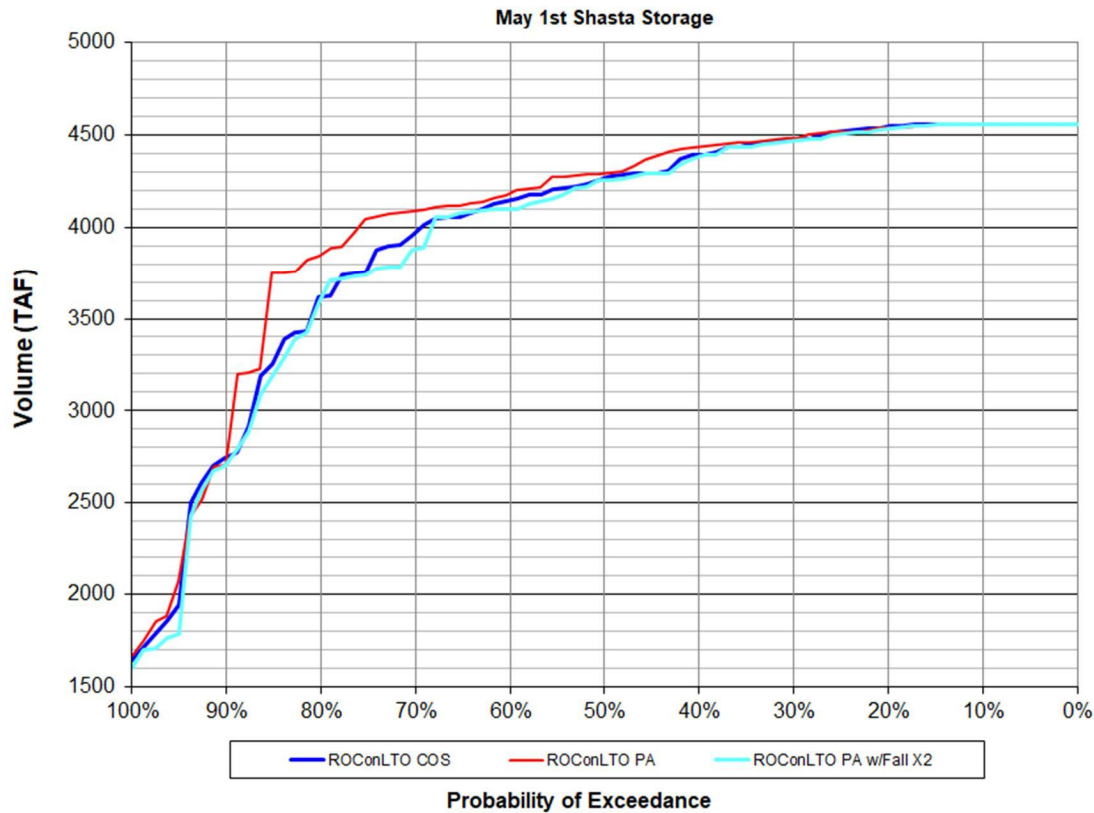


From: Hilts, Derek <derek_hilts@fws.gov>
Sent: Tuesday, May 28, 2019 8:57 AM
To: Cathy Marcinkevage - NOAA Federal
Subject: Re: [EXTERNAL] Fwd: "More Water" in Shasta in PA

Hi Cathy,
If one assumes Fall X2 is eliminated completely, I can see where that person would expect to have higher storage in the following year, if it's not too wet.



*Derek Hilts M.S., P.E.
US Fish and Wildlife Service
650 Capitol Mall Room 8-300
Sacramento, CA 95814
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esk: 916.930.5633*

On Sat, May 25, 2019 at 12:01 AM Cathy Marcinkevage - NOAA Federal <cathy.marcinkevage@noaa.gov> wrote:

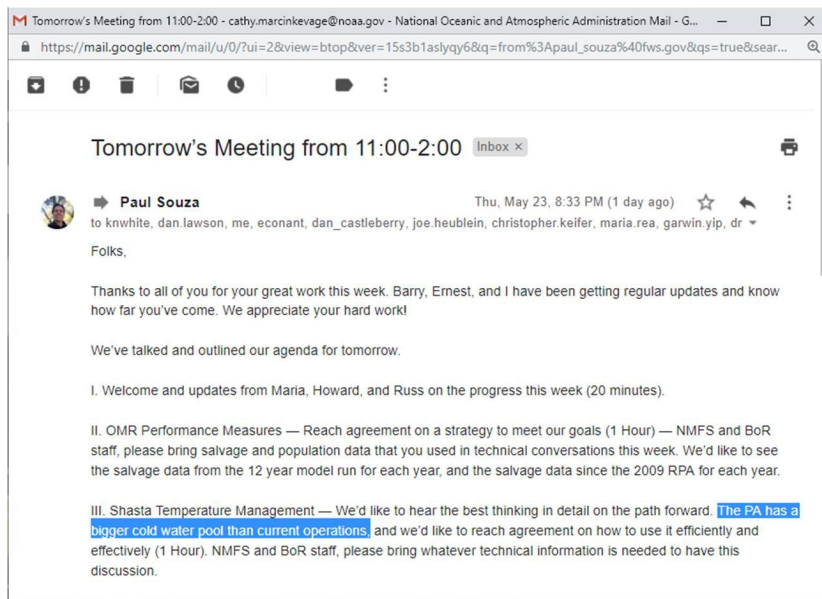
Derek --

Thanks for your previous email showing results of running the ROC LTO with Fall X2 incorporated. That is telling.

We agreed to insert language into the BiOp about the ways that Reclamation intends to build storage (e.g., lower Dec-Apr releases, etc.). I'll admit that I'm going to struggle with that, especially given your email, all of the red cells in Jeff R's table the other day for Jan-Apr post-2009, and the info in my forward below. I keep hearing Paul say "I can't see how this isn't better, the PA provides more cold water" (see screenshot highlight below) and I'm not seeing it anywhere. The tables below sure don't show it. And I don't see it identified anywhere in the BA, either.

Anyhow, I'm just sharing because...you care? Or will maybe also find it interesting? In that challenging sort of way?

Happy weekend -
Cathy



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

From: **Cathy Marcinkevage - NOAA Federal** <cathy.marcinkevage@noaa.gov>

Date: Fri, May 24, 2019 at 10:54 AM

Subject: "More Water" in Shasta in PA

To: Howard Brown <howard.brown@noaa.gov>, Garwin Yip <garwin.yip@noaa.gov>, Barbara Byrne <barbara.byrne@noaa.gov>, Maria Rea <Maria.Rea@noaa.gov>

All --

I'm sensitive to Paul's line that "the PA has more storage" or "the PA has more water to work with". The following tables are from (or calculated from) data in Appendix D of the BA. It is for Shasta storage. Top table shows storages for different months for COS. Bottom table shows the *percent change* in that exceedance storage level given PA ops. You will see that for May, the percent change is actually negative except for very low storage levels. A few percent change compared to 3500+ TAF seems within error of the planning model.

Thanks -
Cathy

**Probability of
Exceedance**

COS	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
10%	3,218	3,252	3,335	3,621	3,875	4,229	4,552	4,552	4,500	4,011
20%	3,036	2,926	3,309	3,539	3,744	4,127	4,544	4,552	4,402	3,789
30%	2,903	2,807	3,266	3,397	3,649	4,046	4,475	4,552	4,288	3,622
40%	2,771	2,709	3,027	3,318	3,529	3,980	4,389	4,486	4,101	3,466
50%	2,677	2,579	2,793	3,247	3,477	3,875	4,265	4,347	3,909	3,380
60%	2,547	2,500	2,656	3,032	3,358	3,724	4,144	4,225	3,800	3,149
70%	2,294	2,305	2,426	2,836	3,252	3,513	3,971	3,960	3,450	2,883
80%	2,033	2,102	2,233	2,544	2,948	3,348	3,619	3,344	2,986	2,509
90%	1,553	1,409	1,720	2,061	2,314	2,593	2,749	2,579	2,276	1,947

% Difference (100*(PA-COS))	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
10%	1	0	1	1	2	1	0	0	0	0
20%	7	11	1	2	2	1	0	0	0	0
30%	11	16	1	4	2	1	0	0	-1	0
40%	8	15	8	3	4	1	1	0	-1	-1
50%	3	12	16	3	3	2	1	0	-1	-3
60%	4	9	17	7	4	4	1	-2	-4	0
70%	10	14	15	5	1	4	3	-1	1	1
80%	11	8	8	7	6	2	6	9	6	9
90%	-1	2	5	3	13	4	0	14	12	10