OFFICIAL FORECAST

Last Updated: Feb-19

North Platte River Basin Forecasts

Location	Variable	Time Period	Forecast Value	Forecast Category ⓘ
Lewellen gage (NE)	streamflow	May-July	135,500 acre-feet	Low Average
Glendo reservoir (WY)	inflow	May-July	415,000 acre-feet	High Average
Alcova reservoir (WY)	inflow	May-July	325,300 acre-feet	Low Average
Pathfinder reservoir (WY)	inflow	May-July	209,700 acre-feet	Low Average
Seminoe Reservoir (WY)	inflow	May-July	345,500 acre-feet	Low Average

South Platte River Basin Forecasts

Location	Variable	Time Period	Forecast Value	Forecast Category ⓘ
Julesburg gage (CO)	streamflow	May-July	72,700 acre-feet	Average
Kersey gage (CO)	streamflow	May-July	216,700 acre-feet	Average
South Platte higher elevations	max snow water equivalent	N/A	N/A	Only available in Jan.
South Platte lower elevations	precipitation	April-June	Probability >50%: 67% Probability <33%: <5%	N/A

Forecast Category	Exceed %	Lewellen	Glendo	Alcova	Pathfinder	Seminoe
Above Average	<20%	>372	>562	>523	>531	>885
High Average	20-40%	226-372	414-562	397-523	368-531	761-885
Average	40-60%	154-226	366-414	332-397	290-368	503-761
Low Average	60-80%	100-154	322-366	289-332	209-290	316-503
Below Average	>80%	<100	<322	<289	<209	<316

units: thousands of acre-feet

Forecast Category	Exceed %	Julesburg	Kersey
Above Average	<20%	>332	>554
High Average	20-40%	101-332	272-554
Average	40-60%	38-101	143-272
Low Average	60-80%	14-38	58-143
Below Average	>80%	<14	<58

units: thousands of acre-feet

Discussion

The previously moderate-strength El Nino event has weakened significantly in the eastern Tropical Pacific. Its affect on the atmosphere continues to be negligible thus far this winter season. Although sub-surface ocean temperatures remain warmer than normal along parts of the Pacific equatorial region, implying a chance for this El Nino event to re-strengthen, this is looking less likely at this time. This has little to no impact on the North Platte, but suggests a reduction in the chances of a very wet spring over the South Platte basin.

The North Platte and South Platte basin snowpack is currently tracking very close to seasonal normal, which at this point in the season begins to reduce the chances of a very low spring runoff. However, a warm and dry March can quickly reverse this and thus, it is too early to rule out low runoff at this time.

The latest North Platte forecast showed higher projected flows in the lower elevations, with generally lower flow projected for the higher elevations. Notably, the Lewellen projected flow increased substantially again, with the latest value being 136K acre-feet (solidly in the Low Average category). Interestingly, the Glendo forecast of High Average appears like an outlier. However, we speculate that the reason for this is the relatively high current reservoir storage, which can prop up future flow at Glendo since it is the last large reservoir in the North Platte system.

PROBABILITY OF LOW FLOW

During 2018, additional forecasts were developed to inform the probability of "Low Flow" for (i) Guernsey April-September outflow and (ii) Lewellen May-July streamflow. These forecasts are being used operationally for the first time. Note that Low Flow was defined as flow below the 25th percentile at each site, which translates to 2,931 c.f.s. for Guernsey outflow and 621 c.f.s. for Lewellen. Thus, the climatological probability of Low Flow is 25%.

Table 1 shows the probability of Low Flow continued its downward trend (i.e. a positive sign!), with the latest projections of 12% and 28% at Guernsey and Lewellen, respectively. The reason for Guernsey being substantially lower is due to the relatively high reservoir storage that currently exists at the major North Platte reservoirs.

Table 1: Probability of low flow at Lewellen and Guernsey Reservoir.

Forecast Location	Time Period	Probability of flow <25%				
		Forecast Time				
		Nov '18	Dec '18	Jan '19	Feb '19	Mar '19
Guernsey res. outflow	Apr - Sep	17%	16%	13%	12%	
Lewellen streamflow	May - Jul	44%	41%	30%	28%	

RESERVOIR STORAGE

As of February 1, 2019, the total reservoir storage at the five main reservoirs upstream of Lake McConaughy (Seminoe, Pathfinder, Alcova, Glendo and Guernsey) was **1,721,115 acre-feet**. Using data from 1959-present, this value is in the **54th** percentile for the date, with little change from the **53rd** percentile observed in December and **54th** percentile observed in January. Although total storage has decreased significantly over the past 2 years, it continues to remain high enough to buffer against any significant precipitation deficits for at least one more runoff season during winter/spring 2019.

COMPARISON TO OTHER FORECASTS

Forecasts developed herein are compared to similar forecasts from the US Bureau of Reclamation (USBR), the Natural Resources Conservation Service (NRCS) and the Climate Prediction Center (CPC).

USBR

Forecasts for the WY2019 runoff season normally start in January via the Water Supply Report. However, neither the January nor February forecast was available as of this update. The USBR will be contacted shortly to seek an explanation.

NRCS

Link: http://www.wrds.uwyo.edu/wrds/nrcs/snowpack/snowmap.html

Tables 2 and 3 show forecasts of North Platte River spring/summer flow for the Upper and Lower parts of the river, respectively. All sites are forecasted to be within 8% of their average value, except the Sweetwater River near Alcova, which is forecasted to see 66% of its normal flow. **Overall, the NRCS forecast is higher than our forecast at this time, because it is relies almost exclusively on the current snowpack (which is currently very close to its long-term average).**

Table 2: NRCS forecast for Upper North Platte River

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
UPPER NORTH PLATTE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
North Platte R nr Northgate								
	APR-JUL	105	182	235	104%	290	365	225
	APR-SEP	118	200	260	104%	315	400	250
Encampment R nr Encampment[2]								
	APR-JUL	75	111	135	105%	159	195	129
	APR-SEP	83	120	145	105%	170	205	138
Rock Ck nr Arlington								
	APR-JUL	35	46	53	108%	60	71	49
	APR-SEP	36	47	55	106%	63	74	52
Sweetwater R nr Alcova								
	APR-JUL	3.5	25	39	66%	53	75	59
	APR-SEP	5.2	28	43	67%	58	81	64
Seminoe Reservoir Inflow								
	APR-JUL	375	605	760	106%	915	1140	715
	APR-SEP	415	650	815	106%	975	1220	770
1) 90% and 10% exceedance probabilities are actually 95% and 5%								
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions								
3) Median value used in place of average								

Table 3: NRCS forecast for Lower North Platte River.

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
LOWER NORTH PLATTE RIVER BASIN	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
La Prele Ck ab La Prele Reservoir								
	APR-JUL	3.2	13.8	21	106%	28	39	19.9
	APR-SEP	2.9	13.7	21	106%	28	39	19.9
North Platte R bl Glendo Reservoir								
	APR-JUL	270	590	805	98%	1020	1340	820
	APR-SEP	285	610	835	98%	1060	1380	850
North Platte R bl Guernsey Reservoir								
	APR-JUL	255	585	805	98%	1030	1360	820
	APR-SEP	270	605	835	98%	1060	1400	850
1) 90% and 10% exceedance probabilities are actually 95% and 5%								
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions								
3) Median value used in place of average								

CPC

The graphic below shows the latest March-May 2019 precipitation forecast from the CPC. Both the North Platte and South Platte are expected to see above normal springtime precipitation with little to change in the forecast since our last update. The CPC forecast is generally consistent with the expectation of a weak to moderate El Nino persisting into the spring. However, as noted previously, this is less likely than it was in early January due to moderating tropical Pacific sea surface temperatures. **Thus, we believe the CPC may be over-estimating the chance of above normal precipitation**.