

Esri Southwest User Conference

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Managing Imagery Using Mosaic Datasets

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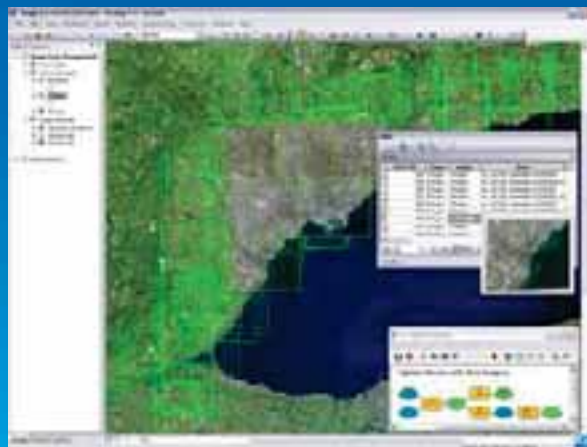


Workshop Agenda

- **Introducing Mosaic Datasets**
- **Managing Mosaic Datasets**
 - **Creating, adding rasters, optimizing**
 - **Elevation data**
- **Visualization**
 - **Image Analysis Window, Band combination, time**
- **Serving and Sharing mosaic datasets**
 - **Image Extension, consuming in ArcGIS Desktop and ArcGIS Online**

What is the Mosaic Dataset?

- A geodatabase data model used to catalog, process, visualize and share your collections of imagery, raster, and elevation data
- Indirect data management
- Unlimited size
- Provides dynamic rasterization, mosaicking, and on-the-fly processing



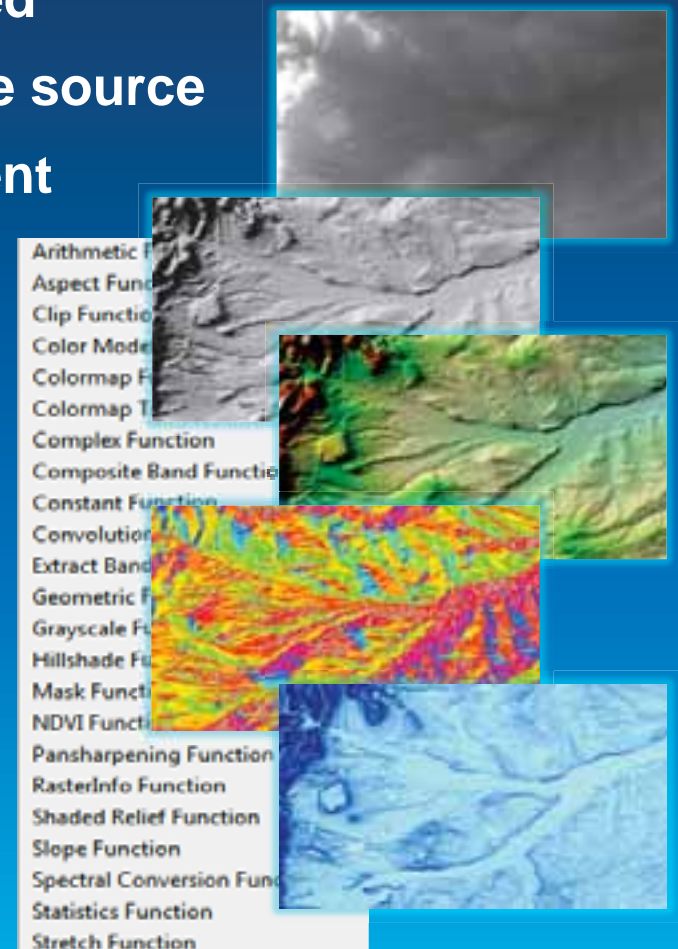
Benefits of Managing with the Mosaic Dataset

- Store multiple collections and projects
- Store variety of raster and elevation data
- Unlimited size
- Provide access to all data
 - As raster
 - As source data
 - Share internally and online



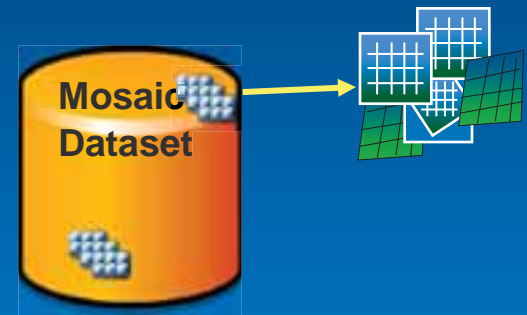
On-The-Fly Processing

- Data is processed as it is accessed
- Create multiple products from one source
- Processing for Image Enhancement
- Processing for elevation
 - Hillshade
 - Shaded Relief
 - Aspect
 - Slope
 - Convolution Filters



Mosaic Dataset - Storage

- A model in geodatabase
- Stored as set of tables
 - Footprint table references source images
 - Boundary, Seamlines
 - Raster type, color correction
- Displayed as a composite layer
 - Boundary
 - Footprint
 - Image



Mosaic Dataset – Mosaic Method

- **Mosaic method to set the display order**
 - **North west (default)**
 - **Closest to center**
 - **By attribute**
 - **Closest to nadir**



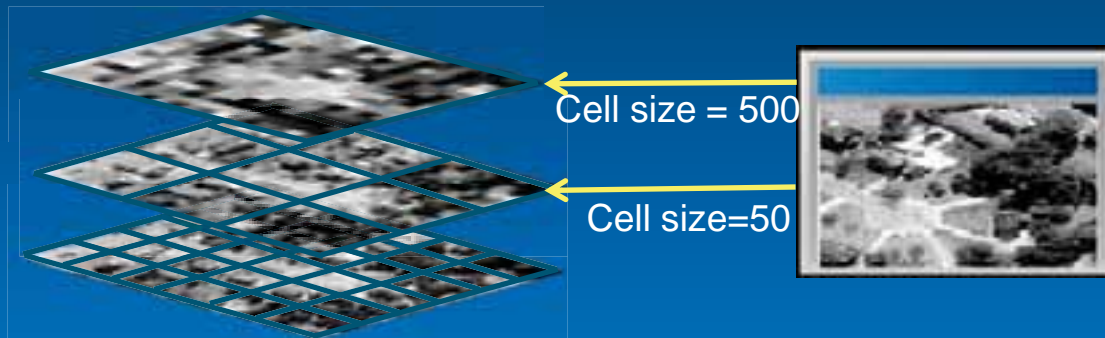
Closest to the center



By attribute: cloud cover

Mosaic Dataset – Overviews and Visibility

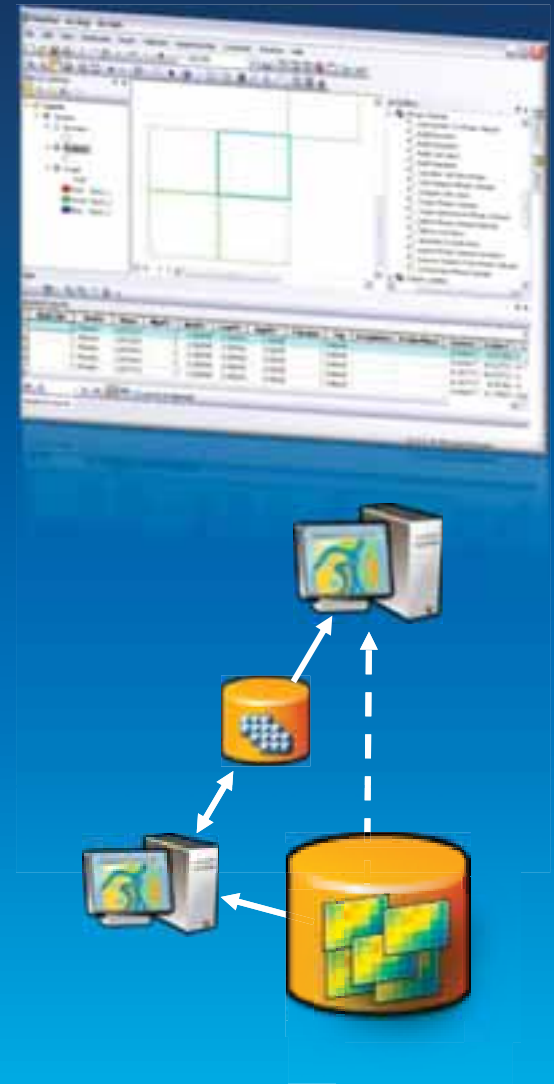
- **Overviews are resampled rasters**
 - Increase visible range of mosaic dataset
 - Fast image display at all levels of details
- **MinPS and MaxPS define the visible range of items**



OID	Shape	Raster	Name	MinPS	MaxPS	LowPS	HighPS	Category	...
1	Polygon	<Raster>	P01.met	0	40	1	4	Primary	
2	Polygon	<Raster>	P02.met	0	40	1	4	Primary	
3	Polygon	<Raster>	filename1.tif	40	400	40	40	Overviews	
4	Polygon	<Raster>	filename2.tif	40	400	40	40	Overviews	
5	Polygon	<Raster>	Filename3.tif	400	4000	400	400	Overviews	

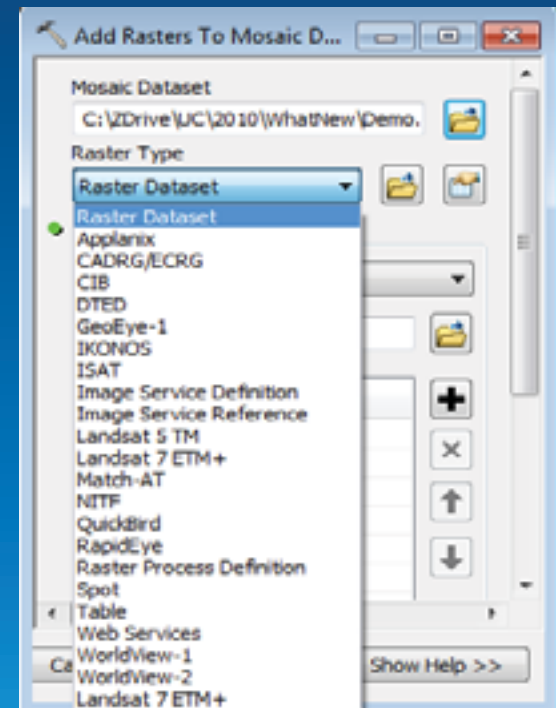
Building a Mosaic Dataset

- **Store in a geodatabase**
 - Build with geoprocessing tools
 - Automation with models or Python
- **Simple workflow**
 - Create mosaic dataset
 - Add imagery
 - Optionally, edit properties and functions
- **Can interactively edit and view in ArcMap**
 - All layers are displayed
 - Edit and add fields in table window



Adding Rasters – Raster Type

- Defines what data to add
 - Processing template
 - Construct a raster function
 - Fields for footprint table
 - Sensor, CloudCover, etc.
- Examples:
 - NITF, QuickBird, IKONOS, Raster Dataset
 - LAS



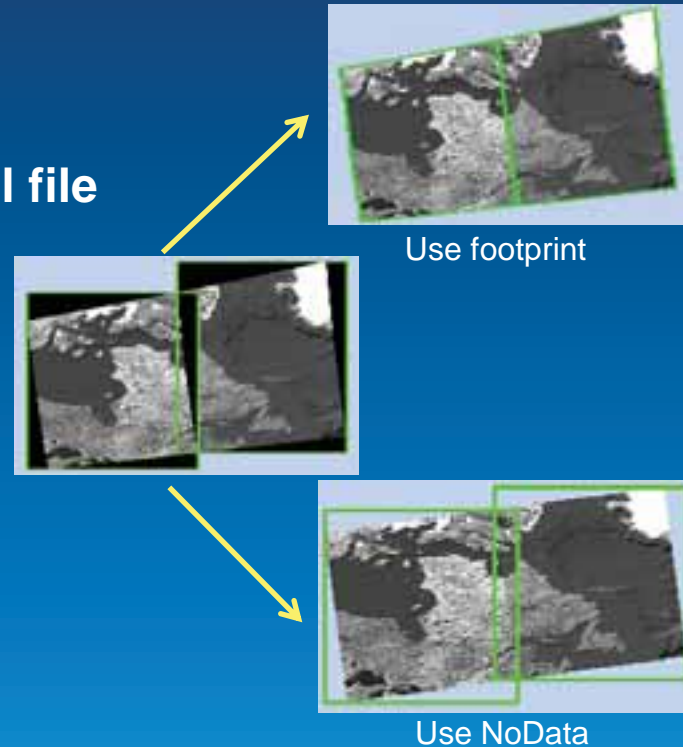
Handling the Image Background

- **Build Footprints**

- Optionally edit using Editor
- Optionally import from an external file
- **black pixels excluded**

- **NoData tool**

- Based on a value or a range
- **Nodata pixels included**



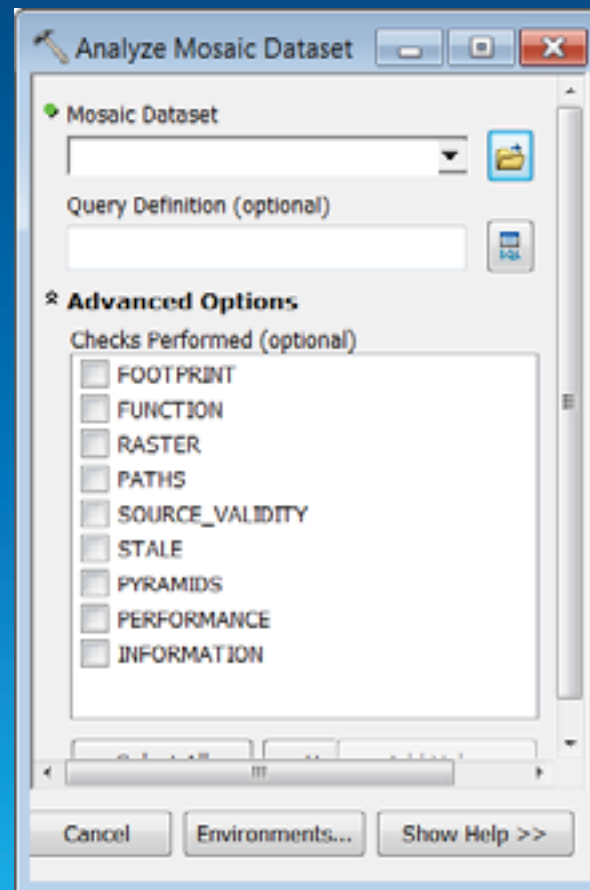
Building Overviews

- **Build Overviews tool create images with default**
 - **TIFF with JPEG compression**
 - **Size of 5120x5120**
 - **Factor of 3**
- **Use Define Overview tool to refine the parameters**
- **Add a raster dataset as an overview**
 - **Create a tile cache using Manage Tile Cache tool and as an overview**

Analyzing Mosaic Datasets

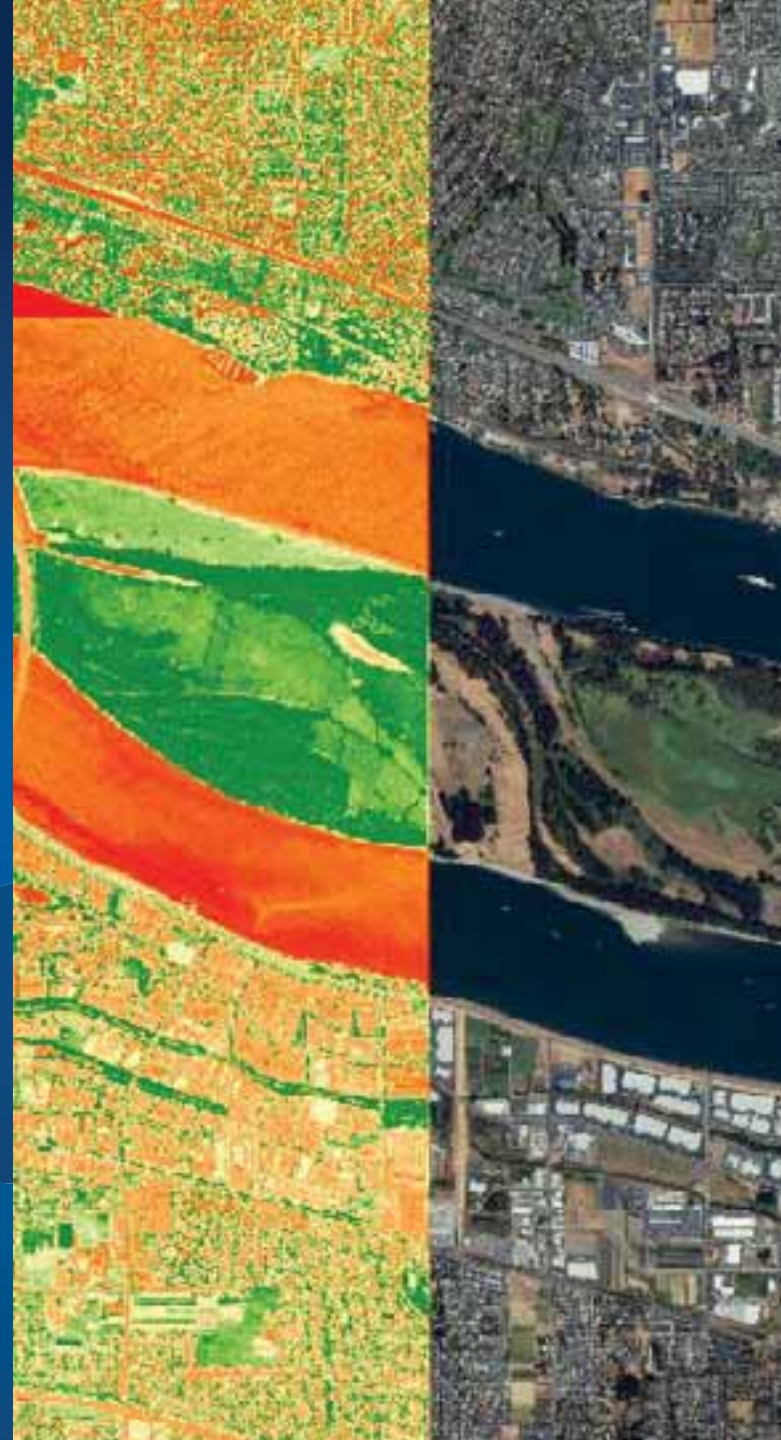
Using Analyze Mosaic Dataset tool

- **Identify errors and provide performance tips**
 - Check raster
 - Check footprint geometry
 - Check function chain
 - Check broken path
 - Performance
- **Recommended for publishing as image services**



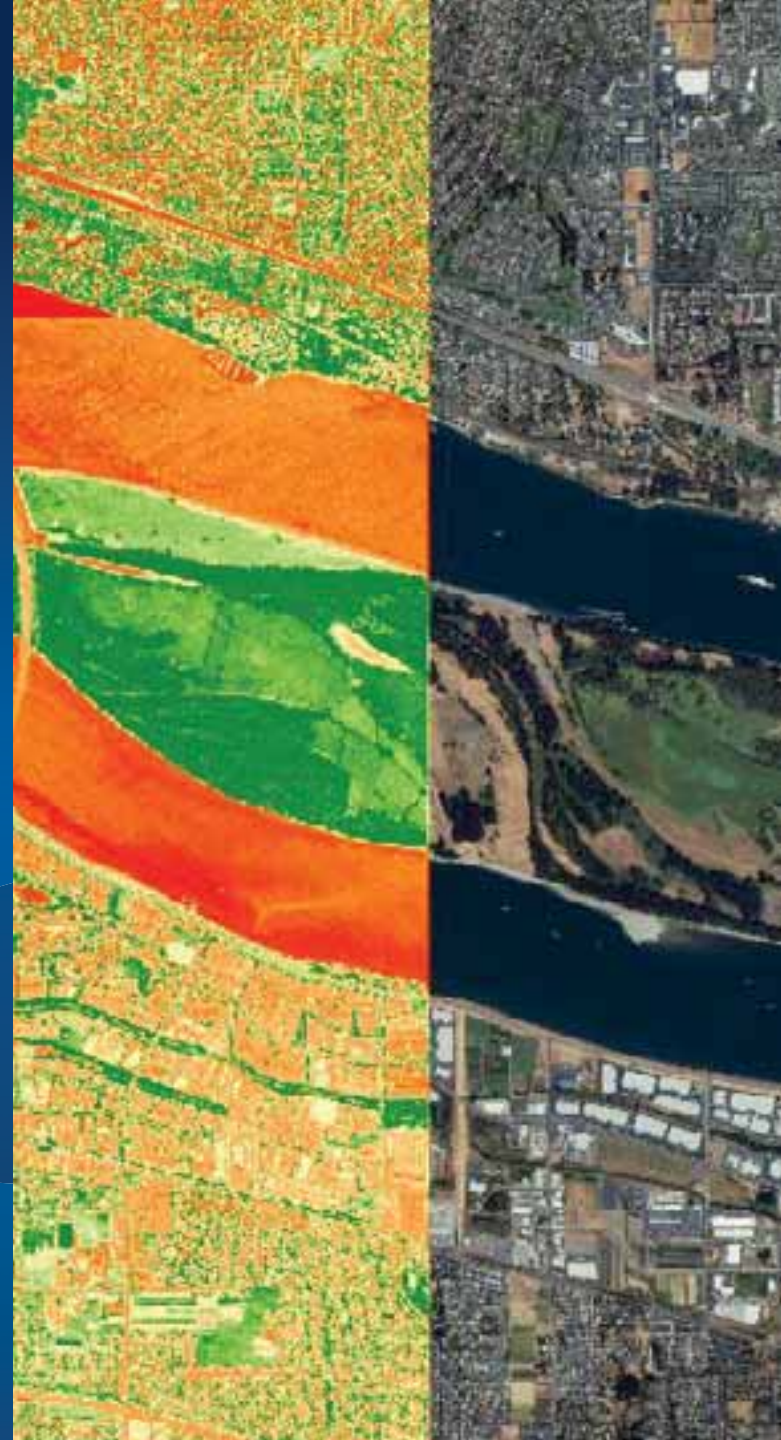
Demo

Creating and Managing Mosaic Datasets



Section

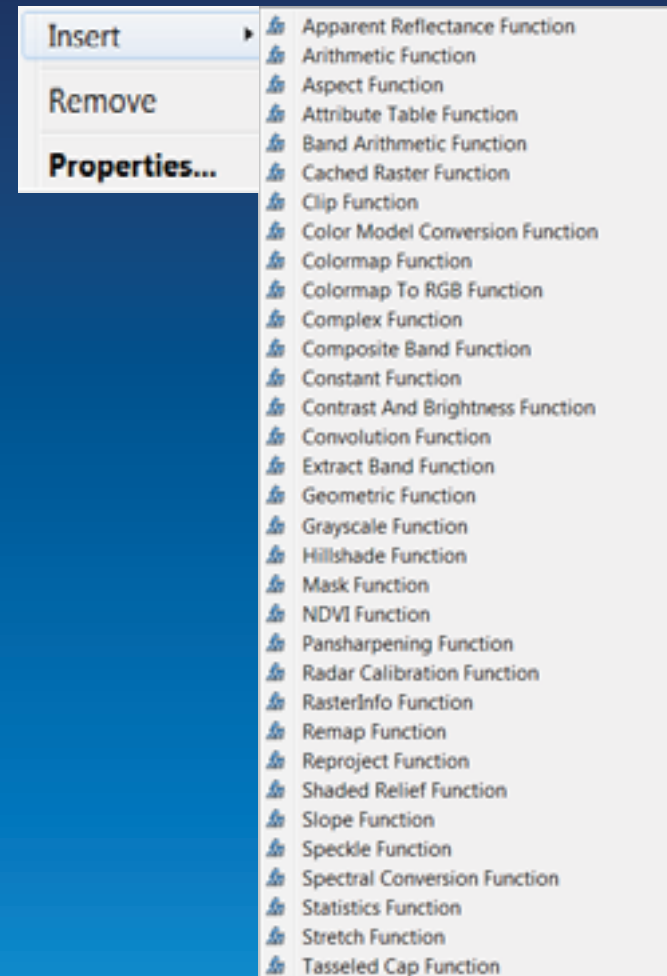
Visualization



Refine Radiometry

Insert, remove, edit raster function

- **Edit mosaic dataset or one item**
 - From function tab
- **Edit multiple items**
 - Make a selection
 - using raster function batch editor
- **The Edit Raster Function tool**
 - For editing item (s) or mosaic dataset



Color Correcting Mosaic Dataset

Use Color Balance Mosaic Dataset tool or Color Correction window

- Based on a calculated color surface
 - Single color, color grid
 - First, second, third polynomial
- Based on an existing target raster
 - World imagery service
- Support excluded area



Before



After

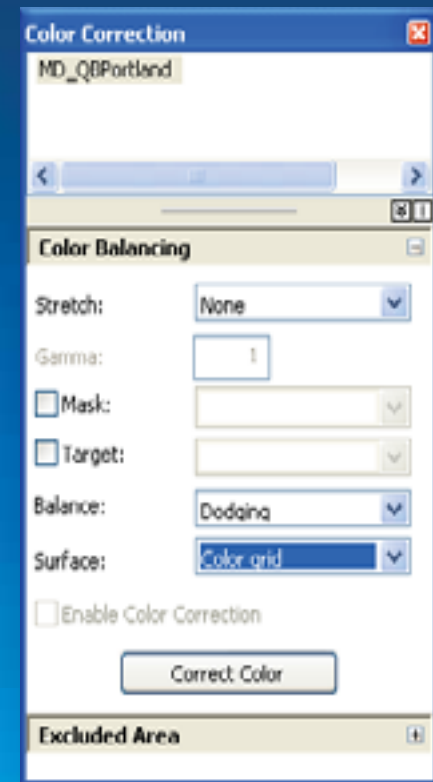
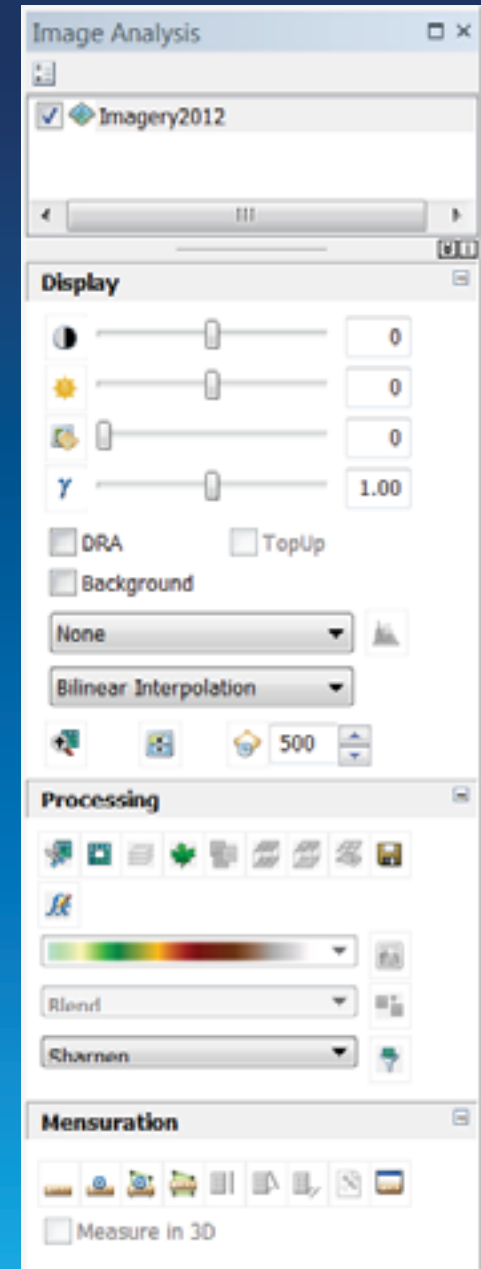


Image Analysis Window

- One interface for improving the display of your imagery... supports all raster types
- Display Tab
 - Brightness, contrast, gamma, transparency
 - Statistics, histograms
- Processing Tab
 - Clip, NDVI, raster functions, export



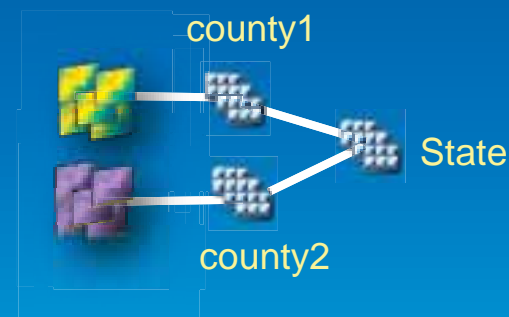
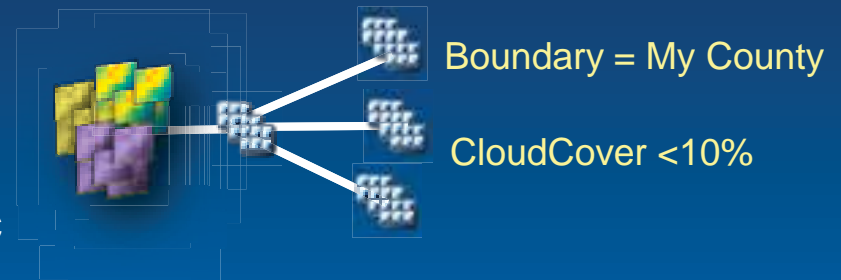
Using Time

- **Create separate mosaic datasets for each year**
 - **Build overviews, add functions, etc.**
- **Create a “Master” mosaic dataset that accesses each year**
 - **Add a field to hold the date (text)**
 - **Add each mosaic dataset**
 - **Populate the date field**
- **Enable time on layer in ArcMap**

Reference and Derived Mosaic Datasets

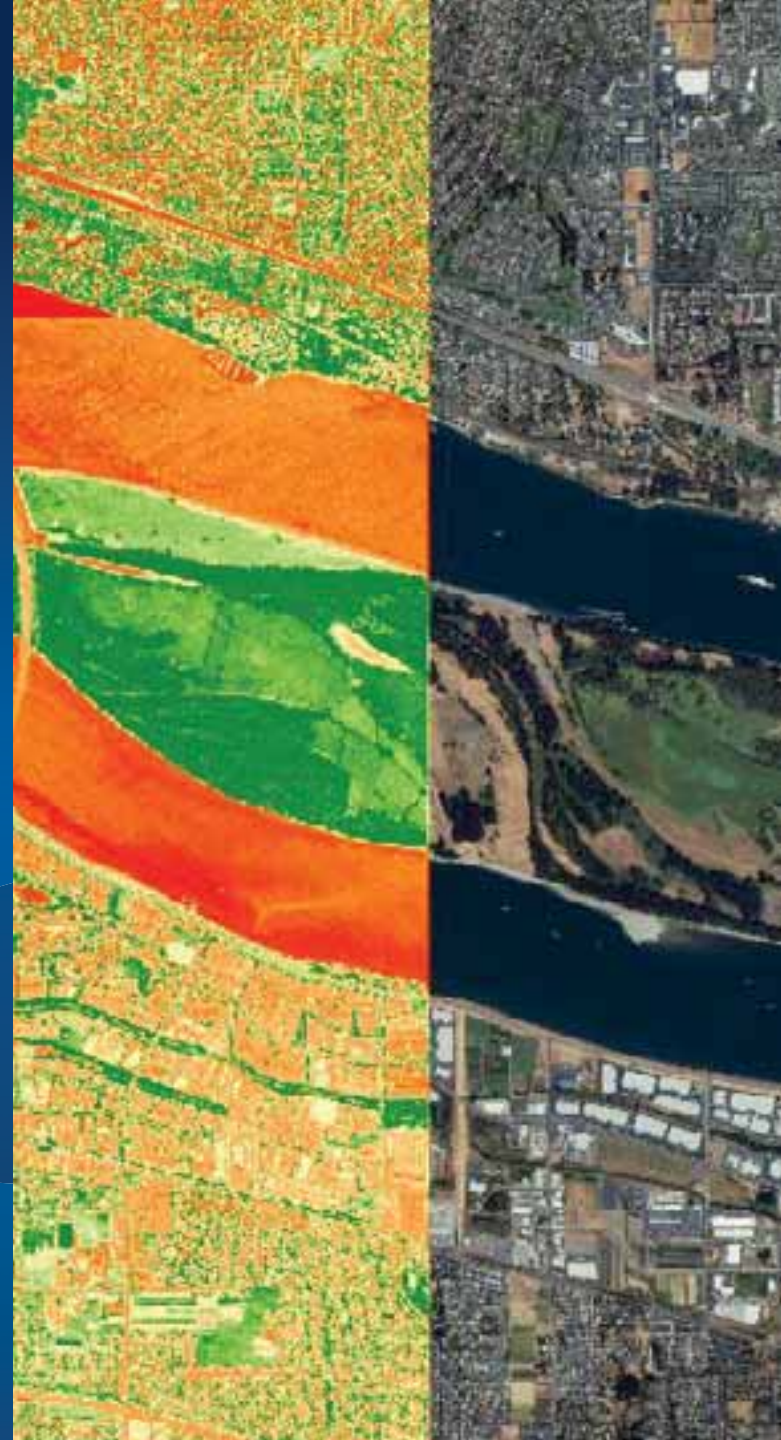
Create Reference Mosaic Dataset tool

- **Source mosaic dataset**
 - References source images
- **Reference mosaic dataset**
 - References an external mosaic
 - Read only
 - Multiple views of source mosaic
- **Derived mosaic dataset**
 - Table type to copy rows
 - Raster Dataset type add as one row
- **Support update mechanism**



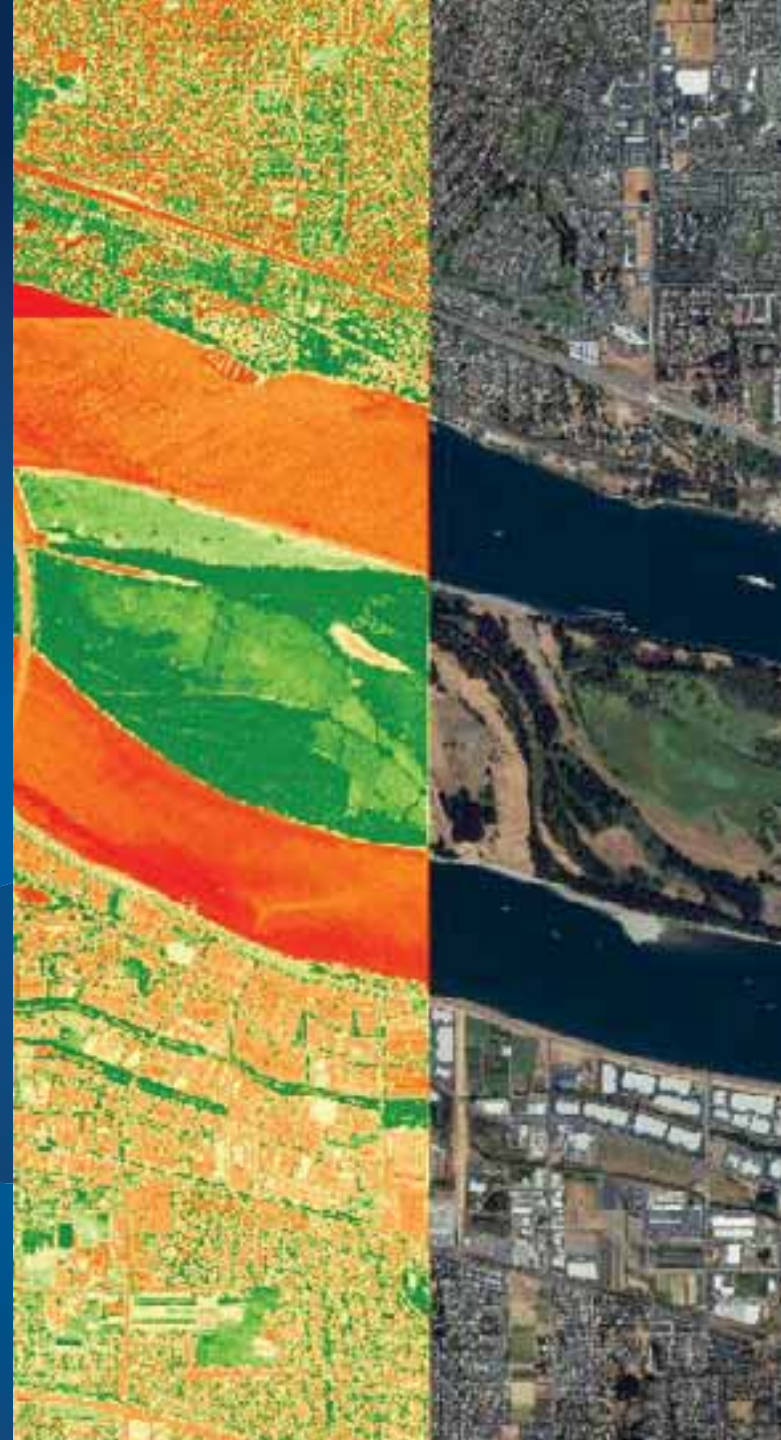
Demo

Visualization



Section

Serving Mosaic Datasets



ArcGIS for Server 10.1 Image Extension

- A license (not a separate install)
- It extends the capabilities to serve collections of imagery or lidar data
 - Stored in mosaic datasets or a raster layer using the Mosaic function

Serving:

- Rasters
- Raster layers
- *Mosaic datasets
- *Mosaic dataset layers



ArcGIS Server



Updating and Synchronizing Mosaic Dataset

Using Synchronize Mosaic Dataset GP tool

- Update existing items
 - Any change in source images
 - Any change in rasters
 - Option to maintain the existing fields
- Add new rasters
- Remove items of broken source
- Data must be added from folder mosaic datasets

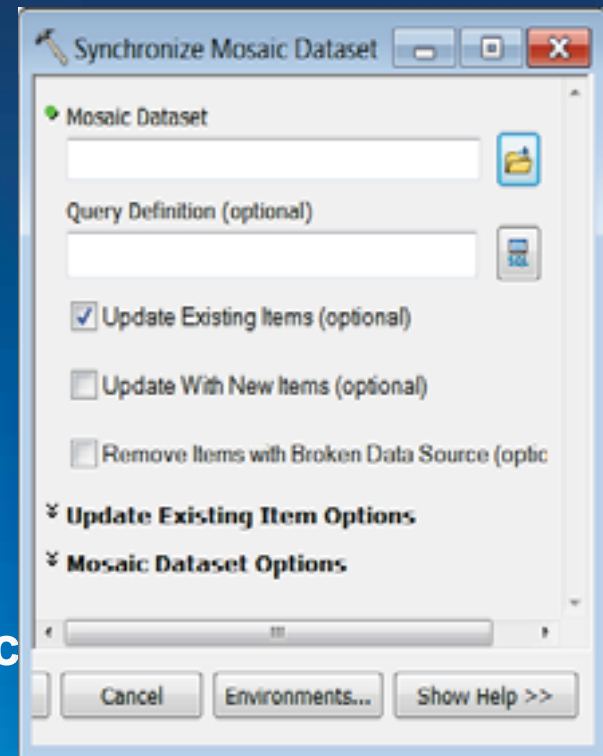


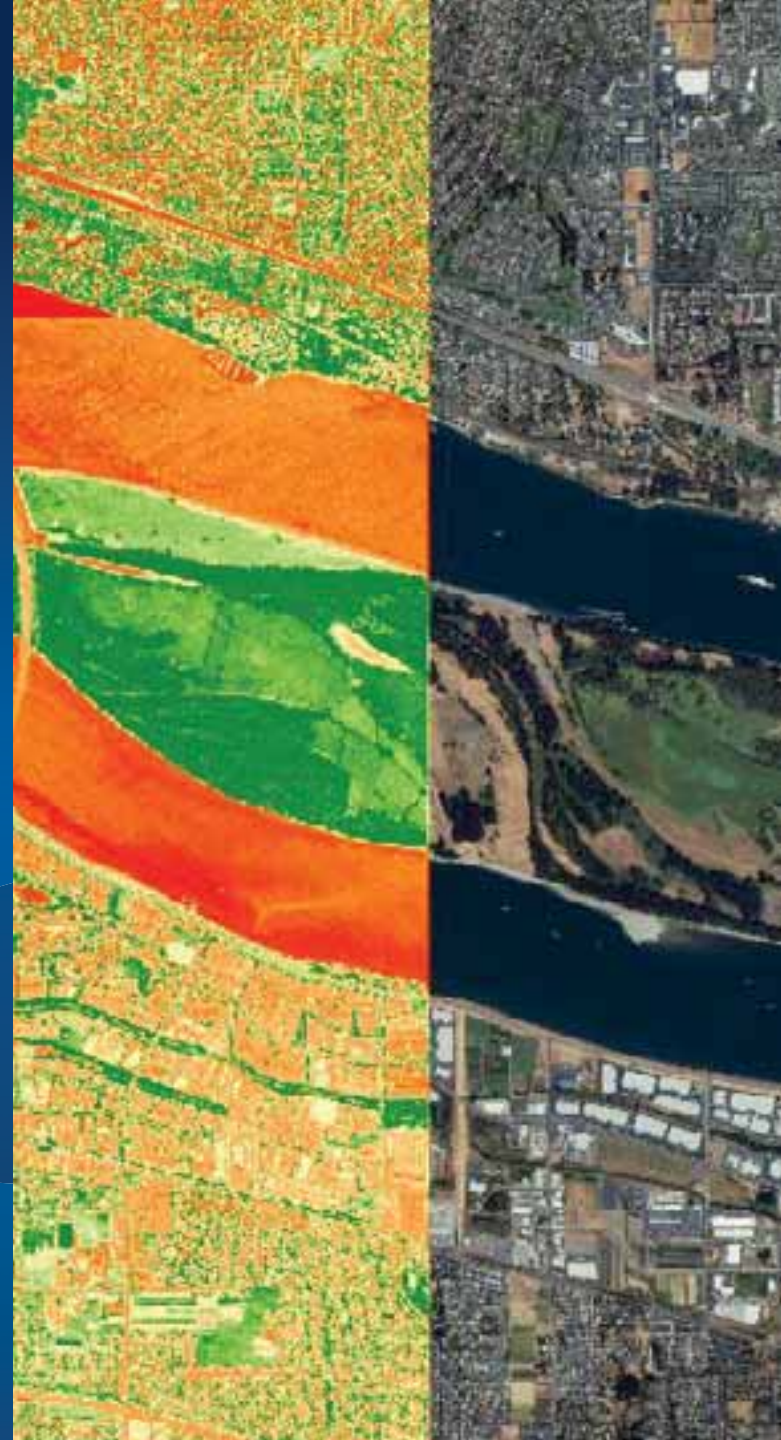
Image Service Capabilities

The screenshot shows a configuration window for an Image Service. On the left is a vertical navigation menu with the following items: General, Parameters, Catalog, Editing, Function, Mensuration, Capabilities, Imaging (highlighted), WCS, and WMS. The main content area is titled "Imaging" and contains the following fields and options:

- REST URL:
- SOAP URL:
- Operations allowed:
 - Catalog
 - Edit
 - Mensuration
 - Pixels
 - Download
 - Image
 - Metadata
- Properties:

Demo

Serving Mosaic Datasets





Understanding our world.