Resilience to Climate Change

Collaborating on Adaptive Management Strategies for the Pyramid Lake Paiute Tribe

Shannon Mandell, Olin Anderson & E. Schuyler Chew

NCAI Tribal Leader/Scholar Forum:
"Agriculture, Timber, & Water: Sustaining our Natural Resources"

Wednesday, June 26, 2013

Presenters

Pyramid Lake Paiute Tribe

- **Shannon Mandell**, Director, Pyramid Lake Museum & Visitor Center
- **Olin Anderson**, Water Quality Standards Specialist, Environmental Department

University of Arizona

- **E. Schuyler Chew**, Research Analyst

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Principal Investigators

University of Arizona

- **Dr. Karletta Chief**, Soil, Water, and Environmental Sciences, Principal Investigator
- **Dr. Aleix Serrat-Capdevila**, Hydrology and Water Resources, Co-Principal Investigator
- **Dr. Alison Meadow**, Institute of the Environment, Co-Principal Investigator

University of Nevada, Las Vegas

- **Dr. William J. Smith Jr.**, Harry Reid Center for Environmental Studies, Co-Principal Investigator

USGS-Pacific Southwest Area

- **Dr. David E. Busch**, Biologist, Co-Principal Investigator

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Collaborators & Funding

Collaborators

- Pyramid Lake Paiute Tribe
- University of Arizona
- University of Nevada Las Vegas

Two year grant funded by

- Southwest Climate Science Center
- United States Geological Survey

Climate Change & Tribes

- Climate change is an emerging area of research that directly affects tribal communities
- Native people share intimate relationships with the environments, resources and landscapes upon which their culture, tradition, and livelihood depend

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Climate Change & Tribes

- "Climate change may disproportionately affect tribes and their lands because they are heavily dependent on their natural resources for economic and cultural identity." (USDOI 2010)
- This presentation demonstrates the process for one tribal community to determine its risks and then to plan for climate adaptation in a collaborative manner

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USDOI's Strategic Response to Climate Change

- In 2009, DOI Secretary Salazar's signing of Order 3289 launched a bold climate change-response strategy
- Establishes eight regional Climate Science Centers as partnerships between universities and USGS to combine the expertise of scientists and resource managers on adaptation science


thephoenixsun.com/archives/6333

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USDOI's Strategic Response to Climate Change

Section 5 of Secretarial Order 3289

- Affirms DOI's primary trust responsibility to tribes
- Ensures government-to-government consultation with tribes on climate change initiatives
- Recognizes that tribal values are critical to determining what is to be protected, why, and how
- Supports the use of traditional ecological knowledge, along with best available science, in formulating policy pertaining to climate change

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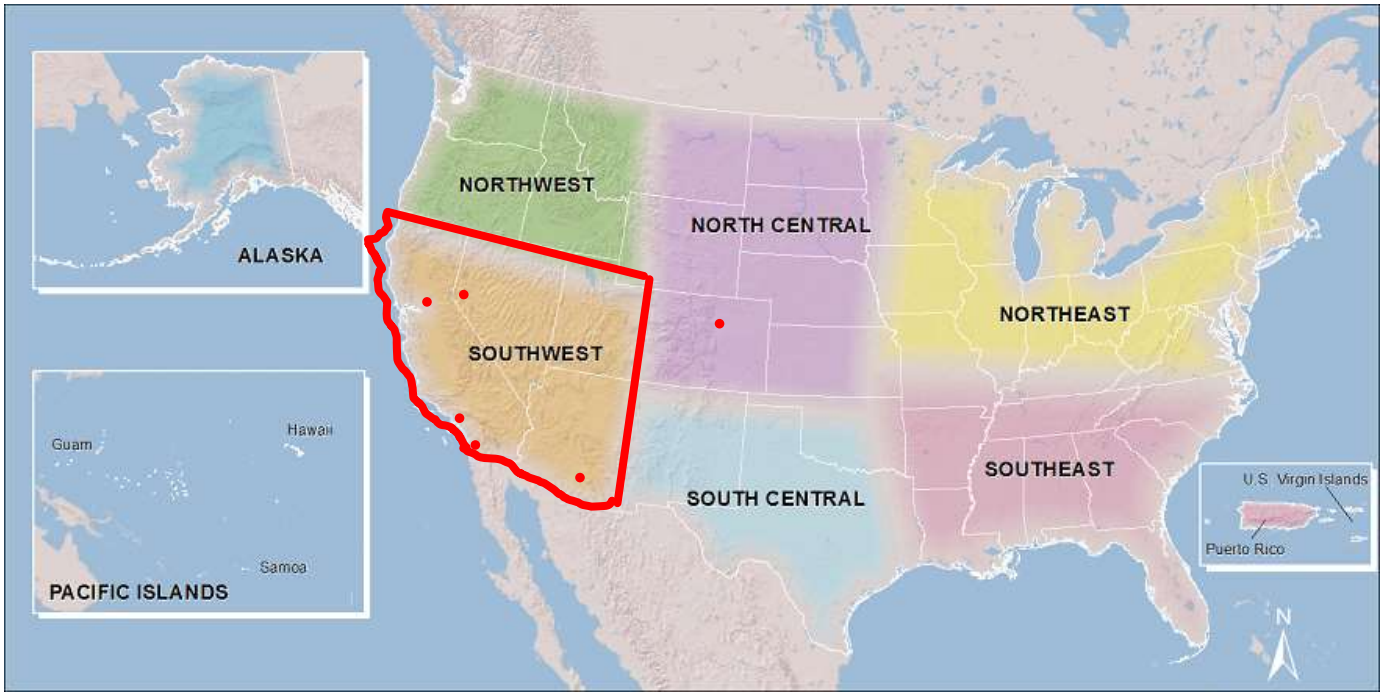
USDOI's Strategic Response to Climate Change



Southwest Climate Science Center (SWCSC) is a consortium of six institutions: University of Arizona; University of California, Davis; UCLA; Desert Research Institute, Reno; University of Colorado, Boulder; & Scripps Institution of Oceanography at the University of California, San Diego

www.doi.gov/csc/index.cfm

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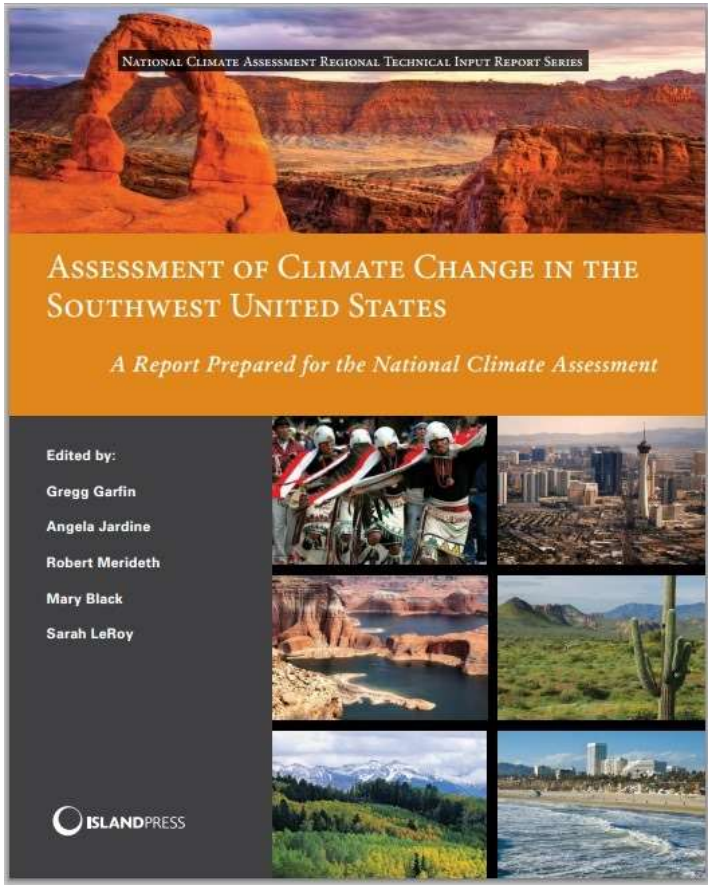
Latest Climate Change Work in the Southwest

- In a regionally-driven effort, the SWCSC partnered with the Climate Assessment for the Southwest (CLIMAS) and other researchers on a comprehensive report for the National Climate Assessment
- This report went far beyond expectations and has been widely praised for its comprehensiveness
- www.swcarr.arizona.edu



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Latest Climate Change Work in the Southwest

This national report evaluates climate change effects on Native American lands in the Southwest

Available online at www.swcarr.arizona.edu/chapter/17

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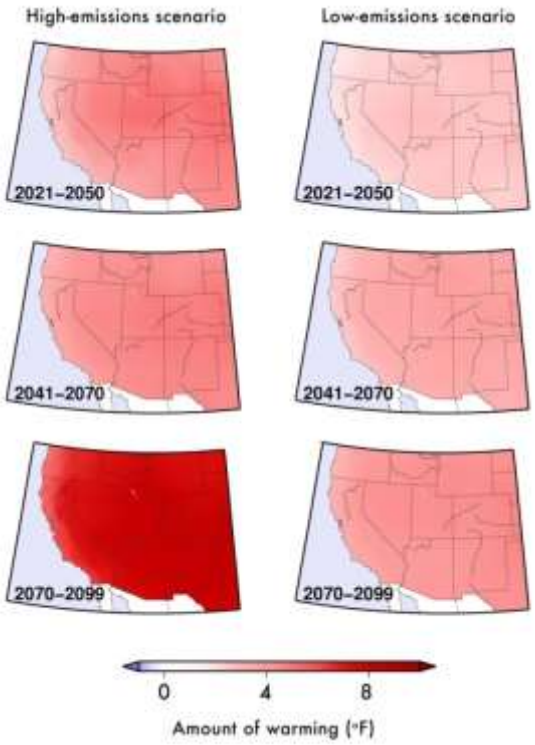
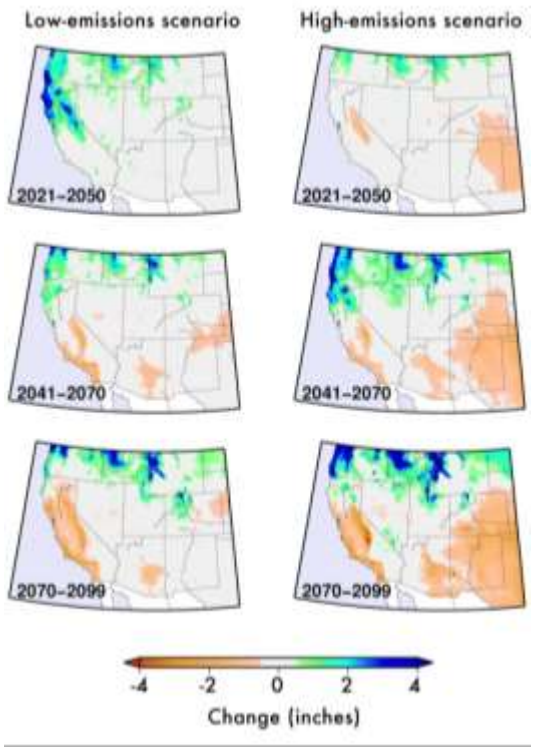
Climate Projections for the Southwest

Temperature change (°F)



Precipitation change (inches)



Southwest temperatures will rise by at least 3°F and up to 9°F over recent historical averages over the 21st century.

Lower precipitation in the southern part of the Southwest and little change in the northern part.

www.swcarr.arizona.edu/chapter/6

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Welcome to Pyramid Lake

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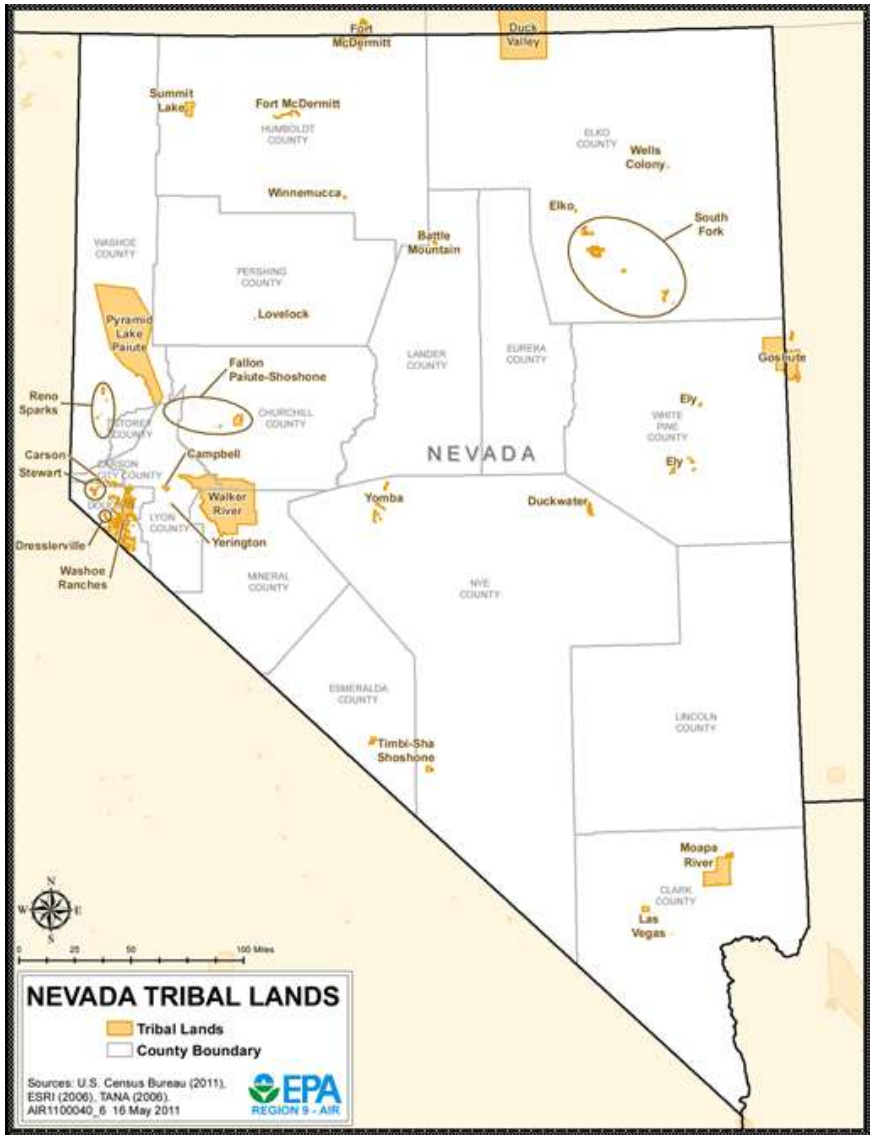

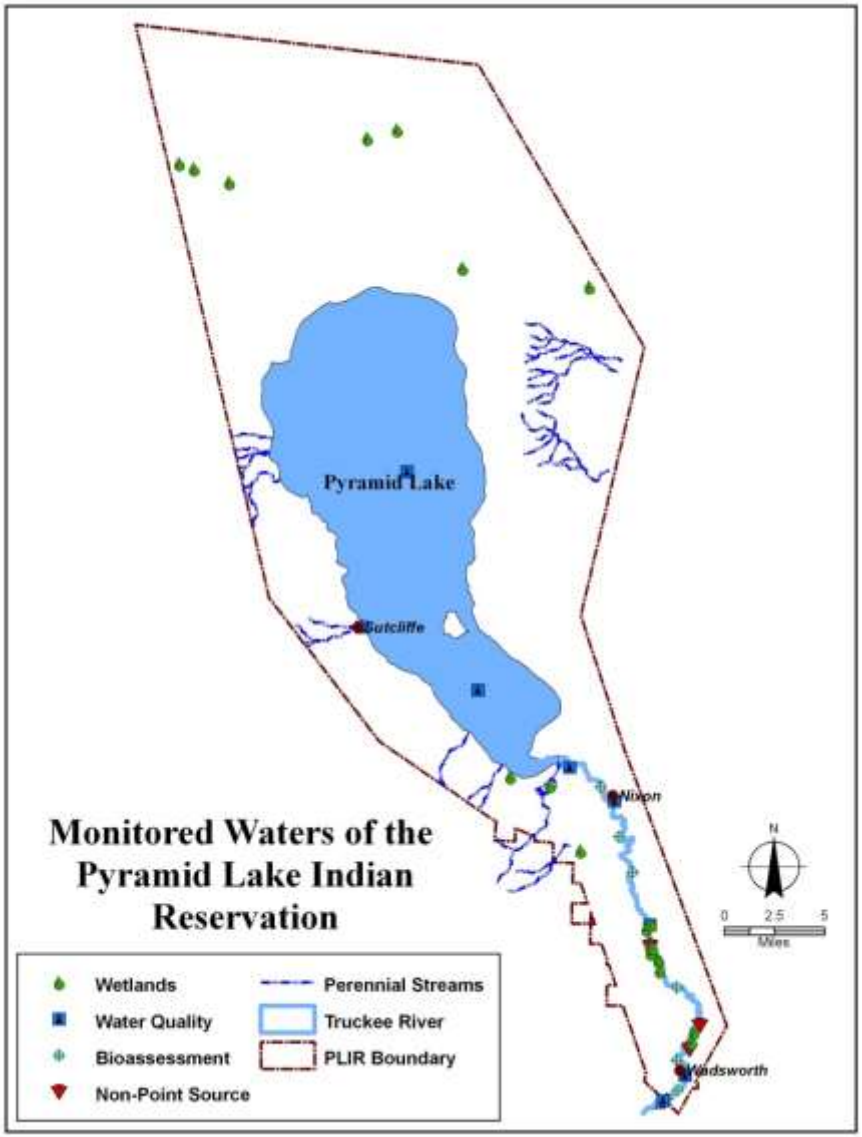

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Tribal Statistics

- Northern Paiute people - “Kooyooee Tukadu”
- 1461 residents on reservation (in 2010 census)
- 2400 members enrolled
- 35 miles northeast of Reno, NV
- Reservation designated 1859 and affirmed in an 1874 Executive Order by President Grant
- Over 745 square miles in size
- Pyramid Lake is 175 square miles in size, 11 miles wide, 26 miles long, and about 345 feet deep

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Man-made Climate Impacts to Pyramid Lake

Construction of Derby Dam on the Truckee River, 1905

- Diverted much of Truckee River flows toward the Carson Basin
- Dropped Pyramid Lake elevation by 85 feet in 1967
- Desiccated Winnemucca Lake (which is now a playa)
- Severe Ecosystem damage for supporting Cui-ui and Lahontan Cutthroat Trout
- Fish are respectively now listed as *Endangered* and *Threatened*

The Tribe has had to adapt to these changes for some time!

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Early Adaptation to Changes

Battling for water rights

- Tribal members and concerned citizens fought and negotiated for many years to save Pyramid Lake
- Water Rights (claim 1 &2) and certain irrigation operating agreements awarded
- Agreements still in negotiation
- Funding obtained to acquire Water Rights from willing sellers

Orr Ditch Decree

O.C.A.P.
Operating Criteria and Principles

W.Q.S.A.
Water Quality Settlement Agreement

PUBLIC LAW 101-618

TROA
Truckee River Operating Agreement

Desert Terminal Lakes Program

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Early Adaptation to Changes

Marble Bluff Dam

- Corps of Engineers, 1975
- Constructed on the Truckee near Pyramid Lake
- Stopped the downcutting of the river
- Featured fish passage structure

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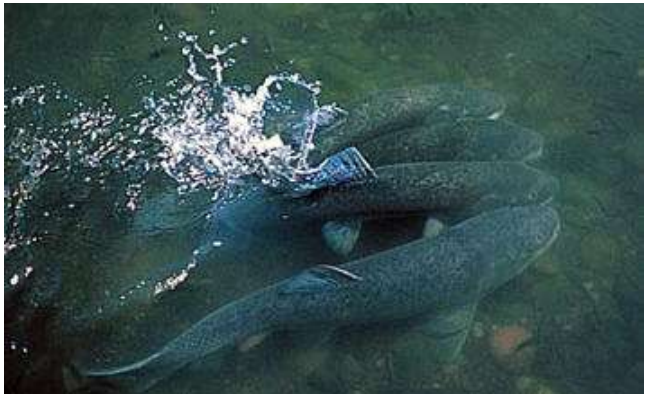
Early Adaptation to Changes

Fishery restoration

- Efforts between State, Tribal, and Federal wildlife authorities
- Tribe and USFWS maintain active fishery projects
- Indications of some success



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Climate & Drought Impacts on Native People

Climate and drought affect Native people in many ways

- Physically
- Economically
- Culturally

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Physical Impacts of Climate and Drought

Rangeland

- Horse populations limit forage for grazing animals
- Edible plant arrival, fewer seeds from native species, increase in weed populations

Wildlife

- Migratory birds and wildlife quality affected

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Physical Impacts of Climate and Drought

Wildfire

- Greatest unknown & greatest risk
- Threatens important species
- May destroy homes, rangeland & businesses
- Ecosystem out of fire cycle balance

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Physical Impacts of Climate and Drought

Water

- Moist areas drying up
- Urban water restrictions
- Residential wells impacted

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Economic Impacts of Climate and Drought

- Cattle health and cost of range improvements
- Community water shortages affect agricultural production and are costly for tribal governments
- Eco-tourism may be affected

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Cultural Impacts of Climate and Drought

- Saddening to see lands degraded
- Reduced ability for subsistence living and continuation of older traditions
- Fewer resources for traditional teaching
- Less water available for ceremonies
- Algal blooms may threaten health of community members

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Pyramid Lake Paiute Tribe Climate Change Efforts

PLPT has been proactive on climate change

- Worked with Dr. Karletta Chief and Desert Research Institute (DRI) on a geothermal grant in 2008
- Collaborated in 2009 with the Innovation Working Group (DRI, Univ. of Idaho, & Univ. of New Mexico) on climate change impacts to Native American and Hispanic communities

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Pyramid Lake Paiute Tribe Climate Change Efforts

PLPT has been proactive on climate change

- Partnered in 2010 with Dr. Chief and DRI on a Nevada EPSCoR seed grant to a conduct socio-vulnerability assessment
- Contributed to the Climate Change Native American Technical Group with Dr. Bill Smith and Dr. Chief on a video on Nevada tribes and climate change

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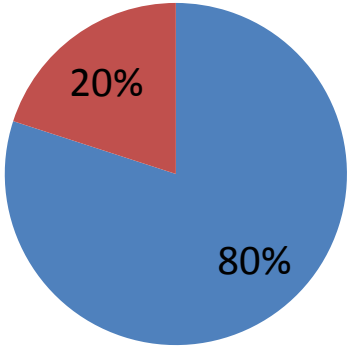
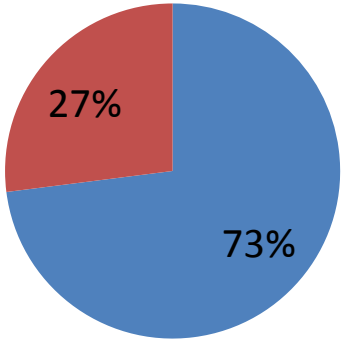
Pyramid Lake Paiute Tribe Climate Change Efforts

Surveys with tribal members indicated

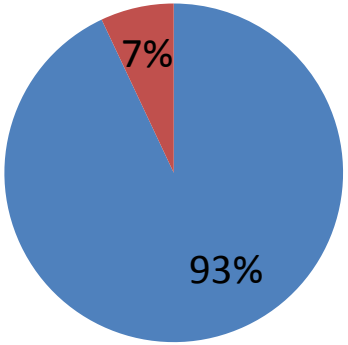
80% were aware of climate change and observed changes in their environment





73% believed climate change is happening and humans play a role in climate change

93% expressed their priority for climate change action at the national level (Gautam et al. 2013)



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Pyramid Lake Paiute Tribe Climate Change Efforts

Focus groups allowed researchers to better understand tribal vulnerability to climate change

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Justification for Research

Conventional climate change adaptation planning may have unintended consequences and may lead to conflict if tribal consultation is not considered (Redsteer et al. 2013)

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Justification for Research

PLPT is seeking new ways to manage ecosystems and build upon existing adaptation efforts

This project expands upon previous CSC work and fills a need for tribal research in the region

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Key Research Questions

Assessing the adaptation potential of PLPT:

- What are the physical and social limits to adaptive planning for PLPT?
- What types of collaboration will lead to successful adaptive planning?

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Hypothesis

The Pyramid Lake Paiute Tribe is a resilient tribe with the adaptive capacity and institutions which help them:

- adapt to climatic and non-climatic stressors
- devise collaborative strategies to prepare for climate change

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Research Objectives

- Determine the climate change adaptation potential of the Pyramid Lake Paiute Tribe by understanding vulnerabilities, thresholds, and resiliencies of the systems

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Research Objectives

- Propose collaborative tribal water management and adaptive strategies
- Explore the potential for partnerships and collaborations between tribes and the climate science community

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Research Progress

- Collaborative planning since project kickoff meeting in November 2012

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Research Progress

- Literature review of Pyramid Lake and Truckee River ecology and hydrology

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Research Progress

- Next major step will involve brainstorming workshops with tribal environmental managers

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Relevant Policy Outcomes

- Identifying “best practices” for partnerships and collaborations between PLPT and researchers
- Sharing these collaborative strategies for the benefit of other tribes

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Relevant Policy Outcomes

- Developing adaptive management strategies specifically for the Pyramid Lake Paiute Tribe
- Equipping tribal environmental managers with scientific information and tools to anticipate and adapt to climate change and other non-climatic stressors

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Relevant Policy Outcomes

Devising an adaptation framework:

- With implications for other tribes, especially in the Southwest, faced with similar climate issues
- With global applicability to indigenous communities around the world seeking to prepare for climate change

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Closing Remarks

- Adaptation is nothing new to the Pyramid Lake Paiute Tribe, given their efforts to secure water rights to protect fish, ecosystems & way of life
- By 2008 PLPT began to consider their role in addressing climate change
- This research project is a collaborative approach that builds on previous PLPT adaptation efforts

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Closing Remarks

- Adaptation planning happens at various levels (government, research) and will have implications for people at the community level
- How can individuals contribute to adaptation planning at the community level?
- Are individuals taking the right steps to move adaptation forward?

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Thank you!
Questions?

Links to Resources

U.S. Department of the Interior Climate Science Centers

http://www.doi.gov/csc/index.cfm

U.S. Department of the Interior Secretarial Order 3289

http://nccwsc.usgs.gov/sites/default/files/documents/other/SO_3289_Amended.pdf

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http://www.swcsc.arizona.edu

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Links to Resources

Assessment of Climate Change in the Southwest United States

http://www.swcarr.arizona.edu

Special Issue in *Climatic Change* "Climate Change and Indigenous Peoples in the United States: Impacts, Experiences, and Actions“

http://link.springer.com/article/10.1007%2Fs10584-013-0737-0

Nevada’s Native American Tribes and Climate Change Video

http://www.thewaterchannel.tv/en/videos/categories/viewvideo/1402/climate-change/nevadas-native-american-tribes-and-climate-change

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