

# Q&A with Carmala Garzione



*Carmala Garzione, Professor and Chair of Earth and Environmental Sciences, is the PI for a recently awarded \$4.2 million NSF grant to test a theory that the planet began cooling 3.6 million years ago because iron-rich dust from Asian deserts may have fertilized the North Pacific Ocean, stimulating the growth of algae that reduced atmospheric CO<sub>2</sub> and ultimately caused the big chill. The research team includes three Chinese institutions and six other U.S. universities (Brown, Columbia, Massachusetts Institute of Technology, University of Arizona, University of Colorado, and University of Texas at Austin). Here is a Q&A with Garzione on the challenges – and rewards – of leading a major project like this.*

## **Q. Is this the first time you've been involved in a large, multi-site, interdisciplinary project like this?**

Very early on in my career I was connected with a large, interdisciplinary project that I wasn't the PI on. I got experience seeing the value of those types of projects, understanding my role in the project, and understanding what it takes to lead a project like that.

A few years later, just after getting tenure, I took on a project like that in the Andes (as the PI). It was a crazy and bold move at that early stage of my career. I was scared and didn't think I could pull it off, but I also thought it was a really exciting opportunity and I had to try it, to make sure I didn't miss it. There was an eager group of co-PIs who wanted to be on the project, so it was relatively easy to pull it together, although it took two submissions to get it funded.

This new PIRE project was harder, more logistically challenging, because I was coordinating with a completely new group of people, most of whom I had never worked with or even talked to in some instances.

(Garzione has now been involved in four other large projects as co-PI and now two as the PI.)

## **Q. For younger faculty, then, would you suggest that a good first step in getting involved in these kinds of projects is to not try to be the PI the first time out?**

Absolutely. I can't imagine taking on a project like this, or trying to lead this kind of effort without first having experience as co-PI.

**Q. Do you have any suggestions for faculty members who may have been co-PI's on a project like this, but are leery of taking the leap to being a PI?**

The good thing about this is that you pursue what excites you if you are the PI. It might be unwieldy at times, and it might seem like herding cats, but you're promoting the science that really excites you. I'd recommend focus on that, rather than the tasks involved, because it is daunting. Hopefully the science that excites you will thrill another group of researchers that you can pull together.

**Q. What was this the genesis for this latest project?**

So I've had this idea since 2003...

**Q. So this does not happen overnight!**

It does not happen overnight. In science, this the general thinking: You have a few times in your career when really big things enter your mind, big scary ideas that you just kind of keep track of in the background. I tried to pursue this idea through a junior faculty leave in 2004. I worked very hard on it, and even pulled together a paper on it. But in the end I wasn't satisfied with it. I didn't feel I had enough information to make a strong, conclusive contribution, and so I didn't submit it. But I kept track of the literature. And as things accumulated that seemed to support this idea, I began to talk to people, and run ideas by them and develop relationships with the team members on the project.

About a year before the proposal was submitted, I started to contact people to see if there was interest.

**Q. Were there papers you had to write or other grants to help you build a foundation for this submission?**

Definitely. The proposal grew out of a body of work I had been doing in northern Tibet in collaboration with a lot of other people. There was an accumulation of knowledge about the tectonic evolution of that region and the interactions between tectonics and climate.

We had published a few papers, but nothing specific to this hypothesis. However, this hypothesis is supported by some of our ongoing work, which provided enough of a foundation or springboard for launching a big effort.

**Q. Did you use any seed grants from the University in building this foundation?**

Not for this project. I did consider [Pump Primer](#), and I would encourage other faculty to do so. But we decided to go for a PIRE (Partnerships for International Research and Education) [grant](#) from NSF and just didn't have the time to do it because announcements for PIRE are infrequent. The other program we were

looking at (NSF's Integrated Earth Systems) has an annual cycle. If we had gone for that, we would have tried to organize a workshop of the participants with Pump Primer and taken a little longer cycle to put together the preliminary proposal.

**Q. To what extent were you visiting program directors at NSF to lobby for this?**

That's difficult to do with PIRE, because it supports a lot of different types of science. So the people who review the proposals are both within your discipline but also in entirely different categories at NSF. International programs get involved, for example. All of the different directorates are involved in some way

That said, I have spent a lot of time at NSF serving on review panels, specifically on review panels that have reviewed PIRE proposals and review panels focused on large integrative proposals.

And I also served as an advisory board member on another PIRE project (Ancient biodiversity and global change along the Panama Canal). Honestly, without having had the insight into the complexity of PIRE and how these projects succeed at the educational component, I wouldn't have tried to take this on. The educational component and international component are so important, that if you don't demonstrate that those pieces will be well executed, you're not going to be competitive. It helped me to see how the other project was competitive and where it was succeeding and where it wasn't.

When I talked with other PIs involved in these projects, they were very supportive and happy to share their ideas. They were completely open about what they thought was going well, and where they felt like they were not achieving what they had hoped to. I tried to use all that knowledge to figure out how to lay out the educational and international activities in our project.

**Q. Was it approved on the first submission?**

Yes. I was stunned. Every single other large integrative project I've served on required two or three submissions. This is the first one that was funded on the first application.

**Q. What was the most important factor in getting it approved?**

I think what is really challenging in pulling a proposal like this together is communicating with all the co-PIs, coordinating efforts early enough so they feel secure in your leadership, getting them on board with the central hypothesis or goal of the proposal, and helping them to help you write it. So with each co-PI I started individual dialogues very early, describing how we might cast the central goal.

I didn't focus on specific research objectives. I knew this was a good team and knew I'd find opportunities to work with each person. It was just a matter of helping them to define their goals and figure out in what ways they could support the writing. So a clearly delineated central hypothesis, or hypotheses, is very important. That gives

people an opportunity to be creative and think about what they can contribute to testing it.

The second stage is pulling individual collaborators together in smaller groups that could coordinate efforts around a component of the central hypothesis. I had to build relationships among the smaller groups to help them integrate their ideas -- because if I had eight different little projects all individually connected to a central hypothesis, it would look weak and the connections would look tenuous. I talked with everyone about his or her interests and tried to build relationships between groups, some of which had not communicated at all before.

**Q. How did you do this? By email, Skype, phone?**

All of them.

**Q. So you did not gather everyone in one place to hammer this out?**

If I could have done that with Pump Primer support I would have. We just didn't have the time. Many of projects I have worked on have a coordinated workshop that is a brainstorming opportunity to figure out how the various parts of the project will work together. I definitely would encourage that.

**Q. How did you identify your collaborators?**

I was following the literature around this topic, so I got to know about the people who, in my opinion, would be the very best to contribute. I was very nervous about contacting them and seeing if they would be interested. I will be honest: I feel shy and insecure when making new research contacts. But despite that insecurity I took that step of contacting people.

I put together a set of data, a little modeling exercise related to the central theme of this proposal, and explained what I was thinking about. I offered that I was ignorant about some things or missing others, and asked if they would be willing to talk. So I got people talking first, then explained I was trying to organize a larger project.

It doesn't happen quickly. You need to have multiple conversations with people. One group in particular, that I knew needed to be part of this project, did not join us in time for the first submission of the pre-proposal. They said they were overcommitted; they were interested, but they couldn't take it on.

After we got the pre-proposal feedback saying 'you really need this component,' I sent that group the feedback, and said 'we really want you, how is your schedule, are you excited, we're being encouraged to go forward with this proposal, would you be willing?'

They wrote back "very excited to join."

So I didn't give up.

