
From: Hilts, Derek <derek_hilts@fws.gov>
Sent: Monday, March 25, 2019 10:44 AM
To: Maria.rea@noaa.gov; cathy.marcinkevage@noaa.gov; garwin.yip@noaa.gov;
evan.sawyer@noaa.gov; howard.brown@noaa.gov
Cc: Jana Affonso; Kaylee Allen
Subject: Re: [EXTERNAL] Question on Shasta Temperature Tier for ROC

Hi Maria,

One of my tasks coming out of last week's meeting was to investigate the cause of the greater May 1st Shasta storage when the PA had higher storage than the COS. I arbitrarily looked at years when the storage was 200 TAF or more higher in the PA. There were 16 such years. Of those, 11 were due to the absence of Fall X2 in the preceding Fall and 3 were due to persistence from a prior year with Fall X2. Please note, the PA storage varied in those years, I was only looking at the relative storage differences. The picture would become much cloudier and year/month specific if I were to look at years using a smaller difference as my criterion.

Derek

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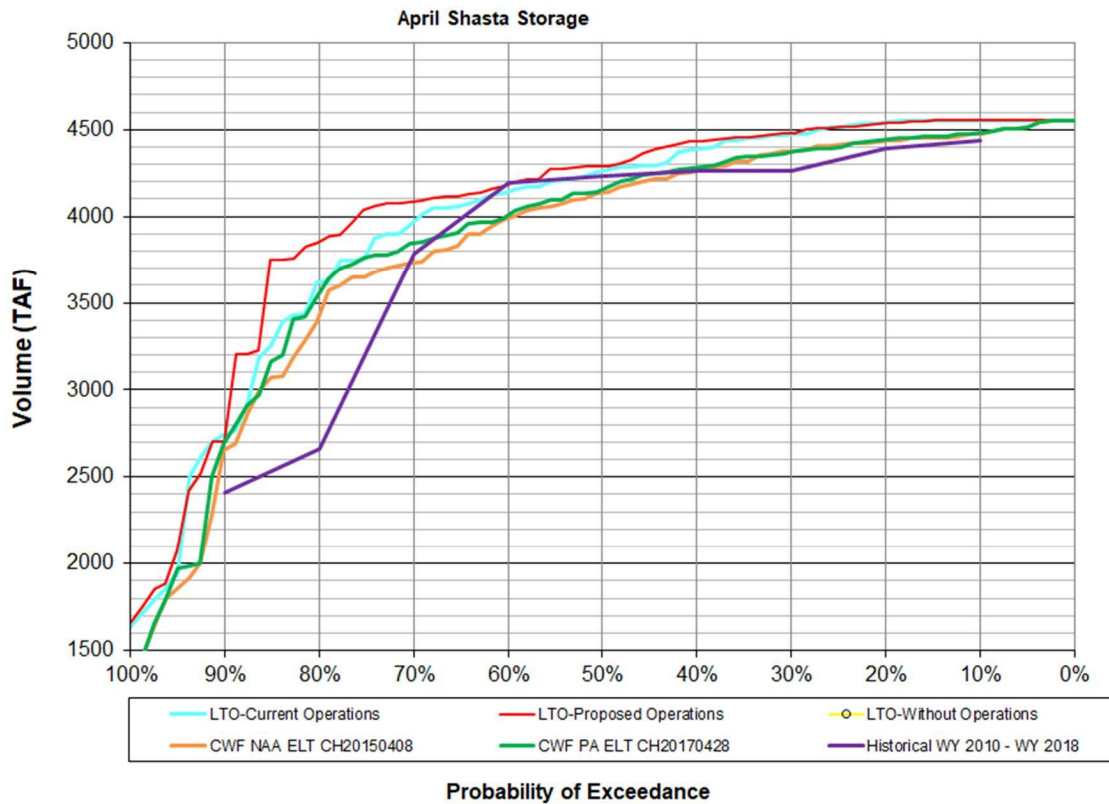
On Fri, Mar 22, 2019 at 5:21 PM Hilts, Derek <derek_hilts@fws.gov> wrote:

See Katrina's email below - so much for the modeling using Tiers at all. :(

Regarding one of my tasks arising from our meeting today, I think we and Katrina may have confused the frequency of hitting 4.0 for the pulse and the frequency of hitting 4.1 for Tier 1 operations. The slope of the frequency curve is very mild in this range. Katrina's 75% of years is what the PA modeling shows for 4.0. The PA modeling shows ~ 69% of years Shasta is at or above 4.1 MAF at the end of April (red line in the chart below). I plotted the LTO-COS frequency, LTO-PA frequency, CWF NAA frequency, CWF last PA frequency and HISTORICAL frequency. You will notice the CWF runs hit the marks less frequency even though all the simulations are using Early Long Term climate conditions. I believe that is in part due to the CWF runs not having SWRCB TUCP-related offramps in dry years whereas the LTO runs DO have them (new feature of CalSimII).

The Historical frequency varies depending on how far back you want to go. Below is a summary of that.

Period used	% of time > 4.0	% of time > 4.1	
1953-2018	67%	57%	(limit of readily available data)
1980-2018	64%	49%	(since New Melones and D1485)
1996-2018	67%	52%	(since D1641)
2010-2018	65%	62%	(since the NMFS BiOp)



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

From: **Harrison, Katrina** <kharrison@usbr.gov>

Date: Fri, Mar 22, 2019 at 4:27 PM

Subject: Re: [EXTERNAL] Question on Shasta Temperature Tier for ROC

To: Barbara Byrne - NOAA Federal <barbara.byrne@noaa.gov>

Cc: Wright, Michael <mwright@usbr.gov>, Miles Daniels - NOAA Affiliate <miles.daniels@noaa.gov>, Derek Hilts <derek_hilts@fws.gov>

Hi Barb -

Just to clarify, when we did the TCD shutter operation in the 5Q model, we just tried to get it as good as possible targeting colder temps in July / August, with the available cold water resource. We did not split it into tiers first.

Katrina

On Wed, Mar 20, 2019 at 12:48 PM Barbara Byrne - NOAA Federal <barbara.byrne@noaa.gov> wrote:

Katrina or Mike -- **Can you confirm that Derek's interpretation is correct (including his breakpoints of 4.1, 3.5, and 2.5 MAF of total Shasta storage)?** It sounds right to me, and seems confirmed by the info in Tables 5.6-10, 5.6-11, and 5.6-12 on pages 5-19 to 5-20 of the BA. In those figures, the blue lines separating

tiers look to be at about 4.1, 3.5, and 2.5 MAF (y-axis represents total Shasta Storage) and the dots (look kind of gold on the figures, show as gray or gold in the legend to the right of each figure) show the May 1st storage and are used to indicate which tier is in effect for each year.

Thanks,
Barb

On Wed, Mar 20, 2019 at 12:33 PM Hilts, Derek <derek_hilts@fws.gov> wrote:

Hi Miles,

Though CalSimII itself doesn't operate based on the Tiers, the HEC-5Q temperature model may. I missed most of the meeting in which Rob Leaf (Jacobs) and Mike Wright (USBR) discussed the HEC-5Q temperature studies. IF the temp model did somehow implement the Tiered approach, presumably it was based on CalSimII's End-of-April (May 1st) storage.

The way I read Appendix A (pages 4-28 and 4-29), I think the HEC-5Q modelers would have simulated Tier 1 ops when CalSimII-simulated May 1st Shasta storage was at or above 4.1 MAF (corresponding to a cold water pool of 2.8 MAF). Similarly, Tier 2 ops presumably would have been simulated when CalSimII-simulated May 1st Shasta storage was at or above 3.5 MAF (corresponding to a cold water pool of 2.3 MAF). Similarly, Tier 3 ops presumably would have been simulated until CalSimII-simulated May 1st Shasta storage was at or below 2.5 MAF (corresponding to a cold water pool of 1.5 MAF) at which point Tier 4 ops would have been simulated.

I would check with Barb Byrne to confirm this - she was at the meeting with Rob and Mike. If the above is correct, then the May 1st CalSimII-simulated storages tell you which Tiers were applied in which years. The storages are attached.

Derek

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On Wed, Mar 20, 2019 at 11:36 AM Miles Daniels - NOAA Affiliate <miles.daniels@noaa.gov> wrote:

Hi Derek,

I work with Eric Danner at the SWFSC and am doing some analysis on the ROC LTO. I was wondering if you have or are aware of a table that indicates the Shasta temperature tiers by year for each scenario? I see how the tiers are classified in appendix A, page A-46, but not what each year were classified as in the modeling.

Thanks for the help you can provide,
Miles

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Barb Byrne

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