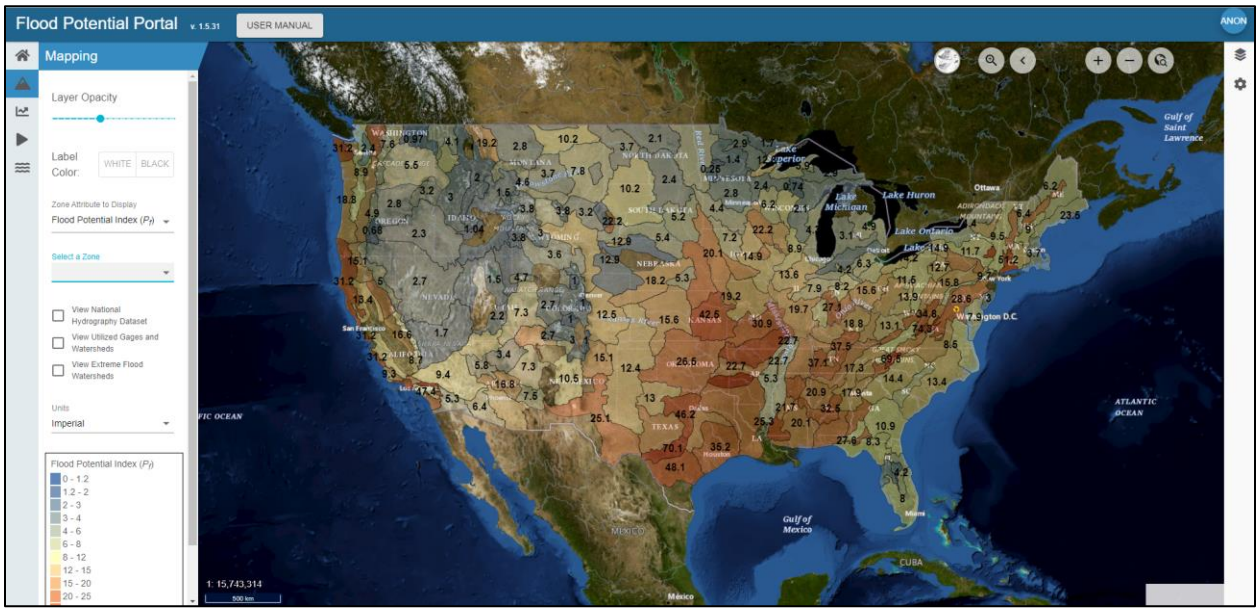
Flood Potential Portal: Quick Start Guide



Click on the links below and follow this workflow to start using the Flood Potential Portal:

- Accessing the Tool
- Mapping Capabilities
- Cross-Section Analysis
- Watershed Analysis
- Streamgage Analysis

Additional details on utilizing this decision support system are available in the Using the Flood Potential Portal section of this user manual.

Where using the Flood Potential Portal for design flood discharge and flood-frequency predictions, thoughtful consideration of results from multiple methods is required for the selection of the most appropriate values – a well-educated and experienced hydrologist, floodplain manager, or civil engineer is needed for this interpretation. The Flood Potential Portal was developed to help with this decision making, but does not replace this expertise.

Accessing the Tool

The Flood Potential Portal is available at: https://floodpotential.erams.com

Mapping Capabilities

This tool is tabbed with the symbol: 

1. Orient yourself to the key features of the map tool.

   a. On the top-right of the map, base layer selection, zooming and panning, and enter location tools are provided
   b. On the bottom-left of the map, scale and scale ratios are provided
   c. Within the left panel, there are controls for adjusting layer opacity, label color, zone attributes to display, flood potential zones to focus on (which can also be selected on the map), and the desired unit system. There are also toggles for viewing the national hydrography dataset, utilized gages and watersheds (in the flood potential analyses), and watersheds that have experienced extreme floods.
   d. On the right, there are tools for adding and displaying GIS layers, and a settings tool where base layers can be selected from a number of alternatives.
2. Pan and zoom in on the map, to begin exploring the delineated zones, and select different base layers.
   a. Zones are areas that experience a similar flood response. Choose from the variety of attributes available, to learn about floods in each zone.
   b. Zoom to regions of interest to explore flooding characteristics.
   c. Select different base layers, to provide different perspectives within the mapping tool.
3. Select a zone in your area of interest, and toggle on/off "*View National Hydrography Dataset*", "*View Utilized Gages and Watersheds*", of the flood potential method, and "*View Extreme Flood Watersheds*". These will display when zoomed in sufficiently.
   a. Extreme floods are systematically identified through the flood potential method, and are compared using the flood extreme index (E_f). Higher E_f values and warmer colors indicate greater extremity.
4. With a zone selected, explore the flood potential zone characteristics displayed below the map. The primary tabs and characteristics are:
   a. ***Zone Summary***: Provides zone values and percentile ranks (compared to the entire extent), as well as equations for flood potential and index flood predictions.
   b. ***Zone Data***: Flood potential plot, showing utilized record peak discharges, expected flood potential regression (Q_{efp}), estimated maximum likely flood potential regression (Q_{mlf}), and low and high outliers. Floods greater than the Q_{mlf} are extreme. Hovering over each point provides information regarding the flood. A frequency plot of the largest annual 5% floods, by month, is also provided.
   c. ***Regional Comparison***: Comparative flood potential and flood hazard plots for the zone of interest and surrounding zones.

   Exporting tools for the tables and figures are provided.

Cross-Section Analysis

This tool is tabbed with the symbol: 

Explore the influence of topography on flood potential and variability through the use of the cross-section analysis tool, by cutting a cross-section across an area with multiple zones and topographic relief.

a) For more informative results, cut transects across distances from 100 to 500 miles (kilometers).
b) The calculation interval is varied, with the time required for the regeneration noted when entering a new interval.
c) Adjust the calculation interval to 1 or 2 mi (1 or 2 km), to view a more accurate rendition of the topography.

Watershed Analysis

This tool is tabbed with the symbol: 

The watershed analysis tool provides flood discharge estimates using both flood potential and traditional flood-frequency methodologies; the use of multiple approaches for quantifying expected flood magnitudes provides multiple perspectives and greater knowledge, for the selection of the most appropriate magnitudes for floodplain management and infrastructure design. The Portal includes three approaches to prediction: (1) the flood potential method; (2) an index flood method that utilizes flood potential zones, and (3) U.S. Geological Survey regional regression equations. Methods 2 and 3 provide flood-frequency distributions.

1. Zoom in to a scale < ~1:10,000 and select an outlet point, or enter the latitude and longitude coordinates. Select the most appropriate base layer to best identify this point within the stream system, which may be aerial imagery. View the National Hydrography dataset, if desired. Click ***Delineate Watershed From Outlet*** and wait for the delineation to be created. Note the ***Running…*** notification in the left panel.
2. Check the red delineated watershed boundary for accuracy. If the delineated watershed is small, compared to what is intended, click ***Delineate Large Watershed*** and (once results are updated) check the red delineated watershed boundary for accuracy.
3. Click ***Run Watershed Analysis*** and wait for the analysis results. Note the ***Running…*** notification in the left panel. Initially, the Flood Potential and Index Flood results will be displayed under the Calculations tab. The ***Running…*** notification will continue spinning until the USGS Regional Regression results are downloaded from the StreamStats application.
4. In some situations the Portal will stop attempting to download the results from the USGS, after a number of failed attempts. Click ***Fetch USGS USGS Regional Regressions*** to make additional attempts.
5. After the USGS regional regression results are downloaded from StreamStats, a second watershed delineation as determined by StreamStats is provided on the map (in yellow). Compare these watershed boundaries and their associated areas for consistency. If they do not sufficiently match, reselect the outlet point from a slightly different location and try again.
6. Inspect the results in the ***Calculations*** and ***Overview*** tabs, including the watershed areas, second predictors utilized in the regressions (other than watershed area), and the existence (or not) of trends in the observed magnitude and frequency of large floods. Pay particular attention to how the magnitudes compare between the different methods, including adjustments for trends in the flood potential magnitudes. The Overview tab also provides a summary of area-averaged indices (by zone) for the selected outlet point, which can be used to quantitively compare the flood risk between any two watersheds. Percentiles (compared to zones across the analysis extent) are also provided for these indices.
7. The ***Overview*** table can be exported for future reference and documentation. It is also advisable to take a screenshot (using an external program) of the map, for additional documentation.

Streamgage Analysis

This tool is tabbed with the symbol: 

The Flood Potential Portal has the capability to perform streamgage flood frequency analyses as defined in Bulletin 17B (IACWD, 1982) and Bulletin 17C (England et al., 2018; in development).

1. Draw or import a geometric shape to define an area of interest. Press the “Fetch Stations Within Bounds” button to activate a search for all streamgages with relevant data within this area.
2. Click on a point on the map or in the table to select a streamgage for analysis.
3. Create a plot of the annual peak discharges using the “Plot Annual Peak Discharges” button. Inspect these measurement through on hover, and note how these values compare to the expected flood potential discharge (Q_{efp}) for this site.
4. Click “Review Tabular Data (17B)” to inspect each of the annual peak discharge values, dates, detected high and low outliers, and set the generalized skew and variance. Unselect any data to be excluded from the analysis.

After reviewing the tabular data, click “Run Bulletin 17B” to perform the streamgage flood frequency analysis. Results are provided using the station skew and the weighted generalized skew.