



Sharing Oblique and Oriented Imagery

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UC2018

ESRI USER CONFERENCE

Image Orientation

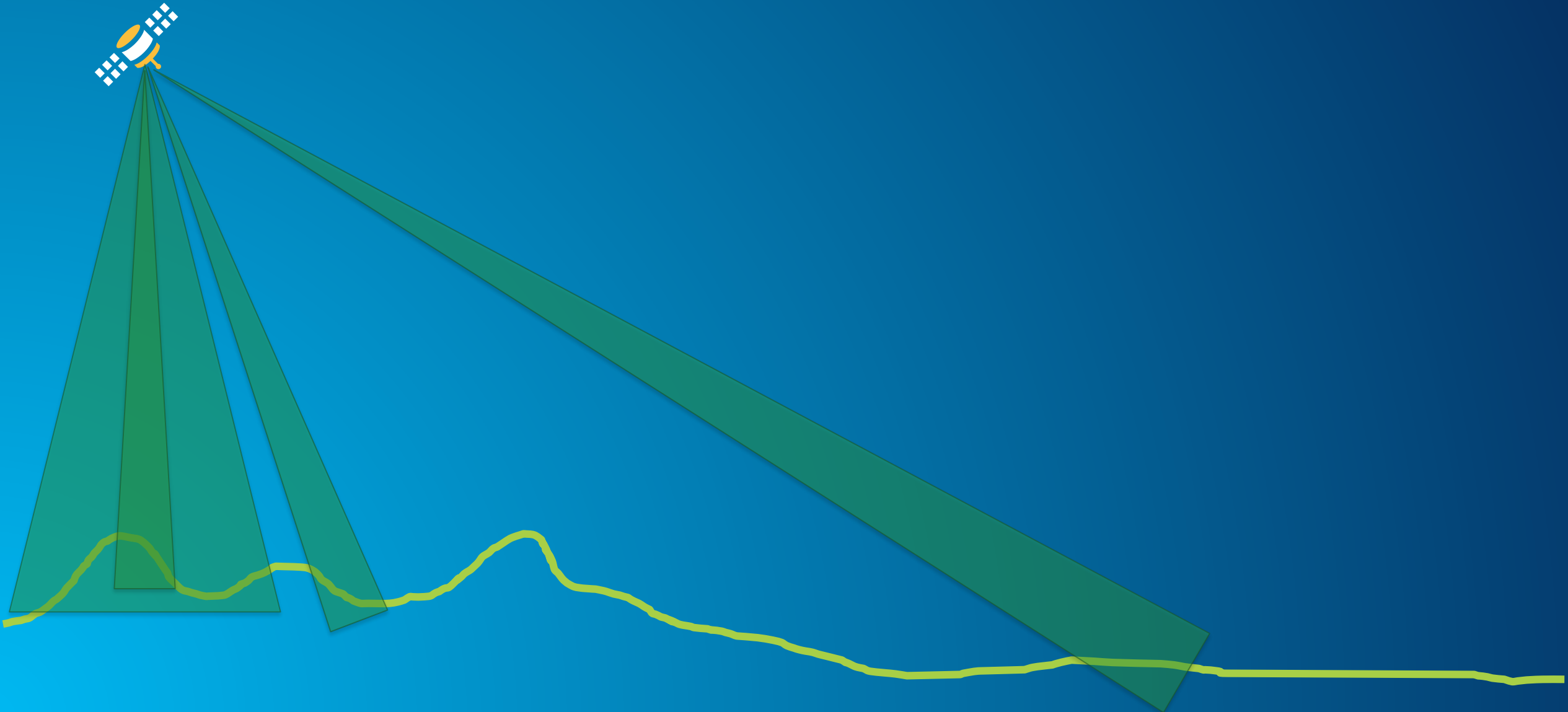


Image Orientation

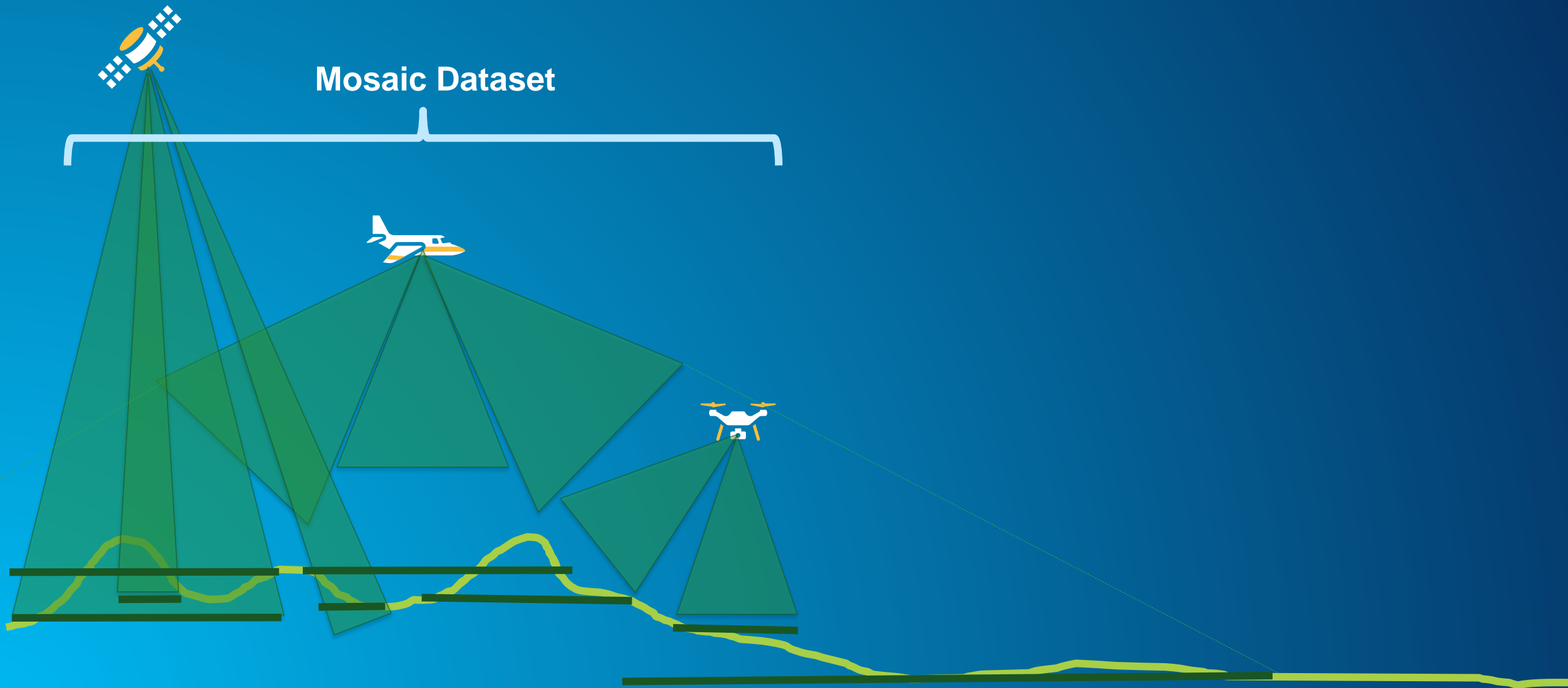
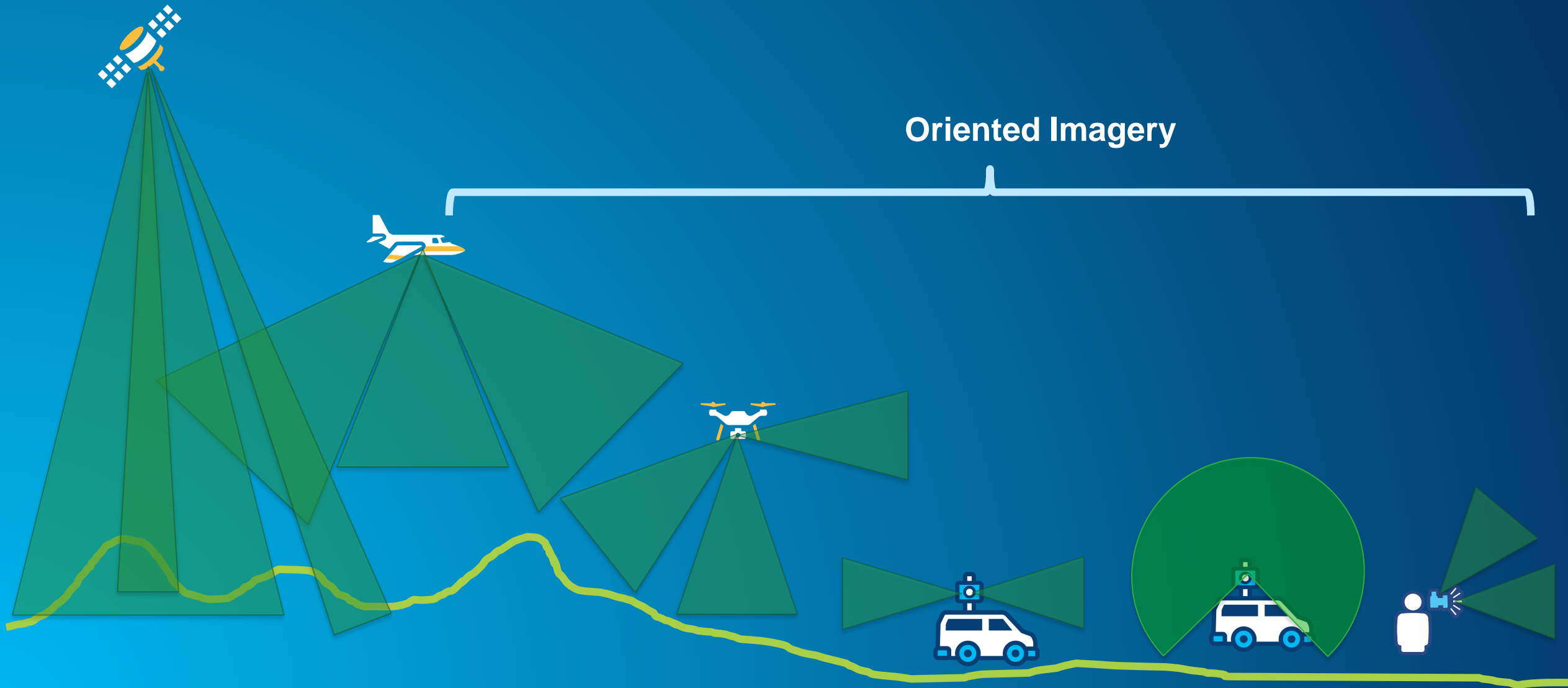


Image Orientation



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)

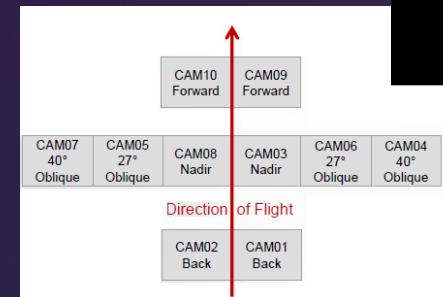
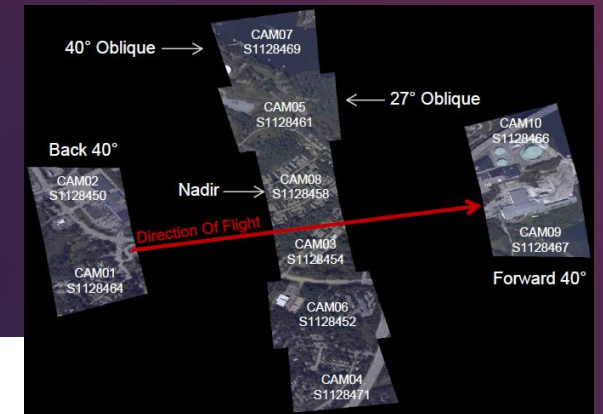
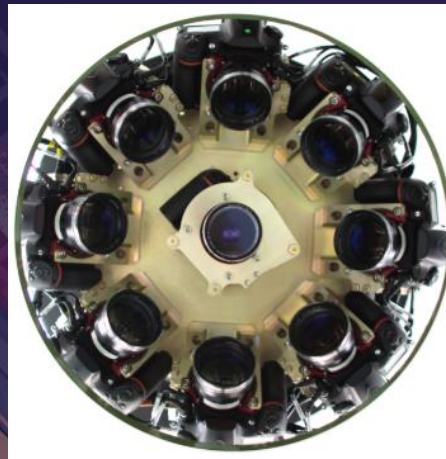


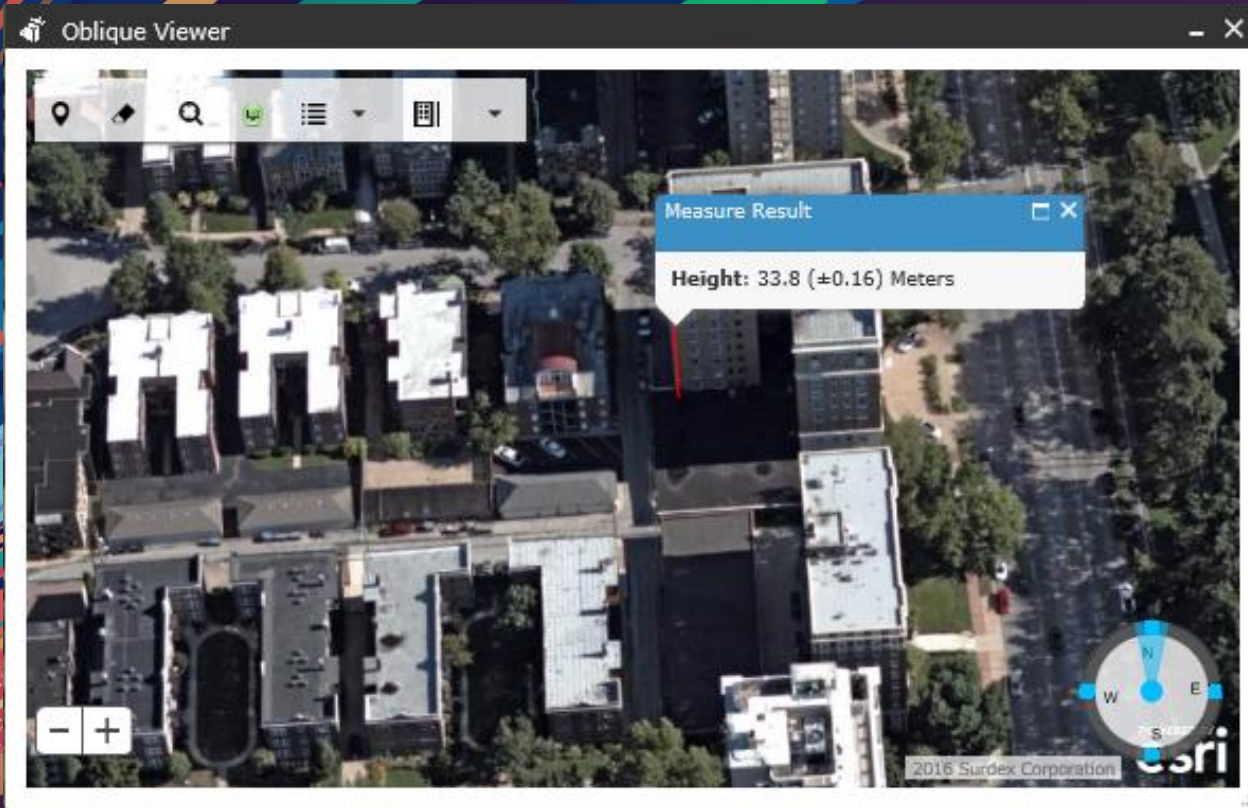
- Aeroptic

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

- Octoblisque 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

Oriented Imagery

From Esri Imagery Workflows

STATUS: Released
(Early Adopter)

Image Orientation

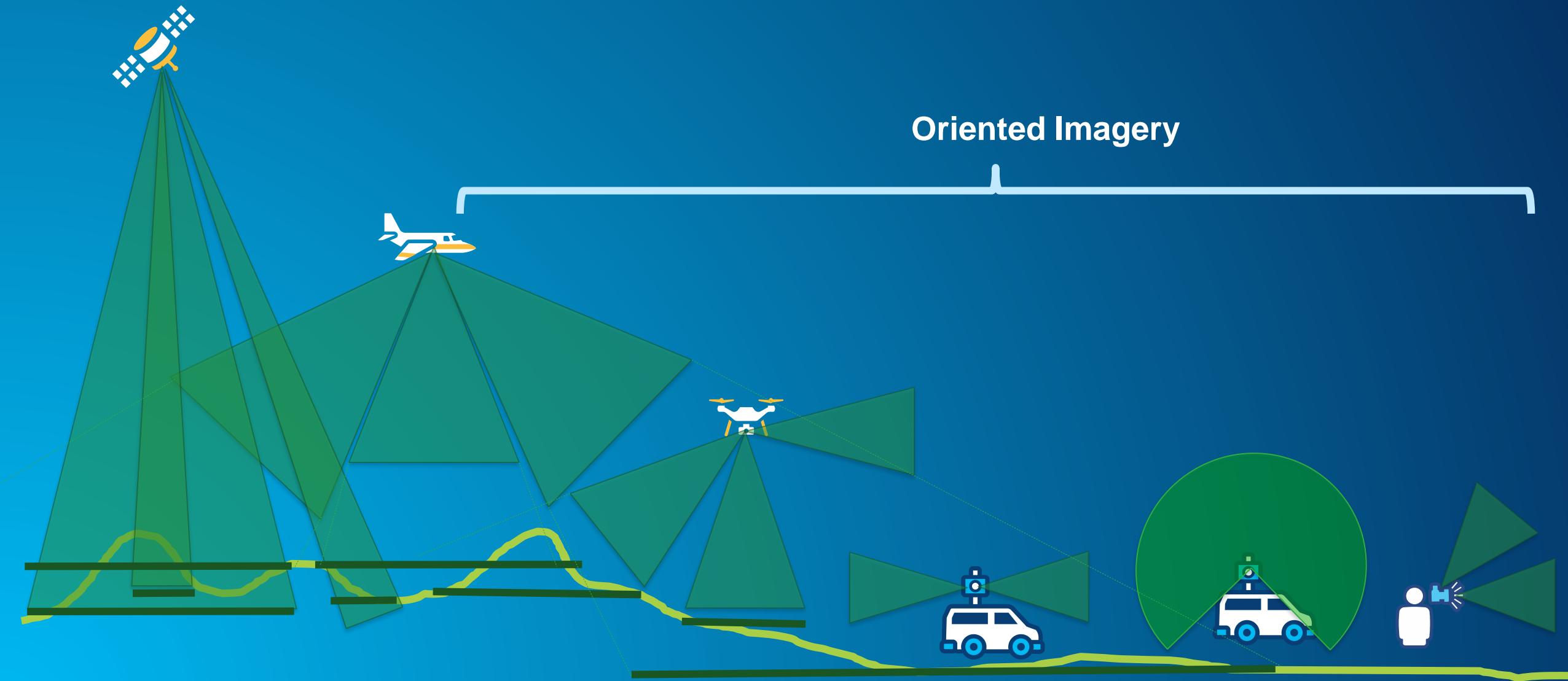
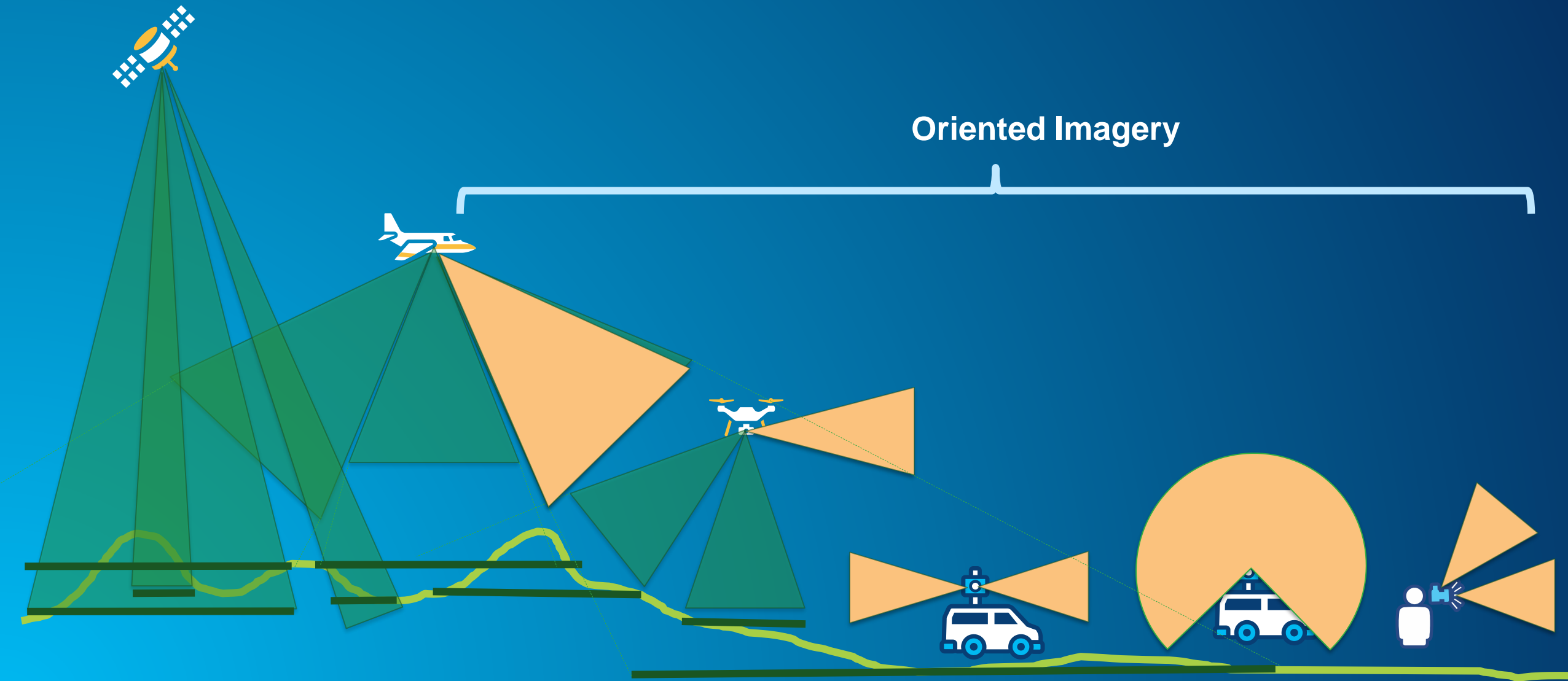
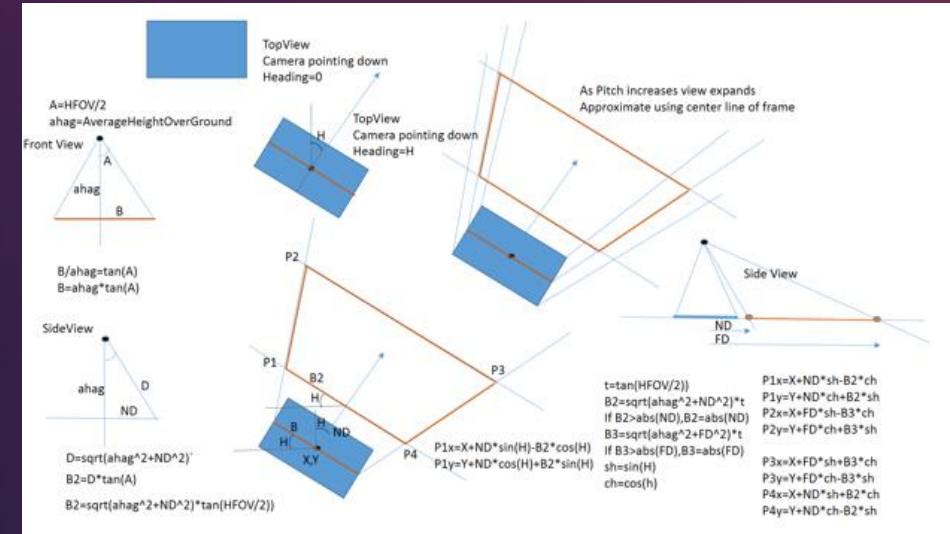


Image Orientation



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**

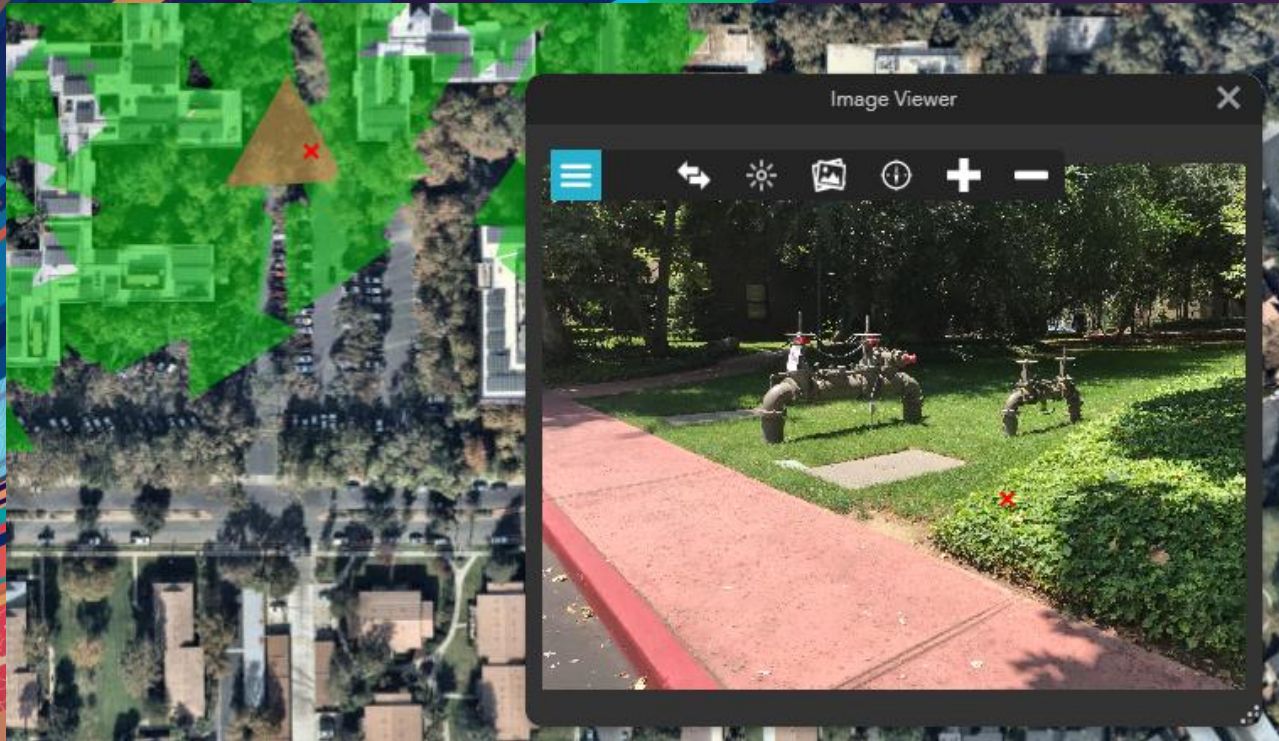
- **Massive Number of frames**
- **Massive Volume of data**
- **Cloud and Enterprise Storage**

- **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...**

The background features a dark purple gradient with abstract, colorful geometric shapes in shades of blue, green, orange, and red. These shapes are layered and oriented diagonally, creating a sense of depth and movement. Faint, light-colored map elements, including a street grid and topographic contour lines, are visible through the layers of shapes.

Authoring OIC

Cristelle D'Souza

Download *Early Adopter* version from
<https://marketplace.arcgis.com/index.html?q=oriented>

OIC Schema

- **Generic schema for Oriented Imagery**

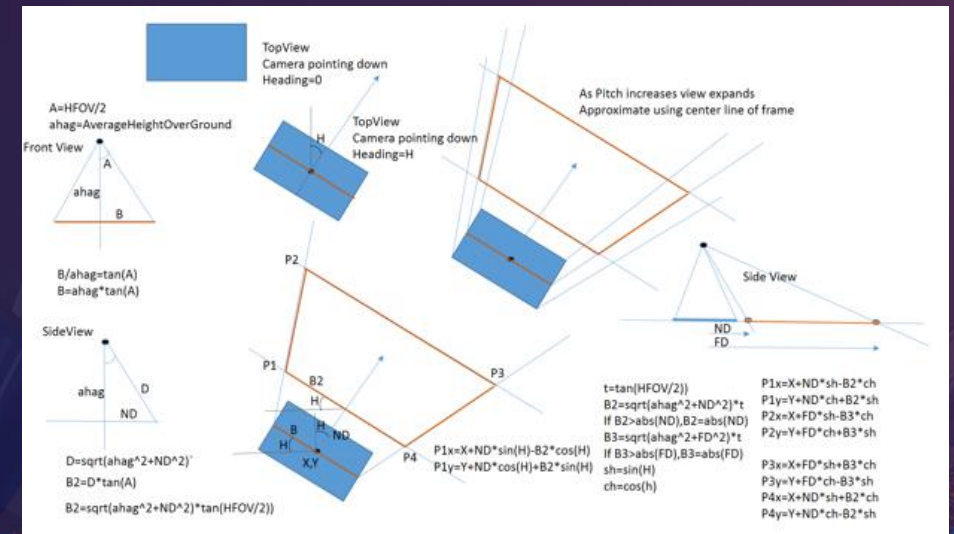
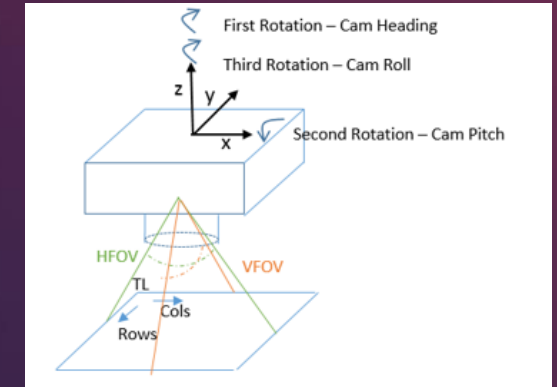
- **Oriented Imagery Item** – Links to services + Key attributes, tags
- **Point feature service with defined attributes:**
 - Heading, Pitch, Roll, NearDistance, FarDistance,
 - AverageHeightAboveGround, HFOV, VFOV,...
 - DTM or Depth Image
- **Coverage Map (optional)** – Vector Tile Cache,

- **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**





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