Forecast Explanation: owyhee_r_bl_owyhee_dam 2023-05-15

The model estimates the following range for naturalized seasonal volume (KAF) of owyhee_r_bl_dam on 2023-05-15, {10th quantile: 455, median: 664, 90th quantile: 882} (Fig 1). This prediction is above historical values for each quantile and is similar for each quantile to the previous prediction due to the lack of fluctuation in the observed feature values (Fig 2, Fig 5-9). The predictions for each month within the streamflow season are also above historical values, as is the observed monthly volume for April (Fig 4). The biggest drivers for this prediction are the SWE estimate (Snotel), which is 2 standard deviations above historical, and a drought measure (PDSI), which is 1.4 standard deviations above historical (Fig 10-13).

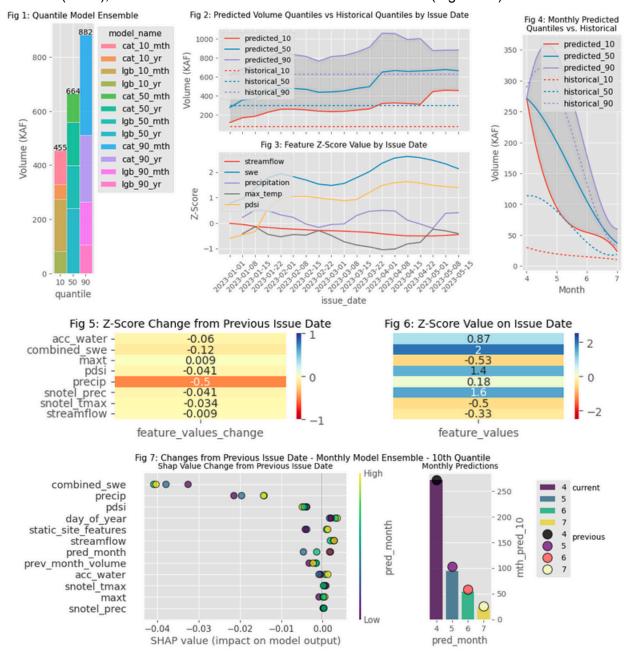


Fig 8: Changes from Previous Issue Date - Monthly Model Ensemble - 50th Quantile Shap Value Change from Previous Issue Date Monthly Predictions combined swe 4 current maxt 5 pred_month 6 200 05 static_site_features 7 month day of year 4 150 pad previous streamflow 5 pdsi pred 6 acc_water 100 precip prev_month_volume snotel_prec snotel_tmax 0 Low -0.020-0.015-0.010-0.005 0.000 0.005 0.010 4 5 6 SHAP value (impact on model output) pred_month Fig 9: Changes from Previous Issue Date - Monthly Model Ensemble - 90th Quantile Shap Value Change from Previous Issue Date Monthly Predictions High 350 maxt 4 current day_of_year combined_swe 300 5 000 6 streamflow 250 month static site features (II) (II) 200 pad previous acc water 000 5 pred_month 6 150 pdsi snotel_prec 100 prev_month_volume precip - 50 snotel_tmax Low 0 -0.010 -0.005 0.000 0.005 0.010 0.015 4 5 6 SHAP value (impact on model output) pred month Fig 11: Yearly Model Shap Values - 50th Quantile (log Volume KAF) f(x) = 6.339Fig 10: Yearly Model Shap Values - 10th Quantile (log Volume KAF) 0 = static_site_features 1.954 = combined swe0 = static_site_features 1.954 = combined swe 271.479 = prev month volume 271.479 = prev_month_volume 1.557 = snotel pred 1.428 = pdsi 1.428 = pdsi 0.183 = precip -0.529 = maxt1.557 = snotel_pred 0.183 = precip -0.529 = maxt-0.331 = streamflow -0.331 = streamflow0.869 = acc_water 135 = day_of_year 135 = day_of_year -0.499 = snotel_tmax -0.499 = snotel_tmax 5.65 5.70 5.75 5.80 5.85 5.90 5.95 6.00 6.05 E[f(X)] = 5.681 6.2 6.3 E[f(X)] = 6.01Fig 12: Yearly Model Shap Values - 90th Quantile (log Volume KAF) f(x) = 6.573Fig 13: Snotel SWE Deviation (Correlated Stations) on 2023-05-15 1.954 = combined_swe 271.479 = prev_month_volume 1.557 = snotel_prec 1.428 = pdsi 135 = day_of_year -0.331 = streamflow -0.529 = maxt86 0.183 = precip $0.869 = acc_water$ 0 = static_site_features

 $-0.499 = snotel_tmax$

6.30 6.35 E[f(X)] = 6.308

6.45

6.50

6.55

6.60