Land Cover and Manning's n Values

Workshop

1 Objective

In this workshop, you will learn how to import land cover data and create vector classification polygons to replace important areas. You will then learn how to assign Manning's n values based on the land cover classification.

2 Background

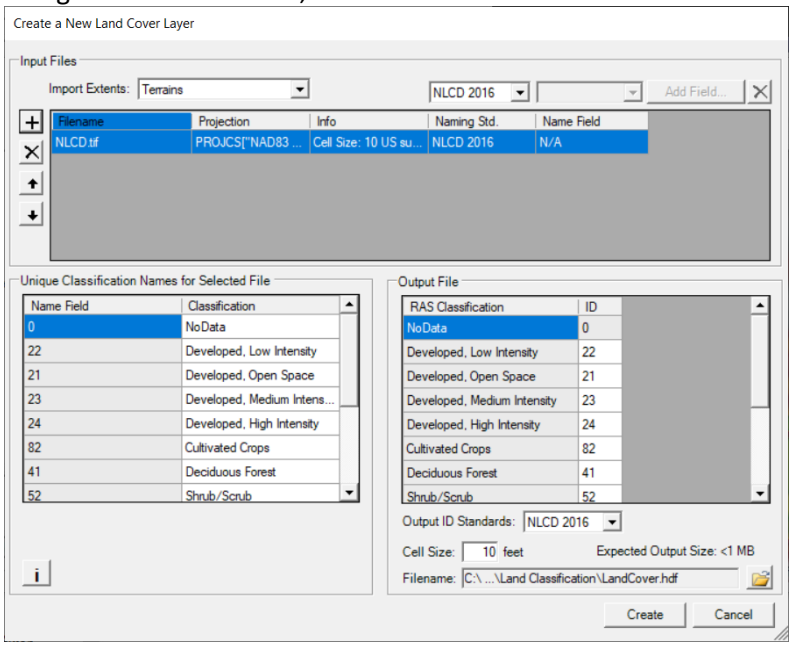
You will be working with data for a section of the White River at Muncie, IN.

3 Create a Land Cover Layer

This task will take you through the process of importing a NLCD dataset. The NLCD 2016 dataset was downloaded and has been clipped to the study area.

3.1 Import the NLCD Dataset

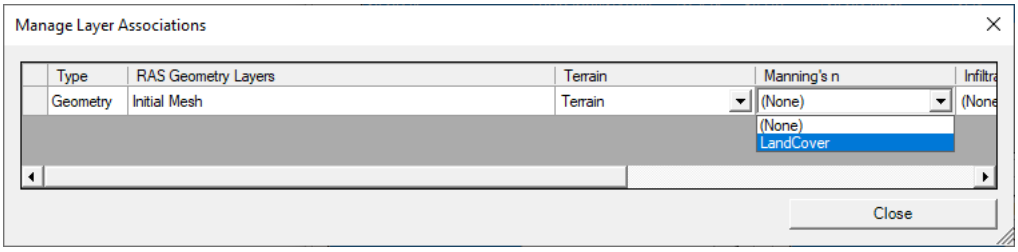
1. Start HEC-RAS and **open** the "**LC_ManningsN**" project.
2. Open **RAS Mapper**
3. Select the **Project | Create a New RAS Layer | Land Cover Layer**
4. Using the add file button, select the "**NLCD.tif**" stored in the GISData folder.



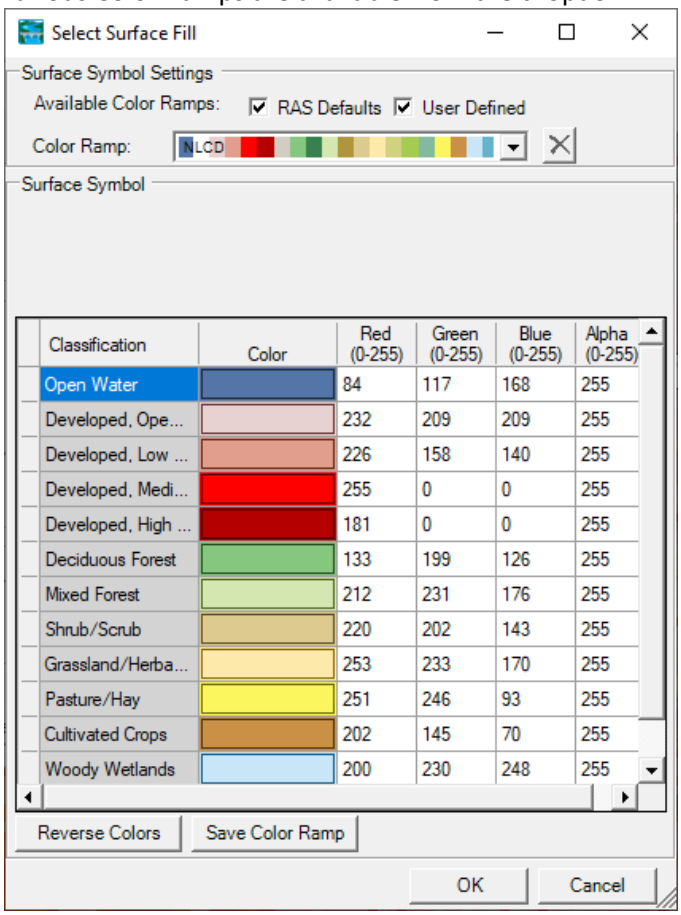
5. Inspect the import options.

6. Press the **Create** button.

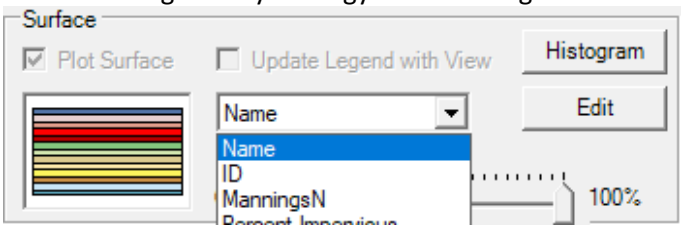
7. The **Manage Layer Associations** editor will launch after you create the layer. Under Manning's n select the **LandCover** layer you just created.



8. Access the **Layer Properties** by double clicking LandCover under **Map Layers** in the layer tree. Change the symbology to the default **NLCD** color ramp. You can open the menu by clicking **Edit** in the **Surface** section of the editor. Various Color Ramps are available from the dropdown.



9. You can change the symbology labels through the interface as well.



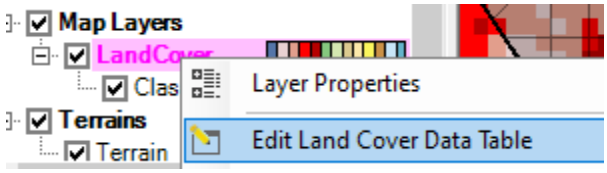
3.2 Provide Manning's n Values

10. Right-click on the Land Cover Layer and choose **Edit Land Covery Layer Data Table.**
11. Provide n values in the **ManningsN** column. Make your best estimates.
12. Click **OK** when finished.

3.3 Create Classification Polygons

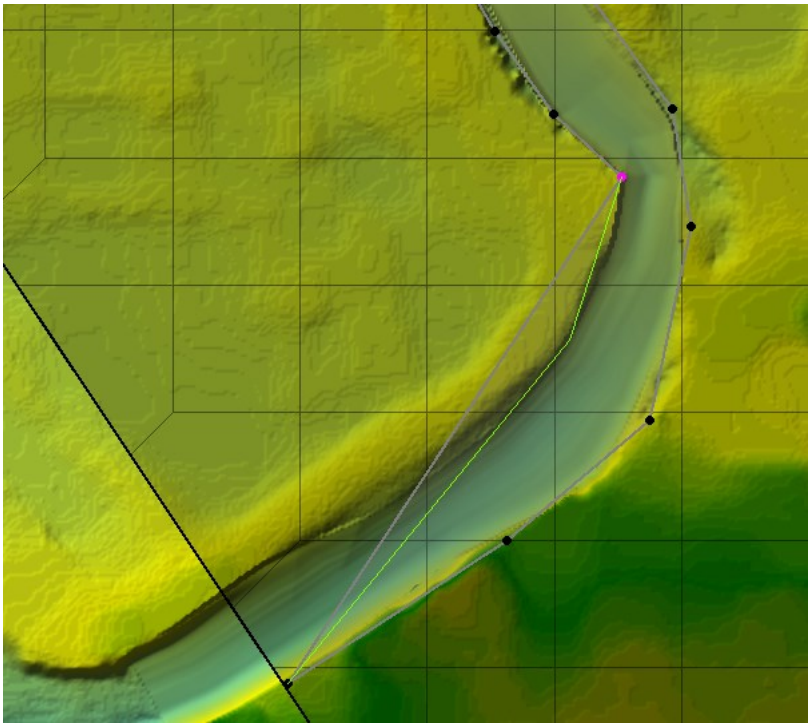
Classification polygons are used to add a new land cover description or to replace an area with a new classification.

13. **Start Editing** the Land Cover Layer

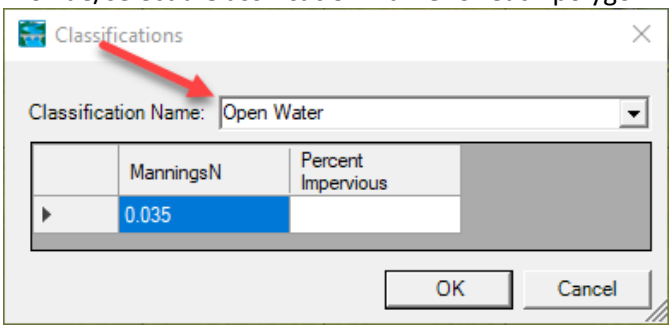


14. Expand the **Land Cover** node to select **Classification Polygons.**

15. Draw polygons (select drawing tool ) for where water should be and/or other interesting features. Once you finish a polygon, the Classifications window will pop up.



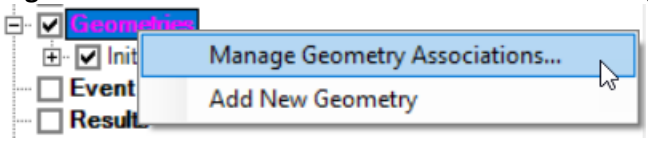
a. Provide/select a **Classification Name** for each polygon.



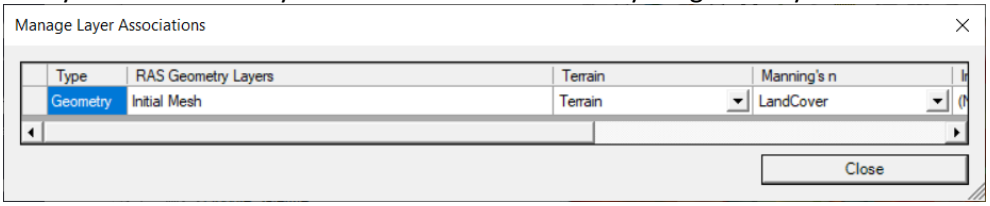
16. **Stop Editing** when finished.

4 Associate the Land Cover Layer

17. **Right-click** on the **Geometries** node and choose **Manage Geometry Associations.**



18. Verify the land cover layer has been associated with your geometry.

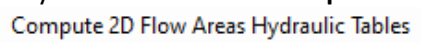


5 Compute Hydraulics Tables

In this step, you will verify that the n values that you expect to see are indeed being used.

19. Expand the "Initial Mesh" geometry and turn on the **Final n Values** layer.

20. Select the Final n Values layer. You should see the n values. Adjust the color ramp, if you like.

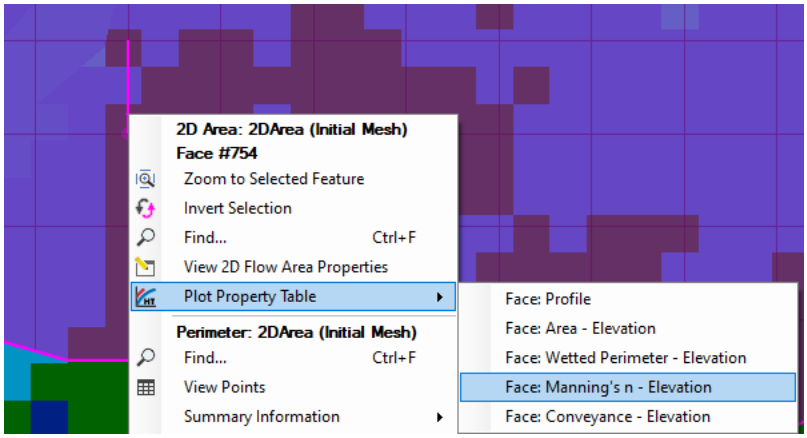
21. **Right-click** on the **2D Flow Areas** layer and choose the **Compute 2D Flow Areas Hydraulic Tables** menu option. 

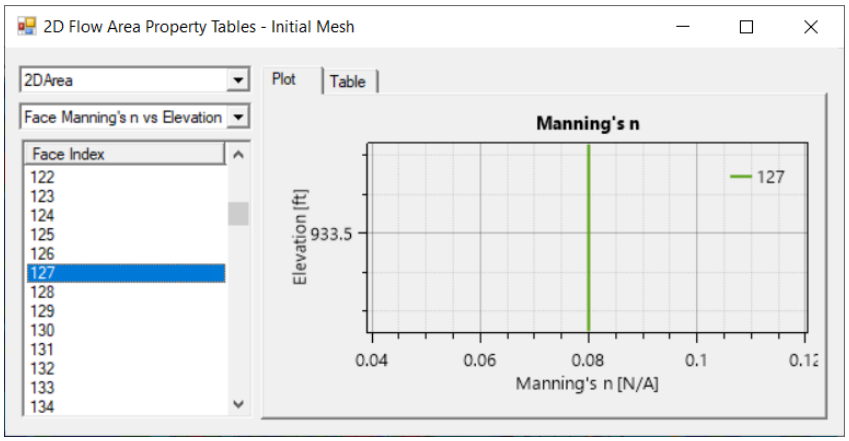
22. After the processing the tables, inspect the properties of the 2D faces.

    a. Select the **2D Flow Areas** layer

    b. **Right-click** on a 2D cell **face**

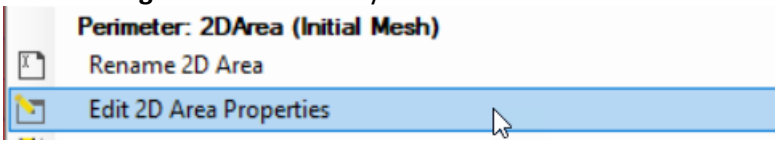
    c. Choose **Plot Property Table | Face: Manning's n – Elevation**.
    You will get a rather boring plot….but use this information to verify the correct n values are used



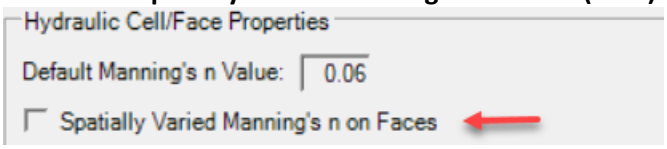


6 Horizontally Varied Manning's n Values

23. **Start Editing** the **Perimeters** layer



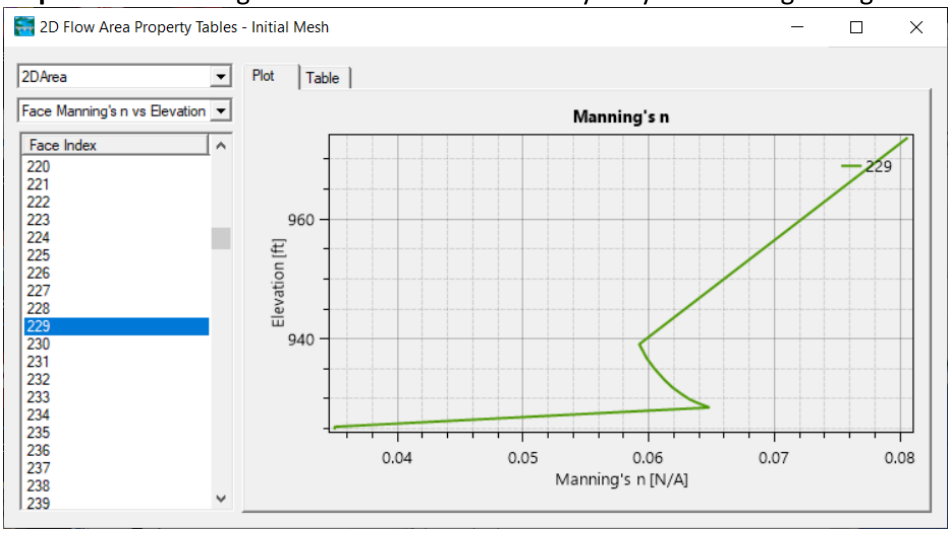
24. **Select the Spatially varied Manning's n on face (Beta)** option.



25. **Stop Editing**

26. **Right-click** on the **2D Flow Areas** layer and choose the **Compute 2D Flow Areas Hydraulic Tables** menu option.

27. **Inspect** the Manning's n values on a face to verify they are no longer single value.



7 Modify n Values

28. Use the Base Override option to override a base n value.
    a. **Start Editing** the **Manning's n** value layer
    b. Right-click on the **Manning's n** value layer and choose the **Edit Manning's n Values** menu option.
    c. For one of the land use types, enter a value into the **Base Override – ManningsN** column to override its current value.
29. **Create** a Calibration Region and provide a name.
30. **Enter** new Manning's n values for the caibration region.
31. **Recompute** the Hydraulic Property Tables.
32. Evaluate the changes.