Yurok Tribe Climate Change Adaptation Plan for Water and Aquatic Resources

A Collaborative Effort Informed by Traditional Ecological Knowledge & Western Science

THE YUROK TRIBE

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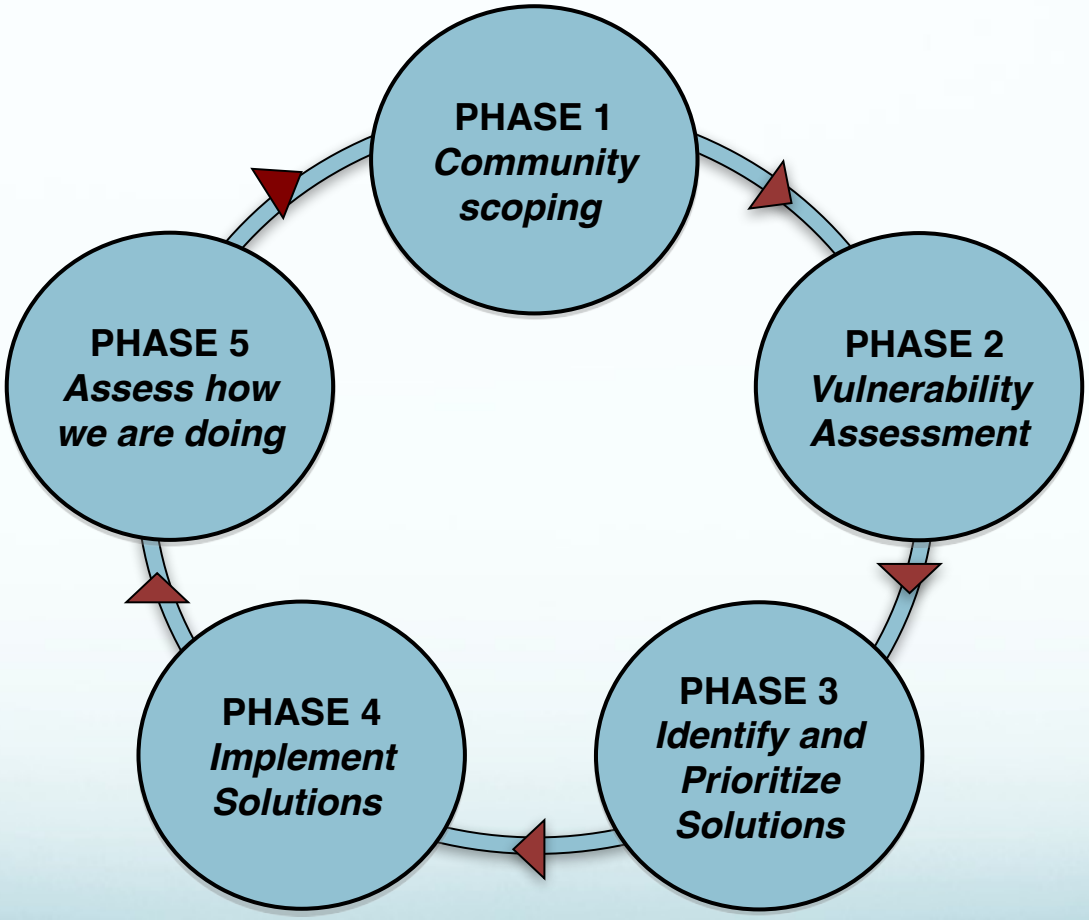
The Yurok Tribe

"The river is like blood flowing thru our veins."
– Tribal Member

Sep. 2002 – Massive Fish Kill

"Never in our time have we, the elders of the Yurok Culture Committee, seen such a mass destruction of our salmon resource."

Yurok Climate Change Adaptation Planning & Implementation Process



TEK ←→ Western Science

What is TEK?

TEK is often a combination of traditional teachings shared between families and community members through verbal transmission and observations shared over multiple generations on issues of cultural importance such as: Subsistence, ceremonial practice, and traditional resource management, among others…

Phase 1 – Community Scoping

- 2010 - **Community Climate Change Prioritization Plan**
- 2012 - **Utilizing Yurok TEK To Inform Climate Change Priorities**

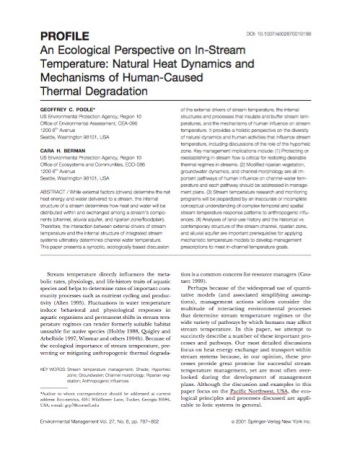
"Our cultural and spiritual identity must survive. This is imperative - this is who we are." – Tribal respondent

Phase 2 – Vulnerability Assessment

- 2014 – **Yurok Tribe Climate Change Adaptation Plan for Water and Aquatic Resources**

- TEK Methods
  - Prior Community Prioritization Plan
  - Prior elder interviews
  - Workshops
  - Community meetings
  - Interviews
  - Newsletters

- WS Methods
  - Review Yurok reports
  - Review scientific literature and data
  - Review government reports
  - Workshops
  - Interviews



PROFILE

An Ecological Perspective on In-Stream Temperature: Natural Heat Dynamics and Mechanisms of Human-Caused Thermal Degradation

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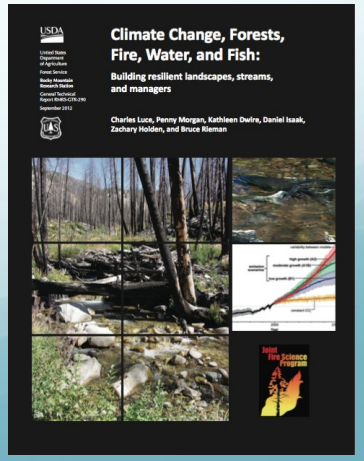


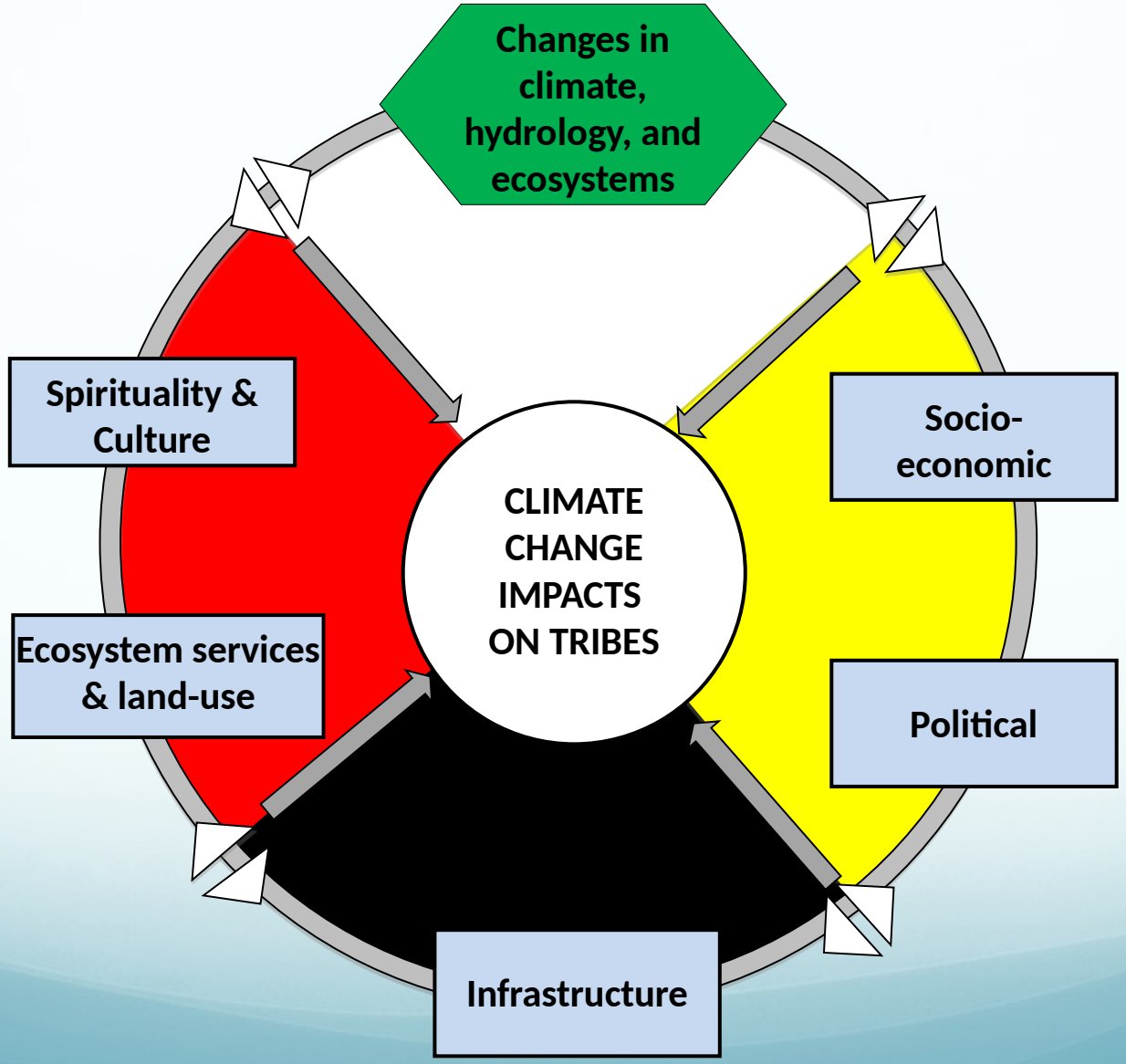
USDA United States Department of Agriculture Forest Service Rocky Mountain Research Station General Technical Report RMRS-GTR-290 September 2012

Climate Change, Forests, Fire, Water, and Fish:

Building resilient landscapes, streams, and managers

Charles Luce, Penny Morgan, Kathleen Dwire, Daniel Isaak, Zachary Holden, and Bruce Rieman

Phase 2 – Vulnerability Assessment



Phase 2 – Vulnerability Assessment
– climate factors affecting water temperatures

“That’s what I miss... Because it used to get really cold and freeze. When we would go out into the field and the little puddles would freeze, you could ice skate across the puddles but now it doesn't get that cold. It doesn't get cold enough to freeze.” – Elder Fern Bates

Recent drought and low flows – community members reported creeks drying up for first time in their lives

During drought - YTEP WS data – shows warmer water temperatures being reached earlier in the year

TEK can validate WS and make it real for the community

Phase 2 – Vulnerability Assessment
– climate factors

"You know sometimes it rains and sometimes it just pours down. I say it's like in the cowboy movies, how it's raining just hard. And the rain just draining off of them. I notice that because of the road. How it makes ditches in the road more so than it used to. You could ditch a road out and then it would be in the ditches but not in the spillways. Not all the time, just once in a while." – Elder Bertha Peters

TEK can indicate changes that WS data perhaps may not be able to show yet or provide more localized information or just be a heads up

Phase 2 – Vulnerability Assessment
- Non-climate factors increasing water temperatures

“I’ve seen the correlation between big elk herds and big fish.” – Yurok Cultural Fire Management Council Meeting

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- Non-climate factors increasing water temperatures

"I've seen the correlation between big elk herds and big fish." – Yurok Cultural Fire Management Council Meeting

- Loss of groundwater recharge through prairies
- Overstocking of forests with trees and higher water consumption

→ Less cool baseflow entering streams

Phase 2 – Vulnerability Assessment
- Non-climate factors affecting water temperatures

*"I never did enjoy swimming in the Klamath when I was a kid, because it was so cold up where we lived…up our way it was all redwood trees. All the way up the river, until about the early 50's they really started logging hard up the river…Before that…The river was cold." – **Elder Raymond Mattz***

Loss of shade provided by towering redwood trees

TEK can inform WS to help create a fuller picture of why impacts are being experienced

Phase 3 – Identify and prioritize solutions

- Maintain/reintroduce prairies → cultural burns
- Manage forests with multiple objectives → Research question – what does this look like?

TEK can foster holistic thinking about adaptation strategies and inform WS on how to create longer-lasting/more sustainable resiliency; can drive WS research questions

Phase 2 ←→Phases 3
Vuln. Assessment ←→ Solutions

- Reintroduce redwoods to riparian areas

→ Very stringent riparian regulations – additional vulnerability

- Tribal ordinance that allows redwoods to take the place of non-redwood species

TEK can inform WS policy, regulations

Phase 4 – Implementation

"*We have a couple of prairies that had hazel on it. We burned that every two years…Set it on fire, it never ever got away from us. When we walked away from it at night it was still burning. It never ever got away, there wasn't much brush, no fuel for it. I imagine now it'd get hot, it's pretty darn brushy now*." – Elder Allen McCovey

Traditional Strategy – New Context → **TEK and western fire management can inform one another**

TEK can drive WS research questions

- How close to a tributary can we burn without impacting water quality?
- How can we burn in a way that does not allow non-native species to spread?

Phase 5 – Monitoring & Evaluation

Local Environmental Observer (LEO) Network – both an adaptation & monitoring strategy

(in collaboration with the Alaska Native Tribal Health Consortium)

YUROK HUB

TEK can provide data to WS of how the climate is changing and how adaptation strategies may be working


Thank you!