

Lahontan Reservoir

2017 Operations Forecast and Discussion

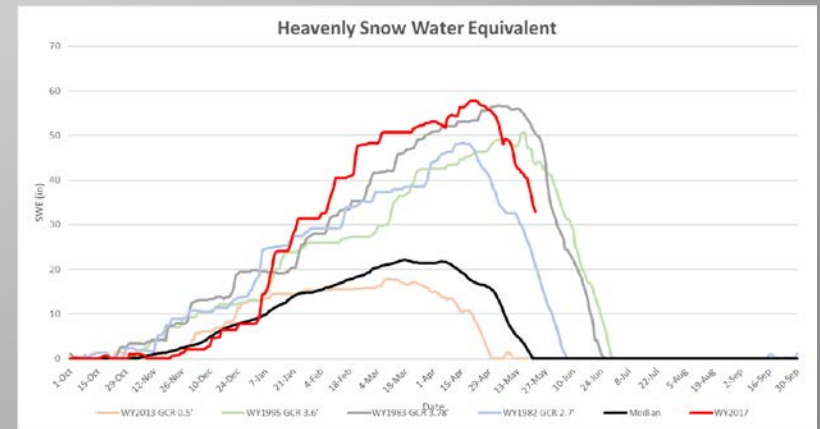
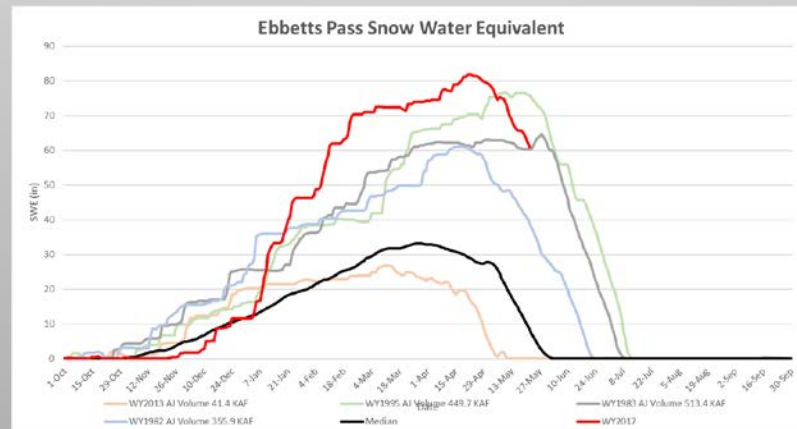
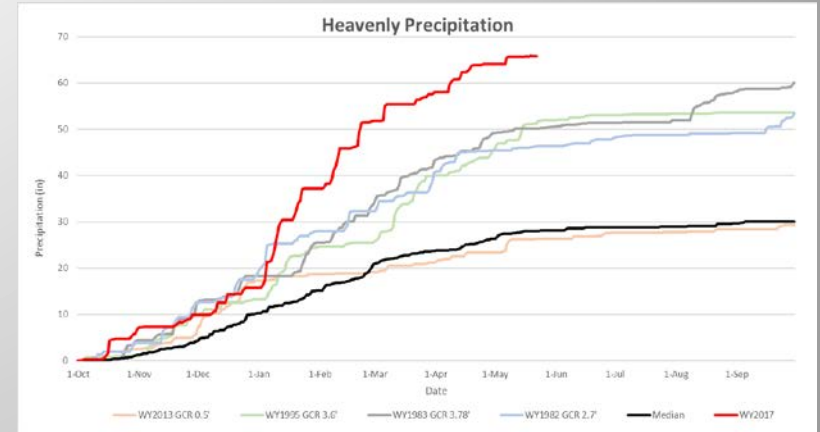
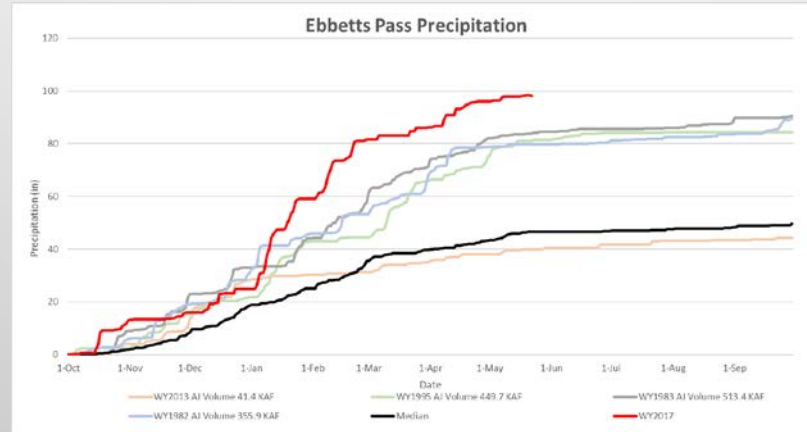
Phone Conference
May 16th, 2017

Shane Coors, PE
Precision Water Resources Engineering
www.precisionwre.com



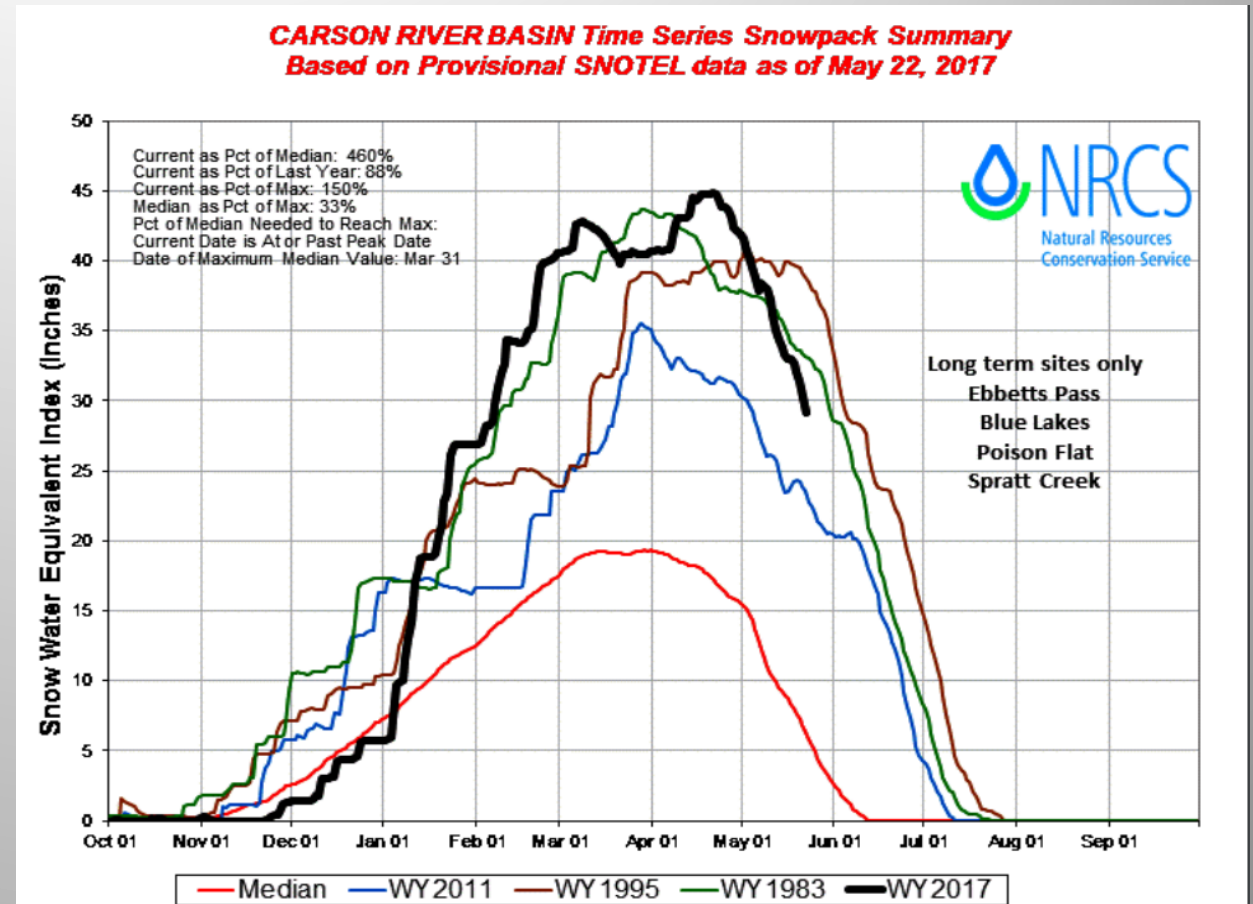
Historical “Big Year” Comparison Current Snotels

- 2017 precipitation to date is largest on record for almost all snotels
- As of May 1st the snowpack began decreasing due to melt and runoff
- Both Heavenly and Ebbetts Pass Snotels have melted significantly
- Most of the Carson Basin snotels are below the historical SWE values from 1983 and 1995
- Average May precip at Lake Tahoe is 1.22 in, maximum May precip is 4.33 in
- Current month-to-date precip is 1.04” at Lake Tahoe, 85% of average



Historical “Big Year” Comparison Current Snotels (2)

- Carson Basin Composite SWE depth across all snotels was largest on record by a considerable margin at April 27th.
- Composite SWE depth is showing significant melt
- Composite SWE depth is below both 1995 and 1983 values on this date
- 2011 – AJ runoff volume – 386 kaf
- 1995 – AJ runoff volume – 450 kaf
- 1983 – AJ runoff volume – 514 kaf
- 2017 – AJ runoff volume - ???

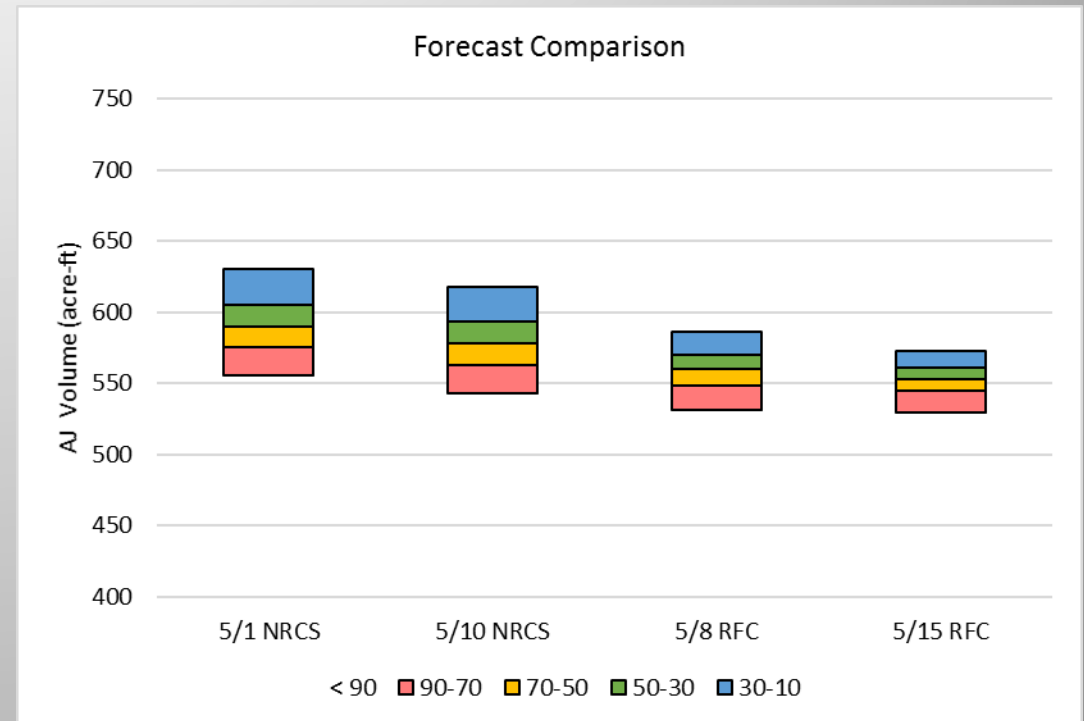


Ft Churchill April-July Volume Forecast Comparison

Last Week vs Current

- NRCS forecast from May 17th was flawed. Resent to me yesterday. It was uncoordinated. I took new mean and kept spread from May 1st forecast
- The RFC median decreased 7 kaf over the week to 553 kaf
- The spread of the RFC forecast decreased this week to 44 kaf

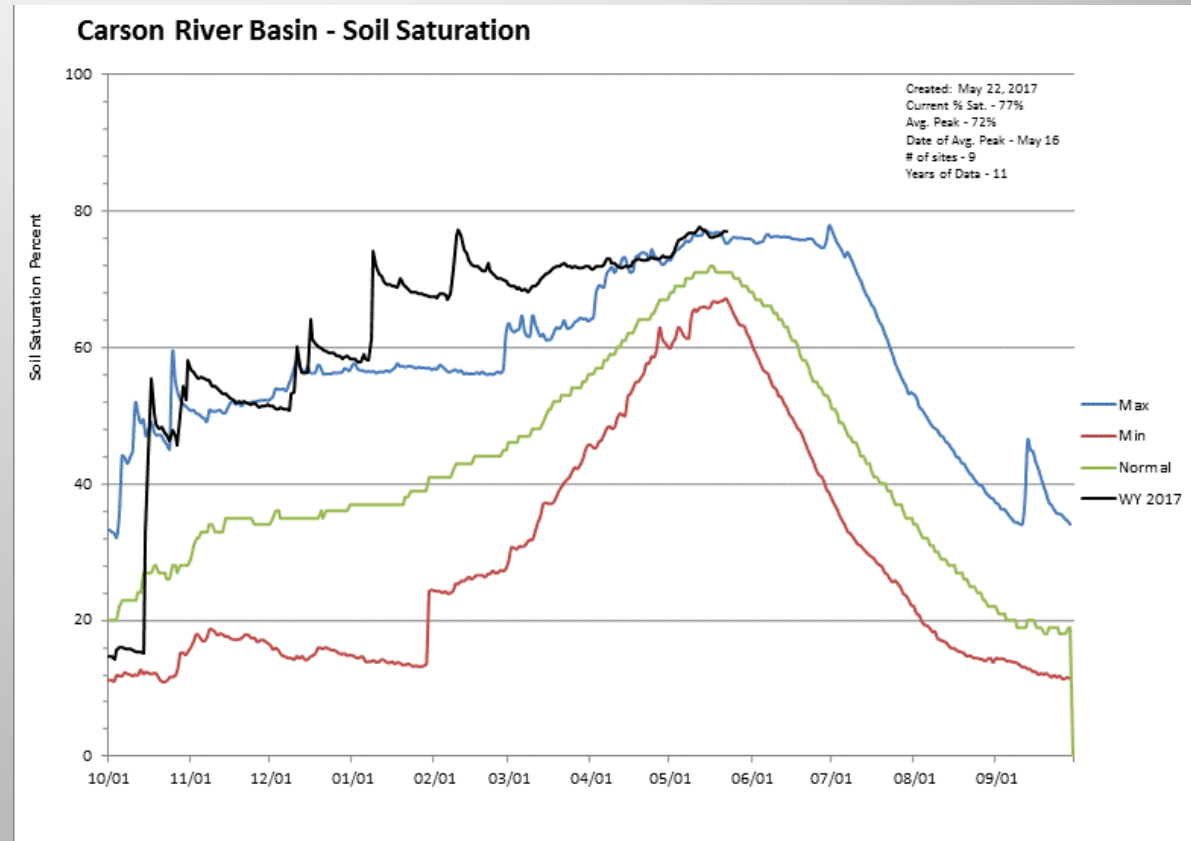
Forecast Comparison				
% exceedance	5/1 NRCS	5/10 NRCS	5/8 RFC	5/15 RFC
10%	630	618	586	573
30%	605	593	570	561
50%	590	578	560	553
70%	575	563	548	545
90%	555	543	531	529
Spread	75	75	55	44



Carson River Basin

Current Soil Moisture Conditions

- Current soil moisture is roughly equal to the highest in the last 11 years
- Current soil moisture is indicative of maximum runoff conditions
- Expect soil moisture conditions to remain at record levels the rest of the runoff season
- The soil saturation remains at an elevated level such that an efficient runoff is to be expected



Midterm Precipitation Forecasts

- Average precipitation (Tahoe City) for the month of May is 1.22". Largest May on record is 4.33"
- Current month-to-date precipitation at Lake Tahoe is 1.04" which is 85% of average
- Little to no precipitation forecasted over the next 6 days in Carson Basin.
- Up to an inch of precipitation is forecasted for the second 8 days. This forecast is more volatile, but needs to be watched!
- It looks like there won't be any more precipitation in May
- 0.2" was received over the past 6 days.

Precipitation Outlook for the Conterminous U.S.

Related Maps: Climate outlook for [Temperature](#) and [Soil Moisture](#)

Precipitation Forecasts

Precipitation (in)
during the period:

Mon, 22 MAY 2017 at 00Z

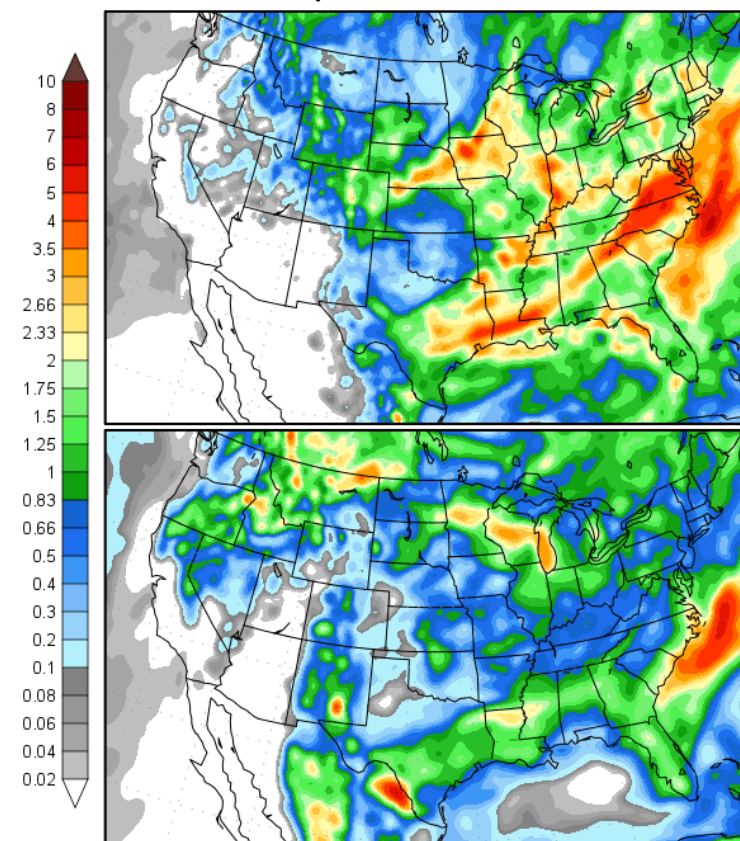
-to-

Tue, 30 MAY 2017 at 00Z

Tue, 30 MAY 2017 at 00Z

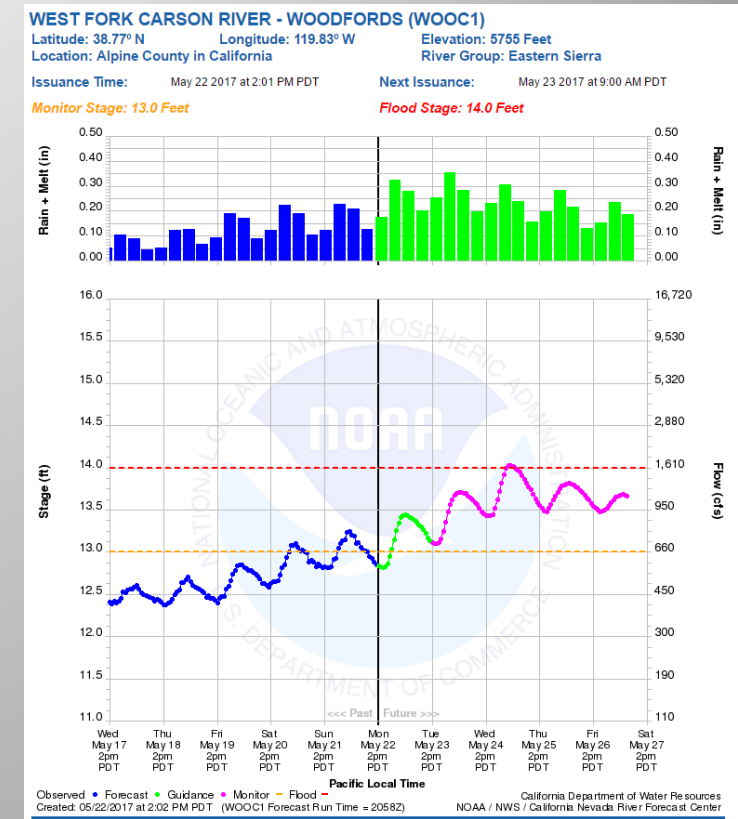
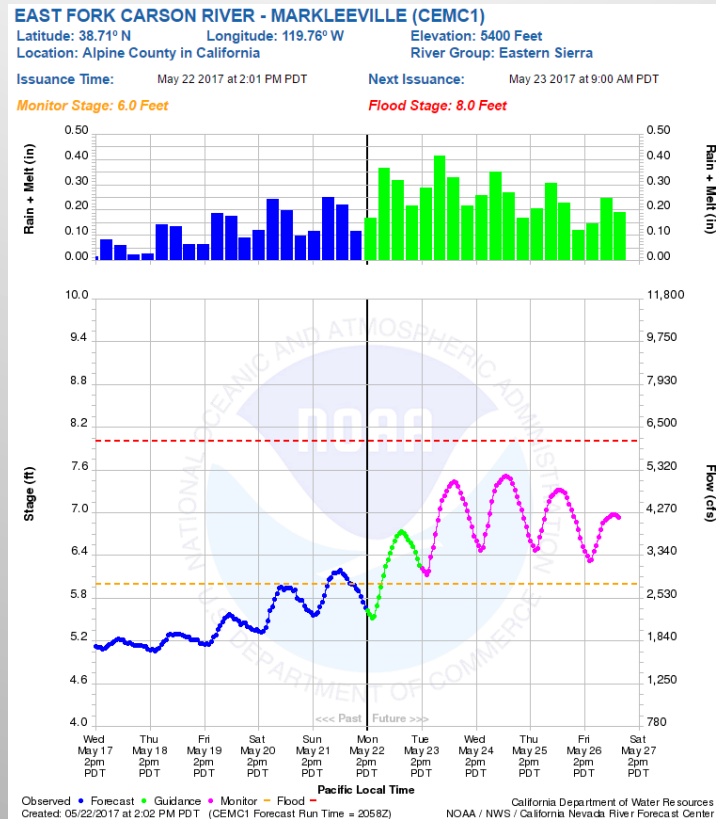
-to-

Wed, 07 JUN 2017 at 00Z



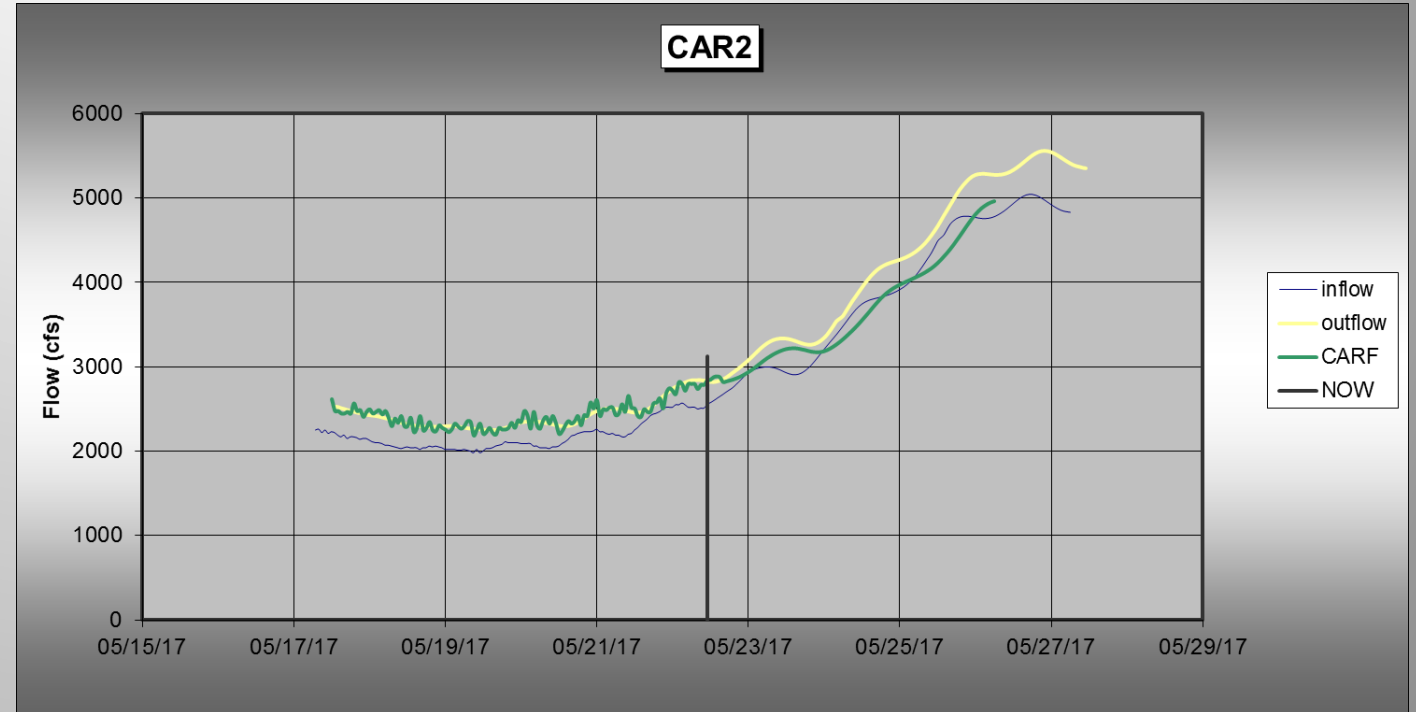
Carson River Short-Term Flow Forecasts Markleeville / Woodfords Gages

- Forecasted headwater flows will continue to rise, peaking on the 24th
- Temperatures are expected to cool slightly, but high flows continue
- Very likely that this is the seasonal peak flow in the headwaters



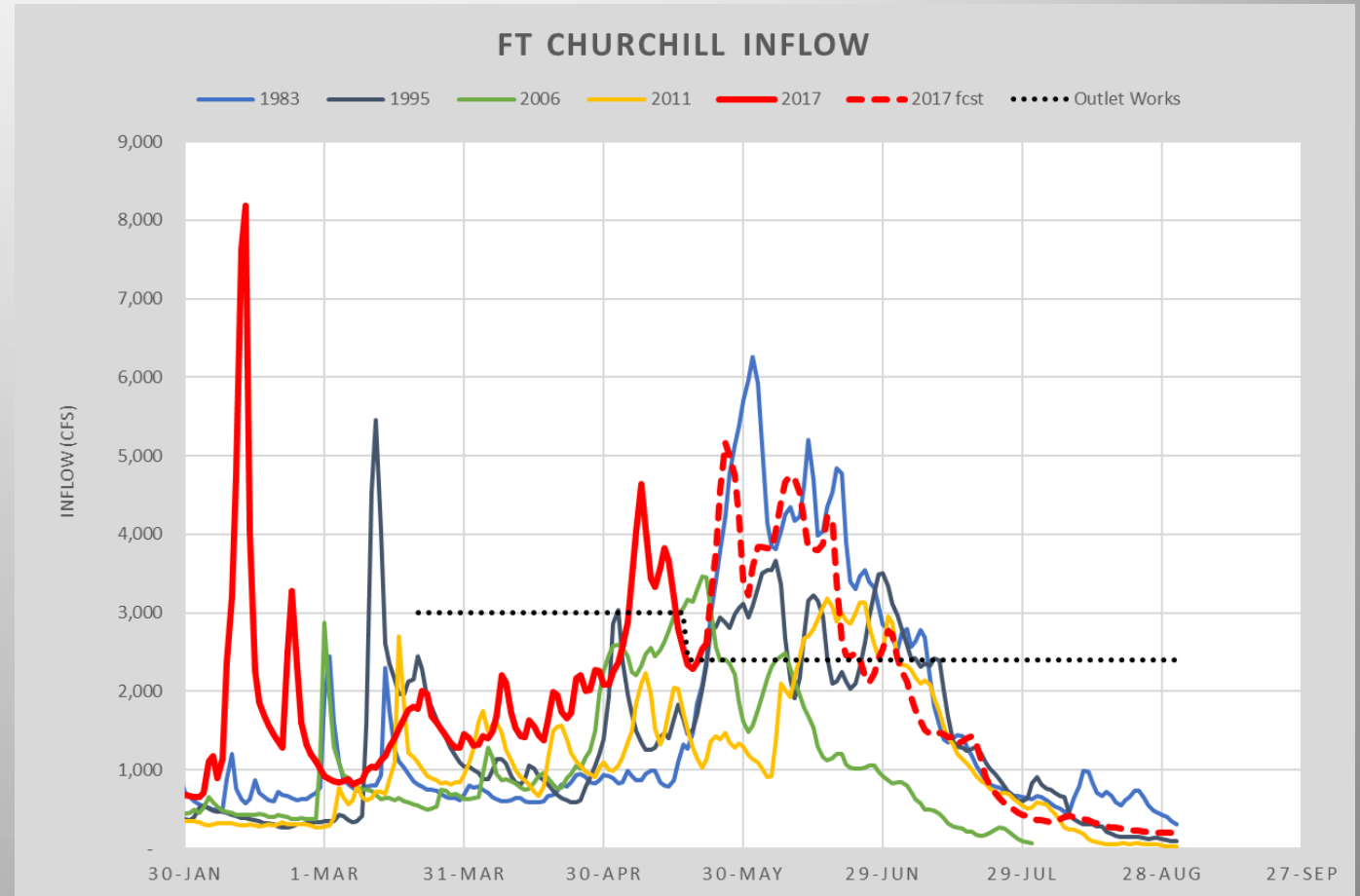
Carson River Short-Term Flow Forecasts Ft Churchill Gage

- PWRE (yellow) is running a parallel short-term high-precision flow forecasting model to supplement the RFC model (green)
- The flows at Ft. Churchill will rise through the week and peak out well over 5,000 cfs
- Flows will exceed Lahontan release all week
- Lahontan reservoir storage will increase all week



Historic “Big Year” Comparison Carson River Inflow

- Historic big years all have inflows that go over maximum conveyance capacity of Carson River / Newlands Project system
- Reservoir must have sufficient space available before inflows exceed release capacity of the reservoir
- Carson River flows have risen above the current release (2,400 cfs) and will stay there for the foreseeable future
- Lahontan reservoir will fill during this time.



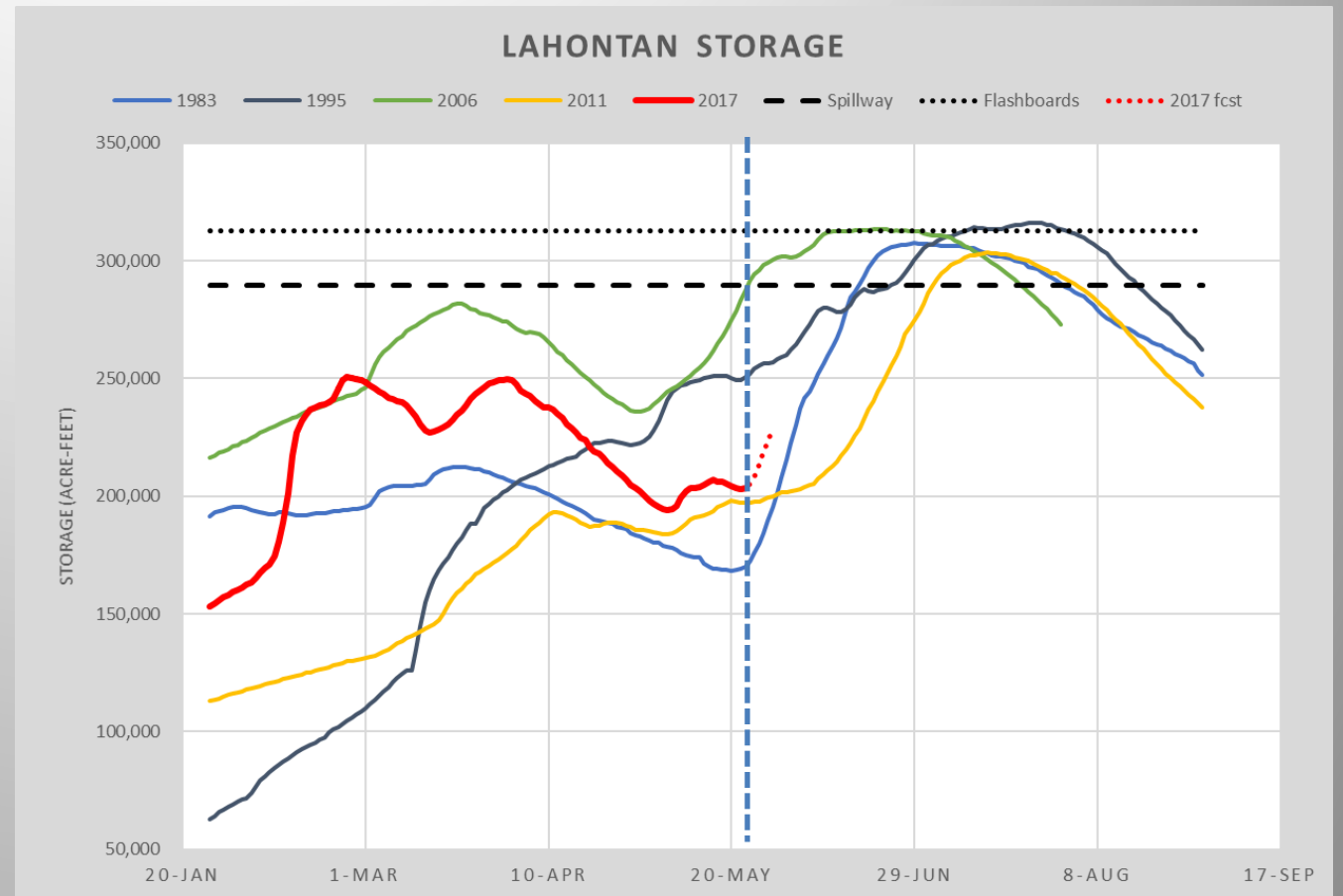
Historic “Big Year” Comparison

Current Lahontan Storage

Year	May 15 th Storage (af)	April Volume (kaf)	AJ Volume (kaf)
1983	170,000	43.6	514
1995	250,500	53.7	450
2006	287,800	59.5	332
2011	197,100	70.4	386
2017	203,400	103.4	578/553*

* NRCS May 1st Forecast / RFC ESP Forecast Median 5/15/17

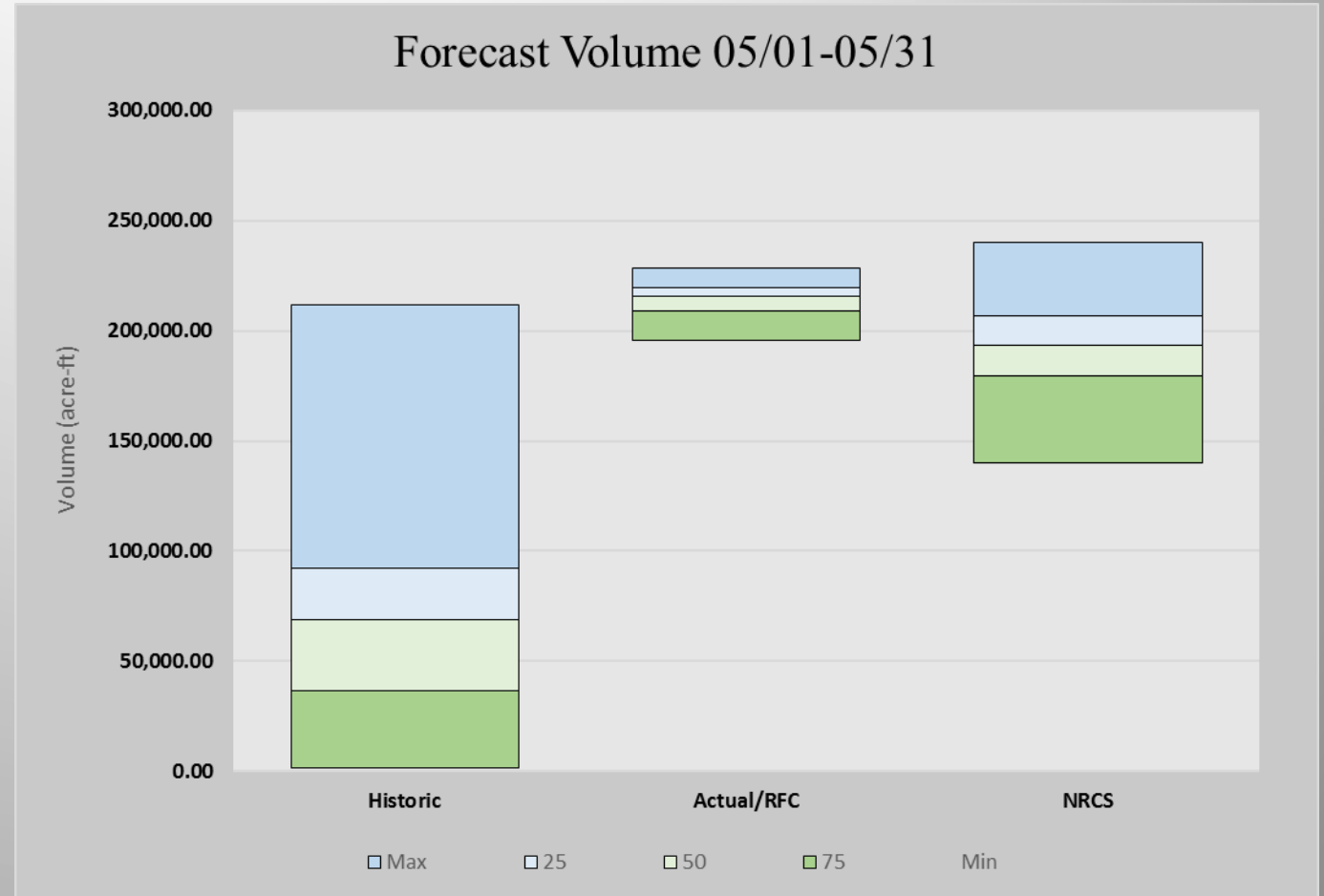
- April inflow volume is largest among big years and second largest on record
- Lahontan drewdown 4,000 af this past week
- Lahontan is expected to store about 29,000 af this week



Today

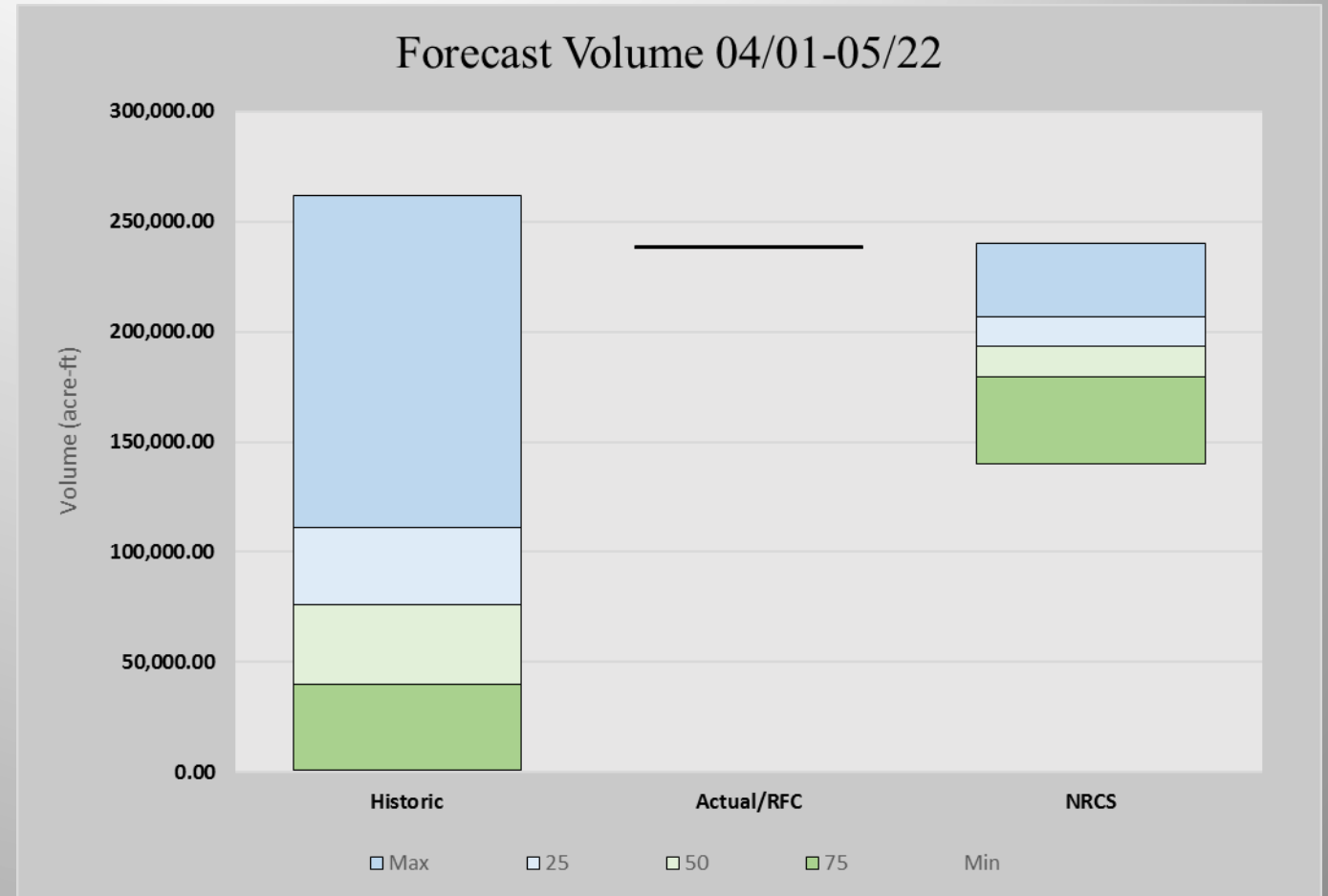
Carson River May Inflow Forecasts Ft Churchill Gage

- May inflow to date is 132 kaf
- May inflow is going to be very high, among the highest in the 116 year record
- Median forecasted RFC inflow (216 kaf) would be a record (1907 – 211 kaf)
- 1983 May Inflow – 131 kaf
- 1995 May Inflow – 130 kaf
- 2006 May Inflow – 159 kaf



Carson River May Inflow-to-Date Ft Churchill Gage

- Inflow since April 1st (April 1st – May 23rd) is just over 238 kaf which is second biggest on record
- Former record was 262 kaf in 1907
- Median historically for this period is 76 kaf



Carson River Peak Flow Date Forecast

- The peak flow date forecast is May 27th
- The peak looks to exceed the flow of May 7th
- Current median expected date is May 31st
- Late date is June 6th
- Peak flow forecast ranges between 4,350 cfs and 5,950 cfs with a median of 5,100 cfs
- Peak instantaneous flow to date at Carson City was 4,940 cfs on 5/7
- Looks very likely that the peak flow in the river will occur late this week. I don't see it coming back up that high again outside of an unusual precipitation event

		Peak to date	Min Forecast (90%)	Likely Forecast (50%)	Max Forecast (10%)
FARC1 TRUCKEE RIVER FARAD	KAF: DATE:	12.8 05/06	8.9 05/24	9.7 05/25	12.3 06/03
WOOC1 WF CARSON RIVER WOODFORDS	KAF: DATE:	2.5 05/06	2.0 05/25	2.7 05/29	3.6 06/05
STWN2 CARSON RIVER CARSON CITY	KAF: DATE:	9.7 05/08	8.7 05/26	10.2 05/27	11.9 06/06

Summary

- Flows at Ft Churchill will rise through the week, but look to top out and decrease through the weekend
- Snowpack will continue to melt rapidly this week
- Short term weather forecast calls for no precipitation this week and possibly a small amount next week. May is looking to end below normal.
- 6-14 day outlook is looking likely to continue to be above normal temperatures. A late May peak is looking very likely
- Lahontan can be expected to fill substantially this week
- Inflows to date have been at record levels as expected

Questions??

