General Proposal Development: Lessons for You

- Successful grant writing is 33% exciting, compelling ideas; 33% hard work; and 34% luck.

- Exciting, compelling ideas: synthesize existing science, show a key gap, and how your *innovative, dynamic, credible* research design fills that gap

- Hard work: EDIT THE HELL OUT OF YOUR PROPOSAL AND SUPPORT DOCS. Don't give reviewers excuses to turn you down, "dot your i's," do a great job with "non-science"pieces (such as outreach, diversity components)

Lessons for You

- You Can Increase Your Luck: Talk to program officers about fit. Agencies frequently request suggested reviewers – TAKE THEM UP ON IT! BUT ultimately your reviewers mostly come from the luck of the draw.

- Take advantage of resources:
  - Centers
  - Staff support
  - Senior scientists

Lessons for You

- Get as much experience as possible now
  - Classes (for students)
  - Apply for small grants
  - Take workshops, attend grants talks
  - Ask your advisor or senior colleagues to give you experience
- Put your experience on your CV!!!!!!!!!!!!!

Problems with Transdisciplinary Proposals and How to Overcome Them

- Token scientists, “stakeholders” added late
- Resources unfairly shared
- Unclear roles
- Unclear disciplinary composition
- Inconsistent writing, poor editing
- Lack strong scientific and real world (policy, management, problem solving, outreach) components
- Poorly integrated

Token disciplines or “stakeholders” added late

- Invite disciplines and “stakeholders” in from the beginning and through to the end
- Include presentations on disciplinary, “stakeholder” goals/perspectives
- Make it clear that everyone is equally important and respected
  - Be careful with hidden messages (for example, always listing social scientists and sections last, always listing biggest country first)
  - Everyone is invited to meetings
  - Make a participant list with contact information

Resources unfairly shared

- PI requests needed budgets from participants, reduces in a fair way

- Some components make *need* more resources, aim for balance in other areas (for example, graduate student funding should be even)

Budgeting

- Start from the sponsor maximum allowable budget and request budgets from team members.
- Combine into one budget, start to cut.
- Work with your organization's budget form (use MTU's to illustrate).
- Indirect cost return: what is it? What does it apply to? How does it affect your budget? What are the sponsor's rules about it?

Unclear roles

- The first meeting should discuss roles and tasks
- Roles and tasks should continue to be reviewed
- PIs need to delegate!
- Roles and tasks should be briefly described in the proposal

Unclear disciplinary or “stakeholder” composition

- Identify people by major discipline and specialty area in proposal (for example, environmental sociologist, ecohydrologist) reviewers can understand

- Note which are social versus natural versus engineering scientists

- Note which are policymakers, NGO staff, community members and (if applicable) disciplinary background

Inconsistent writing

- For example, one section has research questions, the other hypotheses
- PI needs to leave time to look for inconsistencies
- Delegate editing tasks – the more eyes review carefully, the better
- Have “chain of custody” editing
- Know that editing will take more time than it should
- Get outside review, native language editing

Unclear scientific AND problem solving goals

- Intellectual merit: your project's scientific goals.
  - What is the intellectual merit of your TISG proposal? How will you measure progress toward them?
- Broader impacts: your project's educational (K-12, university), outreach (to the public, policymakers), management (problem-solving) goals.
  - What are the broader impacts goals of your TISG proposal? How will you measure progress toward them?
- What are your sponsor's intellectual merit and broader impacts goals (look at the RFP, look at the sponsor's website)?
  - What are the IAI's goals? What are the IAI's TISG goals? What are the reporting requirements of your sponsor?

Project management (cont)

- Given the time, personnel, and budgetary limits of the RFP and your team, what
  - a) is your timeline (when will you do what tasks),
  - b) who on your team will play what leadership, task, disciplinary roles?,
  - c) what processes will you use to achieve your goals (such as weekly/monthly/yearly meetings – how, where, when?, technologies – HubZero, Google Drive, Visimeet, Dropbox, Skype),
  - d) how will you allocate your financial resources?

Your organization and proposal development:

- What paperwork is required by your funder?

- What paperwork and processes are required by your organization?

Poor integration – across disciplines, types of organizations (scientists to “stakeholders”)

- Show how the work will contribute to disciplines (research questions or hypotheses)
- Show how the work will contribute to science
- Show how the work will contribute to problem solving (policymakers, outreach, management)
- Show some integrated research questions/hypotheses
- Show what processes you will use to integrate across disciplines and organizations (weekly meetings, presentations, etc)

Conceptual Frameworks and Transdisciplinary Research design:

- What are variables? (things with different levels that you are trying to measure)
- Independent variables: what already existed, stands alone?
  - What are your key independent variables in your TISG (social and natural science) project?
    - Methods: how will you measure them?
- Intervening variables: what happened in between?
  - What are the intervening variable(s) in your TISG project?
    - Methods: how will you measure them?
- Dependent variables: what outcome, impact, or change are you trying to understand?
  - What is/are the outcome(s) you are trying to understand in your TISG project?
    - How will you measure them?

Independent variables: what already existed, stands alone?

- What are your key independent variables in your TISG (social and natural science) project?
  Methods: how will you measure them?

Intervening variables: what happened in between?

- What are the intervening variable(s) in your TISG project? Methods: how will you measure them?

Dependent variables: what outcome are you trying to understand?

- What is/are the outcome(s) you are trying to understand in your TISG project?
  - How will you measure them?

Research questions/hypotheses:

- TD teams should have innovative, cutting-edge research questions/hypotheses in:
  - Social sciences,
  - Natural sciences, and
  - Integrated socioecological sciences.

- What is one social science hypothesis/RQ in your TISG project?
- What is one natural science hypothesis/RQ in your TISG project?
- What is one integrated hypothesis/RQ in your TISG project?
- What is one trandisciplinary hypothesis/RQ in your TISG project?