



March 14, 2023

TO: Flood Authority Members

FROM: Scott Boettcher, Staff

SUBJECT: 3/13/2023 NWS Meeting Re Forecasting Improvements

The following will be discussed at Thursday's Flood Authority meeting. Please feel free to contact me with questions (360/480-6600, scottb@sbgh-partners.com).

Background

1. At the January 19, 2023 Flood Authority meeting, staff presented a DRAFT letter to the National Weather Service seeking a meeting to discuss lower basin forecasting improvements. That letter was finalized and sent 2/01/2023 (see final letter [here](#)).
2. On March 13, 2023 a meeting was held with the NWS that included NWS weather forecast staff (Seattle), NWS river forecast staff (Portland), OCB (Nat), WEST Consultants, and Flood Authority (Vickie, Edna, Scott, and Cheryl).
3. Meeting focused on forecast improvements for Skookumchuck river (dam to Centralia) and lower Chehalis river (Porter gage to Aberdeen). Meeting stressed importance of lower basin residents and businesses having both accurate weather forecasts and accurate river forecasts. Currently, lower basin only has accurate weather forecasts while upper basin has both.
4. Meeting was productive in that the NWS understood the need presented by the Flood Authority and was willing to brainstorm how to get there (accurate lower basin river forecasts) given the inherent complexity of tidally influenced river systems.

Next Steps (General)

1. All parties agreed to move forward with reviewing available data the NWS could use to generate improved river forecasts for Skookumchuck and Chehalis below Porter and identifying data deficiencies.
2. WEST Consultants will work with NWS to identify steps, data needs, timing, funding/staffing constraints, etc. and document such in their Updated Basin Gage Plan (currently under development).
3. Flood Authority's Ad Hoc Gages Group will review and refine WEST's write-up for the Updated Basin Gage Plan at a late-April meeting.

Next Steps (More Detailed, 3/13/2023)

Skookumchuck:

- (1) Nat with the Office of Chehalis Basin will provide the NWS with data and data sources** he spoke to in the meeting. This includes information and modelling with regard to the reservoir, the fish sluice, and the reservoir discharge. Include reservoir stage/storage curves and spillway ratings, if available. He'll also provide the operational plan (or further describe) that TransAlta has/uses, including reliance on the USGS Bloody Run gage to make reservoir release decisions. Scott can help Nat as necessary.
- (2) Scott will schedule a follow-up technical meeting for two to three weeks after Nat's materials are disseminated.
- (3) The current rating curve for the Skookumchuck gage in Centralia is an artificial rating curve determined from the hydraulic model (HEC-RAS) when the new gage was installed. The forthcoming DRAFT Basin Gage Plan update will have a recommendation to develop a formal rating curve at Centralia.
- (4) DRAFT Basin Gage Plan update should also include a recommendation to rectify inconsistencies between the lower resolution reservoir stage sensor and the higher resolution spillway sensor at Skookumchuck.

Lower Basin:

- (1) WEST Consultants (Dave and Andreas) will scope out and describe in the forthcoming DRAFT Basin Gage Plan update what it would take to bring on-line river forecast points in Montesano and Aberdeen. They will work with NWS to identify the data and sequence of steps necessary to get from where we are today (no river forecast) to a future time (soon) where we have river forecasts in Montesano and Aberdeen. WEST will work with the NWS to identify:
 - What gage data/information exists, is readily available, and is acceptable to the NWS.
 - What data/information is missing/needed and what would it take to get it.
 - What observational data is missing/needed and what would it take to get it.
 - What is the sequence of steps the NWS needs to attend to/follow.
 - What would a first-order pilot look like and when.
 - Determine how to relay the Wishkah stage data to the NWS in real time.
 - Determine what data/instrumentation is needed to verify stage/flows at proposed forecast points.
- (2) This will be an agenda topic for the late-April Basin Gages Group meeting. Scott sent Doodle Poll today.

**** Available Data and Data Sources (from Larry Karpack, 3/13/2023):**

- a. RiverFlow2D Hydraulic model of the entire Chehalis River from Pe Ell to Aberdeen, including the Skookumchuck River upstream to Skookumchuck Dam and the Newaukum River upstream to the confluence of the North and South Forks. The Skookumchuck portion of the model was recently updated using new (2022) river channel cross sections for the Skookumchuck River between Bucoda and the mouth. The Skookumchuck portion of the model was also refined based on recent topographic data and calibrated to high water marks set during the January 2022 flood event.
- b. DHSVM Hydrologic model of the entire Chehalis River basin. The model was calibrated using the PNNL WRF dynamically downscaled meteorological reanalysis data set for the period Jan 1980 - December 2015. The model has been used to evaluate projected climate change in the basin.
- c. HEC-ResSIM model of Skookumchuck Dam calibrated to reservoir water levels for the period October 1987 - March 2022, with downstream inflows calibrated to the Bucoda gage flows for October 2008 - March 2022.
- d. Structure from Motion (SfM) topographic data for the spillway approach channel, plus confirmation of the design drawings for the spillway.
- e. Flow3D CFD model of the existing fish sluice and a proposed alternative.