WELCOME PACKET

Project Confluence: Engineering and Science to Address Community Challenges

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SOME FREQUENTLY ASKED QUESTIONS

What is Project Confluence?

Project Confluence is an effort to create a movement of engineers, scientists, academics, and other professionals to address unmet challenges related to environmental, climate, and energy injustice. Some of the research in Project Confluence—*this* effort *you* are participating in!—is funded by the US National Science Foundation (NSF). It's goal is to understand the impact of collaborations between engineers, scientists, and academics broadly, and community groups to address environmental, climate, and energy justice challenges.

What is in this welcome packet?

This welcome packet contains information and resources you can use to build your collaborations and stay in contact with the research team.

Where can I find files and documents?

There is a Google Shared Drive set up that the research team (Darshan, Wendy, and others) will use to store and share files (like this one, the final team list, and so on) with all participants. Click here to access it.

Who should I contact for what?

You can contact the Principal Investigator of the research grant, Dr. Darshan Karwat (darshan.karwat@asu.edu) and Dr. Wendy Barnard (wendy.barnard@asu.edu) with any questions, comments, input, advice, or concerns you have. Dianna Peters (dianna.peters@asu.edu) is the point of contact for financial questions. In case you want to contact other participants in this research, navigate to the file "Project Confluence – Final teams and contact list" file in the Google Shared Drive, or to one of the group emails Darshan has sent.

Who is participating in the research? What are the teams?

Navigate to the file "Project Confluence – Final teams and contact list" file in the Google Shared Drive to see all the research participants.

I have a thought, idea, approach, or document I want to share with the other participants. Can I? How?

Of *course* you can! Perhaps you found an interesting example of a collaborative challenge assessment that you are using as a template for your own, or there is something important that you think teams should include in their memorandum of understanding. Share it! You can either email Darshan to have him share it, or you can just do it yourself, since you have everyone's email address.

KEY DELIVERABLES AND TIMELINES

Your team will collaboratively produce four key deliverables through participation in this project. Below are high-level descriptions of these deliverables, with more detail on items 1, 2, and 3 to follow:

1) A **memorandum of collaboration**: The memorandum of collaboration will be a foundational document that guides your collaboration. Documented in it will be key principles and processes that will guide your collaborative work. This will be due to Darshan and the research team by June 30, 2021.
2) A **milestone table and budget justification**: The milestone table will document the steps your team will take to produce the collaborative challenge assessment. This could include key check-ins, synthesizing documentation, or any other key steps you determine. This document should include a budget justification for how the academic team will spend its money. This will be due to Darshan and the research team by June 30, 2021.
3) A **collaborative challenge assessment**: The collaborative challenge assessment will document how your team envisions addressing the environmental/climate/energy challenge identified by the community group leader(s) on your team. This will be due to Darshan and the research team by December 31, 2021.

4) A **public presentation of your collaborative work**: At the end of this project, all teams will share their work at a public event that will bring together those in the broader networks we are connected to. We hope to have NSF program officers there, too! This event will be organized for some time in spring 2022.

MEMORANDUM OF COLLABORATION

The starting point for Project Confluence is the recognition that collaborators in a team come with different and diverse perspectives, access to resources and networks, kinds of education, organizational affiliations, motivations, and goals. A memorandum of collaboration (MOC) that simply and clearly acknowledges this diversity, and creates a foundation and framework for engagement, will critical to the success of the collaboration.

Below are elements that can be embedded/questions to be answered in an MOC:

- Motivations and goals of the team
- What participatory processes will be used to make decisions? Whose approval is needed for what?
- How will trust be built and maintained? How might conflicts be resolved?
- Who will own the work? Are there any privacy concerns? How will they be handled?
- Who will be given access to the data and the work? How?
- Who will get credit for the work? How?
- How will the work be disseminated? Who is considered an author?
- Where will data be stored?
- Time expectations and how you will work together
- Anything else your team thinks is important

There are no firm requirements on formatting, length, or anything of the sort what the MOU should look like. It should be what your team finds most useful in laying the foundation of your collaboration. You might consider this to be a living document, making edits as the team feels necessary. In the Google Shared Drive, there are examples of documents similar to MOCs to serve as inspiration.

It may be worth organizing your first conversation or two around the MOC, since hashing through the topics/questions above will be a nice way to get to know each other.

MILESTONE TABLE, BUDGET JUSTIFICATION, COMPENSATION

The milestone table will document the steps your team will take to produce the collaborative challenge assessment, and the dates associated with those steps. Just like the MOU, work on the milestone table collaboratively. Milestones could include things like important presentations/check-ins, drafting or finalizing documents, or any other key steps you determine. (Academics should include in this milestone table document a budget justification; see below). This will be due to Darshan and the research team by June 30, 2021 (the same day as the MOU).

Each team will be given $10,000 for their work over the course of this research. This $10,000 will be split equally between the community group and the academics. Dianna Peters (dianna.peters@asu.edu) is the person who will disburse these funds. Below are the instructions on how you'll get these funds:

- Community groups: Given existing financial and administrative rules, the $5,000 will be given in chunks to your community group for work performed. Darshan will connect you with Dianna, the financial manager of the grant. She will work with you to add your community group as a vendor in the ASU system. You will then simply send along an invoice as you meet milestones. Below is a suggested invoicing timeline:
    - July 1, 2021: Submit invoice for work on MOU ($1000) and milestone table ($1000)

- January 3, 2022: Submit invoice for work on collaborative challenge assessment ($2500)
- After final public presentation: Submit invoice for public presentation ($500)

If you feel like there is a better compensation schedule for you, please let me know, and we will find an arrangement that works for you!

- Academics: After the milestone table, provide a budget justification for how the team envisions using the $5,000. (Of course, the community group leaders should weigh in on this!) Anything except faculty/staff salary is allowed. You can pay for student time, software, hardware, or anything else the entire team thinks necessary. Darshan will approve the budget justification, and then Dianna will then just map this money to your ASU account whenever a cost/charge comes up.

COLLABORATIVE CHALLENGE ASSESSMENT

What is a collaborative challenge assessment?

The Collaborative Challenge Assessment (CCA) is final written deliverable from your collaboration. You can think about it as a collaboratively created/written product that assesses of the engineering/scientific/technical challenge the community group wants to address, and a roadmap on how that challenge can or will be addressed. This document can be used to guide future collaborative efforts.

The notion of a "collaborative challenge assessment" is inspired by documents like "technology needs assessments." We have intentionally injected the world "collaborative" into the term to make sure that all members of a team give their input into it, and we have intentionally steered away from the word "needs" because of the "deficit" connotation it has (see Resources and Capitals and Primers sections below).

The basic questions you can answer through the CCA are:

- What needs doing to address the challenge identified by the community group?
- Why?
- How might things get done? Using what resources?

Core things that should be in the assessment are:

- An engineering/scientific/technical characterization of the challenge
- The broad context this challenge fits in
- Specific questions to answer, gaps in understanding, and things needing accomplishing
- Delineated responsibilities and actions
- How knowledge will be shared
- Existing resources/capitals or those that need to be found or created (see the primers)
- Timeline for action
- Resources and references
- Anything meaningful for the collaboration that supports engineering and science for action

There are no firm requirements on formatting, length, or anything of the sort about what the CCA should look like. If you need ten pages, great. More? Less? No problem. Basically, it should be what your team finds most useful. As the collaboration unfolds, you may actually be able to tackle some of the tasks that come up, but for now, you can think of the CCA process as a planning effort.

Below are some ideas and resources you can use to create your CCA. There are examples of documents similar to a CCA in the Google Shared Drive, too. Beware, one of them is terribly long, and by no means do we expect the one you produce to be that long or in-depth!

An example of an element in the CCA

Below is a purely hypothetical example of a table that captures just some of the bullet points above. You could imagine something like this being embedded in your CCA. Imagine the challenge that the community group wants to address has to do with reducing air pollution in certain parts of Phoenix. You can see in the table below that one question that needs answering has to do with mapping air pollution. You see that this question is answered by the academic team using existing data, as well as the community group learning GIS to do their own mapping moving forward. You see then how this knowledge will be shared through community meetings and in presentations to city council, and that all of this might be able to be accomplished in six months. Similarly you can see how other questions will be answered by the team in the years ahead.

Question	How will the question be answered?	How will knowledge be shared?	Timeline
What are the concentrations of ozone, NOx, PM_{10}, and $PM_{2.5}$ in west and south Phoenix?	• Professor X to use National Air Toxics Assessment to create updated maps • Community group Y to learn how to use GIS to create their own maps moving forward	• Community group Y will organize a community meeting where Professor X will share findings • Community group Y, with support of Professor X, to present results to city council	6 months
What impact would transitioning to electric school buses have on local air quality around Roosevelt high school?	• Community group Y to organize meeting with school district to understand budgetary constraints • Professor X to use modeling to understand air pollutant dispersion around Roosevelt high school and how that would change with electric buses	• Community group Y to create K-12 student taskforce to educate community on differences between electric & diesel buses • Professor X to share with colleagues how new interpolation techniques can be used to downscale air pollution monitoring data	1 year
How can we increase robustness of low-cost air pollution sensors for community use?	• Professor X to apply for funding to enhance lab capabilities for sensor testing, test performance existing sensors, use to hybrid inorganic/organic materials for manufacturing new sensors	• Professor X to lead the writing journal publications with community group as co-authors • Community group Y to organize a community meeting where Professor X will share approach, findings, and how this shapes future R&D	3 years

Resources and capitals

Based on principles of asset-based community development (see Primers section), below are examples of the kinds of resources and capitals that may be documented, leveraged, or created to address the community challenge. They can be mentioned in your CCA:

- Existing community group capacity (membership, staff, financial resources)
- Existing academic capacity and resources (human and financial capital, laboratory space, etc.)
- Community assets (human, financial, and social capital; institutions like schools, community centers, etc.)
- Engineering, scientific, and technical capabilities of community group
- Incentives needed and barriers to overcome to support long-term collaboration
- Educational resources that would be helpful for advancing environmental, climate, and energy justice

Question Formulation Technique

One way for your team to figure out what questions need answering and thus what steps need taking is to use the Question Formulation Technique (QFT). QFT was developed by the Right Question Institute. It "helps *all* people create, work with, and use their own questions, building skills for lifelong learning, self-advocacy, and democratic action." You can learn more about it by clicking here. It's fun, incredibly thought-provoking, and a great way to get to know your collaborators. If there is enough demand for a facilitated session on QFT, Darshan can

reach out to Dan Rothstein and Luz Santana of the Right Question Institute to see if they can organize one. Just let Darshan know.

PRIMERS

We have compiled a set of resources for you to use to (1) understand and navigate power dynamics in collaborative efforts, and (2) use asset-based approaches to characterizing and addressing community challenges. You can find them in the Google Shared Drive. Some details on these primers are below:

1. Navigating power dynamics (called Larson and Karwat 2021 - Power Primer): Academic professionals work for organizations that hold significant power and bestow prestige and privilege upon them. Community group leaders have access to their own unique networks, trust within communities, and voice that give them their own power. This primer intends to help collaborators be more aware of these power dynamics and how they can shape responses to environmental, climate, and energy justice challenges.

2. Asset-based community development (a set of papers): Oftentimes, academic professionals (particularly engineers and scientists) are trained to investigate and solve "problems," and thus, they often approach the world with a *deficit* lens, meaning that their efforts attempt to fill voids. But such *deficit-based* community development generally does not regard marginalized communities as collaborators in community development, collaborators who have their own expertise that is valuable to outsiders seeking to help.

   On the other hand, in *asset-based* community development (ABCD), "outsiders" like academic professionals who want to engage with and help address the concerns of communities start by recognizing the assets (like knowledge, social networks, and so on) that exist in those communities, and then collaborating with them to create shared visions of work that addresses community concerns. ABCD is increasingly used in international development but it has not pervaded community-based engineering and science. The resources below center ABCD, in conversation with ideas like community capitals and appreciative inquiry, and provide examples of how to employ these frameworks. As you read through these resources, see what parallels might be made between the examples and the challenges you are trying to address:

   - Start with **Emery, Fey, and Flora 2006**, to get an overview of the ABCD process using community capitals.
   - **Anglin 2015**, **Koch et al. 2017**, and **Gutierrez 2018** provide examples of ABCD in action in diverse contexts, from psychology to work with Indigenous peoples.
   - Finally, **Alezivou 2016** outlines several additional methodologies along with the community capitals inventory model.

PUBLIC PRESENTATION OF YOUR COLLABORATIVE WORK

One of the outcomes we seek in this grant is to inspire others to do such collaborative work to address the many unmet environmental, climate, and energy challenges we face in the US. We believe firmly there are immense knowledge benefits to be shared and impacts to be made when academic professionals work hand-in-hand with community partners. The social networks each participant in this effort is connected provide opportunities for amplification and expansion of such collaborative work.

A key—and the last!—milestone will be a public presentation of the work all four teams conduct through this process. You'll invite people who you want there, and hopefully this event cements this short-term effort as just a first step in a much longer-term journey. Stay tuned for details on when this event will be organized and how.