Navigating NSF:

The Merit Review Criteria
Common Mistakes & Best Practices
Focus on Broader Impacts
Meet the Program Directors

Sponsored by: The Earth Science Women’s Network (ESWN), NSF, AGU
Writing a Proposal is NOT like writing a Paper

A Paper is:

- a scholarly pursuit: individual passion
- past-oriented, work that has been done
- theme-centered: theory and thesis
- expository rhetoric: explaining to the reader
- impersonal tone, objective, dispassionate
- individualistic: primarily a solo activity
- few length constraints: verbosity rewarded
- specialized terminology: “insider jargon”

A Proposal is:

- aimed at sponsor goals: service attitude
- future-oriented, work that should be done
- project-centered: objectives and activities
- persuasive rhetoric: ‘selling’ the reader
- personal tone, conveys excitement
- team-focused: feedback needed
- strict length constraints: brevity rewarded
- accessible language: easily understood

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search for keywords, topics, regions
many other agencies have grant programs!
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Merit Review Process

Deadline/Target Date

↓

ad hoc review

↓

and/or panel

↓

PO makes recommendation

Note that this varies across NSF, even within GEO!
Merit Review Criteria

• Intellectual Merit: the potential to advance knowledge

• Broader Impacts: the potential to benefit society and contribute to the achievement of specific, desired societal outcomes
Five Review Elements

1. Will the work advance knowledge, and benefit society?

2. Is the work creative? even potentially transformative?

3. Does the work plan make sense? Will they know if they’re successful?

4. Is the team qualified to do what they propose?

5. Do they have the right lab, or know the right people?
Who is the reviewer?

The best possible case:
• You receive a through constructive and positive review.

Worst possible case:
• A busy researcher with too many demands on her/his time.
• Will compare yours with the 3 others that they have been asked to review.
• Will read it in 60 min or less.
• Will compose his/her review in less than 30 min.

Therefore, the proposal must be extraordinarily well written.
How are proposals rated?

E  Excellent;  Fund it!

V  Very good;  Fund it if there is money

G  Good;  Don’t fund it; proposal needs work

F  Fair;  Proposal is flawed in one of the five elements.

P  Poor;  Fundamental rethinking needed before resubmission

No matter the rating, the content is WAY more important than the letter.
Common Mistakes

- Work is too close to what has been done before - i.e., incremental advance
- Techniques + methodology are not cutting edge
- Project has too large a scope or is too narrowly focused to be exciting
- Proposed plan will not actually address the stated goals of the project
Some best practices for a successful proposal

1. an enticing title

The hydrology of the Santiam River watershed 😴

Catastrophic flooding and hill slope activation during droughts 😍
Some best practices for a successful proposal

1. an enticing title
2. a compelling introduction

- this is basically a statement of the Intellectual Merit. Catch the reader’s attention immediately. State up front what you want to do, and why it’s exciting and important

- explain why previous studies have been insufficient to resolve the problem and how you can remedy the situation.

- explain why your field site (or experiment or model) was chosen for the study.

- lay out your specific hypothesis to be tested. Or, explain your compelling observation that is so new, you need to do the work to develop a hypothesis (a “pilot” or “EAGER”)

What is a hypothesis?

Not so great; a list of tasks:

We propose to map Volcano A, then collect and characterize 10 samples from that volcano. We will date these samples to develop a stratigraphy. This will reveal the history of volcanism in the region.

Clarity:

The objective of this project is to assess whether volcanism in this region is related to changes in tectonic regime from compression to extension over the last 10 million years.

or

This project will test the validity of two competing models for the source of magmatism in X region.
Some best practices for a successful proposal

1. an enticing title
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3. do your samples / data come from a place in the world? Include a map!
Some best practices for a successful proposal

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4. lay out a clear work plan, timeline, and role for each participant
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**Work Plan A:**

PIs Wade and Fogarty will go into the field with the graduate and undergraduate students in year 1 to collect samples, and will complete the proposed analyses by year 2.

**Work Plan B:**

PIs Wade and Fogarty, along with one graduate student and two undergraduates from each institution will go into the field in year 1. Graduate students will be responsible for mapping the region, and the undergraduates will learn tephra sampling skills. Upon return from the field, undergraduates will be involved in sample preparation including thin section billet cutting, and bulk major and trace element analyses. Each graduate student has a defined project [describe] focused on mineral-scale analyses.
Some best practices for a successful proposal

4. lay out a clear work plan, timeline, and role for each participant
   - draw out a timeline, with tasks
   - explain how each analysis or model connects to your hypotheses
   - clarify the specific role of each PI + student
   - show that the work is feasible within your timeline
Some best practices for a successful proposal

1. an enticing title
2. a compelling introduction
3. do your samples / data come from a place in the world? Include a map!
4. lay out a clear work plan, timeline, and role for each participant
5. come up with a realistic budget

• We know science costs money. Be accurate, be reasonable
• Find out what size grants are the norm for the program to which you are applying and get into that ball park (might be solicitation-dictated)
• Know what the funder will pay for and will not pay for…talk to your program manager (equipment? Travel? USGS collaborators?)
• Use the “Budget Justification” pages to explain your costs (so important that it’s now 5 pages)
• The detail here is a reflection of your priorities in terms of the research plan
What if you’re Declined?

- It happens to everyone, except those who don’t submit

- Stay Calm, and don’t get discouraged. Breathe deeply and read the reviews more than once

- Identify common themes across different reviews (weaknesses AND strengths)

- Don’t fixate on minutia + cranky comments

- Ask a friend/colleague to read the reviews objectively
What if you’re Awarded?

- Celebrate! We’re so proud of you

- Read the reviews and/or panel summary: they still likely had some useful criticisms and advice

- Cite the award and NSF when you publish or present

- Read NSF’s guide for awardees (the PAPPG) and write your annual reports on time

- Develop a rapport with your Program Director + keep her updated

- Be a good mentor to the students and colleagues you support

- Follow up on this work with another great proposal