

---

**From:** Cathy Marcinkevage - NOAA Federal <cathy.marcinkevage@noaa.gov>  
**Sent:** Monday, May 13, 2019 11:25 AM  
**To:** Eric Danner - NOAA Federal  
**Cc:** Evan Sawyer - NOAA Affiliate; Miles Daniels - NOAA Affiliate  
**Subject:** Re: Summary of Tier 2 temp-mortality

Eric and Miles --

These are great. I honestly didn't have time to chew on them until now, but I think this is really telling. I've shared with some others and will write up some text for this in the next few days.

Eric, now that you are back, I do want to followup on a few items. We are in a push this week to get sections done to go to peer review late Sunday evening. Can we talk, maybe Wed, about the following?

1) Document with assumptions from the PA that are most concerning, 2) thoughts on performance metrics on 2017 Shasta RPA amendment (this is gaining traction after the last week), 4) write-up on LCM, especially on why using Newman and not ePTM.

I think that was it for now Noble did provide some good additional LCM-related analyses and we've written that up. I'll try to get that section to you and Noble to review mid-week.

Welcome back!  
Cathy

On Tue, Apr 30, 2019 at 2:32 PM Eric Danner - NOAA Federal <[eric.danner@noaa.gov](mailto:eric.danner@noaa.gov)> wrote:  
Hi Cathy,

Please see the following analyses from Miles Daniels.

Eric

----- Forwarded message -----

**From:** Miles Daniels - NOAA Affiliate <[miles.daniels@noaa.gov](mailto:miles.daniels@noaa.gov)>  
**Date:** Tue, Apr 30, 2019 at 1:56 PM  
**Subject:** Summary of Tier 2 temp-mortality  
**To:** Eric Danner - NOAA Federal <[eric.danner@noaa.gov](mailto:eric.danner@noaa.gov)>

Hi Eric,

Attached is the summary plot simulating how a stringent adherence to Tier 2 temperature targets on the Sacramento River could affect temperature-dependent winter-run egg mortality. The plot shows the simulated river temperature generated for the Tier 2 simulation (more text below describing methods) and corresponding egg mortality for the emergence (Martin) model and hatch (Anderson) model. Each sub-plot also has marginal histograms showing the distribution of when redds are assumed to be constructed in time and space on the river.

To generate a river temperature landscape from the Tier 2 figure USBR provided, which only specifies temperature targets at the Clear Creek gauge (CCR), historical observations from 1990-2017 were used. Specifically, historical observations were used to estimate the rate of river temperature change above and below CCR. Put another way, if we assume CCR temperature to be 53.5F, what is the river temperature below and above CCR. To generate these temperatures we selected dates when CCR was at 53.5 or 56F (the two temperature targets) and made cumulative distribution functions (CDFs) of how much the river temperature changes from gauges up or downstream from CCR and chose the 75th percentile estimate of the CDF.

The attached plot title "CDF\_CCR", shows an example of this approach for the change in river temperature from Keswick (KWK) to CCR for the month of July. The plot shows that for the 75th percentile, when CCR temperature is 56F (i.e. 13.3C), Keswick temperature is 0.94C cooler. This approach was done for months from May-October using gauge data from KWK, BSF, JLF, BND, and RDB.

Please let me know if you want any further clarification on any of this,  
Miles

--

Miles Daniels, Ph.D.  
Assistant Project Scientist  
University of California, Santa Cruz  
Phone: 831-420-3946

--

Eric Danner, Ph.D.  
Supervisory Research Ecologist  
Fisheries Ecology Division, Southwest Fisheries Science Center  
110 McAllister Way  
Santa Cruz, CA 95060  
831-420-3917  
<http://swfsc.noaa.gov/>