

Tribal Climate Resilience

Introduction to the SW CASC & Climate Change

Cynthia Naha & Anissa McKenna
Southwest Tribal Climate Resilience Liaisons



Southwest
Climate Adaptation
Science Center



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Agenda

- **Introductions**
 - Southwest Tribal Climate Resilience Liaisons
 - Southwest Climate Adaptation Science Center
- **What is climate change?**
 - Climate vs weather
 - Climate change causes
 - Climate change impacts - broad & regional scale
- **Group activity**
 - What climate impacts do you experience in your home communities?
- **Overview of upcoming webinars**
- **Climate adaptation & resilience - resources**

Introductions

Cynthia Naha

Hopi, Tewa, Ithanktonwan Dakota
Sr. Tribal Climate Resilience Liaison



Anissa McKenna

Pascua Yaqui Tribe
Asst. Tribal Climate Resilience Liaison



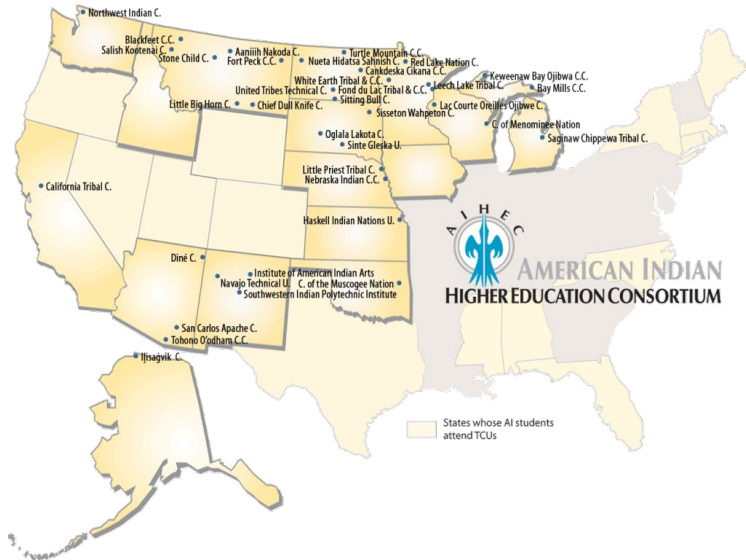
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American Indian Higher Education Consortium

AIHEC is a 501(c)(3) organization that is the collective spirit and unifying voice of the nation's Tribal Colleges and Universities (TCUs)



- Provides leadership and influences public policy on American Indian higher education issues through **advocacy, research, and program initiatives**
- Promotes and strengthens indigenous languages, cultures, communities, and tribal nations
 - 37 TCUs nationwide
 - More information at aihec.org

Southwest Climate Adaptation Science Center

The SW CASC is a collaborative federal-university partnership between the U.S. Geological Survey (USGS) and seven academic institutions across the U.S. Southwest

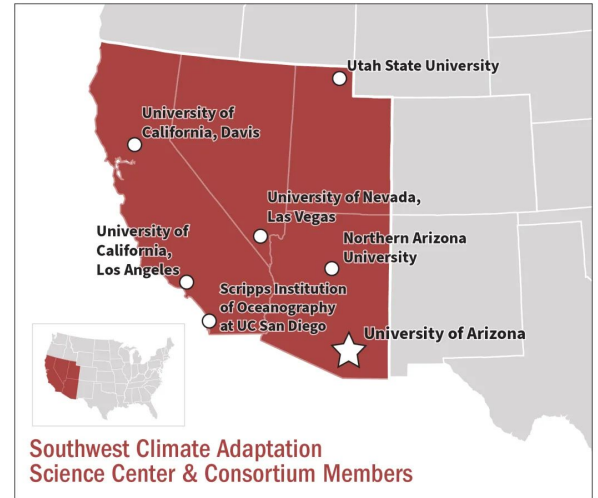
- Established in 2011, the Southwest CASC provides regionally-relevant **scientific information, tools, and techniques** to resource managers and communities in Arizona, Utah, California, and Nevada.

Vision

The Southwest's **ecosystems, communities and cultures are resilient** and thriving as the climate changes. Resource management decisions are informed by climate adaptation science.

Mission

We develop **actionable science** and implementable climate adaptation **solutions** in partnership with natural and cultural resource managers, policy makers, Native Nations, and researchers across the Southwest.



Who are the Southwest Tribal Climate Resilience Liaisons?

Cynthia Naha & Anissa McKenna

Bureau of Indian Affairs – Branch of Tribal Community Resilience

- Technical and financial assistance
- Access to scientific resources

Multiregional network of Tribal Climate Resilience Liaisons

- Assisting Tribes, Tribal organizations and Tribal colleges and universities (TCUs) in addressing science-based needs with resources available at the DOI's Climate Adaptation Science Centers (CASCs)
- Facilitating research, linking Tribal needs to available resources and coordination trainings, workshop, forums and exchanges



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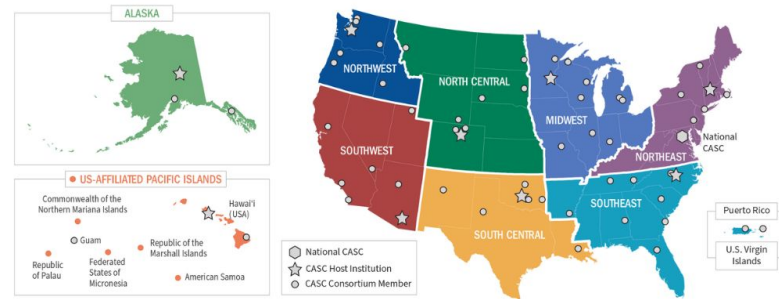


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Climate Adaptation Science Center (CASC) Regions

The CASCs collaborate across boundaries to address shared ecosystems, watersheds, and landscapes



For more information, visit the [SW CASC website](#) and check out our updated SW CASC Tribal Engagement Strategy



Meet other SW CASC team members:



Steph McAfee
Regional Administrator



John Tull
*Asst. Regional
Administrator*



Jia Hu
Host Institution Director



Anita Govert
*Host Institution
Asst. Director*



Tamara Wilson
Research Geographer



Sarah LeRoy
Research Coordinator



Nicole Herman-Mercer
Research Social Scientist



Michiko Beauchamp
Data Steward

Meet other SW CASC team members:



Kerstin Niedermaier
*Science Needs
Assessment Fellow*



Sierra Brown
*ORISE Communications
Fellow*



Allen Leinberger
Website Administrator

SW CASC Tribal Engagement

SW CASC Tribal Engagement Strategy

1. Increase awareness of SW CASC resources among Tribal Nations
2. Learn more about Tribal needs across the region
3. Provide technical assistance to Tribal Nations
4. Build capacity among Tribes, tribal colleges and universities, and researchers



Cultural Burning led by the North Fork Mono Tribe (2020 & 2023)



(Left) February 2024 Southwest Adaptation Forum

(Right) field trip to TOCC campus farm



USGS ASIST Drought in the Colorado River Basin Project - Southwestern Indian Polytechnic Institute Open House (September 2023)

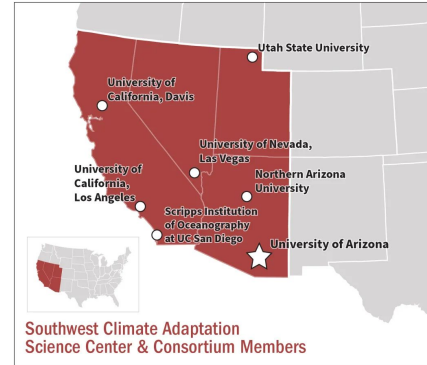


First Americans Land Grant Consortium (FALCON) Annual Conference (October 2023)

SW CASC Tribal Engagement

How can Tribes connect with the SW CASC?

- Joining the SW CASC Advisory Committee
 - Helping inform science priorities
 - Ensuring we focus on science that helps communities plan for and adapt to changes in climate.
- Partnering on research projects
- Participating in workshops and events



Deniss Martinez and Dr. Beth Rose Middleton and a student help Diana Almendariz plant Native plants after the cultural burn workshop at the Tending and Gathering Garden. (Credit: Melinda Adams)

Source: <https://www.chn.uszr/indigenous-wildfire-264617110.html>

What is climate change?

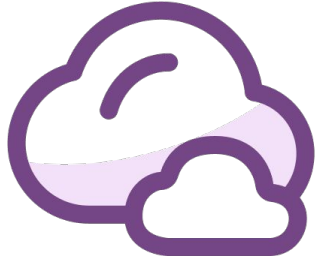
Group activity (optional)

5 min

- Think of a few words that come to mind when you think about climate change



slido



What are a few words that come to mind when you think about climate change?

① Click **Present with Slido** or install our [Chrome extension](#) to activate this poll while presenting.

What is the difference between weather and climate?

Weather reflects **short-term conditions** of the atmosphere while **climate** is the **average daily weather** for an extended period of time at a certain location.

- *“Climate is what you expect, weather is what you get.”*

Weather is what you see outside on any particular day. So, for example, it may be 75° degrees and sunny or it could be 20° degrees with heavy snow.



Climate is the average of that weather. For example, you can expect snow in the Northeast in January or for it to be hot and humid in the Southeast in July.

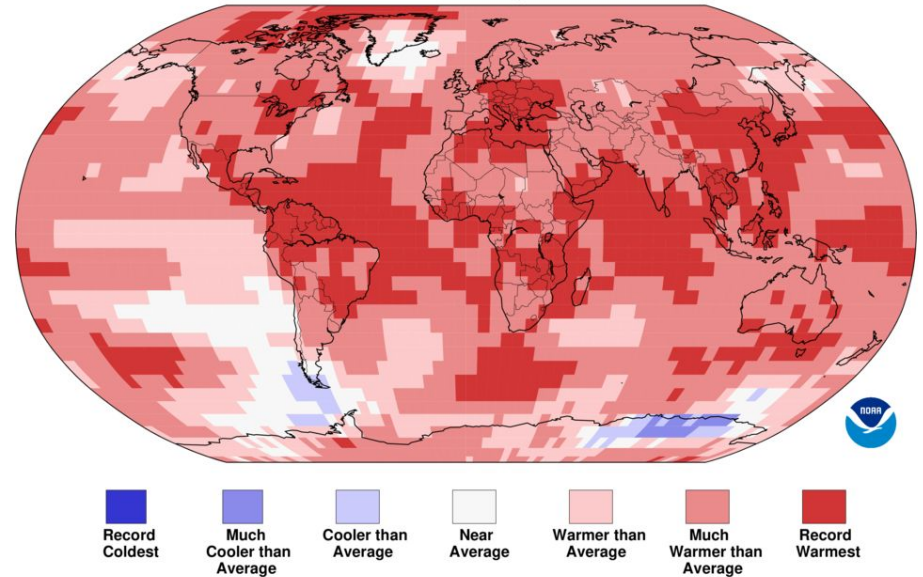
What is the difference between weather and climate?

The climate record also includes **extreme values** such as record high temperatures or record amounts of rainfall.

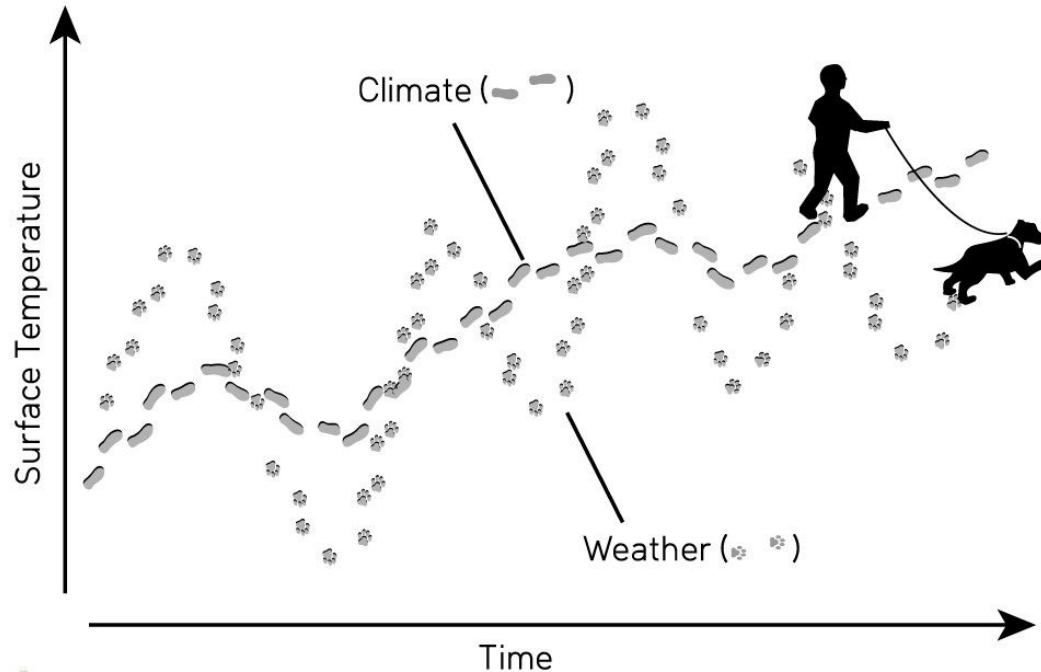
Climate change - changes in *long-term* averages of daily weather

- *“Weather can change from minute-to-minute, hour-to-hour, day-to-day, and season-to-season. Climate, however, is the average of weather over time and space.”*

Land & Ocean Temperature Percentiles Jan-Dec 2024
NOAA's National Centers for Environmental Information
Data Source: NOAAGlobalTemp v6.0.0-20250106



What is the difference between weather and climate?

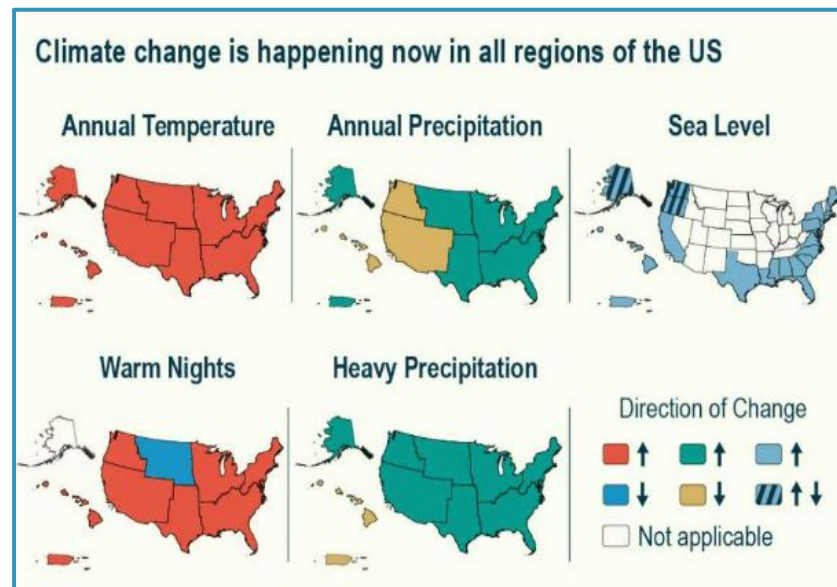


*“You can think of the weather-climate relationship like a person walking their dog. While the dog may twist and turn dramatically along the way (**weather**), the person walks in a less chaotic, more predictable pattern (**climate**).”*

Climate Change

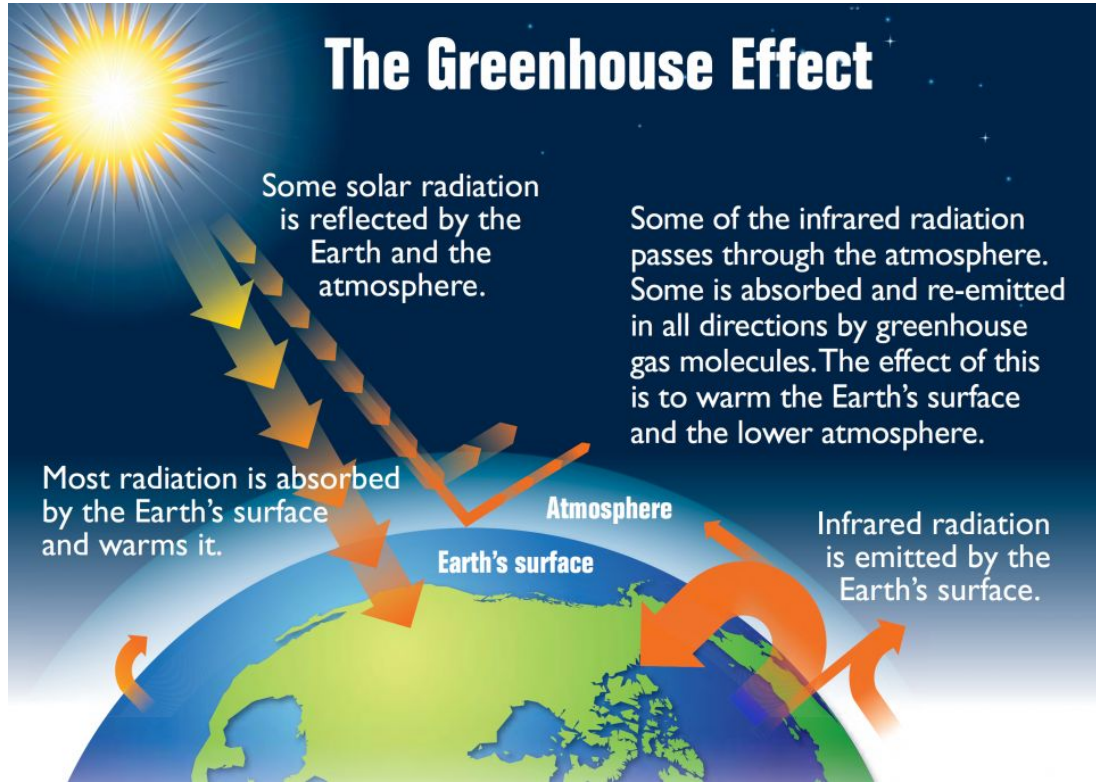
The earth's **climate is changing**. Multiple lines of evidence show changes in our weather, oceans, and ecosystems, such as:

- Changing temperature and precipitation patterns
- Increases in drought frequency and duration
- Increases in ocean temperatures, sea level, and acidity
- Melting of glaciers and sea ice
- Changes in the frequency, intensity, and duration of extreme weather events
- Shifts in ecosystem characteristics



Via: Fifth National Climate Assessment

The Greenhouse Effect



Some solar radiation is reflected by the Earth and the atmosphere.

Some of the infrared radiation passes through the atmosphere. Some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth's surface and the lower atmosphere.

Most radiation is absorbed by the Earth's surface and warms it.

Infrared radiation is emitted by the Earth's surface.

The greenhouse effect helps trap heat from the sun, which keeps the temperature on Earth comfortable.

- *Natural process & necessary to support life*
- *But people's activities are increasing the amount of heat-trapping greenhouse gases in the atmosphere, causing the earth to warm up.*

Greenhouse Gas Emissions

Most of the warming since 1950 has been caused by human emissions of greenhouse gases.

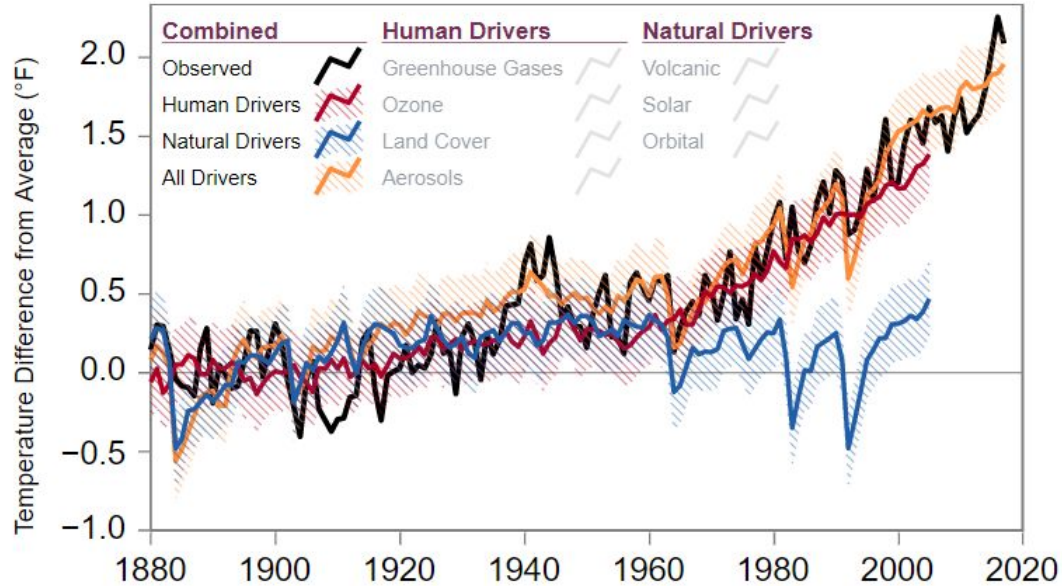
- Greenhouse gases come from a variety of human activities
 - burning fossil fuels for heat and energy
 - clearing forests
 - fertilizing crops
 - storing waste in landfills
 - raising livestock
 - producing some kinds of industrial products.

Key Greenhouse Gases:

- Carbon dioxide
- Methane
- Nitrous oxide
- F-gases



Human and Natural Influences on Global Temperature



Human and natural factors both influence the Earth's climate, but the long-term trend observed over the past century can only be explained by the effect of human activities on climate.

Source: U.S. Global Change Research Program, Fourth National Climate Assessment, [Chapter 2: Our Changing Climate](#), 2018.

Climate Change Impacts

“The climate is changing. Global air temperatures are rising, as are sea levels throughout most of the U.S. Heavy rainfall is increasing in intensity and frequency. Atlantic hurricane intensity is on the rise, and the number of large forest fires in the western U.S. and Alaska is increasing and is exacerbated by drought and heat. In Alaska and the Arctic, sea ice is declining, permafrost is thawing, and warming is more than twice the global average.”

Status of Tribes and Climate Change Report (2021)



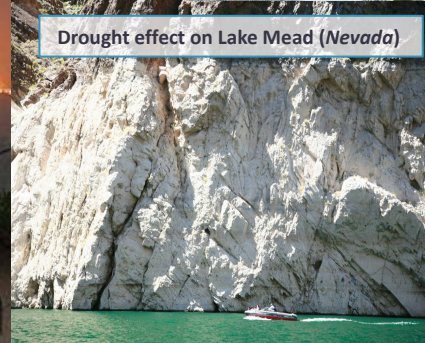
Trees killed by sea level rise (North Carolina)



Increased hurricane intensity



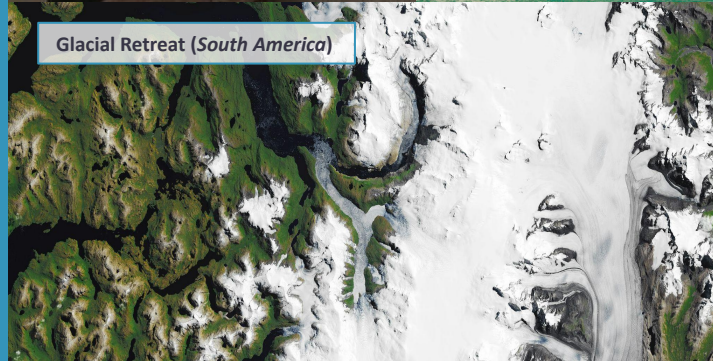
Bobcat Fire (Los Angeles, California)



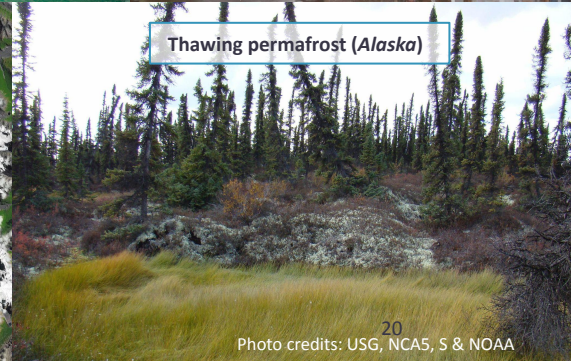
Drought effect on Lake Mead (Nevada)



Flooding associated with heavy rainfall (Iowa)

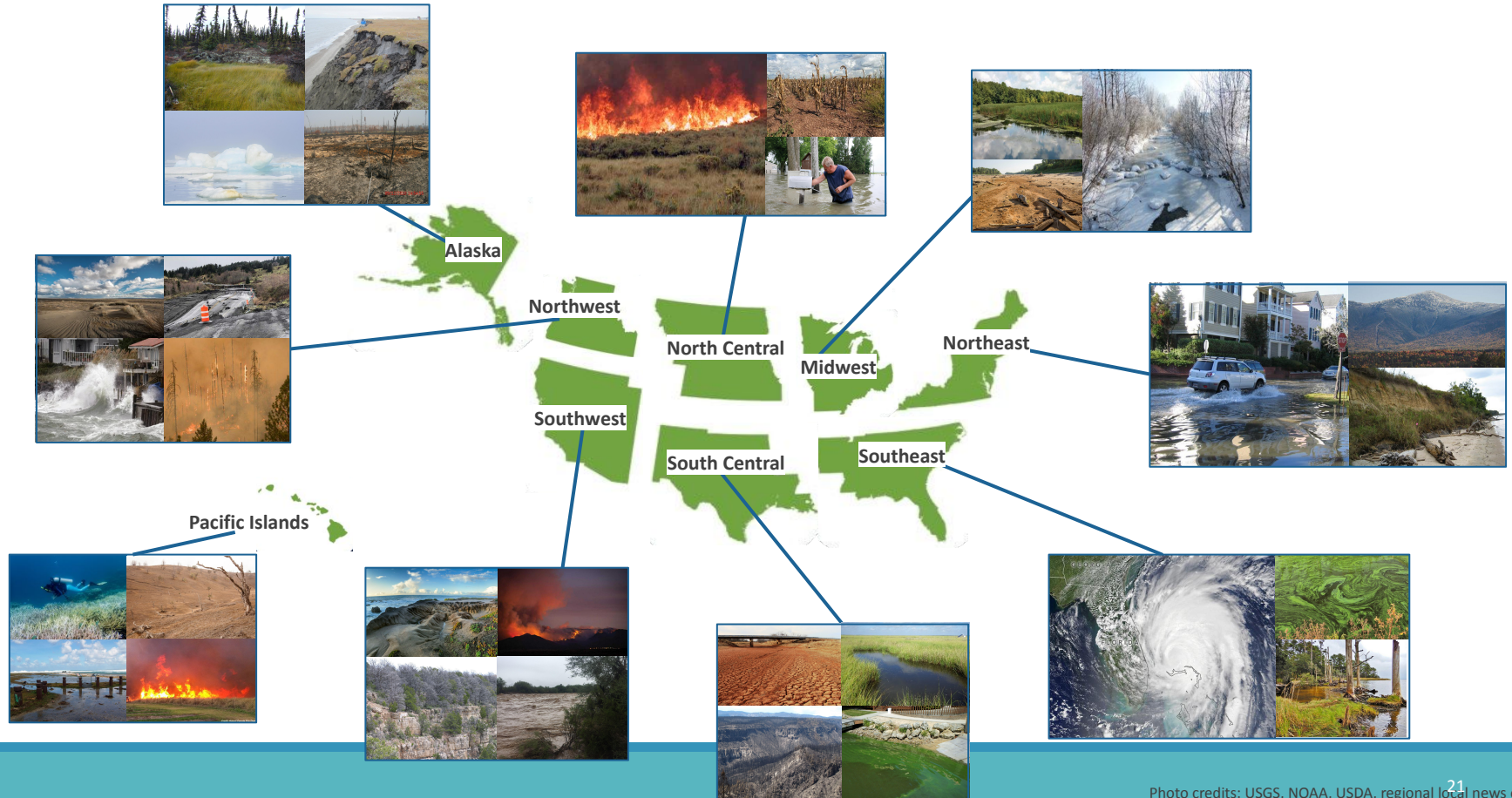


Glacial Retreat (South America)



Thawing permafrost (Alaska)

Climate Change Impacts - regional scale



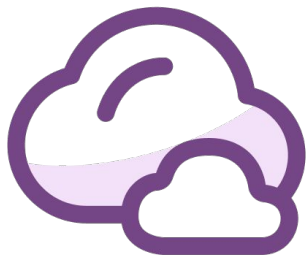
What climate impacts are you experiencing in your home communities?

Group activity (optional)

5 min

- Reflect on climate impacts affecting your communities





What are some climate impacts your communities are experiencing?

Climate Adaptation & Resilience

Adaptation: The process of adjusting to an actual or expected environmental change and its effects in a way that seeks to moderate harm or exploit beneficial opportunities.

Resilience: The ability to prepare for threats and hazards, adapt to changing conditions, and withstand and recover rapidly from adverse conditions and disruptions.

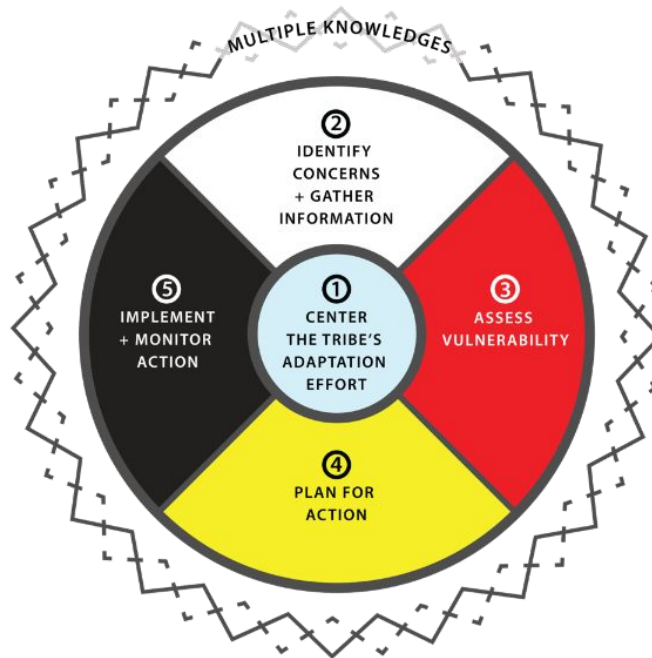


Photo credit: Tribal Climate Adaptation Guidebook

Upcoming webinars: March - August

March
4th

What is Climate Adaptation and Resilience?

- Basics of climate adaptation & resilience
- Real-world applications of these concepts

April
1st

How To – Scoping Climate Adaptation Efforts

- Where to start?
- What to consider?

May
6th

How To – Creating Vulnerability Assessments

- Identifying what is vulnerable to climate impacts
- Incorporating Indigenous & Western Science

June
3rd

How To – Creating Climate Adaptation Plans

- Creating dynamic, actionable plans
- Incorporating disaster/hazard mitigation planning

July
1st

Climate Resilience Funding

- Overview of federal funding available
- Best practices in applying funding

August
5th

Tribal Climate Resilience Success Stories

- What is working for Tribes?
- Resources for success

Next webinar - March 4th

What is Climate Adaptation and Resilience?

Guest speakers: Rachel Novak and
Connie Flores - U.S. Forest Service



Register for upcoming
webinars at:

[https://arizona.zoom.us/
meeting/register/OHLISFD
nTPI4c-ket8Vhvg#/registra
tion](https://arizona.zoom.us/meeting/register/OHLISFDnTPI4c-ket8Vhvg#/registration)



Upcoming opportunity to connect with the SW CASC



Southwest Climate Adaptation Science Center Meet and Greet

Connecting SW CASC researchers and practitioners in the Southwest

Register by
Feb. 12th:

<https://tinyurl.com/52r9t8av>



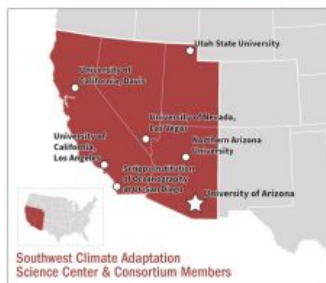
February 18th

12:30-2:00 PST

(1:30-3:00 MST)

Who is invited?

Climate adaptation practitioners from across the Southwest, USGS researchers, and researchers from the SW CASC consortium:



- Learn about the SWCASC project solicitation.
- Make new connections with researchers in the SWCASC consortium and other climate adaptation professionals working on-the-ground.
- Have an opportunity to create multi-disciplinary teams to catalyze innovative projects
- Participate in breakout sessions focused on climate adaptation in the following landscapes: **forest, shrubland, grassland, desert, alpine**

Questions? Sarah LeRoy: sleroy@usgs.gov

Climate Adaptation & Resilience Resources

Planning

- Tribal Climate Adaptation Guidebook
- Tribal Climate Adaptation Planning Toolkit
- Dibaginjigaadeg Anishinaabe Ezhitwaad - A Tribal Climate Adaptation Menu
- Tribal Climate Health Project

Networks

- Institute of Tribal Environmental Professionals
- Native American Fish & Wildlife Society
- Native Climate Working Group
- TCU Earth System Science Collective
- Indigenous Climate Resilience Network

Funding

- BIA Branch of Tribal Community Resilience
- Climate Adaptation Science Centers
- NSF Tribal College & Universities Program
- USDA NIFA Tribal Colleges Research Grants Program

Events

- National Tribal & Indigenous Climate Conference
- Native American Fish & Wildlife Society - annual and regional conferences
- Tribal Climate & Health Adaptation Summit
- National Adaptation Forum

Thank you!

Please feel free to get in touch with us with any questions:

Cynthia Naha

Senior Southwest Tribal Climate Resilience Liaison

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Anissa McKenna

Assistant Southwest Tribal Climate Resilience Liaison

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for more Tribal climate
resilience resources,
events, research, and
information!

