Hydrologic Unit Codes: HUC 4, HUC 8, and HUC 12

The Watershed Boundary Dataset (WBD) maps the full areal extent of surface water drainage for the U.S. using a hierarchical system of nesting hydrologic units at various scales, each with an assigned hydrologic unit code (HUC). HUCs are delineated and georeferenced to U.S. Geological Survey (USGS) 1:24,000 scale topographic base maps according to compilation criteria monitored by the national Subcommittee on Spatial Water Data.

The hydrologic unit hierarchy is indicated by the number of digits in groups of two (such as HUC 2, HUC 4, and HUC 6) within the HUC code. In EnviroAtlas, HUC 4 represents the subregion level, delineating large river basins (shown in yellow in the image). HUC 8 maps the subbasin level, analogous to medium-sized river basins (about 2200 nationwide, pictured in red in the image); and HUC 12 is a more local sub-watershed level that captures tributary systems (about 90,000 nationwide used by EnviroAtlas to display national metrics for the conterminous U.S.).

Things to know before using these data:

The EPA and USGS have incorporated WBD into their NHDPlusV2 dataset that integrates useful features from the National Hydrography Dataset (NHD), the National Elevation Dataset (NED), and the Watershed Boundary Dataset (WBD). These datasets are continually updated. The watershed boundaries data found in EnviroAtlas were updated in a WBD Snapshot in April 2015 to ensure that recent HUC boundaries are available in EnviroAtlas.

A watershed is defined as the geographic area within the boundary of a drainage divide. Watershed boundaries follow the highest ridgeline around the stream drainage area; the bottom of the watershed or the pour point is the lowest point of the land area where water flows out of the watershed. Hydrologic unit boundaries do not always surround a complete watershed but may delineate truncated portions of a larger watershed—for example, the mid-stem of a larger stream or river along with the tributaries in that area. Hydrologic units are generally synonymous with watersheds when their boundaries include all the source area contributing surface water to a single defined outlet point. This distinction between watersheds and HUCs is important in the context of water resources data analysis and water quality monitoring, because the area contributing to the downstream outlet point in a single HUC may extend beyond its boundaries in an upstream direction to include a number of other sub-basin HUCs.

Where can I go for more information?

The Natural Resources Conservation Service (NRCS) defines and compares true watersheds and hydrologic units and their applications for watershed assessment.

Water Supply Paper 2294 from USGS outlines the history and development of hydrologic unit maps, criteria for compilation and certification, and applications.

The improvements incorporated into NHDPlusV2 include greatly enhanced capabilities for upstream and downstream navigation, analysis and modeling. National WBD data, NHDPlusV2 User Guide (January 2016), and the metadata are available online.

NOTE: The data described in this fact sheet have not been prepared or reviewed by the EnviroAtlas team; they are sourced from publicly available external web services and as such are prepared, stored, and managed by the organization listed above. With current technology, the EnviroAtlas team has no control over the way these data display in our application. Please go to the sources listed here for more information.