**Creating a RAS Terrain**
Workshop

1 Objective

In this workshop, you will learn how to create how to create a RAS Terrain from a raster representing ground surface elevations.

2 Background

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

3 Creating a RAS Terrain

1. **Start HEC-RAS**.
2. Open the "Terrain Introduction" project using **File | Open Project**.
3. Launch **RAS Mapper** .
4. Select **Project | Set Projection for Project** and navigate to the "**projection.prj**" provided in the "GISData" folder. This sets the coordinate system for all the data you will view in RAS.
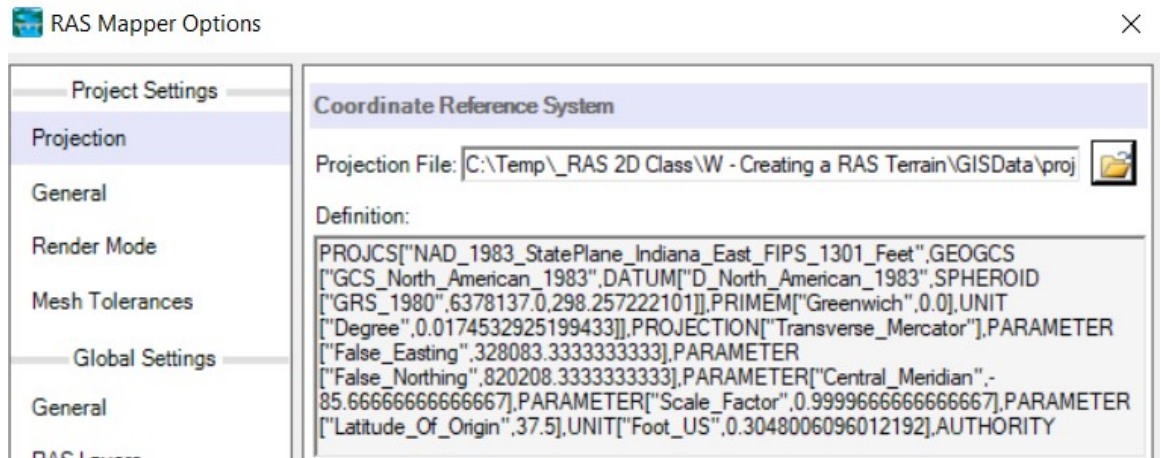
5. Press **OK** to accept the file.
6. Select the **Project | Create New RAS Terrain** menu item (or **right-click Terrains** and choose the **Create a New RAS Terrain** menu item) to import the terrain model.
7. Click the "**+**" button to add files and navigate to the "Terrain" folder. Select the "**base.tif**" file.
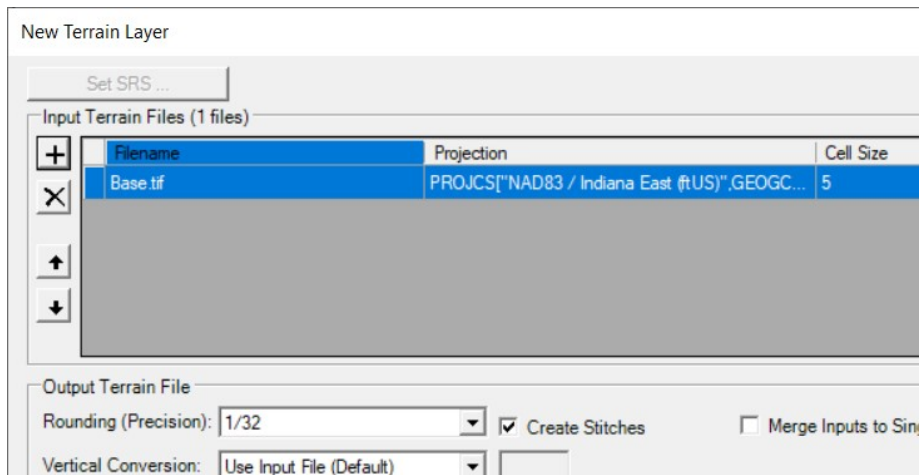
8. Press the **Create** button.
   As the Terrain is created, a computation window will inform you of progress.
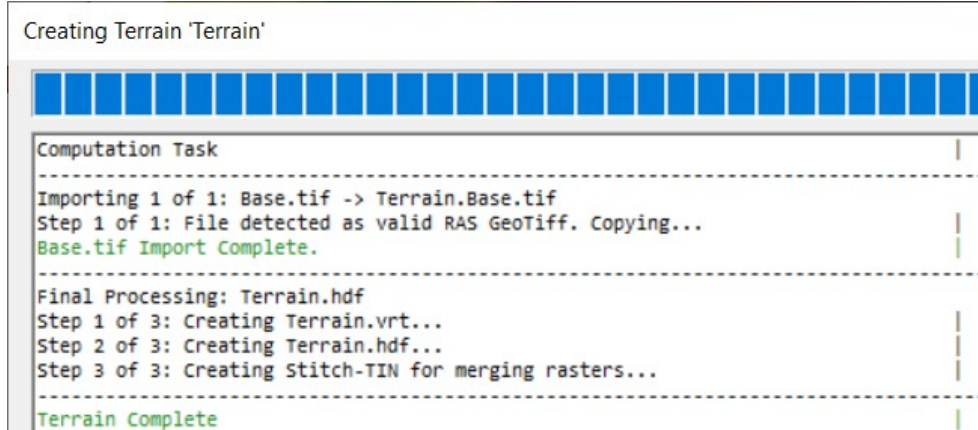
9. **Double-click** on the **Terrain** Layer to access its Properties.
10. Click on the **Plot Hillshade** option.
    Play with the **Z Factor** to find a value you prefer.
11. Click on the **Plot Contours** option. Play with the **Interval**.
    Experiment with the option until the terrain looks good to you.

12. Note the presence of high ground in the middle of the channel at bridge locations.
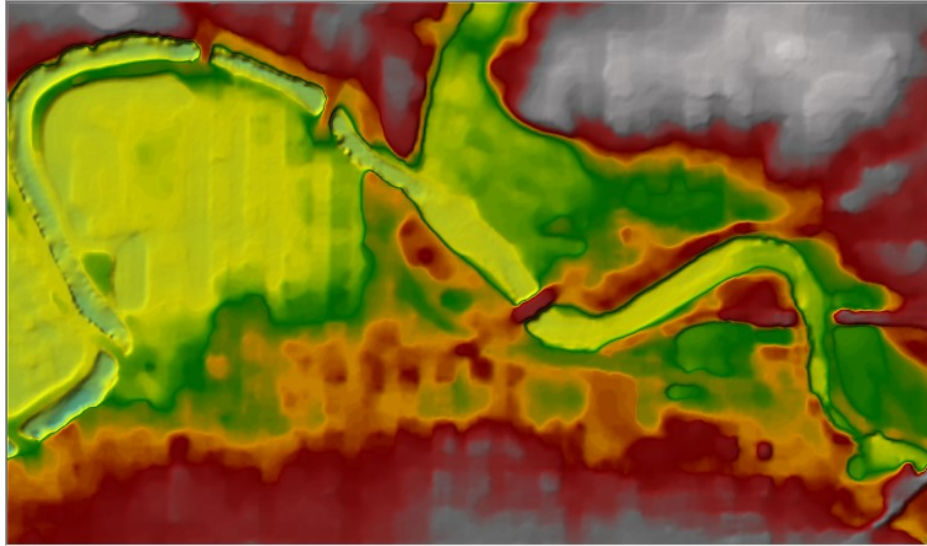
4   Creating a RAS Terrain from Multiple Datasets

This task will take you through the process of creating a RAS Terrain from 2 different terrain models: channel data and overbank terrain, in order to capture the channel geometry where there is currently high ground at the bridge locations.

4.1   Create Channel Bathymetry Layer

13. In **RAS Mapper**, turn on the River and Cross Section layers

14. Turn on the **Bank Lines** layer

15. Turn on the **Interpolation Surface** layer

16. Right-click on the Geometry ("Muncie 1D Base") and Select the **Export Layer | Create Terrain GeoTiff from XS's** menu item

17. Provide a name for the new file ("**myChannel**") and press **OK**.

18. Provide rasterization cell size (**5ft**) and press **OK**.

4.2   Create Grid with Channel Data

19. Select the **Project | Create New RAS Terrain** menu item

20. You will have to add to 2 different files. Make sure that the "priority" is set properly. The top layer should be the channel geometry, followed by the overbank. If you add

them in the wrong order, you can reprioritize them by highlighting on of them, and clicking the up or down arrows on the left-hand side of the menu.

    a. Add the "**myChannel.tif**" (that you just created)

    b. Add the "**Base.tif**"
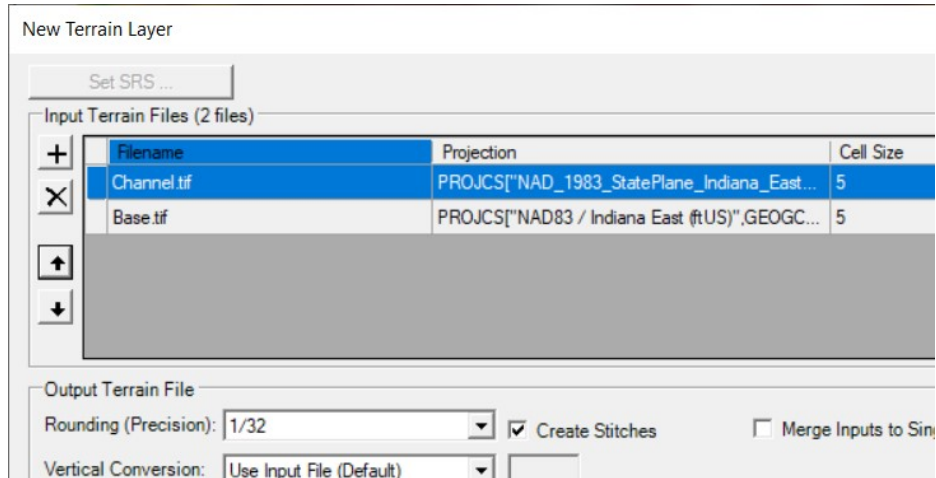
21. Change the output filename to "**WithChannel**" by clicking the open folder icon in the bottom right corner of the menu. Enter the new name, and click save.

22. Press the **Create** button.
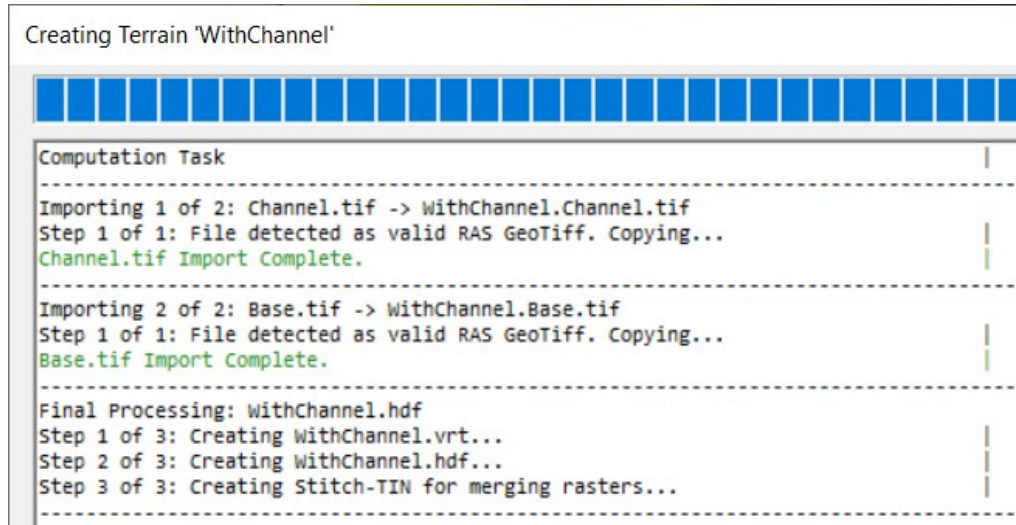
23. Change the **Layer Properties** for the "WithChannel" Terrain.

24. Turn on the **Plot stitch TIN edges** for the "WithChannel" Terrain.

25. Investigate the stitching – a TIN which is the interpolation between the in-channel data and the overbank data. Compare with the base Terrain model.
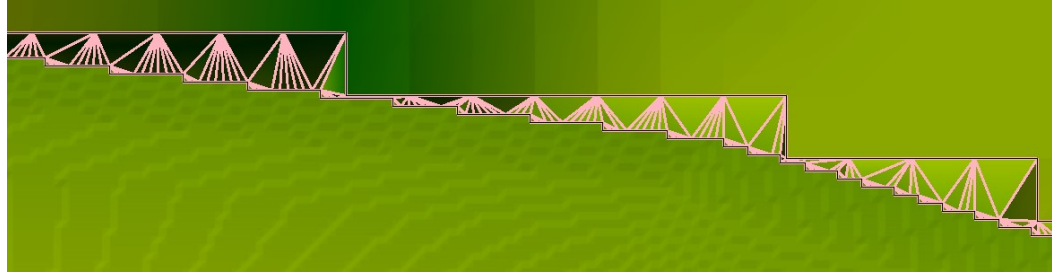
26. Compare the two terrain models (with and without bridge elevations).
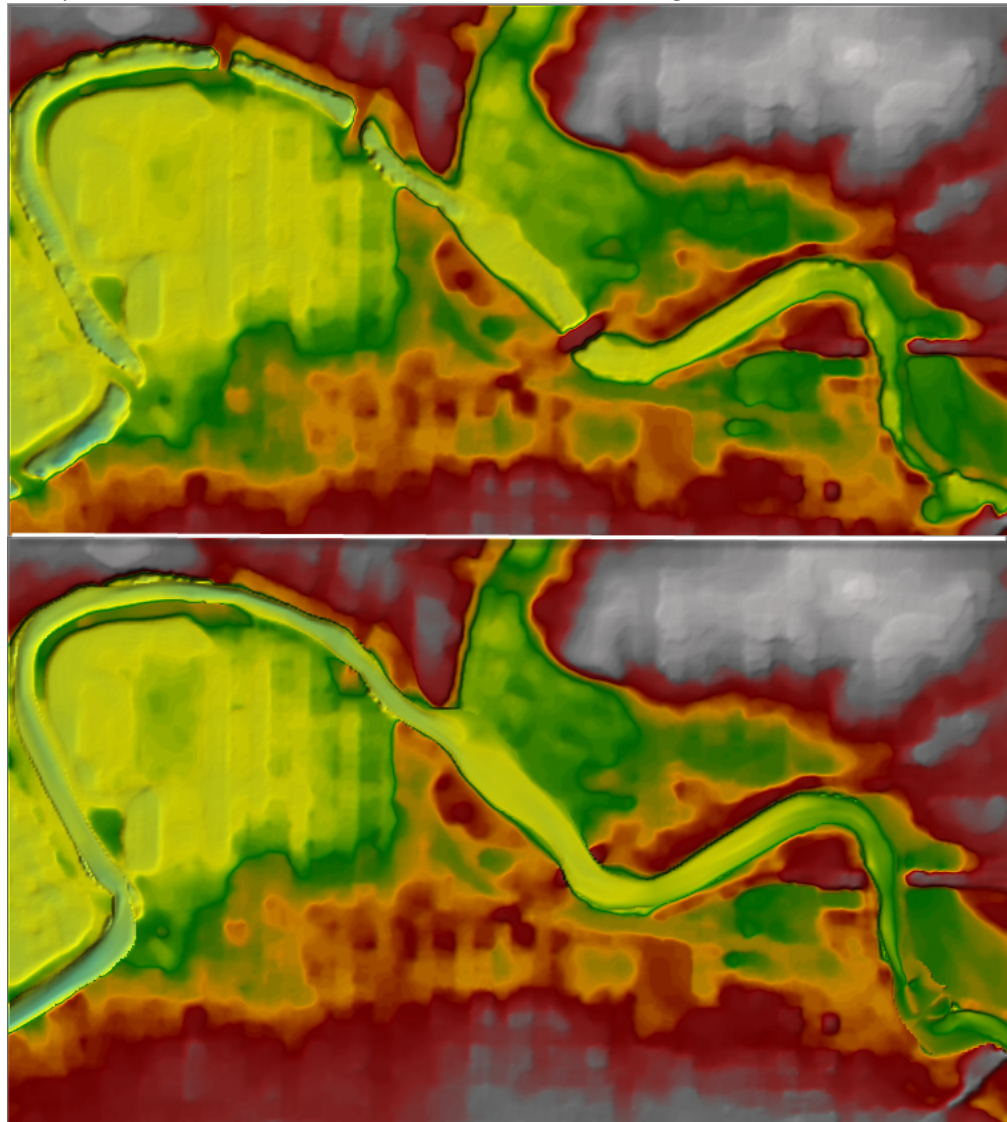
5 Create a RAS Terrain from USGS Terrain

This task will take you through the of downloading data from the USGS and creating a terrain model from the data.

5.3 Download USGS Data

27. In **RAS Mapper**, select the **Project | Download Data | USGS Terrain** menu item.

28. Press the **Query Products** button.

29. Filter the data to the **Original** data of **2020**.
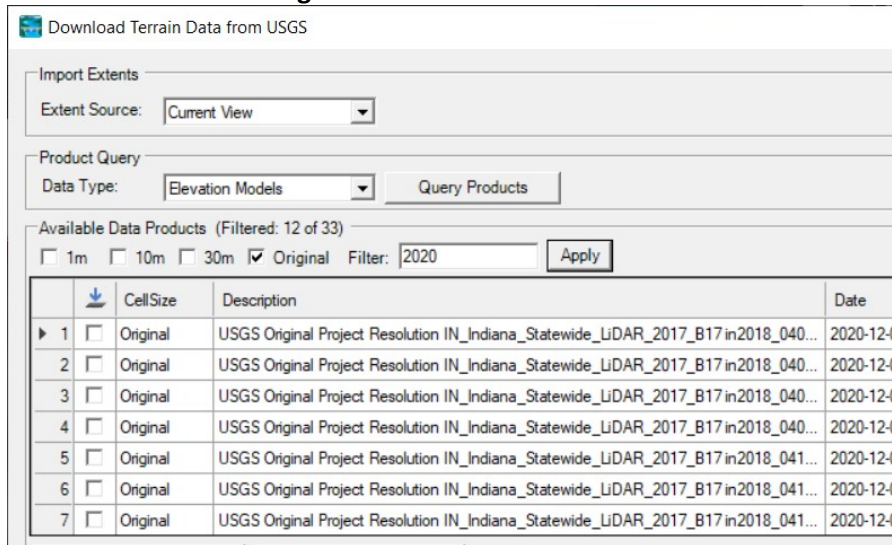

30. Using RAS Mapper, **Select** just the **6** terrain tiles.

31. Once selected, press the **Add Selected** button.

32. Press the **Start Download** button.

33. After the data are downloaded, **dismiss** the dialog.

34. **Close** the Terrain Download tool.

5.4 Create the RAS Terrain

35. Select the **Project | Create New RAS Terrain** menu item

36. Add the downloaded tiles from the "../Terrain/USGS" folder

37. Provide a new **name** for the terrain layer.

38. Click on the "**Merge Inputs to Single Raster**" checkbox.

39. Press the **Create** button.
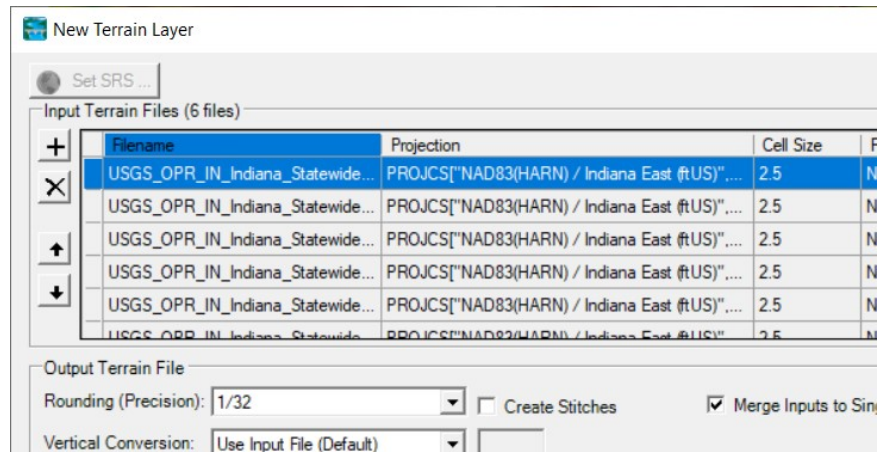
40. Evaluate your new terrain model.

   Would you use this model for detailed hydraulic analysis? Explain.