

- Interactively explore flood frequency results
- Point and Click Maps to Estimate 2, 5, 10, 25, 50, 100, 200, and 500-year floods
- View changes to flood frequency estimates over time



InFRM.us

Watershed Hydrology Assessments

The InFRM team performs Watershed Hydrology Assessments (WHA) to update flood risk probabilities in large, complex river basins to build a robust understanding of the hydrology and flood risk. InFRM WHAs are performed by engineers and scientists from multiple federal agencies, including the Federal Emergency Management Agency, US Army Corps of Engineers, US Geological Survey, and National Weather Service. WHAs examine the hydrology across the entire basin, reviewing influences such as regulation, land use changes, and climate variation, to ensure all variables affecting flood risk in the watersheds are considered. The multi-layered analysis employs a range of hydrologic methods, including rainfall runoff modeling, statistical hydrology, and reservoir simulations. These WHAs produce consistent 1-percent annual exceedance probability (AEP) (100-yr) along with other frequency flows across the river basin, based on all available hydrologic information. The results also provide suggestions for areas where the current flood hazard information may need to be updated.

Flooding Facts



What is a 100-year flood? A 100-year flood refers to the 1 in 100 expected annual probability of such an event occurring. Therefore, a 100-year flood has a 1% chance of occurring in any given year.

Why did my community have 100-year floods two years in a row? This flood chance is based on probability. Each year is a new 'roll of the dice'. While unlikely, there is still a 1 in 100 chance of this flood occurring each year regardless of flooding during the previous year.

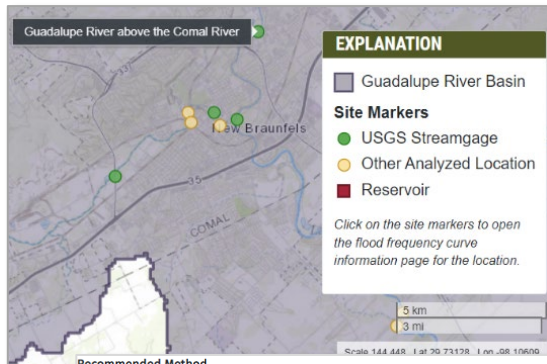
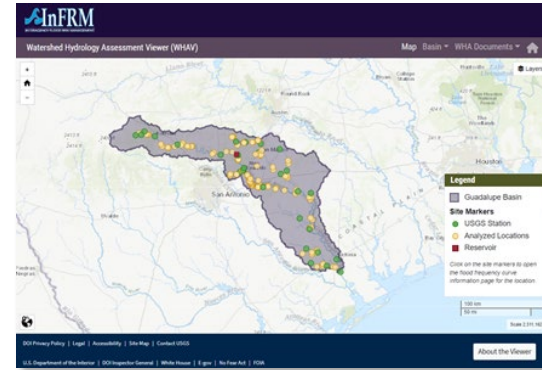
Does a 100-year storm always cause a 100-year flood? Not necessarily. Several factors influence how much streamflow results from a rainfall event. Was the storm centered over the watershed? How dry was the soil beforehand? Were upstream reservoirs able to capture storm runoff?

Watershed Hydrology Assessment Viewer

The Watershed Hydrology Assessment Viewer (WHAV) is a new, user-friendly web application that presents the results of the InFRM WHAs with interactive point-and-click maps designed to make it easier for users to explore the flood frequency results for their area of interest. The WHAV summarizes new analyses that estimate the 1-percent AEP, which is also referred to as the 100-year return period, and other frequency flows for stream reaches within basins where a WHA has been completed. The WHAV also includes a variety of graphs and plots that visually compare the results of the analyses with one another. While the analyses have been thoroughly documented in the InFRM WHA reports, the WHAV provides a simpler way for users to locate and summarize the final frequency flow results for the locations in which they are interested.

Selecting your Basin and Study Area

After opening the WHAV from the main InFRM.us webpage, use the map to select a basin or scroll down to the **Basin Studies** section to find your basin and **Explore Results**. Under **Analyzed Locations** use the search tool to search by stream name, reservoir name, or USGS site ID or description. For example, to see all analyzed locations on Peach Creek, simply search **Peach Creek**. Alternatively, click on the **Interactive Basin Map** and navigate to your subbasin of interest. Results represent flows at the outlet of each specified subbasin. **Green** points represent USGS streamgage locations, **Yellow** are all analyzed locations, and **Red** are reservoirs with pool elevation frequency analyses. The **Layers** icon in the upper right corner of the map enables the user to change base maps.

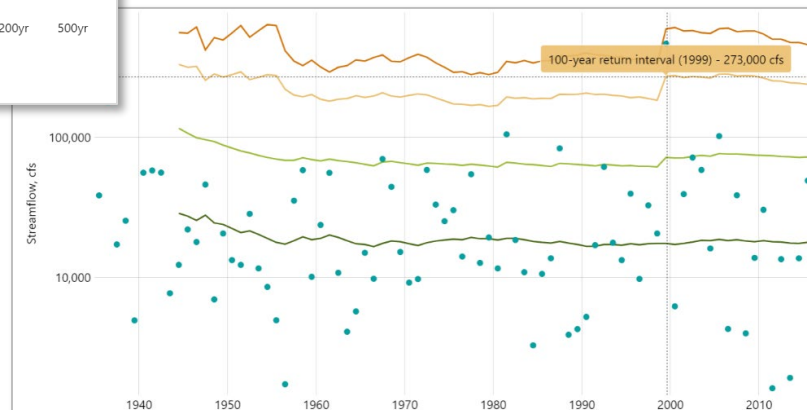


Annual Exceedance Probability	50%	20%	10%	4%	2%	1%	0.50%	0.20%
Return Period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	200-yr	500-yr
Hydrologic Method	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs
Recommended: HEC-HMS NA 14 Elliptical Storm	14,800	41,600	76,300	153,000	240,000	372,000	534,000	764,000

Exploring Results

Each **Site Results** page lists the final, recommended results for each site highlighted in teal. If available, a short description of the results and analyses from the larger

WHA report is provided. If multiple analyses were performed at that site, their results will be included in the table and the frequency curve. Alternate methods may be toggled on and off, but the recommended method may not. Hover over the chart to display a popup showing the results of each selected method by return period or annual exceedance probability. Each hydrologic method represents an analysis completed by the InFRM team, and more information about each method may be found by selecting the **Frequency Curve Method Descriptions** icon. Other methods are previous studies or historical floods to which to compare the current results.



Changes to Flood Frequency Estimates Over Time

An additional section titled **Changes to Flood Flow Frequency Estimates over Time** is available for select streamgages with sufficient length of gaged record to perform that analysis. These plots show how the statistical flow estimates from Bulletin 17C have changed over time with each added year of gage record and whether the current 1% AEP (100-year) estimate is at a relative high point or low point. The change over time plots illustrate the relative instability of statistically based flood frequency estimates, especially for rare frequencies like the 100-yr flood, and demonstrate their susceptibility to new large flood events, climate variability, reservoir construction, or other physical changes to the basin. These plots also show that even with 100 years of gage record, the 100-yr flow estimate is still a moving target.