

## April 2021 Surface Prediction Model Run Notes

1. Differences among NRCS and BSU models
  - a. There have been some questions as to why the BSU model shows slightly different predictions than indicated by the NRCS SWSI (Surface Water Supply Indices). They are both tools that we can use to make predictions on annual water supply.
  - b. The NRCS SWSI uses reservoir carryover and Snotel SWE (Surface Water Equivalent) measurements. The NRCS includes Bear Canyon and Stickney Mill Snotel sites, which are outside of the Big Wood basin and may have been included in an automatic selection of data based on elevation. The NRCS includes data from 1983 – 2017.  $R^2$  fits for NRCS models are 0.85 (at April 1) and 0.90 (April – December).
  - c. The BSU model includes Snotel data within the Wood River watershed, last year's summer stream flow from USGS gauge stations, Agrimet temperature data, historic winter base flows, and curtailment data at larger diversions within the basin. The dataset includes years 1996 – 2019 because the Stanton Crossing gauge was installed in 1996.  $R^2$  fits for center of mass and volume used to develop predictive hydrographs are similar to NRCS model fits.
2. SWE table and graphs (pg 2)
  - a. SWE units of measurement in the table are currently in mm, but will be adjusted to inches in the future.
  - b. NRCS published SWE maps are an average for the entire basin
3. Streamflow volume model output table (pg 3)
  - a. Winter volume % of mean: represents the percentage of the mean for flow volume October 1 – Jan 31.
  - b. Predicted volume in thousand acre-foot: total predicted streamflow volume
  - c. Predicted volume % of mean: represents the percentage of the mean for total predicted volume
  - d. 90% exceedance KAF: % of the mean that this year's 90% exceedance volume represents (i.e., we can be 90% confident that volume at the Big Wood Hailey will be 47% of the mean)
  - e. 50% exceedance KAF: 50% exceedance volume (we can be 50% confident that we will reach this volume)
4. Most similar year estimates (pg 5)
  - a. Table on the left is based on volume. In terms of volume, 2021 is predicted to be similar to these years.
  - b. Table on the right is based on timing of snowmelt. In terms of snowmelt timing, 2021 is 89.74% predicted to be similar to 2013.
5. Curtailment predictions (pg 6)
  - a. The second column ( $\text{adj}R^2$ ) shows the goodness of fit of the model, and 0.7 is considered to be a relatively good model fit. Fit may be improved for priority dates below Magic when historic curtailment data is included during the next phase of work.
  - b. The last column (Days +/-) indicates number of days on either side of the predicted curtailment date when curtailment could occur.
6. Other things to keep in mind – this is the first year using the surface water prediction model, and we will be funding more development and refinement throughout the year. Additional questions and comments help with model development and interpretation. If there are other output graphs or tables that would be helpful, please let us know.