



# Climate Change, Salmon and Steelhead, and the Columbia River Tribes



## The Columbia River InterTribal Fish Commission (CRITFC)

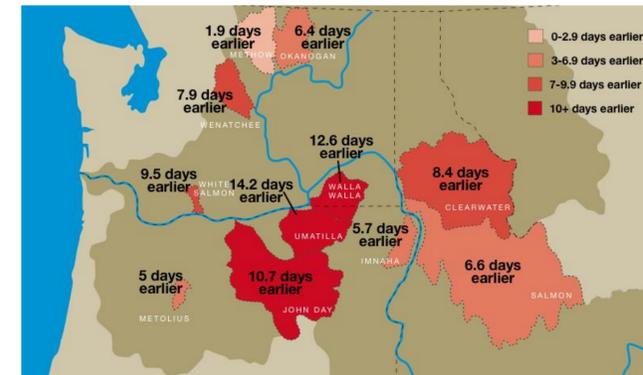
The Columbia River Inter-Tribal Fish Commission and its member tribes are addressing climate change and its effects on tribal fisheries and water resources, as well as other natural and cultural resources. There is an important need for the tribes to prepare for, mitigate and adapt natural resource programs and policies to manage the effects of climate change. CRITFC is supporting these efforts through collaboration, coordination and development of science and technology (i.e. conducting technical research on climate change impacts on tribal lands), and development and coordination of tribal mitigation and adaptation strategies and actions in state, federal and other venues.



For more information contact Laura Gephart at (503) 238-0667 or at [gepl@critfc.org](mailto:gepl@critfc.org)

## CRITFC Research

### Freshet timing: All Treaty Tribal Watersheds

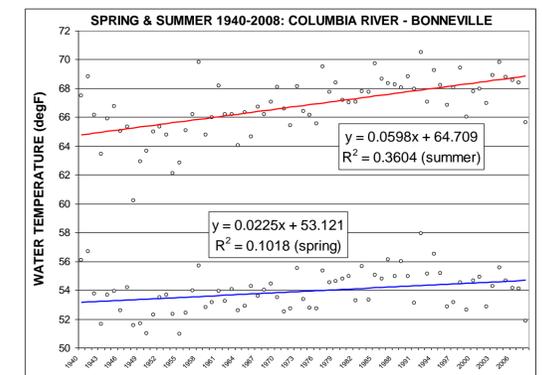


Change in median flow date

Source: Dittmer (2008) in preparation

The timing of the peak of the annual snow-melt (the freshet) in the last 100 years has moved 2 to 14 days earlier. The impact is greater at lower elevation watersheds. This timing change may have a negative impact on fish rearing and migration timing. (Contact: Kyle Dittmer, 503-238-0667, [dtk@critfc.org](mailto:dtk@critfc.org))

### Water Temperature: Columbia River Basin



Data Source: US Army Corps of Engineers

Summer water temperatures in the lower Columbia have increased twice as much as spring values in the last 70 years. In 1940, it was rare for water temperatures to be above 68 degF (harmful to salmon). Now, the summer seasonal water temperatures are above 68 degF half of the time.

## Climate Change: Effects on Salmon and Steelhead



### Tributary Effects on Salmon and Steelhead:

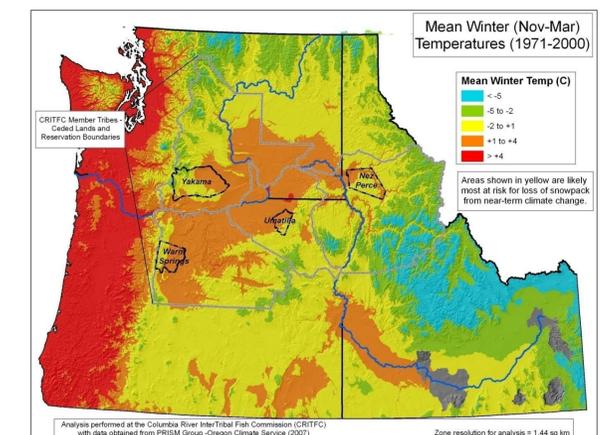
- \* Winter flooding affect eggs/fry
- \* Summer low flows affect migrating/spawning adults
- \* Higher water temperatures stress all life stages
- \* Increased opportunities for predators and invasive species
- \* Effects differ depending on watershed characteristics



### Mitigating Effects on Salmon and Steelhead:

- Climate change makes a stronger argument for habitat improvements:
- \* Upstream riparian restoration
  - \* Reconnections to groundwater / side channel habitat
  - \* Upstream water and land use changes

## A GIS Analysis of Climate Change and Snowpack on Columbia Basin Tribal Lands



Source: Graves (2008) CRITFC Scientific Report

The results of this analysis demonstrate that large portions of the tribal ceded areas are vulnerable to near-term climate change, especially in those subbasins that have a large amount of area at moderate elevations, and those that are further west and experience relatively mild temperature ranges. The results also identify higher elevation areas and areas in more eastern continental climates, which may be buffered from near-term temperature increases and could offer thermal habitat reserves for salmon as temperatures increase. (Contact: David Graves, 503-736-3589, [grad@critfc.org](mailto:grad@critfc.org))

## Current Research

CRITFC is currently finishing a water temperature modeling project for future climate change scenarios on two tributaries of the Yakima River (Satus and Toppenish Creek) in collaboration with the USGS on a large project to assess climate change impacts in the Yakima River Basin. During the next year, we will complete a similar project to model water temperatures in the Upper Grande Ronde Basin under future climate change scenarios.