# How groundwater in the Scott River Valley (and in the Shasta Valley and Tule Lake Area) impact us (and the fish) downstream



# Previous presentations and handouts

- Understanding Tribal Water Rights and Western Water Law (including Oregon's Klamath Adjudication and KBRA/UBCA Water Deals' impact on water rights in the Klamath River Basin

- Water Justice For All: an alternative to the KBRA and UBCA Water Deals

- KBRA excerpt which terminates the federal trust responsibility toward the six federal tribes of the Klamath River Basin.

- Can PacifiCorp's Klamath River Dams comply with the Clean Water Act?

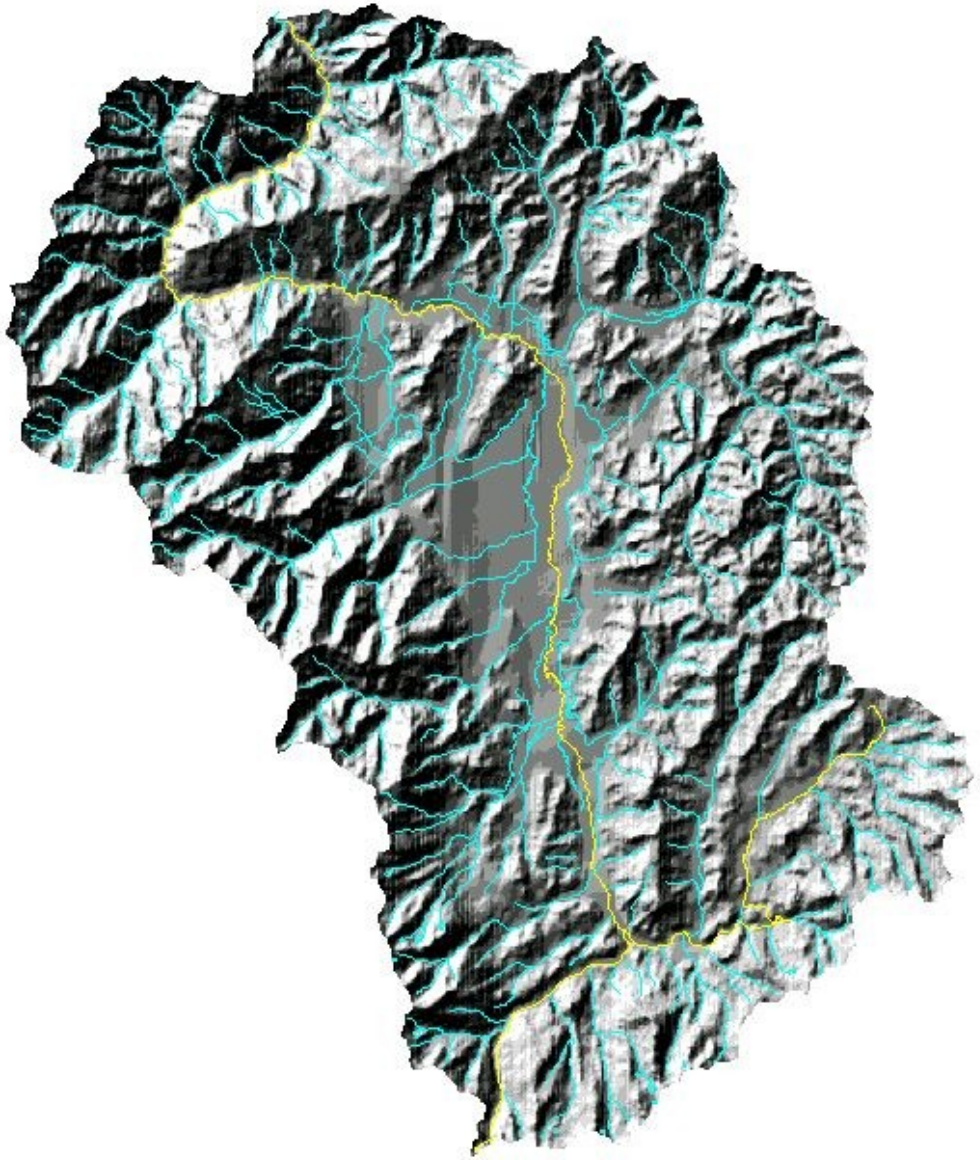
- KlamBlog Sign-Up Sheet


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# What is Groundwater?

- **The classic, western US interpretation:**
  - Percolating Groundwater (not connected to surface flows)
  - Underground Streams (interconnected with surface flows
- **The scientific interpretation:**
  - All ground and surface water is interconnected
  - Ground Water and Surface Water are a Single Resource ( http://pubs.usgs.gov/circ/circ1139/)
- **With respect to groundwater, there is a disconnect between western water law and our scientific understanding**

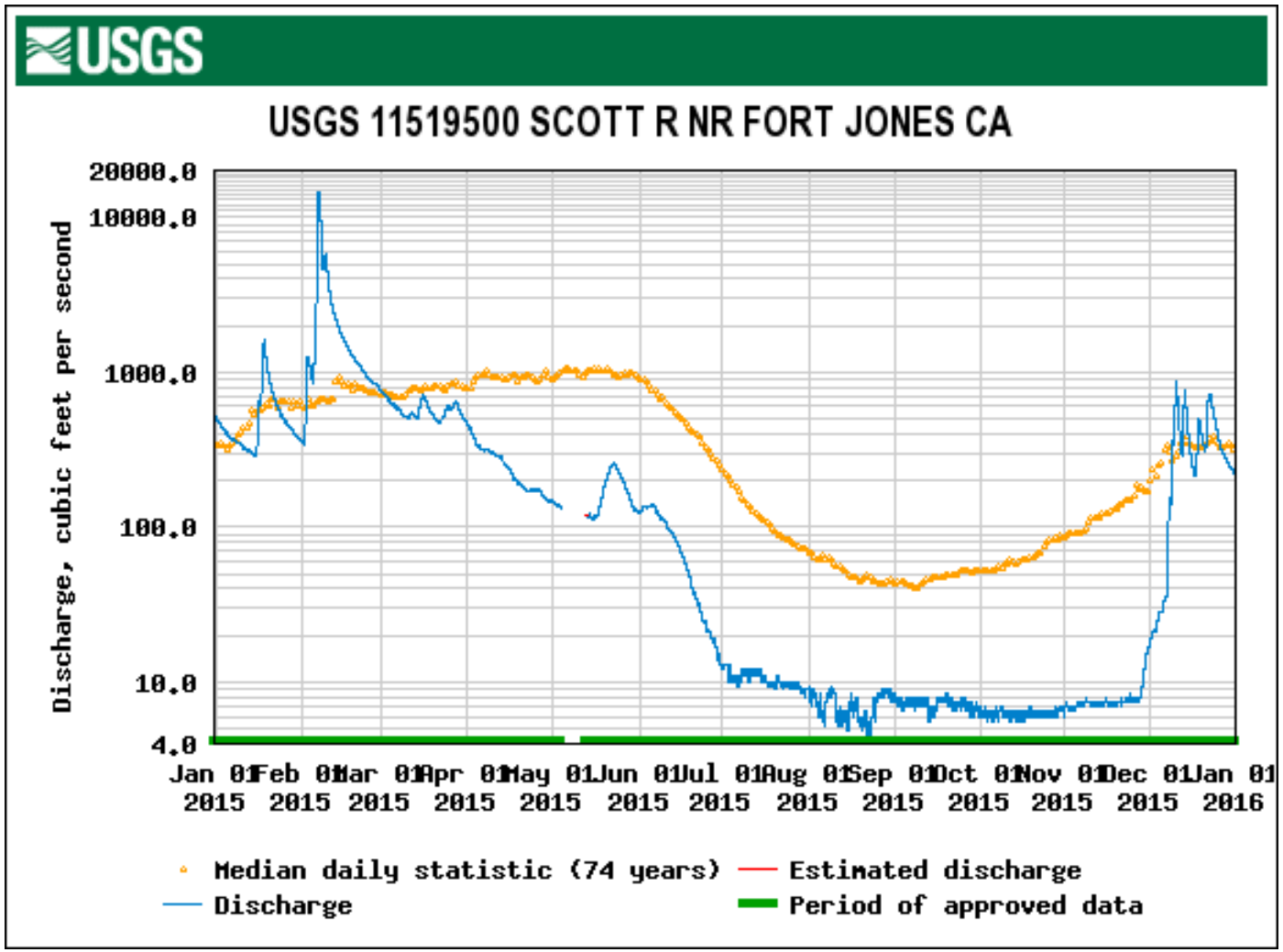
# How groundwater extraction impacts Scott River streamflow



# RELATIVE EFFECTS OF CLIMATE AND WATER USE ON BASE-FLOW TRENDS IN THE LOWER KLAMATH BASIN

Robert W. Van Kirk and Seth W. Naman

https://www.fws.gov/arcata/fisheries/reports/technical/Van%20Kirk%20and%20Namen%20Base%20flow%20Trends%20JAWRA.pdf





# The Sustainable Groundwater Management Act (SGMA)

- High and moderate priority groundwater basins, as identified by Cal DWR, must complete groundwater plans and begin managing groundwater sustainably by 2022 for high priority basins and 2024 for moderate priority basins.
- Sustainable management includes avoiding or ending “undesirable results” which occur after January 1, 2015.
- In the Klamath-Trinity River Basin groundwater plans are required for the Scott, Shasta and Tule Lake Basins (Can you find these basins on a map?)


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# What are “Undesirable Results” for purposes of SGMA?

“Undesirable result” means one or more of the following effects caused by groundwater conditions occurring throughout the basin:

- (1) Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels .

- (2) Significant and unreasonable reduction of groundwater storage.

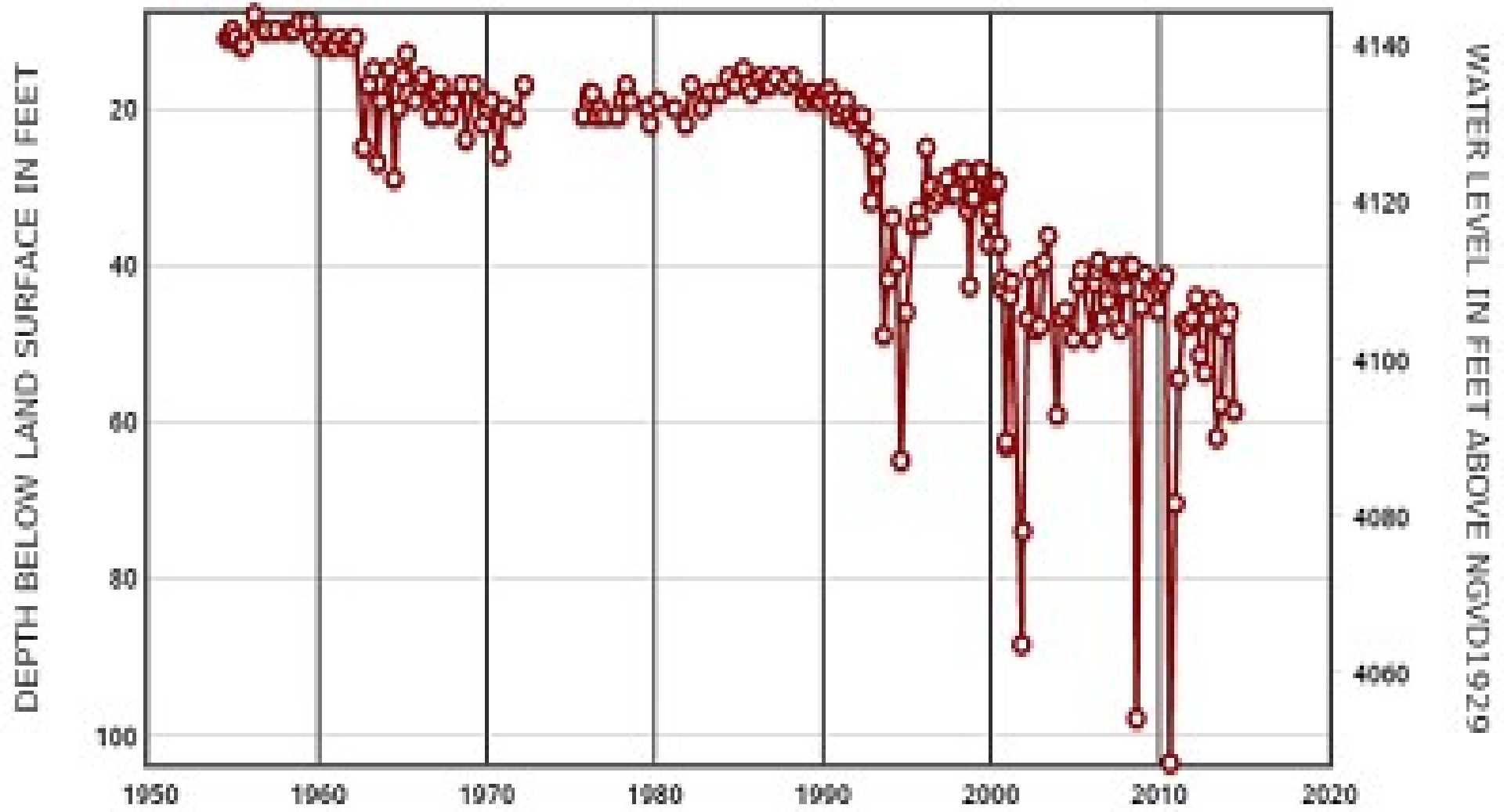
- (3) Significant and unreasonable seawater intrusion.

- (4) Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies.

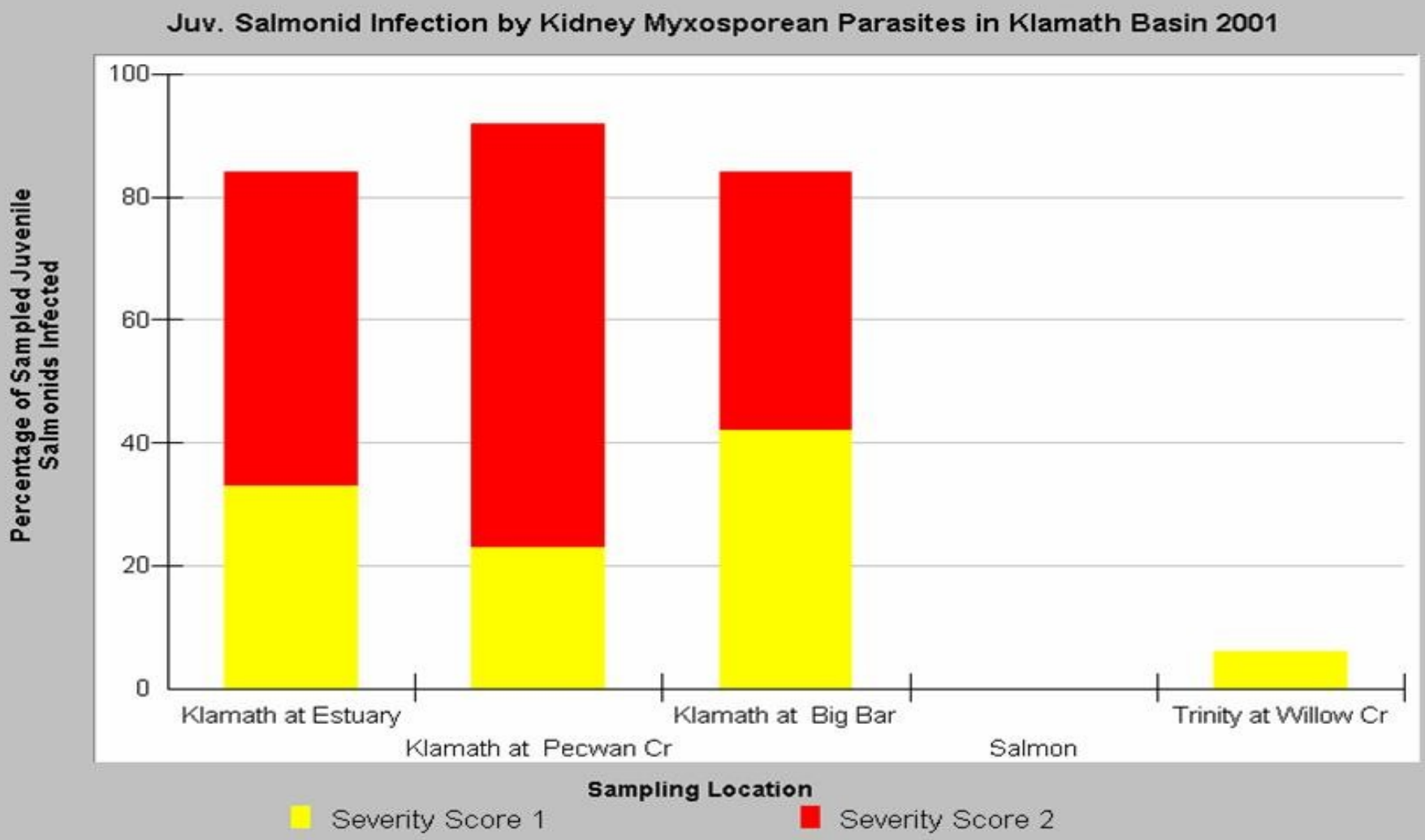
- (5) Significant and unreasonable land subsidence that substantially interferes with surface land uses. Sustainable Groundwater Management Act, and related provisions (as chaptered) Page 18 As Effective January 1, 2016 [rev. 1/15/2016]

- **(6) Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.**

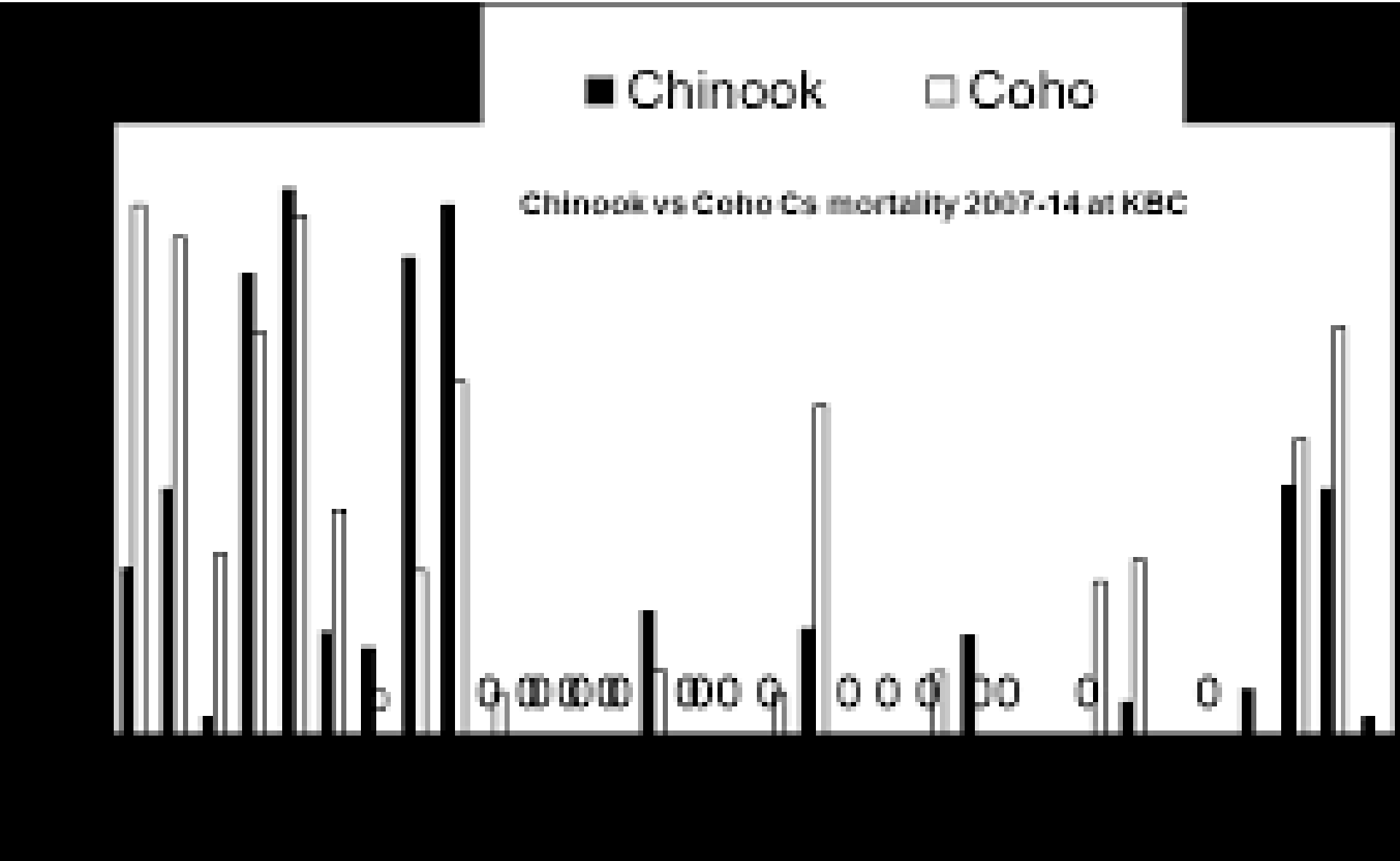
# Groundwater Elevation in the Tule Lake Groundwater Basin (1950 – 2014)



# Why it is important that Klamath River Basin Tribes, fishermen and all who care about Klamath River Salmon participate in groundwater planning for the Scott, Shasta and Tule Lake Groundwater Basins



# Klamath River Juvenile Chinook and Coho Mortality, 2007 – 2014



# Diseased Juvenile Salmon



# Background







- *Ceratomyxa shasta* is a microscopic, spore-forming parasite
- Causes intestinal necrosis and mortality of Klamath River juvenile salmonids
- 60% of out migrating juvenile salmonids infected
- Severe economical and ecological impacts

# What changes do scientists tell us are most critical to restore the health of Klamath River Salmon and the Indigenous Natives who depend on them?

- High springtime flows to flush disease organisms from river gravels. The KBRA and UBCA Water Deals do not provide those flows soon enough and maybe not at all.

- Significantly Improved water temperature in the River year around. Removing four PacifiCorp dams should reduce Klamath River water temperatures in summer and fall to some extent but riparian restoration is also needed, particularly on streams running through agricultural lands in the Upper Basin and in the Shasta and Scott Sub-basins.

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