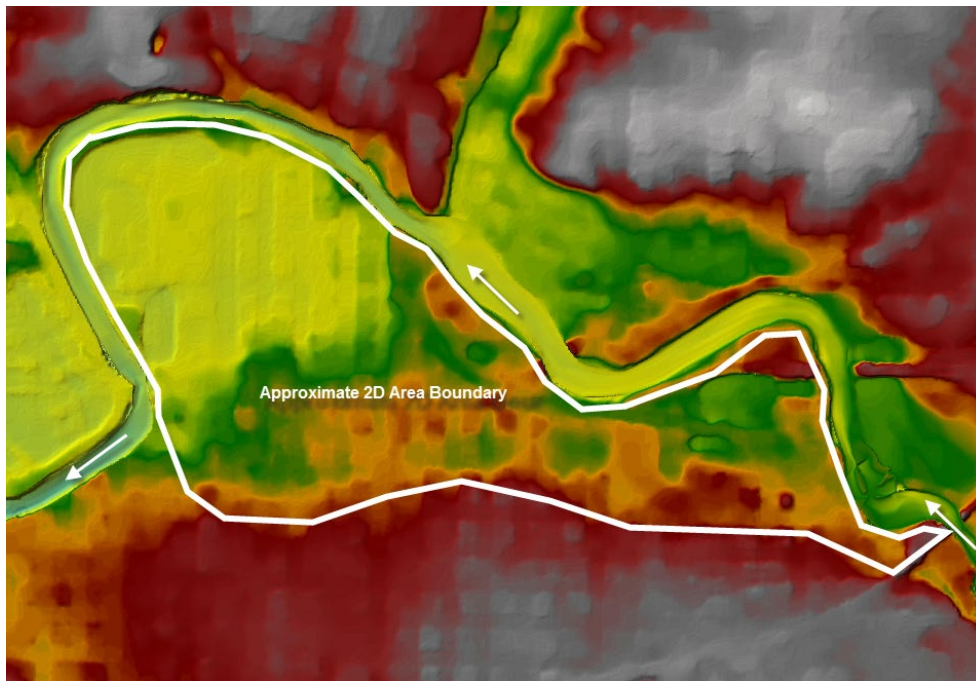

Terrain and 2D Mesh Generation Workshop

1 Objective

In this workshop, you will learn how to create how to generate a 2D Mesh within a 2D Flow Area with HEC-RAS. This workshop will require you to use import a terrain model, develop a 2D mesh, compute hydraulic properties for the grid cells, and view hydraulic table results.


2 Background

You will be working with a section of the White River at Muncie, IN. You will evaluate how to lay out a 2D Flow Area in the left overbank of the river which is protected by a levee to model a levee breach or over-topping scenario.



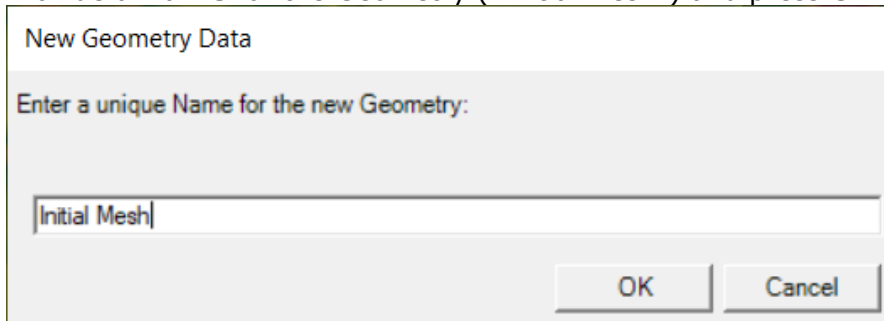
3 Terrain Model Preparation

This part of the workshop will guide you through the process of importing terrain data. The terrain data will be used as the basis for the mesh used for 2D hydraulic computations.

1. **Start HEC-RAS.**
2. Save the project using **File | New Project** and providing a project name.
3. Launch **RAS Mapper** .
4. Set the projection for the project using the "**projection.prj**" file provided in the "GIS_Data" folder.
5. Import terrain data for use in RAS by selecting the **Project | Create New RAS Terrain** menu item.
6. Click the "+" button to add files and navigate to the "Terrain" folder. Select the "**base.tif**" file.
7. Press the **Create** button.

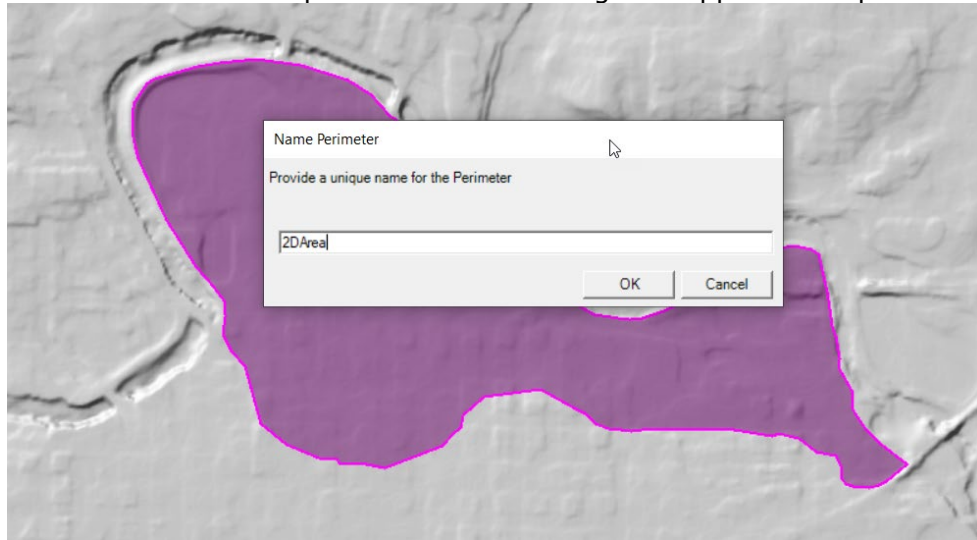
4 Create and Edit New Geometry

8. Create a new Geometry by **right-clicking** on the **Geometries** group layer and choosing the **Add New Geometry** menu item.
9. Provide a **Name** for the Geometry ("Initial Mesh") and press **OK**.

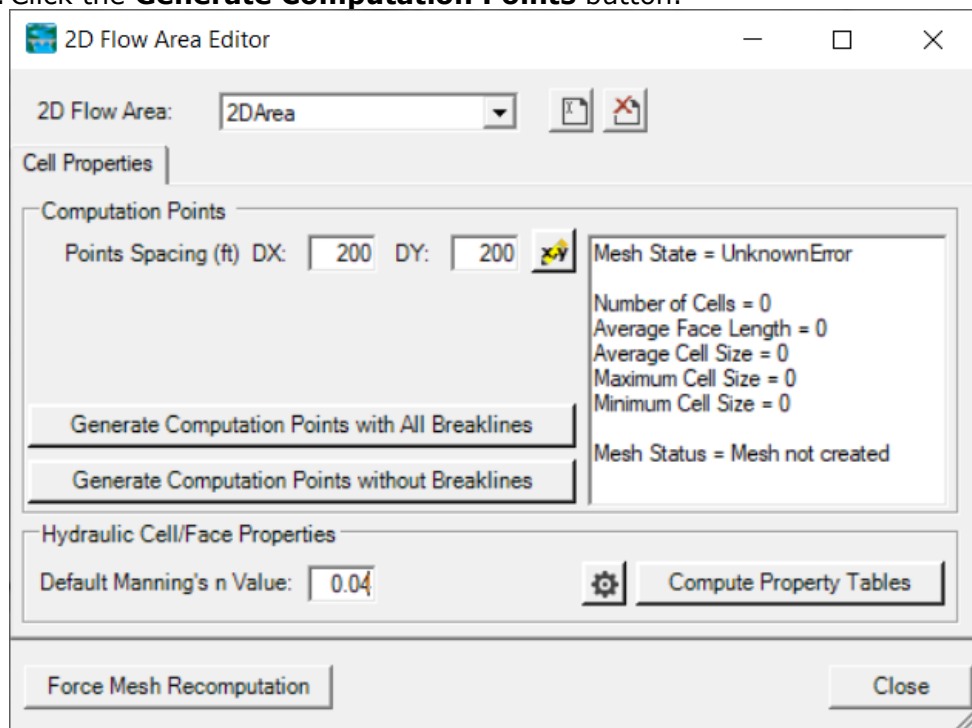


10. Right-click on the **2D Flow Areas** group and select **Edit Geometry**.
11. Create a 2D Flow Area boundary by **selecting the Perimeter** layer.
12. Use to **Add New Feature** tool to digitize the 2D Flow Area boundary.
13. **Double-click** to finish (end) the sketch.

14. Enter a **name** for the perimeter in the dialog that appears and press **OK**.



15. Enter a point spacing in the 2D Flow Area Editor. Use "**200**" ft.
16. Set the n Value for the region to "**0.04**".
17. Click the **Generate Computation Points** button.



18. **Close** the 2D Flow Area Editor.



19. **Inspect the edge of the 2D Flow Area Mesh** for any mistakes in the boundary.

20. Turn on the **Computation Points** Layer to ensure each cell has only one point in it.

21. If there are any mistakes, select the **Computation Points** layer and use the **Add New Feature** and **Edit Feature** tools to modify the points.

22. When finished, **Stop Editing** to **Save** the Geometry!

5 Compute Hydraulic Properties

23. **Right-click** on the "2D Flow Areas" layer and select **Compute 2D Flow Areas Hydraulic Tables**. The bottom left of the Mapper window will provide status on the processing.

24. **Select** the "2D Flow Areas" layer by clicking on it (it will turn magenta when selected). (If the Layer is NOT highlighted magenta, the cells and cell faces will not highlight as you select them in the next step.)

25. Use the mouse to select Cells and Cell Faces to investigate the cell properties. Right-click on a cell and select **Plot Property Table** for various 2D cell properties.

