

## **A Brief Overview of the NWS Precipitation and River Forecasting and the River Forecast on the AHPS Hydrograph**

### **How does AHPS use precipitation observations and forecasts in its river models to produce river forecasts?**

The National Weather Service (NWS) uses river forecast models to estimate the amount/level of water flowing through the US Rivers. These models estimate the amount of runoff a precipitation event generates, computes how the water will move downstream, and then predicts the flow of water at a given location (AHPS forecast point) throughout the forecast period (every six hours, out 3 to 5 days in many locations).

As the precipitation event unfolds and actual reports of precipitation amounts from rain gauges and radar estimated rainfall become available, the precipitation forecast values are replaced with the observed amounts in the river model. For an ongoing precipitation event, the river model will use both observed and forecast precipitation amounts to predict the river levels. In addition to precipitation, some other factors the NWS River Models account for are: snowmelt, base flow/groundwater, reservoir operations, and routed water from upstream.

This discussion on river models provides the background information on the river forecasts provided on the AHPS hydrograph. Additionally, it's beneficial for AHPS users to understand the process of issuing river flood watches and warnings.

Every morning, hydrometeorologists at the NWS River Forecast Centers (RFCs), collect and quality control precipitation observations and precipitation forecasts. Depending on the particular weather scenario and the forecaster confidence in the precipitation amounts forecasted (timing, location and total volume), forecasters will use anywhere from 6 to 48 hours of forecast rainfall. RFC hydrologists enter these data into their river models. Model output is examined and adjusted to produce the best forecast possible. The river forecasts at each AHPS location are sent to the NWS Weather Forecast Offices (WFOs), who in turn issue flood watches and warnings to the public.

### **What does this look like on the AHPS hydrograph pages?**

On occasion an AHPS hydrograph will show the river forecast going above flood stage, but no river flood watch or warning is issued by the NWS. Typically, this indicates significant forecast uncertainty. In this case, AHPS users should routinely monitor NWS web pages, NOAA Weather Radio and stay alert to the changing conditions.

As confidence in the forecast increases, forecasters will issue watches and/or warnings. A flood watch indicates that there is still some uncertainty in this forecast. AHPS users should utilize the AHPS hydrographs and the NWS flood watch information to make appropriate decisions to protect lives and property. In this case, AHPS users should routinely monitor NWS web pages, NOAA Weather Radio and stay alert to the changing conditions. Forecasters will either issue flood warnings if confidence in the forecast increases, or allow the watch to expire.

A flood warning issued by the NWS means that forecasters have significant certainty in this forecast. AHPS users should utilize the AHPS hydrographs and the NWS warnings to make appropriate decisions to protect lives and property.

In all cases, the AHPS river forecasts and NWS watches/warning may be updated at any time with new forecast information.