

Transcript - Native Waters on Arid Lands Podcast

Episode 1: Traditional Knowledge and Ecology with Dr. Alexandra Lutz and Dr. Beverly Ramsey

<http://nativewaters-aridlands.com/2017/04/lutz-ramsey/>

Abbreviations:

KF: Kelsey Fitzgerald

BR: Beverly Ramsey

AL: Alexandra Lutz

KF: Hi everyone, I'm Kelsey Fitzgerald with the Native Waters on Arid Lands project, and I'm here today with our project director, Dr. Maureen McCarthy, to talk with two of the members of our research team about their work in the areas of Traditional Knowledge and ecology.

Dr. Beverly Ramsey is the Executive Director of the Division of Earth & Ecosystem Sciences at the Desert Research Institute in Reno, Nevada, and Dr. Alexandra Lutz is an Associate Research Professor of Hydrogeology here at DRI. Welcome, and thanks for joining us today.

KF: Beverly, could you start by telling us a little bit about yourself and your research?

BR: Hi. Well, let's start with my general background. I'm a systems ecologist, I did my Ph. D. work at the University of Tennessee, out at Oakridge National Lab. So, what is systems ecology? That basically means I chase things through natural systems. So, physical scientist by background, and looking at whether it's nutrients or its toxic materials, how they move in different ecosystems, and how fast they go, and where they end up, and whether they indeed are a help or hindrance to people or animal or plants. That's more or less my background.

So, my part of this project is to look at it from a traditional standpoint — I am Eastern Cherokee by heritage, so luckily for me, I was raised in that tradition of how to deal with traditional knowledge to grow our own food up in the mountains. Now we're looking at that versus our current agricultural practices in western tribal areas, and trying to help figure out what's best to use.

KF: Can you give us a brief overview of what you're working on for the Native Waters project?

BR: Well, where we started was to do two things: one, to actually characterize and understand the watersheds, or the drainage basins, in which our reservations are located. How much rain do they get, what are the trends in terms of both meteorology and in terms of what people were growing. And whether they're doing that for their own sustainability or they're doing it in terms of economic crops to be able to sell. So we're starting from that framework, really talking to somewhere between 8 and 14 or 15 tribes that are in the Great Basin, Colorado River Basin, and really into Arizona and a little bit west of there, depending on what their interest and experience

is in these areas.

KF: And what are the goals of your work?

BR: Well, we're trying to do several things. One of those is to actually evaluate what the current conditions are in these watersheds where the reservations are. By that I mean how much water is there, what are the trends, what's the current metallurgy. Then we're looking back into antiquity, if you will. We know that around 1500 AD and 900AD there were huge droughts in many of these areas, but people were inhabiting these areas. So our paleoecologist and archaeologist are looking at both their own research and others to see if we can identify in those records what people were doing in terms of foods, how they were supporting themselves, what the size of the human population but also wildlife including fish and so forth were at that point. Part of that is to evaluate what do we know, what is the real productivity in those areas historically. From a traditional knowledge standpoint, we're really looking at what are the traditional agricultural practices, food-growing practices. How has that changed with people being in smaller reservations instead of migrating so much. What's happened in terms of the governance models and land tenure, and all of the changes that have occurred. And then how is the traditional knowledge we have actually reflected in current agriculture in these particular watersheds and for those tribes.

KF: Alex, could you tell us a little bit about your area of expertise?

AL: Hi, thanks for having me on today. First of all, A lot of people ask me, what is hydrogeology? That's just another way of saying groundwater. What I've looked at though is not just groundwater, but a lot of water resources and climate. My dissertation work and a lot of my research has taken place in west Africa, where I've found that there's not a lot of information to work with. So I bring expertise in working in data-sparse areas, as well as working with stakeholders who are farmers. In west Africa, the farms are very small. They're not mechanized. It's a lot of small holder family farms. So getting information to those people in the communities who need it is something I bring to the project.

KF: Can you give us a brief overview of what you're working on for this project?

AL: Sure. One thing I've noticed in this project, as in other projects in the western US, is again getting back to not enough information to do all of your work. So, one idea that Beverly had was lets try to close some of these information gaps. How can we do that. There are weather stations that can be put into areas like community gardens and schools. These weather stations can collect information on wind speed, temperature, solar radiation - so over time, what you get is a picture of agricultural conditions for farming. So it helps the communities who'd like to farm. It's also an interesting thing for children - they can plot temp over time, it becomes a learning tool, and it's something they'll never forget.

KF: What is the geographical region that we're talking about?

AL: The areas of the project are the Great Basin, the four corners region, also the lower Colorado River Basin. I've basically been working with the tribes who have expressed an interest in

hosting a weather station. That's pretty much been the entire area. We also do have a weather station in the Santa Ynez Chumash area, which is outside of Santa Barbara, CA. So that's been a little bit of a stretch, in a really interesting way.

KF: And Alex, what are the goals of your work?

AL: The goal in this case would be to collect information in some of these areas where we don't have enough, so these large rural areas we have in the Great Basin - large rural valleys where we don't have temperature data, we don't have wind speed. Then also things about the hydrology. So there's a stream, but we haven't been measuring streamflow. There's snow, but we don't know on average how much snow falls. So, then, when it melts, we don't know how much runs off into the watershed. If we can get some more monitoring equipment out into some of these areas and have it measured, that would be great - but then even more important is taking some of that information and getting it back to the communities in a way that is meaningful for them. For instance, at DRI we have access to a lot of datasets. They're huge, you download these tremendous files, they're huge spreadsheets, it's really hard to manage. But we can push the data into time steps that work, months or weeks, we can format it, we can help do some interpretation on it. So, having conversations with community members about what their needs are for information.

KF: Beverly, your work involves a lot of collaboration with tribal partners. Can you tell us what you're learning from that?

BR: I'm a storyteller, and I love listening to stories. A lot of what we're trying to do is to listen to people tell us what their experience has been, from what they've been told from their parents and grandparents and elders, but also what they're currently doing in terms of meeting their own nutritional needs. How the communities are really meeting food needs in the schools, in elder care, things of that sort. And what their experience has been in terms of both the benefits and the barriers to doing economic level of really crops that they can sell, of course. One of the interesting issues is that if you look at history, for instance, nobody was growing alfalfa on reservations or native lands. That's something we brought to folks so that we could sustain and build beef populations and things that are commercially viable. But in areas and at times where droughts were occurring, being able to keep the irrigation systems running to support alfalfa is very different. One of the questions we're looking at is what did we do historically, and even prehistorically, that allowed us to survive in these environments and at periods of times that were dry, that we could use again. That use less water or are more sustainable, things of that sort. How do we bring those particular elements back to the front. And how does that help the communities that we're working with.

KF: What has been the most interesting thing that you've learned so far?

BR: I think the most interesting thing is probably self-evident. The way human beings have maintained resilience is to migrate. If an area got too dry, too wet, too cold, too hot, they went somewhere else where the food was more traditional to them and they had to. As we have settled in villages and towns, or where we have reservation boundaries and have made restrictions, it's a very different issue to try to deal with resilience. We now have not the option of migration, and we really have to look at what did we know in this kind of area and under these conditions and how do we apply it now.

KF: Alex, what has been the most interesting thing about the project so far for you?

AL: Having a background in the physical sciences, what's been really interesting for me is to learn about how a lot of the land trust works. Like, I've learned that it's not always straightforward to put out monitoring equipment because of land ownership issues. That's something to think about and consider when we put out monitoring equipment.

KF: Has any of your work with rural communities in West Africa helped to inform the work you're doing on this project?

AL: What I learned in West Africa was to listen. That was a difficult thing at first, because I was young and I was a student and I wanted to get my research done and finish my dissertation. And I had to sit back and listen. I also found out that it's very important to have a conversation with the communities about equipment that you might be installing, what you were hoping to get from them, what you would be providing in return. Because what I was doing there was putting loggers into hand pumps, so this was going to measure the groundwater level. Once I explained to the communities what was going on, they were very supportive of it. But in cases where I didn't do that, and I didn't know, it didn't really go as well.

KF: Beverly, what are the target areas for your research in the coming year?

BR: A lot of dialog with the individual communities. To really start looking at both spatial and temporal patterns. I really think this next year we're going to be moving a little faster than maybe we thought we would, because there are so many datasets available and so much information available about traditional crops, and there are organizations within practically each of the tribal communities we're working with that are both very practiced in dealing with everything from seed banks and multiple use of crops as they're grown, both in an educational way as well as making food. For instance, Alex has made sure that a lot of our weather stations are close to schools. So, the kids get the benefit of that. Many of the community gardens are also student projects. So, being able to put raised beds there for them to be able to not only look at traditional crops such as beans and corn and squash grown together, but how do you add an oil crop that's very easy to grow, like sunflowers? Many of our tribal communities have been doing that for many years. So they're beginning to teach the young people different ways that are smaller, more integrated into the community, of being resilient by household and resilient by community.

KF: Alex - what are the target areas for your work in the coming year?

AL: In this coming year, I'd like to see that the weather stations are up and running. If help is needed, I'm happy to do that. I paid a visit to local communities to help them get it set up. If the stations are up and running, I'd like to find out how's it going. Are they working well, does it suit the needs, have there been mechanical failures? We have a station here at DRI that's out in front of my office that's working great so far. That doesn't mean it's going to work great everywhere. Then, for the ones where we're getting information, is the information enough or is there still something that's missing? Then if there's a gap, what can we do to help fill that gap?

KF: Beverly is there anything else you'd like people to know about your work?

BR: Yeah, it's a lot of fun. I think one thing that's very important is that all communities have similar issues. The more rural they are, the more energy or energy limitations tends to affect what they can grow and how they grow it. Certainly hydrologic conditions are increasingly issues because the temperatures are warming and drought is occurring in several places. Luckily, right now in the Tahoe Basin we are not experiencing that problem for the first year in many years. I think what we can learn here will value not only in the native communities, but communities that are particularly small, but even community redevelopment inside urban areas - so that people can be a bit more independent and supportive of their own nutritional needs.

KF: And Alex, anything else you'd like people to know?

AL: Sure, we still have a few weather stations available, if anyone would like to host one. A couple things that have been really nice is having communication with some of the communities that have hosted weather stations. I've gotten to know some new people, gotten to know what they're working on and their needs. That's been a really nice experience for me. One thing that was by chance - the Santa Ynez Chumash weather station, which is nearby a children's center, was able to capture the latest atmospheric river in southern California. I think that was really exciting for them. We'll have to go through that data and see how it worked, because it was a lot of rain. They've also had a little bit of flooding. They had actually a couple of years ago actually prepared for flooding. So, They were sitting high and dry and the surrounding community maybe not so much. So there's a great example of resilience on their part.

KF: Thank you very much to both of you, we look forward to hearing about what you're working on next.