## 2. MOLDING YOUR TEAM | Tom Richard, Leida Mercado, and Peter Goodwin

### Rationale and Preamble

Wow! You've won the big grant! Step one is to celebrate your success. Step two is to create a high functioning multidisciplinary team to get to work on the project. A high functioning team is more than an assemblage of independent actors – although you do need a great group of individuals to work with. One of the first jobs of the project director is to create the conditions for that group of individuals to come together as a new team and work as an integrated unit. Critical components of this initial activity include hiring key staff; getting group buy-in on the project vision, goals, and outcomes; setting expectations; providing training for key team-work skills; and assuring that the team has the communication, data management, institutional, and financial resources to get off to a great start.

### Timeline Narrative of Elements across Project Life Cycle

These start-up activities are critical at the outset of the project, but many continue through to the end. New members of the team will join mid-project and will need orientation and training to integrate effectively. Some of the skills and processes established at the outset will need reinforcement, while others can be expanded and extended as team members master the basics. Below is an outline of how these activities play out over the life cycle of a project, with extra emphasis on critical times and junctures.

| | PHASE I<br>PROPOSAL | PHASE II<br>GETTING STARTED | PHASE III<br>PERFORMING | PHASE IV<br>FINISHING STRONG |
|---|---|---|---|---|
| Finding the right project manager | x | x | | |
| Understanding team and institutional strengths and limitations | x | x | | |
| Understanding the difference between teamwork and taskwork | x | x | | |
| Developing (and owning) a shared vision, goals, and outcomes | | x | x | |
| Setting and meeting expectations | | x | x | |
| Developing effective communication across remote geographies | | | | |
| Mobilizing additional resources | x | x | x | x |
| Co-learning Basics | | | | |
| Principles of co-learning | | x | x | |
| Communication | | x | x | x |
| Conflict management | x | x | x | x |
| Data management | | x | | x |
| Collaboration (work styles, expectations, attribution) | | x | x | x |
| Team science | | x | x | x |
| Mentoring (working with multiple mentors, leveraging the pipeline) | x | x | x | x |

## Finding the Right Project Manager

This is perhaps your most important early decision. If you are like most leaders, you already have a full plate and now there are suddenly a host of new tasks and responsibilities. A large SES project budget should include a competitive salary line for a manager so you can hire the best person possible. Depending on your institution and funding source, you may have other administrative staff positions to fill – and the right project manager can help you fill them. This person must share your vision for the project, have a workstyle that is compatible with yours and those of your project leadership team members and partners. Passion for the project is desirable, but project management skills are essential. Key attributes include writing and communication abilities, an eye for detail, and a head for numbers. People from many different disciplinary backgrounds can make wonderful project managers, including people coming from industry or government with experience managing large, complex teams. If you hire someone from outside academia, remember that universities have an unusual system of incentives and rewards that you and your project manager will need to leverage for both administrative effectiveness and operational success.

## Understanding Team and Institutional Strengths and Limitations

You may be working with a group of several universities, perhaps government laboratories, and companies, consultants, government agencies, and/or civic organizations. Each of these entities has its own organizational culture, its own standard practices, and its own expectations of employees. Some of your partners may be able to leverage tremendous institutional resources, while others have very limited facilities and support. Even within a single organization there can be a wide range of work styles, some of which will likely clash with yours. Some issues, such as co-PI responsiveness and administrative and budgetary support, will become apparent at the proposal stage, but rest assured, other surprises await! You and your project manager need to be sensitive to these differences, and recognize and celebrate every team member's unique contributions (see Section 4, Enabling Participant Success). You also need to find respectful ways to assure everyone has the necessary administrative support (an administrative champion from your own institution can be a big help with this – see Section 9, Institutional Resources and Support); communicate clear expectations, schedules, and deadlines; and plan for contingencies.

## Understanding the Difference Between Teamwork and Taskwork

While there will be many activities that your team needs to learn how to do together (teamwork), there are also plenty of specific tasks that team members need to do on their own or in small groups (taskwork). As you work through the team building and co-learning activities in this section, be thoughtful about what aspects are best accomplished through one-way communication (information sharing); multi-party dialogue, teamwork, co-learning and shared discovery; or individual or small group accomplishment of tasks. Clear and continuous communication is necessary throughout the project to assure that both essential activities are accomplished and that multiple sub-team efforts are complementary rather than competitive or redundant. Share your thoughts on these issues with the rest of your team so that everyone has an understanding of how goals are established, tasks are assigned, and collaborators are engaged.



Breakout sessions at project meetings for PINEMAP (left) and REACCH are structured to focus team members on specific teamwork and taskwork that move the project forward.  Credits: Anonymous

## Developing (and owning) a Shared Vision, Goals and Outcomes

The vision, goals, and outcomes of your proposal were likely generated by a small group of individuals, but now they need to be embraced by the much larger group of your full list of PIs and participants. There are many methods for uniting a team around a common purpose and you want to do so in a way that is comfortable for
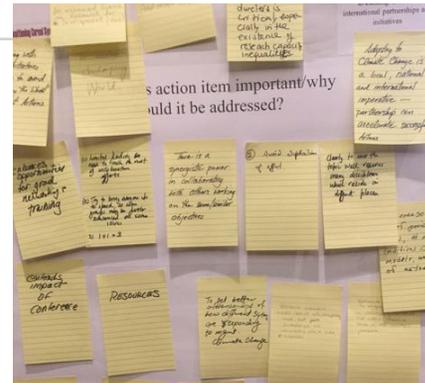


Exercises for project-wide planning (right) involve the entire team brainstorming ideas and prioritizing. The USDA-NIFA sponsored project identified future challenges to US agriculture and discussed how their project addresses these large societal goals.
Credit: Wendy-Lin Bartels
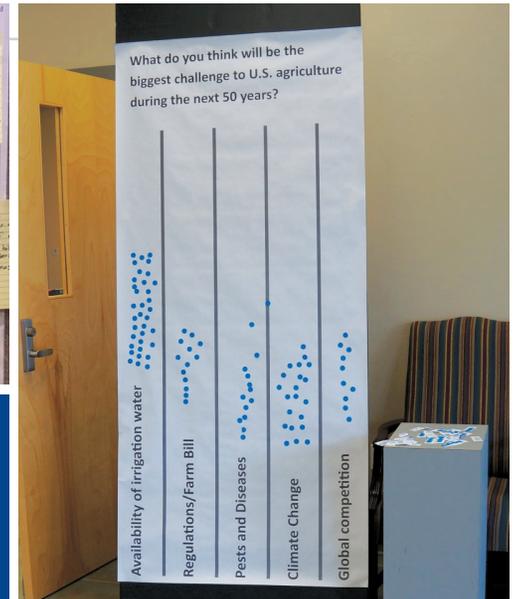
you and both empowers and inspires all members of the team (Ledford 2015). If you don't have someone on your team with strong facilitation skills, consider hiring a professional to facilitate a session during your kick-off meeting. Depending on your funding agency, the level of detail in your proposal, and the culture of your team's institutions, your flexibility at this point in time may be constrained and you need to make that clear to your team. However, if this process of brainstorming and consensus building generates brilliant new strategies and tactics that you did not anticipate and did not budget for, do not despair. The sponsors of large research projects usually allow for some flexibility in implementation, and many encourage project leaders to practice adaptive management. While you will need to get sponsor approval for major shifts in tasks or resources, if your team supports the changes and they are a clear improvement over what you had planned, you will likely have a compelling case.

## Setting and Meeting Expectations

You are likely to have on your team many individuals for whom team science is a new approach. Most professors and students are used to working independently, with few deadlines and no one particularly dependent on their output. A large socio-ecological systems (SES) project is a web of complex interactions and dependencies that can include sharing of knowledge, samples, models, and results. Some of these exchanges will be "mission critical" – if one essential component is not available on time, then everything that depends on it will grind to a halt. Yet research is by nature unpredictable and unforeseen roadblocks will arise. As project director, you will need to identify the critical linkages, evaluate risks, and develop

alternative pathways to success. However, part of that risk management process is to make sure that your team members understand their roles; commit to a timeline, milestones and deliverables; and feel both empowered and responsible to report to the leadership team when there are any deviations from the plan. Real-time feedback is essential if the leadership is going to be effective at clearing roadblocks, prioritizing resources, and keeping the project on track.

## Developing Effective Communications Across Separate Locations

We live in a teleconnected world that not only makes long distance communication possible, but also allows large complex teams to tap expertise at many locations. Whether your team is itself distributed over multiple institutions and requires long distance communication every single day, or your telecommunication needs are occasional with sponsors, stakeholders, and outside experts, there are a host of communication tools and technologies available. Whatever software you select, a crucial task is to make sure that all your team members have the access and familiarity needed to use these communication tools. Some of the elements you will want to consider include voice and visual communication (including meeting archives for team members that miss an event or join in later years), private team access to project organization files, contact lists, timelines, datasets and working papers, and a public webpage that is updated regularly with project events, publications and other products. Newsletters, press releases, and various new media options are good ways to maintain engagement and enthusiasm with both internal team members and external stakeholders. These activities are essential at the outset of the project, but also need to be re-emphasized throughout the project to convey synthesis and impacts. Many federal agencies now require that data and other outputs are accessible to the public and that outcomes are well documented, so plan for some extra effort to make sure the project finishes strong.

While an effective distance communication strategy is necessary for most SES projects, do not assume it can entirely substitute for face-to-face contact that is necessary to build effective human relationships (see Section 3, Creating a Culture of Collaboration, and Olson and Olson, 2013, cited therein). Most multi-institutional projects will have an annual "all-hands" meeting that provides many opportunities for both formal and informal interactions to build trust, respect, and understanding among the diverse members of the team.

## Mobilizing Additional Resources
The best time to get administrative support from your home institution or your



Use of on-line tools for long-distance collaboration; example from REACCH. Credit: Sanford Eigenbrode

partners is before your proposal is submitted, when institutional commitments might increase the prospects for success (see Section 9). In addition, the glory of landing a major project can be used to solicit additional support, as now your institution has a clear stake in assuring you have the time and resources needed to direct the project effectively. Once your project is announced, you will often have other organizations interested in finding ways to partner. Some of these organizations might be willing to invest their own funds in your effort, while others may have connections to external funding to support project expansion. Even without expanding your initial team, your group is likely to need additional resources as the project proceeds to address gaps in the original plan, spin off complementary activities, or exploit new discoveries.

As director, you need to spend time expanding the resource pool, but it is important that everyone realize that fundraising is a collective effort. Make the extra effort required to engage your co-PIs and partners to help mobilize the resources needed to maximize the impact of the project. Their networks and ties to other agencies, organizations, and potential beneficiaries can help generate additional resources for your team and lay the groundwork for sustaining the project into the future by implementing the knowledge, practices, and policies developed through your project.

# Co-learning Basics

Co-learning, sometimes called collaborative learning, describes the process whereby groups learn something together rather than receiving knowledge from an authority. Large, transdisciplinary SES projects require co-learning. They are unique constructions of stakeholders and participating scientists, students, and others. There is often no authoritative precedent to the endeavor. All participants become creators. Everyone on your team must understand and fulfill their individual responsibilities and contribute effectively to the group. You need a high performance team! (see Section 6, High Performance Teams). In summary, high performance teams require a distinct and varied set of skills that are rarely taught in the academic disciplines, yet are absolutely essential for project success. Using co-learning processes to establish team policies, procedures, and expectations and develop baseline knowledge in relevant disciplines can be a very effective way to build a high performance team. In a high stakes, high visibility project, failure is not an option, mediocrity will not suffice, and participants must find excellence together.

While there are increasing opportunities for both formal and informal education on leadership, process facilitation, teamwork and team management, many members (and leaders) of cross-disciplinary teams will have had limited opportunities to learn or practice these skills. If you don't have much experience with some of these skills yourself, this primer and its references can help you get started. You may also want to engage an expert facilitator, at least initially, and you definitely want to both leverage and improve the skills of your project manager and the rest of your leadership team (see Section 3, Creating a Culture of Collaboration). As an initial exercise, you should consider using a co-learning approach to define the project's goals, processes, and procedures together as a team. Engaging the team in this co-learning process early will provide a common baseline of knowledge and expectations and will demonstrate the communication tools.

Co-learning can also provide a platform for team members to become familiar with core knowledge and methodological approaches outside their home disciplines, which they can then draw on for interdisciplinary and transdisciplinary work. As a project director, you will have assembled a team with the disciplinary skills and expertise needed to accomplish the goals the project and these need to be harnessed and celebrated (see Section 4, Enabling Participant Success). However, large SES projects also demand the generation of new interdisciplinary and transdisciplinary knowledge. Co-learning can provide a structured setting for team members to share their expertise and come together to generate the new ideas and creative solutions required to accomplish the project's goals.

The term co-learning implies engagement, and participation in co-learning processes is itself a team-building exercise. It is important that all team members be involved, whether they are undergraduates getting their first research experience or full professors well along in a successful career. While we recognize that senior faculty have many other responsibilities and may have substantial experience with cross-disciplinary teams, their participation in co-learning activities lends credence to the team, indicates respect for the project director, and fosters engagement by the more junior members of the team. This is an opportunity for them to share their wisdom and begin the mentoring process!

There are a variety of project management topics to be covered during the co-learning process, many of which are detailed in later sections of this primer. Collaboration and team science skills include process facilitation, active listening, respect and attribution (see Section 3, Creating a Culture of Collaboration, and Section 6, High Performance Teams). Additional communication topics include internal and external communication goals and mechanisms, including distance education tools (covered above and in Section 3, Creating a Culture of Collaboration). Unfortunately – but realistically - participants on large projects need to be versed in conflict management, including understanding power relationships, team agreements, and grievance processes (see Section 7, Project Design and Management). Data management requires consensus on software tools, procedures, access, and attribution (see Section 7, Project Design and Management). Finally, but perhaps most important for the project's long-term impact, large SES projects, need to include explicit plans for mentoring. This may include students and junior researcher staff working with multiple mentors and recognition that we need to build diverse pipelines of talent at all levels (see Sections 4, Enabling Participant Success, and Section 5, Support for the Next Generation of Researchers).

## Take Away Messages:

- Finding the right project manager is perhaps your most important early decision. This person must share your vision for the project, have a compatible workstyle, and be able to work with the full complement of team members and partners. Passion for the project is desirable, but project management skills are essential. Key attributes include writing and communication abilities, an eye for detail, and a head for numbers.

- You will need to understand strengths and limitations of your team members and their institutions.

- You will need to understand the difference between teamwork and taskwork and make sure that everyone has an understanding of how goals are established, tasks are assigned, and collaborators are engaged.

- The vision, goals and outcomes of your proposal were likely germinated among a small group of individuals but now need to be embraced by a much larger group.

- Team members need to understand their roles; commit to a timeline, milestones and deliverables; and report when there are any deviations from the plan. Real-time feedback is essential if you are going to be effective at clearing roadblocks, prioritizing resources, and keeping the project on track.

- Regular, online as well as occasional face-to-face interactions are needed to build effective collaborations across long distances.

- You should leverage funds from your host institution; and the best time to do so is before your proposal is submitted.

- Co-learning processes can help establish team policies, procedures and expectations; develop baseline knowledge across disciplines; and build a high-functioning team for transdisciplinary work.