How to get NSF funding: a view from the "inside"

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NSF Organizational Structure

- Discipline-based Directorates (7)
  - Biological Sciences
  - Computer & Information Sciences & Engineering
  - Education & Human Resources
  - Engineering
  - Geosciences
  - Mathematical & Physical Sciences
  - Social, Behavioral & Economic Sciences
- Divisions within each Directorate
  - Sections
    - Programs within Sections
    - **Program Directors (permanent & IPAs)**

Working with your Program Director

- What is the proper etiquette for dealing with program officers?
  - Funding decisions are based on many factors, but **not** on personal relationships with program directors
  - Program Officers should be treated as you would a respected colleague
  - They are very busy: contact them only when necessary (check the agency web site first) and in a way that allows for an efficient reply (email is preferred)
  - Do not contact them when you are upset (following a declination)

- Program directors are available to you for advice and appointments (conference booths, visits to NSF)
  - Do your homework before you meet with program officers, prepare specific questions
  - Program officers can help you find out about other programs and make contacts across the Foundation
- Program officers are your contacts for becoming a reviewer and panelist

Proposal Preparation

NSF Resources

- Grant Proposal Guide (GPG)
  www.nsf.gov/pubsys/ods/getpub.cfm?gpg

- NSF publication on broader impacts
  http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf.

- NSF HomePage -- Guide to Programs
  Program Announcements – eligibility, goals, special requirements

- Announcements – eligibility, goals, special requirements

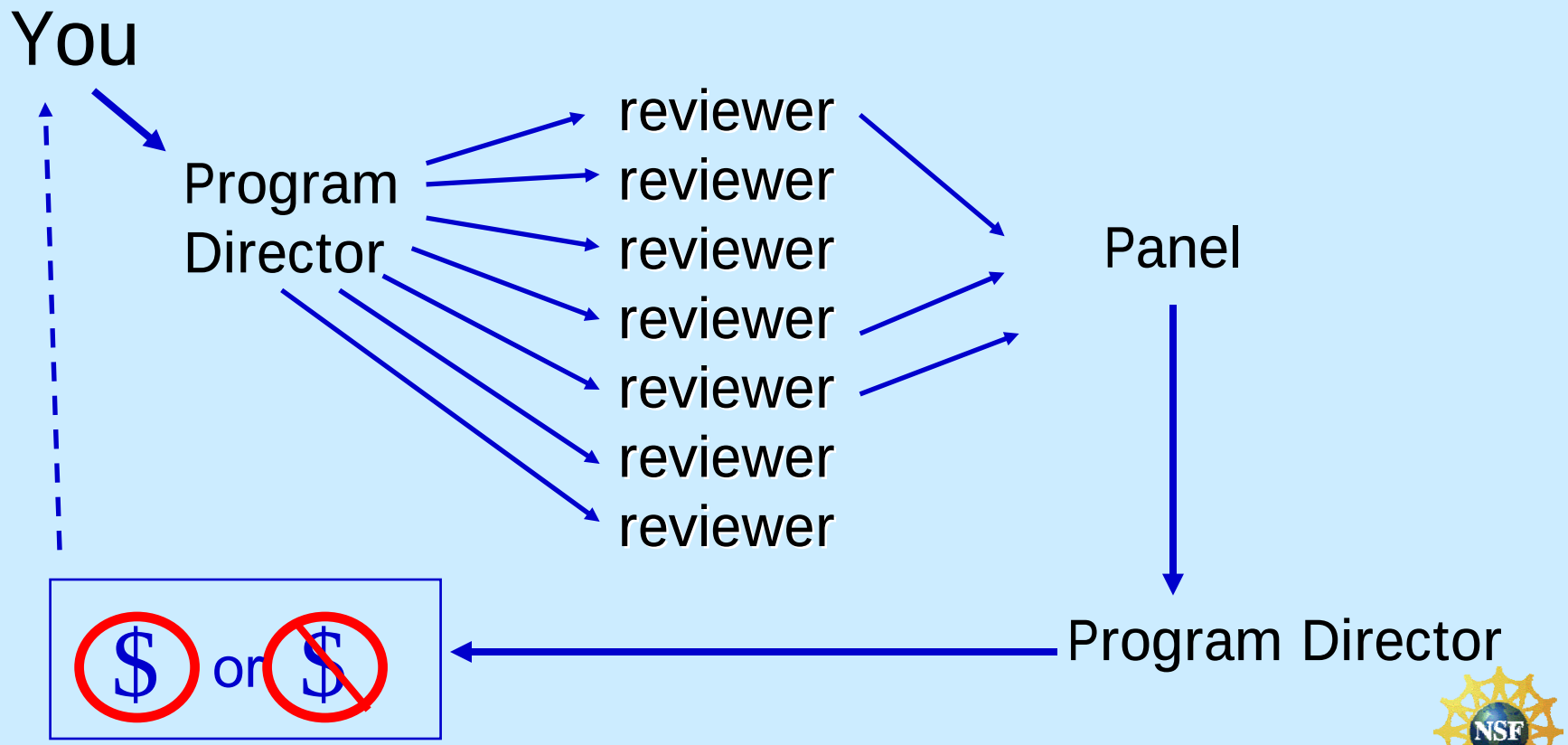
Types of NSF proposals

- Program Solicitations/Announcements
- Cross-Directorate Programs (CAREER)
- Unsolicited proposals
- SGERs (small Grants for Exploratory Research; <$200,000 for 2 yrs)
- Supplements (including REU, RET)

Review Process Overview

Four possible layers of review

Two distinct audiences – technical and general



General characteristics of people making decisions on your proposal

Program director

Generalist in your field
Busy
Looks at all proposals
Runs merit review
Helpful, can be cranky
Wears reading glasses
Counsels PIs

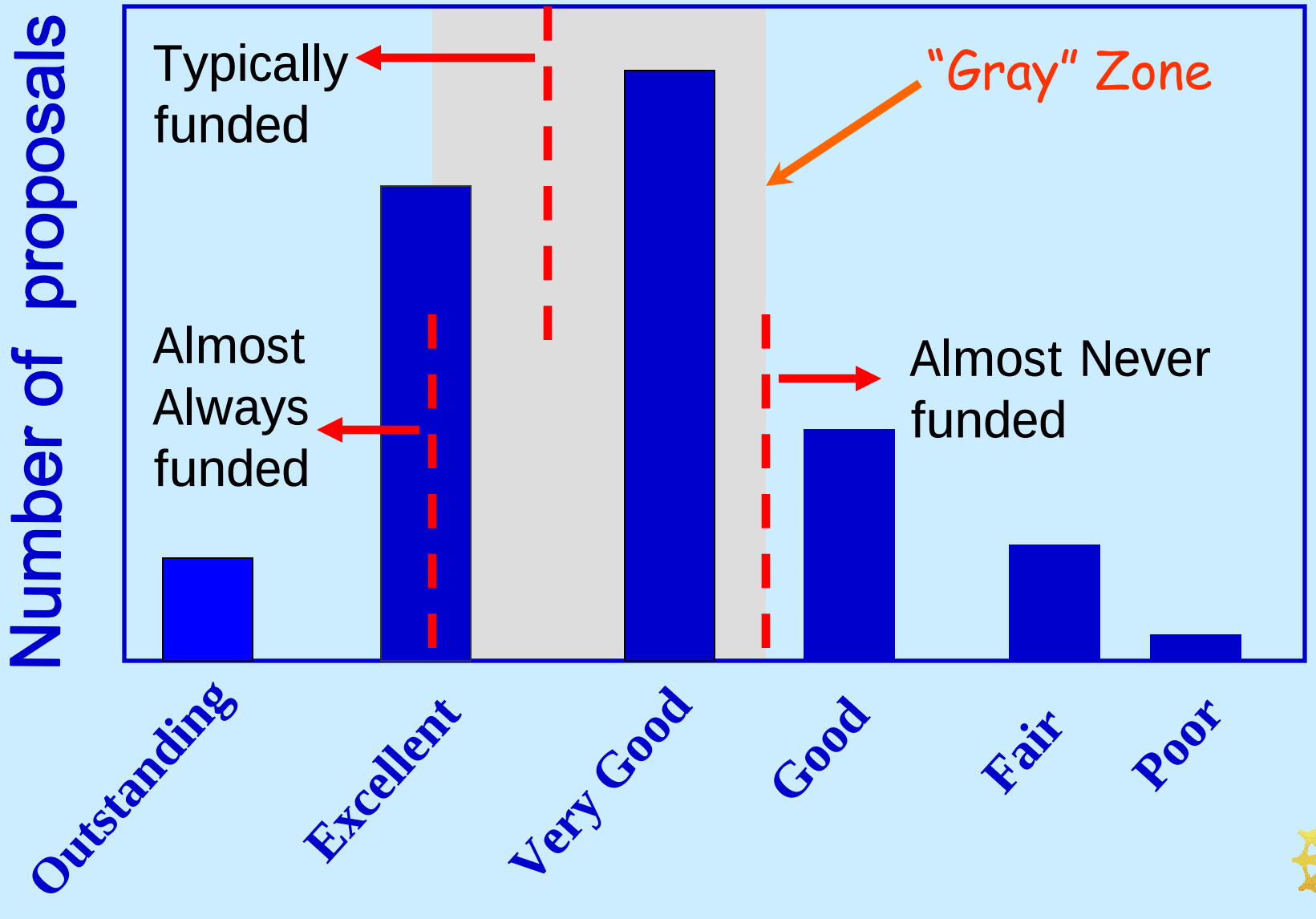
Reviewer

Technical expert in the field
Very busy
Reads one proposal in detail
Wants to be doing anything else
Often helpful, can be grumpy
Has eyestrain

Panelist

Broad Expertise
Very, very busy
Has glasses & eyestrain
Reads many proposals (~50)
Compares and ranks proposals
Just wants to be done

Who Gets Funded



Common Reasons for High Ratings

- "This proposal suggests a clear, elegant, well-documented approach to a problem that has plagued this field for decades."

- "The PI has a beautiful plan. Undergraduates or new graduate students can step right into this work, yet it solves a major problem and will be publishable in a first-rate journal."

- "This is certainly adventurous, and I frankly would have doubted it could be done. Yet the PI has proven the method in preliminary work *AND* had it accepted by a peer-reviewed journal!"

- "This reads like a dream. I have rarely seen a proposal, even from long-established investigators, that shows such careful thought and meticulous presentation."

Common Reasons for Low Ratings

- No well defined hypotheses or tests of same. Lack of focus. "Why all the rambling, this seems like a fishing expedition."

- Extraneous aspects or PIs. "What does that component/co-PI have to do with the central focus of the proposal?"

- Important information on experimental and sampling procedures is omitted. "I really can't tell what is going to be done and how."

- The work can certainly be carried out, but it doesn't address any topic of broad current interest. "I would probably not read a paper describing the results."

- Scope of the work is out of proportion to the budget and amount of time needed to do the work.

How to Interpret a Review

Everyone Gets Bad Reviews!

Reasons:

1. Flaw in idea, logic, or approach
2. Written in a way that allows that criticism
3. Reviewer is wrong

(if a reason is noted by more than one reviewer, you've got a problem)

Strategy:

Read review

Blow off steam *(in private, not to the program director)*

Think about what the reviewer is REALLY saying

Read again, annotate trouble spots in proposal

Now read the proposal pretending this is someone else's proposal

What makes a proposal competitive?

- Original ideas
- Succinct, focused project plan
- Cost effective
- Knowledge and experience in the discipline
- Experience in essential methodology
- Realistic amount of work
- Sufficient detail
- Strong rationale or evidence of potential effectiveness

Tips for Writing Competitive Proposals

- Discuss size and scope of intellectual payoff
- Use plain, simple English
- Let no question fester
- Do not include extra stuff
- Put specifics in the Methods section
- Use tables, figures, and flow charts to save words
- Make it visually appealing (i.e. do not make reviewers curse you for making their job harder)
- Include sufficient budget justification
- Think of your proposal as the 40th in a stack

Preparing the Proposal:

- Start Early (3-6 months before deadline)!
- Review NSF Award Abstracts (Fastlane)
- Talk to your NSF Program Director
- Talk to your colleagues; have experienced colleagues review a draft and comment
- Recruit and describe university infrastructure support for your proposed project
- Address the merit review criteria
- Compliance checks (GPG)

Give careful consideration

- Two NSF Merit Review Criteria
- Integration of Research and Education
- Integration of Diversity into projects and activities
- Additional program-specific Review Criteria (listed in the program announcement)

- Suggest reviewers from institutions like WWU (RUI)

General NSF Review Criteria

- What is the **intellectual merit** of the proposed activity?
- What are the **broader impacts** of the proposed activity?
- **Additional criteria** may be listed in the solicitation/announcement of opportunity

Intellectual Merit – 5 strands

- How important is the proposed activity to **advancing knowledge and understanding** within its own field or across different fields?

- How **well qualified** is the proposer to conduct the project?

- To what extent does the proposed activity explore **creative and original concepts**?

- How **well conceived and organized** is the proposed activity?

- Is there sufficient **access to necessary resources?**

NSF Broader Impacts activities – 5 strands

- How well does the activity advance discovery and understanding while **promoting teaching, training and learning**?

- How well does the proposed activity **broaden the participation of underrepresented groups**?

- To what extent will it **enhance the infrastructure for research and education**, such as facilities, instrumentation, networks and partnerships?

Broader Impacts

- Will the results be **disseminated broadly to enhance scientific and technological understanding**?
- What may be the **benefits** of the proposed activity **to society**?

Examples and further information provided at:

http://www.nsf.gov/pubs/2002/nsf022/biexamples.pdf

Broader Impacts activities……

- Justify your reason for getting the money
- Address the funding agency's mission
- Tell Congress and the general public why they should care
- Allow programs to pick your proposal over others

How to integrate research and education?

- WWU is RUI-classified (Research in Undergraduate Institution): RUI statement is important in the review process
- **Build** these efforts into your research plan (Broader Impacts criterion)
- **Target** specific NSF programs in your discipline and in Education and Human Resources (EHR)
  - Division of Undergraduate Education (DUE, eg CCLI)
  - Division of Graduate Education (DGE)
  - Division of Elementary, Secondary and Informal Science Education (ESIE)

Support in proposal preparation

- **Talk to NSF Program Officers**
- **Serve as reviewer and panelist**
- **Review funded proposals**
- **Seek mentors on campus**
- **Use your Sponsored Research Office**

NSF Publications

- ✓ Program Announcements
- ✓ Grant Proposal Guide
- ✓ Web Pages
- ✓ Funded Project Abstracts
- ✓ Reports, Special Publications