

INFORMATION ABOUT THE FILES

The zipped download contains two or three files, depending on the hydrologic unit level.

For HUC8, HUC6, and HUC4 levels, the three files are: XX01d_YYY_data.txt, XX01d_YYY_flag.txt, and readme.pdf. XX is the time step and can be “wy” (water-year), “qv” (quarterly), or “mv” (monthly). YYY indicates whether the hydrologic units are listed by “row” or “col” (column). The _data.txt file contains the runoff values and the _flag.txt file lists whether finer resolution HUC-level estimates were filled-in with coarser resolution HUC-level runoff values. (See below for more information.)

The units of runoff in the _data.txt files are mm/XX, where XX is the time step. The values in the _flag.txt files indicate which HUC-level runoff values were used for each HUC and time step: 8 = HUC8, 6 = HUC6, 4 = HUC4, and 2 = HUC2. A value of -1 in the _data.txt and _flag.txt files indicates no data are available.

For the HUC2 level, the two files are XX01d_YYY_data.txt and readme.pdf. XX is the time step and can be “wy” (water-year), “qv” (quarterly), or “mv” (monthly). YYY indicates whether the hydrologic units are listed by “row” or “col”(column). The _data.txt file contains the runoff values. There is no _flag.txt file because HUC2 is coarsest resolution data.

DESCRIPTION OF HOW HYDROLOGIC UNIT RUNOFF WAS CALCULATED

The estimates of HUC runoff were generated by combining historical flow data collected at streamgages, the drainage basins of the streamgages, and the boundaries of the HUCs. The required steps (listed below) were applied to each individual water-year (WY) from 1901 to 2009 and to each of the HUC levels (HUC2, HUC4, HUC6, and HUC8). A water-year is defined as the period from October 1 to September 30, and the water-year designation (e.g., 1971) corresponds to the year of the ending date (e.g., September 30, 1971).

1. Streamgages were selected for each water-year based on two criteria: a complete daily flow dataset (365 or 366 days) for the water-year and a reasonably accurate basin boundary. The criterion for an acceptable basin boundary was an estimated drainage basin area within 25% of the basin area recorded in the USGS National Water Information System (NWIS). The streamgage basin boundaries were delineated using the WATERSHED command in ArcGIS and the flow direction grid provided with NHDPlus.
2. Runoff (RUN_BASIN, flow per unit area) was computed for each basin by dividing the average daily flow for the water-year by the drainage basin area. The runoff was assumed to be uniform over the entire basin area.
3. Each basin was overlain on a geospatial dataset of HUCs to determine the area of intersection between the basin the HUCs. For each basin/HUC combination, the proportion of the basin in the HUC (BASIN_IN_HUC) and the proportion of the HUC in the basin (HUC_IN_BASIN) were calculated. These proportions were multiplied by each other to compute a weighting factor (WEIGHT = BASIN_IN_HUC x HUC_IN_BASIN); the proportions and weighting factor were used in the computation of runoff for the HUC (RUN_HUC) as described below.

4. For each individual HUC, the RUN_HUC value was calculated as follows:

- If both the HUC_IN_BASIN and BASIN_IN_HUC values were greater than 0.9 for a HUC, then only the RUN_BASIN value for the basin with the highest WEIGHT value was used to compute the RUN_HUC value.
- If no basin/HUC combination had both HUC_IN_BASIN and BASIN_IN_HUC values greater than 0.9 for a HUC, then the RUN_HUC value was computed as a weighted average of (1) all RUN_BASIN and corresponding WEIGHT values for basins contained entirely within the HUC and (2) the RUN_BASIN and corresponding WEIGHT value for the smallest basin larger than the HUC.

Steps 3 and 4 for repeated for each of the hierarchical HUC levels (HUC2, HUC4, HUC6, HUC8). The individual HUC2s have largest areas (coarse-scale) and the HUC8s have the smallest areas (fine-scale).

For some water-year/HUC8 combinations, there were HUC8s with no overlapping streamgage basins. (The available streamgage basins vary from year-to-year depending on which streamgages have a complete daily flow dataset for the water-year.) In this situation, the RUN_HUC value for the appropriate HUC6 was used to “fill in” the missing HUC8 runoff value. If no HUC6 value could be computed, then the HUC4 value would be used instead; if no HUC4 value was computed, then the HUC2 value would be substituted. For a few water-year/HUC combinations, there are no HUC8, HUC6, HUC4, or HUC2 estimates, so no RUN_HUC value is estimated and a missing value flag (-1) is inserted in the dataset.