



2-DAY VIRTUAL WORKSHOP

TRIBAL CLIMATE RISK ASSESSMENT AND ADAPTATION

WEDNESDAY, AUGUST 9 & **THURSDAY, AUGUST 10**
9:00 AM - 12:00 PM 9:00 AM - 11:30 AM

TOPICS COVERED

Understanding climate change, climate impacts, climate risk management and adaptation planning

Water-related issues

Climate-related hazards including health, cultural heritage, sacred sites, and other valued lands and resources

Real-world examples of adaptation plans and lessons learned from other Tribes

This workshop was intended for tribal environmental and public health staff, tribal leaders, community members, and students

CO-CONVENED BY:



THE UNIVERSITY OF ARIZONA
ARIZONA INSTITUTE FOR RESILIENCE
**Indigenous
Resilience Center**



ARIZONA INSTITUTE FOR RESILIENCE
**Center for Climate
Adaptation Science
& Solutions**

AGENDA August 9

9:00 AM - 9:20 AM

Welcome, Workshop Goals, and Introductions; Overview of Lessons Learned in Tribal Climate Adaptation

Dr. Karletta Chief, University of Arizona

9:20 AM - 9:30 AM

Tribal Case Study: Navajo Nation Climate Adaptation Plan

Dr. Karletta Chief, University of Arizona

9:30 AM - 9:50 AM

Climate Projections and Trends; Drivers of Risk in a Tribal Context

Dr. Gregg Garfin, University of Arizona

9:50 AM - 10:05 AM

Water Management Impacts and Adaptation

Prof. Kathy Jacobs, University of Arizona

10:05 AM - 10:15 AM

Break

10:15 AM - 11:00 AM

Overview of Lessons Learned in Tribal Climate Adaptation across Arizona

Eric Descheenie, Indigenous Baaja Ádaani Al Son (IBAA); Amy Juan, San Xavier Cooperative Farm; Roman Orona, Ak-Chin Indian Community

11:00 AM - 11:45 AM

Breakout Groups:

- Discussion/Identification of Cultural, Livelihood, and Other Values at Risk
- Compound Impacts, Post-event Cascades of Impacts to Values at Risk

Prof. Kathy Jacobs, University of Arizona; Dr. Joe Hoover, University of Arizona; Dr. Neha Gupta, University of Arizona; Dr. Amy McCoy, AmnInsights

11:45 AM - 12:00 PM

Plenary Report-out and Preparation for Day 2

Dr. Karletta Chief, University of Arizona

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AGENDA August 10

9:00 AM - 9:05 AM

Welcome and Recap

Dr. Karletta Chief, University of Arizona

9:05 AM - 9:35 AM

**Vulnerability Assessment and
Climate Risk Management: Focusing
on What Matters**

Dr. Karletta Chief, University of Arizona

9:35 AM - 10:25 AM

Breakout Groups:

- Adaptation Opportunities to Respond to Anticipated Risks Identified Yesterday
- Integration of Traditional Knowledges

Prof. Kathy Jacobs, University of Arizona; Dr. Joe Hoover, University of Arizona; Dr. Neha Gupta, University of Arizona; Dr. Amy McCoy, Amplnsights

10:25 AM - 10:35 AM

Break

10:35 AM - 11:30 AM

Plenary Discussion:

- Report-out from Breakout Groups
- Resources Available to Help with Adaptation
- Next Steps and Opportunities
- Evaluation/Feedback (via chat)
- Closing thoughts

Dr. Karletta Chief, University of Arizona; Dr. Neha Gupta, University of Arizona

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Workshop Summary

The purpose of this 2-day workshop was to empower Tribal citizens and communities to take action related to climate change and to manage climate-related risks through climate adaptation. The event was sponsored by the Inter Tribal Council of Arizona with funding provided through the Bureau of Indian Affairs (BIA) Branch of Tribal Climate Resilience. Nearly 60 people attended this August workshop. Most of the attendees were Tribal representatives within Arizona but several joined from other states. The goals of the event were outlined by Dr. Karletta Chief at the outset (see goal slide on final page).

Day 1 started with a review of lessons learned in a prior workshop from development of Tribal adaptation plans across North America, and from the Navajo Nation's Climate Adaptation Plan. Then, Dr. Gregg Garfin of the UArizona team presented a review of climate trends and projections, with a focus on drivers of risk in a Tribal context. Professor Kathy Jacobs then discussed anticipated climate change impacts to water management efforts in Arizona and adaptation options related to water. A tribal panel, including Amy Juan (Tohono O'odham), Eric Descheenie (Diné), and Roman Orona (Apache, Pueblo, & Yaqui) provided their own perspectives on risk and resilience associated with climate change. One of their key messages was to encourage tribes to work together and learn from international examples that center Indigenous Knowledges and livelihoods.

We then went into breakout groups to identify cultural, livelihood and other values at risk, and discuss compounding impacts or "cascades" of impacts to values that are at risk. Summaries of these discussions were presented to the group and are summarized on page two.

On **Day 2**, Kathy Jacobs led a conversation about protecting what matters – our communities, livelihoods, sacred sites, traditional and cultural lifeways – and building from that point to focus on adaptation. We reinforced the idea of empowering ourselves to take action and building the ability to make a difference through networks of people with similar concerns. Given the pace of change, there has not been as much adaptive action at the governmental level as is needed to manage the consequences of climate change.

Gregg Garfin gave a presentation on resilience, adaptive capacity and vulnerability assessment (see second slide on final page). In particular, he emphasized the importance of assessing individual and community, or reservation-wide, capacities and assets to enhance resilience and reduce risks and provided examples and resources. This was followed by breakout groups that provided an opportunity for participants to respond to the risks listed below, including integration of Traditional Knowledges.

Things of value that are at risk (A summary of participant inputs and our discussion of adaptation options)

Traditional Materials: Medicinal herbs and medicines/cactus fruits/basket weaving materials/sticks used for ceremonies are all at risk. Loss of access to these materials, having to travel further to obtain them, and plants coming into season at different times disrupts the ceremonial cycle. Invasive and new species replacing traditional plants is also a problem. Changes in plants is just what we see, fear was also expressed about what else is changing that we cannot see.

o **Adaptation options:** We discussed the importance of networks for access to ceremonial materials and better communication to overcome these limitations, also growing some materials if they can't be harvested from the wild. We also talked about the fact that some tribes are shifting the timing of ceremonies to adapt to changing conditions and timing of access to materials.

Changes to Agriculture and Food Access:

- o Transitions to smaller home farming from larger communal farms
- o Decreases in crop productivity, success of propagation, size of harvests
- o Decline in fruit tree yield
 - We discussed an adaptation to frost damage and drought for tree crops is piling up snow to keep trees cool and provide moisture over a longer period of time
- o Not enough water and feed for cattle
 - Adaptation options include hauling water and feed, but this is expensive and may not work in some cases.;Other adaptations undertaken by some tribes is to look for other pastures in different locations, but options are limited.
- o Reduction in herd size
- o Increased acreage to support same number of animals
- o High temperatures and drought affecting corn and other crops
- o Loss of agaves for food, berries etc.;Decline of hummingbird moths that are the pollinators of yucca
- o Concerns about access to and welfare of traditional seeds and traditional knowledge

Wildfire- health effects due to air quality, land loss, home loss, evacuations

- o Adaptations include working with adjacent jurisdictions on forest thinning, flood management, etc.; anticipating debris flows and channel changes downstream of fires/ improved land use planning
- o People can adjust their personal life styles, e.g. buying bigger trucks (to be able to evacuate more people/possessions), and having all the essentials packed at all times- emergency planning starts at a household level
- o Planning to save and provide shelter for bigger animals (not just pets) as people will not leave without them

Health- heat is a major stressor/elders especially at risk; impacts include allergies and cabin fever during times of extreme heat when community members, particularly elders, are advised to stay indoors. This can affect ability to participate in rituals and events such as saguaro fruit harvesting that takes place in summer. Heat also impacts health of outdoor workers particularly during periods of extreme heat.

- o Adaptation options include increased air conditioning where available
- o Adaptation options include an elder care alert system
- o Trailers with cooling to support outdoor workers

Range/Wildlife- Migration of game animals, birds leaving tribal lands

- o Feral animals are destroying range and riparian areas
- o Forests are damaged by bark beetles, which increases fire risk
- o Increase in invasive species, e.g. more prickly pear at Canyon de Chelly, impacts on aquatic systems
- o Heat impacts to vegetation can reduce productive capacity of landscape, including reduced forage for livestock

Livelihoods- for those collecting wild materials, hunting, fishing, agriculture all are affected by climate change

- o Impacts on tourism- Heat, floods, high snowfall, fire all affect tourism (e.g. reduced numbers of tourists, increased risk to health/safety of tourists)
 - One adaptation option is to create businesses to collect or produce traditional materials/could include youth engagement and cultural education.

Flooding- loss of farm lands and cattle, loss of homes, roads, erosion

- o An adaptation is better land use planning

Ways Traditional Knowledges can be Integrated into Our Approaches to Managing Climate Risk:

- Traditional Knowledge encompasses so many things. Tribal communities are now being empowered to maintain their culture and languages. It's about resilience and seven generation perspectives
- Tribal members have a responsibility to pass on Traditional Knowledge to their children and grandchildren, need to think how they/we witnessed conservation when they were growing up
- Ensuring there is storytelling and knowledge transfer with the younger generation about Indigenous Knowledge as it applies to climate change.
- Traditional Knowledge includes everyday practices that everyone does; can bring this to the issue of climate change
- Traditional Knowledge embraces the idea of beings we do not see, and animals, plants and land being alive. Participants stressed the importance of giving voice to those as well.
- In some cultures, like Navajo, it is believed that imagining and planning for bad things can actually make bad things happen, so when doing adaptation and mitigation plans, cultural beliefs and practices need to be respected, and actions need to be taken to not cause these events, such as appropriate ceremonies and careful communication.
- Traditional Knowledges are already represented in disaster response plans created by Tribes and communities. Notably, kinship and relationships are essential to the design and implementation of these plans (such as call trees or checking on relatives when a disaster happens).

Additional Adaptation Actions identified included:

- Community organizing
- Youth engagement in finding creative solutions and participating in dialogue and trips to share knowledge with other communities
- Knowledge sharing forums and events to build networks to share best practices and design collaborative approaches to protecting resources (e.g. international corn gathering)
- Integration and education of Traditional Knowledge among community members and expand intergenerational relationships and networks
- Infrastructure to support coordination at multiple levels ranging from individual to grassroots organizations to tribal governments
- Education and trust building towards new practices
- More adequate funding for tribal governments to facilitate outreach and education
- Rainwater harvesting
- Modify existing emergency plans to include climate change adaptation if Tribe doesn't have an adaptation plan or one that sufficiently addresses climate change. Doesn't have to be a specific climate adaptation plan. Changes in our lives are adaptation.
 - Multiple participants noted that enhanced early warning and communications are essential to save lives in advance of fires and floods, and noted that good communication at the reservation border is a particular challenge.
 - Risk preparedness includes individual household preparedness, such as family preparedness plan and ensuring that phones are always charged, as well as community-level preparedness, such as checking on your kin and your area, and ensuring that the community has an alert system.

Our closing session included discussions of next steps, potential additional events of this type, etc. Nina Sajovec also provided a summary of federal and state funding available to Tribes to assist with resilience. The need for more help in preparing funding applications was a strong theme from participants.

UA Faculty:

Dr. Karletta Chief, Director of Indigenous Resilience Center, Professor and Extension Specialist, Environmental Science

Dr. Gregg Garfin, Professor and Extension Specialist, School of Natural Resources and Environment, Director for Science Translation and Outreach, Arizona Institute for Resilience (AIR)

Professor Kathy Jacobs, Director, Center for Climate Adaptation Science and Solutions (CCASS) within AIR, Professor, Environmental Science

Facilitators:

Dr. Neha Gupta, Assistant Research Professor, AIR

Dr. Amy McCoy, AmpInsights Consulting

Dr. Joe Hoover, Associate Professor, Environmental Science

Kathy Jacobs

Funding Opportunities Document was prepared by Nina Sajovec

Notetakers:

Nancy Petersen, Assistant Director, Agnese Nelms Haury Program

Nina Sajovec, Program Coordinator, Haury Program

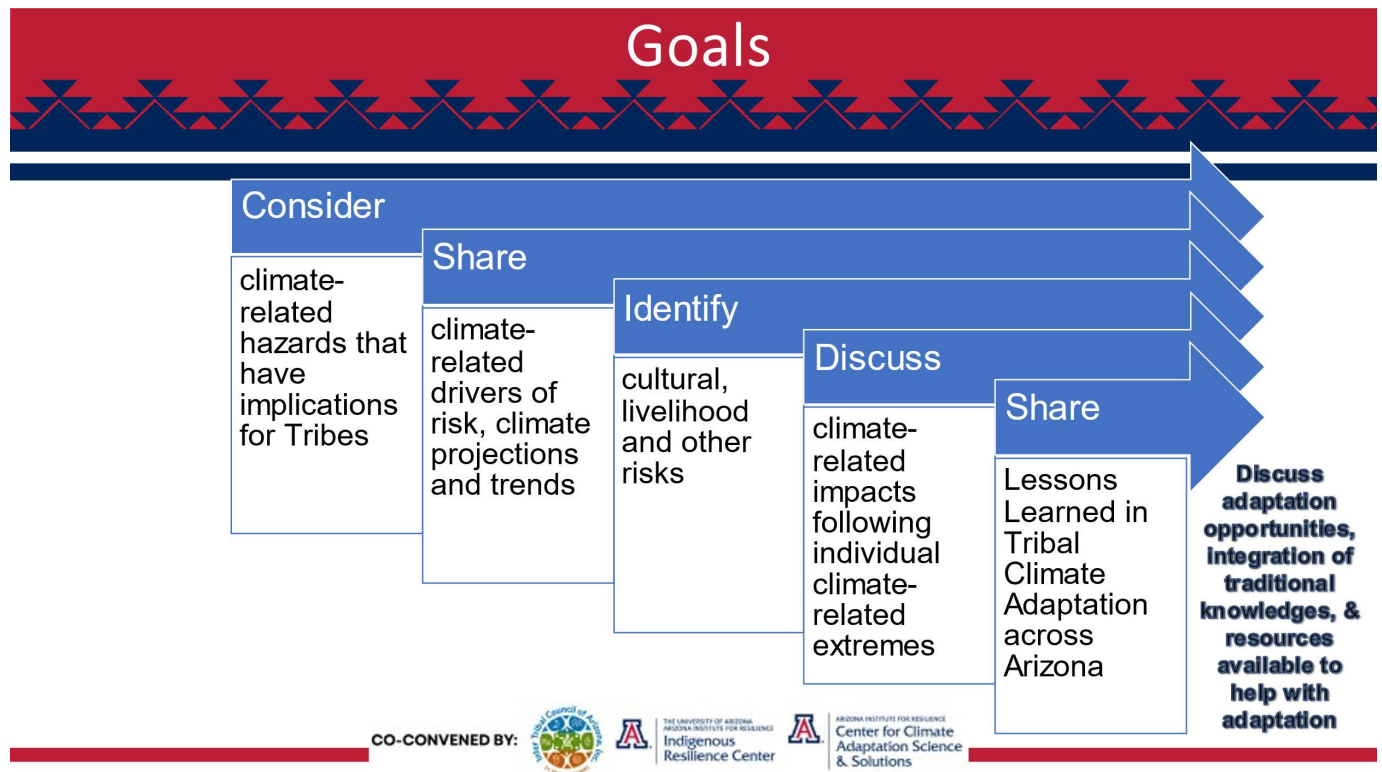
Amanda Leinberger, Program Manager, CCASS

Miguel Angel Corrales Valencia, Student, IRes

Logistics Support:

Amanda Leinberger

From Karletta’s Introduction:



From Gregg’s presentation on Resilience:

For Indigenous peoples, adaptation and mitigation measures must be **holistic**. They must be approached in an interconnected way that is **aligned with the values and knowledge of the communities**. Adaptation and mitigation are **not just about “solving” a single physical problem** such as flooding or establishing solar power. Rather, they are about **empowering the community to restore, revitalize, and strengthen their cultures, social wellbeing, and political sovereignty**. For many Indigenous peoples, it is about achieving good relationships of interdependence with the diverse nonhumans that share the environment.

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