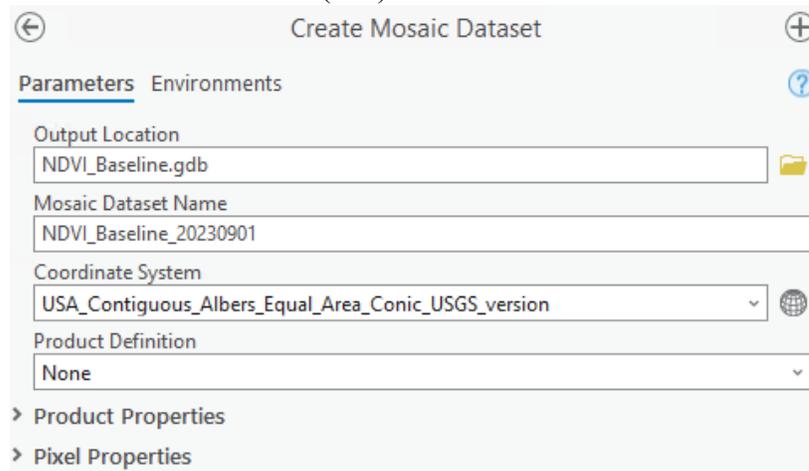


CREATING A MOSAIC DATASET WITH MULTIDIMENSIONAL DATA

This protocol documents how to use a collection of raster images (TIF files) to create a multidimensional dataset. In this example, we will use NDVI derived from Landsat 8 OLI. See also the step-by-step video at https://giscenter.isu.edu/files/Esri_CreateMultidimensionalRasters.mp4
Download Landsat imagery (NDVI) and organize these data in a [RASTERS] data folder.

Using ArcGIS Pro:

1. Use the CREATE MOSAIC DATASET (MD) tool



2. ADD RASTERS to this MD. This process follows a very standard add rasters approach and nothing special needs to be done at this point for a MDiD (see the figure on the next page).
 - a. Run this processing tool and understand that a large volume of data can take a substantial amount of time to process (approximately 1.5-2 hours).

Mosaic Dataset

NDVI_Baseline_20230901

Raster Type
Raster Dataset

Processing Templates
Default

Input Data
Folder

C:\arcgisserver\NDVI_Baseline\Rasters_INT

Advanced Input Data Options

Auxiliary Inputs

Name	Value

Coordinate System for Input Data

Input Data Filter

Include Sub Folders

Add New Datasets Only
Allow duplicates

Enable Pixel Cache

Raster Processing

Calculate Statistics

Build Raster Pyramids

Maximum Levels

Maximum Cell Size

Minimum Rows or Columns

Mosaic Post-processing

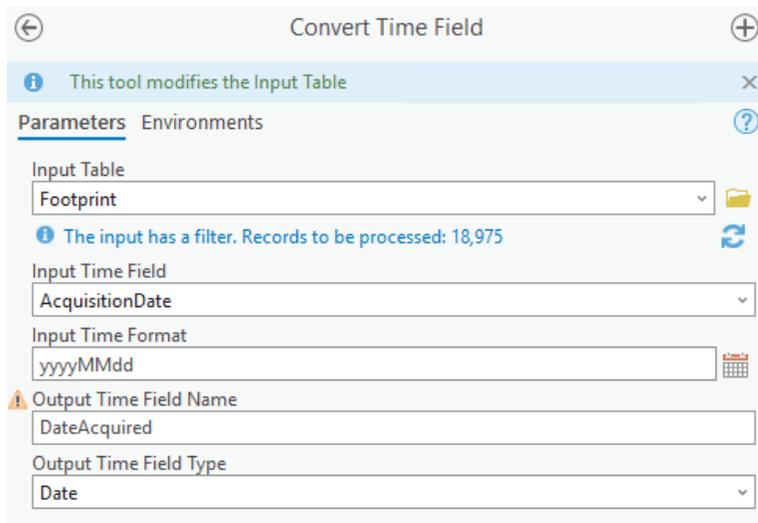
Build Thumbnails

Update Overviews

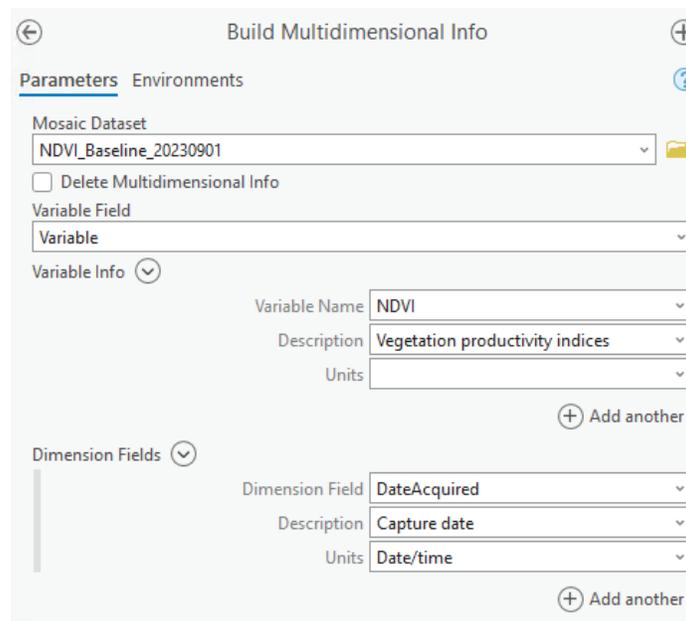
Estimate Mosaic Dataset Statistics

Operation Description

3. Once completed, zoom into the Image data and ensure you can see the imagery.
4. Open the Footprint attribute table and ensure all layers have been added. There will be some additional overview layers (Ov*.tif) as well. Each layer is represented by one record in the table.
 - a. Populate the ProductName field for the data records (not the overview records) with NDVI
 - b. Create an AcquisitionDate field as LONG.
 - c. Populate this field using the Arcade function:
`Mid($feature.Name,12,8)`
 - d. Again, do this only for the data records (not the overview records).
5. To support time data and a fully functional multidimensional dataset, date needs to be stored in a real DATE data type field. This is accomplished using the Convert Time Field Tool.



6. Next, use the BUILD MULTIDIMENSIONAL INFO tool to add multidimensional awareness to this MD.
 - a. For this to work correctly, we need to specify what variable is being described by these data.
 - b. Set the Variable field to `ProductName` (which is populated with NDVI).
 - c. Next, we need to add additional information about this variable.
 - d. Set Variable Name to be NDVI
 - e. And add a Description of what this really means
 - f. Secondly, we need to identify the Dimension field.
 - g. Select `DateAcquired` as the Dimension Field
 - h. Enter `Capture Date` as the Description
 - i. Enter `Date/time` as the units



- j. Run this tool.

- k. When finished, the menu/ribbons for the Mosaic Layer will change and the geoprocessing tool will indicate the information has been built successfully.
 - l. Test the temporal profiling tool to ensure it is working correctly. To do this, right click the MD and choose CHART—TEMPORAL PROFILE
7. Using the completed MD, click the Multidimensional ribbon and create derived summary layers.
 - a. Summary Statistics---Calculate Mean
 - b. Summary Statistics---Calculate Median
 - c. Summary Statistics---Calculate Maximum
 - d. Summary Statistics---Calculate Standard Deviation
8. Create a lower and upper bound NDVI raster layer. To do this:
 - a. Use the TIMES tool to multiply Standard Deviation by 1.96 (this represents a 95% CI).
 - b. Use the MINUS tool (Mean – SD_95PCT). This creates an NDVI Lower Bounds layer at 95% CI.
 - c. Use the PLUS tool (Mean + SD_95PCT). This creates an NDVI Upper Bounds layer at 95% CI.
9. Publish (share) the NDVI Baseline multidimensional MD and summary layers as image services.