Working Group Proposal Planning Guidance

Purpose of the Guidance

This guide is intended to help future working group leaders enhance the design, implementation, and impact of their projects. Our aim is to share what works based on twenty-nine years (and counting) of synthesis science at the National Center for Ecological Analysis and Synthesis (NCEAS), collaboration best practices, and the science of team science. The guidance below will walk you through what a successful working group looks like, how to start thinking about proposal ideas and how to develop an idea, things to consider when choosing group members, and tips for ensuring success.

Proposal Checklist

- ❏ Have you identified a problem that is ripe for a synthesis science approach?
- ❏ Does your project idea align well with the funding program's objectives?
- ❏ Are the appropriate data available and does your team have access to them?
- ❏ If this is a translational research project, do you have a clear pathway to implementation and willing partners on board?
- ❏ Have you put together a diverse group that will work well together and be committed to your goals and objectives? Have they helped shape the proposal?
- ❏ Is the scope of the project appropriate and attainable given the timeframe and proposed budget?
- ❏ Have you sought feedback from the program on your idea and approach?
- ❏ Have you considered the need for working group facilitation?

NCEAS Working group model

Working group meetings are intended to be *active work sessions*, action- and product-oriented. Ideas are generated, data are analyzed, and particularly in later working group meetings, concrete products are produced.

Successful working group meetings are a dynamic, focused and productive way to tap into the creativity and energy of a group of scientists and practitioners (Hampton and Parker 2011). Convening the right group is critical: you want participants who are interested in synthesis, excited about the working group format, have time to significantly contribute to the group over its duration, and are aligned in their desire to help solve the problem you have identified. One or more participants with experience in synthesis science working groups can be helpful.

In some working groups, implementation partners – decisionmakers, practitioners, or stakeholders directly connected to the problem of interest – are integrated, ensuring working group research outputs are suitable for rapid transition into new solutions and adopted or implemented.

Ingredients of a successful synthesis science working group

1. **Exciting synthesis science questions linked to impact:** Novel synthesis of existing data with high likelihood of contributing solutions to pressing problems
2. **Diverse participants:** Gender, ethnicity, geographic-origin, sector, discipline, age, job function and career stage
3. **Effective leadership** to spark a creative vision, facilitate an inclusive process, and provide effective project management to maintain momentum and deliver on objectives.
4. **Data access and management:** Working group members identify and access rich datasets, integrate data management into work plan, and apply best practices for open, reproducible science
5. **Well-developed work plan** takes advantage of the group's diverse talents, interests, and incentives, with clear milestones, deliverables, and assigned responsibilities
6. **Justified methods and logical links:** Data collection and analytical methods, metrics, and models based on a solid understanding of the existing literature
7. **Good communication and collaboration:** Establish mutually agreed upon norms and systems
8. **Social bonding and team cohesion:** Make time for getting to know each other, take advantage of being in Santa Barbara and being together in person

Incubating an idea for a proposal

Most successful working group ideas result from significant iteration among the PIs, implementing partners (if applicable) and the funding program leadership (e.g., LTER, Morpho, Gulf Ecosystem Initiative), with additional input from working group participants. This process can take many months, so start well in advance of the RFP deadline.

Translational research projects - developing an idea

Translational or applied science working groups (e.g., Morpho, Gulf Ecosystem Initiative teams) should involve implementing partners from the beginning, to help identify opportunities, refine the approach and develop a sound proposal. These are resource managers, practitioners, policymakers, or industry representatives who help you define:

- Who wants the outputs of your group?
- How can the science questions be adapted to serve their needs and activities planned to ensure timing is ripe?
- What channels exist for getting your results to the end-stage implementers?

Don't skimp on engaging implementing partners or wait until the last minute; it will be apparent in the proposal review. Do keep an open mind to different methods of engagement and to adapting your synthesis questions, data source and products based on their input.

Methods for engaging implementation partners vary. Implementation partners can be integrated as PIs, co-PIs or working group participants. Sometimes working groups hold a meeting(s) focused on technical analysis with a subset of members, and implementation partners join for only one day or for a virtual session. Some groups establish a separate Advisory Board to provide high-level policy and implementation advice through short, focused engagements.

Just having implementation partners at the table doesn't guarantee your work will have the impact you want. **You also need to articulate how you will communicate your results and products to the intended audience and how your engagement with implementation partners is going to bring about change.** This could take the form of a theory of change that spells out what activities you will undertake, who you need to engage, and what you hope they will do differently as a result of your work.

Potential activities and products that can support implementation include:

- Pilot programs/sites that deploy and test preliminary products
- Outreach to existing formal or informal networks
- Training workshops, webinars and demonstrations
- Policy briefings and consultations
- Engagement with stakeholders
- Media and PR, including press releases, interviews, blogs, etc.
- Publication and dissemination of guidelines, manuals, technical or policy briefs

The guiding questions below, from Beier et al. 2017, may be used to help codesign project goals and activities with your implementation partners that will lead to actionable results.

Table 1 Questions that could be used as agenda items at a Goal-Defining Meeting for a coproduction project

• What is the issue at hand? What questions are being addressed? What topics are included or excluded from consideration?
• What decisions are being made? Are they flexible or limited in scope?
• Who will use the scientific information (including downstream uses) and how will they use it?
• In what form, process, or product will the data be most useful to the users?
• Given that decisions must be made before the science can be "settled," what is a realistic expectation of what is possible and useful within the available time and budget?
• What is necessary to make data accessible to all projected users? Who will own the data or other products? Where will the products reside?
• What would success look like for all parties?
• What alternatives are available to achieve success? What is gained or lost by pursuing one alternative over another?
• What variables does the decision maker care about? What resolution of data? What spatial extent? What level of precision is realistic, achievable, and adequate for the decision? If such precision is not feasible, should the project be abandoned or modified?
• What is the planning time horizon? Is this horizon appropriate for the purposes agreed on by the stakeholders?
• How will uncertainty be addressed? To what extent can multiple projections (e.g., emission scenarios, general circulation models) bracket uncertainty?
• Is a technical advisory group or steering committee needed for this project? If so, who should serve?

Table 1. Beier et al. 2017, Conservation Letters

Scoping data and methods

In developing your proposal, some initial data and analysis scoping is critical to understand whether your proposed work is feasible.

Key questions to ask yourself:

- What data and/or models do we need to answer our question(s)?
- Are those data and models publically available or already in hand?
- If not, who controls these data and are they willing and able to share them? Do they need to be part of the group for us to be successful?
- How much data wrangling (reformatting, QA/QC, pre-processing) will be necessary before we can use the data in our planned analyses?
- Do we need to alter existing models or develop new ones to accomplish our work?
- What resources (skilled people, computing infrastructure, time and $$) can we marshal to get data, wrangle and analyze it?
- What resources are available to you (e.g., from a partnering synthesis center)? A conversation with your computing support team can help determine how far they will get you.

Putting together your group

Collaborative science is a social endeavor. Think about the personalities of your prospective working group participants and the roles they can play in the group. ***Big thinkers*** have a keen eye for important, cross-cutting questions that can help the group stay focused on what's most important. ***Constructive opposers*** bring new perspectives and voice their opinion, even if it's contrary to the thinking of the group; this can lead to critical breakthroughs. Finally, even the best proposals will fall short if there aren't enough ***do-ers*** in the group. These are people with the skills, motivation and time to tackle working group tasks during and especially between meetings. Such tasks may include project management, data wrangling, analysis, tool development, and implementation. While postdocs can help with some of this heavy lifting they cannot carry the entire load.

To compose a successful working group:

- Convene 12-16 attendees per meeting
- Authentically engage diversity and avoid tokenization. Strive for:
    - Even gender mix
    - Balanced ethnic, racial and cultural diversity

- Institutional and sectoral diversity appropriate to the project
- A mix of career stages
- Balanced mix of relevant disciplines
- Mix of new and old collaborators (not just the usual suspects!)

Aligning for success

Motivations are a critical aspect of working group success; think about why each of your invited participants might want to join. What are their personal and professional rewards; what do they consider exciting or cutting edge? If you are bringing together folks from academia, government, NGOs and the private sector, consider how their performance is evaluated and rewarded in their institutions. What do they get paid to do? Does all or some of the planned work align with that? If not, are there ways to still tap their expertise, or do you need to adjust your expectations, group membership or work plan? Varying career goals of participants can help you to match people and tasks, e.g., lead authorship on papers is generally most motivating to pre-tenure scientists. Your group will be much more productive if you invite people to discuss their needs openly and honestly and design the work to help them satisfy those needs.

Open science philosophy

NCEAS requires the scientists we support to document and publish their datasets and code. Our own data science tools are open source, and we encourage a culture of data sharing and open access in environmental science (NCEAS' data policy). NCEAS has many resources to help you with this, including tools, training, and support.

Facilitation

The success of your project will depend on well-designed and run meetings (whether virtual or in person) that allow your team to learn and exchange ideas, work collaboratively, and make effective decisions. A facilitator helps you design and manage an effective transdisciplinary collaborative process during your meetings, freeing you to focus on content. Our resident team science facilitator can help you design and facilitate accessible, efficient, interactive meetings that will strengthen connections across your team and allow you to achieve your goals and objectives. The facilitator not only guides the process, but also models a set of tools and approaches that you can use throughout your project to strengthen remote collaboration and team culture.

Situations where a facilitator may be particularly valuable include:

- Contentious, high profile or controversial subject matter
- PIs have little experience running meetings
- Highly diverse group, especially across cultures or very different institutional contexts
- Working group kickoff meeting, especially if most collaborators have not worked together before
- Ancillary “high stakes” meetings to engage stakeholders, decision makers or the public

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