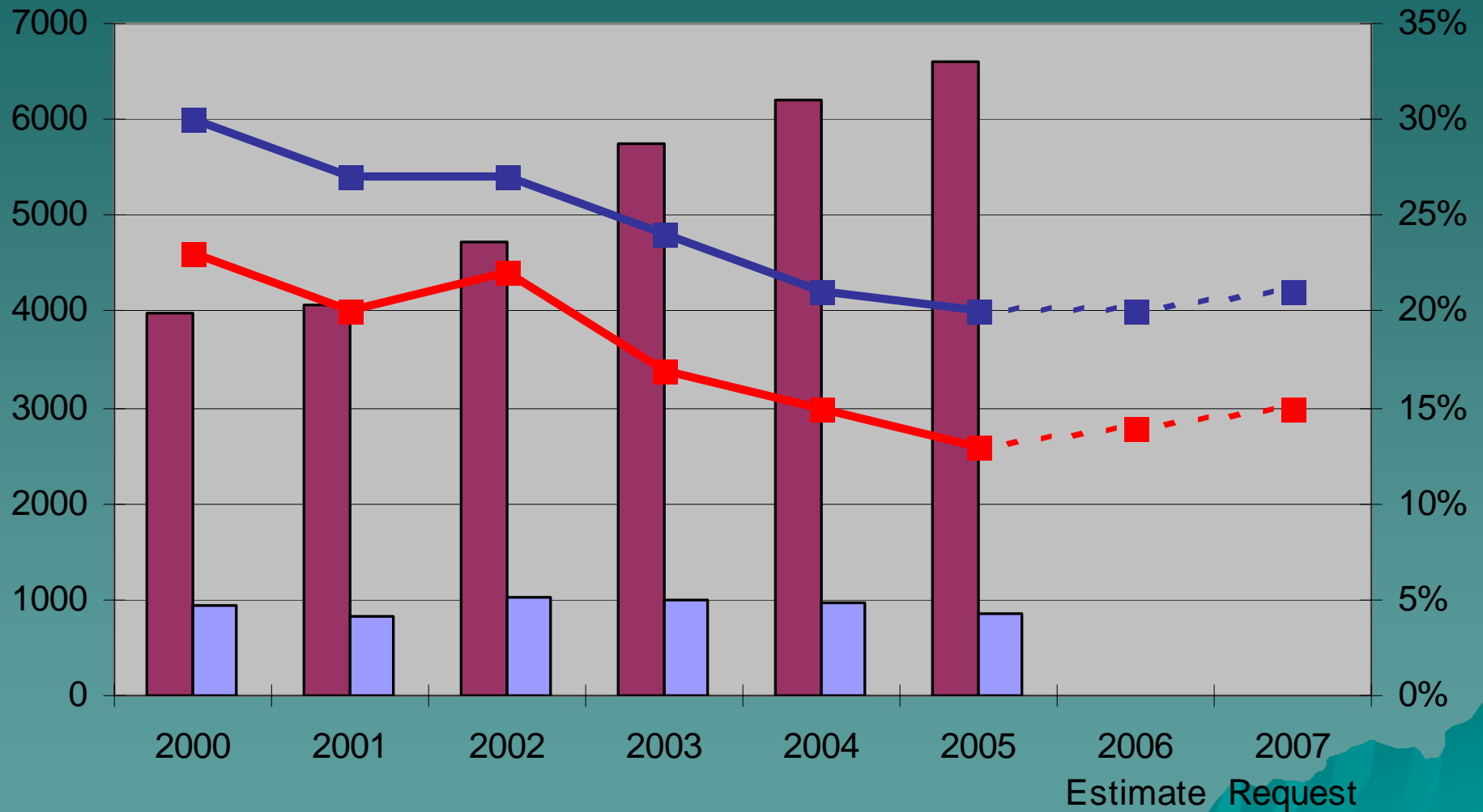
- ◆ In 2007
  - ~2600 proposals submitted
  - 458 awards made (18%)
- ◆ Success rate NSF-wide typically 15% - 23%; varies widely by directorate
- ◆ But remember you have three tries

# Success Rates for CAREERs 2006

<u>Directorate</u>	<u>Submitted</u>	<u>Awarded</u>	<u>%</u>
ENG	636	121	19%
MPS	461	118	26%
CISE	417	128	31%
BIO	346	42	12%
GEO	65	21	32%
EHR	36	5	14%
SBE	91	13	14%
	2600	448	17%

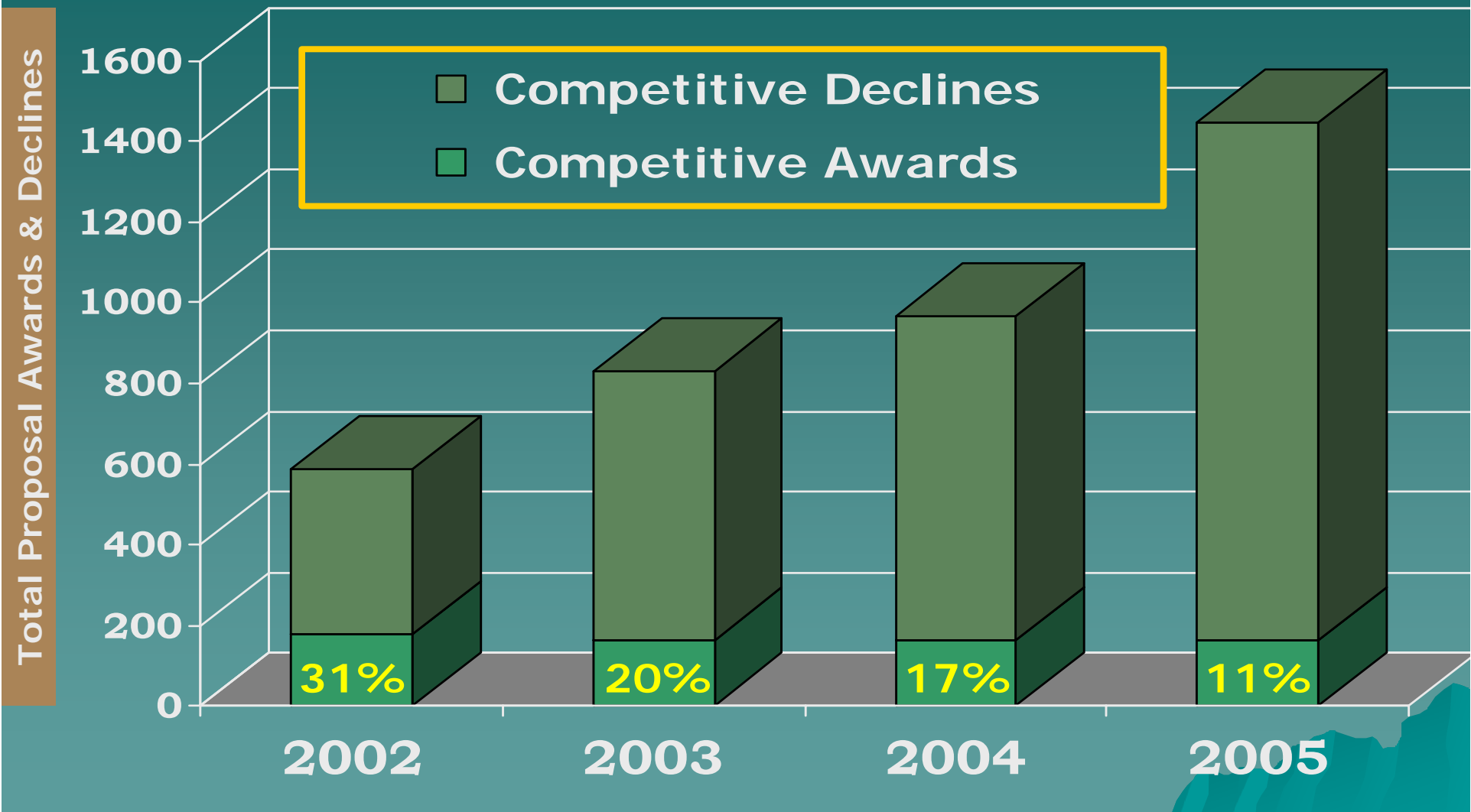
# ENG and NSF Funding Rates

## Research Grants



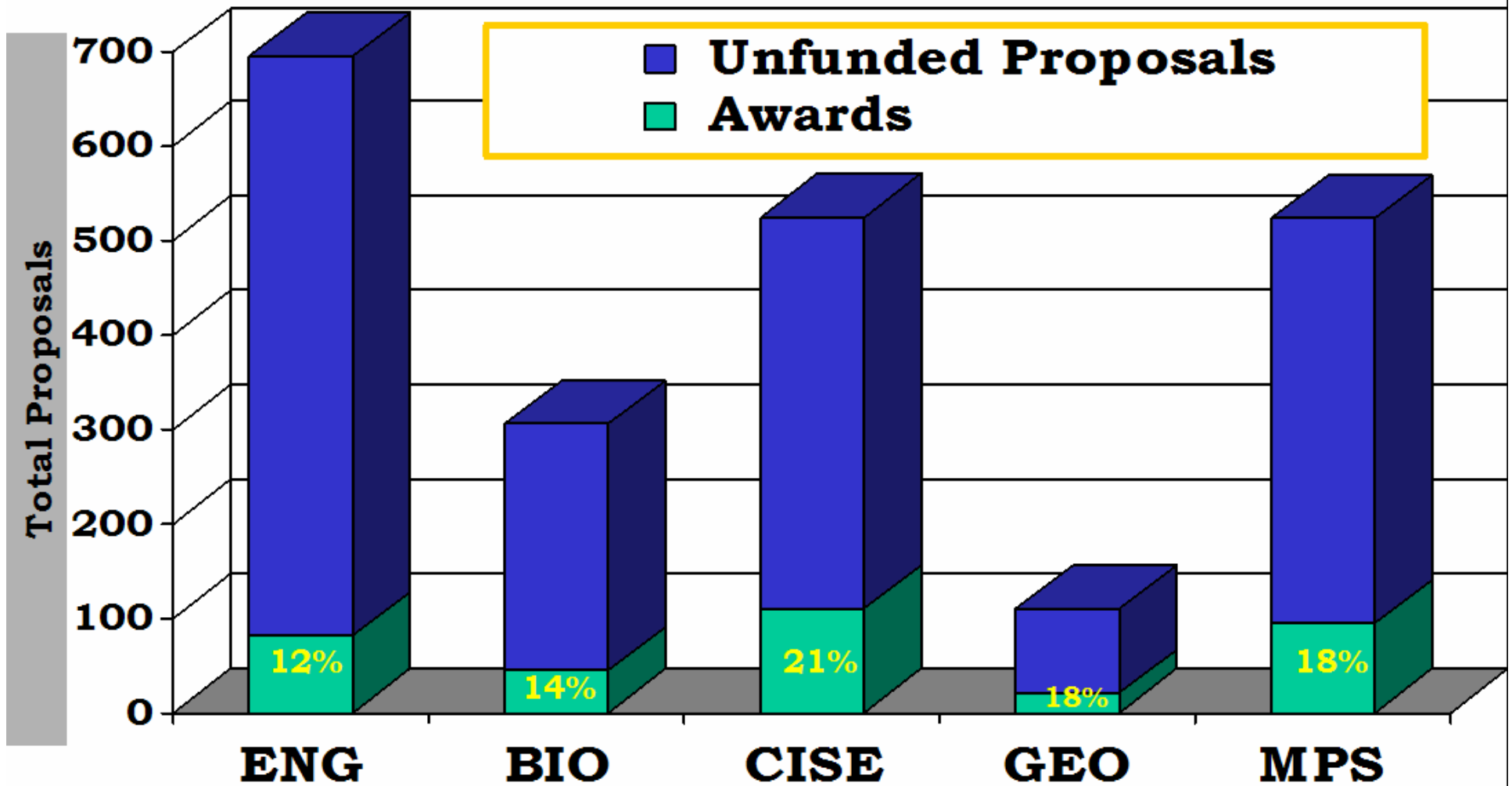
ENG Proposals    ENG Awards    ENG Funding Rate    NSF Funding Rate

# CTS Funding Rate for Competitive Awards



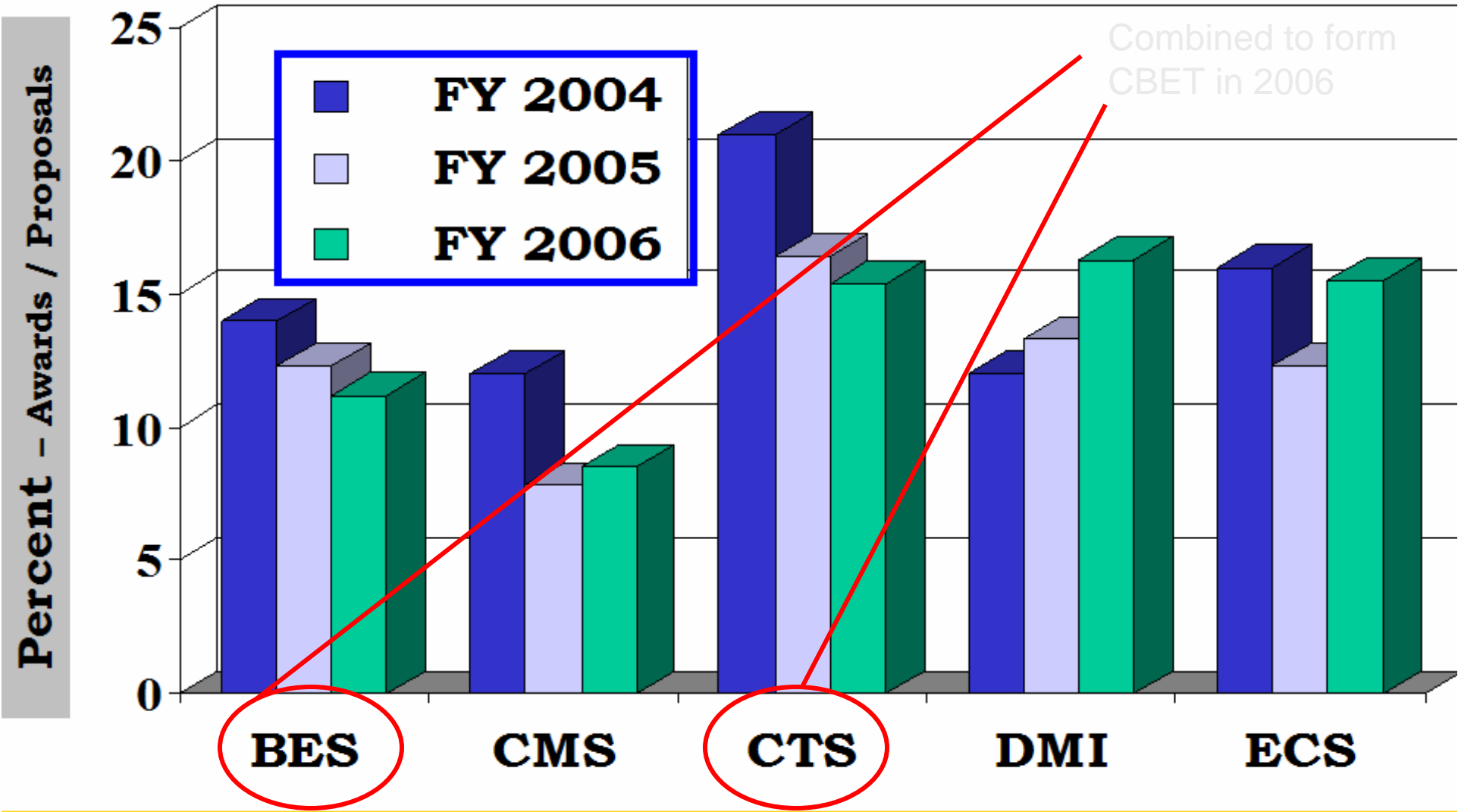
	2002	2003	2004	2005
<u>Declines</u>	<u>407</u>	<u>664</u>	<u>803</u>	<u>1286</u>
<u>Awards</u>	<u>179</u>	<u>166</u>	<u>163</u>	<u>162</u>

# CAREER Program Awards by Directorate FY 2005



<u>Awards</u>	<u>81</u>	<u>44</u>	<u>110</u>	<u>20</u>	<u>95</u>
<u>Proposals</u>	<u>694</u>	<u>306</u>	<u>524</u>	<u>110</u>	<u>523</u>

National Science Foundation Directorate for Engineering  
**CAREER Grant Award Success Rates**  
 FY 2004-2006



**Five Divisions**