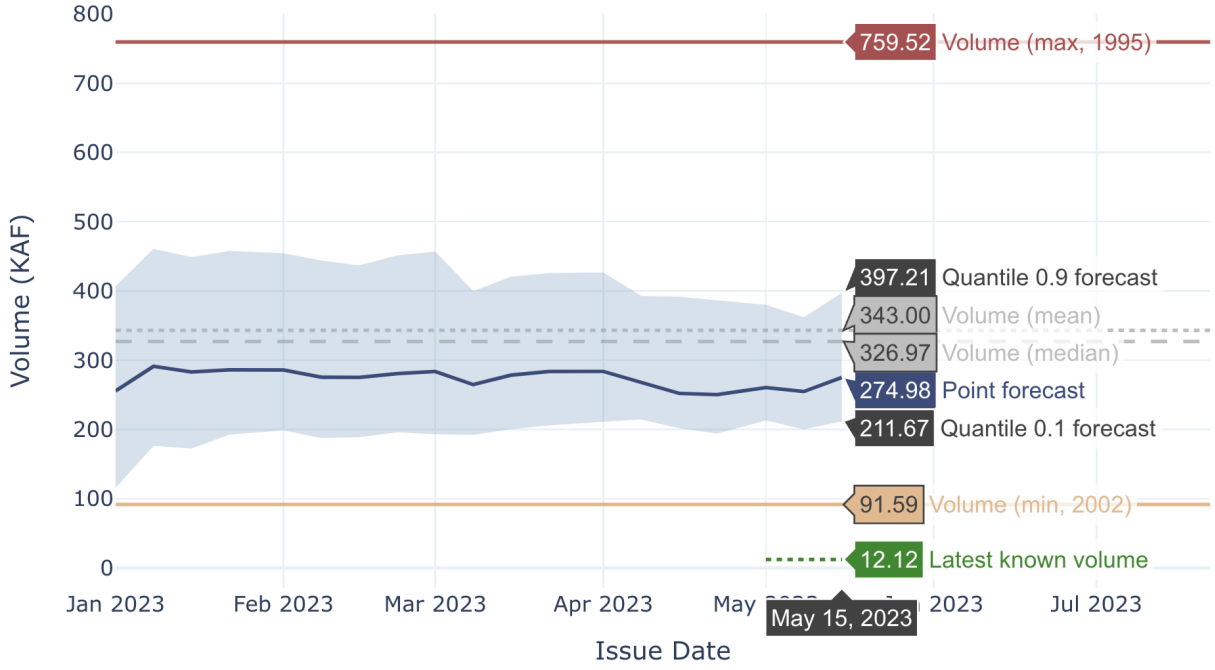
Water Supply Forecast - Pueblo Reservoir Inflow

Issue Date: 2023-05-15
Forecast Period: Apr-Jul

Figure 1: Water supply forecast and uncertainty bounds



The water supply forecast for April-July 2023 at Pueblo Reservoir Inflow is below normal, at 84% of median (275 KAF), with 10th and 90th percentile forecasts ranging from 65% to 121% (212 to 397 KAF). Compared to the previous forecast, there is a slight increase. However, there is no noticeable trend across different forecast issue dates. The uncertainty bound range also consistently gets smaller as we get closer to the seasonal month period.

For the forecast generated at this issue date, the actual water supply in April 2023 is already known (12 KAF, 4% of estimated total) which has been translated from total precipitation in that month and partial snowpack that has melted. The model originally generated the forecast for May-July 2023 (263 KAF, 96% of estimated total). This means that the model explanation in the next section accounts for May-July 2023 rather than the full April-July 2023 period.

Table 1: Feature (predictor) of water supply and explainability

Feature	Issue Date: 2023-05-15 Value	% Feature contribution Q0.5	Q0.1	Q0.9	Rel	Previous Issue Date: 2023-05-08 Value	% Feature contribution Q0.5	Q0.1	Q0.9
Base		**47.9%**	**45.5%**	**53.7%**	**1.69**		**45.1%**	**49.3%**	**49.6%**
Snowpack		**23.6%**	**29.4%**	**13.6%**	**0.62**		**25.2%**	**23.6%**	**17.2%**
SNOTEL/CDEC	101%	17.0%	6.4%	12.9%	1.20	90%	19.6%		16.7%
UA-SWANN	60%-80%	3.3%	15.1%		0.25	21%-75%	2.2%	13.2%	
ERA5-Land	110%	3.3%	7.9%	0.7%	0.31	101%	3.4%	10.4%	0.5%
Precipitation		**9.3%**	**9.9%**	**6.3%**	**0.89**		**10.8%**	**9.6%**	**4.1%**
SNOTEL/CDEC	100%	4.0%	2.8%	6.3%	0.89	94%	1.8%		4.1%
UA-SWANN	86%-94%	5.3%	7.1%		0.89	66%-70%	9.0%	9.6%	
Drought		**11.5%**	**13.0%**	**9.5%**	**0.97**		**11.2%**	**13.8%**	**13.4%**
PDSI	-1.68	10.0%	10.6%	8.0%	1.10	-1.77	10.2%	10.7%	8.5%
Soil water	87%-125%	1.5%	2.4%	1.5%	0.54	86%-99%	1.0%	3.1%	4.9%
Others		**3.5%**	**2.1%**	**9.4%**	**0.87**		**3.0%**	**2.7%**	**9.3%**
Temperature	-4.33	0.4%	0.4%	0.2%	0.56	0.53	0.4%	0.2%	0.2%
Snow cover	27% (28%)	1.8%	0.9%	7.6%	1.04	26% (34%)	1.4%	1.1%	8.0%
Snow albedo	104%	0.2%	0.0%	0.3%	0.43	98%	0.1%	0.4%	0.4%
Leaf area index	1.49-3.00	1.1%	0.8%	1.2%	0.94	1.48-2.98	1.0%	0.9%	0.7%
SEAS51 Forecast		**4.3%**		**7.4%**	**0.58**		**4.7%**	**1.0%**	**6.4%**
Snowpack	217%-237%	2.7%		5.5%	0.79	217%-237%	2.7%	0.4%	5.0%
Precipitation	88%-94%	0.5%		0.3%	0.33	88%-94%	0.4%	0.5%	0.0%
Temperature	0.03; 0.14	1.0%		1.7%	0.46	0.03; 0.14	1.6%	0.1%	1.3%

The forecast output is mostly driven by base predictors (historical average) rather than snowpack, where snowpack relative contribution is 0.62 times lower than the average of all sites. Snowpack and precipitation from all data sources report below-normal to normal levels, ranging from 60% to 110%. Drought indicators, PDSI, is classified as “mild drought”, and soil water volume for all layers ranges from 87% to 125% of normal.

For the uncertainty bounds, the 90th percentile forecast is driven by all predictors without SEASS51 forecast. On the other hand, the 10th percentile forecast is driven by all predictors without UA-SWANN data.