



CLIMATE RESILIENCE INCLUDES HEALTH: PLANNING IN NATIVE AMERICAN COMMUNITIES

Moderator: Sharon Hausam, Ph.D. Climate Adaptation Planner and Research Scientist

American Planning Association Sustainability & Resilience Series Guest Host: APA Sustainable Communities Division April 22, 2022



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- Climate Science and Planning
 - The Basics
 - Intermediate Roundtable
- Responding to Climate Change
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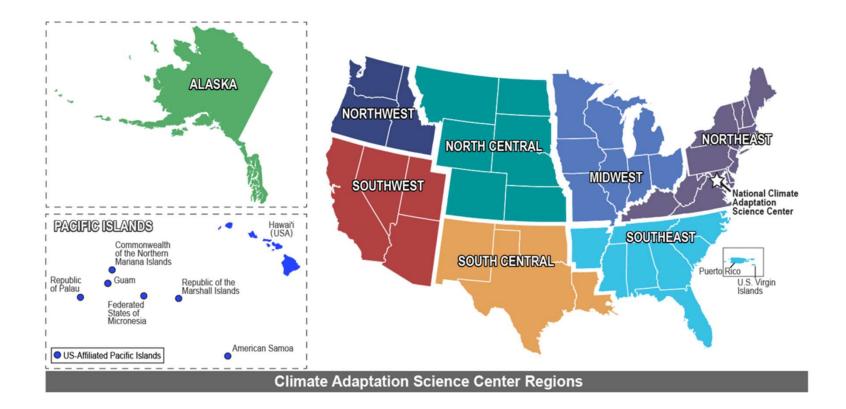


<u>This Webinar</u>

- How health is linked to community resilience
- What health means in tribal communities
- How health can be integrated into vulnerability assessments and climate adaptation plans to increase resilience



Climate Adaptation Science Centers



Department of the Interior U.S. Geological Survey

Partnerships with host universities Regional consortia

South Central CASC Hosted by University of Oklahoma

CASCs have tribal liaisons



Work with Tribal and Indigenous Communities

What's your experience?

- I've worked directly for a Tribal government (federally- or staterecognized)
- I've worked for an organization whose mission is primarily to support Indigenous peoples
- I've worked under contract on projects for Indigenous peoples
- I've coordinated or worked with Indigenous peoples in other ways
- I haven't worked on a project for or with Indigenous peoples yet







For more information about planning with Native American communities, check out the 2018 APA planning webcast "Native American Tribes, Law, and Planning"

video:

- https://www.youtube.com/watch?v=4vcm9lu4u-U slides:
- https://www.ohioplanning.org/aws/APAOH/asset_manager/get_fi le/220618?ver=2880

Contact information: shausam@ou.edu





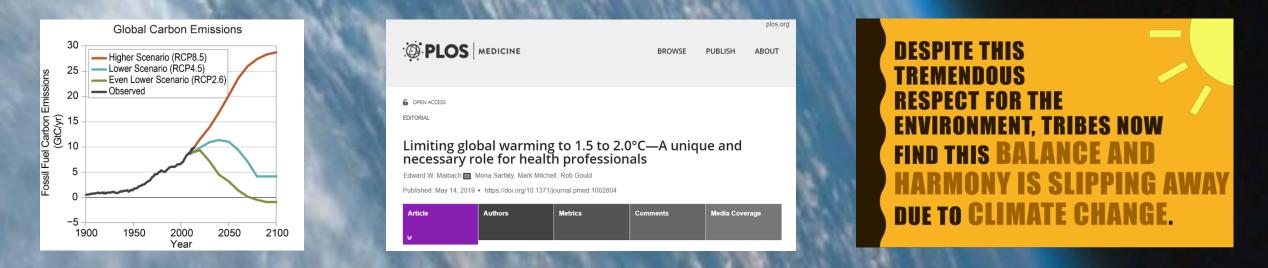
Climate Resilience Includes Health: Planning in Native American Communities

4/22/2022 | AMERICAN PLANNING ASSOCIATION

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Climate changes lives

Life on Earth depends on, is shaped by, and affects climate



"Treat the earth well: it was not given to you by your parents, it was loaned to you by your children. We do not inherit the Earth from our Ancestors, we borrow it from our Children."

- Native American Proverb





Presenter Introduction



Angie Hacker

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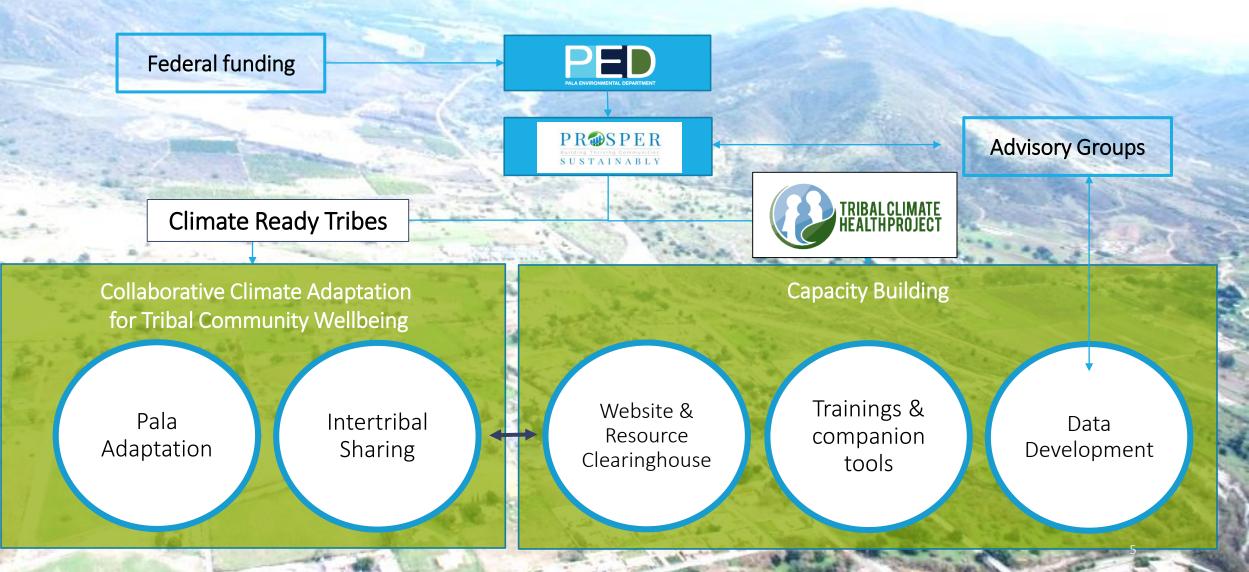
Presenter Introduction

Dr. Shasta Gaughen Environmental Director Pala Band of Mission Indians (805) 694-8089 <u>sgaughen@palatribe.com</u>

http://ped.palatribe.com/



Pala Band of Mission Indians (Northern San Diego, CA) National collaboration and leadership on climate and health adaptation





About TCHP

- <u>General objective</u>: to build knowledge and capacity for tribal-serving professionals working to prepare US tribes for the health and other impacts of climate change
- Compiling and synthesizing literature and best practices for curriculum development
- Recruited advisors to develop/review curriculum
- Built information sharing channels via website, listservs, social media, and partner networks
- Developed data tool alongside CA tribes

•25+ training presentations, 7 full trainings, and other content for national audience on varied topics

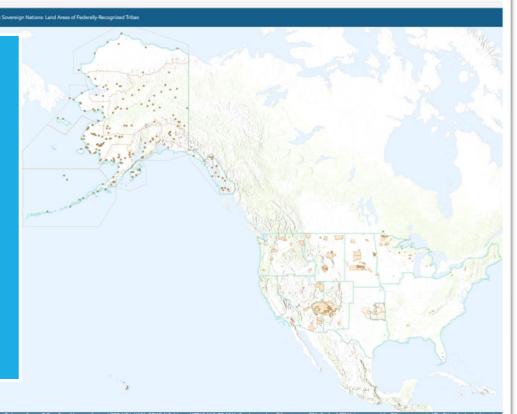
• 3rd round of intertribal resilience data development project in CA

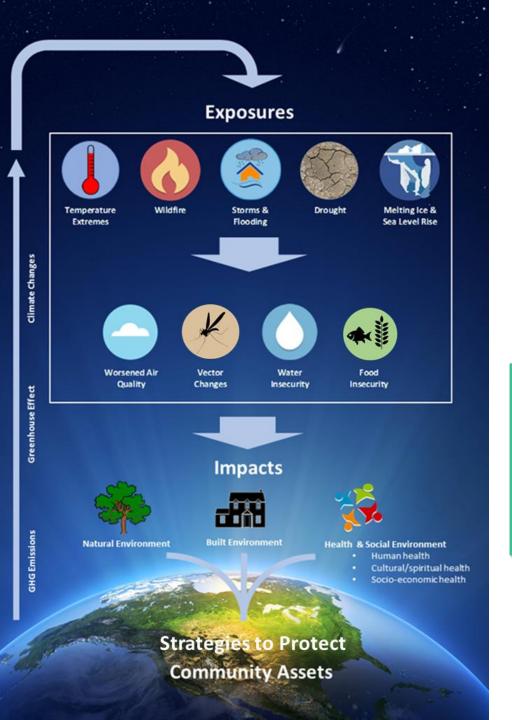


U.S. Native American Tribes

"Since time immemorial, tribal nations and California Native Americans have stewarded, managed, and lived interdependently with the lands, waters, and natural resources that now make up the State of California. Tribal nations are critical leaders and key knowledge holders in land stewardship, habitat restoration, and natural resource management. In recognition of this truth and the critical importance of partnership with California's many Native American tribes to strengthen climate resilience, this Strategy commits to incorporating and supporting tribal expertise and traditional ecological knowledge into this work at all levels."

- California Climate Adaptation Strategy





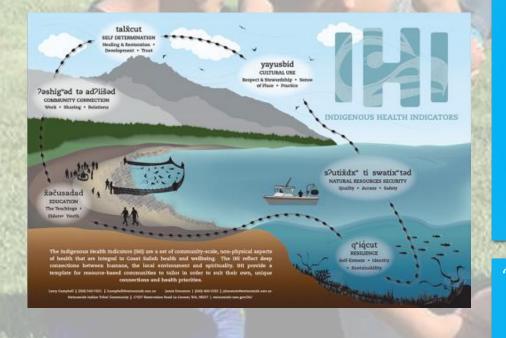
Climate change has cascading effects

TCHP Framework

"Indigenous health is based on interconnected social and ecological systems that are being disrupted by a changing climate. As these changes continue, the health of individuals and communities will be uniquely challenged by climate impacts to lands, waters, foods, and other plant and animal species. These impacts threaten sites, practices, and relationships with cultural, spiritual, or ceremonial importance that are foundational to Indigenous peoples' cultural heritages, identities, and physical and mental health."

Key Finding, Fourth National Climate Assessment

Tribes define health more broadly/holistically than just the absence of medical disease



"Indigenous health is based on interconnected social and ecological systems that are being disrupted by a changing climate. Its impacts threaten sites, practices, and relationships with cultural, spiritual, or ceremonial importance that are foundational to indigenous peoples' cultural heritages, identities, and physical and mental health." – US Climate Toolkit

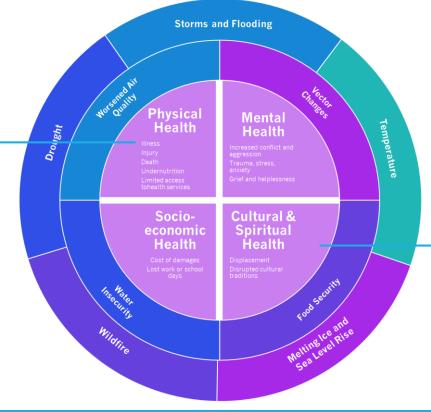
"Our environment was rich in the wealth of natural resources, providing all our needs, allowing us to live healthy happy lives!" - Puyallup Tribe "Nobody can be in good health if he does not have all the time fresh air, sunshine and good water." *Flying Hawk (Chief) 1854* – 1931, Oglala Lakota

"We live off the land. It is the land that is being impacted by climate change. Unless we do something drastically, quickly, the land will not be salvageable. We are tied to the land. If the land goes away, we go away as a people." ~ Sally (híin 'ónni) Peterson, Tribal Elder, Middletown Rancheria of Pomo Indians of California

Tribes define health more broadly/holistically than just the absence of medical disease

Examples of Illness

- Heat related illness/mortality (and worsened chronic illness)
- Asthma/respiratory illness
- Vector borne illness
- Infections due to contact with, inhalation, or ingestion of pathogens
- Allergies
- Electricity-dependent individuals



Examples of Effects on Culture

- Loss of hunting areas
- Relocation of villages
- Cancelled ceremonies
- Impacts to traditional farming
- Effects on traditional species
- Destroyed gathering areas
- Identify
- Values
- Traditions

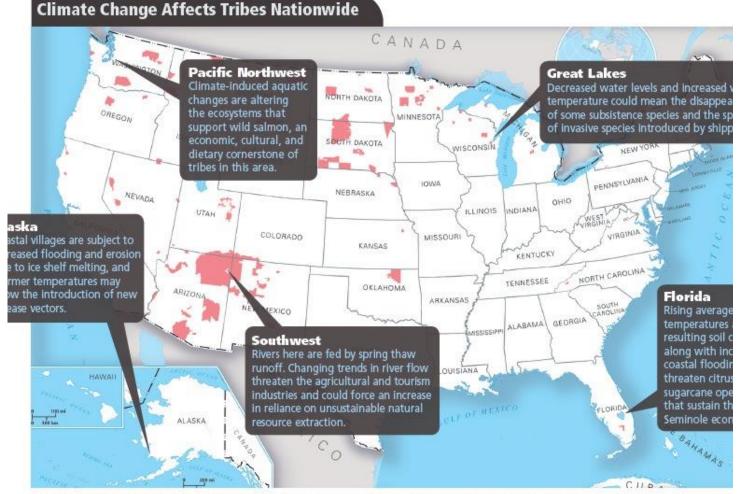
Tribal health is already at risk

USGCRP Climate and Health Assessment Key Findings

- Increased exposure to extreme events and coastal flooding will effect health
- Disruptions to essential infrastructure can limit access to healthcare and emergency response services



	Climate Driver	Exposure	Health Outcome	Impact
Extreme Heat	More frequent, severe, prolonged heat events	Elevated temperatures	Heat-related death and illness	Rising temperatures will lead to an increase in heat-related deaths and illnesses.
Outdoor Air Quality	Increasing temperatures and changing precipitation patterns	Worsened air quality (ozone, particulate matter, and higher pollen counts)	Premature death, acute and chronic cardiovascular and respiratory illnesses	Rising temperatures and wildfires and decreasing precipitation will lead to increases in ozone and particulate matter, elevating the risks of cardiovascular and respiratory illnesses and death.
Flooding	Rising sea level and more frequent or intense extreme precipitation, hurricanes, and storm surge events	Contaminated water, debris, and disruptions to essential infrastructure	Drowning, injuries, mental health consequences, gastrointestinal and other illness	Increased coastal and inland flooding exposes populations to a range of negative health impacts before, during, and after events.
Vector-Borne Infection (Lyme Disease)	Changes in temperature extremes and seasonal weather patterns	Earlier and geographically expanded tick activity	Lyme disease	Ticks will show earlier seasonal activity and a generally northward range expansion, increasing risk of human exposure to Lyme disease-causing bacteria.
Water-Related Infection (Vibrio vulnificus)	Rising sea surface temperature, changes in precipi- tation and runoff affecting coastal salinity	Recreational water or shellfish contaminated with <i>Vibrio vulnificus</i>	Vibrio vulnificus induced diarrhea & intestinal illness, wound and blood- stream infections, death	Increases in water temperatures will alter timing and location of Vibrio vulnificus growth, increas- ing exposure and risk of water- borne illness.
Food-Related Infection (Salmonella)	Increases in temperature, humidity, and season length	Increased growth of pathogens, seasonal shifts in incidence of Salmonella exposure	Salmonella infection, gastrointestinal outbreaks	Rising temperatures increase Salmonella prevalence in food; longer seasons and warming winters increase risk of exposure and infection.
Mental Health and Well-Being	Climate change impacts, especially extreme weather	Level of exposure to traumatic events, like disasters	Distress, grief, behavioral health disorders, social impacts, resilience	Changes in exposure to climate- or weather-related disasters cause or exacerbate stress and mental health consequences, with greater risk for certain populations.



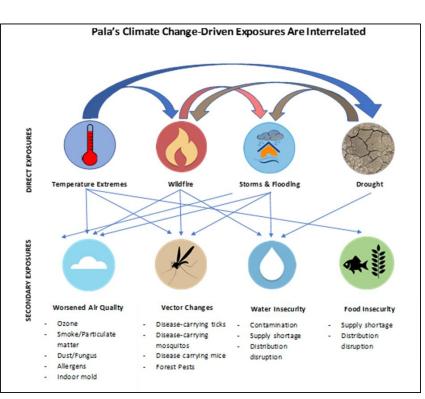
Tribal lands are indicated in pink. Sources: map—www.nationalatlas.gov; climate change effect predictions—Hanna JM. 2007. Native communities and climate change: protective tribal resources as part of national climate policy. Boulder, CO: Natural Resources Law Center / NWF. 2007. Overview of recent research: effects of global warming on the Great Lakes [fact sh Ann Arbor, MI: National Wildlife Federation.

Climate changes lives differently in different places

- *Pacific Northwest and Great Lakes tribes*: fish, food, and forests
- Alaska coastal tribes: thawing, erosion and hunting
- *Navajo*: heat and water insecurity
- *Mojave*: shrinking river (spirituality)
- Seminole Tribe of Florida: hurricanes and sea-level rise
- <u>Lakota</u> (South Dakota): Bomb cyclone and flooding

Tribal Climate Experiences

Pala







Tribal Climate Experiences

Bishop Paiute Tribe (CA)

- Two distributary creeks flow through Reservation from the Eastern Serra Nevada mountains.
- Man-made changes to surface and groundwater (LADWP pumping water from Owen's Valley in early 1900s) has intensified climate change exposures such as drought
- Less snowpack
- Streams drying earlier and springs are disappearing
- Stream temperatures are increasing
- Changes to native and invasive fish populations and bacteria/algae levels
- Drought and beetle infestations have caused an increase in tree mortality, effecting culturally important foods (pine nuts and acorns) and increasing wildfire danger
- Wildfire danger is also elevated due to grasses that grow rapidly after sporadic heavy rains in winter and spring, then dry out to become fuel
- Tribe has documented high levels of PM10 due to smoke

Has begun working on an adaptation plan

OEHHA listening session: https://oehha.ca.gov/media/downloads/climate-change/document/eslistensessnsummary.pdf





Tribal Climate Experiences

Alaska Native Villages (Shishmaref, Alaska)

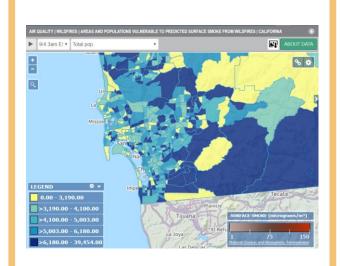
- Since 2001, an average of 23 feet of shoreline is being lost per year because of storms.
- A few of the village's 60 or so buildings have already been abandoned given their proximity to the edge of the town's eroding shoreline
- Eighty-six percent of Alaska Native Villages are threatened by thawing permafrost, erosion and flooding. Thirty-one villages face imminent threats and at least 12 have decided to relocate or to explore relocation options.



Health Impacts of Climate Exposures

Sample Video: Wildfire





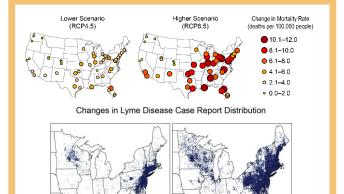




Figure 21.1. Projected Percent Change in National Crop Yields Results shown represent the average of the five GCMs under RCP8.5 and RCP4.5 compared to the reference period (1386-2005). Results are weighted averages of the individual irrigated and rainfed values from the EPIC model.

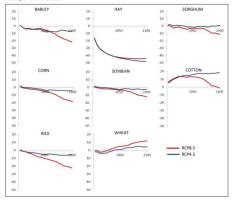


Figure 212 shows the projected change in national yield under RCPBS for the three largest U.S. crops (by area and production volume, not including hay) under the five different climate models, along with the ensemble average, in general, three is agreement in the direction of yield effects across the GGMs, although the magnitude of change varies by climate model and crop. In addition, the magnitude of hange, whether positive on regative, increases over time in almost al classes. The largest change from reference yields is projected under the HadGEML255 model, which is the hottest model used in this analysis, with the execution of wheth where yield changes under this GGM are the most positive.

Tribes, Climate Change, and Health

The volume of potential impacts is overwhelming

"In Northwestern California, drought has decimated the salmon stock, an important food, economic, and ceremonial resource for the Yurok, Hoopa Valley, and Karuk tribes on the Klamath and Trinity rivers." - APEN Mapping Resilience Report

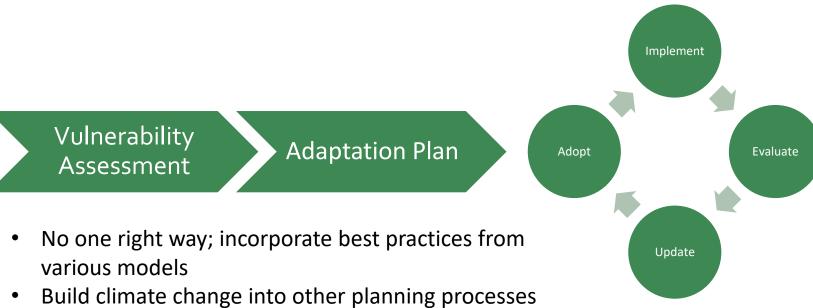
Tribes are disproportionately vulnerable AND uniquely resilient (as seen with COVID)

Reflection Checkpoint

• What is your experience incorporating health into climate adaptation efforts within Tribes or other communities? What challenges have you faced?

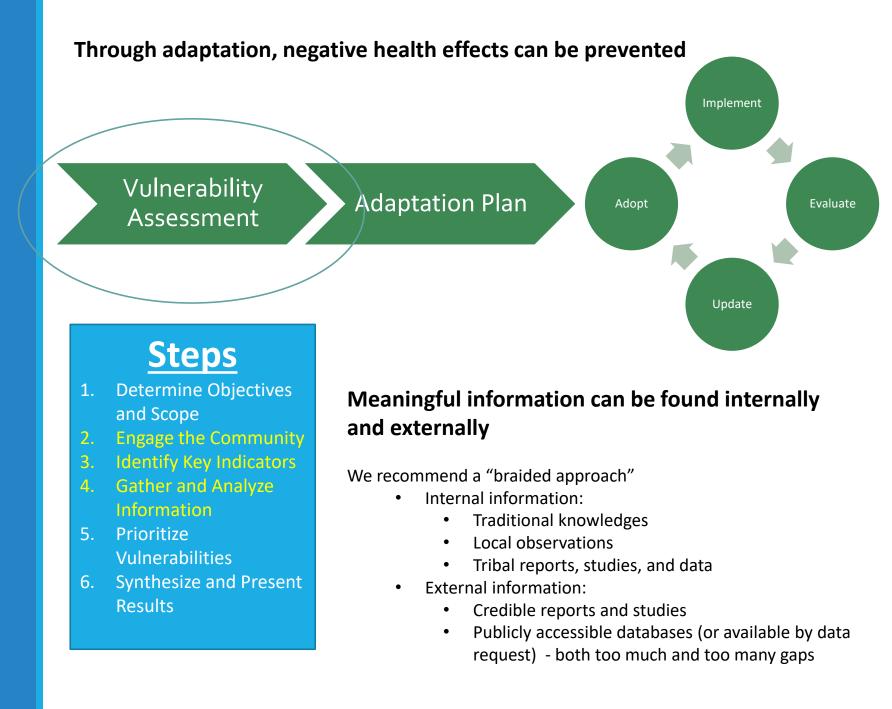


Through adaptation, negative health effects can be prevented



Report prepared by: Michael Brubaker, MS Raj Chavan, PE, PhD ANTHC recognizes all of our technical advisors for this report. Thank you for your support: Gloria Shellabarger, Kiana Tribal Council Mike Black, ANTHC Linda Stotts, Kiana Tribal Council Brad Blackstone ANTHC Dale Stotts, Kiana Tribal Council Jay Butler, ANTHC Sharon Dundas, City of Kiana Eric Hanssen, ANTHC Crystal Johnson, City of Kiana Oxcenia O'Domin, ANTHC Brad Reich, City of Kiana Desirae Roehl, ANTHC John Chase, Northwest Arctic Borough Jeff Smith, ANTHC Paul Eaton, Maniilag Association Mark Spafford, ANTHC Millie Hawley, Maniilag Association Moses Tcheripanoff ANTHC Jackie Hill, Maniilag Association John Warren, ANTHC John Monville, Maniilag Association Steve Weaver, ANTHO James Berner, ANTHC C Alaska Native Tribal Health Consortium (ANTHC), October 2011. Funded by United States Indian Health Service Cooperative Agreement No. AN 08-X59 Through adaptation, negative health effects can be prevented.

Data is key to adaptation planning, and fact finding can be overwhelming



Vulnerability is a function of ...

EXPOSURE RISK +

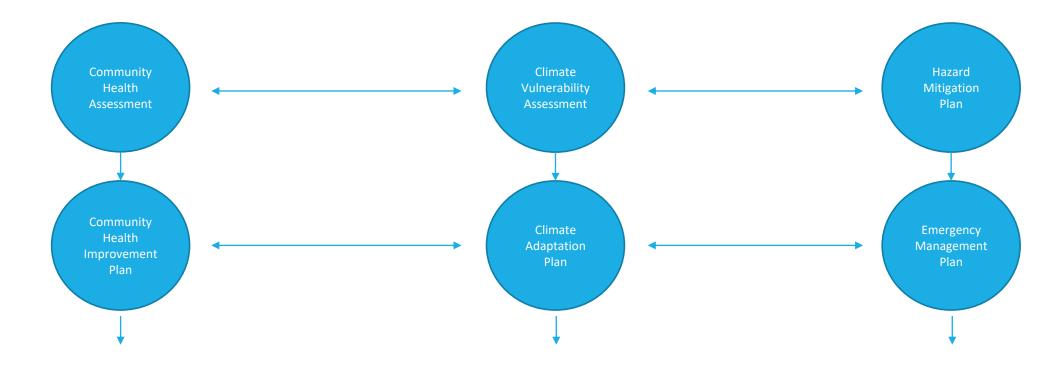
IMPACT RISK (TO VALUED ASSETS) +

POPULATION SENSITIVITY –

ADAPTIVE CAPACITY

Many Types of Professionals Can Be Involved

Public Health Planning Approach Climate Adaptation Planning Approach Emergency Management Approach



Initiates more plans, policies, and actions that can be complementary

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About News/Events Learn

Connect

About

We are developing learning tools to help tribal professionals safeguard their communities from the health impacts of climate change.

LEARN MORE →



Adaptation Planning Tool – Exposures, Impacts, and Strategies Inventory (EISI) tool (Updated October 2, 2019 BETA VERSION). This is a draft of a customizable companion tool that can support communities that are conducting adaptation planning. Information and data sources are compiled and organized to present information needed at several decision-making steps to help your community prepare to take the most effective actions. We are continuing to build functionality and improve information. The latest update includes more indicators and data sources (national and California specific). Please send questions or comments to ahacker@prospersustainably.com.

Survey Template – Climate Vulnerability Experiences and Priorities Survey for gathering initial community input. If you have a Google account, you can use this link to create and save a copy of this template to customize for your tribe.

Sample Reports – Pala Band of Mission Indians Climate Change Vulnerability Assessment and Climate Change Adaptation Plan. These reports incorporate health impacts and strategies. This Word version allows others to modify for their own community. Climate Vulnerability Experiences a

Fact Sheets – Pala Band of Mission Indian produced the following fact sheets to help their community understand how to recognize and prepare for climate threats:

- Extreme Heat (Elevated Temperatures)
- Wildfires
- Flooding and Storms
- Drought

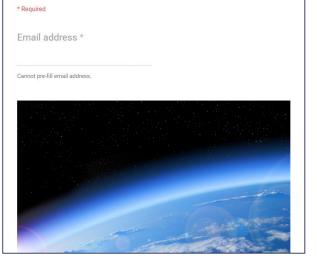
Other Relevant Training Materials not Produced by the Tribal Climate Health Project

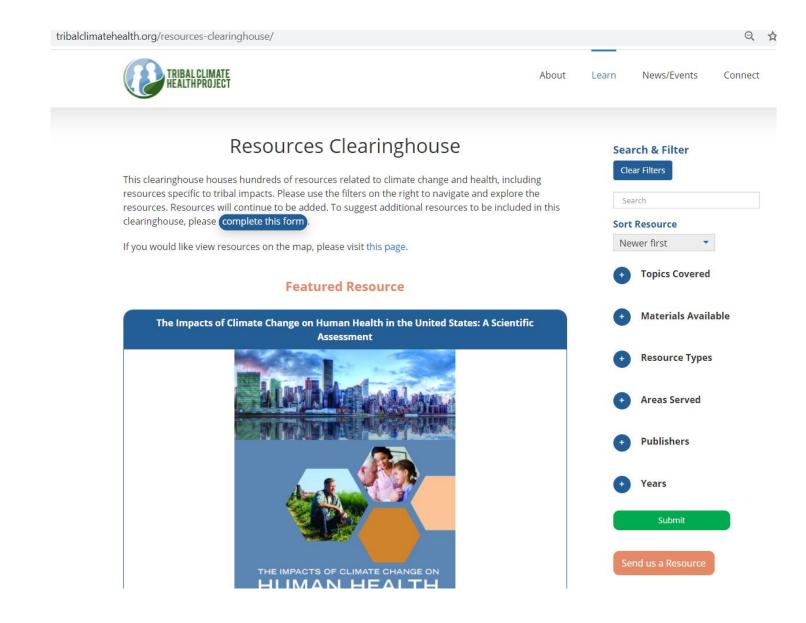
Tribal Resolution Template –ITEP's Tribal Climate Change Resolution Template

Climate Vulnerability Experiences and	
Priorities Survey	

The <insert tribe name- is working on evaluating its vulnerability to the impacts of climate change within the Reservation. Community members and stakeholders are asked to complete the following survey to help us better understand the community's experiences and priorities by -insert date-.

Your responses may be quoted in the Vulnerability Assessment Report





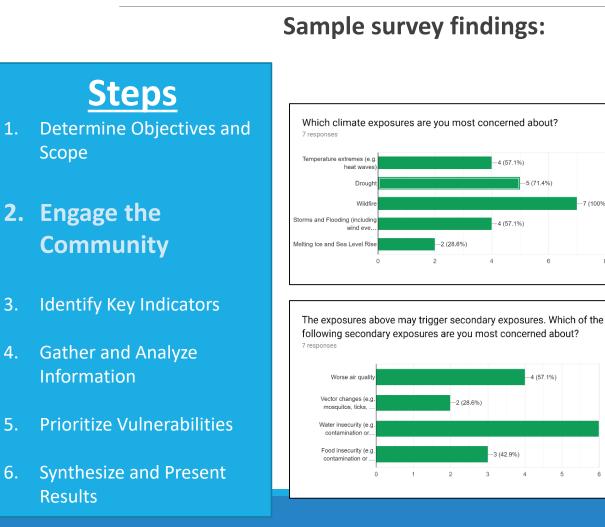
We can help point Tribes in the right direction of additional support and resources

• Resource clearinghouse

•Contacts:

- Climate Adaptation Science Centers
- USDA Climate Hubs
- Tribal epidemiology centers
- Federal/State Tribal liaisons
- State/local public health departments
- Colleges and universities
- Tribally focused environmental organization (e.g. ITEP)

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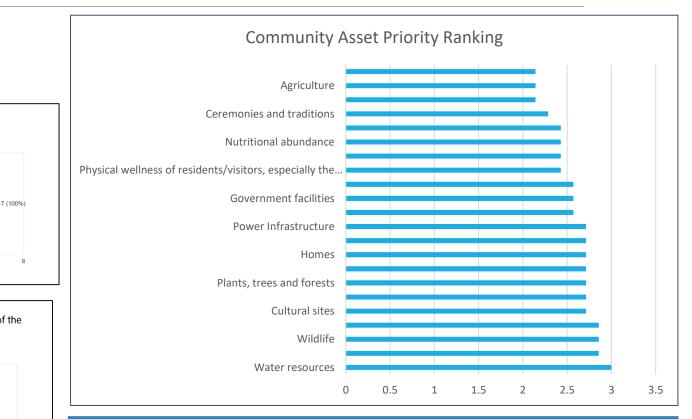
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Results

Scope



"I'm worried about fires in our area. The dry brush on our reservation is extreme." - Survey Respondent

It is possible to lower the burden of fact finding on Tribes

Exposures, Impacts, and Strategies Inventory (EISI) tool

- Companion to TCHP trainings to ease the fact-finding burden on low-resource communities and free them up to make meaningful, community-driven adaptation decisions
- Filterable/customizable worksheet to evaluate and track vulnerabilities and adaptation strategies
- Suggests and organizes menus of :
 - Vulnerability indicators and accessible data sources for:
 - Exposures
 - Secondary exposures
 - Impacts
 - Population sensitivity
 - Adaptative capacity
 - + Valued community assets
 - Adaptation strategies coded to address vulnerabilities

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6			µ/m3), with percentile (vs other census tracts)		HPI				c	hart; map; table Basel
7 Drought	Worsened air quality: dust particulate matter	x	PM2.5 -% Days above CDC regulatory standard (County) NEP		<u>CDC -</u> <u>CDC -</u> NEPHT NEPHT				C	Histo hart; map; table Basel
			West Nile Virus-carrying mosquito surveillence - Non-	CDC -	CDC -					
8 Drought	Vectors: mosquitos	x	human WNV actvitiy (State) Forest vector surveillence - Bark USFS	WNV JUS USFS/US	WNV USFS/US USFS/US				N	Nap Basel
9 Drought	Vectors: forest pests	X X	beatles <u>DA</u> Water pathogens - Nitrates in	DA	DA DA				N	1ap Basel
0			Community Water Systems CDC (County) NEP	HT NEPHT	CDC - CDC - NEPHT NEPHT					Histo hart; map; table Basel
1			Water exposure outbreaks CDC (State) NOF		CDC CDC NORS NORS					Nap; Table; Histo hart Basel
2			Incidents of water contaminated by waste/chemicals during storm Drinking water contaminants							
3			CA percentile) (Census thact) Impaired water bodies (CA		CalEnviro				N	1ap; Table Basel
4			percentile) (Census tract) Observed water quality		CalEnviro				N	1ap; Table Basel
6 Drought	Water: contamination	x x	Drinking water violations (County)	RWJF	RWJF				т	able; map Basel
	Water: shortage/supply and distribution		Well production (meter reads) or							,
7 Drought	disruption 1. Evaluate Exp		other water level observations ate & Track Impacts 2.8 Pe	on Sens Adapt Car	3. Evaluate St	rategi				· · · · · · · · · · · · · · · · · · ·
Instructio				p sens_Adapt Cap	5. Evaluate SI	rategi 🕂 🕴 🖣				-

May 2021 | Tribal Climate Health Project



Accessing Tribal Climate and Health Resilience Data

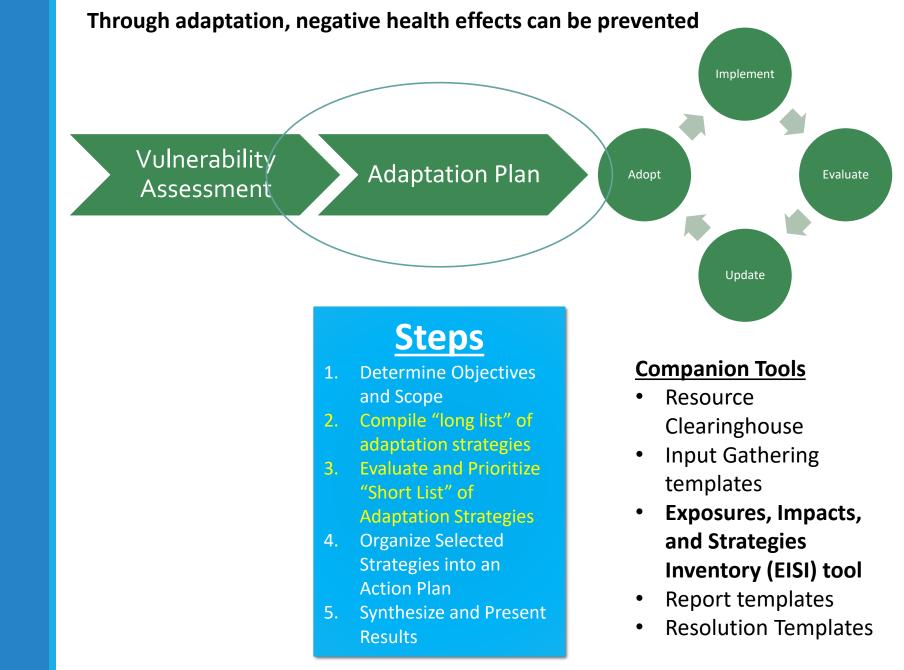
A Step-by-Step Guide

Our NEW Step by Step Guide to Accessing Tribal Climate and Health Resilience Data

Download at:

http://tribalclimatehealth.org/training-materials/

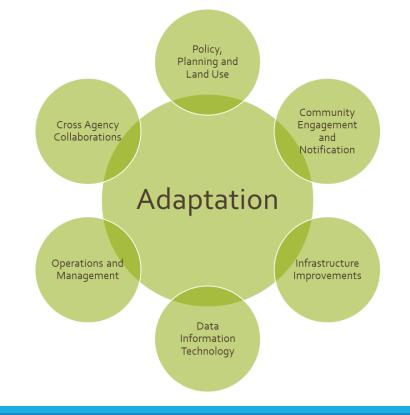
Values-based decision making based community and cultural priorities



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4 10	x	× :	x x	< x	: x	×	×	×	×	<				n te a a c P c	notifications before and during exposure event via website, text, social media, TV, radio, and other media. Notifications should include relevant safety tips (e.g. limit outdoor activities, don't drive through flooded roads, limit water usage evacuation zones, boil advisories, etc) and how to access additional information or help. Implement emergency communications to provide realistic recovery timeline and plan to set reasonable expectations given likely post-event challenges to avoid greater mental health impacts. equipment and processes to allow for real time climate		x																
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Tribes are adapting, despite limited capacity, and institutional barriers





"Barriers include limited access to traditional territory and limitations of existing policies, programs, and funding mechanisms that account for the unique conditions of indigenous communities." - US Climate Toolkit

Examples of Health Adaptation Strategies

Steps

- 1. Determine Objectives and Scope
- 2. Compile "long list" of adaptation strategies
- Evaluate and Prioritize
 "Short List" of Adaptation Strategies
- 4. Organize Selected Strategies into an Action Plan
- 5. Synthesize and Present Results

Temperature Extremes

- Mescalero Apache Tribe (NM) Hoop houses, greenhouses and solar power to protect food crops
- Mashpee Wampanoag Tribe (MA)- Provide early, real-time heat warnings
- <u>Choctaw Nation (MI)</u>: Promote food cooperatives, CSA programs, tribal garden plots

Storms and Flooding

- Kiana, Alaska Conduct education to help residents avoid food and water safety risks
- Mikah Tribe (WA) Regional climate adaptation dashboard shows it has completed watershed and salmon habitat restoration

Drought

- Chickasaw Nation (OK) Create or update a drought contingency plan
- Blackfeet (MT) Increase water storage capacity naturally by protecting beavers and restoring riparian areas
- Tohono O'odham (AZ) Developing seed-banks of traditional plants to improve food security

Wildfire

- Karuk Tribe Collaborate with federal agencies on forest management plans including traditional wildfire techniques
- Yakama Nation Partnering to increase air quality monitoring and developing local committees to implement climate measures for most vulnerable populations

Melting Ice and Sea Level Rise

- Biloxi-Chitimacha-Choctaw Develop plans for phased relocation, if necessary
- <u>Wainwright (AK)</u> Promote location devices for hunters and travelers
- <u>Alaska Native Tribal Health Consortium -</u> Local Environmental Observer (LEO) Network map tool connects knowledge keepers to document/share observed climate/health changes

Access services

PED has developed the following referral list of local health services to support the wellness of our community in response to increasing climate events such as wildfire, flooding, drought, and heat.

Mental, Emotional and Spiritual Health

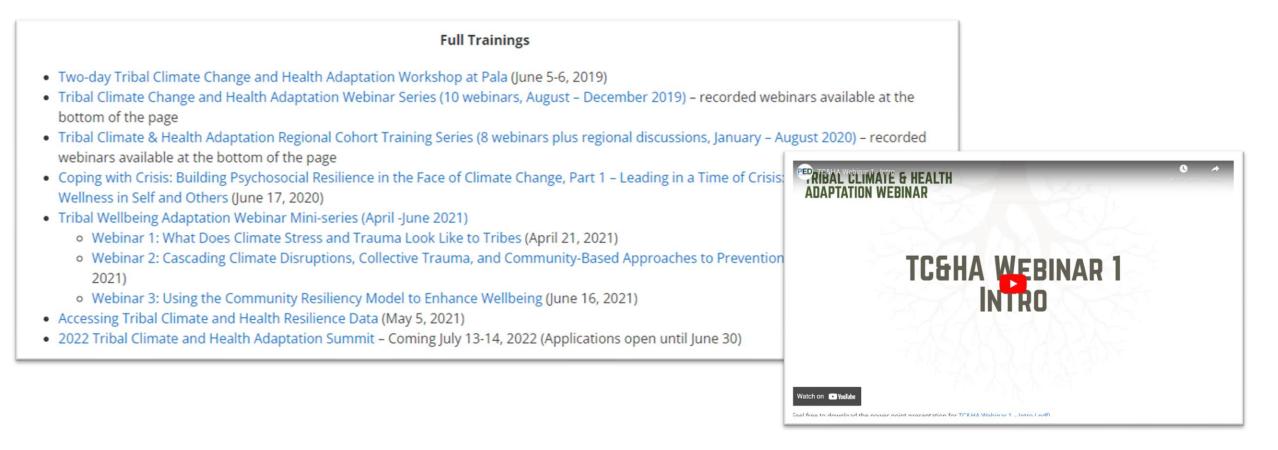
Indian Health Council, Inc. - Behavioral Health Services

- Crisis intervention
- Staff psychiatrist
- Individual, child and family counseling Social Services

American Red Cross San Diego - Recovering Emotionally

- Emotional recovery resources and free 24/7 counseling or support
- ✓ Medical Health Services
- ✓ Social Services
- ✓ Public Safety/Emergency Services
- ✓ Cooling Centers
- ✓ Climate Change and Climate Readiness

Access Free TCHP Trainings





White House Commits to Elevating Indigenous Knowledge in Federal Policy Decisions | The White House



There is significant interest in better supporting Tribes



THANK YOU FOR ATTENDING!

Questions?

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Panel

- What can local governments and regional organizations do to support and include Tribes?
- What can local governments and regional organizations learn from Tribes?
- What are some do's and don't of Tribal engagement and knowledge exchange?
- Where can attendees go for further help weaving health into their climate adaptation work?

Assessing Your Vulnerabilities – Key Resources

Guidance

Oregon Climate Change Research Institute - Tribal Climate Adaptation Guidebook (Steps 1, 2 and 3)

International Tribal Environmental Professionals - Adaptation Planning Toolkit

US Climate Resiliency Toolkit

<u>Tribal National Topic</u>

CDC: <u>Accessing Health Vulnerability to Climate Change:</u> <u>A Guide for Health Departments</u>

CDC Community Health Needs Assessment

U.S. Center for Disease Control and Prevention: <u>Building</u> <u>Resilience Against Climate Effects (BRACE)</u>

<u>IPCC – Chapter 11: Human Health: Impacts, Adaptation, and Co-benefits</u>

ITEP Webinar (2018)

Tools and Templates

TCHP - Exposures, Impacts, Strategies Inventory (EISI) tool – Beta Version

TCHP - Pala Vulnerability Assessment Sample

TCHP - <u>Climate Vulnerability Experiences and Priorities</u> Survey Template

TCHP – <u>Blog: "Data Sources to Assess TribalClimate and</u> <u>Health Data"</u>

TCHP – Resources Clearinghouse

CDPH – <u>Template for Assessment of Local Climate</u> Mitigation, Adaptation, and Resilience

International Tribal Environmental Professionals <u>–</u> <u>Resolution Template</u>

Examples

NIHB - Tribal Climate Champions: Spotlight on Gila River Indian Community

US Dept of Energy - Makah Tribal Engagement

UW Climate Impacts Group - Makah Interview

Swinonmish Indigenous Health Indicators video

Shoshone-Bannock Tribe video

Collville Tribes Climate Change Page

Oregon State Health Authority – <u>Climate and health</u>

Tribal Vulnerability Assessments

Pala Vulnerability Assessment

Community Observations on Climate Change: Nashagak River Trip Report

<u>Climate Change Vulnerability of Native Americans in the</u> <u>Southwest</u>

Puyallup Climate Change Impact Assessment

Upper Snake River Watershed: <u>Climate Change</u> <u>Vulnerability Assessment</u>

Swinomish Climate Change Initiative Impact Assessment Technical Report

Jamestown S'Klallam Tribe: <u>*Climate Vulnerability</u>* <u>Assessment and Adaptation Plan</u></u>

Karuk Tribe Climate Vulnerability Assessment