Sharing Oblique and Oriented Imagery

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Oblique Imagery
Oblique imagery – modes to consider

• Sources
  - Satellite
  - Drones
  - Professional multisensor digital cameras

• Project size
  - One at a time
  - Large image collections

• Coordinate systems
  - Map space vs. Image space
  - Mensuration
Professional multisensor digital cameras (oblique + nadir)

- Pictometry, MIDAS, Others
  - 5 sensors:
  - 1 nadir
  - 4 oblique (forward, back, left, right)

- Aeroptic
  - 10 sensors:
  - 2 nadir
  - 2 each direction oblique

- Octoblique MIDAS
- Others…
Using oblique imagery

Satellite (simple case)
Professional multisensor (collections)
WebApp Builder
Workflow for large image collections, multisensor cameras

• Management
  - Mosaic Dataset
  - Frame Camera raster type (see Demo Theater #1 @ 4:00 p.m. today)

• Usage
  - Direct use in Pro
  - Web AppBuilder widget for Obliques
    - Web AppBuilder Developer Edition; also see http://esriurl.com/WABIS
    - Two image services:
      - Nadir imagery
      - Multidirectional obliques
Managing oblique imagery
ArcGIS Pro

Data courtesy of Aeroptic, LLC, a KeyW Company
Oriented imagery in ArcGIS

- Management and sharing of imagery defined by
  - Camera location (geocoded),
  - View orientation (heading and pitch),
  - Other attributes (FOV, search distance, more)

- Imagery stored in the cloud (AWS, Azure, Google)
Oriented Imagery – Challenges considered during this development

• Management
  - Massive Number of frames
  - Massive Volume of data
  - Cloud and Enterprise Storage

• Use
  - Web - No (limited) suitable viewers in ArcGIS
  - Desktop - No (limited) suitable viewers in ArcGIS
  - Need fast spatial, temporal & attribute based queries
  - Mensuration – Ranges from approximate to very accurate
  - Gallery control
Oriented imagery - components

• Authoring & Publishing tools – ArcGIS Pro

• Support for consuming OIC (Oriented Imagery Catalog) feature services
  - ArcGIS Pro Add-in
  - Web AppBuilder Widget
Using Oriented Imagery
Web App & Pro
Workflow for Authoring & Managing Oriented Imagery

• Authoring
  - Creating OIC – Oriented Imagery Catalog
    - Points for exposures
    - Polygons for coverage
  - Add Images – read directory, or CSV list, or existing feature class
  - Create coverage features – populate polygons
  - Create coverage map – vector tile package
  - Copy images to web – AWS, Azure, Google
  - Publishing – OIC file, vector tile package, point & polygon feature services

• Managing
  - OIC = Feature classes
  - Tools for managing paths, find broken paths, manage upload, create referenced OIC…
OIC Schema

- **Generic schema for Oriented Imagery**
  - Oriented Imagery Item – Links to services + Key attributes, tags
  - Point feature service with defined attributes:
    - Heading, Pitch, Roll, NearDistance, FarDistance,
    - AverageHeightAboveGround, HFOV, VFOV,…
  - DTM or Depth Image
  - Coverage Map (optional) – Vector Tile Cache, ….

- **Library of code to:**
  - Query for AOI
  - Compute Footprint on plane surface / DTM / Depth
  - Coordinate transform
    - Image to Ground (xyz)
    - Ground (xyz) to Image

- **API that integrates with multiple apps**
- **Extensible for 3rd parties**