This help guide describes how to merge two or more feature classes (vector) or rasters into one single feature class or raster dataset.

The Merge Tool

The Merge Tool combines input features from input sources (of the same data type) into a single, new, output feature class. The input data sources may be point, line or polygon feature classes or tables.

The Mosaic Tool, Mosaic to New Raster Model Tool and Create Raster Dataset in a File Geodatabase

The Mosaic Tool “mosaics” [merges] multiple input rasters into an existing raster dataset.

The Mosaic To New Raster model tool “mosaics” [merges] multiple datasets into a new raster dataset in one simple step. The Create Raster Dataset in a File Geodatabase also creates a new raster dataset.

Which one should you use?

The merge tool, in effect, joins multiple rasters to an existing raster dataset. The mosaic to new raster tool retains the input rasters as individual datasets and creates a new raster combining all the individual datasets.

Using the Merge Tool (Vector data)

Input data sources need not be adjacent; features may overlap. If no coordinate system is specified in the Environment Settings, the output feature class will be in the same coordinate system of the first feature class in the input features list. Merge cannot use multiple input layers of the same name. (Although different layers with the same layer name - from different directories - can be displayed in ArcMap, these may not be used in the Merge tool.) Merge does not perform edge matching. There will be no adjustment to the boundaries of features. Edge matching can be performed in ArcMap or ArcINFO Workstation only. Unlike the Union function, Merge does not planarize the input features into a single output. Input features from all the input feature classes remain intact in the target feature class.

Open the Merge Tool

1. Open Arc Toolbox
2. Expand the Data Management Tools and the General Tools.
3. Double click Merge to open the Merge Tool Dialog box.

Enter the Merge Tool parameters
MERGING (MERGE / MOSAIC) GEOSPATIAL DATA

1. Use the drop down arrow to select the input features or click and drag the input features from the ArcMap Table of Contents.

   ![Merge Tool](image)

   Input Datasets
   - non_core_greenlands

2. Use the folder button to navigate to specify the location of the merged data set.

   ![Output Dataset](image)

   Output Dataset
   - P:\guelph\greenlands.shp

3. **Field Map** options are not required elements. These are filled in by default and can be added, renamed or deleted. The fields and field contents are chosen from the inputs. Note in this example the attribute “type” is included so that the user can still distinguish non-core from core greenlands by the field type.

   ![Field Map](image)

   Field Map (optional)
   - FIELD1 (Text)
     - non_core_greenlands.FIELD1 (Text)
   - AREA (Float)
     - non_core_greenlands.AREA (Float)
     - core_greenlands.AREA (Float)
   - type (Short)
     - non_core_greenlands.type (Short)
     - core_greenlands.type (Short)
   - ID (Double)
     - core_greenlands.ID (Double)

4. Click **Ok** to execute the tool.

**Using the Mosaic Tool (Raster Data)**

Mosaics multiple input rasters into an existing raster dataset. Use this tool to merge DEMs that are adjacent and have the same cell resolution and coordinate system. There are two advantages to having a single DEM raster - it draws faster in ArcGIS and is better suited for performing any geoprocessing or analysis tasks.

**Open the Mosaic Tool**

1. Open Arc Toolbox.
2. Expand the **Data Management Tools**, the **Raster Tools** and the **Raster Dataset Tools**.
3. Double click Mosaic to open the Mosaic Tool Dialog box.

**Enter the Mosaic Tool parameters**

1. Use the drop down arrow to select the input raster datasets or click and drag the raster datasets from the ArcMap Table of Contents.
2. In the Target Raster use the browse button to select the raster to which the input raster will be mosaicked (merged).
3. Choosing a Mosaic Colormap Mode, Ignore Background Value and NoData Value are optional fields. Click OK to run the tool.

**Using the Mosaic to New Raster Model Tool (Raster Data)**

Mosaic multiple raster datasets into a new raster dataset. The inputs must have the same number of bands and same bit depth.
Open the Mosaic to New Raster model
1. Open ArcToolbox
2. Expand the Data Management Tools, the Raster Tools and the Raster Dataset tools.
3. Open the Mosaic to New Raster model. It is helpful to open the Help while you enter the inputs. [Click the Show Help button.]

Enter the Mosaic to New Raster model tool inputs and outputs

A model simply consists of one process or a sequence of processes connected together. Models can be run from a dialog box and behave like any tool.

1. Use the drop down arrow to select the input raster datasets or click and drag the raster datasets from the ArcMap Table of Contents.

2. For the Output Location navigate to the local directory using the Browse button.

3. In the Raster dataset name with extension enter a name for the new mosaiced DEM dataset. [No file extension is needed for GRID format. Other formats that can be used are bmp, gif, img, jpg, jp2 or png.]

4. Optional - Enter the Coordinate system for the raster. Since all inputs are projected to UTM NAD83 Zone 17N the output will be in this projection.

5. Optional – Pixel type. (To determine the pixel type of the input DEM open its properties.) The DEMs used in this example have a floating point pixel type and a 32 BIT Pixel Depth. To match the Pixel Types of the input with the output grid change the Pixel
type to 32_BIT_Float by using the drop down arrow.

6. Optional – Cellsize. The cell size of the input DEMs is 10. Enter 10.

7. Choose a Mosaic Method - Blend. (In many cases, there will be some overlap of the raster dataset edges that are being mosaicked together. These overlapping areas can be handled in several ways; for example, you can specify to keep only the first or last raster dataset's data, you can blend the overlapping cell values using a weight-based algorithm, you can take the mean of the overlapping cell values, or you can take the minimum or maximum value. For mosaicking of discrete data, the First, Minimum, or Maximum options will give the most meaningful results. The Blend and Mean options are best suited for continuous data. If any of the input rasters are floating point, the output will be floating point. If all the inputs are integer and First, Minimum, or Maximum is used, the output will be integer.)

8. Optional – Mosaic Colormap Mode – applies when the input raster datasets have a colour map. Note the information in the help column.

9. Click OK to run the model tool. The Output will be a merged floating point grid that can be symbolized using an elevation colour ramp.

Creating a Raster Dataset in a File Geodatabase

Raster data can be imported into a geodatabase in several ways: by using Import raster datasets (geodatabase context menu), the Copy Raster tool (geoprocessing tools), or Load Data (ArcCatalog dataset context menu). The input rasters must be adjacent and have the same coordinate system, cell
size and data format. The new raster dataset in the geodatabase will be a single, seamless dataset with areas of overlap removed.

Why store rasters in a geodatabase?

- Rasters can be stored as one continuous image (usually a mosaic of many adjacent smaller images).
- Rasters display faster and data extraction is more easily facilitated.
- Large data holdings can be easily built, modified, and utilized.

Create a new File Geodatabase to house raster data

1. Open ArcCatalog and navigate to the folder where the geodatabase will be stored.
2. Right click the folder and Select New and File Geodatabase.
3. Right click the new file geodatabase – example, DEM.gdb – and Select New and Raster Dataset.
4. In the Create Raster Dataset toolbox window fill in the Output Location, the Raster Dataset name – example, DEM, the Cell size, the Pixel Type, and the Spatial Reference for Raster. [This information can be found in the Properties >Source Tab.] Click OK.

Loading Raster data into a File Geodatabase

1. In ArcCatalog, right-click the empty geodatabase raster dataset, point to Load, and then click Load Data.
2. Click the Input Rasters browse button and navigate to the location of the Input raster dataset you want to load and select it. You can add more than one.
3. Make sure that the Target Raster (output location) is correct. If not, click the browse button and navigate to the proper location.
4. Click the Mosaic Method drop-down arrow and choose the rule for overlapping areas if you are loading more than one raster dataset (mosaicking).
5. Click the Mosaic Colormap Mode drop-down arrow and choose the rule for dealing with color maps if you are loading raster datasets that have color maps.
6. Optionally, type a number for Ignore Background Value to set a background value to ignore.
7. Optionally, type a number for NoData Value to set a NoData value.
8. Optionally, check the Convert 1 bit data to 8 bit check box.
10. Click OK to run the Import to File Geodatabase Raster Data Set.

11. Click OK.