

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

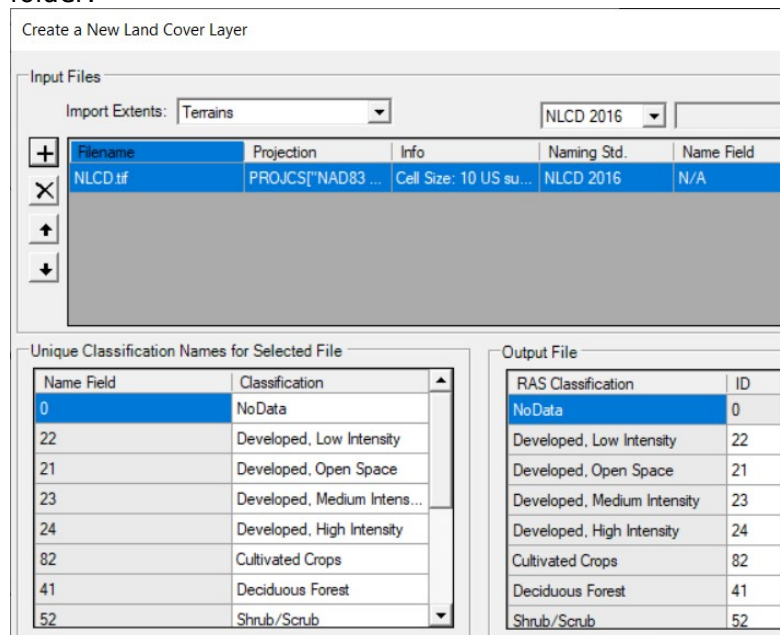
You will be working with data for a section of the White River at Muncie, IN.

3 Create a Land Cover Layer

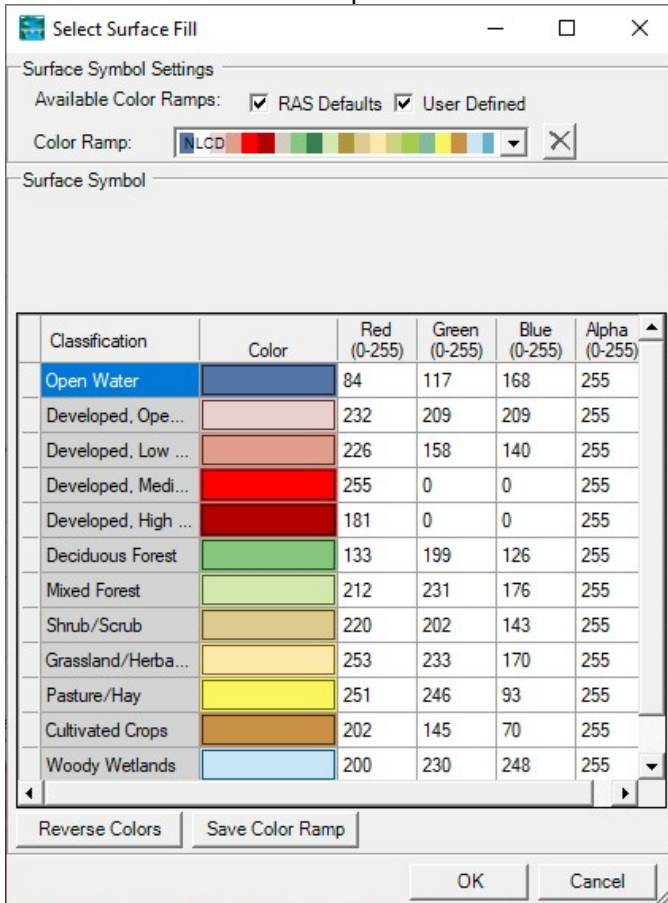
This task will take you through the process of importing a NLCD dataset. The NLCD 2016 dataset was downloaded and has been clipped to the study area.

3.1 Import the NLCD Dataset

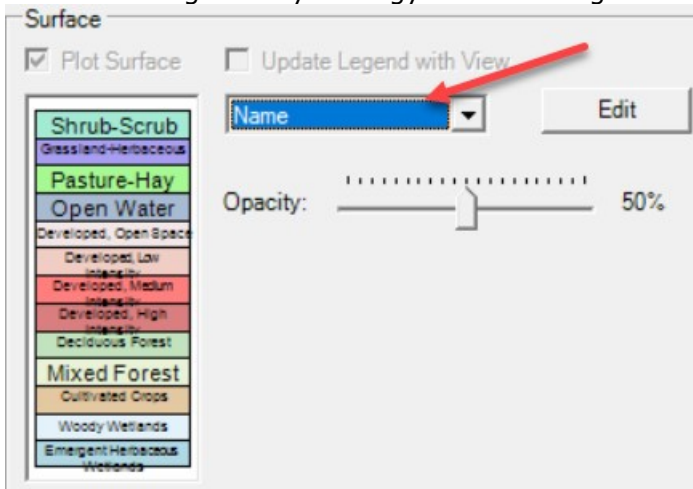
1. Start HEC-RAS and **open** the "LC_ManningsN" project.
2. Open **RAS Mapper**
3. Select the **Project | Create a New RAS Layer | Land Cover Layer**
4. Using the add file button,  select the "NLCD.tif" stored in the GISData folder.



- Inspect the import options.
- Press the **Create** button.
- 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.



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



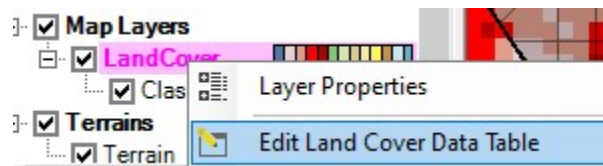
3.2 Provide Manning's n Values

9. Right-click on the Land Cover Layer and choose **Edit Land Cover Layer Data Table**.
10. Provide n values in the **ManningsN** column.
11. Click **OK** when finished.


3.3 Create Classification Polygons

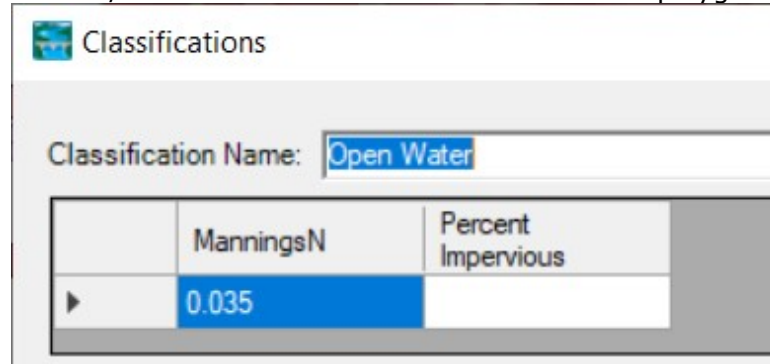
Classification polygons are used to add a new land cover description or to replace an area with a new classification.

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



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

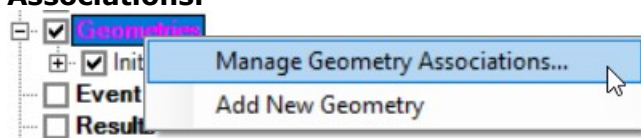
14. Draw polygons (select drawing tool ) for where water should be and/or other interesting features. Once you finish a polygon, the Classifications window will pop up.
 - a. Provide/select a **Classification Name** for each polygon.



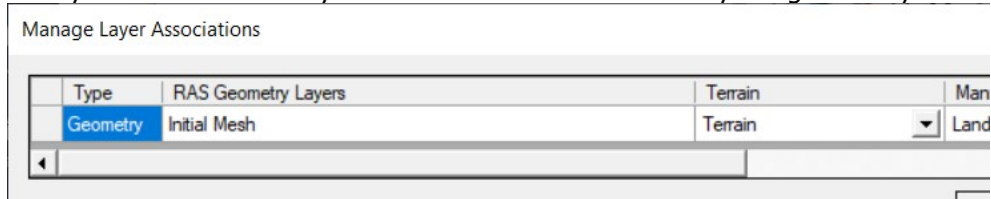
15. **Stop Editing** when finished.

4 Associate the Land Cover Layer

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



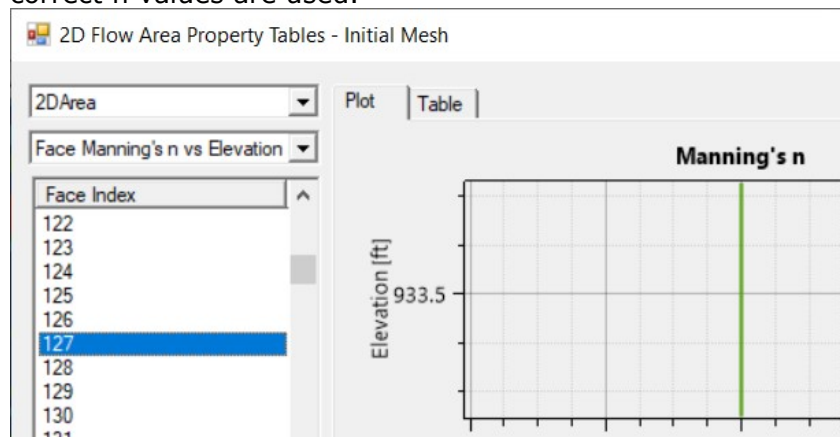
17. Verify the land cover layer has been associated with your geometry.



5 Compute Hydraulics Tables

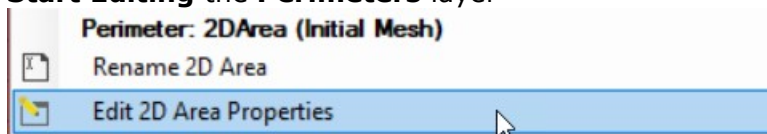
In this step, you will verify that the n values that you expect to see are indeed being used.

18. Expand the "Initial Mesh" geometry and turn on the **Final n Values** layer.
19. Select the Final n Values layer. You should see the n values. Adjust the color ramp, if you like.
20. **Right-click** on the **2D Flow Areas** layer and choose the **Compute 2D Flow Areas Hydraulic Tables** menu option.
21. 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.

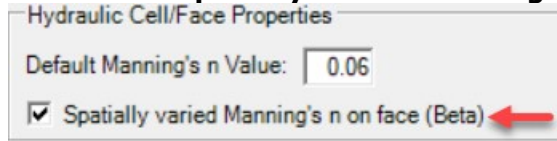


6 Horizontally Varied Manning's n Values

22. **Start Editing** the **Perimeters** layer



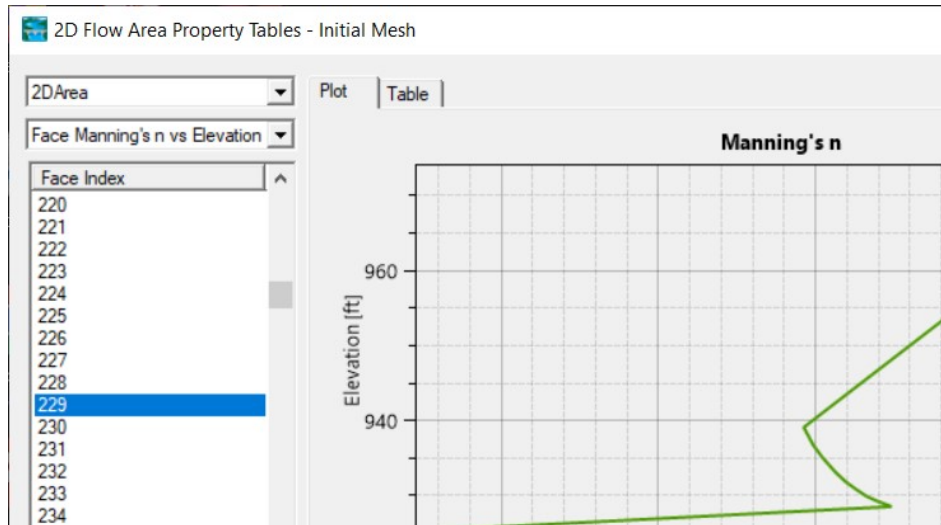
23. **Select the Spatially varied Manning's n on face (Beta)** option.



24. Stop Editing

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

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



7 Modify n Values

27. Use the Base Override option to override a base n value.

- Start Editing** the **Manning's n** value layer
- Right-click on the **Manning's n** value layer and choose the **Edit Manning's n Values** menu option.
- For one of the land use types, enter a value into the **Base Override – ManningsN** column to override its current value.

28. **Create** a Calibration Region and provide a name.

29. **Enter** new Manning's n values for the calibration region.

30. **Recompute** the Hydraulic Property Tables.

31. Evaluate the changes.