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**From:** Stephen Maurano - NOAA Federal <stephen.maurano@noaa.gov>  
**Sent:** Tuesday, May 7, 2019 4:26 PM  
**To:** Brittany Cunningham - NOAA Affiliate  
**Cc:** Brian Ellrott - NOAA Federal; Garwin Yip - NOAA Federal; Cathy Marcinkevage - NOAA Federal  
**Subject:** Re: ROCON American River Effects

Hi Brittany,

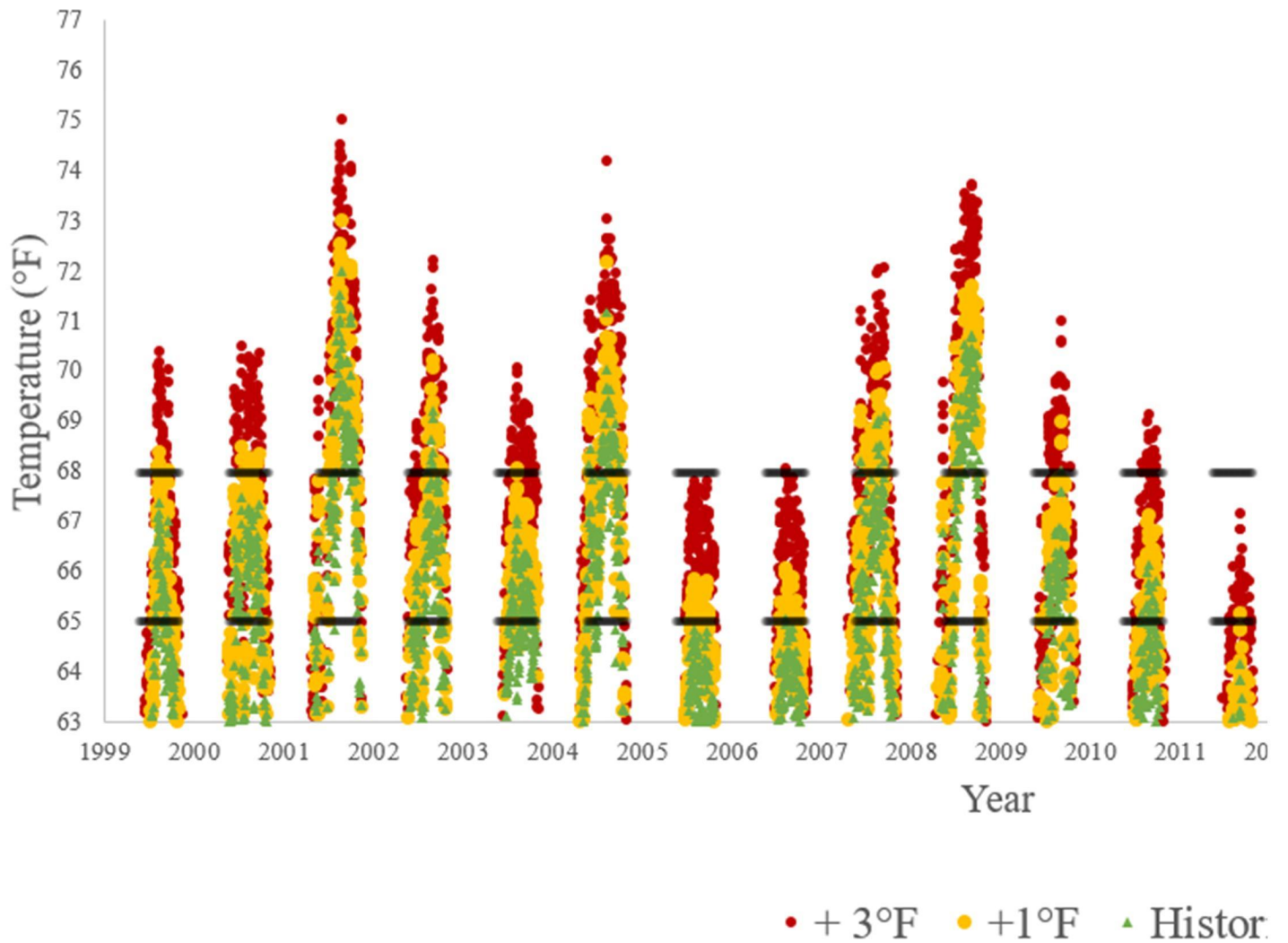
I hope these are still useful, I was a meeting Monday so I didn't make additional progress. Per Brian's directions from Friday afternoon, these tables/figures:

- Consider historic temperatures ( +0°F ), plus two climate change scenarios (+1°F and +3°F) and compare against two temperature metrics (65°F and 68°F). Note that two of those scenarios are functionally the same since 65+3=68°F.
- Count exceedances with duration of 1 day and magnitude of  $\geq 0.1^\circ\text{F}$ .
- Limit the analysis to July - Sept (rather than May 15 - Oct 31) (except the very first figure below, which just plots all the data to show trends)

Just let me know if you'd like anything changed, Thanks!

# Lower American River Temperature Suitability Decreases With Anticipated Climate

Comparing Historic Daily Average Temperatures (Green) with Projections of +1°F (Yellow) +3°F (Red) overlaid with 65°F / 68°F temperature suitability thresholds from May 15 - Oct 31 for Juvenile Steelhead Over-Summer



# % Days with Lower American River Temperature Amenable to Steelhead Rearing

(65°F or 68°F) in Key July through September Period Under Historic (+0°F) or Climate Change (+1°F / 3°F) Scenarios

Year	68°F Metric			65°F Metric		
	+0°F	+1°F	+3°F	+0°F	+1°F	+3°F
1999	100%	97%	59%	59%	32%	9%
2000	100%	91%	32%	32%	21%	2%
2001	38%	20%	8%	8%	7%	5%
2002	93%	71%	32%	32%	17%	7%
2003	100%	100%	43%	43%	14%	0%
2004	50%	30%	5%	5%	1%	1%
2005	100%	100%	100%	100%	74%	0%
2006	100%	100%	100%	100%	67%	9%
2007	92%	65%	22%	22%	13%	0%
2008	18%	5%	0%	0%	0%	0%
2009	100%	97%	39%	39%	30%	13%
2010	100%	100%	85%	85%	55%	13%
2011	100%	100%	100%	100%	99%	61%
2012	100%	100%	71%	71%	36%	9%
2013	77%	49%	16%	16%	13%	0%
2014	33%	5%	0%	0%	0%	0%
2015	2%	0%	0%	0%	0%	0%
2016	88%	62%	15%	15%	12%	7%
2017	100%	100%	100%	100%	59%	5%
2018	100%	99%	32%	32%	7%	0%
<b>Average</b>	80%	70%	43%	43%	28%	7%

On Sat, May 4, 2019 at 6:09 AM Brian Ellrott - NOAA Federal <[brian.ellrott@noaa.gov](mailto:brian.ellrott@noaa.gov)> wrote:  
 Thanks Brittany for working on the American effects section. Please coordinate with Stephen on updating the water temperature analysis. He's putting together a couple of tables for over summer rearing that we'll want to incorporate, and likely will be able to help with other temp data updates.

Stephen, for the tables, instead of looking at the entire May through October compliance period, please modify the analysis so the table just focus on July through September. I think that will be a better indicator of potential effects to steelhead, and I'm more interested in showing potential effects than compliance. Feel free to call me if you want to talk that over.

Thanks,  
Brian

On Fri, May 3, 2019 at 8:59 PM Garwin Yip - NOAA Federal <[garwin.yip@noaa.gov](mailto:garwin.yip@noaa.gov)> wrote:  
It's been too long since I reviewed. I'd have to take a look. If we have the data we should be able to make our own.

Sent from my iPhone

On May 3, 2019, at 8:43 PM, Brittany Cunningham - NOAA Affiliate <[brittany.cunningham@noaa.gov](mailto:brittany.cunningham@noaa.gov)> wrote:

I'm still working on addressing comments the American River effects section. The biggest gap in it and the majority of comments left to address have to do with the figures needing to be updated. Did we ever get or make updated figures for the American Effects Section?

Brittany

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