Figure S1: Scree plot from Provo River PCA, indicating that a four PC model is ideal to describe the variance in the dataset.
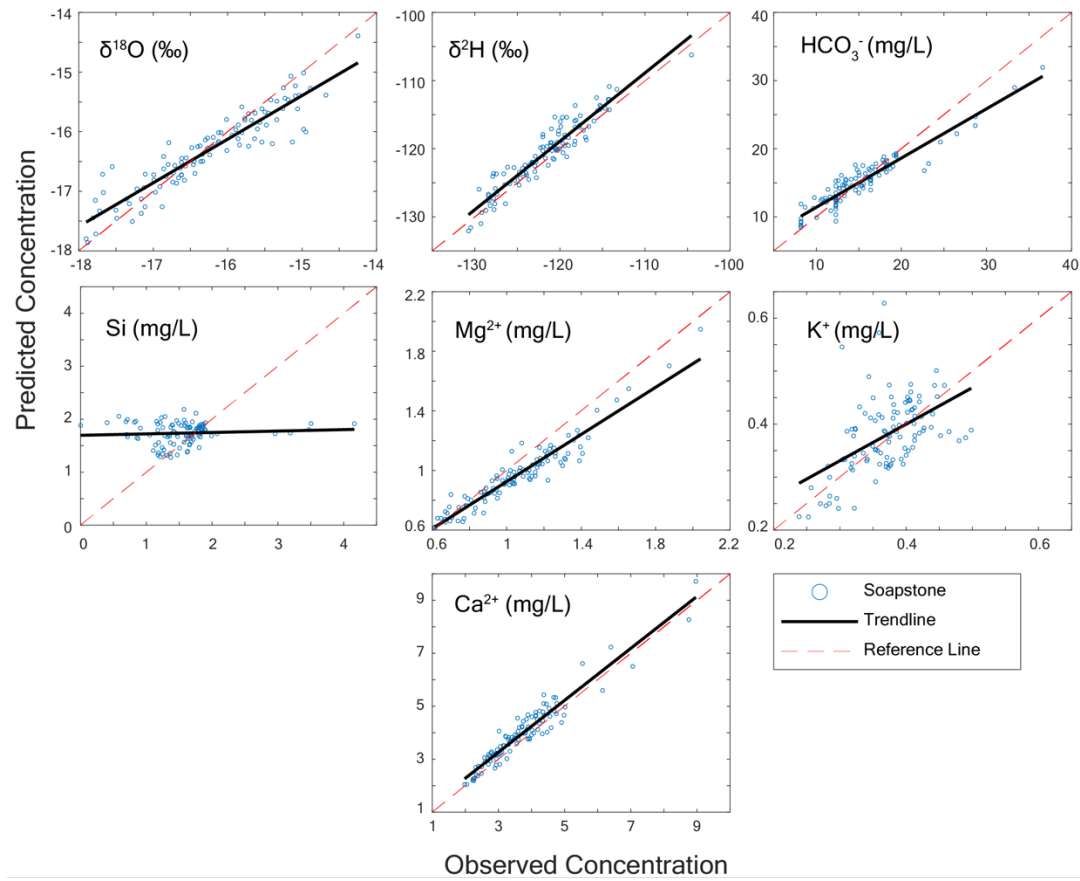
Figure S2: Model predictions for the 2 PC/5 EM model. Most of the predictions remain similar to the 7 tracer/5 EM except for Si and K⁺.
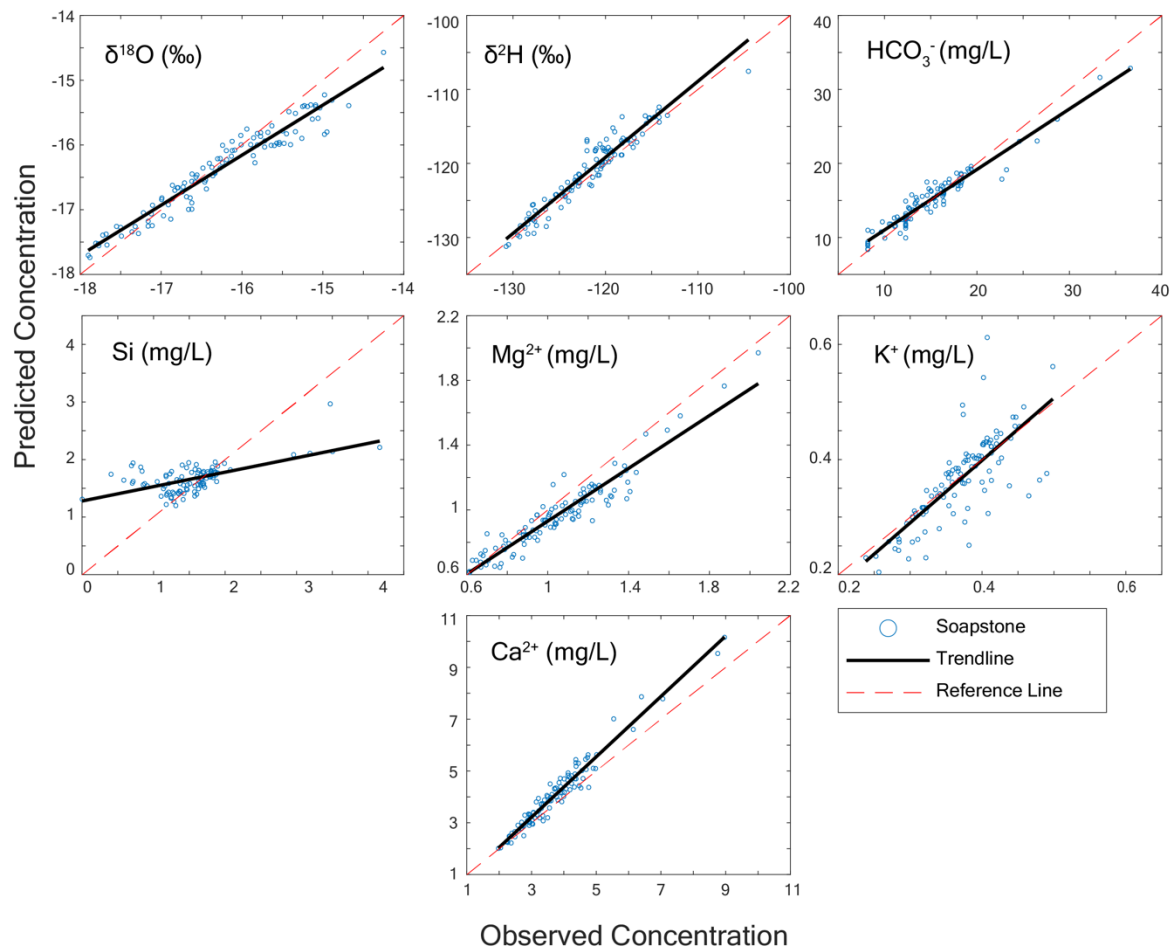
Figure S3: Model predictions for the 3 PC/5 EM model. Most of the predictions remain similar to the 7 tracer/5 EM except for Si and K⁺.
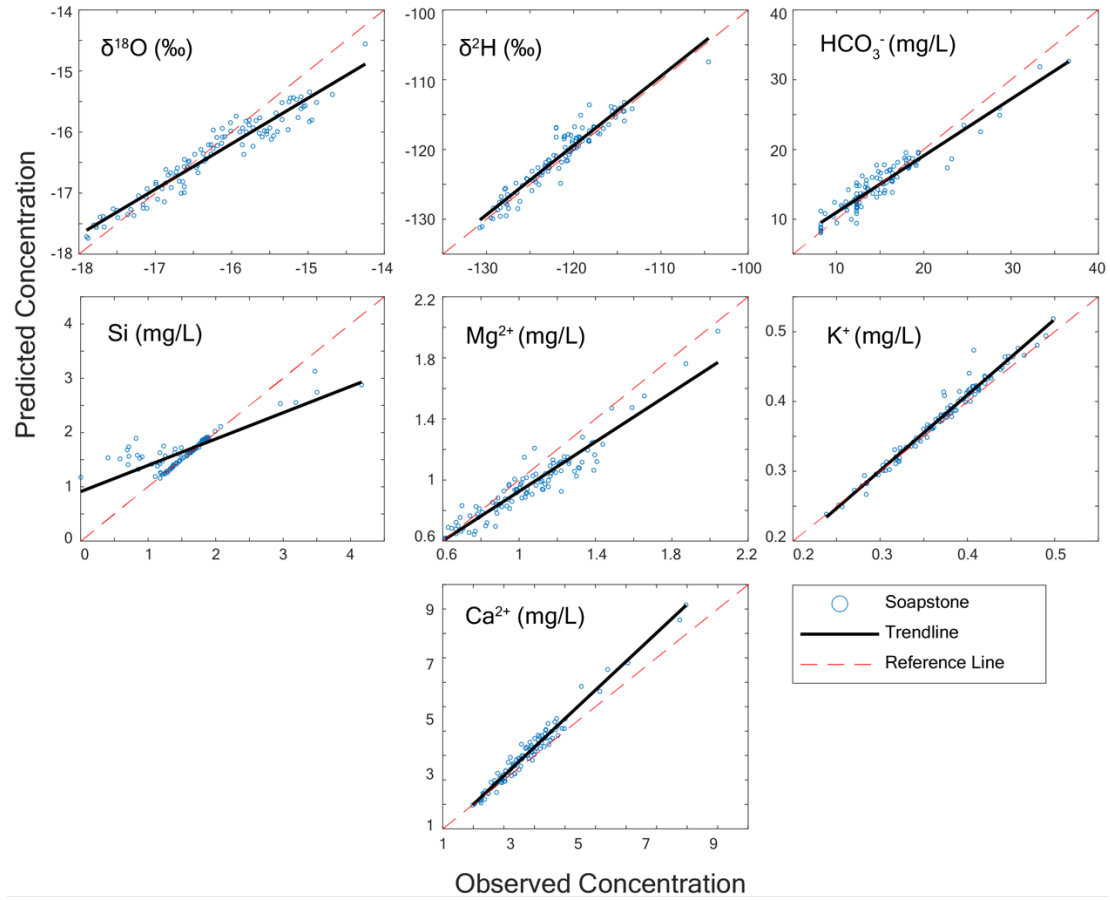
Figure S4: Model predictions for the 4 PC/5 EM model. Predictions are improved from the 2 PC/5 EM and 3 PC/5 EM model, but K⁺ are predicted more accurately in the 7 tracer/5 EM model.
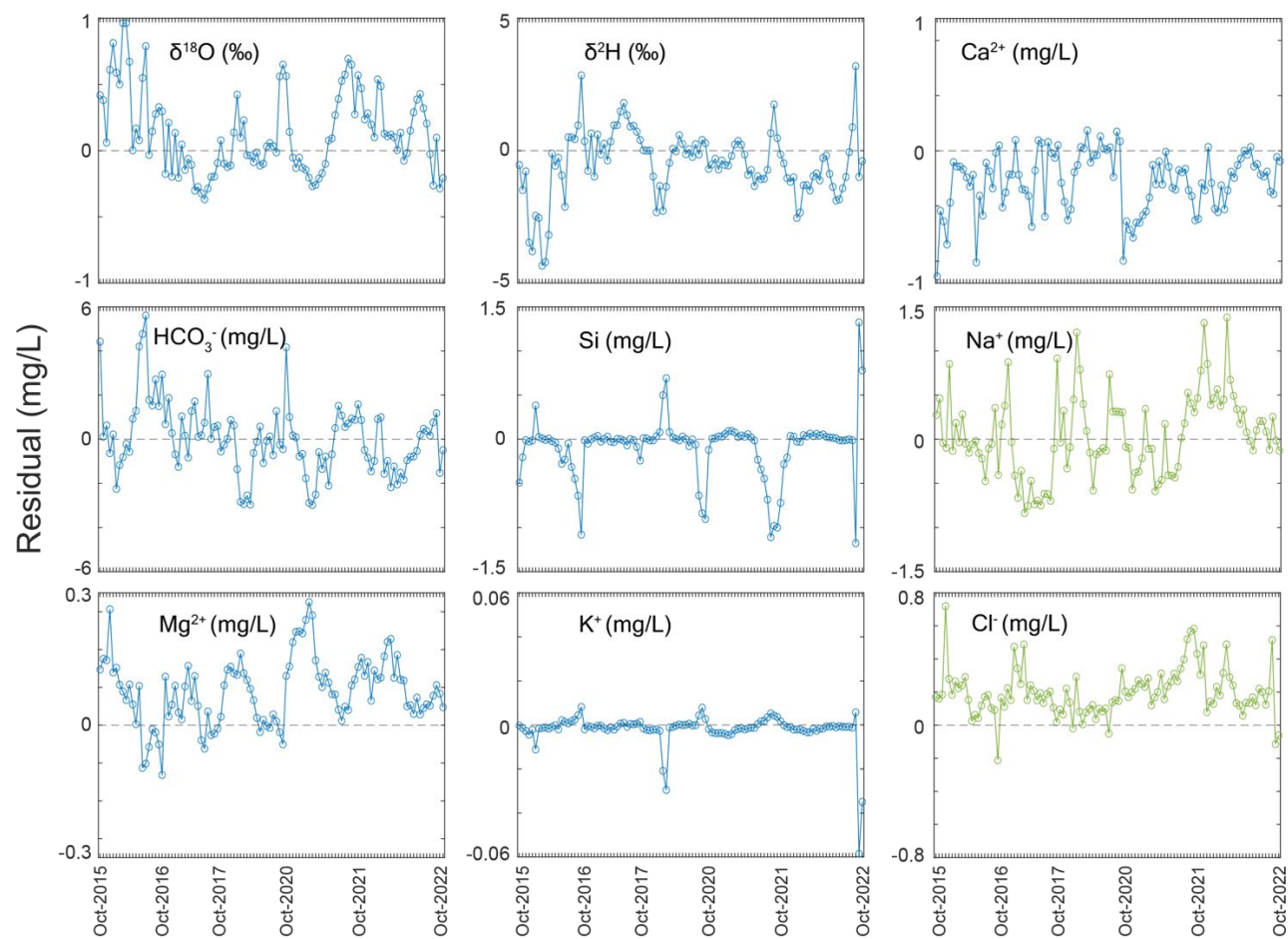
Figure S5: Residual plot of tracer prediction concentrations over time. Na$^+$ and Cl$^-$ are coloured green to indicate that they were not included in the final model.
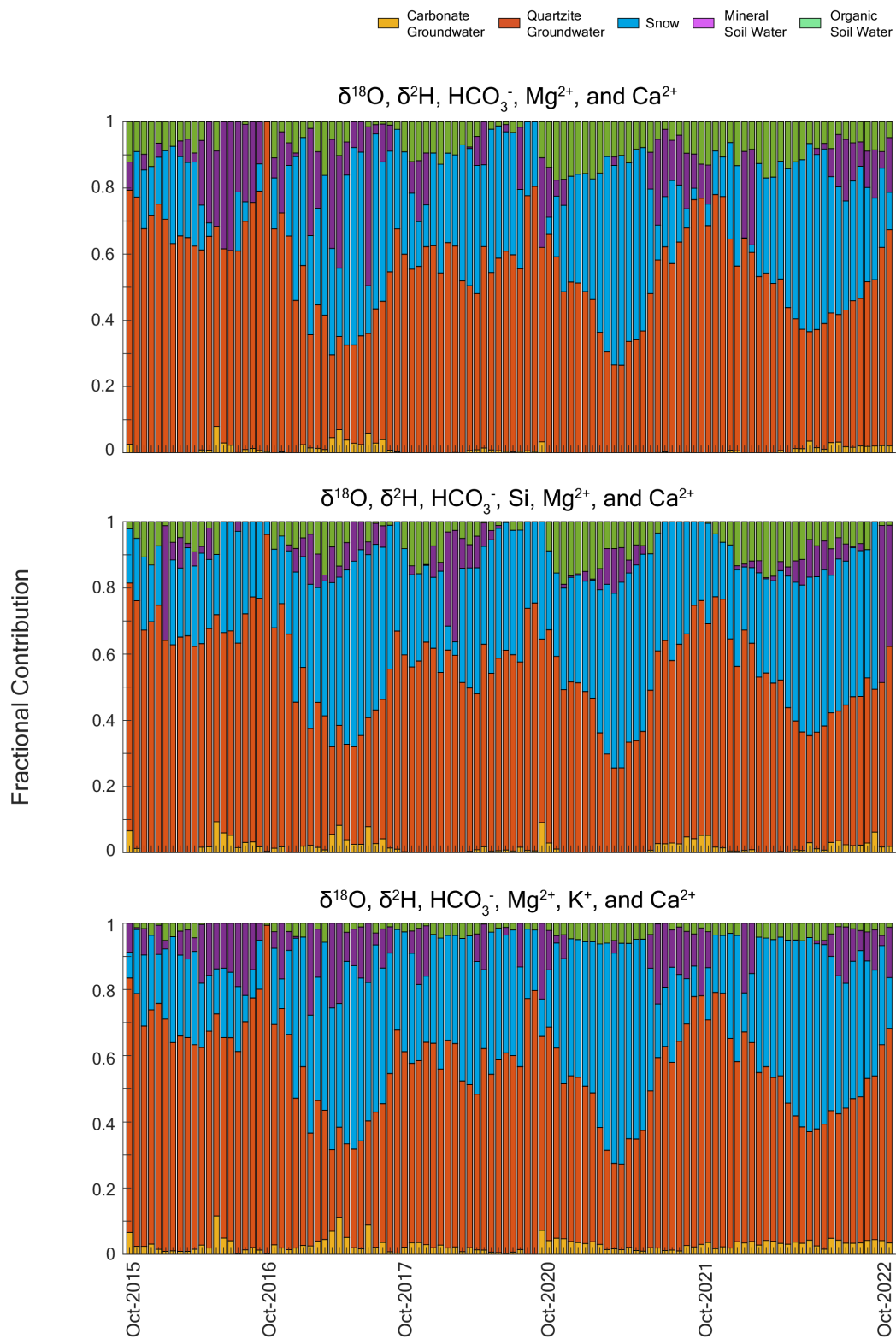
Figure S6: Fractional contributions calculated from varying combinations of tracers.