



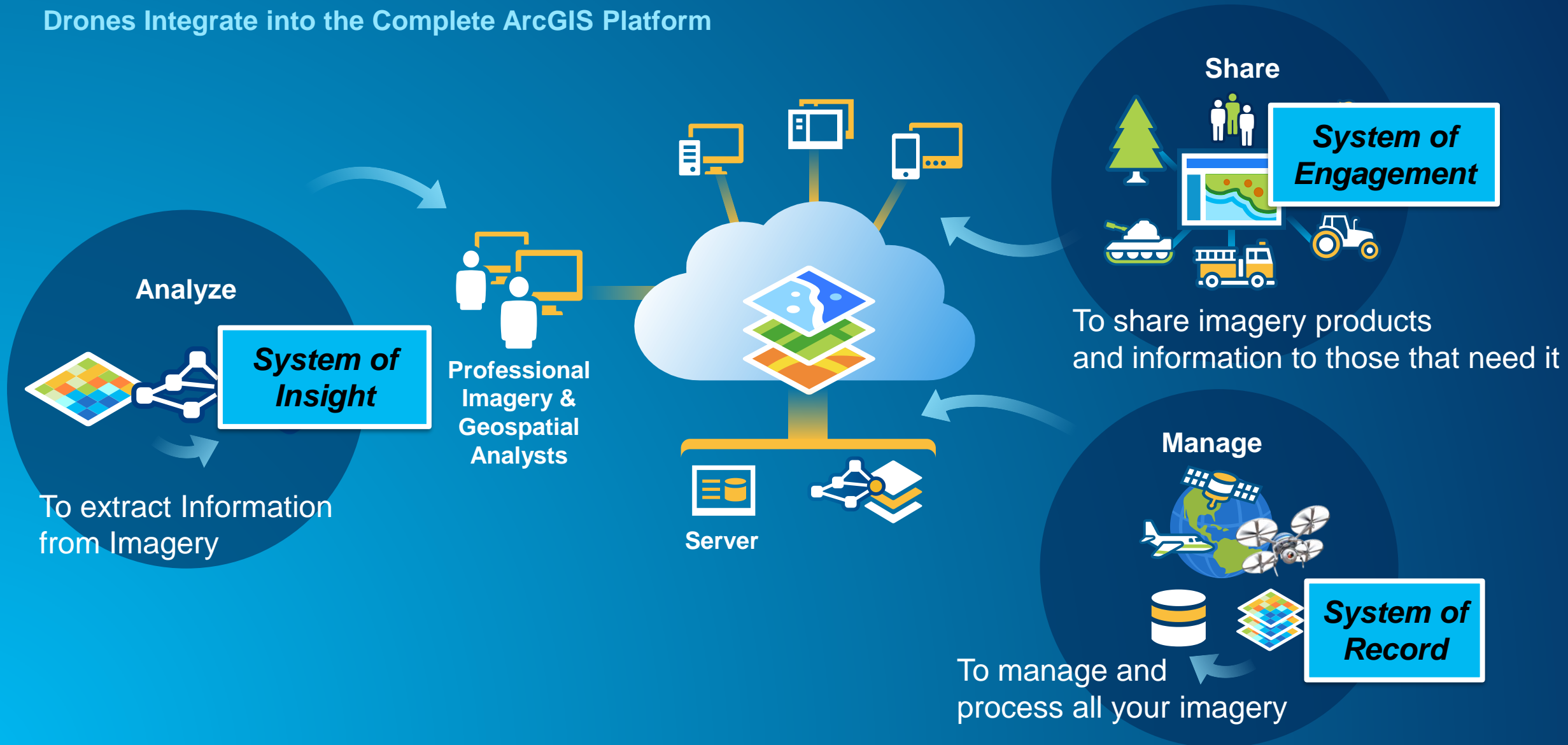
# Drones and Imagery in the ArcGIS Platform

Cody A. Benkelman

Technical Product Manager - Imagery

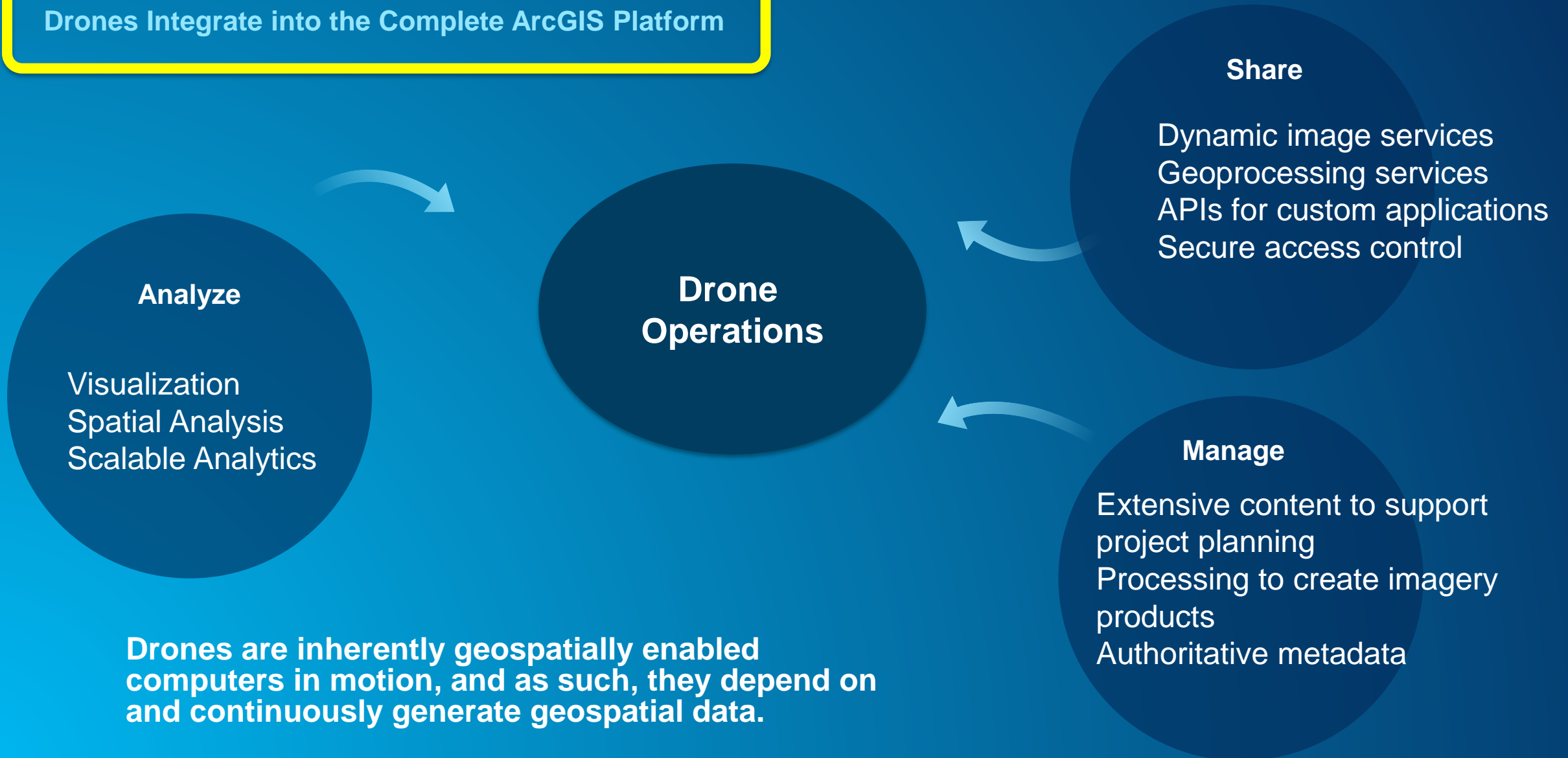
# ArcGIS is a Comprehensive Imagery Platform, *including Drones*

Drones Integrate into the Complete ArcGIS Platform



# ArcGIS is a Comprehensive Imagery Platform, *including Drones*

Drones Integrate into the Complete ArcGIS Platform



# Project planning in GIS

# Project planning

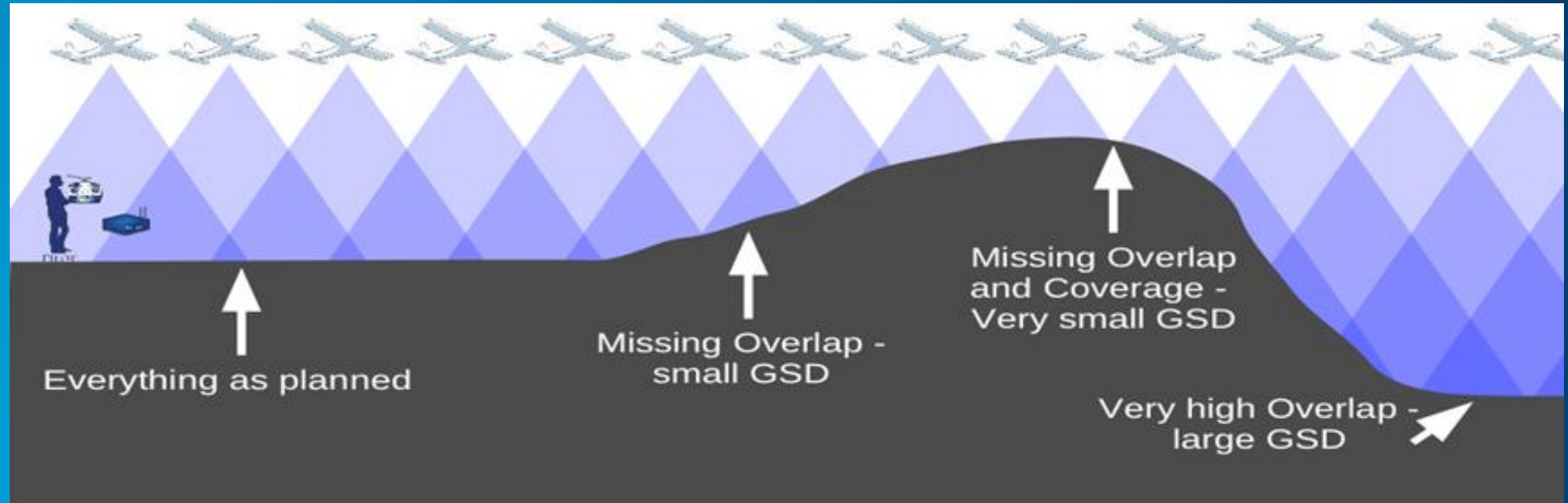
*Extensive content and tools to support your drone project planning*

- **The Living Atlas and ArcGIS Online**
  - Elevation

# Project planning

*Extensive content and tools to support your drone project planning*

- **The Living Atlas and ArcGIS Online**
  - **Elevation**



Graphic courtesy of TopCon/MaVinci Flight Mission Control Software

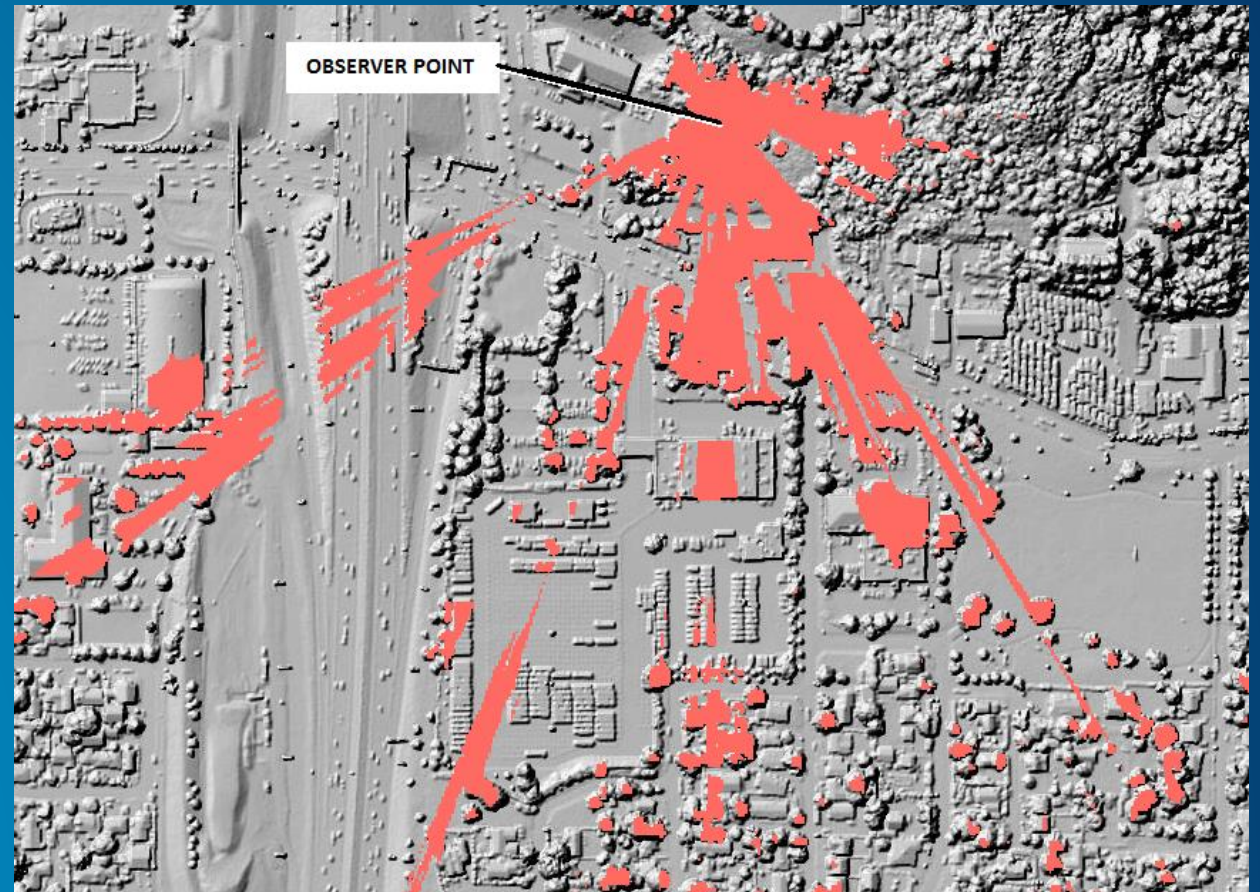


# Project planning

*Extensive content and tools to support your drone project planning*

- The Living Atlas and ArcGIS Online
  - Elevation

Viewshed calculation to maintain line of sight



# Project planning

*Extensive content and tools to support your drone project planning*

- **The Living Atlas and ArcGIS Online**
  - Elevation
  - Weather, Wind
  - Political Boundaries
  - FAA maps

*...more...*

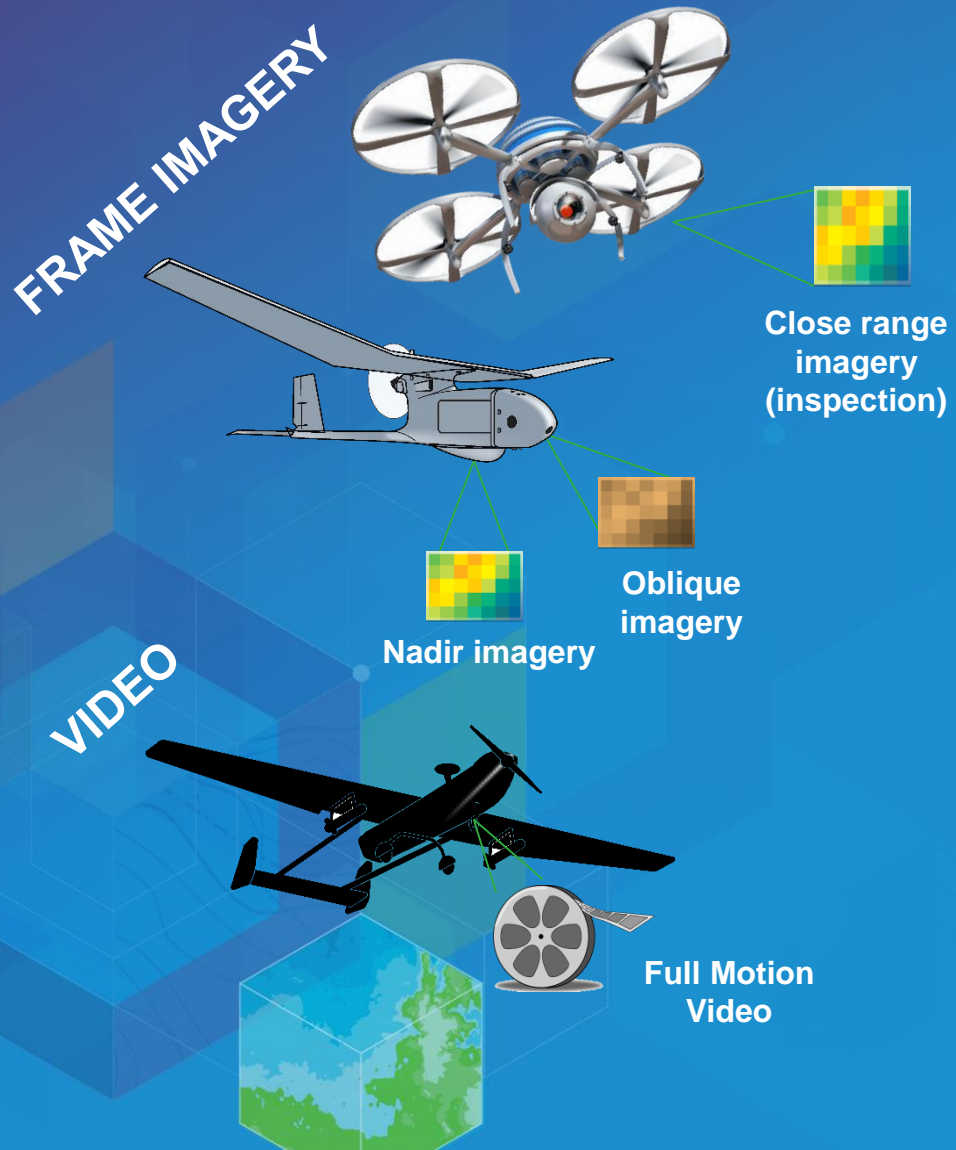
- **Client GIS data content**



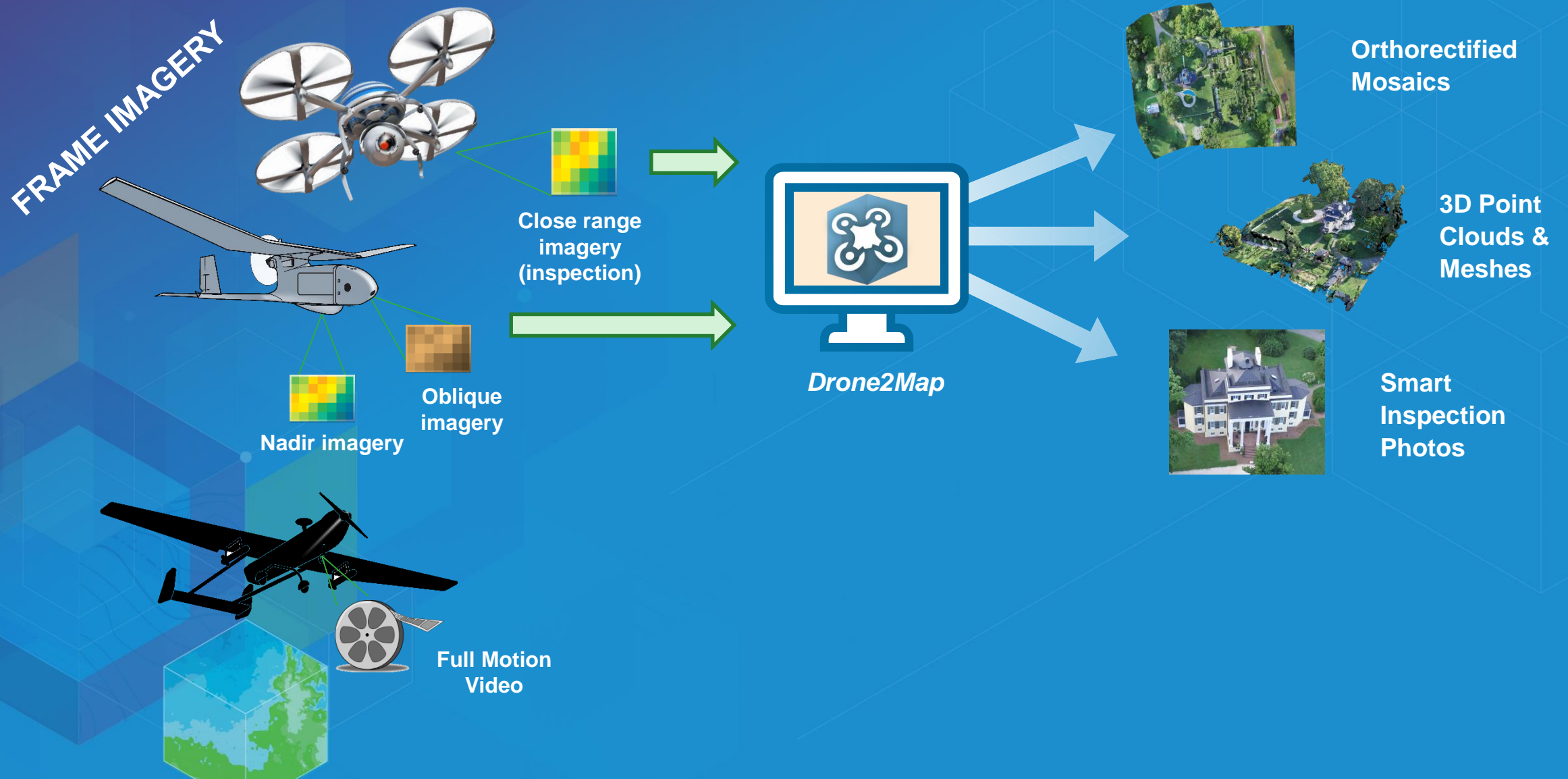
# Drone data ingestion & processing

Drone2Map, FMV

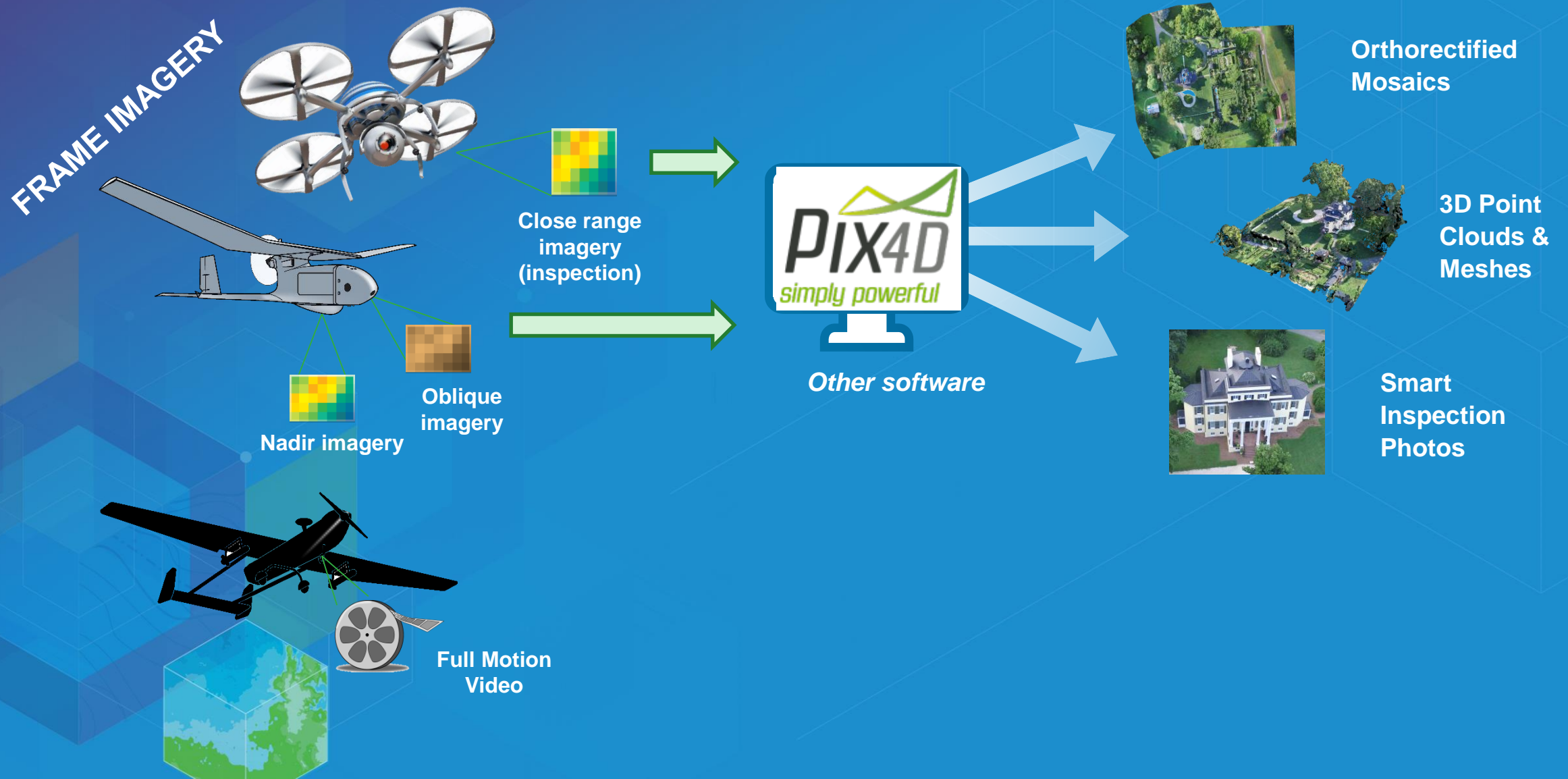
# Workflow for drone imagery based on camera & operational mode



# Workflow for drone imagery based on camera & operational mode

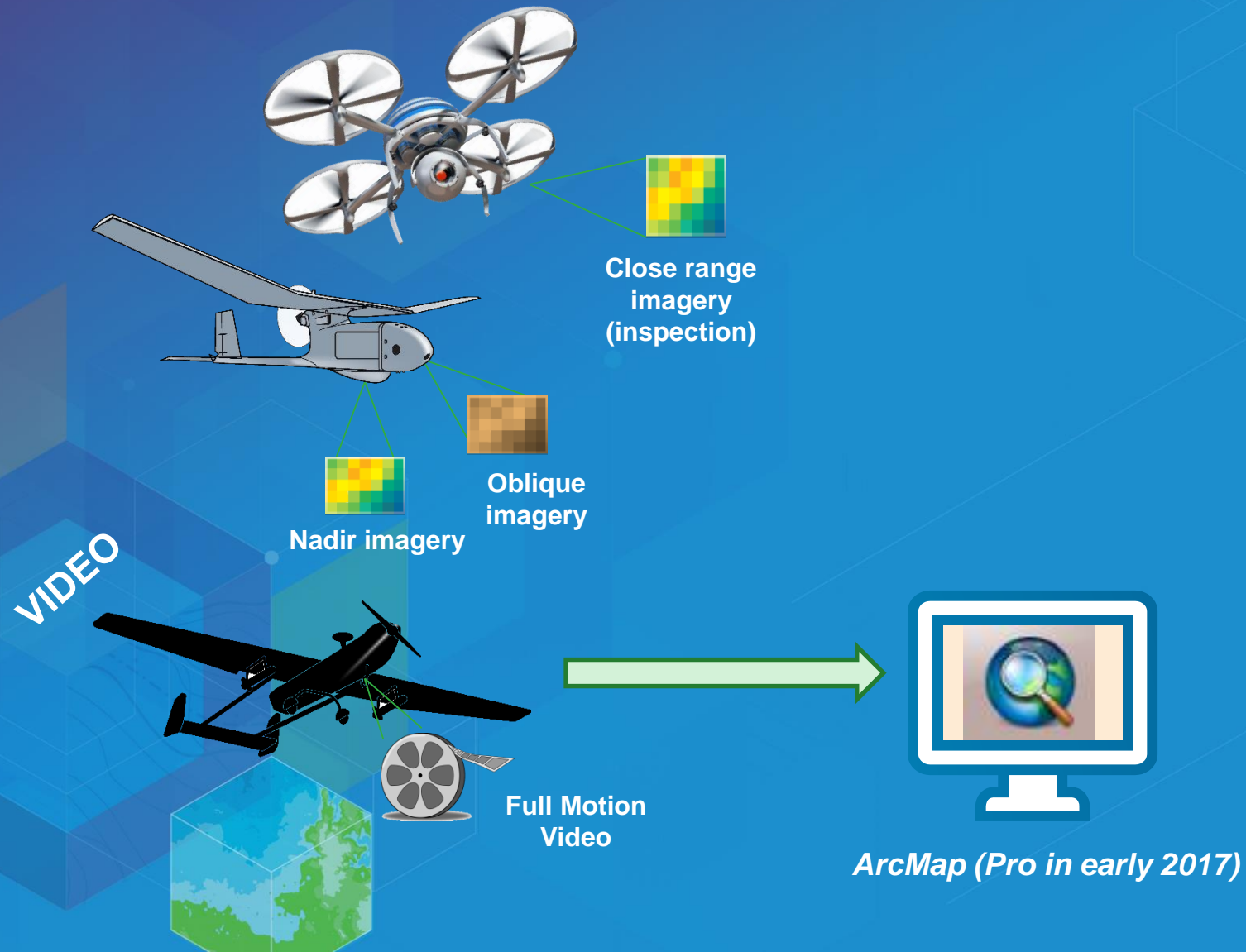


# Workflow for drone imagery based on camera & operational mode



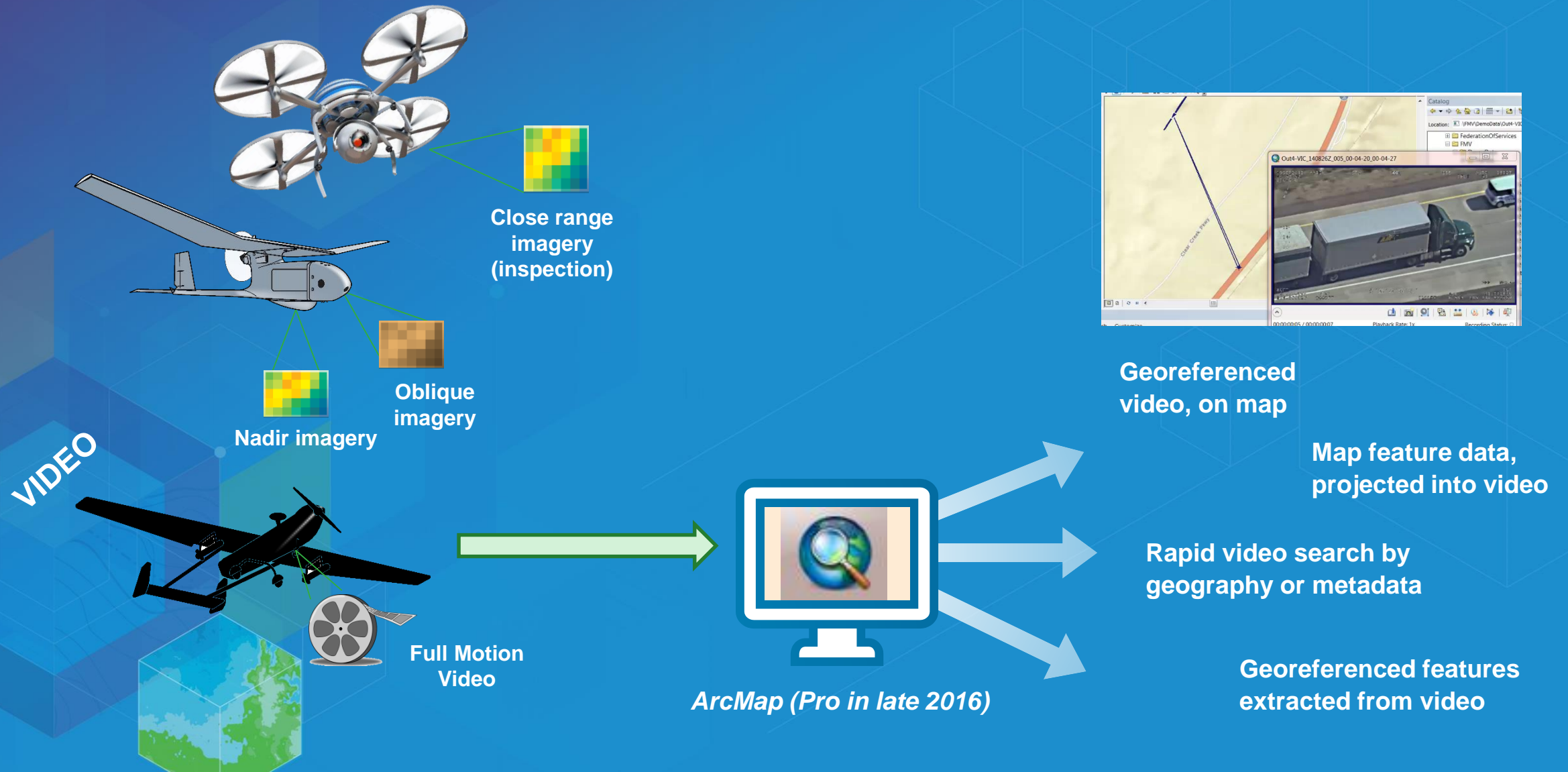


# Workflow for drone imagery based on camera & operational mode





# Workflow for drone imagery based on camera & operational mode

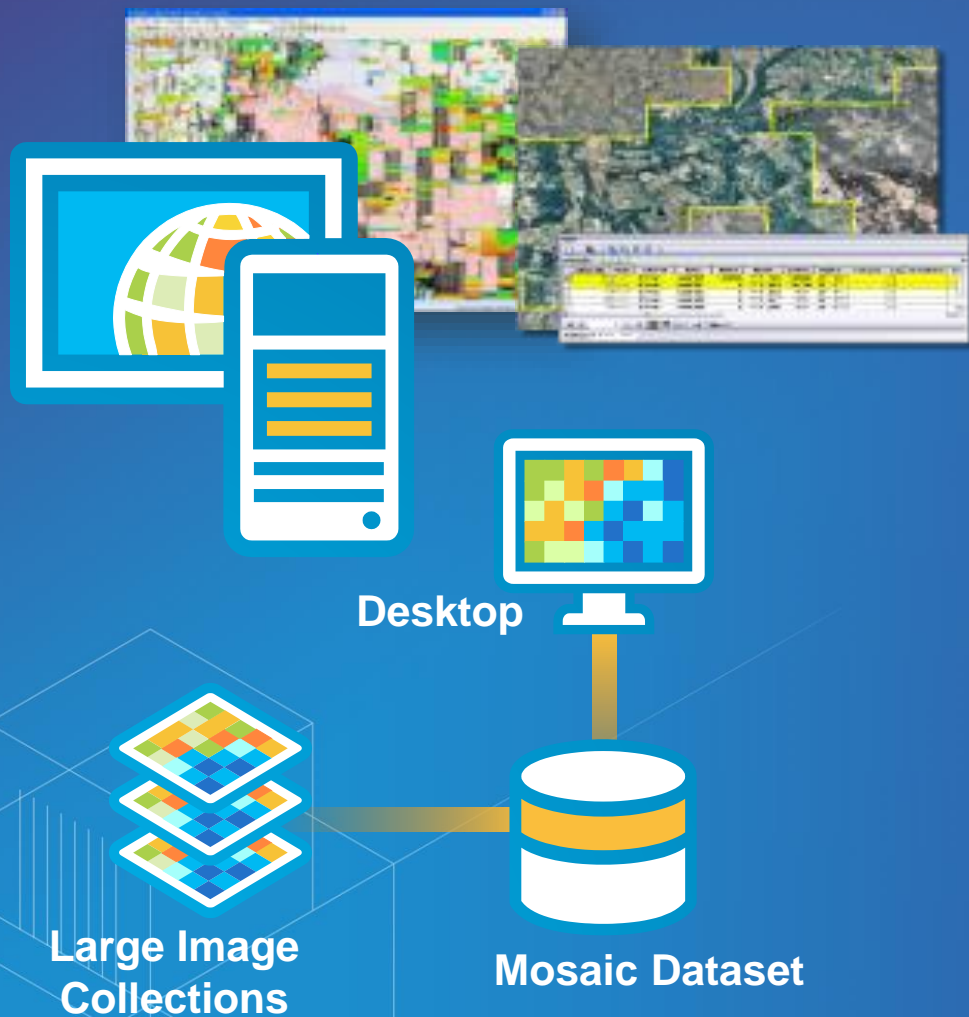


# Drone data management

Mosaic Dataset & Automation

# Image Management Using Mosaic Datasets

Highly Scalable, From Small to Massive Volumes of Imagery



## Create Catalog of Imagery

- Reference Sources
- Ingest & Define Metadata
- Define Processing to be Applied

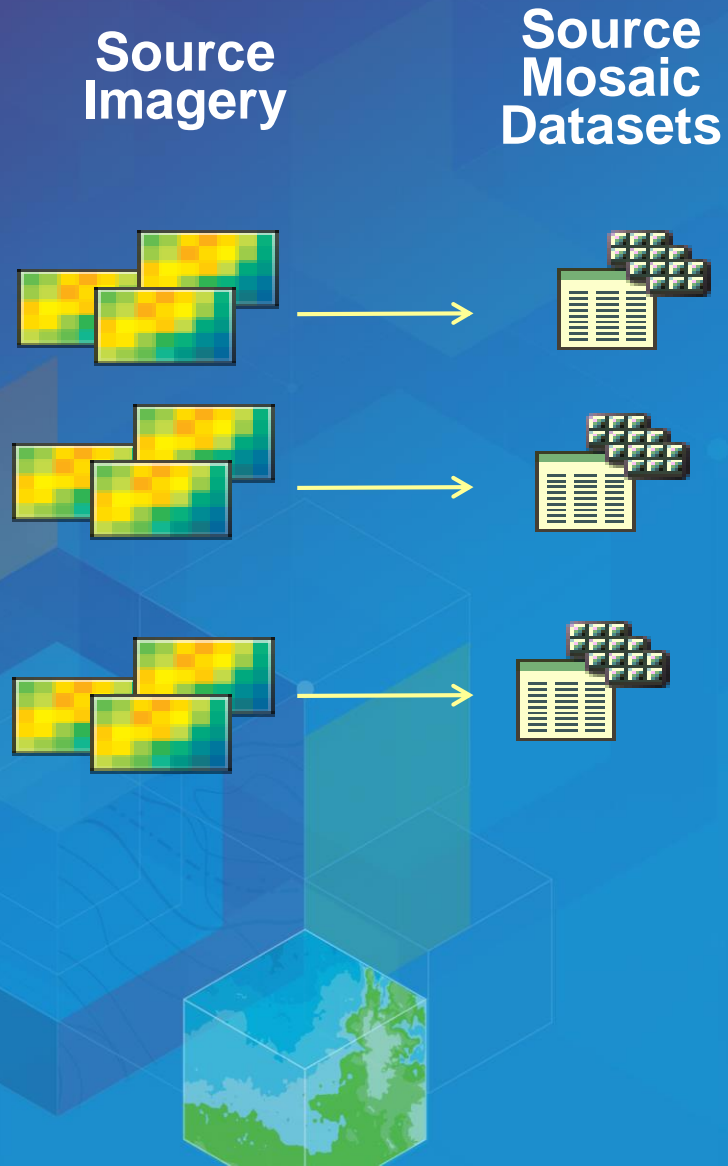
## Apply:

- On-the-fly Processing
- Dynamic Mosaicking

## Access as Image or Catalog



## Source / Derived Data Model – begin with “Source” Mosaic Datasets



May 15

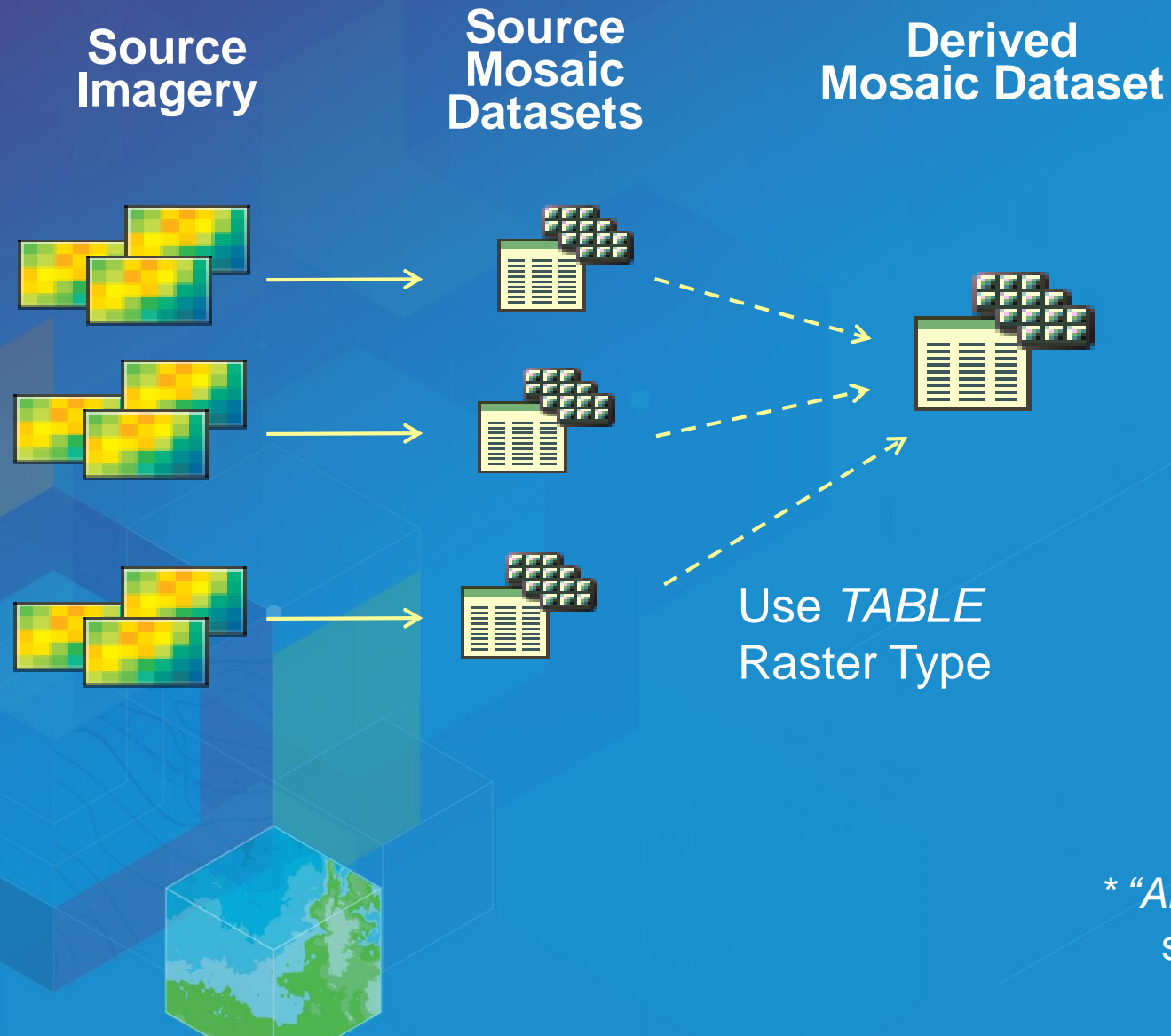
June 1

June 15

Ingest outputs from each individual project into a mosaic dataset, then complete QC to ensure proper configuration & metadata.



# Combine into Derived Mosaic Dataset

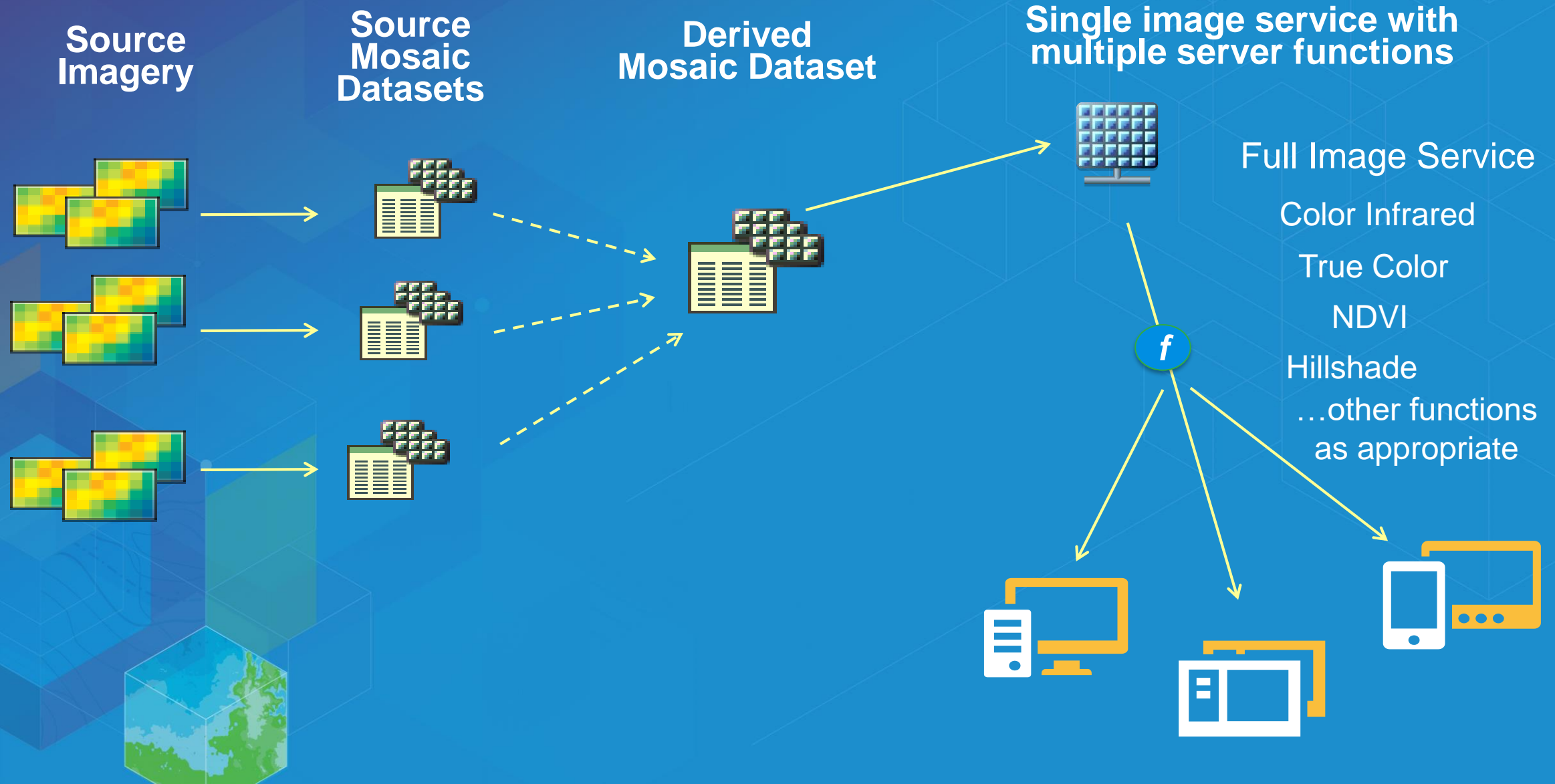


**Advantage: All image data\* available in a single location**

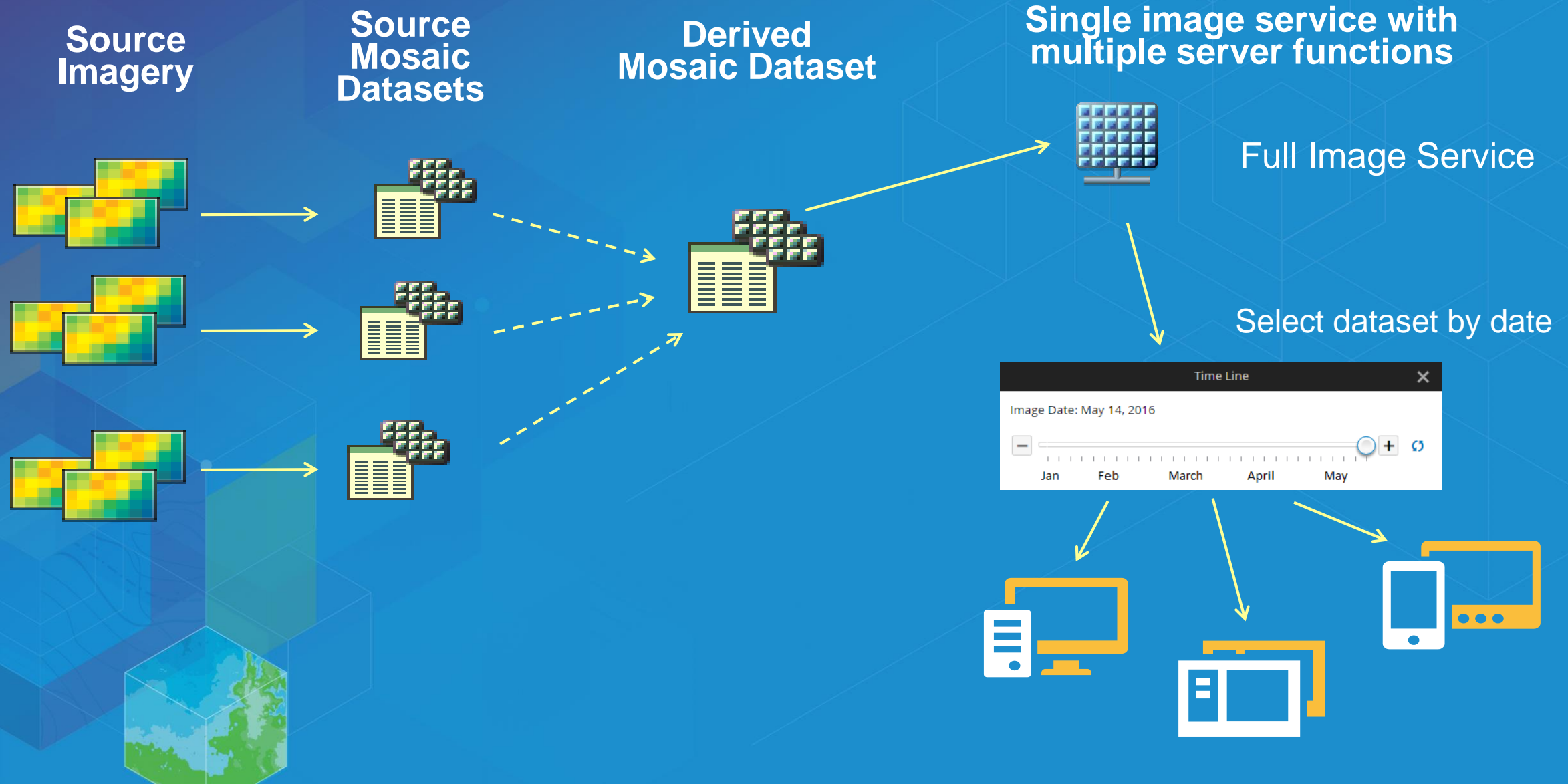
\* "All data" refers to data with common content; should not mix elevation data with imagery



# On-the-fly Products using Server Raster Functions



Shared from a single repository, client can select data by attribute



# Resources: Image Management Workflows

- Image Management Workflows & FAQ

- <http://esriurl.com/ImageManagement>

- Image Management Guidebook (ArcGIS Help)

- <http://esriurl.com/6007>

- ArcGIS Online Group

- <http://esriurl.com/6539>

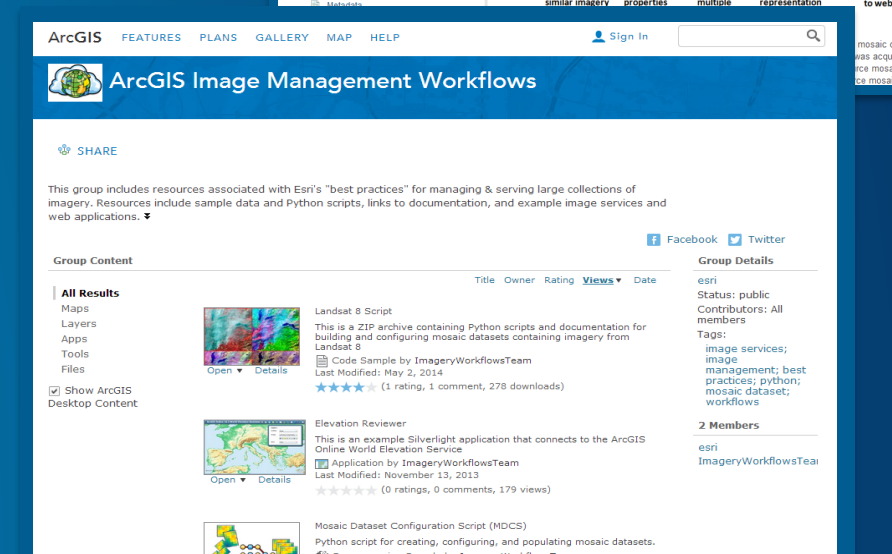
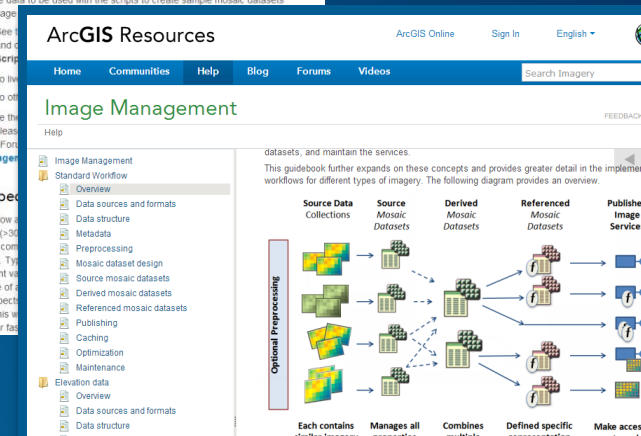
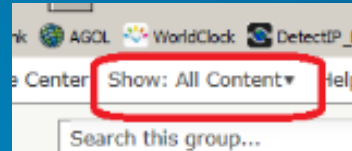
- Enterprise Image Management White Paper

- <http://esriurl.com/EIMWP>

- Optimize Rasters (MRF for cloud storage)

- <http://esriurl.com/OptimizeRasters>

- <http://esriurl.com/MRF>



# Analysis...

Terrain

Forestry

Utilities

Hydrology

Agriculture

...many more

# Sharing/Dissemination

ArcGIS Online, ArcGIS Server



# Sharing imagery – a range of options

- **ArcGIS Online**

- Raster tile cache (base map format) for RGB orthos
- Feature services with FMV flight tracks & footprints
- Scene services for 3D models
- Web access to oriented (inspection) imagery stored in the cloud

- **ArcGIS Server**

- Dynamic image services for multispectral imagery
- Raster functions for on-the-fly products (NDVI, Hillshade, Slope...)
- Geoprocessing services (Viewshed, Downstream Trace, Stockpile volume calculations...)

- **ArcGIS Portal**



# Stockpile volume calculations

*Volume calculation on sloping ground*

*Geoprocessing services for server-side processing*

