Quantitative Microbial Risk Assessment Tutorial
Navigate the SDMPB and Identify an 8-digit HUC of Interest
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Summary

This tutorial reviews some of the screens, icons, and basic functions of the SDMProjectBuilder (SDMPB) that allow a user to identify an 8-digit HUC (HUC-8) of interest from which a pour point or 12-digit HUC (HUC-12) can be chosen for a microbial assessment. It demonstrates how to identify and delineate a HUC8-8, initiate the execution of SDMPB, navigate the SDMPB, use basic functions of the SDMPB tool bar, and identify and label a HUC-8.

Navigate the SDMPB and Identify a Watershed of Interest

PURPOSE

Automate data acquisition to meet input data requirements for a confederation of models

OBJECTIVE

Identify an 8-digit Hydrologic Unit Code (HUC-8) of interest from which a pour point or 12-digit HUC (HUC-12) can be chosen for a microbial assessment.

DEMONSTRATION

This tutorial reviews some of the screens, icons, and basic functions of the SDMProjectBuilder (SDMPB) that allow a user to identify an 8-digit HUC of interest from which a pour point or 12-digit HUC can be chosen for a microbial assessment. It demonstrates how to

- Identify and delineate an 8-digit HUC
- Initiate the execution of SDMPB
- Navigate the SDMPB
- Use basic functions of the SDMPB tool bar
- Identify a 12-digit HUC

SOFTWARE ACCESS, RETRIEVAL, AND DOWNLOAD

If users have already downloaded and installed the SDMPB to their computers by following the most current instructions, skip this step; otherwise, follow the installation instructions outlined for the SDMProjectBuilder in the QMRA tutorial, titled "Installation of Software for Watershed Modeling in Support of QMRA" (Whelan et al., 2017).

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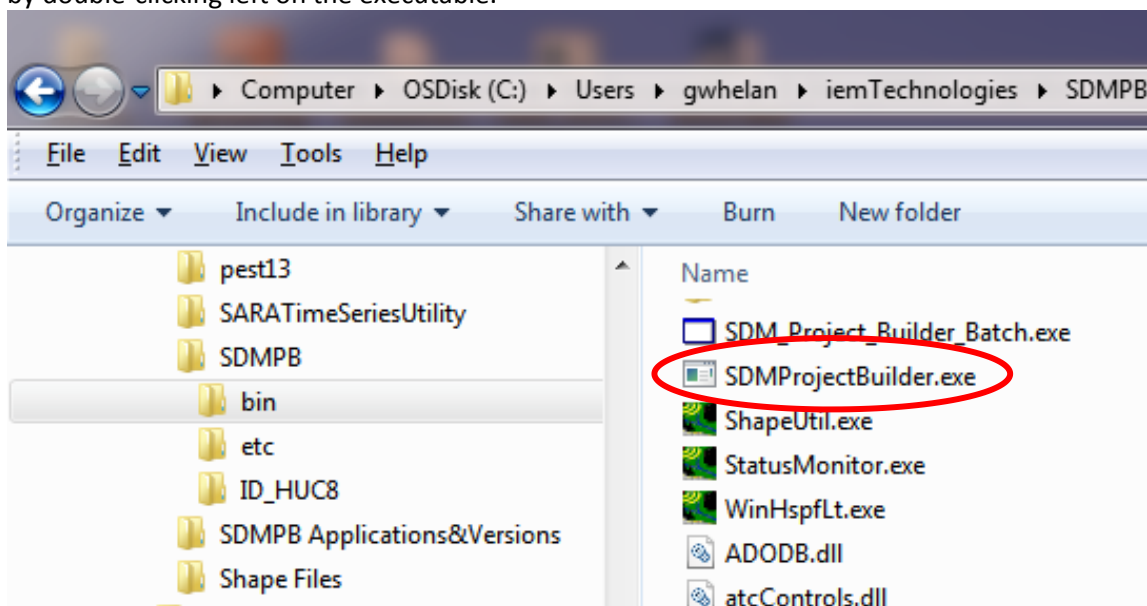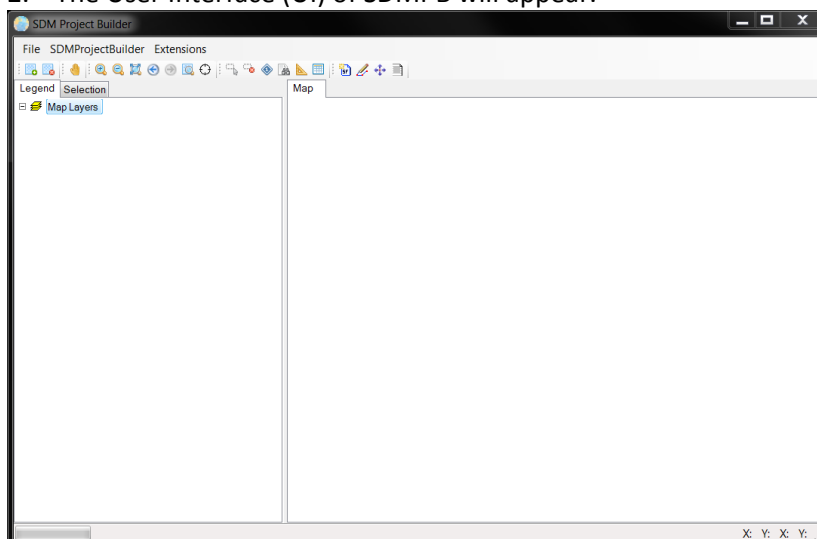**ESTABLISHING A WORKING FORLDER**

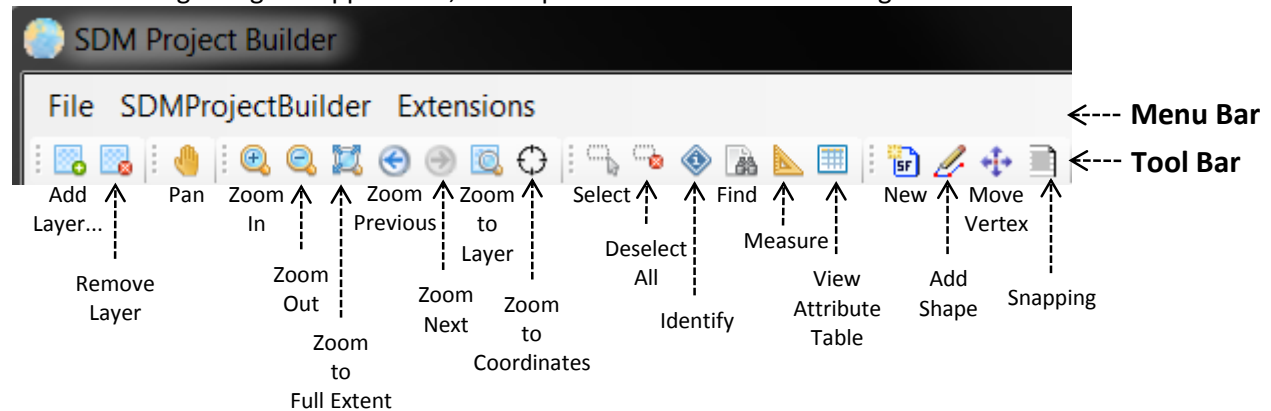1. An SDMProjectBuilder (SDMPB) shortcut icon should now appear on the computer screen:

Double-click left on the icon to execute the SDMPB application. If you cannot find the icon, locate the executable on your hard drive (i.e., SDMProjectBuilder.exe), typically in the folder name that you placed the SDMProjectBuilder (e.g., \SDMProjectBuilder\bin or \SDMPB\bin). In the following screen capture, the SDMPB was placed in the C:\Users\gwhelan\iemTechnologies\SDMPB folder. Execute the program by double-clicking left on the executable.

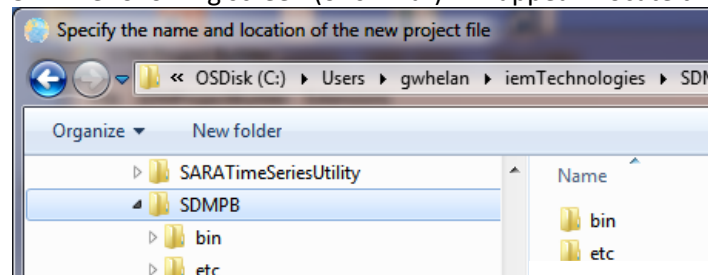2. The User Interface (UI) of SDMPB will appear.

3. Before beginning the application, it is important to know the meanings of the tool bar icons.
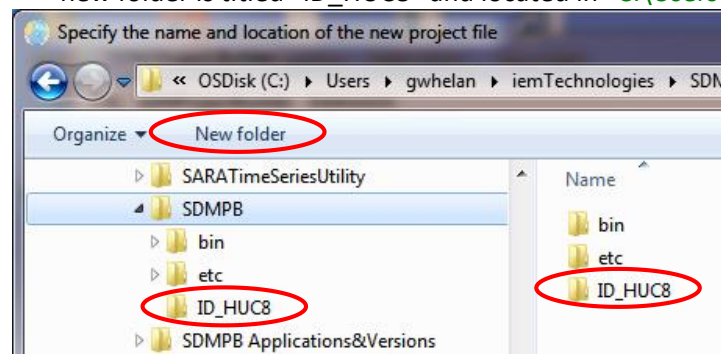

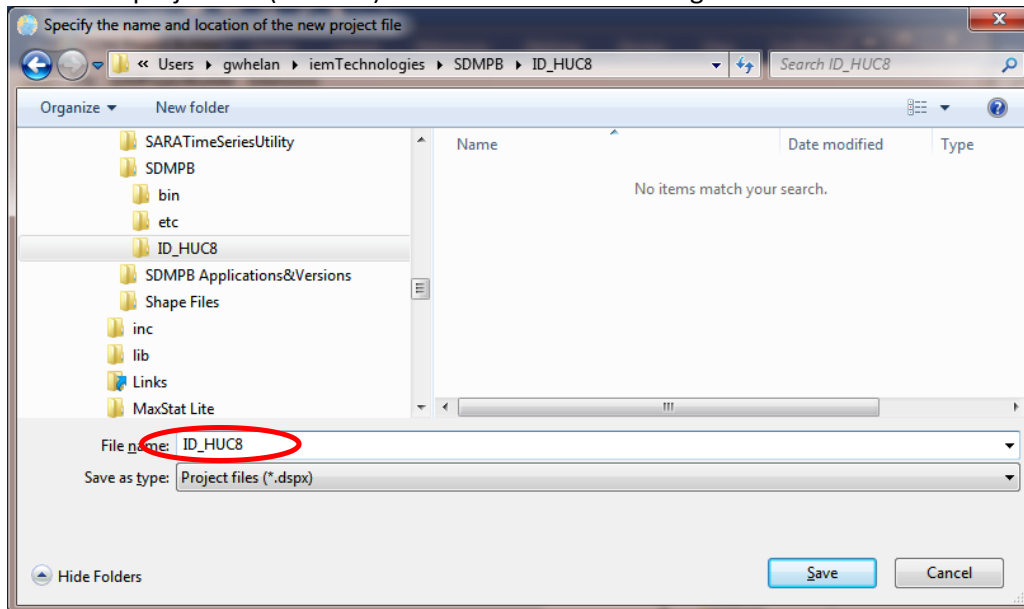4. From the Menu Bar, select "SDMProjectBuilder>New SDM Project" to define a new project.

5. The following screen (or similar) will appear. Locate the \SDMPB\ folder in this example.

6. The user must identify a working folder where the assessment will be housed. If a folder does not exist, the user can create one by clicking "New folder" and supplying a name. In this example, the new folder is titled "ID_HUC8" and located in "C:\Users\gwhelan\iemTechnologies\SDMPB".
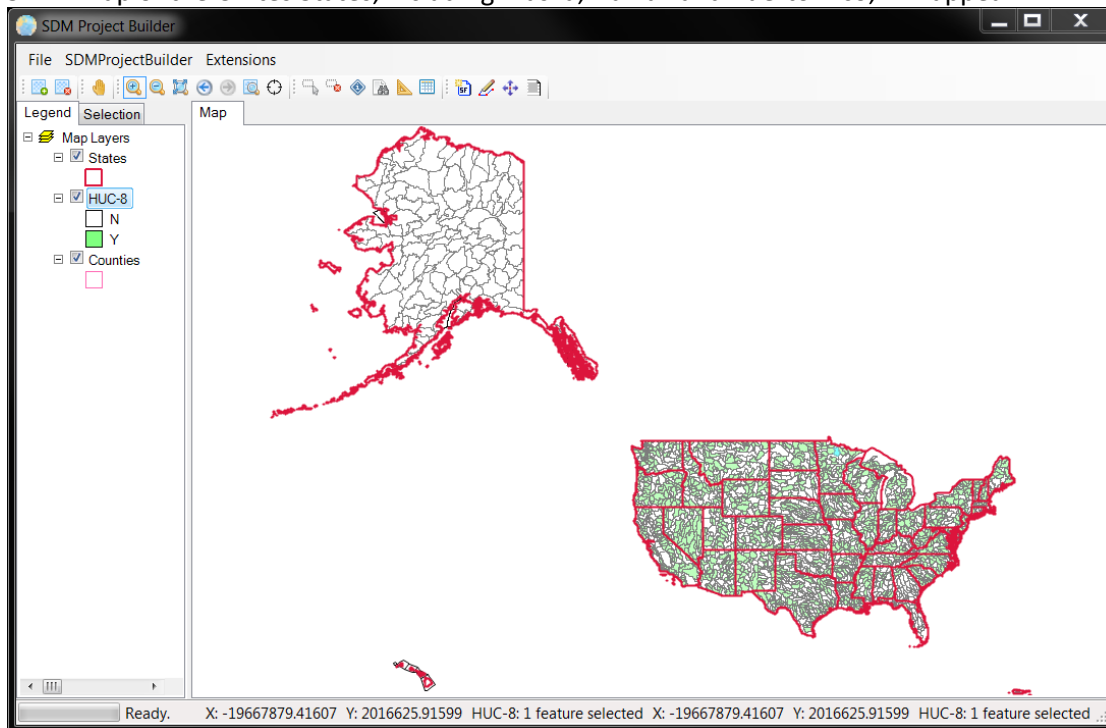
7. A name of the file for the project, the dot spatial project file, must be defined. In this case, the name of the project file ("TEST8") is the same as the working folder:
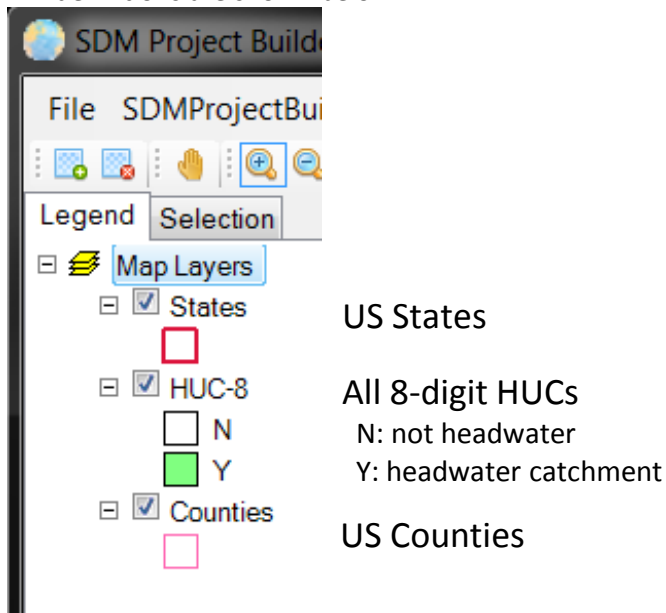

8. Click "Save".
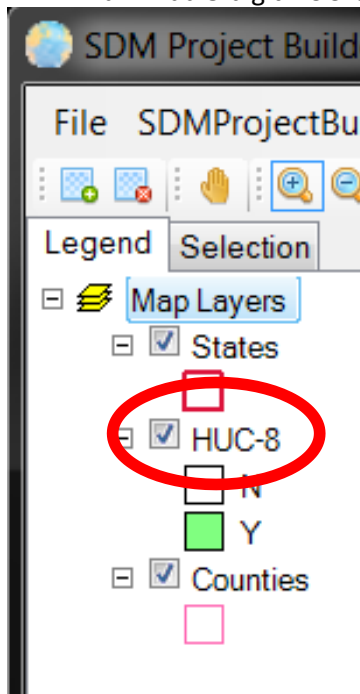
NAVIGATING THE SDMProjectBuilder INTERFACE

9. A map of the Unites States, including Alaska, Hawaii and Puerto Rico, will appear.
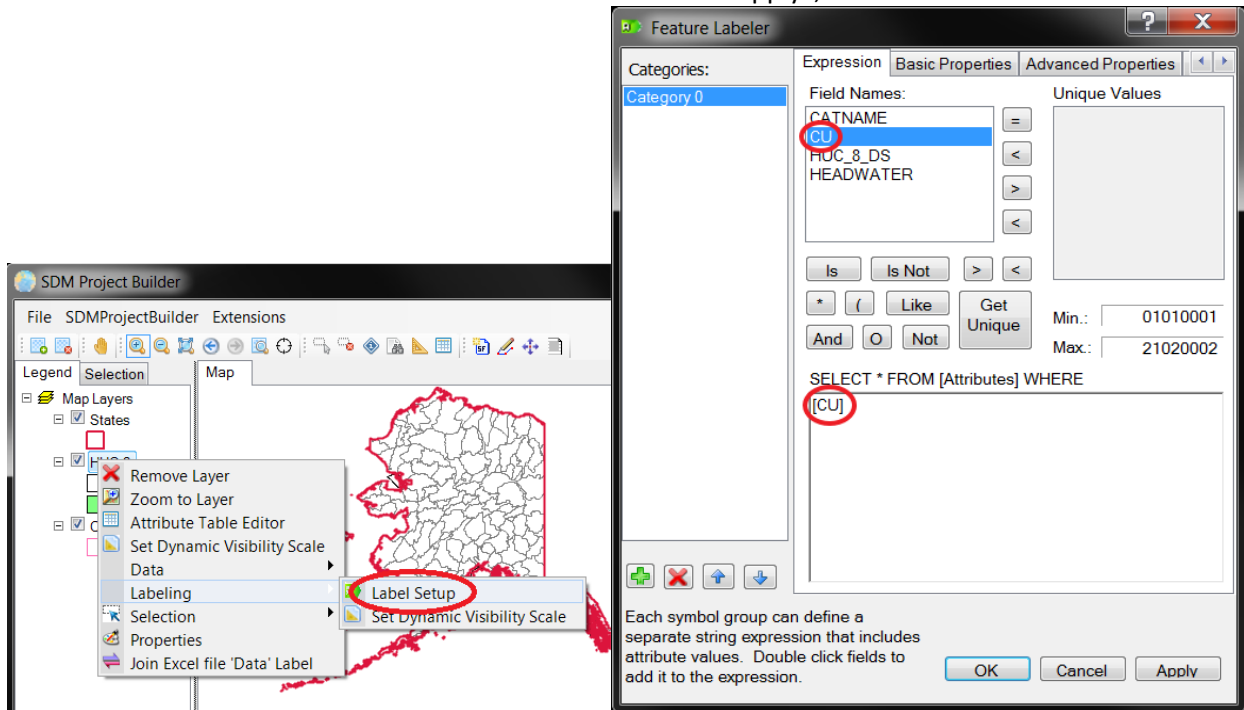
10. In the "Legend", the layers are sequentially displayed, top to bottom. They can be moved by holding the left mouse button down and moving it up or down to the desired position. Layers can be turned on or off by checking ("√") or un-checking the box at the left of the layer's name. The map layers' definitions are shown below.

US States

All 8-digit HUCs
 N: not headwater
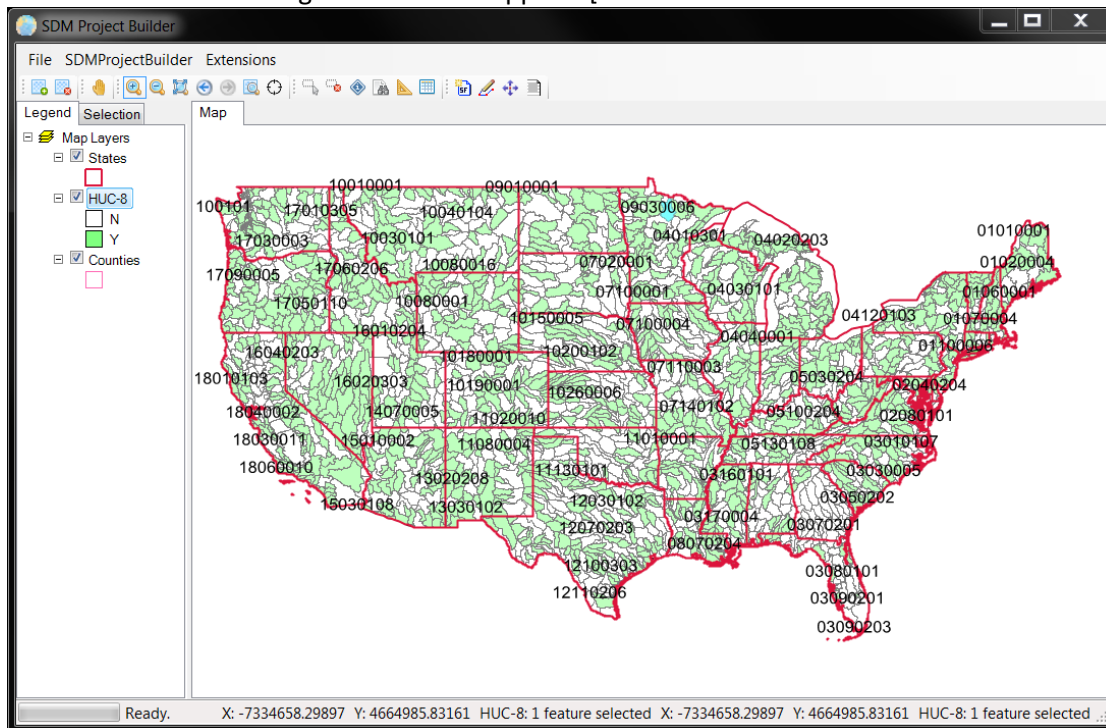 Y: headwater catchment

US Counties

11. To find a watershed and collect the desired data, identify each 8-digit HUC and its unique ID number called the Hydrologic Unit Code (HUC) Catalog Unit (CU). Assign CU numbers to the HUC-8s:
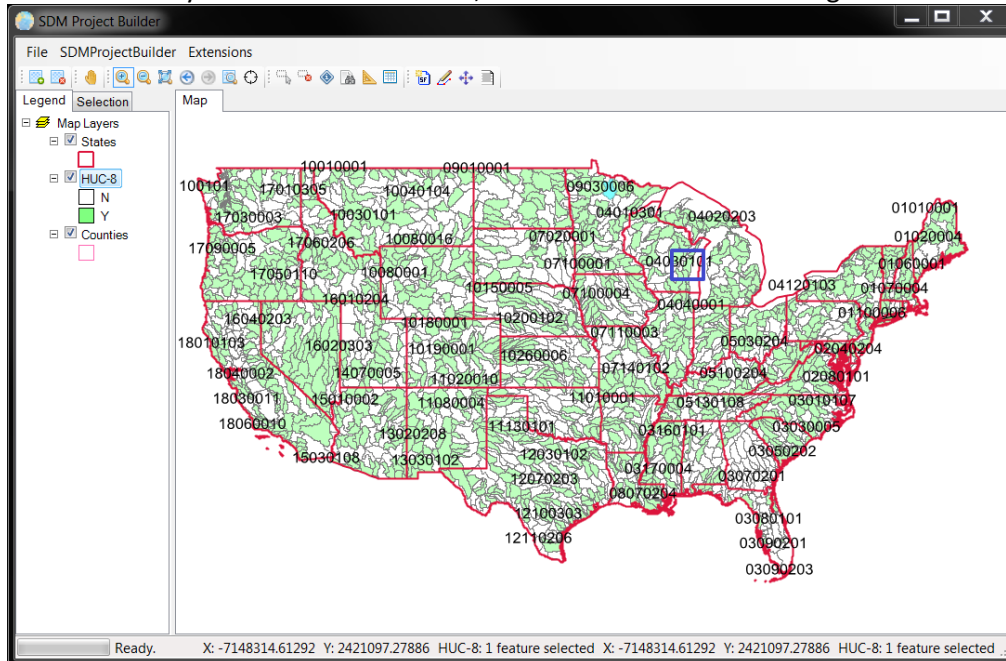   a. Add 8-digit HUC labels by right-clicking on the "HUC-8" Layer

b. Select "Labeling>Label Setup" and double click left on "CU". Make sure "[CU]" shows in the "SELECT" box at the bottom of the screen. Click "Apply", then "OK".
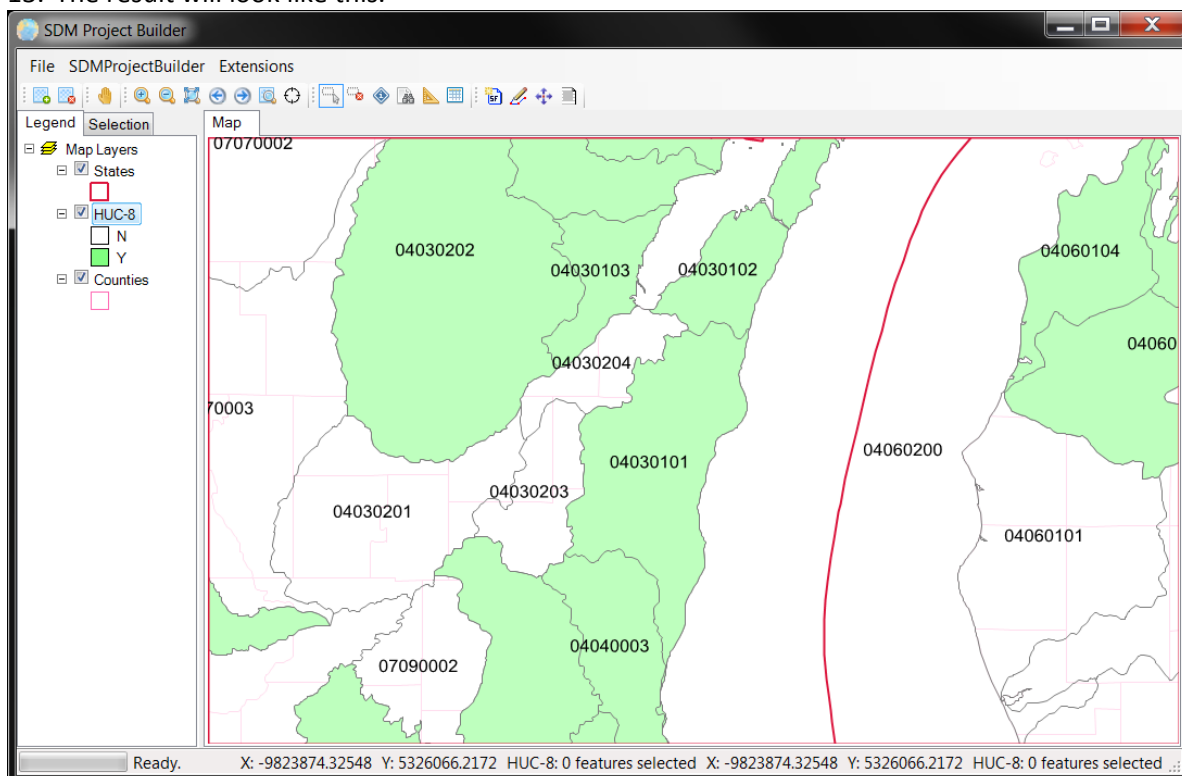
c. The following screen should appear. [Note: All HUC-8s now have associated CU ID numbers.]

12. We are interested in the Manitowoc River Basin in the County of Manitowoc, WI (see blue box in figure below), but there are many ways to identify this watershed. For example, we can zoom to the general area using the "Zoom In" button 🔍 on the tool bar. Click it, then go to the "Map" screen and identify the area to zoom in on, as with the blue box in the figure below.
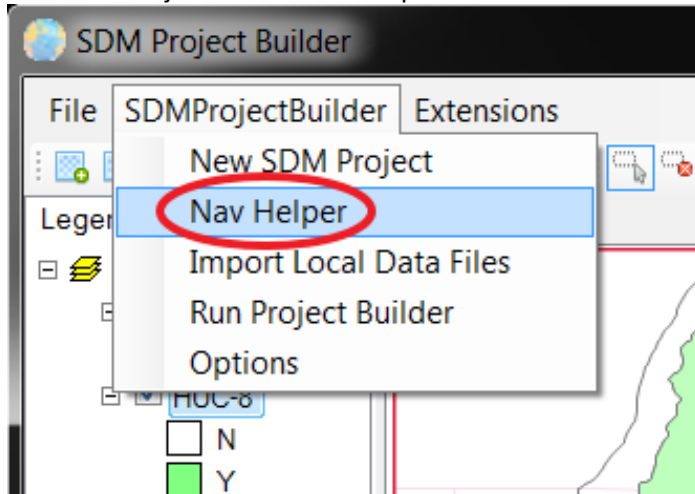

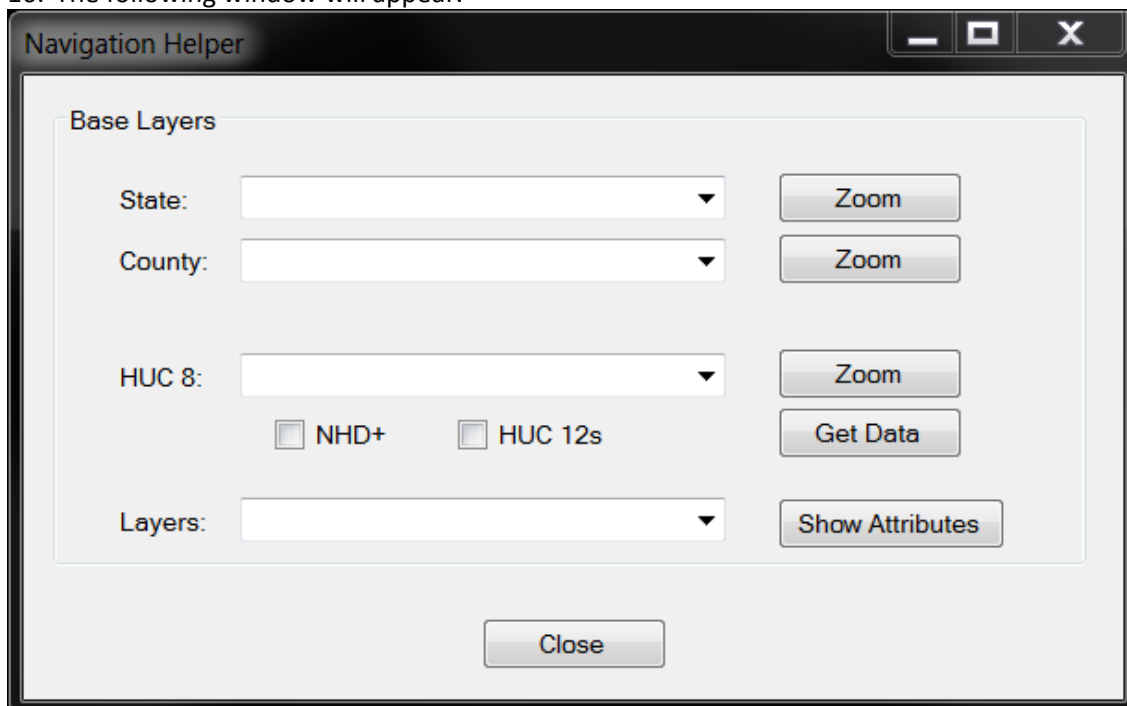13. The result will look like this.

14. The HUC we are interested in has a CU of 04030101. Now practice zooming in and out to identify the HUC-8 of interest.
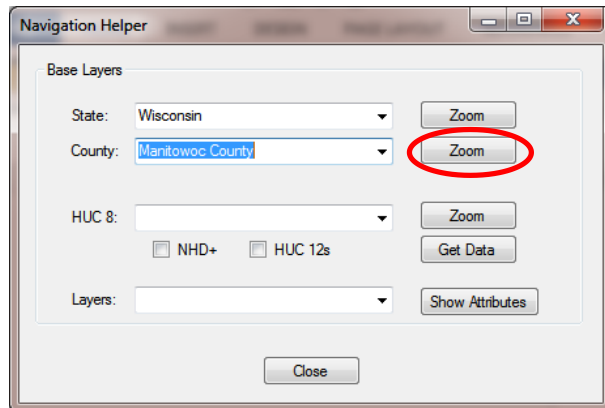
NAVIGATION HELPER

15. Use the "Navigation Helper" to collect the first map layers. On the menu bar, select "SDMProjectBuilder>Nav Helper".
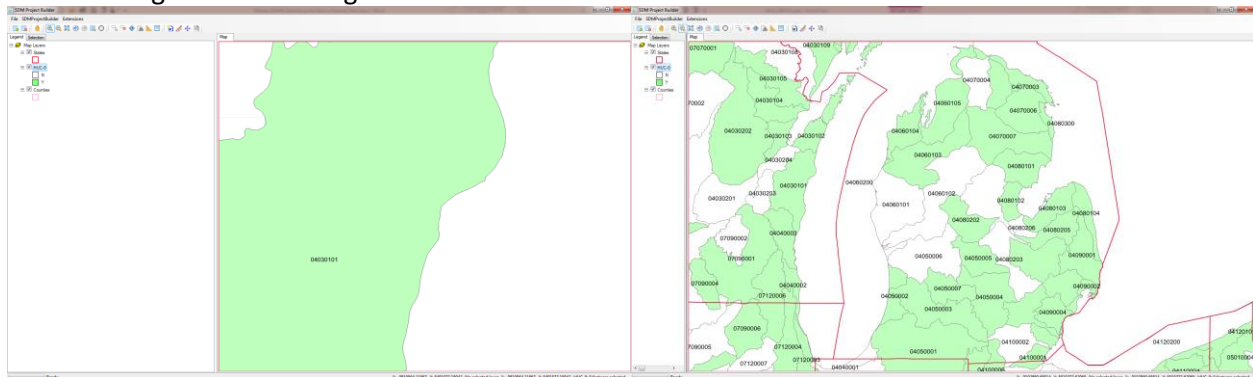

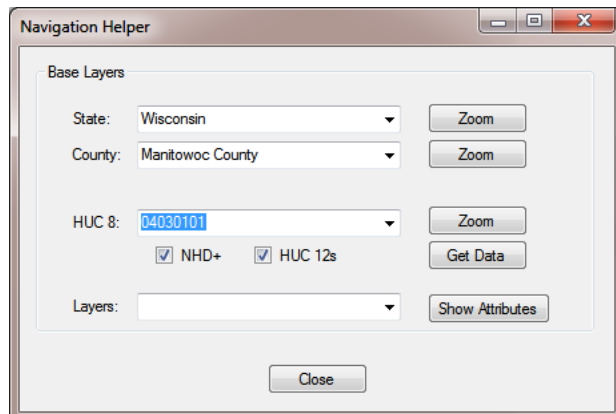16. The following window will appear.

17. With the "Navigation Helper", zoom to State, County, or HUC-8. If you do not know the HUC 8 identification number, but you know the location, you can type in the "State" and "County" and choose "Zoom". In our example, we are interested in the watershed in Manitowoc County, Wisconsin.
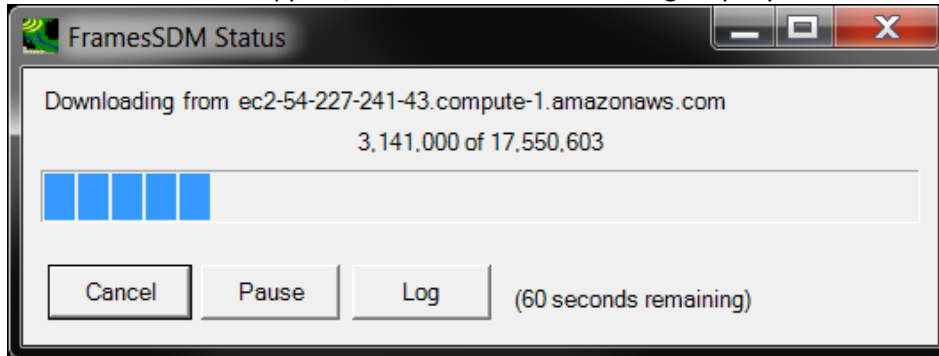

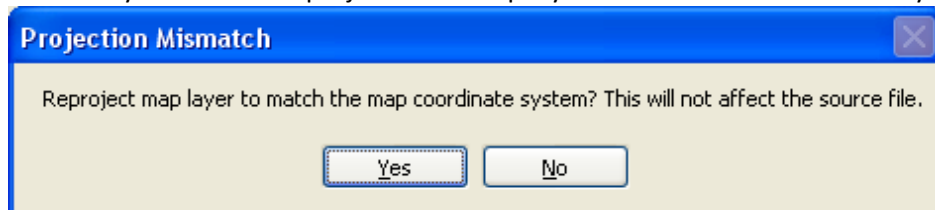
Resulting in the following:

18. A user can find a HUC-8 within the United States., by zooming in based on the State and County, or by directly inputting the HUC-8 identifying Catalog Unit (CU) code. From the figure, we can see that the HUC-8 CU identification number is 04030101, which we will need to collect data on the HUC-8. Type or choose "04030101" for "HUC 8", check the "NHD+" and "HUC-12" boxes, then click "Get Data" beside "HUC 8".
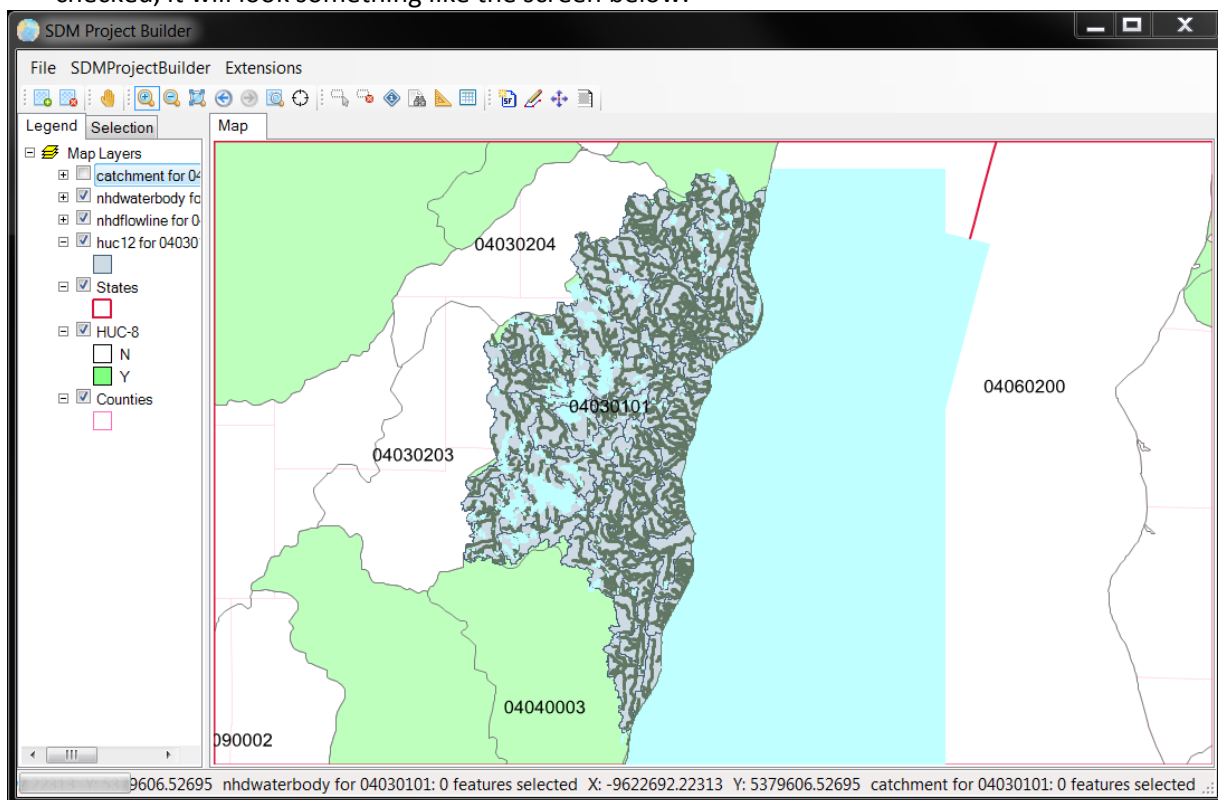
19. This window will appear; the SDMPB is downloading map layers.

20. If you encounter the Projection Mismatch screen, which may appear more than once, choose 'Yes' since you want to re-project these map layers to match the coordinate system.
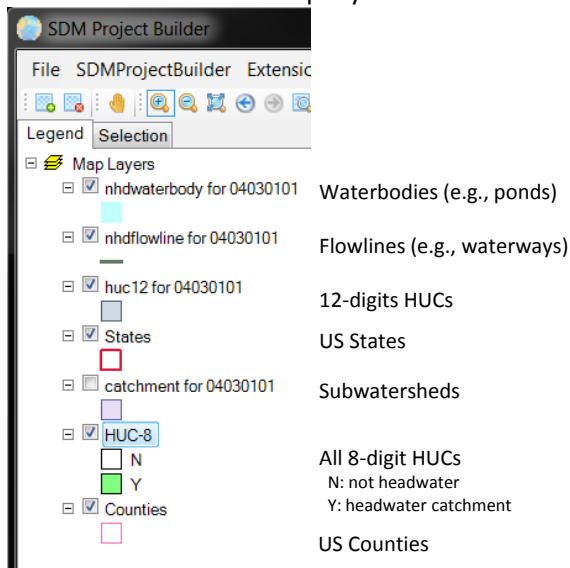

21. The map is now updated with HUC-12s and other features. Depending on which map layers were checked, it will look something like the screen below.
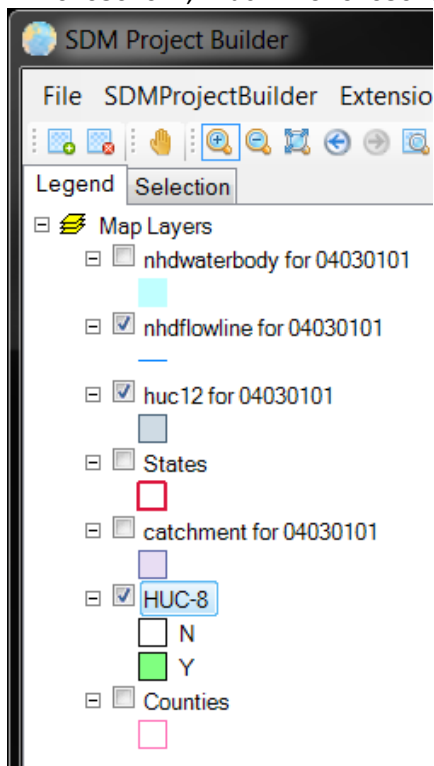
MANAGING MAP LAYERS

22. Definitions of the map layers are shown.

Waterbodies (e.g., ponds)

Flowlines (e.g., waterways)

12-digits HUCs

US States

Subwatersheds

All 8-digit HUCs
 N: not headwater
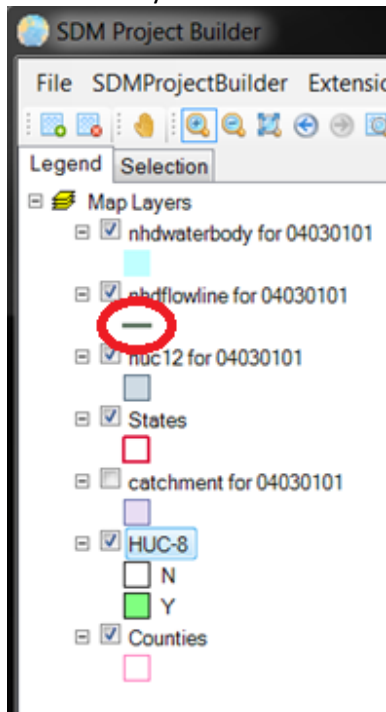 Y: headwater catchment

US Counties

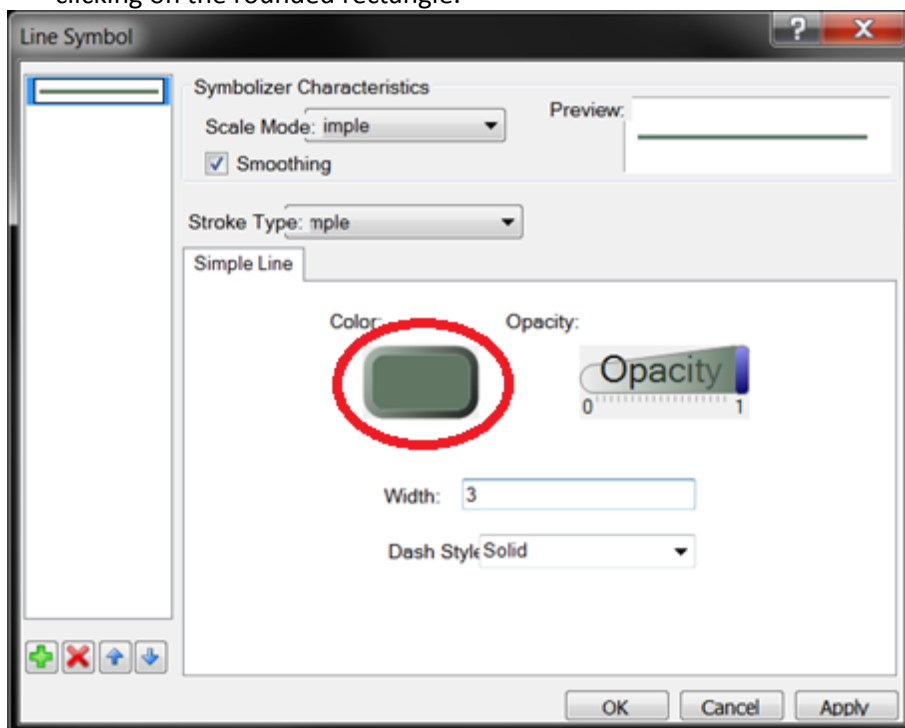23. Close the Navigation Helper by clicking "Close".

24. For clarity, colors associated with map layers can be modified. For example, turn on "nhdflowline for 04030101", "huc 12 for 04030101", and "HUC-8", with the other layers turned off.
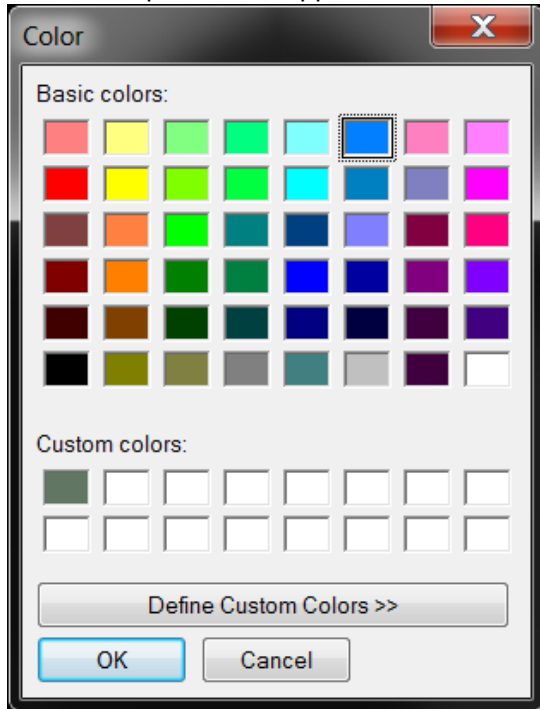
25. To adjust width and color of flowline associated with "nhdflowline for 04030101", double-click left on the symbol below "nhdflowline for 04030101".
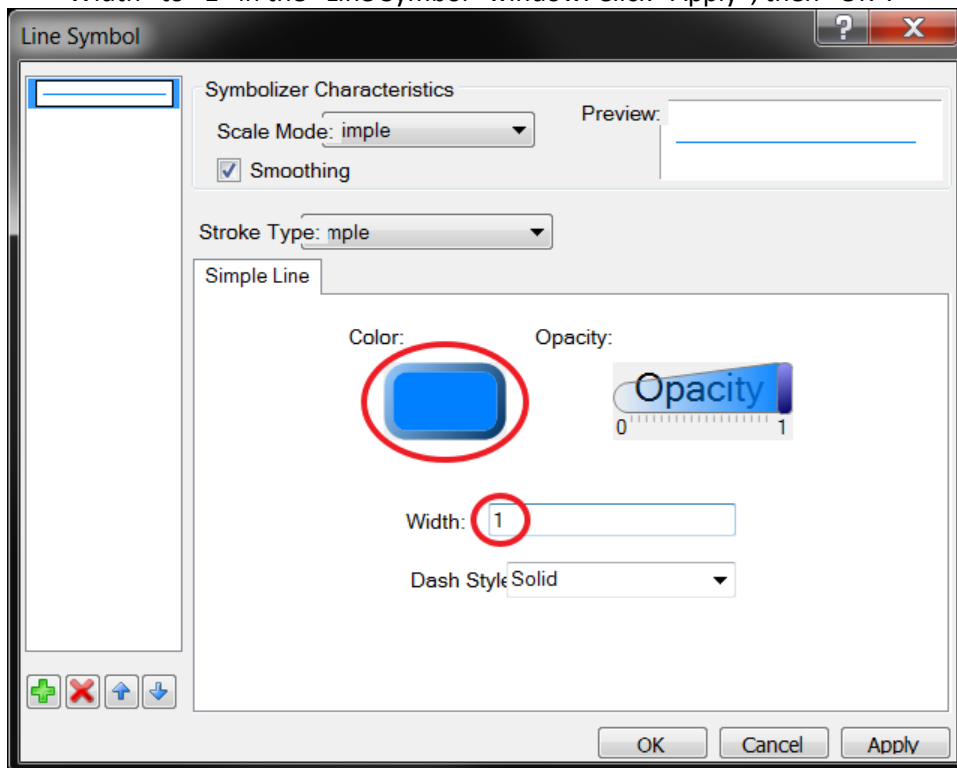

26. The "Line Symbol" window will appear. Modify the color by opening the "Color" window by left-clicking on the rounded rectangle.
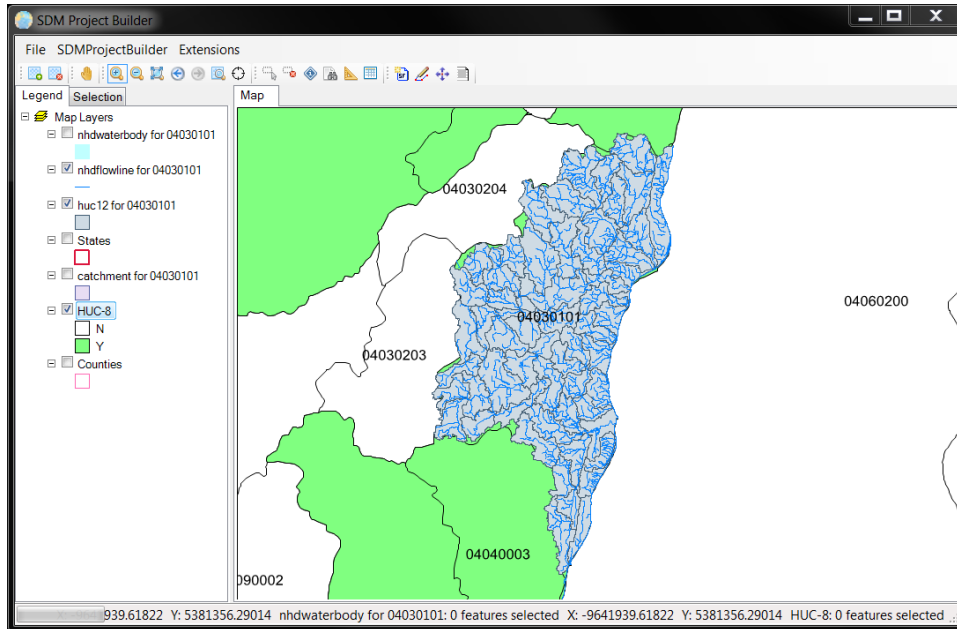
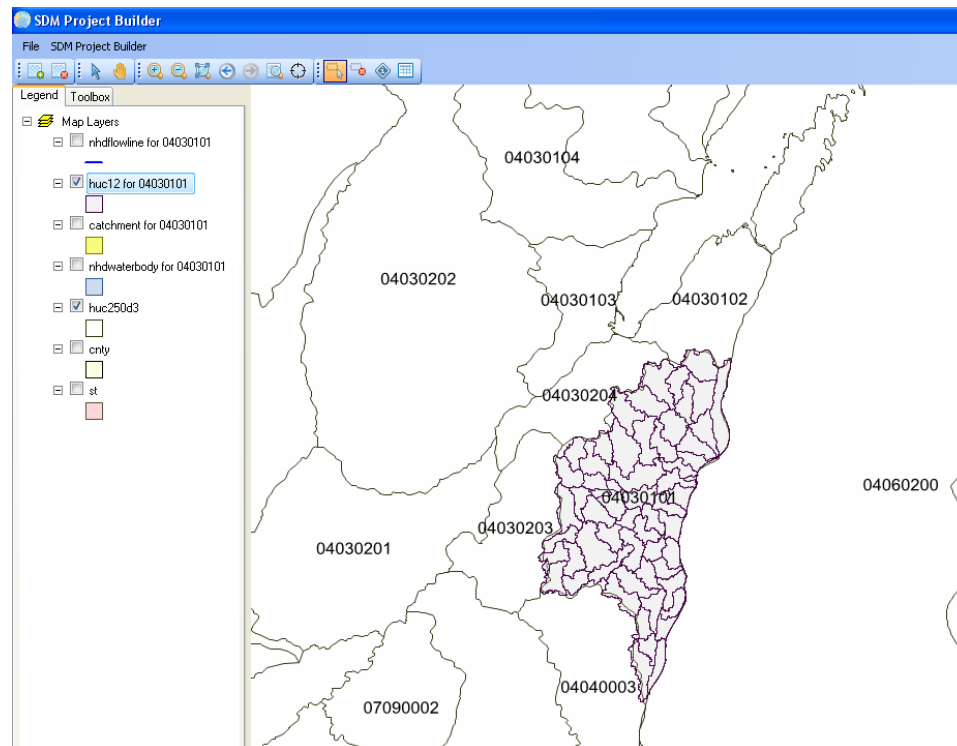27. A color palette will appear. Select blue and click "OK".

28. Make sure the color of the rounded rectangle changed to blue like the screen below. Change "Width" to "1" in the "Line Symbol" window. Click "Apply", then "OK".
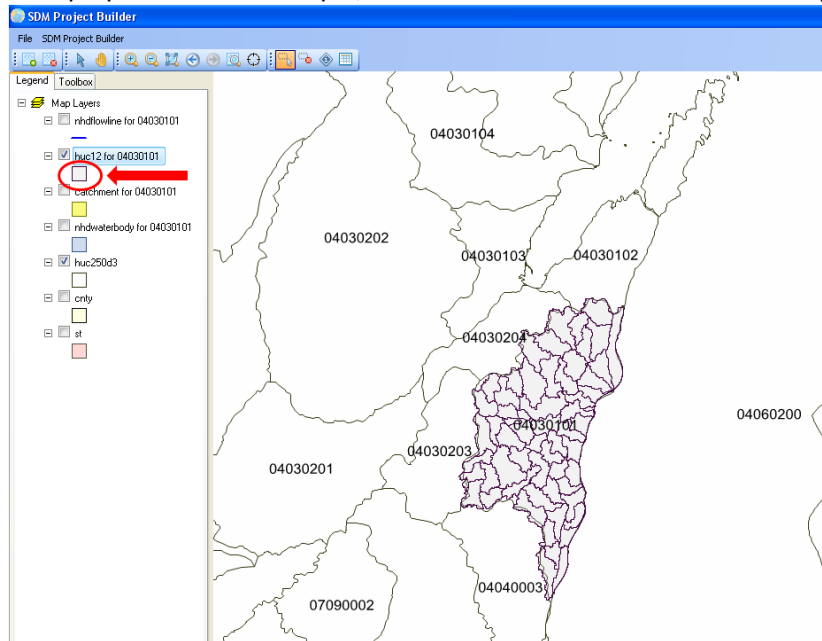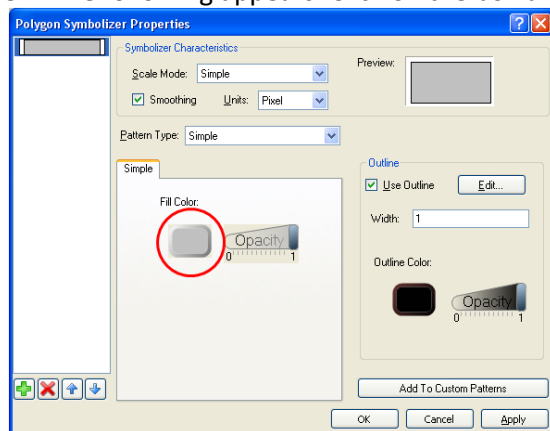
29. Now we have better view of the watershed.

30. Rearrange the Map Layers as illustrated below. Place the 'ndflowline for 04030101' on top, followed by 'HUC-12 for 04030101', deselecting all map layers except the 'huc 12 for 04030101' and 'huc250d3'.

31. The user now can change the color associated with a Map Layer and even define its degree of opaqueness. For example, double-click on the box under the Map Layer, 'HUC-12 for 04030101.'

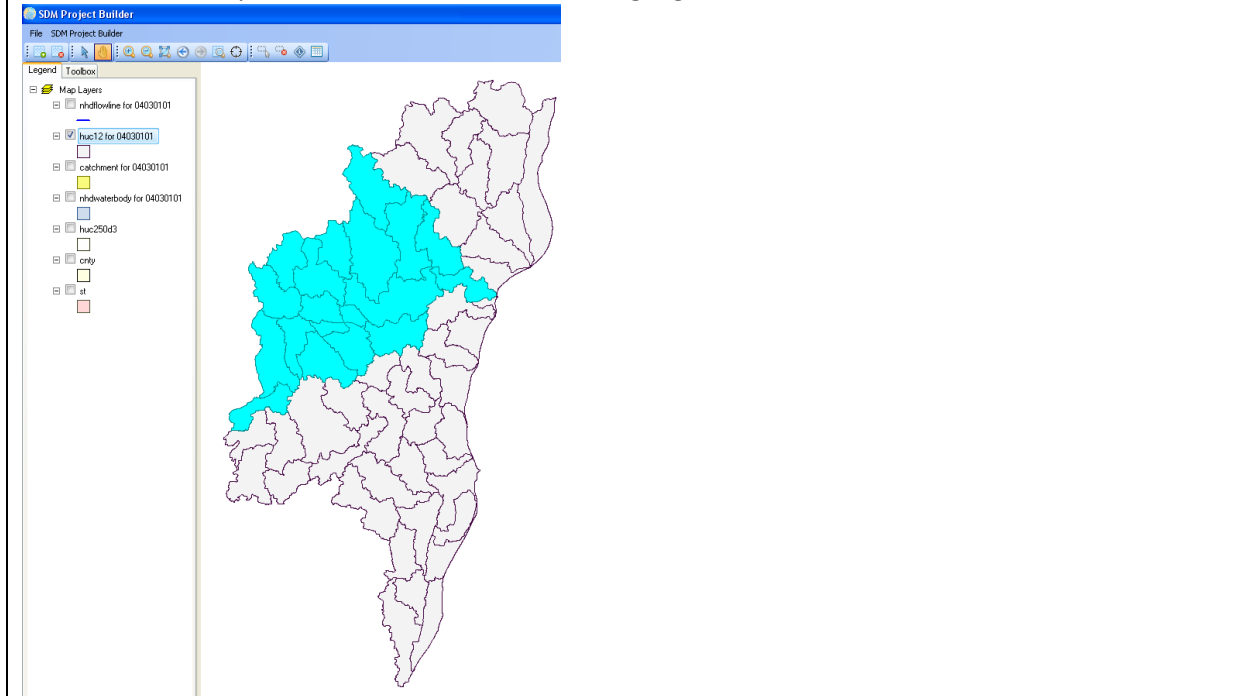32. The following appears. Click on the box under 'Fill Color.
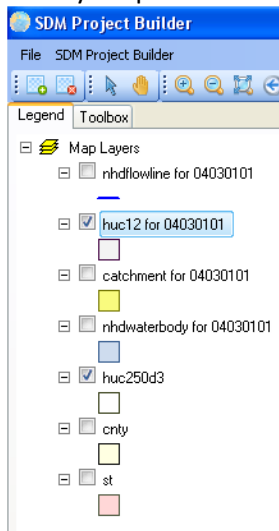

33. The following appears. Pick a color, and choose OK.

> Opaqueness can be changed by sliding the bar labeled 'Opacity.' 'Line Width' and 'Outline Color' can also be modified; modifying the 'Line Width' is very helpful in differentiating boundaries, stream networks, etc.

34. Check results by choosing 'Apply.' Now, pick 'OK.'

> In this example, we are interested in the Manitowoc Watershed which is a subset of the HUC-8. The HUC-12s that comprise the Manitowoc Basin are highlighted below.
>
>

35. To demonstrate how the HUCs were highlighted, select "huc-12 for 04030101" and move the map layer up in the listing to ensure it is one of the top layers.

18

36. Using the Select button on the tool bar, click on each HUC-12 on the map while holding the Ctrl key down.

DISCLAIMER

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REFERENCES

Whelan, G., K. Kim, K. Wolfe, R. Parmar, M. Galvin. 2017. Quantitative Microbial Risk Assessment Tutorial: Installation of Software for Watershed Modeling in Support of QMRA – Updated 2017. EPA/600/B-15/276, U.S. Environmental Protection Agency, National Exposure Research Laboratory, Athens, GA.