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. 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.
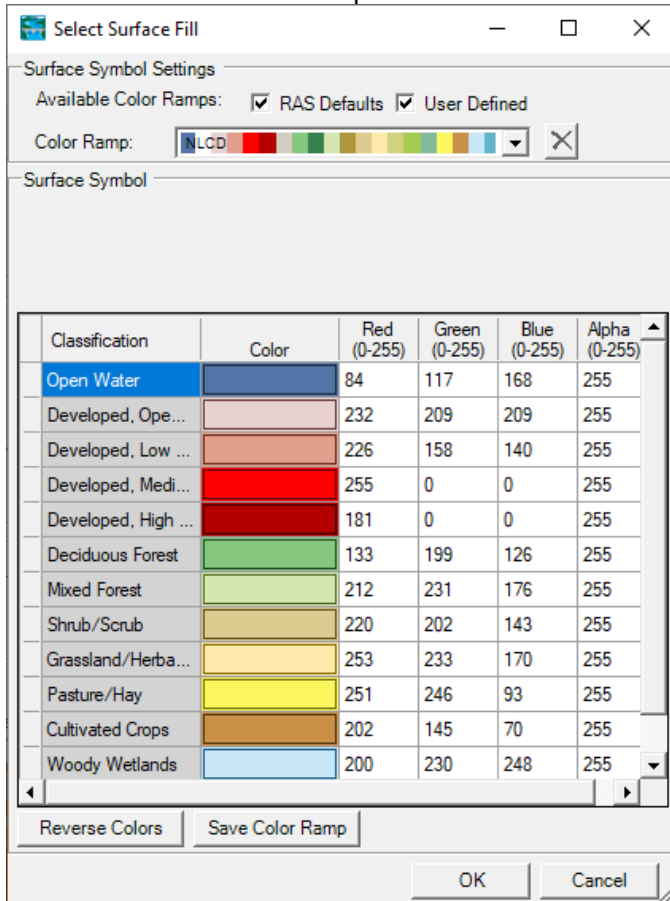
8. You can change the symbology labels through the interface as well.
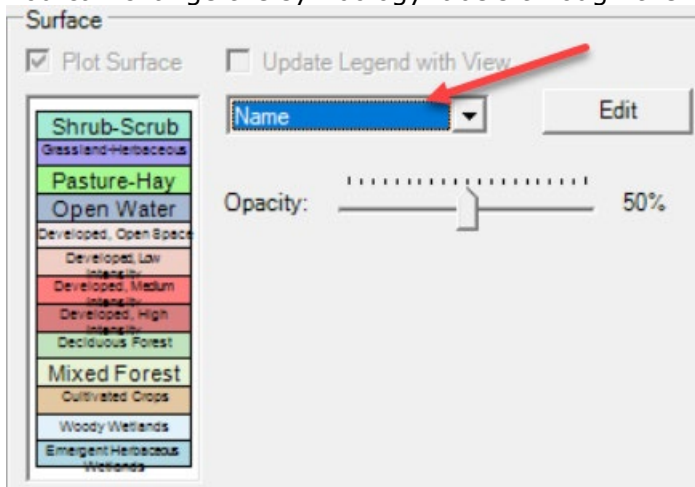
3.2 Provide Manning's n Values

9. Right-click on the Land Cover Layer and choose **Edit Land Covery 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 **Classification Polygons.**

13. Create polygons 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.
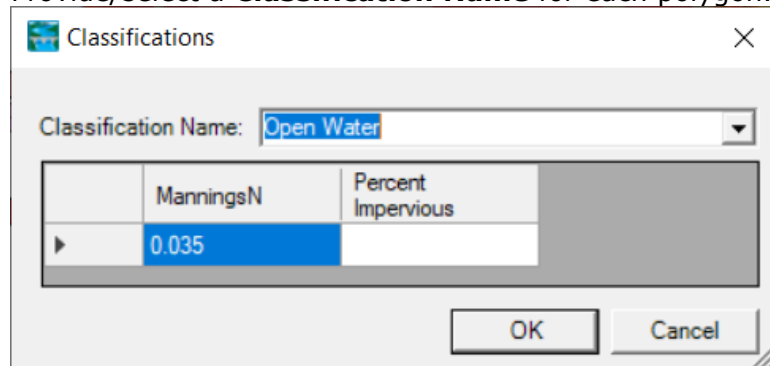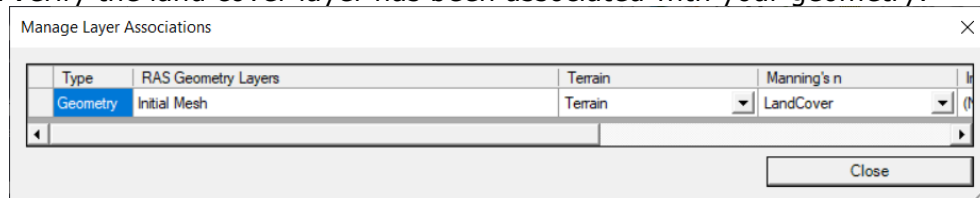

14. **Stop Editing** when finished.

4 Associate the Land Cover Layer

15. **Right-click** on the **Geometries** node and choose **Manage Geometry Associations.**
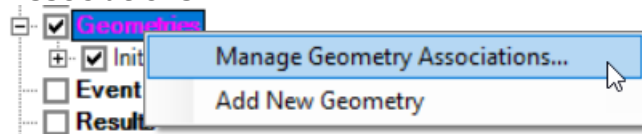
16. Verify the land cover layer has been associated with your geometry.
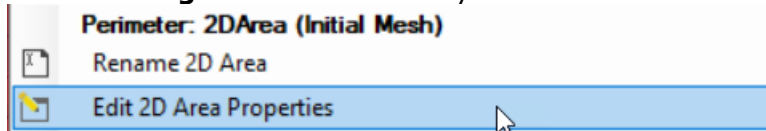
5 Compute Hydraulics Tables

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

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

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

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

20. 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.
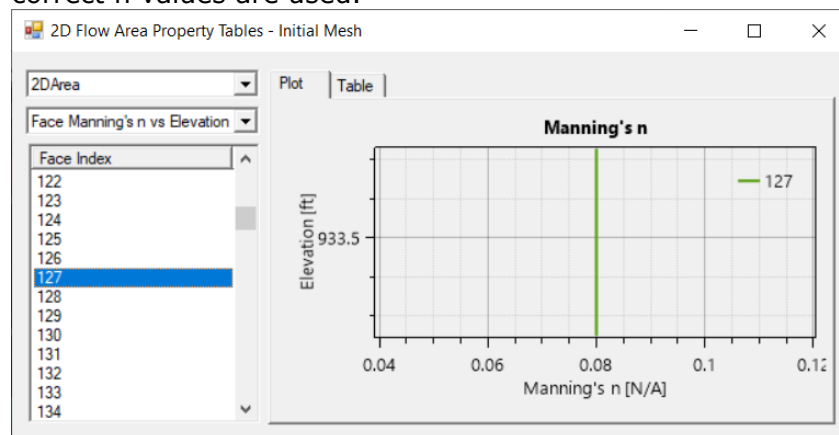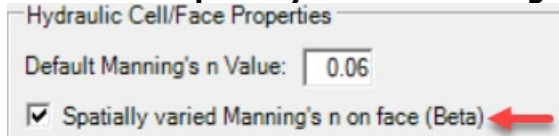

6 Horizontally Varied Manning's n Values

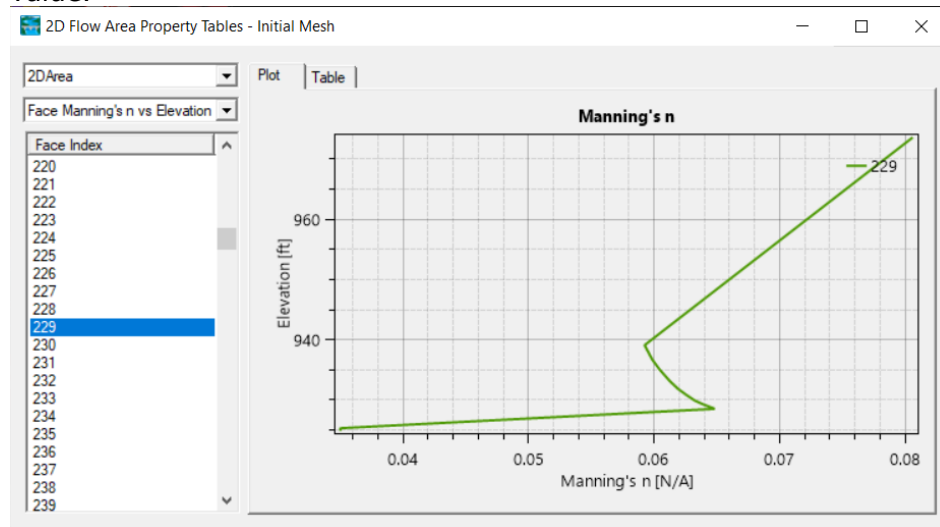21. **Start Editing** the **Perimeters** layer

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

23. **Stop Editing**

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

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

7   Modify n Values

26. 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.

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

28. **Enter** new Manning's n values for the caibration region.

29. **Recompute** the Hydraulic Property Tables.

30. Evaluate the changes.