

This help guide describes how to merge two or more feature classes (vector files) or raster files 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 **Merge** tool cannot be used with raster datasets.

The Mosaic Tool and Mosaic to New Raster Tool

The **Mosaic** tool “mosaics” [merges] multiple input rasters into an existing raster dataset. The existing raster dataset can be empty or it can already contain data. The **Mosaic To New Raster** tool “mosaics” [merges] multiple datasets into a new raster dataset in one simple step.

Which one should you use?

The **Mosaic** 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. You should try to preserve your original raster datasets wherever possible, so the **Mosaic to New Raster** tool and the **Mosaic** tool with an empty raster dataset as the target dataset are the best choices.

The Create Raster Dataset Tool

The **Create Raster Dataset** tool creates a new, empty raster dataset into which you can then mosaic/load raster datasets. You can create the new raster dataset as a file or in a geodatabase.

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. 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.

1. Open **ArcToolbox**. Expand **Data Management Tools > General >** double-click on **Merge**.
2. For **Input datasets**, select the datasets you would like to merge from the drop-down box.
3. For **Output Dataset**, **Browse** to where you would like to save the output and give it a meaningful name.

4. **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.
5. Click **OK**.

Using the *Mosaic Tool* (Raster Data)

The **Mosaic** tool is used to mosaic multiple input rasters into an existing raster dataset. The existing raster dataset can be empty or it can already contain data. (You can create a new empty raster dataset using the **Create Raster Dataset** tool – see below). Use this tool to *merge* rasters that are adjacent and have the same cell resolution and coordinate system. There are two advantages to having a single raster - it draws faster in ArcGIS and is better suited for performing any geoprocessing or analysis tasks

1. Open **ArcToolbox**. Expand **Data Management Tools > Raster > Raster Dataset >** double-click on **Mosaic**.
2. For **Input Rasters**, select the input raster datasets you would like to mosaic together from the drop-down box.
3. For **Target Raster**, click Browse to select the existing raster dataset into which the input rasters will be merged. It is OK for the target raster to be one of the rasters listed as an input raster.
4. The rest of the fields are optional. Click on Show Help at the bottom of the dialog box to learn more about these fields.
5. Click **OK**.

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

Similar to the **Mosaic** tool, the **Mosaic to New Raster** tool is used to mosaic multiple input raster datasets. However, unlike the **Mosaic** tool, the **Mosaic to New Raster** tool saves the output mosaic in a new empty raster dataset which it creates on the fly. The input rasters must have the same number of bands and same bit depth.

1. Open **ArcToolbox**. Expand **Data Management Tools > Raster > Raster Dataset >** double-click on **Mosaic to New Raster**.
2. For **Input Rasters**, select the input raster datasets you would like to mosaic together from the drop-down box.
3. For **Output Location**, **Browse** to where you would like to save the output.
4. For **Raster Dataset Name with Extension**, enter a name for the new mosaiced raster dataset. [No file extension is needed for GRID format. Other formats that can be used are *bmp, gif, img, jpg, jp2* or *png*.]
5. Optionally, enter the **Spatial Reference for Raster**.

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6. Optionally, enter the **Pixel type** (to determine the pixel type of the input rasters, open their properties) and/or **Cellsize**.
7. Enter the **Number of Bands**. Enter the number of bands of the input rasters. Typically, black and white rasters (such as DEM rasters) have one band, and colour rasters (such as air photos) have three bands.
8. Optionally, choose a **Mosaic Operator**. (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.)
9. Optionally, choose a **Mosaic Colormap Mode** – this applies when the input raster datasets have a colour map. Note the information in the help column.
10. Click **OK**.

Creating raster datasets in a geodatabase using the *Create Raster Dataset Tool*

The **Create Raster Dataset** tool creates a new, empty raster dataset into which you can then mosaic/load raster datasets. You can create the new raster dataset as a file or in a geodatabase. These steps describe how to create a new file geodatabase, create a new raster dataset in the geodatabase, and then load raster datasets into that new, empty geodatabase raster dataset.

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.

Raster data can be imported into a geodatabase in several ways: by using the **Import raster datasets** dialog in the geodatabase context menu, the **Copy Raster** tool in the **Data Management** toolbox, or the **Load Data** dialog in the ArcCatalog dataset context menu. These steps will describe how to use the **Load Data** dialog. 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.

Create a new File Geodatabase

1. Open **ArcCatalog** and navigate to the folder where the geodatabase will be stored.

2. Right-click on the folder and select **New > File Geodatabase**.
3. A new geodatabase will appear. Type a name for it (without spaces) and press **Enter**.

Create an empty raster dataset

1. Open **ArcToolbox**. Expand **Data Management Tools > Raster > Raster Dataset >** and double-click on **Create Raster Dataset**.
2. For **Output Location**, **Browse** to the geodatabase you just created and click **Add**.
3. For **Raster Dataset Name with Extension**, enter a meaningful name. Because it is being stored in a geodatabase, no extension is required.
4. Optionally, enter a **Cellsize**.
5. Choose a **Pixel Type**. 8_BIT_UNSIGNED is the default. If you need help choosing a pixel type, check the pixel type of the rasters you plan to load into this empty raster dataset. [You can find their pixel type in **Layer Properties > Source**.]
6. Optionally, enter a **Spatial Reference for Raster**.
7. Enter the **Number of Bands**; the default is 1.
8. Click **OK**.

Loading raster data into an empty geodatabase raster dataset using *Load Data*

1. In **ArcCatalog**, right-click the empty geodatabase raster dataset that you just created, then select **Load > Load Data**. This will open the **Mosaic** dialog box.
2. For **Input Rasters**, **Browse** to the location of the input raster dataset you want to load and select it. You can add more than one.
3. For **Target Raster**, make sure the output location is correct. [It should be the empty geodatabase raster dataset you just created.] If it is not correct, **Browse** to the proper location.
4. The rest of the fields are optional. Click on **Show Help** at the bottom of the dialog box to learn more about these fields.
5. Click **OK**.