## Forecast summary for 2023-05-15 – Owyhee River Below Owyhee Dam

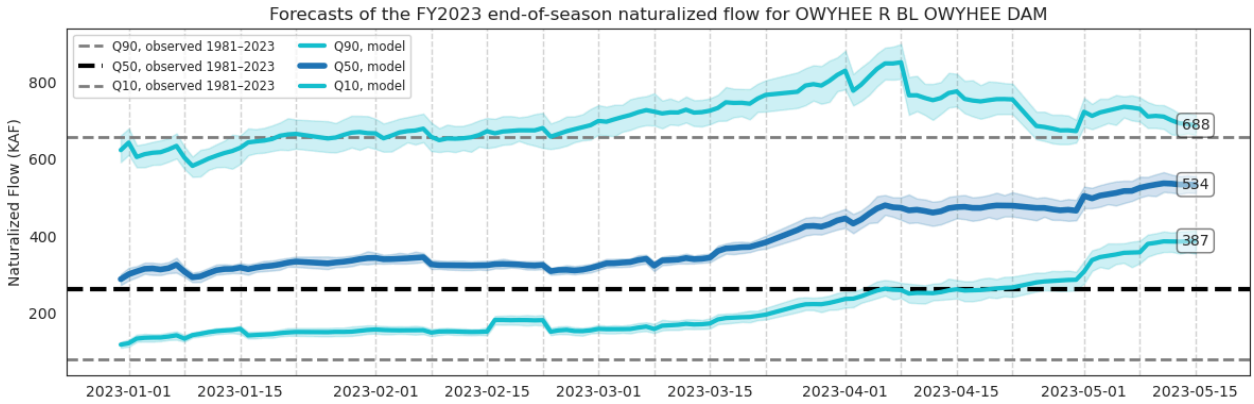


*Figure 1. Model forecasts and observed quantiles. Shading indicates the ensemble range.*

The forecast year 2023 at Owyhee River Below Owyhee Dam is predicted to be much wetter than normal (Fig 1), the model Q50 predicting almost twice the amount of the climatological median. Already the forecasts in January indicated above normal flow values, and after February the median has been steadily increasing towards the latest prediction value of 534 KAF. The model Q10 exceeded the climatological median in April, and the uncertainty range has become narrower.

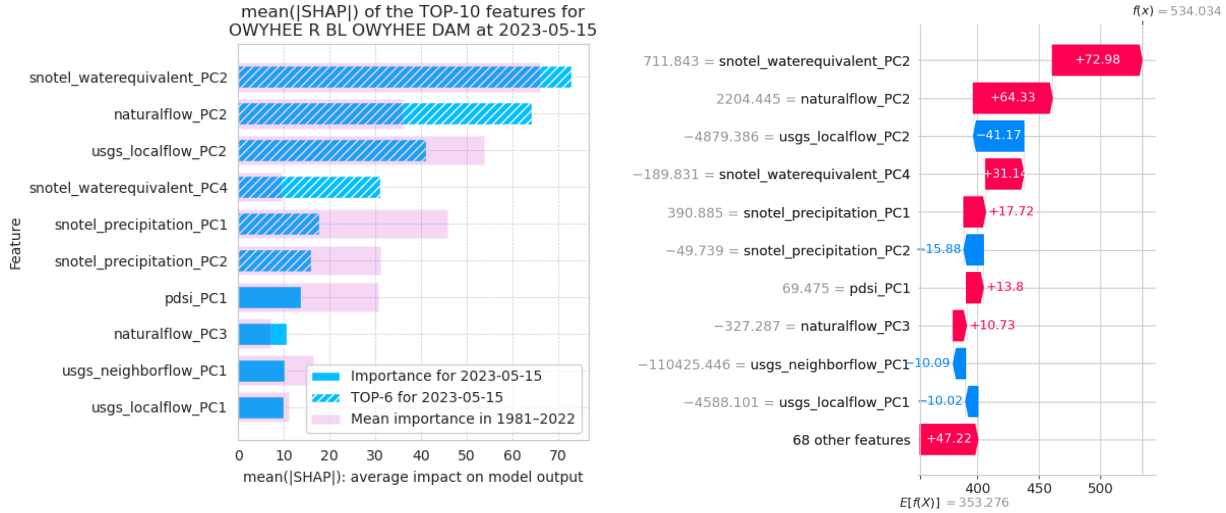


*Figure 2. Left: the mean(|SHAP|) feature analysis. Right: the contribution of features to the issue date forecast relative to the long term mean.*

High forecasted flow values can be explained mostly by the record-high snow water equivalent (Figs 2 and 3), which has grown above average conditions throughout the water year. In March it started growing steeply reaching the peak in mid-April, exceeding the climatological Q99 by a clear margin. Temperatures have been near or below normal, allowing the snowpack to develop until April, when rapid melting started, causing the natural flow values surge from extremely dry conditions in March to near normal in April and wetter than normal in May. SNOTEL stations in the proximity of the catchment report completely melted snowpack (Fig 4), which narrows the prediction uncertainty range (Fig 1) as most of the temporary storage of water is already released.

The dry conditions in early and mid winter, manifested in the Palmer Drought Severity Index and low flow conditions in rivers (Figs 2, 3 and 4) have dampened the extremity of the forecasts. Filling up the soil water storage takes a part of the available meltwater. In May these storages are already full in all parts of the basin except a small area in the eastern part of it (Fig 4), and most of the precipitation falling in the remaining water year can be expected to contribute to the increase of the streamflows.

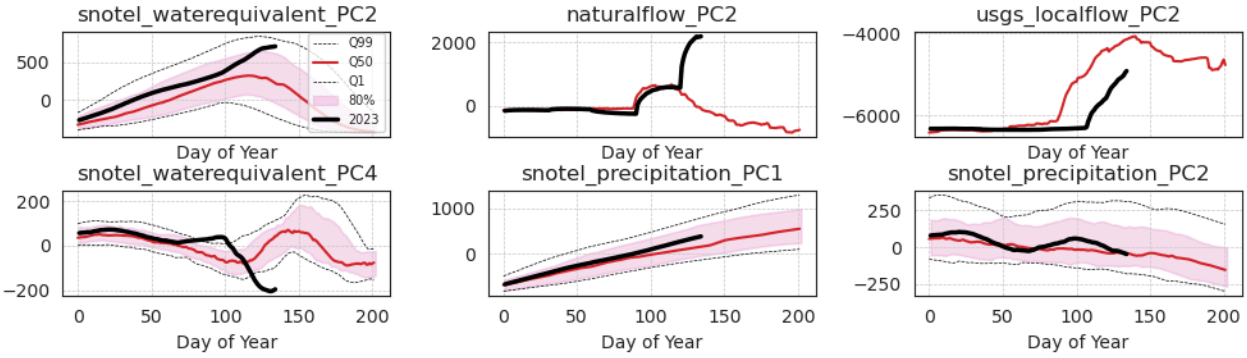


*Figure 3. The forecast year time series and the climatological distributions of the TOP-6 most important features contributing to the forecasts of the current issue date.*

The SHAP analysis (Fig 2) did not pick up any of the forward-looking datasets, namely the ECMWF seasonal forecasts or the teleconnection indices. This is an indication of non-extremity in the forecasted future conditions in May, June, and July.

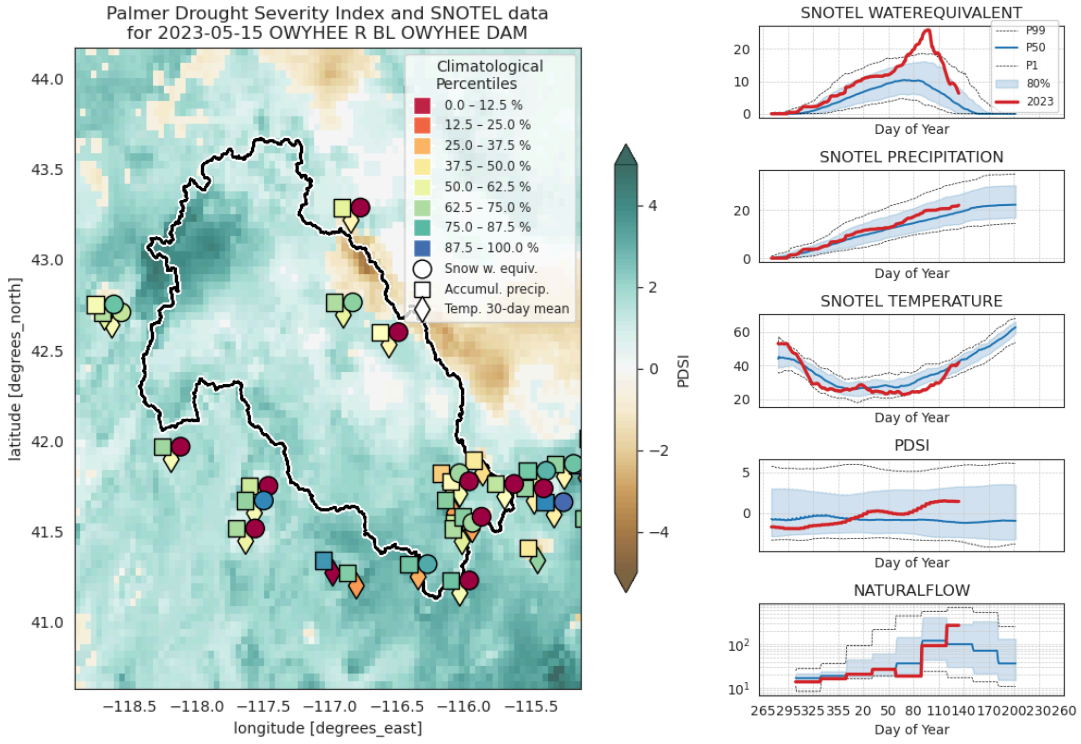


*Figure 4. Left: the PDSI and SNOTEL data for the current issue date. Right: climatological quantiles and data for the current forecast year for the key data sets.*