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.

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- 5. Inspect the import options.
- 6. 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.

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(Color Ramp: NLCD						
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	Developed, Low		226	158	140	255	
	Developed, Medi		255	0	0	255	
	Developed, High		181	0	0	255	
	Deciduous Forest		133	199	126	255	
	Mixed Forest		212	231	176	255	
	Shrub/Scrub		220	202	143	255	
	Grassland/Herba		253	233	170	255	
$ ^{-}$	Pasture/Hay		251	246	93	255	
	Cultivated Crops		202	145	70	255	
	Woody Wetlands		200	230	248	255 👻	
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Reverse Colors Save Color Ramp							
OK Cancel							

3.2 Provide Manning's n Values

- 8. Right-click on the Land Cover Layer and choose **Edit Land Covery Layer Data Table.**
- 9. Provide n values in the **ManningsN** column.
- 10. Click $\boldsymbol{\mathsf{OK}}$ 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.

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13. **Stop Editing** when finished.

4 Associate the Land Cover Layer

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

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- Result		

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

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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 caibration region.
- 23. **Recompute** the Hydraulic Property Tables.
- 24. Evaluate the changes.