So You Want to Write an NSF Grant Proposal

Dana Brunson
Oklahoma State

Brian Stengel
University of Pittsburgh

Content provided by Henry Neeman - OU
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- And then from Henry Neeman to us.
Objectives

- Gain a working knowledge of the grant proposal process at the National Science Foundation.
- Have a clearer idea of what you hope to accomplish when writing an NSF grant proposal.
- Identify common elements for grant proposals.
The NSF Proposal Process

1. You write and submit proposal via NSF’s Fastlane or grants.gov.

2. Proposal review process initiated
   - Proposals tallied by program director by category.
   - Panel dates set.
   - Reviewers selected.
   - Review criteria are furnished.
   - Assignments made to reviewers.
   - Reviewers submit reviews.

3. Review panel(s) assembled.
About the Reviewers

- The reviewers may be subject matter experts in an area relevant to your proposal -- or they may not be.
- You’re writing your review for the review panel.
  - But you have no idea who they are: not when you’re writing, nor when you find out the NSF’s decision, nor ever after.
  - The panel has zero authority -- they recommend, not decide.
- More panel members than actual readers of each proposal.
  - Each panel member reviews multiple proposals, and each proposal has multiple reviewers, but usually no one reviews all of the proposals that the panel gets.
- You get to suggest reviewers in your proposal -- but the NSF program officer isn’t bound by your suggestions.
- Become a reviewer! It’s the best way to learn how they think.
Reviewer 2 walks into a bar complaining loudly of it being the worst library ever.

Reviewer 2 walks into a bar that's not the one they would have built.

Reviewer 2 walks into a bar complaining immediately of this not being the joke they would have written.
The Proposal Process (cont’d)

- Panel recommendation made to the program officer.
  - “Highly Competitive,” “Competitive,” “Non-competitive”
- Program officer reviews recommendations from all panels.
  - There may be multiple panels for the same program.
- If the program officer selects your proposal to be funded, that doesn’t mean you’ve won yet.
  - You may be contacted to respond to panel concerns, in which case you’ll be expected to prove that you’ve got those concerns addressed.
  - The program officer makes the final decision for funding -- but they’ve got to be able to justify the heck out of their decision to their boss, and so on up the chain of command.
- Always make the program officer’s job easy ….
The Proposal Process (cont’d)

1. Preliminary (non-binding) decision by program officer.
2. You probably will be asked to submit follow-up materials.
   - At least an abstract to be publicly posted after the official decision has been announced
   - Confidentially, because no official decision has been made.
3. Official decision publicly announced.
Before you begin, remember

- Sometimes you win, some times you lose.
- “You cannot close what you don’t propose.”
- Great proposals often don’t get funded.
  - Sometimes they have too many great proposals to fund.
  - Sometimes your reviewers misunderstand your proposal.
    - That’s your fault.
    - Which means, you can do better on the resubmit -- which means this is something you have a good deal of control over.
    - Resubmits are much more likely to get funded than the first time.
- Lousy proposals rarely get funded.
- It often takes more than one try to get funded (law of large numbers)..
Probability of Success

- National Science Foundation, FY2015: 24% overall
  - BIO 27%, CISE 23%, EHR 20%, ENG 20%, GEO 25%, MPS 28%, SBE 24%
  - EPSCoR jurisdictions: Northern Marianas Islands 0% (no PhD-granting), ND 12%, AL/PR 15%, AR/ID 16%, KY/MS/NV 17%, OK/SD 18%, NE/NM/SC/VT 19%, AK/MO/WV 20%, IA/WY 21%, LA 22%, DE/HI/KS 23%, MT 24%, ME/NH 26%, Guam/USVI 33%, RI 36%
  - Non-EPSCoR jurisdictions: FL 20%, TN/TX 21%, AZ/OH/VA 22%, UT 23%, CT/IN/NJ/NC 24%, CO/GA/MI/NY 25%, MD/PA/WI 26%, CA/MA/OR 27%, IL/MN 28%, WA 30%, DC 37%

- Funding is governed by the Law of Large Numbers: You have to submit lots of proposals to get any funding.

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August 7-13, 2016
Proposal Components

- Cover Page
- Project Summary
- Project Description
- References
- Budget
- Budget Justification
- Biographical sketches
- Current and Pending Support
- Conflict of Interest List
- Facilities and Equipment
- Data Management Plan
- Postdoc Mentoring Plan
- Supplementary Documentation (varies by program)

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Note

- Each piece of the proposal is another opportunity to make your case.
- Think in terms of using each section to enhance your argument.
Pointers

- Read the solicitation.
- Ask the program officer about any questions you might have.
- Read the solicitation.
- Pay attention to
  - Section II: Program Description
    - Program-wide Criteria
    - Program Areas
  - Section V A: Proposal Preparation Instructions
    - Full Proposals
    - Program Areas
  - Section VI A: Review Criteria
    - There are Solicitation Specific Review Criteria
Pointers (cont.)

- Read the solicitation.
- Aim to make a compelling argument.
- Be satisfied with a competent argument.
- Demonstrate that you know what you don’t know – and what you are going to learn…
- And who you will be contributing to greater knowledge and/or improving the state of the art.
What Are You Trying to Achieve?

- Give reviewers reasons to recommend your proposal for funding.
- Never give the reviewers an excuse to say no.
  - If they’re going to say no, at least they should have to earn it.
- Consider what the reviewer will think after reading your proposal:
  - “I see where they’re going with this.”
  - “They really know their stuff.”
  - “I didn’t know they had all that going on over there!”
  - “Wow! This will mean a lot to that campus.”
  - “They have their act together. (I wish we communicated as well on my campus.)”
  - “This is a GREAT investment!”
- Everything in your proposal should support this.
Proposal Beginning

- Cover Page
  - Title
  - PIs/Co-PIs

- Project Summary
  - One Page
  - Brief project description -- executive summary
  - Intellectual Merit statement
  - Broader Impacts statement
  - Make it easy for the reviewers and program officer to be able to tell what you plan to do, why it’ll work, and how it’ll help.
Project Description

- 15 pages long (usually)
- Introduction/Vision
  - This is a good place to quote from a major national report that says that the kind of work you’re planning is very important.
- Project Objectives (typically 3 or 4)
- Intellectual Merit
- Implementation Plan
- Broader Impacts
- Management Plan
- Evaluating Progress
Broader Impacts

- Advancement of scientific knowledge
- Activities that contribute to achievement of societally relevant outcomes
- Full participation of women, persons with disabilities, and underrepresented minorities in STEM
- Improved STEM education and educator development at any level
- Increased public scientific literacy and public engagement with science and technology
- Improved well-being of individuals in society
- Development of a diverse, globally competitive STEM workforce
- Increased partnerships between academia, industry, and others
- Improved national security
- Increased economic competitiveness of the US
- Enhanced infrastructure for research and education
- Your broader impacts are judged on what you’ve already done.
Results from Prior NSF Support

- Every NSF proposal has to have a section on “Results from Prior NSF Support.”
- If your team has lots of that, you can’t fit it all. The solicitation and the NSF’s Grant Proposal Guide provide useful guidelines on that.
  - The PI and each Co-PI should each provide the one most relevant grant.
  - Each should include explicit sections on Intellectual Merit, Broader Impacts and a list of publications (or “No publications were produced under this award.”).
- If you don’t have anything relevant, say that.
- If you do, is there a way that you can fit this proposal into a more coherent story?
Management Plan

- Who will do what?
- Decision making: Describe the procedure.
- Advisory committee(s)
  - External: one CI, one researcher, one broader impacts.
  - You can also have an Internal Advisory Committee.
- Timeline and milestones
- Sustainability plan: What happens when the grant ends?

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People: Start with salary, then add in fringe benefits and Indirect Costs (also known as Facilities & Administration).
- For professionals, typically the “fully loaded” amount roughly doubles the salary amount.

Things
- Permanent equipment over $5000: not subject to IDC
- Other: subject to full IDC

Subcontracts: The first $25,000 of each subcontract may be subject to IDC by both the lead institution and the subcontracting institution.
- You can do a Collaborative proposal, which waives that.
  - Submitting a collaborative proposal is painful.
  - The lead institution has zero control over the other institutions’ budgets.
Budget (cont’d)

- Participant support: not subject to IDC
  - Travel, subsistence, stipends etc for participants in workshops and similar events.
Cost Share

- Either mandatory or forbidden
- Can only be done at exactly the level required.
- There is **NO SUCH THING** as voluntary cost share: if they don’t ask for it, you can’t include it.
  - Your proposal can be returned without review.
- Typically has to be items that could otherwise be funded on the grant budget.
- Typically has to be paid from non-federal funds.
Institutional Commitment

- Not the same as cost share.
- Not required nor prohibited.
- Strange rules:
  - **CANNOT** mention any dollar figures (or anything that can be straightforwardly translated into dollar figures).
  - **MUST** appear in the Facilities, Equipment and Other Resources section, because it’s an “other resource” (preference for at the end).
  - **SHOULD** be confirmed in a letter of collaboration from someone who has the authority to commit.
  - **MAY** appear in the project description.
  - **MAY** be (and usually is) contingent on getting grant.

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Everything Else

- Budget & Budget Justification
  - Many institutions provide a template
- Data Management Plan (dmptool.org)
- Letters of Commitment/Collaboration
  - Some solicitations put restrictions on these, others don’t.
  - Letters of support (“This is a swell project”) are FORBIDDEN unless explicit allowed by the solicitation.
- Biographical Sketches (PI, Co-PIs, Senior Personnel)
- Current & Pending Support (PI, Co-PIs, Sr Personnel)
  - You may not have any.
  - You **MUST** list this proposal.
- Conflict of Interest List (PI, Co-PIs, Sr Personnel) -- NEW!
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Thanks for your attention!

Questions?

hneeman@ou.edu