Tribal Resilience Across the Country: From Guidebook to Action

Webinar Transcript

May 22, 2019

Contents

This transcript reflects the statements made during a live webinar on May 22, 2019. The transcript has been reviewed for accuracy. Any grammatical errors or otherwise unclear passages are true to the statements of the presenters.

State and Local Energy and Environment Program

I. Introduction

Slide 1. Tribal Resilience Across the Country: From Guidebook to Action

Operator: Good afternoon, ladies and gentlemen. My name is Mel and I will be your conference operator for today. At this time, I would like to welcome everyone to the Tribal Climate Adaptation Guidebook Conference Call. All lines have been placed on mute to prevent any background noise. If you need any assistance during the call, please press star then zero and then an operator will come back on line to assist you. Thank you. I would now like to turn the call over to host today, Ms. Erica Bollerud. Ma'am, the floor is yours.

Erica Bollerud: Thank you Mel. Good afternoon, everyone, and welcome to this webinar on tribal climate resilience. My name is Erica Bollerud and I am the Tribal Coordinator for the U.S. Environmental Protection Agency's State and Local Energy and Environment Program.

Slide 2. How to Participate

Erica Bollerud: Our programs support state, local, and tribal governments in designing, analyzing and implementing programs that reduce the environmental impacts of their energy use.

In our webinars, we always strive to highlight the experience and work of practitioners at the state, local, and tribal levels as much as possible so we can all learn from one another. And today we are honored to be able to highlight the work of several professionals building resilience to climate change in their tribal communities and we're glad you're all able to join us to learn from them. Before we get started, I'd like to turn it over to Sarah Chadwick who's going to give us some information on how you can participate in the webinar today. Sarah.

Sarah Chadwick: Hi, everyone, and thank you so much for joining today's webinar. I'm going to go over a few ways that you can participate in today's webinar. There are three ways to participate. First, participants can answer questions in the question and answer (Q&A) box on the right side of the screen. Let us know who your question is for and we'll moderate all the questions at the end of the webinar. Any questions we don't have time to answer today will be posted on the Environmental Protection Agency (EPA) site in a few weeks. I quickly like to show one neat feature of the webinar platform we're using.

All hyperlinks you see on the slides today should be active. So, feel free to click on those anytime to explore more web content.

Slide 3. How to Participate

Sarah Chadwick: The second way to participate is through several polling questions. It should be fairly simple to participate, but users on mobile devices or tablets may need to exit full screen mode and tap on the poll icon which looks like a slip of paper dropping into a ballot box.

And then the third and final way to participate today is to complete the webinar feedback form. At the end of today's webinar we will share a link to that. However, if you are unable to stay until the end of the webinar you can find this link in the Q&A box at any time. So, again, thank you for joining us and that's all from me.

Slide 4. Today's Agenda

Erica Bollerud: So, this is Erica again. Many of you may be familiar with our State and Local Climate and Energy program and our resources if you participated in previous webinars or accessed our website, but overall I just want to briefly let you know that we're focused on helping state, local, and tribal governments identify, understand, and implement strategies to help them pursue multiple goals through the use of clean energy and whether that's energy efficiency renewable energy or other related technologies.

Slide 5. Introduction

Slide 6. U.S. EPA's State and Local Energy and Environment Program

Erica Bollerud: And ultimately we want to help you all achieve your air quality and public health goals, strengthen your energy systems, reduce greenhouse gas emissions, save money, and many other benefits. To do this we offer analytical tools data, technical expertise, guidance resources, and other information on our website and you can access all of that at the link on the bottom of the screen.

Slide 7. Tribal Greenhouse Gas Emissions (GHG) Tool

Erica Bollerud: Before I turn this over to our panel I did want to highlight a tool our program has developed specifically for tribes to use. It's our Tribal Greenhouse Gas Emissions Tool. It's a free spreadsheet tool you can access at the link on the slide. You could use this tool to create a community wide greenhouse gas inventory or one for tribal government operations only or both. Ideally you can use it to create an emissions baseline, track trends, measure progress, and inform your mitigation work. Now I want to turn this over to our main event.

We have several great speakers for you today though we do have some breaking news. It will be a smaller panel than intended. Eric Chapman at the Lac du Flambeau Tribe of the Lake Superior Chippewa Indians in northern Wisconsin won't be able to join us. Mother Nature has intervened. Unfortunately, his tribal community experienced extensive power outages this morning due to very high winds.

So, right now approximately 4,600 residents there are without power including his Natural Resources building which is where he was going to call us from. So, he's doing on the ground work right now coordinating tree and debris cleanup and helping to find hotel rooms for tribal elders. So, he is doing very direct tribal resilience work and our thoughts are with him today.

Slide 8. Contact Information

Erica Bollerud: But now I want to say a big thanks to kick it off to Sascha Petersen who was instrumental in putting this panel together.

II. Sascha Peterson, Adaptation International

Slide 9. Tribal Climate Adaptation Guidebook

Erica Bollerud: And I want to give a quick introduction to him. Sascha has been working on climate change for more than 13 years. He was the first managing director of the American Society of Adaptation Professionals and is the founder of Adaptation International. He's worked with both climate scientists and municipal governments and focuses on bridging the gaps between climate change, science, policy, and action.

He has direct experience with local governments and tribal communities helping communities ranging from the Upper Snake River Tribes Foundation in Idaho and the Washoe Tribe in California to the City of Boulder and the City of San Antonio build climate resilience. He's worked with a number of tribal communities and multi-tribal organizations to assess climate vulnerability and develop adaptation plans. I'm very glad we can have him in here today to talk with you about the new tribal climate adaptation guidebook. And now I'll turn it over to you, Sascha.

Sascha Peterson: Great. Thank you, Erica, and thank you everybody for joining the webinar today. I'm really grateful to be here and have an opportunity to give you a little highlights of the new Tribal Climate Adaptation Guidebook and then also, you know, listen to our other presenters who are leading tribal resilience efforts in their communities. And so just a little background on Adaptation International before I jump in.

We're a small mission driven organization and we work exclusively on partnering with communities to build tribal resilience and we've had the opportunity to work with almost 20 tribes or tribal consortiums across the country over the last eight or so years on climate change resilience and so it's a really exciting time to be collaborating in building resilience. There are so many new tools and resources available to support these efforts.

And so this new Tribal Climate Adaptation Guidebook is just one of those resources and now have an opportunity to tell you a little bit more about it over the course of the next 10 or 15 minutes.

Slide 10. No title

Sascha Peterson: The first question that comes to mind probably is what's different about this tribal adaptation guidebook, how is it different from, you know, the guidebooks that was published more than 10 years ago that King County and Local Governments for Sustainability (ICLEI) put together on how to do climate adaptation planning or how is it different from the resources that the state of California is putting together to support their communities building resilience or the new Tribal Adaptation menu?

Slide 11. No title

Sascha Peterson: You may even ask, you know, what's the difference between this guidebook and this new tribal climate tool that the Climate Impacts Group has put together that is called Climate Vulnerability Assessments Throughout the Pacific Northwest in the Great Basin or the Climate Resilience Tool kit that's hosted by the federal government and has case studies and examples of climate projections for counties across the country or many other climate resilience handbooks that are out there?

Slide 12. Tribal Climate Adaptation Guidebook

Sascha Peterson: So, there's a lot of information and resources available. The cool thing about the new Tribal Adaptation Guidebook, the first version of which came out in the fall of last year, is that in my mind it does two things that these other guidebooks don't do.

So, first of all it really acknowledges the importance of multiple knowledges in resilience building process. You know, explicitly highlights places where a tribal community can consider the incorporation of traditional knowledges. Knowing that that's a decision that only an individual tribe can make the Guidebook does build off the guidelines for including traditional knowledges in climate change initiatives and highlights where in the adaptation process other tribes have chosen to do that.

So, it makes that really explicit and so it's not just western science based, but you know, it builds off the traditional knowledges or has the opportunity to include that because it can be so important in helping guide the adaptation and resilience efforts of a community. It also does it in a way that highlights, you know, the potential risks and so that those are front and center as the tribe makes a decision whether or not to include multiple knowledges in the process.

The other thing that it does which hasn't been done before is build off all the great work that's happening in tribal communities across the country. So, the first guidebook that I showed was published about 10 years ago. There's been so much effort in communities across the country to build resilience and a lot of it is funded by the Bureau of Indian Affairs (BIA) and other federal programs. But it's nice to be able to have a consolidated resource that highlights those efforts, shows examples of how other tribes have chosen to address similar issues.

And then kind of create a new platform or foundation that, you know, new communities coming into their resilience building efforts can build off of. So, these are the two biggest things I think this climate adaptation guidebook provides in the space it's different from those other guidebooks.

Slide 13. Writing Team

Sascha Peterson: I was lucky enough to be part of the writing team for the Guidebook along with Meghan Dalton who works at Oregon State University and the Oregon Climate Change Research Institute as well as Samantha Chisholm Hatfield who is the member of the Confederated Tribes of Siletz Indians as well as works at Oregon State University.

Slide 14. Acknowledgements

Sascha Peterson: But while we did the most of writing we had a huge group of support and I like to acknowledge all of the people that contributed to creating the Guidebook. So, there were nine advisors from tribal communities or organizations that work with tribes to help to inform the development of the Guidebook. We had reviewers and contributors: 20 reviewers and contributors that reviewed an early version of the guidebook and then helped make changes and improvements. There were six editors, three people who worked on designing of it-- they put together funding from three different sources in order to create this initial version of the Guidebook and then as I mentioned those tribal case studies. There were case studies from more than 30 tribes including in one way or another in the guidebook.

Slide 15. Tribal Case Studies

Sascha Peterson: This slide is maybe a little bit hard to see but it highlights, you know, the tribes. These case studies were included and then you can see they're in those different columns the different steps that were referenced. So, in some cases it may be, you know, that organization or that tribe provided an

example of a specific engagement technique or resilience strategy in other cases highlighted, you know, for a process, choice, or a way that they addressed a specific issue and you can see some, you know, tribal planning efforts were referenced in multiple steps of the adaptation planning process.

Slide 16. Tribal Case Studies

Sascha Peterson: One of the great ways that case studies are used is that we believe the Guidebook acknowledges that every tribe is different and what works for one tribe may or may not be appropriate for another tribe and that tribes have found solutions to different challenges in the resilience arena in different ways.

So, this table is from the vulnerability assessment approach portion of the Guidebook and it highlights five tribes and the way they chose to assess climate related vulnerability and risk for their community and you can see there's varying degrees of investments from both the staff or, you know, western science or traditional knowledge is included in that process.

And we all know that for each effort there's generally a limited time, a specific time frame and specific budget and so highlights in a way that you could choose to approach those issues given different budgets or different time frames. Along with this table there's kind of a short write up with each of these case studies to help your community think about, you know, which is the right approach for us, how much staff involvement or community involvement do you want to do, what's the right type of analytical framework that we want to use and where do we start in the process?

Slide 17. Multiple Knowledges

Sascha Peterson: One thing I didn't focus on when I was initially speaking about the Guidebook and its value is the steps in the adaptation planning process.

So, for this guidebook everything starts with centering the tribes' adaptation efforts. So, thinking about what is the tribes' vision for its community or the issue that it's currently dealing with, what are the goals for the community and then how does adaptation and resilience fit into that framework? You know, it's not people have found that building resilience is not something totally separate, it is a way to augment and support and move community goals forward so centering the effort is really important.

And then step two is identifying key concerns and gathering information around, you know, the vision and goals for the project. And then step three would be assessing the vulnerability of those key concerns. Planning for action is step four, you know, what are we going to do about these climate related risks that are already affecting and will continue to affect the community? And then step five is implementing and monitoring those actions to insure that they're being successful in addressing those risks.

Many of the western focused Guidebooks jump right in to step three or have a little planning phase where you're trying to assemble a team but then jump into step three so, you know, that's starting with identifying key concerns not only ties back to the issues that are important to the community but then also allows the project to focus what is inherently a limited budget and timeframe on specific issues that are critically important to the community at this time knowing that this circle continues indefinitely and that it's not a single planning effort.

But as you work around and monitor and implement action, there may be some that aren't working right and you need to tweak and then re-implement those actions.

Slide 18. Features

Sascha Peterson: For each of those steps, I'm just going to give a couple of highlights that are features included in the Guidebook. For each of those steps, we're not going to go through all the little substeps or anything like that, but do wanna highlight that there are checklists associated with the steps and the substeps so that you can pick and choose the pieces that you want to do and kind of check them off as you go through what the Guidebook calls checkpoints.

And these are highlighting places in adaptation planning process where, for example, traditional knowledges could be incorporated or other tribes have chosen to incorporate traditional knowledges and along with that it highlights potential risks and in some ways to reduce those risks if you choose to include traditional knowledge is at that point in the process.

There are also check points for community engagement, places where other tribes have found it extremely useful to go out for a broader community input or to help, you know, build the climate resilience conversation across the community and their documentation check points. It can be a really painful task to organize and document everything for a funder at the end of the process.

So, the documentation checkpoints highlight places in the process where it would be easier to consolidate information before moving on to the next step, so then they have at all there. There are guiding questions help kind of focus your choices and help you determine which path to take or what opportunity would be the best or most fitting for the community. There are again case studies and then there are links to other resources that are available to go into more detail in certain areas or help support a specific step.

The goal is that this Guidebook while its version one is out there now would not be static document that it could be updated and improved over time. So, if you have thoughts, comments, ideas, case studies that could be included in for future versions, feel free to contact me or one of the authors. The goal also is to eventually find funding to be able to create an online version of the guidebook so that it doesn't have to be just a static PDF document, but at least know that foundation is there and it's available to use.

Slide 19. Tribal Case Studies

Sascha Peterson: But you don't have to take my word for it. We get to hear from both Stefanie and Mike today, and unfortunately, we'll get to hear from Eric, but you know they're leading their climate resilience initiatives in their communities. And, you know, so this framework may be applicable to the work that they're doing but they'll give you kind of how they translated the framework into on the ground action in building resilience.

Slide 20. Thank You!

Sascha Peterson: If you want to download the tribal adaptation guidebook you can do that from our website at AdaptationInternational.com/tribal-resilience. You can also get it from the Oregon State website and then I think it's on some of those clearing houses as well. So, I look forward to the continuing conversation. Thank you for the opportunity to share this information, Erica, and thank you everybody for participating in this webinar. I look forward to the question and answers at the end.

Erica Bollerud: Thank you, Sascha. I really appreciate you being with us here today and taking the time to share this Guidebook. I hope a lot of folks on the line learning about it today are able to use it in their work.

III. Poll I

Slide 21. Poll 1

Erica Bollerud: Before we turn to Mike for our next presentation I wanted to have a brief poll that I'm going to ask people to weigh in on. It should be appearing on your screens now and the question we're asking is in what phase of the adaptation planning process is your tribe?

We'll leave this open for the next 20 seconds or so but would just be good for us and for our presenters to know where everyone is in the process. All right, looks like few more folks are still weighing in, but looks like most folks are definitely involved in planning their adaptation effort and other folks doing the important work of assessing their vulnerability.

IV. Mike Chang, Makah Tribe

Slide 22. Makah Traditional Knowledge (TK) & Cultural Resource Assessment

Erica Bollerud: Our next presenter is Mike Chang. He's the climate adaptation specialist for the Makah Tribe. He's led the Makah Tribe's climate impacts assessment and coordinates the climate adaptation and resiliency planning process across tribal departments and the Makah tribal community.

Mike also supports the tribe by participating in various state and regional marine planning groups and is working on a tribal land policy tool for natural resources managers. He's an author for the North west chapter of the recent U.S. Fourth National Climate Assessment where he focused on highlighting climate impacts to tribes and indigenous people, cultural heritage, and frontline communities. And now I'll turn it over to you, Mike.

Mike Chang: All right. Thank you for the introduction. Thank you, Sascha, for the presentation before hand. So, just the brief overview. At least for the Makah tried this presentation today is really going to highlight on how we began using cultural, traditional, and local knowledges within our climate change planning process. And we've really highlighted this as a framework we've been using because when we start talking about climate change, ocean acidification, rising temperatures, drought, it all came back to the cultural values that the tribe has historically and traditionally held. And so that kind it became the central theme throughout all of our planning processes which I'll talk about today.

Slide 23. Overview of the Makah Tribe

Mike Chang: So, before we begin, I just wanted to give a brief overview of Makah Tribe. So, the Makah Tribe, their traditional name is Qʷidicca?a'tx, which means People of the Cape in the Makah language. In 1855, they signed the Treaty of Neah Bay and in doing so they ceded about 300,000 acres of land to the US government and reserved the right to hunt, fish, gather, whale and seal within their traditional Usual and Accustomed Fishing Areas. The Makah identity, culture and economy like many, many tribes were dependent on the natural environment and for the Makah tribe, in particular the ocean, and this is best encapsulated in minutes from the signing of the Treaty of Neah Bay when one of the tribal leader says, "I want to see the sea of my country."

Our current reservation is about 47 square miles and we're located at the northwest tip of the Olympic Peninsula in Washington State.

Slide 24. Makah Climate Adaptation Logic Model

Mike Chang: If you're familiar with the area, it is beautiful. So, I just wanted to show real quick about how we've begun at least planning for climate change internally and this is kind of a very simplified logic model on how we're trying to accomplish that.

And so, I guess the big take away from this slide is that often times I think when we began doing this process we saw a lot of examples of climate change, planning and adaptation, it's often the time accumulated into this one report and plan. And as we began trying to do this internally within the tribe we realized that probably was efficient to kind of address, kind of breadth of impacts that climate change will happen.

And so we have multiple different types of products that address different things. And again, we really view this as the planning process, not planning towards a product, and so we've kind of built into this

logic model multiple iterations when we can reassess what we're doing, new information that is available, updated actions that the tribe is taking, and so on.

Slide 25. Makah Climate Change Workgroup

Mike Chang: And so again I want to highlight that even though I'm the one speaking today I'm really grateful in building and speaking about the work that is built upon by this true collaborative effort amongst the entire tribe.

And so you can see here that we have a diversity of departmental representatives. And I think this is really indicative of how the Makah Tribe sees and tries to plan for climate change for this holistic approach. And so you can see a lot of representatives from different departments that may traditionally not be involved within climate change vulnerability assessments which includes our clinic, our public works, operations, emergency management, or historic preservation officer.

Slide 26. Makah Traditional and Local Knowledge Framework

Mike Chang: So, this slide, I guess, really tries to encapsulate how we've tried to incorporate Makah's traditional and cultural knowledge throughout the entire planning process. And so from preliminary interview surveys work within the community we kind of identified four main objectives on how our Makah climate workgroup views how we can utilize traditional cultural knowledge.

One is to define historical baseline and observational environmental changes. The second one is identifying critical cultural resources and activities. The third one is identifying culturally relevant adaptation strategies. And then the last one is being able to engage within the community throughout the climate planning process. So, one of the things we really wanted to highlight is often times I think within planning processes, especially with the tribal community, there's this focus on trying to get these data sets, right, quote unquote data sets that focus on traditional western science monitoring data and so one of the things is that a lot of the things that we've begun informing our adaptation planning process aren't these traditional data sets.

A lot of it is cultural knowledge that's embedded within certain groups or families or individuals. A lot of the knowledge is then passed down inter-generationally. And because of this kind of traditional form of knowledge we had to be creative in the ways we essentially collect this information. So, the four kind of like main points of data collection we have, I don't have them on this slide, but we've used kind of traditional and cultural interviews conducted with the tribe last year. We also have multiple community surveys that we've collected the past few years.

But it's just kind of embedded within our internal tribal department annual engagement efforts too. In addition to that, we also realize that the Makah Tribe has also historically partnered with a lot at universities, research organizations. And so we're lucky enough to also rely on a lot of past archived research that the tribe has engaged in, but past partners too. This really leads to the idea that research often times and especially climate resilience planning, often times for tribal communities is opportunistic. We have to rely on opportunities and be strategic in choosing which opportunities we engage in. But it also tries to highlight that often times you don't really need a huge grant to try to begin addressing these questions at a local tribal level.

Slide 27. Ethical Considerations

Mike Chang: So, one other thing I wanted to highlight is that often times when we deal with tribal, cultural and traditional knowledge there are a lot of ethical considerations that surround that. And so, here are kind of three topics that our internal tribal working group talked about. The first one is this idea of climate adaptation. It's a new word I guess within the literature that came up within the past decades.

And there was a lot of conversation about how this could potentially be problematic, especially within the tribal communities and many tribes have been adapting to environmental and climatic changes for generations and millennium. It's also been criticized by several indigenous communities and scholars because often times, not often times, but sometimes using the term climate adaptation can be viewed as this extension of this scientific imperialism of these typical institutions and so continually utilizing this term for forced adaptation or forced assimilation of indigenous people and communities.

In addition to that there is a lot of conversation at least within indigenous scholar circles about how do you appropriately and ethically gather traditional knowledge? And so this idea of free, prior and informed consent is people need to give their information freely. They need to be given prior knowledge of what it's being used for and then they need to give their consent to use their information too.

And then finally there is a lot of conversations again within our working group about how should we even be complementing western science with our cultural knowledge because at the end of the day these are two distinct ways of knowing and attempting to complement that always puts them in relation to each other and whether that should even be a thing. And so overall, I guess these are kind of the ethical considerations we considered with the Makah tribe. These are all conversations. We don't pretend that we know the answer to everything.

Nor should be happy answer to everything because I think at the end of the day it should really be dependent on each tribe and each community in trying to define and have these conversations for themselves.

Slide 28. Defining Traditional Knowledge

Mike Chang: So again we keep using this term traditional and cultural knowledge and so I think we wanted to explicitly define that for everyone. And so how we define traditional knowledge is relied on this definition from Pearce et al., and it says traditional knowledge or traditional ecological knowledge is built on personal experience and interaction with peers including people from other communities and passed on through stories, apprenticeship, and practice.

It could be understood as knowledge and skills that are fluid, dynamic, flexible, adaptable, and continually updated and revised in light of new observations and experiences, and it can incorporate new technologies alongside the traditional.

And we pick this definition mostly because it resonated with everyone within the working group, it resonated with our tribal leaders. It resonates with the community because it emphasizes how knowledge is formed and continually evolves, and the challenges that the notion that when we talk about traditional knowledge or traditional ecological knowledge is often seen as static because it's formed thousands of years ago and it's not seen as this dynamic continually involving body of knowledge.

Slide 29. Historical baselines & observational changes

Mike Chang: So here we kind of delved into each of kind of the four objectives from a few slides ago. And kind of defining how we've been approaching using traditional cultural knowledge to inform these objectives. So the first one is I didn't find historical baseline and observational changes.

So we thought this was important because this directly informs our planning goals and help filling gaps within the western science monitoring efforts. Often times, a robust western science data set goes back twenty or thirty years in a specific area, whereas we realized that using data sets twenty or thirty years was insufficient to confirm our planning goals.

And so using kind of cultural and traditional knowledge to kind of fill in these gaps within these data sets could provide really valuable information. And so how we use this is is we both utilized traditional knowledge interviews that we conducted last year as well as archival data from the Makah Cultural Research Center from an archaeological dig done in 1969 to 1970.

And so using these data, we were able to kind of re-construct historical resources, abundance and habitat of culturally important species and resources too.

Slide 30. Identify critical cultural resources

Mike Chang: The second big thing is identifying critical cultural resources and relationships that are important for the Makah culture and community.

And so the big thing about this is often times especially from this western science perspective is we often plan for species or resources, often times within its own silo. And one thing that really came out throughout community engagement, interviews, and surveys is that not only do we have to identify the resources, we have to identify the relationships, culturally, spiritually using it for subsistence activities that the Makah community relies on.

And so utilizing interviews and surveys from the past couple of years, we begun identifying many of these critical relationships that tribal members have with their surrounding natural environment. And so this is one quote at the bottom of the slide that came out through our interviews and so this is a Makah commercial and subsistence fisherman, and he said “Being on the water I have to be. There is nothing like it, the water draws me to it, the ocean draws me to it, and I just need to be out there.” I think this highlights that the fact that often times kind of these intangible activities and relationships are often not represented within these traditional vulnerability assessments or adaptation plans.

Slide 31. Identifying culturally-relevant adaptation strategies

Mike Chang: The next one is identifying culturally relevant adaptation strategies. And so this one is more self-explanatory in this fact that any adaptation or resilience strategy that we’re trying to propose and implement, we want them to be culturally relevant and culturally appropriate. And so from our surveys and interviews, a lot of different types of resilience strategies have been merged such as supporting the teaching and learning of traditional and cultural food at the local school in Neah Bay, the sharing of harvest methods and food preparation across the generations especially having elders teach the youth, and emphasizing community events to increase social cohesion which will also increase collective adaptive capacity to respond to extreme event and future climate change impacts.

Slide 32. Community Engagement

Mike Chang: And finally this is something that using kind of traditional and cultural knowledge and stories as a means for community engagement has been a process that works well for the Makah tribe.

So the community is about 1200 people and within kind of all of these different informational gatherings quote unquote data sets almost every single family and household is represented within all of this.

And so that provides us an extremely robust, baseline of data that we can use to inform our tribal planning process. It also creates a lot of buy-in because they feel that each household, each family is represented within this process, and they can see it reflected back at them.

In addition, kind of using this cultural knowledge, stories, tradition, activities, and relationships, it directly connects kind of these climate change data which is often times used in framed as like scenarios or future projections or in climate models, but it connects them directly to the lived and local experiences for the tribes.

Slide 33. Makah Traditional and Local Knowledge Framework: Lessons Forward

Mike Chang: So again bringing it back to this framework that we've begun utilizing, the first thing is it's not the end all be all, and I think the big thing is we're still learning, we're still constantly changing about how we are responding to community priorities to the tribal priorities.

In addition to that like we know that each tribe should be having these conversations within their own community. And so we're not reporting that this is the only way to plan for climate change, we're just kind of adding this as another example in this tool box or suite of case studies that tribes can rely on to begin planning for.

As Sascha said earlier, there are over thirty different case studies and examples within the Tribal Adaptation Guidebook. The second one is again opportunistic data. We've been lucky that the Makah Tribe has this history of partnering with other institutions and organizations. And so lot of the information that we used to kind of inform our climate planning process is research that's already been completed and stored and archived by the tribe.

And so a lot of times, it's often times once research is completed it's kind of like put into this shelf and no one ever kind of uses it again. And so we realize that there's a lot of wonderful, robust informative information that we already have that we can utilize within our planning process and we didn't need a huge grant to kind of go and tackle and incorporate these.

And again finally this idea of ethical considerations I think whenever you do work with community members, especially tribal members and you're dealing with information regarding traditional and cultural knowledges, it's important to always consider the ethics and the message you're using, how you're incorporating the community within the process and how you're getting back to the community too.

Slide 34. Questions?

Mike Chang: So thank you for listing today. So my contact information is at the top if you want to reach out for anything else.

Erica Bollerud: All right Mike, this is Erica. Thank you so much for that presentation. I really appreciate it. I know I definitely took away some new information from your presentation. I had not really recognized or heard before how the phrase climate adaptation, the full meaning of that, how that might play in tribal communities and that's really valuable to hear.

I'm sure other folks on the line also might have some questions that they want to ask of our speakers. So I did want to remind people that they can use the Q&A box now to start typing in their questions right now or anytime while people are presenting.

V. Poll II

Slide 35. Poll 2

Erica Bollerud: Before we turn to our final presenter, I did want to roll out our second poll question. It should be appearing on your screen now. It says what resources has your tribe used for adaptation planning? Adaptation toolkits or guides, assistance from non-profit or adaptation groups, assistance from state or federal governments, assistance from universities and scientific partners, guidance and information sharing with other tribes or other.

We will leave this open for another 20 seconds or so. And here's a note that if you are viewing the presentations in full screen, you might not see the poll. Okay. It looks like it's a pretty even spread here of what people are using, but I'm glad folks are finding all of these offerings useful.

VI. Stefanie Krantz, Nez Perce Tribe

Slide 36. The Nimíipuu: A Climate Change Story

Erica Bollerud: Now will turn to our final presenter, last but not least Stefanie Krantz, the climate change coordinator for the Nez Perce tribe in northern Idaho. She is dialing in from her hotel room from a recent conference and nursing a broken toe. So I'm very grateful that she can be here with us today.

She's coordinating the vulnerability assessment and adaptation planning processes for the Nez Perce tribe. She's also working on a toolkit project to help staff include climate and cultural concerns and restoration planning, assisting with a climate smart agriculture modeling project, and with solar development planning at the tribe. Her background includes wildlife biology, agricultural ecology, research, surveys, monitoring, and planning. Take it away Stefanie.

Stefanie Krantz: Thank you, Erica, and thank you, Mike and Sascha, for your presentation. Sascha and Mike have both been inspirations to me through this process and a huge help and I just want to give them a shout out for their incredible work that they've been doing.

For my presentation, I'm also going to talk about traditional knowledge, but as Mike highlighted, every tribe is different and in some regards the Nez Perce tribe wants really detailed scientific data to help with planning. We have a large fisheries department and a large natural resources department and there is some siloing and a lot of coordination and a lot of complexity to the work that they do.

And about 30% of our staff are non-tribal and about 60% are tribal members. And so it's a really great place to work and to learn. And I think the first thing I want to do for this presentation is call your attention to the four pictures at the bottom of this introductory screen because this depicts a series of events that really led to me having this job and the tribe taking on climate adaptation planning in the new way.

As Mike was saying, the idea of being adaptive or resilient is a little bit offensive for the Nez Perce or the Nimíipuu**.** The Nimíipuu is what the Nez Perce call themselves. The French erroneously named them the Nez Perce. But the Nimíipuu are resilient. They have survived many changes including dramatic changes in climate.

They have oral history that describes the Bonneville floods and the Missoula floods and for those of you who aren't familiar with those events, it’s t's essentially when the glaciers went away in Utah and Montana and Northern Idaho and Northern Washington, and there were a series of huge floods. And the Nez Perce are based in Northern Idaho. Their Indian Claims Commission Territory is actually in four states, mostly in central Idaho, but also in Oregon and Washington and Idaho.

And they were nomadic and so their phenological knowledge of the timing of seasons is a very important part of their culture. And one other things that central to their culture is fishing and so this series of pictures focuses on these extreme events that were an incredible tragedy for the tribe and for many tribes in the Columbia River basin.

So the summer of 2015, they had the worst drought in living memory. There were incredible fires and smoke events. The fishery staff that were monitoring salmonid reproduction and have been in these creeks for you know decades. Sounds that places where steelhead and other salmonids had been laying eggs successfully were dry.

In this picture, the third picture from the left there's Haya eggs, steel head eggs and a dry creek bed. And then the fourth picture is the mud slides that came when the rains did start after these fires and drought. So this event it was very important in the timeline of the planning process for the tribe.

Slide 37. Process

Stefanie Krantz: And it kicked off a more comprehensive process. And like I was saying this process was driven by the tribal leadership and the staff in the community and the tribe had already been responding and planning for climate change, but they recognized the need for a comprehensive process because of these events and they also decided that they wanted to have local staff to do the work.

And you know for me it was extremely flattering to receive this job to do this work with the tribe. We got our funding from the BIA initially and since then and I've gotten some funding from the EPA to do this climate and culturally Smart Restoration Toolkit which I don't have time to talk about in this talk, but stay tuned for climate smart workshops.

But one of the things I really wanted to point out is that for the Nez Perce, it's not enough to adapt for they want to focus on mitigation and sustainability. They want to change their culture and reduce their carbon footprint as well, which has been an exciting part of working for them and like I was saying western science and traditional science are just as important for the work that is being done at the tribe. And this picture just gives you a taste of the Clearwater River and how beautiful it is in Northern Idaho where we live.

Slide 38. Timeline of Nimíipuu Climate Planning Process

Stefanie Krantz: I put the timeline of our climate planning process on the timeline of the rising level of carbon dioxide in the atmosphere because I think it's instructive and important to know that these processes take time and while time is passing, our climate is changing dramatically, and I just wanted to give a shout out like I said due to the fact that the Nimíipuu are people who have survived the huge floods, and one of them actually told me that they believe their next trial will be by fire. And I suspect that to be true.

So in the mid-1990s, when there was about 350 parts per million of carbon dioxide in the atmosphere, the tribe developed a carbon offset project. And it was a forestry projects where they got carbon mitigation funds from the Chicago Exchange to plant trees and that project was completed by 2010, and they haven't done additional projects of that nature in part because they want to have the sovereign right to manage their resources the way that they see fit and those carbon exchange programs don't necessarily account for tribal sovereignty. So that's been another really interesting part of working for the tribe since they are so interested in mitigation, but the mechanisms for doing that aren't necessarily inclusive of the tribal perspective.

Another really interesting project and this is just one of the things that fisheries are doing I mean fish or salmonid are I think endangered because of climate change in a way that few other species currently are in our area. And so the fisheries division or department is doing many, many things. But from 2005 till now, we are working on a project to end the diversion of water off reservation to our local city, Lewiston, and move that water back into local streams to protect habitat for salmonids.

In 2011, one of the staff of water resources got a small grant from a model forestry group to do an adaptation plan for the Clearwater Subbasin and that staff person actually had a change of plans. She got pregnant and left her job to be a mom and so my supervisor Kim Park actually wrote this plan over a

couple of months and didn't have time to include the community. And it was a good start and it helped forestry and water resources focus on planning and learn about climate change, but it wasn't officially adopted by the tribe.

Slide 39. Timeline of Nimíipuu Climate Planning Process

Stefanie Krantz: And then as I mentioned from that story before 2015 was the year when there were massive smoke events, drought, fires, etcetera. And that humongous fish kill where millions of fish died in the Columbia River basin.

Slide 40. Timeline of Nimíipuu Climate Planning Process

Stefanie Krantz: And after that, Nez Perce Tribal Executive Committee (NPTEC) asked fisheries and natural resources to do something about climate change. So in response to that, in January 2016, they devoted their annual retreat to climate change and did workshops where tribal staff came up with ideas for how to mitigate for it and respond.

And the result of that was the formation of a climate change task force which includes staff from natural resources and from fisheries, and that task force decided that they did not have the capacity in their individual jobs to work on climate change, so they hired a coordinator and they received funding from the BIA to do that.

So, there I am, in December 2016. I want to give a shout out to Institute for Tribal Environmental Professionals (ITEP) for those of you who are starting your planning process or in the middle of it, they do excellent training and climate adaptation planning and that was one other things that really helped us in our process and our planning.

When I first started, I had some seed money to hire climate change interns. So I hired three students. One with a masters in cultural anthropology. And, one that was doing ecology and sociology for her Doctorate of Philosophy (PhD) on water resources and then another who was a climate modeler and scientist looking at forestry.

Those people are Amber, Becky, and Eric. And Becky unfortunately left us to go to Africa in the first year, but she helped us update our water section and Amber, because of her background in social science, she was instrumental in doing a lot of the work that I'm going to present today. And Eric has done a huge amount of mapping and modelling for us.

So it was a huge benefit to have people with other skills to assist with this project. The other thing that happened as a result of the Department of Natural Resources (DNR) retreat is that the tribe actually passed short term climate mitigation measures. These measures are just the lowest hanging fruit, you know northern Idaho is not a place that's known for its sustainability culture. And the tribe recognized that climate change was a way to tackle some of the low hanging, inexpensive, and easy sustainability work with plans to do more.

My team started a community-based process where we actually interviewed elders and spoke to locals and did a survey and became involved in things that the tribe in order to learn more.

We received additional funding in 2017 and 2018, which allowed us to do a full vulnerability assessment which we're almost done with and then to work on this climate and culturally smart toolkit and to do surveys, and this climate smart agricultural project. So our vulnerability assessment will be in review by the end of the summer, and our toolkit is in testing and these other projects are going forward.

Slide 41. No title

Stefanie Krantz: So I just wanted to share a little bit of the information that we learned from the community through doing a survey and I would highly recommend putting together a survey even if it's not perfect. The unscripted responses were incredibly meaningful and showed us just how much people care about this and how accurate and incredible their observations have been. The Nimíipuu live very close to the land and gathering and hunting and fishing is a huge part of their culture and so they've already noticed a lot of changes because of climate change.

So we asked a lot - way more questions than we probably should have - but we wound up getting 274 complete responses. And when we asked people when using climate change will start harming treaty reserve resources, 86% said it already is and then when we asked how important it is for the tribe to focus on adapting to the impact, 88% said very important.

Water and renewable energy were two of the main things that people wanted us to focus on, which was very interesting. These quotes are just a taste of some of the impacts that people have observed. I'm just going to read a little bit from these quotes.

“These changes have impacted my family personally for years. We've experienced lower numbers in herd animals that we hunt. We've experienced less and dry roots and berries because of extreme temperatures and lack of snow pack. With snow run off going faster than ever so the river gets low fast which prevents us from certain fishing, invasive species are starting to cover sections of land that used to be covered by native plants and species.”

“Climate change could literally change our entire way of being and doing, this is alarming.”

“All I know is that we are greatly impacted as a tribal people. We can pass our knowledge to the next generation, but if we do not in some way preserve this plan for future what we have to pass on?”

Slide 42. The Seasonal Round is an integral part of the Nez Perce Culture

Stefanie Krantz: So from interviews with the elders and the survey and interactions with tribal members, we developed a summary from the traditional knowledge of how the climate changes are impacting tribal numbers. And I'm just going to present a tiny bit of that here.

The changing timing of the seasons and movements, health and abundance of wild animals, fish, and native plants had dramatic spiritual practical and economic impact on the tribe.

Slide 43. The Seasonal Round is an integral part of the Nez Perce Culture

Stefanie Krantz: Notably the seasonal round is an important part of Nez Perce culture like I was saying the Nez Perce were nomadic and this depiction of the seasonal round shows that different resources are available at different times of the year and if you can imagine you know in the past people were walking hundreds of miles with thousands of people to go fish at Idaho Falls or traveling over the Bitterroot Mountains to hunt bison or going to particular places to gather particular food and the order and timing of these foods is an important part of their culture and spiritual practice.

So the gatherers have noticed that the timing of early spring foods has changed and in some cases the order. The gathering period is shorter and that some other ancient and precious gathering sites are being impacted already by climate change. Like I was saying with fish, the water temperatures rise in dry creek bed ending extremely low returns have impacted subsistence fishing.

The distribution, timing and quality of berries has changed. There've been huge impacts to the tribe because of the wild fire and actually because of flooding. We just declared a state of emergency in the last few weeks because of the spring flood this year.

And this is affecting our economy and health and access to the outdoors. So with Camas, the size, quality, and abundance has changed. Camas meadows were traditionally managed with fire. And the tribe is no longer able to do that and so they're actually working on a Camas restoration project right now.

But those wet meadow environments are sensitive. And then also not only have the timing and movements of animals changed, but emerging diseases are a huge concern. We know that in some cattle tick outbreaks have led to the death of cows and we're concerned about that in other ungulates. Some of our Wildlife staff and others have observed incredible outbreaks of ticks on the deer and elk that people hunt.

Slide 44. Sample of Technical Work

Stefanie Krantz: So this is like a little bit of the traditional knowledge and this is just a tiny snippet of some of the technical work they were doing, so we took Frank Isaac's data and we plotted it for the five water sheds that overlapped the Indian Claims Commission. And then we changed the temp or the color scale to match what was fatal or favorable for salmonids. And as you can see here the water shed that overlap the ICC some of them are blue and some of them are red and orange. So the red is fatal for salmonids the orange is stressful. The yellow is meh and the blue is favorable.

The Bitterroot Mountains are really important place for salmonids, it's the head waters of the Snake River and the Columbia River and it's an important refugia for fish but one of the concerns is that the lower parts of the basin along the main stem of the Columbia River may be too hot for fish to move up to river in the summer and several of the species that the tribe works with move up river in the summer. And so they notice the adults are ducking into colder tributaries on the way up and actually starving to death before they make it. So this blown up version, we have one where it just shows the stream channels but in this case, we have raster data to make it easier to see on a larger map.

So the black circle on the bottom, highlights an area where we have a fish hatchery and an acclimation site and as you can see the water is going to be really hot by the 2080s and this is based on the medium emission scenario. And then if you look down river to the sadder green arrow, you can see that the Clearwater River - this main stem of the river is the clear water its blue and that's because Horshack Dam releases cold water into the river and that dam has been used to help salmon get up river by cooling the rivers down. So dam management and water temperatures are a really important thing for our fishery staff and we're trying to collect high level technical data to help them do their work.

Slide 45. Successes, Blessings, and Challenges

Stefanie Krantz: So one of the things that's been a huge blessing is that we started this more comprehensive process later than other tribes and as a result there are really good reports and models and maps already out to help but climate science is always evolving and there's always more and better information. So at some point you have to just decide that you're going to use what you have and move forward, but also the Climate Impacts Group just released their Tribal Climate Tool Kit. And that tool kit effectively did a lot of the work that we would have to do on our own and has been a huge help in our process and allowed us to include more information and have something that our staff can go to and look at and explore to answer some of their own questions.

And we're going to do our own internal webinars soon, sharing that toolkit with staff at the tribe. One of the challenges is that everyone working for a tribe is wearing ten hats and they're already being asked to do a lot and to go to a lot of meetings and have jobs that are funded usually in our case already in ours is almost been completely funded by staff for soft money, so asking people to take time out of their otherwise busy days to work on climate change has been a real challenge for us and we've had to come up with a way to work around that and work with that. It took me a long time to get to know people since they brought in someone from outside to be a part of the community but I just got involved in what other people are doing, as a way to start and in time made friends that are happy to help.

Like I said before, Nimíipuu are a resilient people. They want education about what western science has to offer, but they know that within their own communities they have the knowledge to survive. And also our tribe just started a climate change and energy subcommittee, and we're very excited about that.

Slide 46. In 2017, The Nez Perce Tribe Adopted Short Term Mitigation Measures that focus on…

Stefanie Krantz: So our short term mitigation measures focus on reducing transportation emissions, reducing energy use and transitioning to renewables, reducing solid waste and transitioning to biodegradable alternative and planning for more aggressive cuts on carbon footprint.

Slide 47. Vision of a resilient future…

Stefanie Krantz: Part of this process has been imagining the future that we want and trying to paint that picture for ourselves and for others.

The staff at the tribe and the community all have a vision of what they want the future to look like. And I think it's really important as climate planners to remember that if we want a hopeful future, we need to help other people imagine that future. And at the Nez Perce tribe, they're working on Condor restoration, they reintroduced coho into Eastern Oregon recently, they've re-introduced coho into the clear water, they're working on Camas restoration and rare plant restoration and economic wellbeing.

Slide 48. Qe 'ci 'yéw 'yew

Stefanie Krantz: So I wanted to say thank you, Qe ‘ci ‘yéw ‘yew, for listening and leave you with two quotes; this one, “I really believe when you're working in the area of protecting Mother Earth, you're a warrior.”

Slide 49. No title

Stefanie Krantz: And this other quote from our Governor Brad Little in Idaho, who is a Republican and he acknowledged that the climate is changing and this quote is incredibly interesting and just shows that more and more people are on board with doing something about climate change.

But in particular, it's interesting the way that he put it. “Climate is changing there's no question about it, it's here, we've got to figure out how to cope with it and we've got to slow it down. Now reversing it is going to be a big darn job.” And other staff at the tribe sometimes write me and sign off a big darn job. So I know that the people on this call are people that are working on the big darn job, and I just want to encourage you not to give up and to reach out for help, because there are many people that are delighted to be there to help. Thank you.

Erica Bollerud: Thank you, Stefanie for that presentation, I really appreciate it. I really love how you were imposing your climate planning time line over the carbon dioxide (CO_2) trends, I thought that was pretty brilliant. And you really echoed my thoughts in that.

VII. Poll III

Slide 50. Poll 3

Erica Bollerud: You showed some pretty hard hitting real time terrible impacts that Nez Perce are living with right now and that you're doing enough-- you and all the other presenters today are doing hard work to try to help and I appreciate that, I think probably most people attending this call are involved in this kind of hard every day work and I'm hoping that this call will give people more resources to draw on to help. Before we go to the Q&A, feel free to keep adding questions now that our presenters are done. We did wanted to do one last poll that we'll put up on the screen shortly.

And this one reads what non-monetary resources would be most helpful for tribal planning adaptation, there are a bunch of options; Tribal case studies and best practices, step by step guidance, connections for nonprofits or adaptation organizations, connections with state or federal government or with the universities or scientific partners, with other tribal organizations or other. And we'll leave this open for another fifteen or twenty seconds. All right, close the poll.

Looks like tribal case studies and best practices are definitely in high demand and step by step guidance. So hopefully the tribal guidebook that Sascha presented on today will be helpful.

VIII. Question and Answer Session

Slide 51. Question and Answer Session

Erica Bollerud: So thank you for that, now I would like to turn to the Q&A, we've had some good questions coming in some for specific speakers, so I'll start with a question for you Mike. Are the survey questions from the Makah community engagement process available as a shared resource in some way? And make sure you're not on mute.

Mike Chang: Yeah, I was on mute. Yeah, so that's a very good question, so obviously since we are doing more of this internal tribal working group in order to publicly share all of our information or results that kind of has to go through an intense vetting process and so others have asked for our survey questions before and we've tried to ask for permission and we didn't get it to share more broadly, is the short answer. But if you want to reach out to me there has been other short write ups and presentations I've given in the past, so they can direct you to at least see the questions and the answers that were given permission for public presentations. So Stefanie might have a different answer.

Erica Bollerud: Stefanie did you want to weigh in on that?

Stefanie Krantz: So I think that we could share some of the questions but not all of them. And I would have to ask for permission. But we also, it's interesting because Amber and Becky developed our surveys and then Amber and Becky were both working part time for me, and Amber had a second part time job, actually working for a survey group at the University of Idaho and after she started working for them, she realized that she would have done her survey a little bit differently, like it was pretty long.

But we offered three, $100 gift cards to Walmart, which in our community is one of the few places where our tribal members can shop inexpensively and so that was a big draw and it made it worth it for people to spend the 20 minutes on a survey or 25 minutes. But the answer is maybe and some of them for sure.

Mike Chang: Yeah I just want to reiterate the gift cards, I think one thing that's really important is, you want to compensate people for the time that information that they were giving to you and so we also gave gift cards for every single person who completed the survey too.

Stefanie Krantz: Well and also in our case like our tribe has a very specific honorarium system for elders, so we wrote that into our grant and asked for the money to pay elders for their time for interviews. We had written other really interesting thing happen to where a photo journalist, who's from Idaho contacted us and she did a story about climate change in Idaho which she is negotiating with a couple of distribution outlets about publishing that, I know there's at least a couple of publishers that want to have exclusive rights for a period of time to her story, but she came and interviewed several people that we were not able to interview during our process and we participated in that and that was also a really interesting experience and very helpful.

And we will get these pictures to use as well. So I guess with that, I just want to say there are other people really interested in this that would love to work with tribes and understand what tribes are experiencing and if you're tribe is open to receiving some help or doing partnerships that can be a big part of the planning process as well.

Sascha Petersen: Stefanie and Mike those are great thoughts, the other thing that comes to mind it's not-- you know but it's free and accessible and it's not tribally focused is the Yale program on climate

change has been doing surveys for about a decade on, you know like some of the questions could be easily adapted just like on public perceptions on climate change, so setting aside is like when is climate change affecting our community now, in the next five years, the next ten years and fifty years, like that's the question that's also in the Yale survey on climate change, that could be a resource too.

Erica Bollerud: Great, thank you for everyone for weighing in on that. We have another question that I think might go to you first Sascha. Is there a good listing of tribal adaptation planning reports or list of tribes doing any sort of planning?

Sascha Petersen: Yeah there are a few of those actually or places to start. So the Guidebook is obviously one place, then we'll have a list of the tribal case studies there included in the Guidebook. Cathy Lynn organizes the Pacific Northwest tribal climate change network and they have in Oregon. The University of Oregon has this tribal adaptation guide online and I can drop the link into the question & answer, you can include it however, you think is best done. But they have a list of tribal adaptation plans on it.

I think ITEP also carries a list of tribes who've been working on it, So BIA, who's been instrumental in funding tribal adaptation and resilience efforts on their website has a map feature that shows the projects that they've funded and some of them have links you know to more specific information about a particular project that was funded, but they're map kind of compiles federal resources that have been put towards tribal resilience efforts and then there are a couple of the other kind of clearing house sites, there's a Climate Adaptation Knowledge Exchange: cakex.org the Georgetown Adaptation Clearinghouse run by Georgetown University and then the Climate Resilience Toolkit that all have some adaptation example, then you could search you know tribe or tribal resilience and see what comes up there.

Erica Bollerud: Thank you Sascha. We have couple questions for you Stefanie. One person asked, have you used forest management stand age as a tool for controlling stream temperature?

Stefanie Krantz: That's a great question. So fisheries have a watershed group and watershed does restoration and they often work with forestry and then forestry does a number of projects but most of forestry's work is actually limited to the reservation except for fire. Our fire crew obviously works all over the place. And so you know in the case of the Nez Perce, a lot of the reservation has been converted to wheat-- you know they were allotted and so I didn't show a map of this, but the tribe owns about 17 percent of their reservation and forestry does projects on that land, but it's checker boarded with farms.

Some farmers are better stewards of the land than others and the tribe because most of the landscape has been converted to wheat, the tribe has worked pretty hard on trying to push or encourage and create incentives for non-tribal farmers within the reservation boundaries to switch to no-till and they've had a lot of success with that, but they haven't had a lot of success with getting farmers to shade the tributaries, but also you know, the tribe works with Nez Perce-Clearwater National Forests and ten other National Forests on doing consultation management and some cases co-management, and so where there is forest, the creeks and rivers are actually quite a bit cooler. Where these water bodies move through farms, they are a lot hotter. And in some cases these farms used to be wet meadows that had meandering streams and patches of trees and riparian areas and they were highly diverse.

A lot of the reservation is part of the Palouse prairie and so you know it's one of the rarest prairies on earth now because of conversion mostly for growing wheat. And so modeling has been done that looked at cooling down all of the tributaries, if you were to essentially to plant by pairing vegetation and cool down all of these tributaries, you know could you cool down the main stems of the river and the rivers?

And the answer is no, because these rivers are impounded behind dams. They are so hot, that even shading every single tributary would not make the difference. And the reason that we started the climate smart agriculture and modeling project is to figure out how much carbon could be sequestered and water by different land management practices because if our precipitation is switching from snow pack to rain fall, then the water has to be captured on the landscape and filtered underground and the ground is the best next cold place to store water in order to help our creeks and streams. And a lot of the springs and creeks have dried up on the reservation because of land management. And not necessarily just because of climate change, so this is a long term ongoing challenge that the tribe is facing with managing for salmonids is hydroelectric power and land conversion. So that's the long answer to that little question.

Erica Bollerud: Thank you for that. My next question is for everybody. Does your tribe have experience with a hazard mitigation plan and if so, how did the development of that relate to your climate work?

Sascha Peterson: This is Sascha. I wish Eric was on the call, because they are co-developing an update to their hazard mitigation plan at the same time that they're doing their climate resilience initiative, so they sort of bundled those two together and the synergy there is that they have that same kind of working group, working on both kind of the shorter term emergency issues and some of the longer term resilience initiative issues, because there's a lot of overlap between those two and other distinctions in funding and things like that, maybe you know doing a community survey that gets people's input on both short term shocks and long term stressors, for the community can be really synergistic and valuable. So I'm not going to speak for him, but there are tribes that are working on both those aspects at the same time.

Mike Chang: Yeah and this is Mike. I want to build on that. The Makah tribe we're also currently updating our hazard mitigation plan too with the emergency management department and one way I think like Sascha highlighted is that, our mitigation specifically is focusing on earthquake and tsunami risks and what does that mean at least at an infrastructure support system accessibility level and then we've really taken at least some of their preliminary findings to at least inform kind of what are potential challenges and barriers in the context of an extreme event and climate change for kind of short term adaptive capacity for the tribe to respond to such events?

And then knowing that like I think every single tribal organization, I think Stefanie mentioned this earlier is- we are also beholden to silos too and so one things here at least our adaptation resilience planning process is we realize that a lot of other departments among the tribes have their own management plans, so they aren't specifically addressing climate change and so I think one thing that's really worked for us is not stepping on their toes within their own internal departmental processes and so really trying to leverage and not trying to be duplicative of work that's already been currently done. So we haven't, we're not directly incorporating the hazard mitigation plan that were definitely being communicative throughout the entire process of both developing the climate resilient plan and our tribes hazard mitigation plan tool.

Erica Bollerud: Okay, we're almost at time, but I did want to throw out one more question, that maybe folks can give quick answers to. A question came in, how prevalent or relevant is youth activism in your tribes?

Stefanie Krantz: That's a really, go ahead Mike.

Mike Chang: Okay, yeah.

Stefanie Krantz: Why don't you go first Mike and then I'll go.

Mike Chang: Okay, sorry. Yeah that's a really good question. I think at least youth activism, we've really seen come in handy at least at our tribal organizational level. So one part is through our survey too, we also were really encouraging youth to come forward, talk about their priorities, identify their own resilience actions. And so we have this and so I think through that whole community engagement process, there is this new awareness, I think that is like being cultivated among at least the tribal youth that go to the school to try to become more engaged, so there's a lot of different instances of them advocating for more curriculum and trying to address changing ocean conditions for instance.

And then some of the programs and funding that we currently have or that we are seeking out. We're trying a lot of these ideas also come from the youth, because they feel now empowered to voice their opinions to their parents were also tribal. It has kind of cascaded into like a lot of different ideas, we've had videos produced targeting cultural food gathering and preparation, mechanisms that since the youth are really technologically savvier, we are able to help out throughout the entire process, we've had people come to us with ideas about, can we do a cultural food map across the reservation and or how can we implement community food networks and so at least at the tribal level activism and kind of voicing their opinions, their ideas has been really, really fruitful. I'm done, Stefanie go ahead.

Stefanie Krantz: All right, so I think with Nez Perce culture it's hard for, there's sort of a-- it's an honor to be a spokesperson and it's not something that most people feel comfortable doing. So the kind of activism that we've seen has been actually led by people who have Gen Xers I'd say. And a group formed a separate nonprofit that works with youth and does education, it's called Nimíipuu Protecting the Environment and they were-- that group came out of the Megaloads protests, when tribal members were finally like you can't be shipping this dirty energy through our reservation on our small highway next to a creek. And several members of the tribe went to Standing Rock, but I wouldn't say that there's like a youth movement within the tribe to focus on climate change at this point.

The tribe's been working on environmental issues for a really long time and I think that's part of it, but there are a lot of really great programs and educational opportunities that youth have participated in like salmon amp and drone camp. And we have been working with-- you know we've given presentations at the schools and we've done other outreach event to try to help young people learn more about climate change, but it's-- I think every tribe is different and in our case that hasn't been a major component. And yeah, we've gotten really great feedback from young people about the kind of future that they want to see and somebody is knocking on my hotel room right now so, I'm going to pass it off to the other speakers.

Slide 52. Connect with the State and Local Energy and Environment Program

Erica Bollerud: Okay, thank you Stef. Well, we're at the end of our time, so we'll end the Q&A there. We did get a few questions we weren't able to share. So we will share those with the speakers and hopefully gather some answers from them that we can share online. We'll also be sharing the recording of today's webinar in the slides and a transcript on our website, you just need to give us a couple of weeks to format all that stuff correctly and we'll get it online. I will definitely want to thank all of our speakers, Sascha Petersen, Mike Chang and Stefanie Krantz. I only wish Eric Chapman had been able to join us as well, but I thank you all for taking your time to share your expertise and insights with everyone today.

I do want to encourage folks before you leave us, to reach out to our presenters if you have any additional questions or want to follow up with them on any of their responses. And please do complete our webinar feedback form, you can see the link right there on the screen, you can click on it. We

appreciate any insights we can get from you all to improve future webinars. So thank you for taking the time to do that, there are also links at the bottom of the slide on your screen, to get to our program website and to register for our newsletters.

I definitely do try to include information about tribal climate renewable energy, energy efficiency work and include news about that and resources. So hopefully, it will benefit tribal users as well, who want to subscribe. And with that, I will thank everyone for being with us today and turn this over to the operator to end today's webinar. Thank you.