What’s New in Imagery in ArcGIS

Presented by: Christopher Patterson
Date: September 12, 2017
Agenda

• Ortho Mapping
• Elevation extraction
• Drone2Map
• Raster Analytics
ArcGIS is a Comprehensive Imagery System

Imagery is integral to the ArcGIS Platform

System of Insight
Extract Information from Imagery

Professional Imagery & Geospatial Analysts

Content: ArcGISOnline Partners, Org

Server

System of Engagement
Share imagery products and information to those that need it

System of Record
Manage and process all your imagery

Imagery is integral to the ArcGIS Platform
Imagery in ArcGIS Advancing

2010
- Stretch, Extract Bands
- Clip, Mask
- Reproject, Orthorectify, Pan Sharpen
- Vegetation Index, Classify
- Shaded Relief, Slope, Aspect
- Color Correction
- Mosaic Dataset
- On-the-fly Process

2011
- Stretch, Extract Bands
- Clip, Mask
- Reproject, Orthorectify, Pan Sharpen
- Vegetation Index, Classify
- Shaded Relief, Slope, Aspect
- Color Correction
- Mosaic Dataset
- On-the-fly Process

2012
- Stretch, Extract Bands
- Clip, Mask
- Reproject, Orthorectify, Pan Sharpen
- Vegetation Index, Classify
- Shaded Relief, Slope, Aspect
- Color Correction
- Mosaic Dataset
- On-the-fly Process

10.1
- Raster Products
- Interactive stretch
- Image mensuration
- FMV
- LiDAR support
- MD Analyzer

2013
- Stretch, Extract Bands
- Clip, Mask
- Reproject, Orthorectify, Pan Sharpen
- Vegetation Index, Classify
- Shaded Relief, Slope, Aspect
- Color Correction
- Mosaic Dataset
- On-the-fly Process

10.3
- Raster Products
- Interactive stretch
- Image mensuration
- FMV
- LiDAR support
- MD Analyzer
- ArcGIS Pro
- Block Adjustment

2014 ....... 2017
- Stretch, Extract Bands
- Clip, Mask
- Reproject, Orthorectify, Pan Sharpen
- Vegetation Index, Classify
- Shaded Relief, Slope, Aspect
- Color Correction
- Mosaic Dataset
- On-the-fly Process

10.3.1
- Raster Products
- Interactive stretch
- Image mensuration
- FMV
- LiDAR support
- MD Analyzer
- ArcGIS Pro
- Block Adjustment
- Improved segmentation
Ortho Creation - ArcMap
ArcGIS Pro Ortho Mapping Workflow

- Simplified by streamlining complicated photogrammetry calculations

Input image collection → Create ortho mapping workspace → Perform block adjustment → Generate ortho mapping products → DTM, DSM → Orthomosaic
Ortho Mapping – ArcGIS Pro 1.4
Create orthos based on specific accuracy specifications
Scanned Aerial Images

Create Historical Map
Ortho Mapping Derived Products
Demonstration
Ortho Mapping
Drone Data Processing
Drone2Map

Orthomosaics

Digital Surface Models
DSM & DTM

Point Clouds
&
3D Meshes

Smart Inspection
&
3D PDF
Drone2Map - What’s New

- Open Projects In ArcGIS Pro
- Batch Processing
- Share Project As Web Map
- New Image Carousel Integrated With Map Clicks
- Draw Tool
- Mesh Support For LOD’s
- Support For Output Spatial Reference
- Updated 3D Textured Mesh Settings
- Additional Calibration Parameters

- Updated Ribbon
- Selection Of Image Centers (Camera Stations)
- Allow Layer Symbology Color Change:
  - Image Centers
  - Flight Lines
  - Contours
  - GCP’s
  - Project Area
- Application Quality Improvements
Demonstration
Raster Analytics
What is Raster Analytics?

A new way to create and execute spatial analysis models and image processing chains which leverage distributed storage and analytics

A new capability of Image Server 10.5 !!!!
Raster Analytics Workflows

**Math**
- Square
- Square Root
- ArgStatistics
- Times
- Cell Statistics
- Bitwise And
- Bitwise Left
- ACos
- Bitwise Not
- Bitwise Or
- ASin
- Exp
- Exp10
- Exp2
- Float
- Log
- Log10
- Log2
- Minus
- Greater Than
- Mod
- Greater Than
- Negate
- Equal
- Plus
- Is Null
- Power
- Less Than
- Round Down
- Less Than
- Round Up
- Equal

**Abs**
- Square Root
- Times
- Cell Statistics
- Bitwise And
- Bitwise Left
- ACos
- Bitwise Not
- Bitwise Or
- ASin
- Exp
- Exp10
- Exp2
- Float
- Log
- Log10
- Log2
- Minus
- Greater Than
- Mod
- Greater Than
- Negate
- Equal
- Plus
- Is Null
- Power
- Less Than
- Round Down
- Less Than
- Round Up
- Equal

**Arithmetic**
- Shift
- ACosH
- Boolean And
- Boolean Not
- Boolean Or
- Boolean Xor
- Equal To
- Greater Than
- Greater Than Equal
- Is Null
- Less Than
- Less Than Equal
- Not Equal

**Band**
- Square Root
- Times
- Cell Statistics
- Bitwise And
- Bitwise Left
- ACos
- Bitwise Not
- Bitwise Or
- ASin
- Exp
- Exp10
- Exp2
- Float
- Log
- Log10
- Log2
- Minus
- Greater Than
- Mod
- Greater Than
- Negate
- Equal
- Plus
- Is Null
- Power
- Less Than
- Round Down
- Less Than
- Round Up
- Equal

**Correction**
- Apparent Reflectance
- Geometric Correction
- Speckle Filtering (Lee,Frost,Kuan)

**Data Management & Conversion**
- Raster to Vector
- Vector to Raster
- Colorbar
- Colormap To RGB
- Complex
- Grayscale
- Remap / Reclass
- Spectral Conversion
- Unit Conversion
- Vector Field
- LAS to Raster
- LAS Dataset to Raster
- Clip
- Composite
- Extract Bands
- Mask
- Mosaic Rasters
- Rasterize Features
- Reproject

**Visualization & Appearance**
- Contrast and Brightness
- Convolution
- Pan sharpening
- Resample
- Statistics and Histogram
- Stretch

**Surface Generation & Analysis**
- Aspect
- Curvature
- Elevation Void Fill
- Hillshade
- Shaded Relief
- Slope
- Viewshed

**Analysis: Distance & Density**
- Euclidean Distance
- Cost Distance
- Least Cost Path
- Kernel Density

**Analysis: Overlay**
- Weighted Sum
- Weighted Overlay

**Analysis: Band Math & Indices**
- NDVI / NDVI Colorized
- SAVI / MSAVI / TSAVI
- GEMI
- GVI (Landsat TM)
- PVI
- Tasseled Cap (Kauth-Thomas)
- Binary Thresholding

**Analysis: Image Segmentation & Classification**
- Segmentation (Mean Shift)
- Training (ISO, SVM, ML)
- Supervised Classification

**Analysis: Overlay**
- Weighted Sum
- Weighted Overlay

**Python**
- Custom Algorithms

*Does not contain all capability of Spatial Analyst*
Minimum Image Server and Raster Analytic setup

Portal

ArcGIS Pro

Webmap

Hosting Server

ArcGIS Data Store (Relational and Tile Cache)

Image Server

Raster data store

File share storage

Cloud storage
Road Ahead
PUT ON YOUR GLASSES !!!
Imagery Road Ahead – Pro 2.1

Projected for December 2017

Additional imagery capabilities
- Histogram manipulation

New Image Analysts Extension – For Pro Standard & Pro Advance
- Stereo, Full Motion Video, Oblique and Mensuration support
- Add some Raster Functions that currently require Spatial Analyst

Image Management
- Support for Google Cloud
Imagery Road Ahead – Pro 2.1

Raster Analytics

• Additional function (more global functions)
• Simplified collection processing
• Web UX for custom models from Pro
• Enhanced Renderers

Enterprise Ortho Mapping

• Add Ortho Mapping capabilities to Image Server
• Pro can process locally or on Server
• Web UI for Drone processing
Resources

Webinars
What’s New with Imagery in ArcGIS
Thu, Oct. 5, 2017

The ArcGIS Imagery Book
Learn More ↓
Questions