

A short and narrow view of the past, present and future of Shasta water and salmon

Jim Anderson

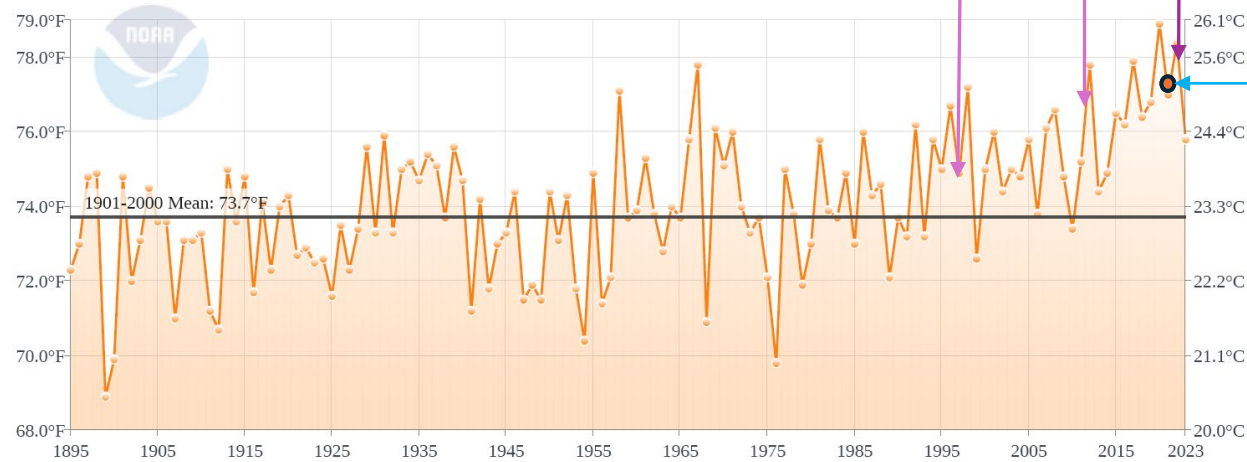
Columbia Basin Research

University of Washington

As Central Valley water and climate change the challenges to the science panels change

California Average Temperature

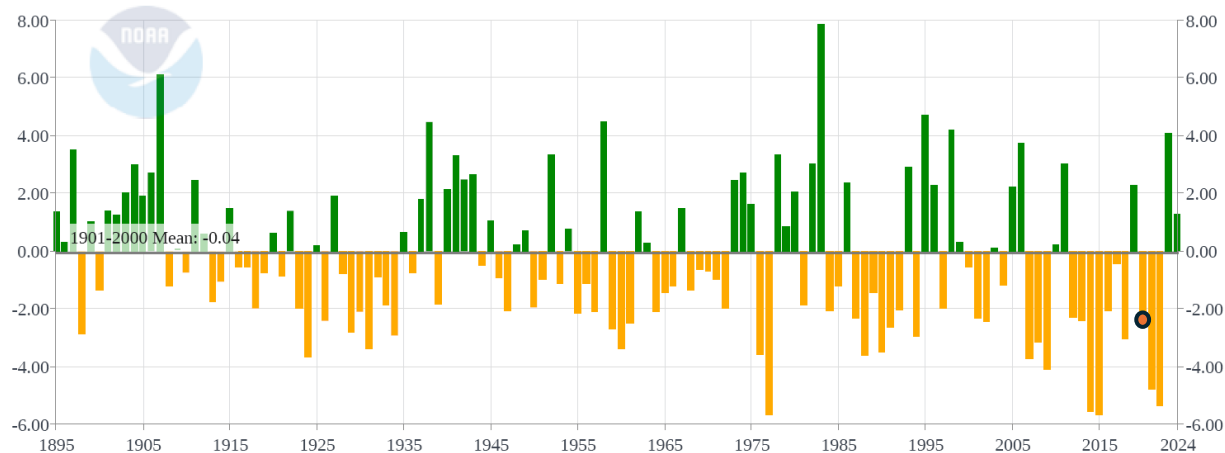
August



SACPAS analysis of
Shasta pool
operations

California Palmer Drought Severity Index (PDSI)

March



2021 Shasta pool operations in a warm low-water year

Winter Chinook egg survival depends on critical window assumptions

1. Mortality occurs over all incubation
2. Mortality occurs at hatching

Operation starts at first redd @ 54°F

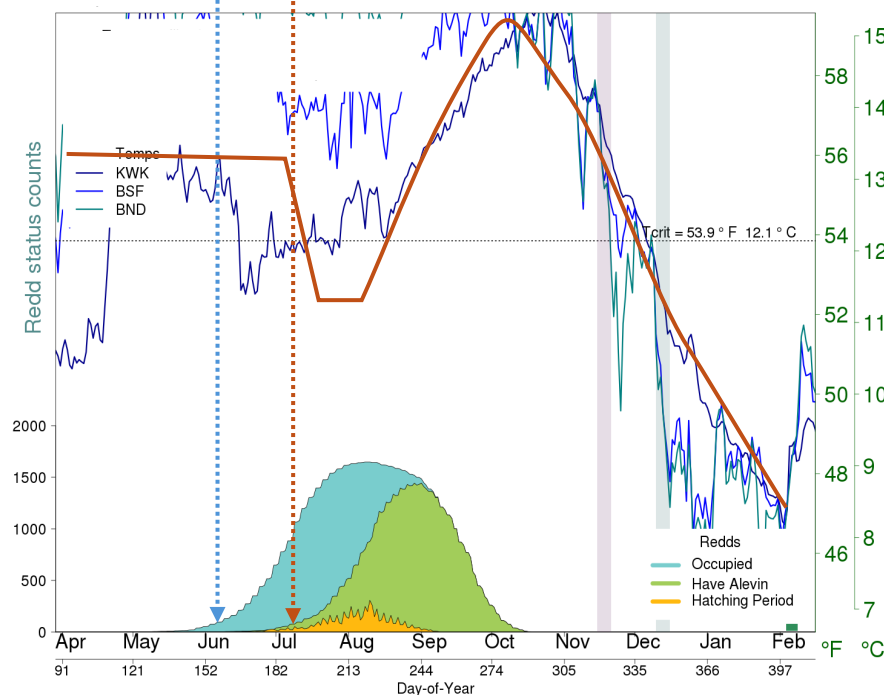
Thermal survival 25% (4%)

For both critical windows

Alternative operation starts at hatch @ 53°F

Hatch critical window **58.3% (11%)**

Incubation critical window 15.3% (2.3%)



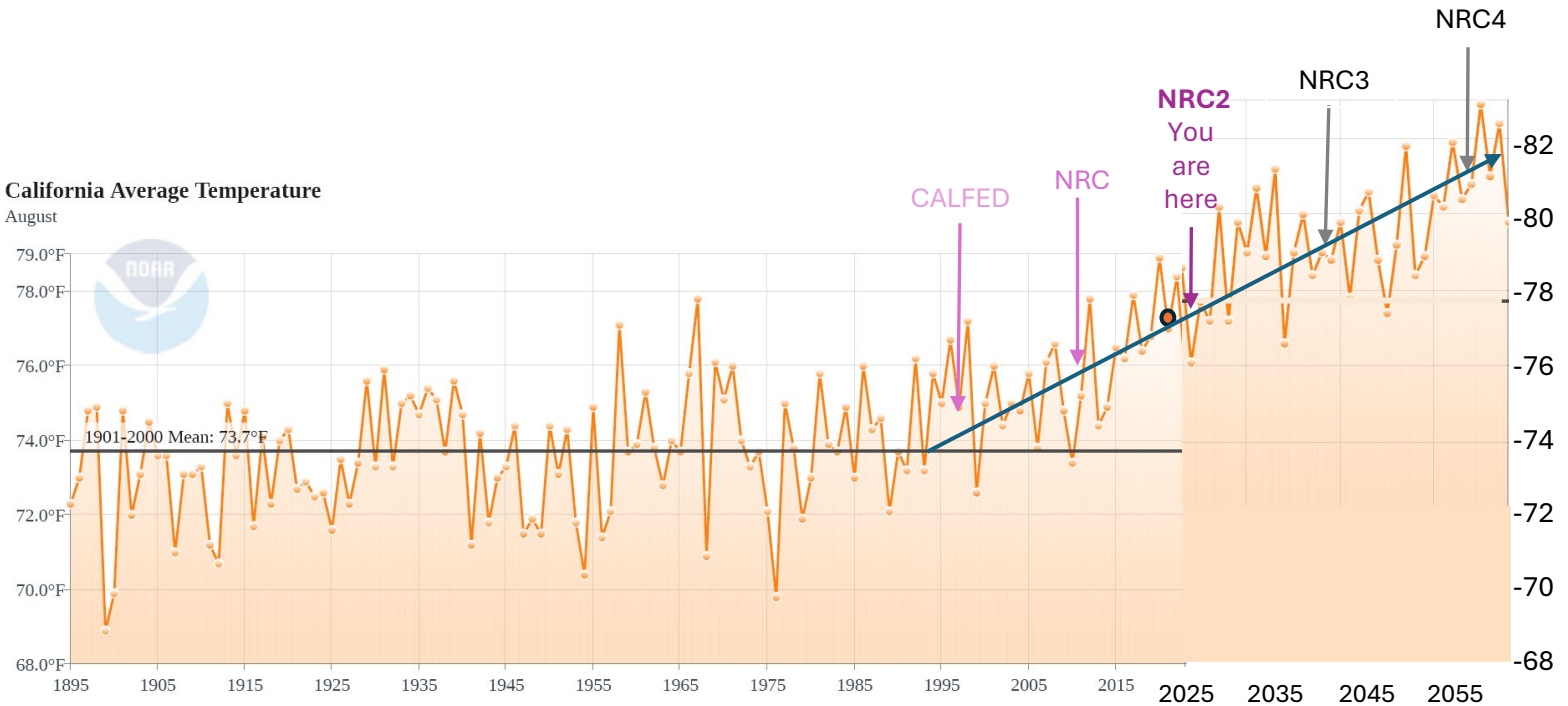
Critical window assumption may be important for optimizing Shasta operations in warm dry years

What about the future?

Imagine future NRC reviews of the central valley

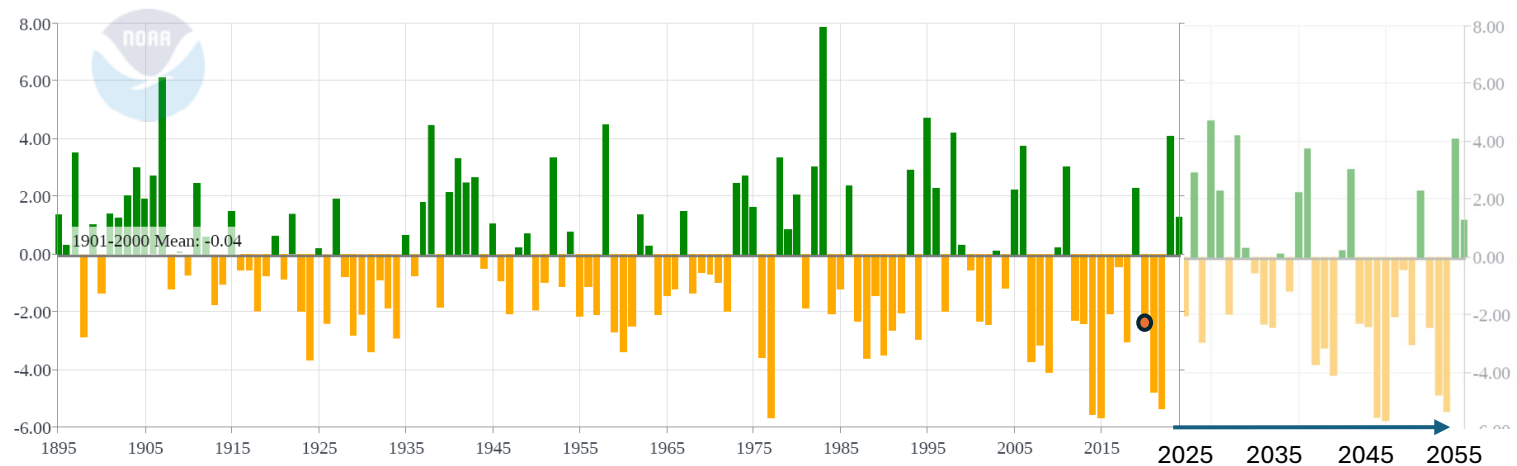
California Average Temperature

August



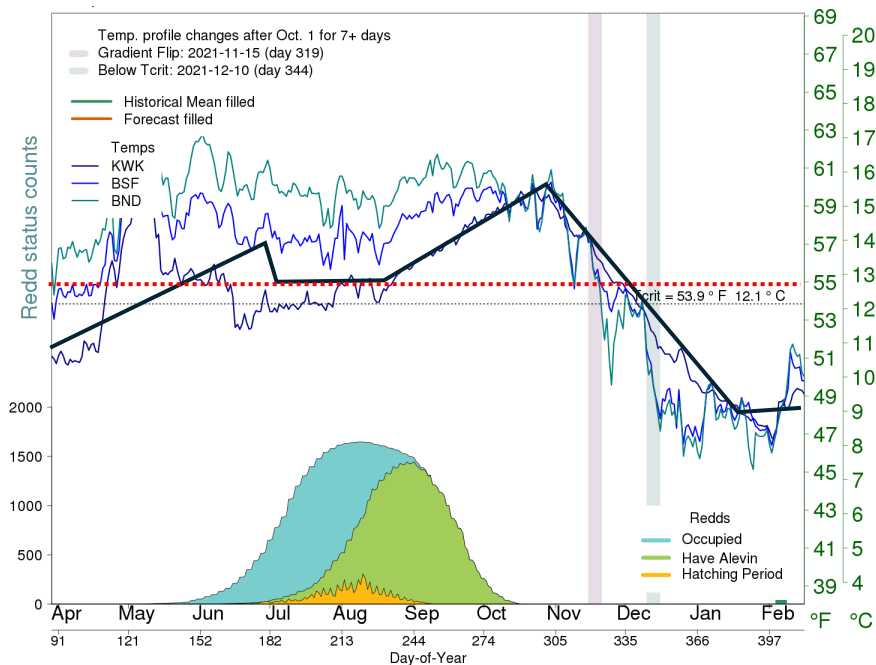
California Palmer Drought Severity Index (PDSI)

March



Modeled future Shasta operations under hot and dry conditions

NRC 2037



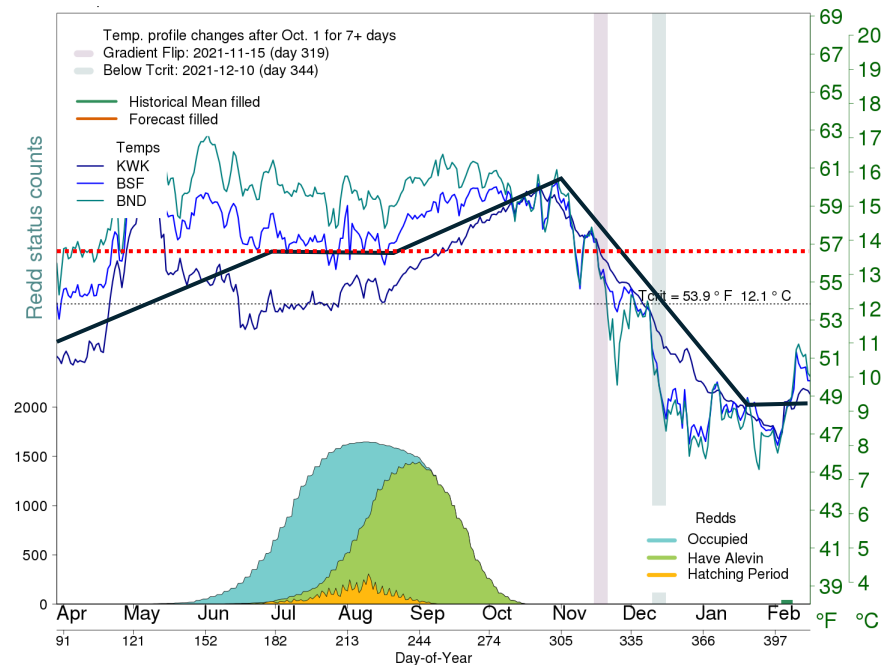
Incubation Survival

Target redd temp 55°F

Thermal survival 6 %

Total survival 1%

NRC 2055



Incubation Survival

Target redd temp 57°F

Thermal survival 2 %

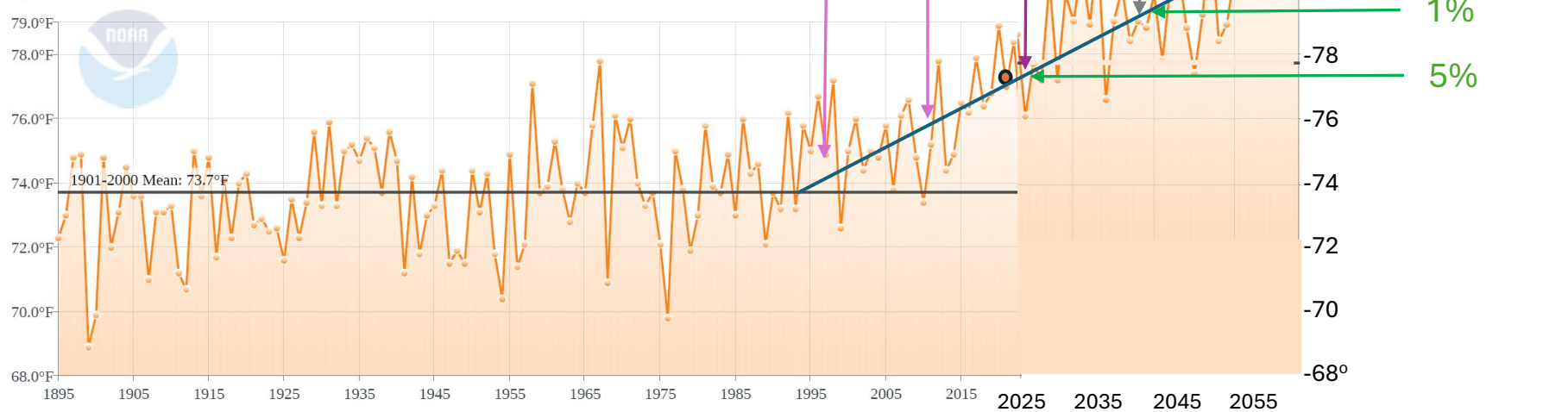
Total survival 0.5%

The critical window assumption
may be important for optimizing Shasta
operations in a *future new normal*

But not in hot dry years because
there will be too little cold water to
protect winter chinook and other runs

A trajectory of water in the Central Valley is becoming clearer but how society and the ecosystem respond seems opaque.

California Average Temperature
August



California Palmer Drought Severity Index (PDSI)
March

