From: Hilts, Derek <derek_hilts@fws.gov>
Sent: Tuesday, March 26, 2019 4:24 PM
To: Barbara Byrne - NOAA Federal
Subject: Re: [EXTERNAL] Re: ROC on LTO Stanislaus info by yeartype

Hi Barb,
Responses to your questions -
1. Yes, Column G of the "Conv_Flags" worksheet is what you should use for 60-20-20 yeartypes at the Early Long Term climate. Those yeartypes match what was input into CalSimII for both the COS and PA runs.
HOWEVER, heretofore I was using a timeseries of 60-20-20 ELT yeartypes that classified 1933, 2002 and 2003 as DRY, DRY, DRY rather than CRT, CRT, BN, respectively. The person who generated the yeartype-based values in Table 37-3 must have also used DRY, DRY, DRY despite Column G on "Conv_Flags" because when you use DRY, DRY, DRY for those three water years you get the values AND the yeartype percentages shown in Table 37-3.

2. I don't understand your terminology.

3. I'm sorry that I used a different convention for numbering the wateryear types. I could have easily used the other way. There is no convention unless you want to be consistent with CalSimII code in which case 1=WET...5=CRT. Sorry again for any confusion/loss of time.

4. Yes, I agree, except for row 15. I would say a change "MAY be" rather than "MUST be"

5. I don't see anything inaccurate. And while it is interesting intellectually, I think the bottom line is most important, which you address in Cells S60-S66.

6. I think you've summarized it as clearly as mud can get. The thing that nags at me is that the NMI seems like a more direct, self-correcting parameter than 60-20-20. In any given year, the 60-20-20 could have a monster month that makes the yeartype an imperfect predictor of available water supply whereas the NMI seems like a less imperfect predictor (it's imperfection being limited to inaccuracies only in the spring/early summer months). Hope that makes sense.

Good luck!
Derek

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On Tue, Mar 26, 2019 at 8:57 AM Barbara Byrne - NOAA Federal <barbara.byrne@noaa.gov> wrote:

Derek -- Please see some Stanislaus-related questions below. Our effects analysis is due Thursday, so feedback by COB today (at least on questions 1-3, which I think are quick) would be much appreciated.

Attached are: Excel workbook (see "Yeartypes" tab) and Table 37-3 from Modeling Appendix.

Part 1:
In the chain forwarded below, you code yeartype as Wet=5 to Critical=1. I pulled the 60-20-20 yeartype from the CALSIM "trend reporting" workbook (Column G of the "Conv_Flags" tab) and it seems to code yeartype as Wet=1 to Critical=5 (see, for example, 2001 and 2002. In the real world, those were Dry; in the ELT Q5 scenario they are listed as 5's. My interpretation is that they are Critical in the Calsim climate change scenario.)

1. Is it correct that I should pull the 60-20-20 yeartypes from Column G of the "Conv_Flags" tab of the trend reporting workbook? If not, where can I find that info?
    --Hmmm... I just looked at Table 37-3 in Attachment 3-2 of Appendix D (Flow below Goodwin, COS and PA comparison), and their 60-20-20 yeartypes percentages are listed as: Wet (23%), AN (24%), BN (10%),Dry (16%) and Critical (27%). The numbers I get in my excel sheet ("Yeartypes" tab in the attached, see cells Q29-Q34) are the same in some cases (green highlight) but different in others (yellow highlight): Wet (23%), AN (24%), BN (11%),Dry (12%) and Critical (29%). Pretty close, but I'm concerned about the discrepancy -- **any ideas why that might be?**
2. Is it correct that I should "sync" up your NMI summary with the 60-20-20 by recoding one or the other (I recoded yours)?
3. Is your coding (Wet=5 to Critical=1) the more conventional ordering? If so, why does the darn trend reporting workbook reverse it (or have I misunderstood)?

Part II:
If you have time, I'd appreciate your eyes on the "Yeartypes" tab in the attached (added a tab to what you sent over), particularly:

4. (Rows 6-15) Do you agree with the assumptions/interpretations stated in these rows?
5. (Summary tables and general conclusions in Columns M-S) Do you see anything inaccurate in my summaries or conclusions? Any insights to add?
6. (Cells S60-S66 and Table 37-3 from Attachment 3-2 of Appendix D) Any suggestions on these conclusions in particular? I would welcome your take on the mechanisms behind the different or similar flows in Table 37-3, bottom panel.

Barb

---------- Forwarded message ---------
From: **Hilts, Derek** <derek_hilts@fws.gov>
Date: Fri, Mar 1, 2019 at 4:06 PM
Subject: Re: [EXTERNAL] Re: ROC on LTO Stanislaus info by yeartype
To: Barbara Byrne - NOAA Federal <barbara.byrne@noaa.gov>

Just in case storage isn't enough to mull over, I've added Goodwin flows to the workbook. See attached - AFTER the weekend! :)

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On Fri, Mar 1, 2019 at 1:31 PM Barbara Byrne - NOAA Federal <barbara.byrne@noaa.gov> wrote:
Responses embedded below, in blue.

On Fri, Mar 1, 2019 at 12:48 PM Hilts, Derek <derek_hilts@fws.gov> wrote:
Hi Barb,
As you may know, the results in Appendix D Attch 3-1 Tables 7.1, 7.2 & 7.3, although arrayed as Jan - Dec, actually are displaying Oct, Nov, & Dec values based on the previous water year type (which I think is good). For example, the value for NM storage in Oct 1976 is used in the calculation of Wet Yeartype average because WY75 was a wet year. (WY76 winds up being a critically dry year). I thought this was the case, but wasn't sure -- meant to ask you so thanks for flagging this!

I will use this same approach to tabulate NM storages on a NMI-based yeartype basis. The problem of course with tabulating water year type-based averages using NMI bins is that each run may have its own set of W, AN, BN, DRY, CRT years. Below is a table of the three runs' NMI yeartypes (WET=5, ..., CRT=1)

	COS NMI YRT	PA w/o Ops NMI YRT	NMI YRT
1922	4	4	1
1923	4	4	1
1924	2	2	1
1925	3	3	1
1926	2	2	1
1927	2	3	1
1928	2	3	1
1929	1	2	1
1930	1	2	1
1931	1	1	1
1932	1	2	1
1933	1	1	1
1934	1	1	1
1935	1	1	1
1936	2	2	1
1937	2	2	1
1938	5	4	2
1939	3	2	1
1940	3	3	1
1941	4	4	1
1942	5	4	1
1943	5	5	1
1944	3	3	1
1945	3	3	1
1946	3	4	1
1947	2	3	1
1948	2	3	1

1949 2 2 1
1950 2 2 1
1951 3 4 1
1952 5 5 2
1953 4 4 1
1954 3 3 1
1955 2 2 1
1956 4 4 1
1957 3 3 1
1958 4 4 1
1959 3 3 1
1960 2 2 1
1961 1 2 1
1962 1 2 1
1963 2 2 1
1964 1 2 1
1965 3 3 1
1966 2 2 1
1967 4 4 2
1968 3 3 1
1969 5 5 2
1970 4 4 1
1971 3 4 1
1972 3 3 1
1973 3 4 1
1974 3 4 1
1975 3 4 1
1976 2 3 1
1977 1 2 1
1978 2 3 1
1979 3 3 1
1980 4 4 1
1981 2 3 1
1982 5 5 2
1983 5 5 3
1984 4 4 1
1985 3 3 1
1986 5 5 2
1987 3 3 1
1988 1 2 1
1989 1 2 1
1990 1 1 1
1991 1 1 1
1992 1 1 1
1993 1 1 1
1994 1 1 1
1995 3 3 2
1996 4 4 1
1997 4 4 2
1998 5 5 2
1999 4 4 1

2000 4 4 1
2001 2 3 1
2002 2 3 1
2003 2 3 1

Do you want me to tabulate each run's NM storage averages based on **its own** NMI yeartypes? I need to think about this -- don't want to ask for everything and not use it. Will check in Mon or Tuesday!

The above all applies to tabulating Stan flows below Goodwin (Appendix D Attch 3-2 Tables 37.1, 37.2 & 37.3) as well. I need to think about this -- don't want to ask for everything and not use it. Will check in Mon or Tuesday!

For Appendix D Attch 3-4, do you want me to re-do all five sets of temperature tables or is there a particular location of interest? I need to think about this -- don't want to ask for everything and not use it. Will check in Mon or Tuesday!
Derek

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