

Experimental Alaska Pacific River Forecast Center (APRFC) Probabilistic Streamflow Forecasts (AK-MMEFS)

1. **Format and Science Basis:** This service uses air temperature forecasts provided by the Global Ensemble Forecast System (GEFS) as well as probabilistic precipitation forecasts provided by the National Blend of Model probabilistic forecast distribution. Randomly sampled precipitation percentiles for each NBM forecast timestep are combined with the 31 GEFS temperature ensembles to provide forcing for input to the hydrologic model Community Hydrologic Prediction System (CHPS run by the APRFC. These ensemble river forecasts were developed for several reasons.
 - a. Hydrologic forecast uncertainty is closely linked to the uncertainties associated with precipitation and temperature forecasts used by hydrologic simulation models.
 - b. This service explicitly uses short-range meteorological model ensemble temperature and precipitation data, eliminating the need for historical precipitation and temperature data for its results.
 - c. This service provides a means to further users' understanding of the effects of model inputs used in hydrologic simulations.
 - d. These ensembles river forecasts are useful surrogates for multiple contingency runs that are typically used by river forecast centers to convey quantitative precipitation forecast (QPF) or quantitative temperature forecast (QTF) uncertainty for worst case scenarios.
2. **Availability –** The ensemble river forecast web pages are available 24-hours per day and 7days a week and are monitored by APRFC staff.
3. **Experimental Status:** AK-MMEFS is a new product for 2025 and is undergoing validation to determine reliability of high flow forecast events. Science concerns with regards to sampling the NBM precipitation ensembles and their combination with specific GEFS ensemble members and the resulting reliability of the streamflow forecast distribution are of concern. Validation metrics after the 2025 WY will provide information on reliability of the streamflow forecast distribution as well as skill.

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