

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.

Create a New Land Cover Layer

Input Files

Import Extents: Terrains NLCD 2016 Add Field...

+	Filename	Projection	Info	Naming Std.	Name Field
X	NLCD.tif	PROJCS["NAD83 ...	Cell Size: 10 US su...	NLCD 2016	N/A

Unique Classification Names for Selected File

Name Field	Classification
0	NoData
22	Developed, Low Intensity
21	Developed, Open Space
23	Developed, Medium Intens...
24	Developed, High Intensity
82	Cultivated Crops
41	Deciduous Forest
52	Shrub/Scrub

Output File

RAS Classification	ID
NoData	0
Developed, Low Intensity	22
Developed, Open Space	21
Developed, Medium Intensity	23
Developed, High Intensity	24
Cultivated Crops	82
Deciduous Forest	41
Shrub/Scrub	52

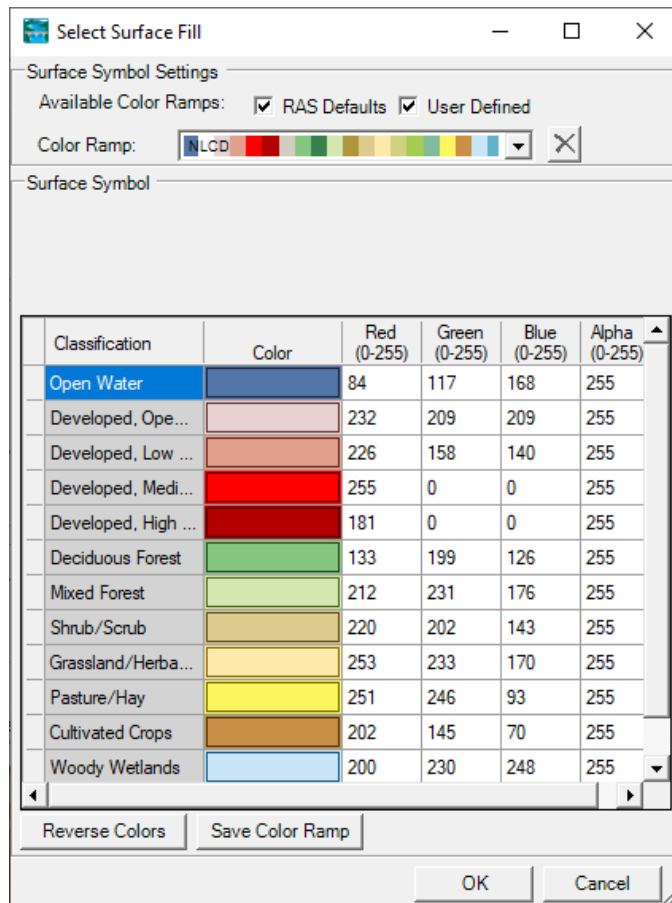
Output ID Standards: NLCD 2016

Cell Size: 10 feet Expected Output Size: <1 MB

Filename: C:\...\Land Classification\LandCover.hdf

Create Cancel

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.



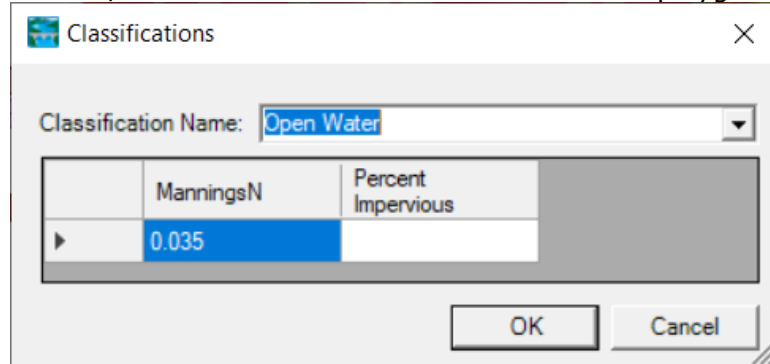
3.2 Provide Manning's n Values

8. Right-click on the Land Cover Layer and choose **Edit Land Cover Layer Data Table**.
9. Provide n values in the **ManningsN** column.
10. 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.

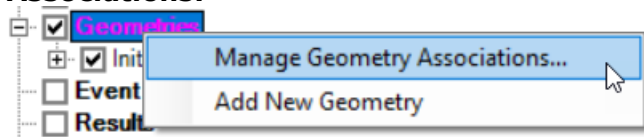
11. **Start Editing** the Land Cover Layer **Classification Polygons**.
12. Create polygons for where water should be and/or other interesting features. Once you finish a polygon, the Classifications window will pop up.
 - a. Provide/select a **Classification Name** for each polygon.



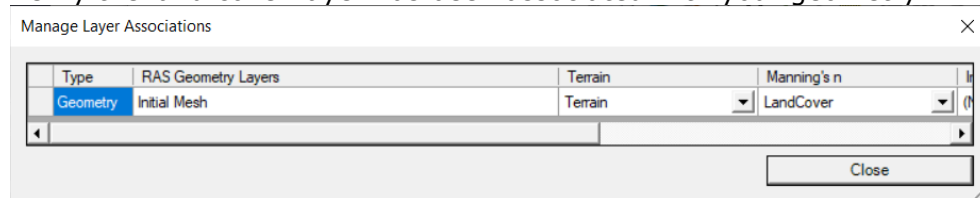
13. **Stop Editing** when finished.

4 Associate the Land Cover Layer

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



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

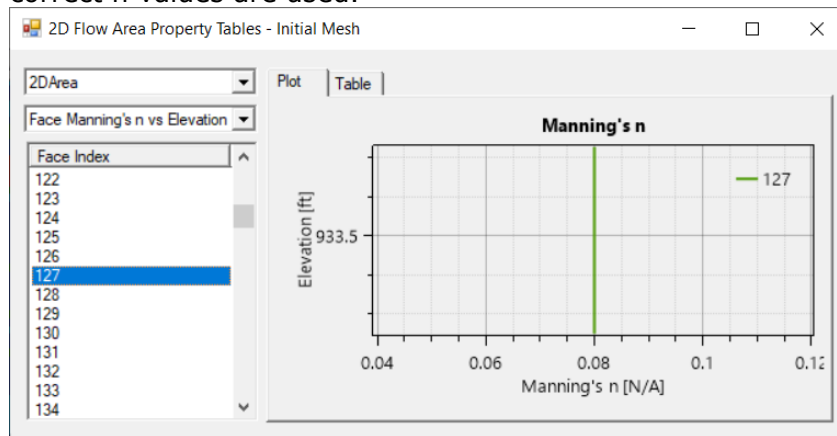


5 Compute Hydraulics Tables

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

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

20. 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.
21. **Create** a Calibration Region and provide a name.
22. **Enter** new Manning's n values for the calibration region.
23. **Recompute** the Hydraulic Property Tables.
24. Evaluate the changes.