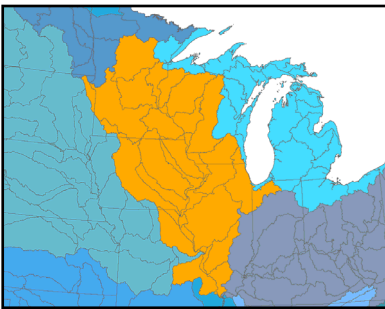


# About the new 24K HUC dataset

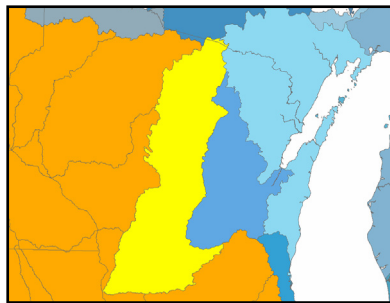
## What's a HUC?

NRCS and USGS are developing a nationwide digital watershed boundary dataset. The dataset is comprised of nested regions, called hydrologic units (HUs), which delineate progressively smaller watersheds. Each hydrologic unit has a code assigned to it, called a hydrologic unit code (HUC). A HUC is a series of two-digit groupings of numbers that describe a hydrologic unit's scale, plus where it fits in the larger hydrologic unit framework.

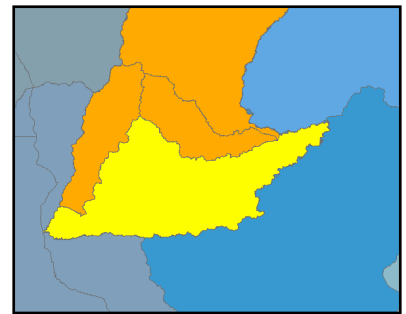
Hydrologic units range in size from regions, which can cover several states, to subwatersheds, which generally cover areas of 25 to 50 square miles. HUCs start with a two-digit code for the region level, and then additional two-digit codes are appended as one moves in to smaller watersheds. The subwatershed level contains a 12-digit HUC, as illustrated below.



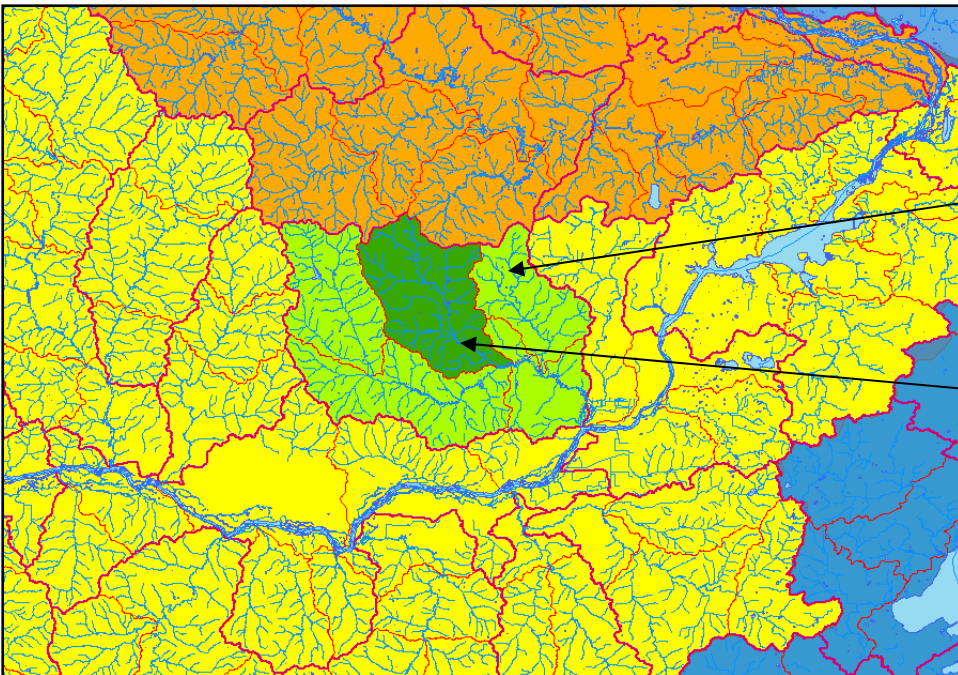
**07** – Upper Mississippi Region



**0707** – Wisconsin Subregion  
**070700** – Wisconsin Basin  
(same extent as the Wisconsin subregion)



**07070005** – Lower Wisconsin River Subbasin



**0707000504** – Honey Creek Watershed (green)

**070700050403** – North Branch Honey Creek Subwatershed (dark green)

## How this dataset was developed:

Generally, hydrologic unit boundaries are delineated in accordance with the "FGDC Proposal, Version 1.0 - Federal Standards for Delineation of Hydrologic Unit Boundaries 3/01/02".

([http://www.ftw.nrcs.usda.gov/huc\\_data.html](http://www.ftw.nrcs.usda.gov/huc_data.html)). This is a national watershed set involving land and water in all states, and was developed by federal agencies using federal guidance for the use by federal agencies. In many cases, state agencies were not involved or consulted. The lead agencies were USGS and NRCS.

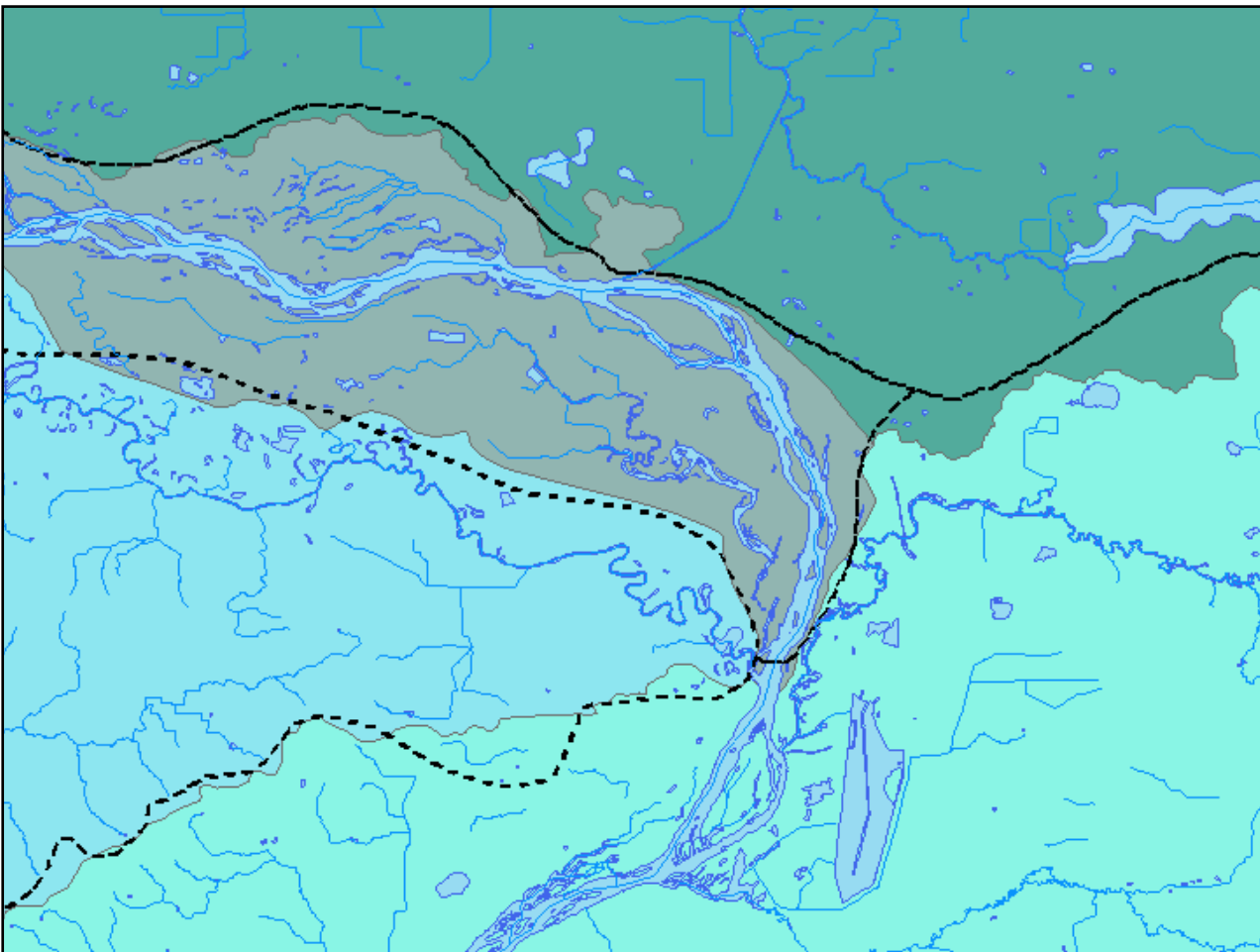
In Wisconsin, USGS and NRCS sought to involve WDNR due to our past watershed layer delineation. The Forest Service and EPA provided much of the work, and should be credited for all of their effort. USGS and NRCS would be working on this for many more years without the FS and EPA assistance. The Wisconsin delineation has been certified, and the national approval process has been or is being shut down.

For much of the state, USGS 1:24,000 topo maps were used as the base vertical data for watershed delineation. In the Lake Superior basin, 1:10,000 topo maps were used.

For the full description of the national HUC dataset, see the watershed boundary dataset page at <http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/>.

## What this dataset replaces:

The previous HUC data contained a single layer of 8-digit HUCs, digitized from 1:100,000 topo maps. This dataset dates back to the mid-1970s and is generally not suitable for use in GIS applications due to the coarse scale at which it was digitized, and the relatively crude and inconsistent method of watershed delineation that was used. The image below compares the new 1:24,000 8-digit HUCs (color fill) with the old 1:100,000 HUCs (dashed black lines) in the Portage vicinity.



In the 1990s, the 8-digit dataset was more finely delineated into 11 and 14 digit datasets. These datasets were developed without the benefit of national guidance, and never gained acceptance. They are no longer used or accepted. The new 10 and 12-digit HUC data replaces these, but in spite of fewer digits does not reduce the level of detail of the dataset.

For a complete history of HUC delineations and more information on the national 24k digital HUC conversion, visit <http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/history.html>.

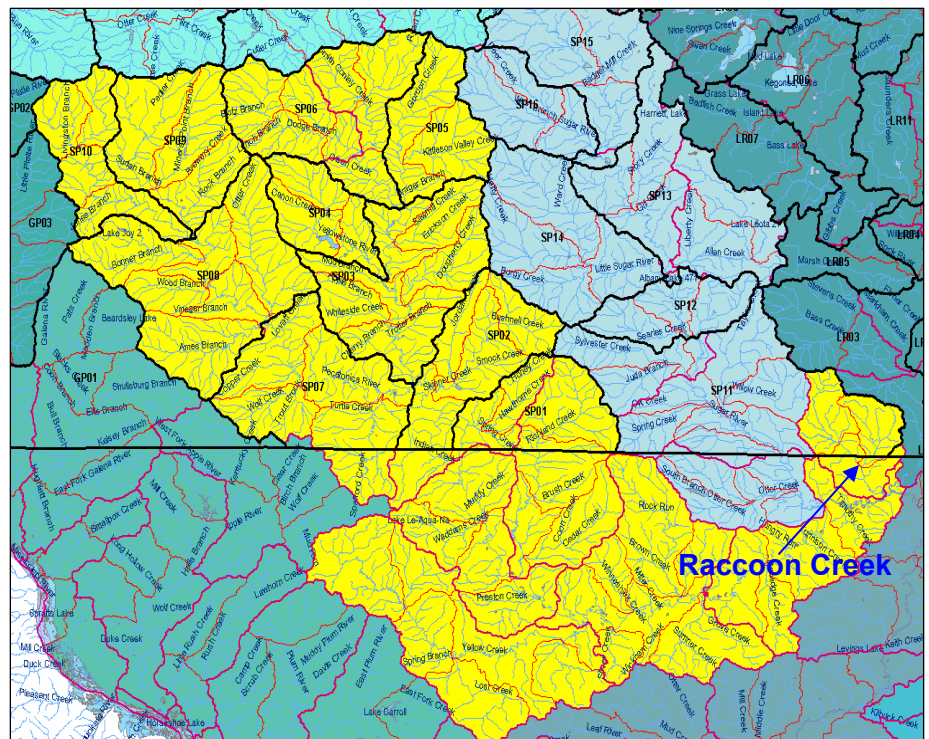
## How the HUC dataset compares to WDNR's 24K Watersheds:

The 10-digit HUC dataset is analogous to WDNR's 1:24,000 watershed data. Differences between the two datasets are in part the result of improved GIS watershed modeling, but are mostly due to differences in the emphasis of different watershed features:

- The 10-digit HUC layer gives greater emphasis to restricting HUCs to "natural watersheds" with a single "pour point". Any delineation of this type always results in adjoining areas that are too small to be 10-digit HUCs. Instead of adding these areas to an adjoining watershed, as was done in WDNR's watershed data, the national guidance calls for creation of additional 10 digit HUCs composed almost entirely of these "too small" leftovers. In developing the HUC dataset, it was a great challenge to aggregate these into something that made sense and not result in a very long, disjointed snake-like 10-digit HUC. However, many of these serpentine aggregated HUCs exist, particularly along larger rivers and the Lake Michigan shoreline.
- The national guidance did not allow the use of major rivers as boundaries, as used in WDNR's watershed data. For example, the Mississippi River could not be used as a HUC boundary. In contrast, and some would argue inconsistently, the national guidance did allow the shore of the Great Lakes to be used as a boundary. As a result, there are many 10-digit HUCs that span the Mississippi River and the Wisconsin River. In developing the HUC dataset, there were questions as to how wide a water body had to be before it could be used as a boundary, and care had to be exercised to not create something that was irrational. Lake Winnebago, which was delineated as its own 10-digit HUC, is an example of a loop hole in the guidance.
- The national guidance called for "ignoring" reservoirs, flowages, ditches, canals and other man-made features. As a result, there are a number of reservoirs split between two or three 10-digit HUCs, for example, Tainter Lake.

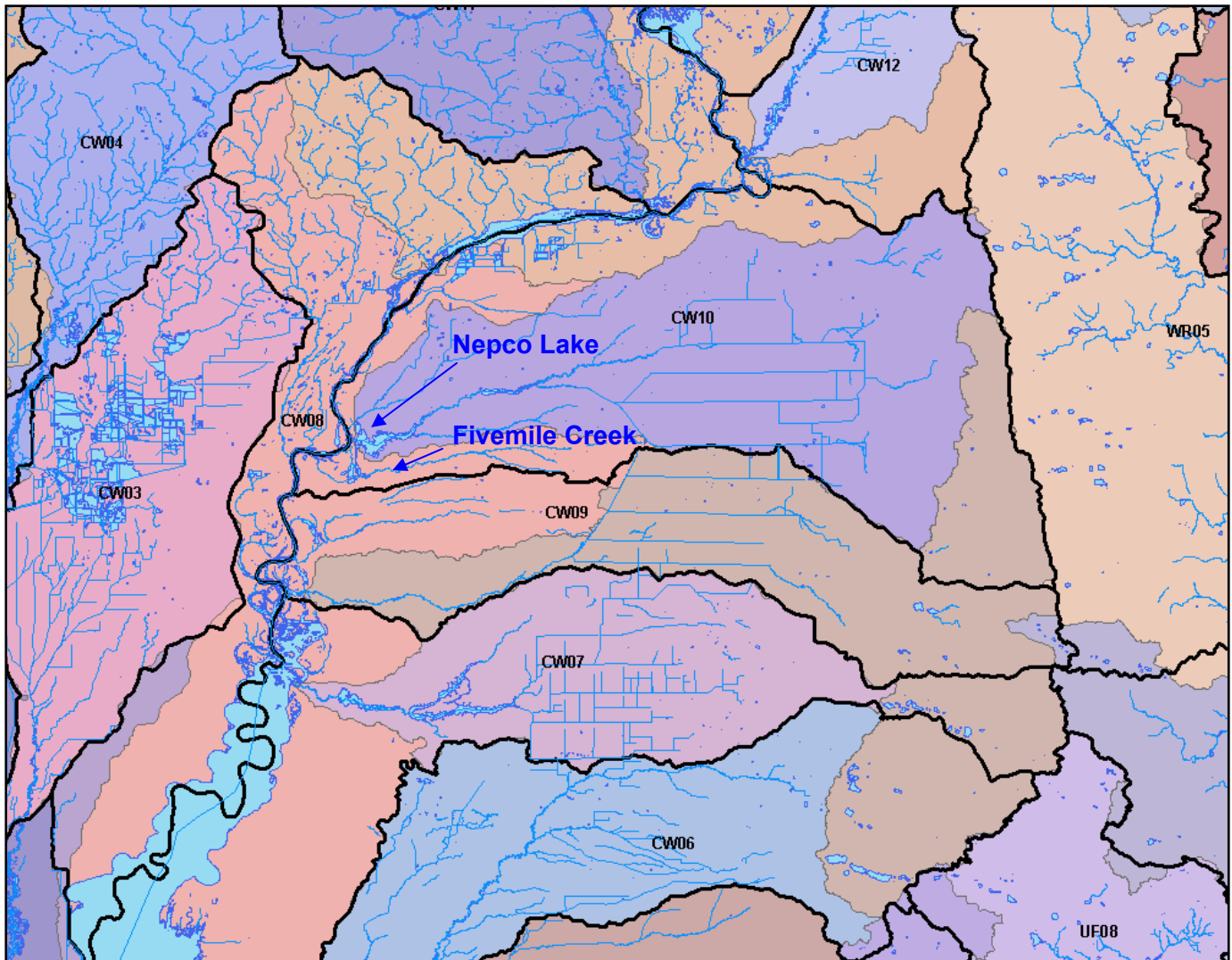
WDNR's watershed data took the reservoirs as water resources and delineated accordingly. In some parts of the state the national guidance was ignored, such as the Mississippi River lock and dam system.

- Since the HUC dataset is a national dataset following natural boundaries, HUCs at all levels can cross state lines. In the graphic at the right, the Pecatonica River subbasin (HUC 07090003) contains two extents in Wisconsin. In the WDNR watershed data, the Raccoon Creek watershed is lumped in with the Sugar River in watershed SP11.





Watershed delineation is based to a large degree on what one chooses to emphasize, and different choices can result in a different -- but perfectly correct -- hydrologic delineation. The graphic below illustrates some of the differences between 10-digit HUCs (color fill) and WDNR 24k watersheds (black outline, labels) in the Stevens Point/Wisconsin Rapids/Petenwell Lake region. Note how Fivemile Creek is included in the WDNR watershed CW10, but in the HUC dataset is lumped in with the rest of the small streams flowing into Petenwell Lake (HUC 0707000307). This example shows the difference between using the dam at Nepco Lake as the watershed "pour point" versus not recognizing its existence.



## 12-digit HUC attribute descriptions:

**Hydrologic Unit Code (HUC):** Twelve Digit Hydrologic Unit Code - This field provides a unique 12-digit code for each subwatershed. Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined, numbers were assigned in a clockwise fashion.

**HUC Name:** Sixth Level Hydrologic Unit Name - Officially recognized names were used in this field. This field was populated by following the directions in subsection 6.3, "Watershed and Subwatershed Naming Protocol", of the Federal Standards For Delineation of Hydrologic Unit Boundaries. The name used to attribute the subwatershed was used only once within a 4th level unit.

**HUC Type:** Sixth Level Hydrologic Unit Type - This field was populated with the hydrologic unit type from the list provided that most closely identifies the subwatershed.

**S** - "Standard" hydrologic unit - Any land HU with drainage flowing to a single outlet point, excluding non-contributing areas. This includes areas or small triangular wedges between adjacent HUs that remain after classic hydrologic units are delineated. Some examples include "true", "classic", "composite", and "remnant" hydrologic units.

**C** - "Closed Basin" hydrologic unit - A drainage area that is 100% non-contributing. This means all surface flow is internal, no overland flow leaves the hydrologic unit through the outlet point.

**F** - "Frontal" hydrologic unit - Areas along the coastline of lakes, oceans, bays, etc. that have more than one outlet. These HUs are predominantly land with some water at or near the outlet(s).

**M** - "Multiple" hydrologic unit - A hydrologic unit with more than one outlet, excluding frontal and water units.

**W** - "Water" hydrologic unit - Hydrologic units that are predominantly water with adjacent land areas, ex. lake, estuaries.

**I** - "Island" hydrologic unit - A hydrologic unit that is one or more islands and adjacent water out to the toe of the shore face.

**U** - "Unclassified" hydrologic unit - A hydrologic unit that can't be defined or doesn't fit into one of the types that have been listed.

**Hydro Modifications:** Sixth Level Hydrologic Unit Modifications - This field identifies any type of man-made modification(s) to natural overland flow that alters the location of the hydrologic unit boundary for a 12-digit subwatershed. One or more of the following abbreviations was chosen for this field.

**SC** - Stormwater Canal

**ID** - Irrigation Ditch

**IT** - Interbasin Transfer

**BC** - Barge Canal

**SD** - Stormwater Ditch

**PD** - Pipe Diversion

**CD** - Channel Diversion

**NC** - Non-Contributing Area

**KA** - Karst

**LE** - Levee

**NM** - No Modifications

**OC** - Overflow Channel

**DM** - Dam at outlet or HU boundary

**GC** - General Canal

**PS** - Pumping Station

12-digit HUCs (Subwatersheds)	
<b>Hydrologic Unit Code (HUC):</b>	070700050601
<b>HUC Name:</b>	East Branch Blue Mounds Creek
<b>HUC Type:</b>	S
<b>Hydro Modifications:</b>	NM
<b>States Spanned:</b>	WI
<b>HUC Area (Acres):</b>	22481
<b>Noncontributing Area (Acres):</b>	0
<b>10 digit HUC:</b>	0707000506
<b>10 digit HUC Name:</b>	Blue Mounds Creek
<b>10 digit HUC Hydro Modifications:</b>	NM
<b>10 digit HUC Type:</b>	S
<b>8 digit HUC Name:</b>	07070005
<b>Next 12 digit HUC downstream:</b>	070700050603
<b>Next 10 digit HUC downstream:</b>	0707000512

**DD** - Drainage Ditch  
**AD** - Aqueduct  
**RS** - Reservoir  
**TF** - Transportation Feature (road, railroad, docks etc.)  
**GF** - Ground Water Flow  
**MA** - Mining Activity  
**UA** - Urban Area  
**OT** - Other

**States Spanned:** States - The "States" field includes the names of all state(s) that the subwatershed falls within. The 2-digit postal abbreviation in upper case and in alphabetical order was used, separated with a comma.

**HUC Area (Acres):** Acres - Area of subwatershed including non-contributing areas calculated to acres as a whole number, no decimals. The "Acres" field was calculated from the "Area" field.

**Noncontributing Area (Acres):** Non-Contributing Area - Drainage areas that do not flow toward the outlet of any hydrologic unit are considered non-contributing. If a non-contributing area is on the boundary between two or more hydrologic units, the non-contributing area is associated with the hydrologic unit adjacent to the low point on the boundary. This attribute should be the total of the non-contributing areas within a hydrologic unit calculated in acres.

**10 digit HUC:** Ten Digit Hydrologic Unit Code - This field provides a unique 10-digit code for each "parent" watershed. This same number was used in every record that pertains to a subwatershed that resides within the same 10-digit watershed. Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion.

**10 digit HUC Name:** Fifth Level Hydrologic Unit Name - This field used officially recognized names only. This field was populated by following the directions in subsection 6.3, "Watershed and Subwatershed Naming Protocol", of the Federal Standards For Delineation of Hydrologic Unit Boundaries. The name used to attribute the watershed was used only once within a 4th level unit.

**10 digit HUC Hydro Modifications:** Fifth Level Hydrologic Unit Modifications - This field identifies any type of modifications to natural overland flow that alters the location of the hydrologic unit boundary for the "parent" 10-digit watershed. This field shows the most significant to least significant modification(s) to the watershed boundary. One or more of the following abbreviations was used.

**SC** - Stormwater Canal  
**ID** - Irrigation Ditch  
**IT** - Interbasin Transfer  
**BC** - Barge Canal  
**SD** - Stormwater Ditch  
**PD** - Pipe Diversion  
**CD** - Channel Diversion  
**NC** - Non-Contributing Area  
**KA** - Karst  
**LE** - Levee  
**NM** - No Modifications  
**OC** - Overflow Channel  
**DM** - Dam at outlet or HU boundary  
**GC** - General Canal  
**PS** - Pumping Station  
**DD** - Drainage Ditch  
**AD** - Aqueduct  
**RS** - Reservoir  
**TF** - Transportation Feature (road, railroad, docks etc.)  
**GF** - Ground Water Flow

**MA** - Mining Activity

**UA** - Urban Area

**OT** - Other

**10 digit HUC Type:** Fifth Level Hydrologic Unit Type - This field was populated with the hydrologic unit type from the list provided that most closely identifies the watershed.

**S** - "Standard" hydrologic unit - Any land HU with drainage flowing to a single outlet point, excluding non-contributing areas. This includes areas or small triangular wedges between adjacent HU's that remain after classic hydrologic units are delineated. Some examples include "true", "classic", "composite", and "remnant" hydrologic units.

**C** - "Closed Basin" hydrologic unit - A drainage area that is 100% non-contributing. This means all surface flow is internal, no overland flow leaves the hydrologic unit through the outlet point.

**F** - "Frontal" hydrologic unit - Areas along the coastline of lakes, oceans, bays, etc. that have more than one outlet. These HUs are predominantly land with some water at or near the outlet(s).

**M** - "Multiple" hydrologic unit - A hydrologic unit with more than one outlet, excluding frontal and water units.

**W** - "Water" hydrologic unit - Hydrologic units that are predominantly water with adjacent land areas, ex. lake, estuaries.

**I** - "Island" hydrologic unit - A hydrologic unit that is one or more islands and adjacent water out to the toe of the shore face.

**U** - "Unclassified" hydrologic unit - A hydrologic unit that can't be defined or doesn't fit into one of the types that have been listed.

**8 digit HUC Name:** Eight Digit Hydrologic Unit Code - A unique 8-digit code from the USGS map series "Hydrologic Unit Maps". The same number was used in every record that pertains to a subwatershed that resides within the same 8-digit sub-basin. Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined numbers were assigned in a clockwise fashion..

**Next 12 digit HUC downstream:** Sixth Level Downstream Hydrologic Unit Code - This field was populated with the 12-digit code of the 6th level hydrologic unit that is receiving the majority of the flow from the subwatershed. Outlets created by ditching or other artificial drainage were not considered for this field. If a HU flows into one of the Great Lakes, the term "LAKE" was used. If a HU is a closed basin, this field was populated with the term "CLOSED BASIN".

**Next 10 digit HUC downstream:** Fifth Level Downstream Hydrologic Unit Code - This field was populated with the 10-digit code of the 5th level "parent" hydrologic unit that is receiving the majority of the flow from the subwatershed. Outlets created by ditching or other artificial drainage were not considered for this field. If a HU flows into one of the Great Lakes, the term "LAKE" was used. If a HU is a closed basin, this field was populated with the term "CLOSED BASIN".