

# Esri Imagery System Overview

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# ArcGIS is a Comprehensive Imagery System

Transforming Remotely Sensed Content Into Insight



# ArcGIS is a Comprehensive Imagery System

Transforming Remotely Sensed Content Into Insight

## Reality Mapping

- Drone, Aerial & Satellite
- True Ortho
- DSM & DTM
- 3D Mesh & Point Cloud

## Management

### Data Transformation and Analytics

- Simplify access to your content
- Hosted imagery & features
- Open standards compatible

- Calibration & ARD
- Change detection
- Extraction
- Raster analytics
- GeoAI (ML & DL)

## Analysis

- Classification
- Change detection
- Extraction
- Raster analytics
- GeoAI (ML & DL)

## Visualization

- Image Exploitation
- 3D, Radar, Temporal, Voxels, Oriented Imagery, Stereo
- Build Apps with low code or no code
- Integrate map and image Space

## Content

- Your data
- ArcGIS Living Atlas
- Content Providers

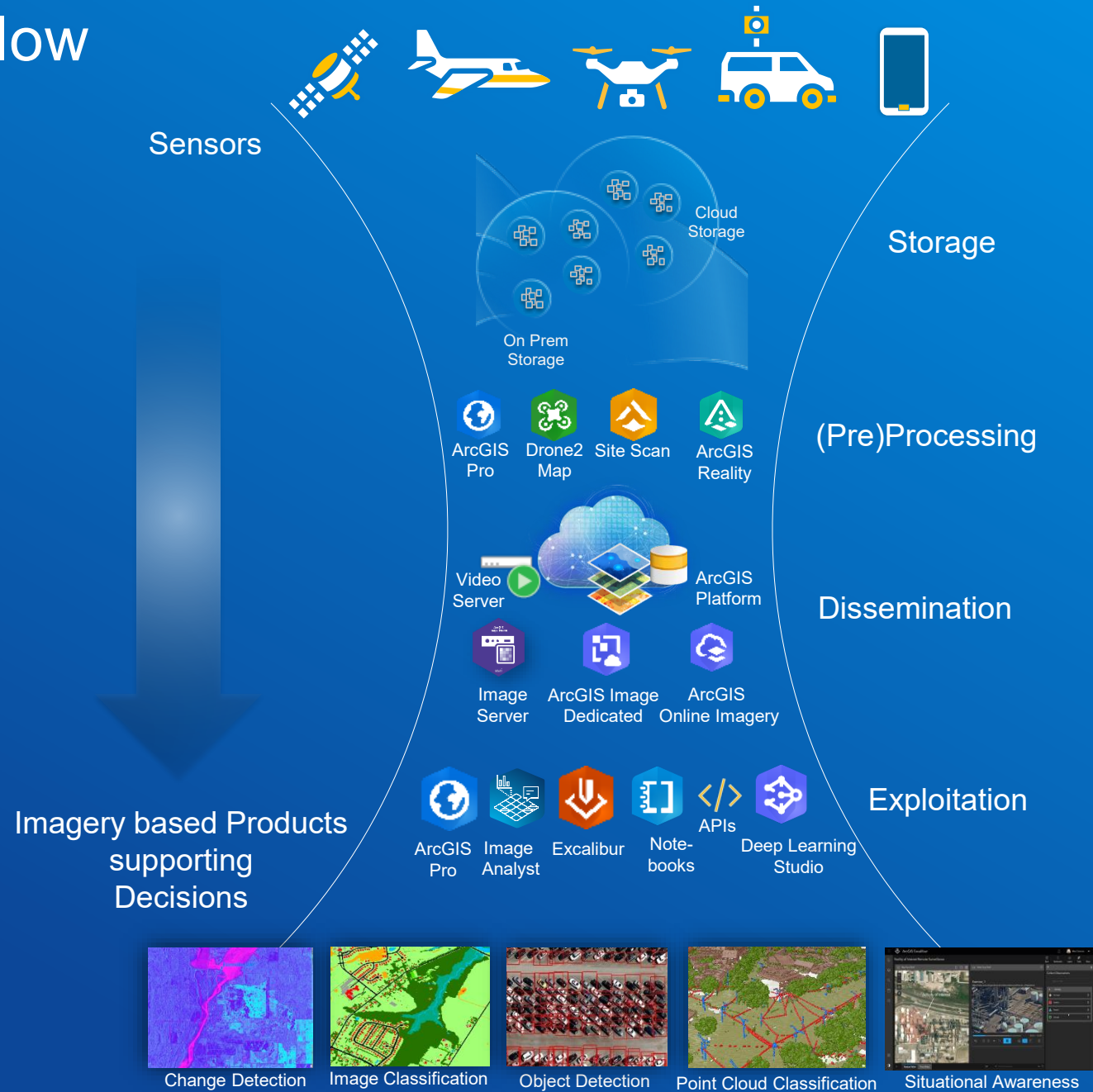
Pixels

System of Record

Insight

# The Complete Workflow

The ArcGIS Imagery System

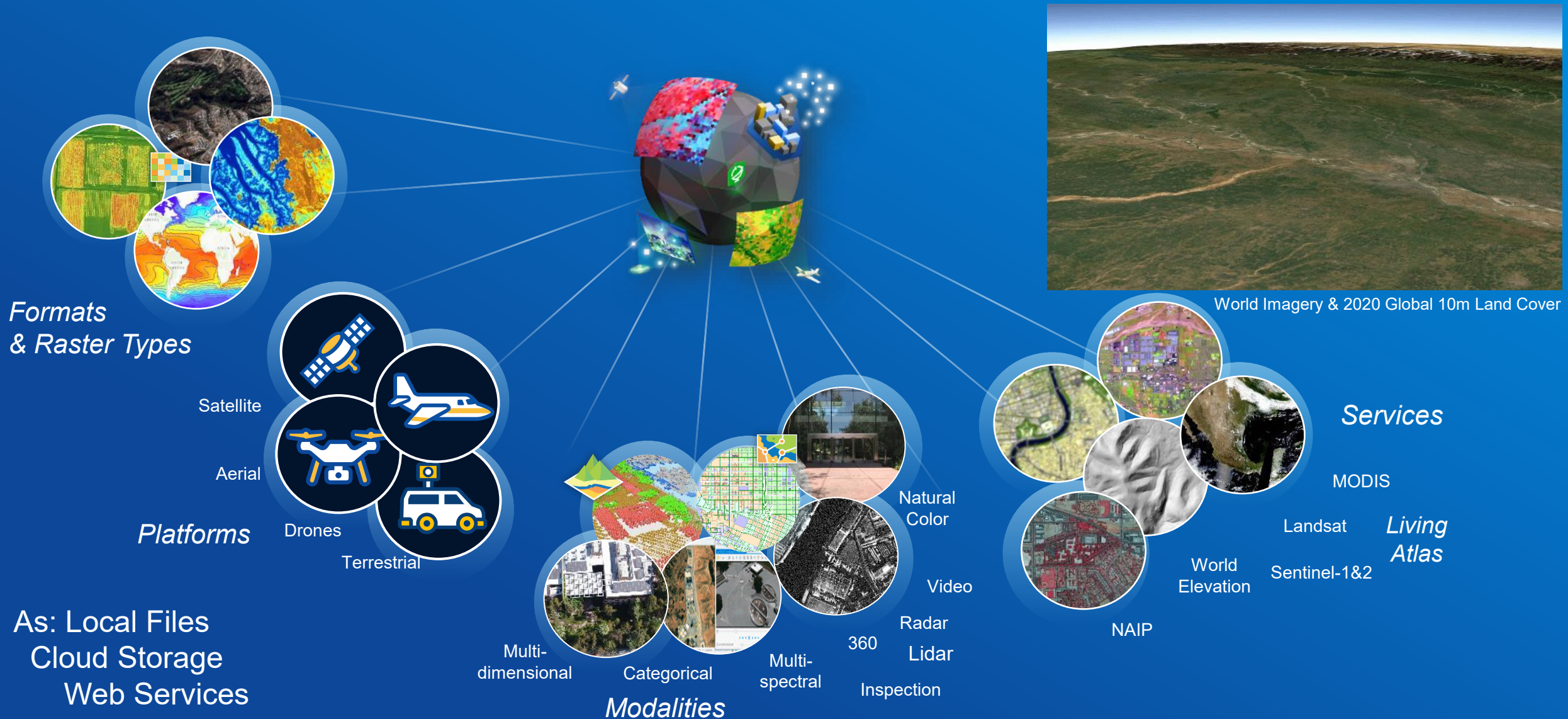


# Imagery & Remote Sensing Capabilities

Comprehensive Imagery System



# Content – Access to all Imagery and Rasters

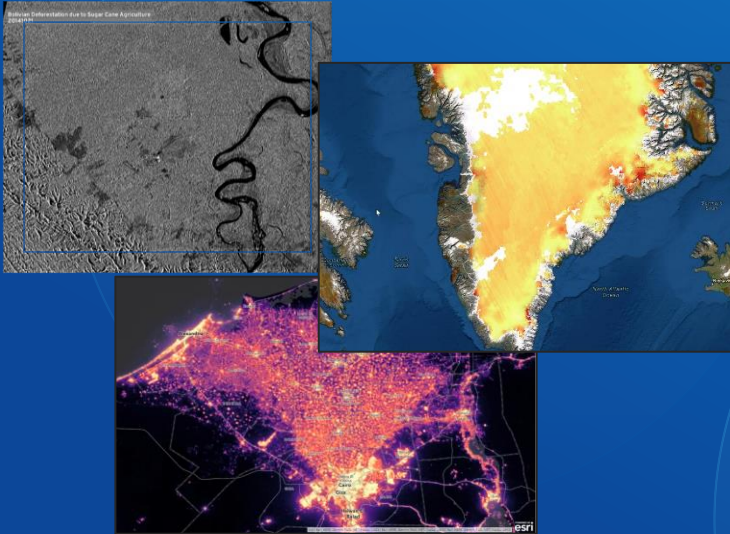


# Content

The most extensive geospatial imagery sources



## Living Atlas



## Your Content

### On Premises or in the Cloud

- Any Sensor
- Any Modality
- Any Format

## Partners

Wide range of imagery providers

Vexcel    Airbus    Planet    ICEYE  
Maxar    BlackSky    Satellogic  
EagleView    Sanborn    GeoDyn    UP42  
GHGSat    AerialSphere    QSI    Leica geosystems  
CycloMedia    Aerometrex    Hexagon  
PGC    Nearmap    Woolpert  
Impact Observatory    CompassData    NC Tech  
USGS    ESA  
Microsoft    AWS

Ready for Visualization & Analysis

# Imagery & Remote Sensing Capabilities

Comprehensive Imagery System




# Image Management

Make Imagery Accessible

Manage  
Small or Massive  
Datasets

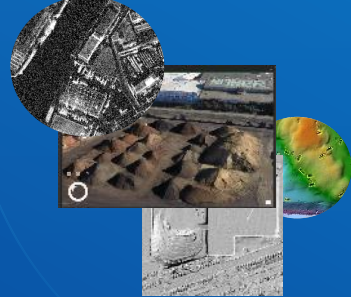
### Sensor and Imagery Metadata



Directly read wide  
variety of sensors  
and sources

Python to automate  
any sensor

STAC Support



### Efficiently Share and Stream

Map Tiles



Oriented  
Imagery



Image Services

Dynamic  
Imagery



Tiled  
Imagery



Scene  
Layers

3D Mesh  
Point Cloud



Voxel  
Layers

OGC  
- WMS/WCS  
- WMTS/I3S

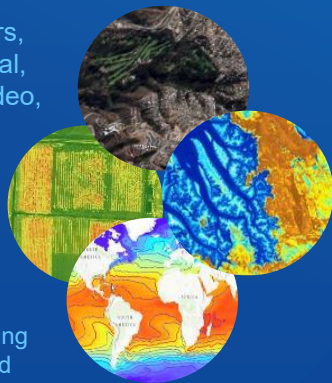
### Formats and Modalities

Images, Rasters,  
Multidimensional,  
Lidar, Radar, Video,  
...

150 Formats

TIF, COG, MRF,  
CRF, NITF, JP2,  
netCDF, HDF,  
GRIB...

Including  
Cloud  
Optimization



### Optimized Data Models

Mosaic Dataset



LAS Dataset



TileCache



Multidimensional  
CRF



Oriented  
Imagery  
Catalog



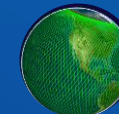
Voxels



3D Mesh



Trajectory



### Identity

Share Everyone  
Share to Organization  
Share to Group  
Only Yourself

# Oriented Imagery Capability of ArcGIS

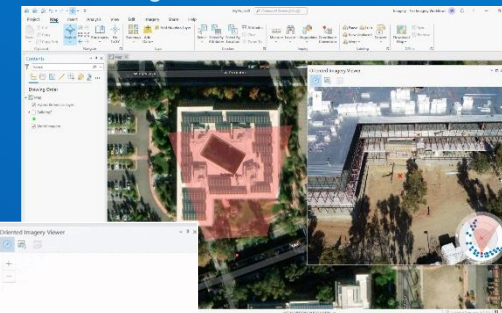
Enhance your GIS with imagery taken from multiple perspectives

- Turn any image into a **geospatial asset**
- Discover insights from **any angle**
- Maximize the value of your image archives by making them **accessible and searchable**

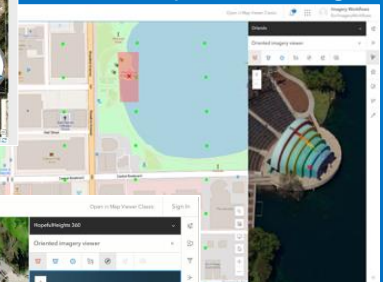
Visualize oriented imagery with other GIS layers

- Asset locations
- Streets
- Land cover
- Building footprints

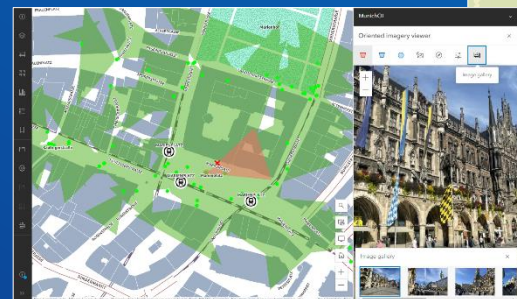
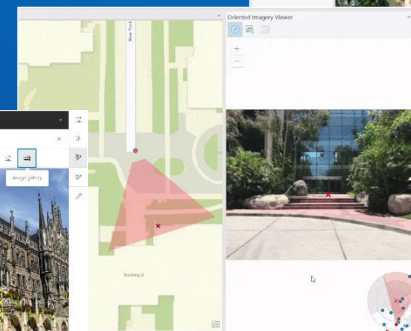
Drone images



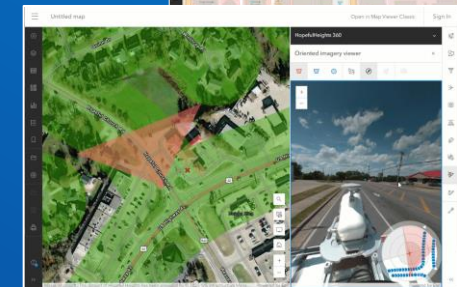
Oblique aerial images



Street-level images



Images from cell phones and tablets



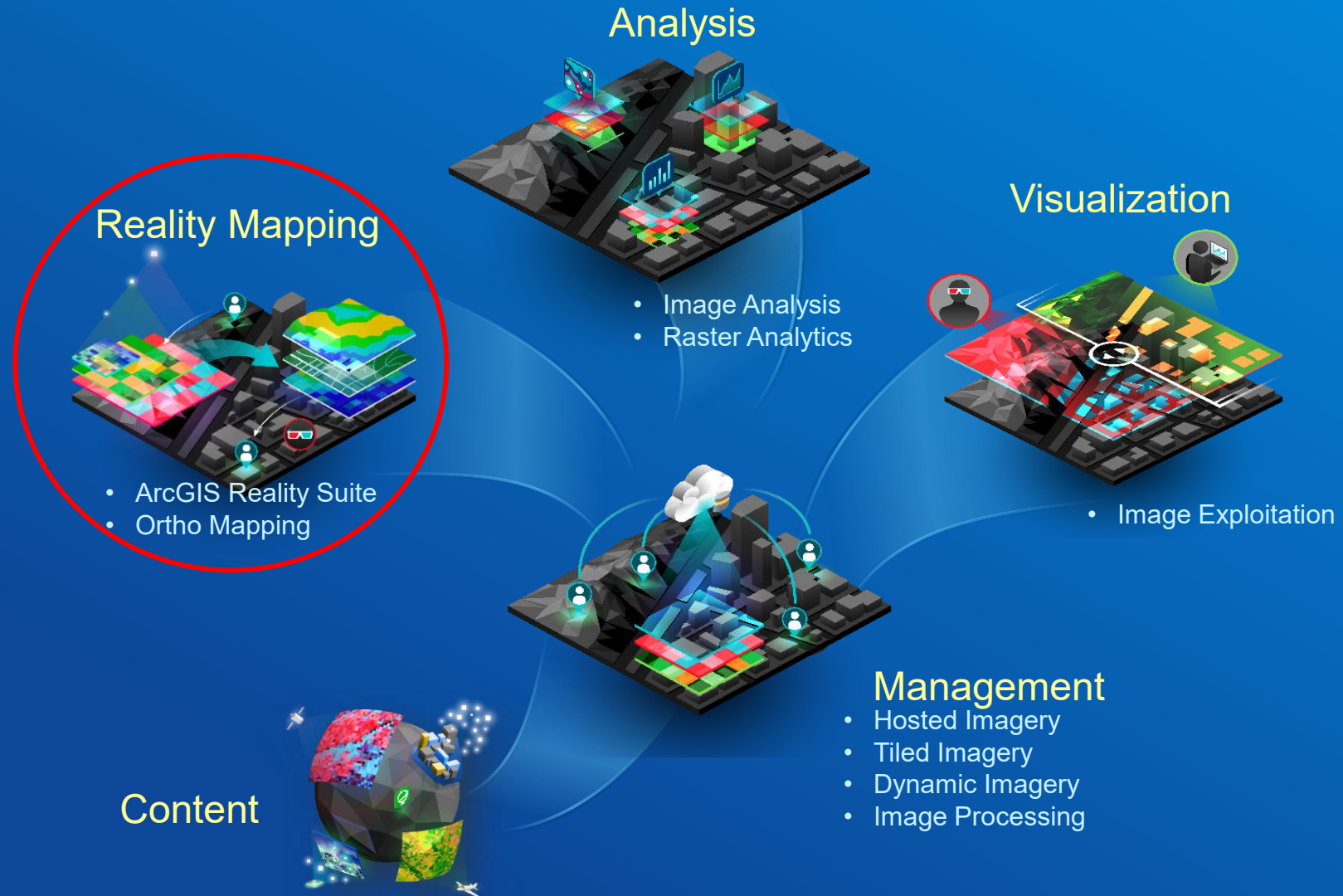
360-degree images

*Leverage valuable collections of street-level images, oblique images, 360 images, and more...*

*Manage, explore, and visualize imagery taken from any angle in the context of a map*

# Imagery & Remote Sensing Capabilities

Comprehensive Imagery System



# ArcGIS Reality Suite

Harmonized product line to support various sensors, processing platforms, & project sizes



Drone2Map



Site Scan



Ortho Maker



Ortho Mapping



ArcGIS Reality

Fast and Massively Scalable . . .

Quality Check

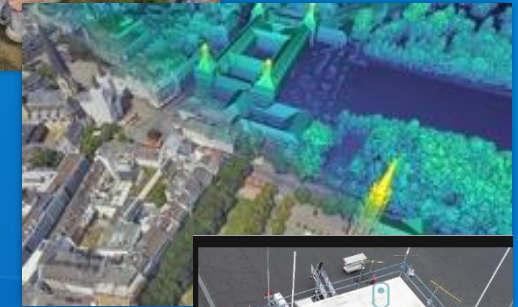
Images	median of 38010 keypoints per image	🟢
Dataset	46 out of 47 images calibrated (97%), all images enabled	🟢
Camera Optimization	0.08% relative difference between initial and optimized internal camera parameters	🟢
Matching	median of 3319.84 matches per calibrated image	🟢
Georeferencing	yes, 9 GCPs (9.3D), mean RMSE error = 0.134 m	🔴

Preview

The corresponding terrain Digital Surface Model (DSM) before denoising.

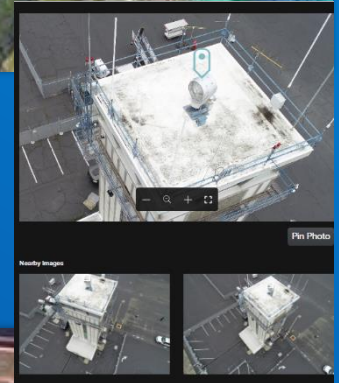


Digital Surface Models  
Point Clouds



Textured Meshes

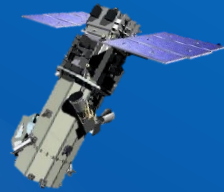
Oriented Images



True Ortho



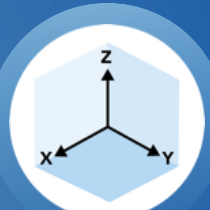
Capture Nadir & Oblique



Imagery



Orientation Data



Built on SURE Technology





30+cm  
GSD



2-25cm  
GSD



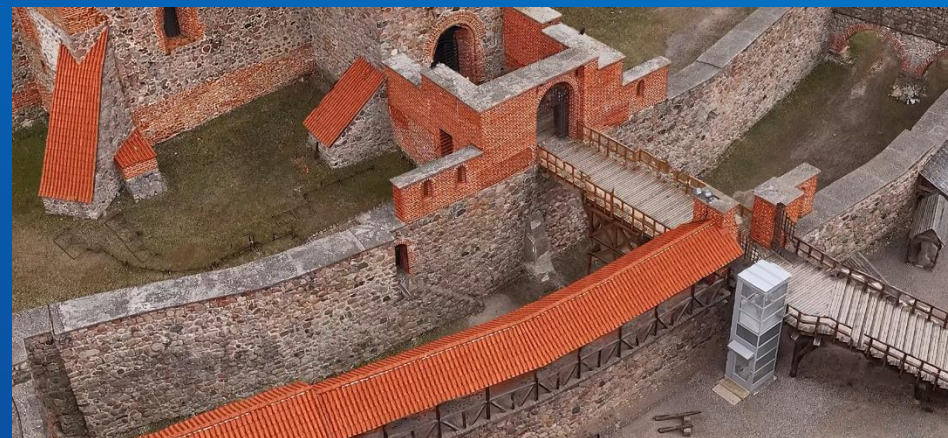
< 2cm  
GSD



Data courtesy Airbus, Pleiades Neo 30 cm



Data courtesy Kavel 10, GSD 5 cm



Data courtesy HNIT Baltic, GSD 1 cm

# Reality Engine

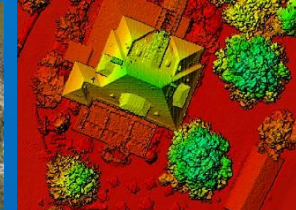
Powering the ArcGIS Reality Product Family



Drone, Aerial & Satellite Images



True Ortho



Surface Model



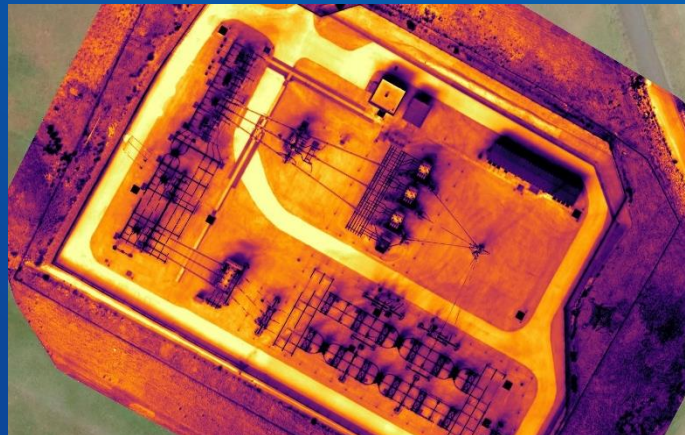
Point Cloud



3D Mesh

Thin Structure Mesh – Courtesy of ShareUAV

Thermal True Ortho



**Contents**

Search

**Drawing Order**

- Scene
- 3D Layers
  - Mesh
- 2D Layers
  - Light Gray Reference
  - Light Gray Base
- Elevation Surfaces
- Ground
  - Terrain 3D





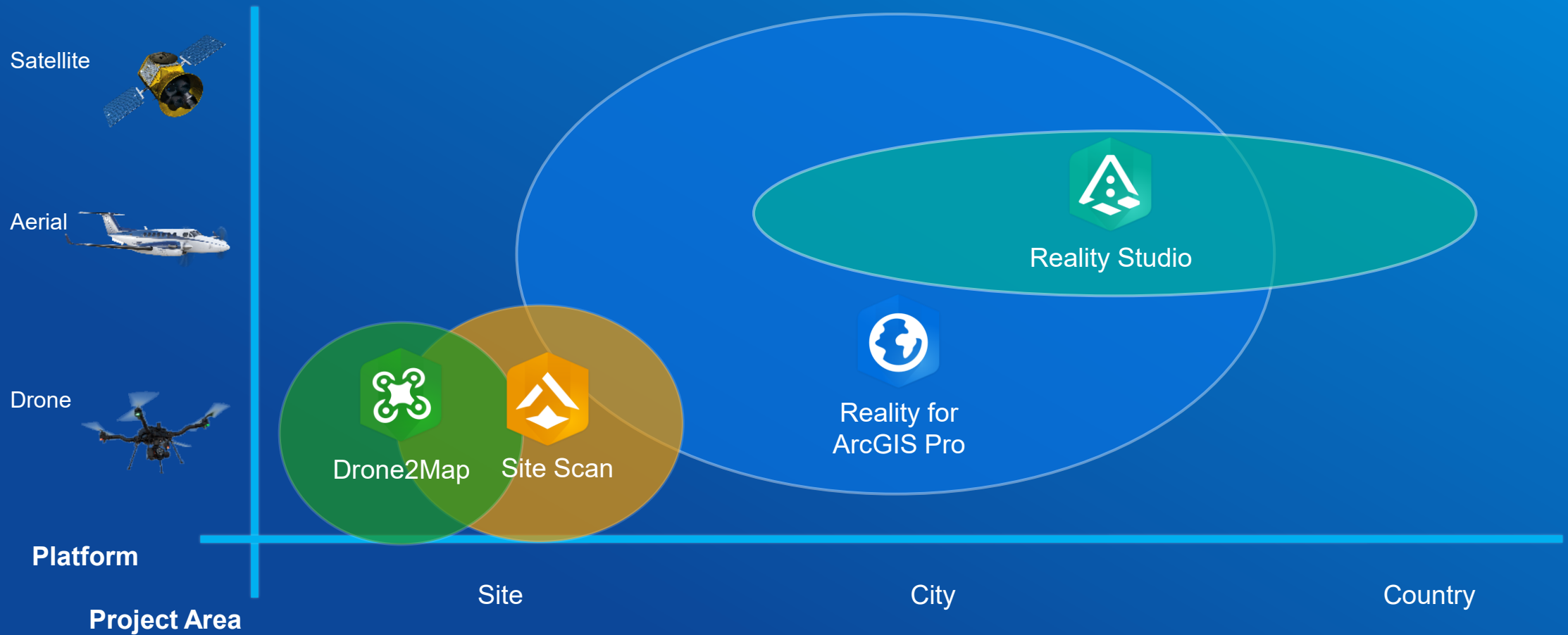
Slide Manager

Search  X



# ArcGIS Reality Product Family

Reality Mapping at Any Resolution for Any Extent



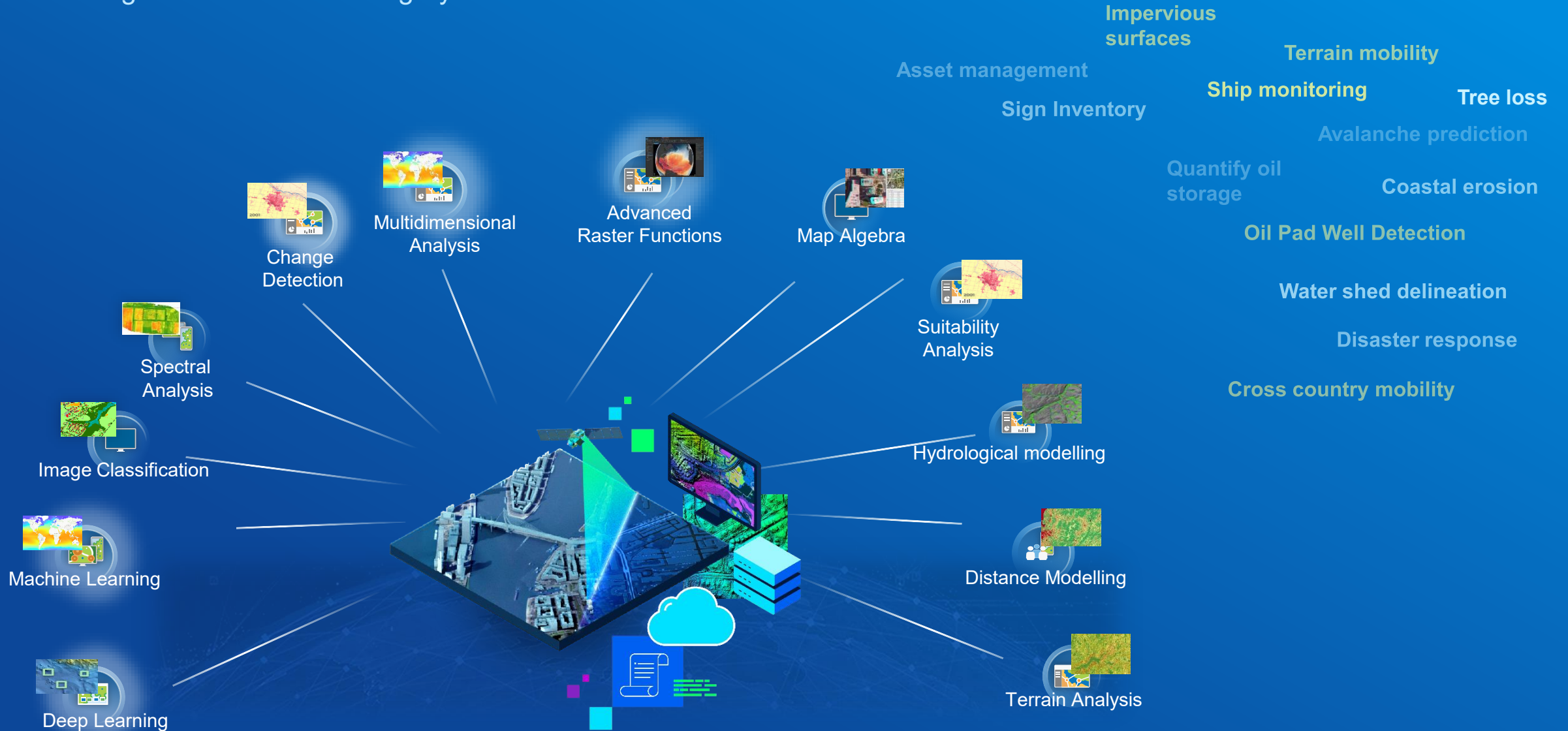
# Imagery & Remote Sensing Capabilities

Comprehensive Imagery System



# Image Analysis

Extracting information from imagery



# GeoAI: Imagery



# Imagery & Remote Sensing Capabilities

Comprehensive Imagery System



# Image Visualization & Exploitation

Enabling human interpretation of imagery & rasters

Moving target tracking

Agricultural assessment

Natural disaster response

forensic video review

Property inspection

Digitizing roads

Imagery search & discovery

Pipeline inspection

Construction monitoring

Dynamic reporting

Damage assessment

Structured observation management



Motion Imagery



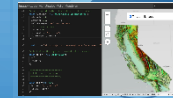
Image Space



ArcGIS Excalibur



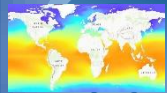
Operations apps



ArcGIS API for JavaScript



Stereo Imagery



Multidimensional Data



ArcGIS Pro

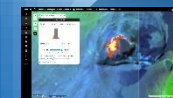


## Make informed decisions

User experiences for human interpretation of imagery  
Desktop, Web and Mobile



Configurable app templates



Web AppBuilder & Experience Builder



Oriented Imagery

# ArcGIS Excalibur

Focused Web Application for Imagery

## Search & Discovery

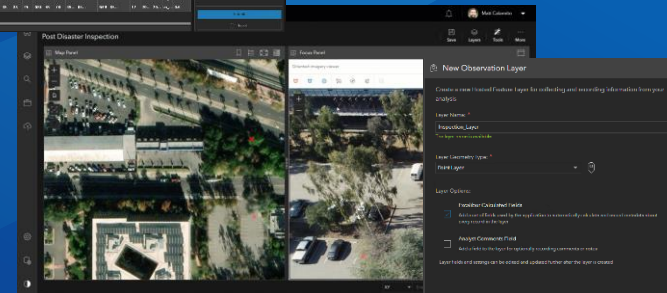
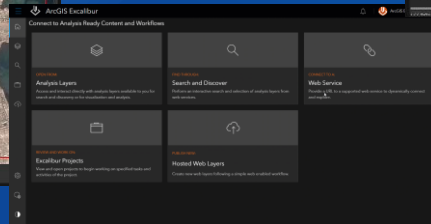
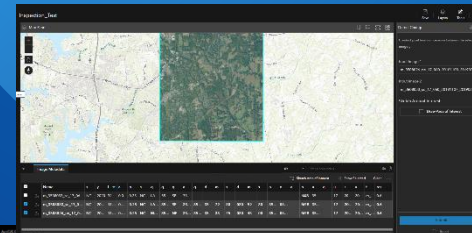
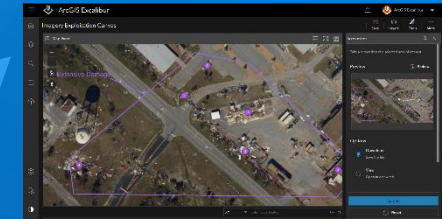
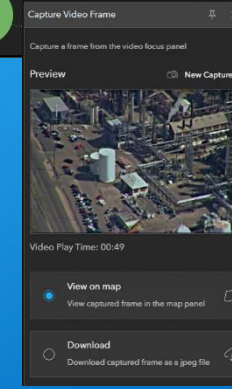
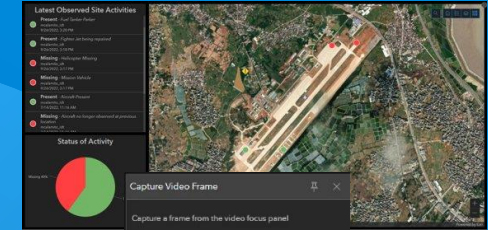
- Intuitive experience for searching imagery-based services.
- Query based upon variables such as time and extent.
- Ability to publish layers directly into ArcGIS Enterprise.

## Analysis

- Observation collection
- Object counting
- Syncing extents
- Change image display
- Change Detection

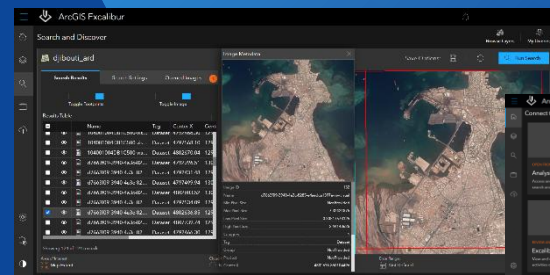
## Sharing

- Screenshot tool
- Capture video frame
- Publishing imagery and video layers
- Integrate imagery and vector data
- Create output reports



## New & Improved

- Integration with Video Server
- Support for consuming and publishing ArcGIS video layers
- Project configuration enhancements
- Oriented Imagery Layer
- Capture video frame tool
- ArcGIS Knowledge Data Integration



# ArcGIS Video Server

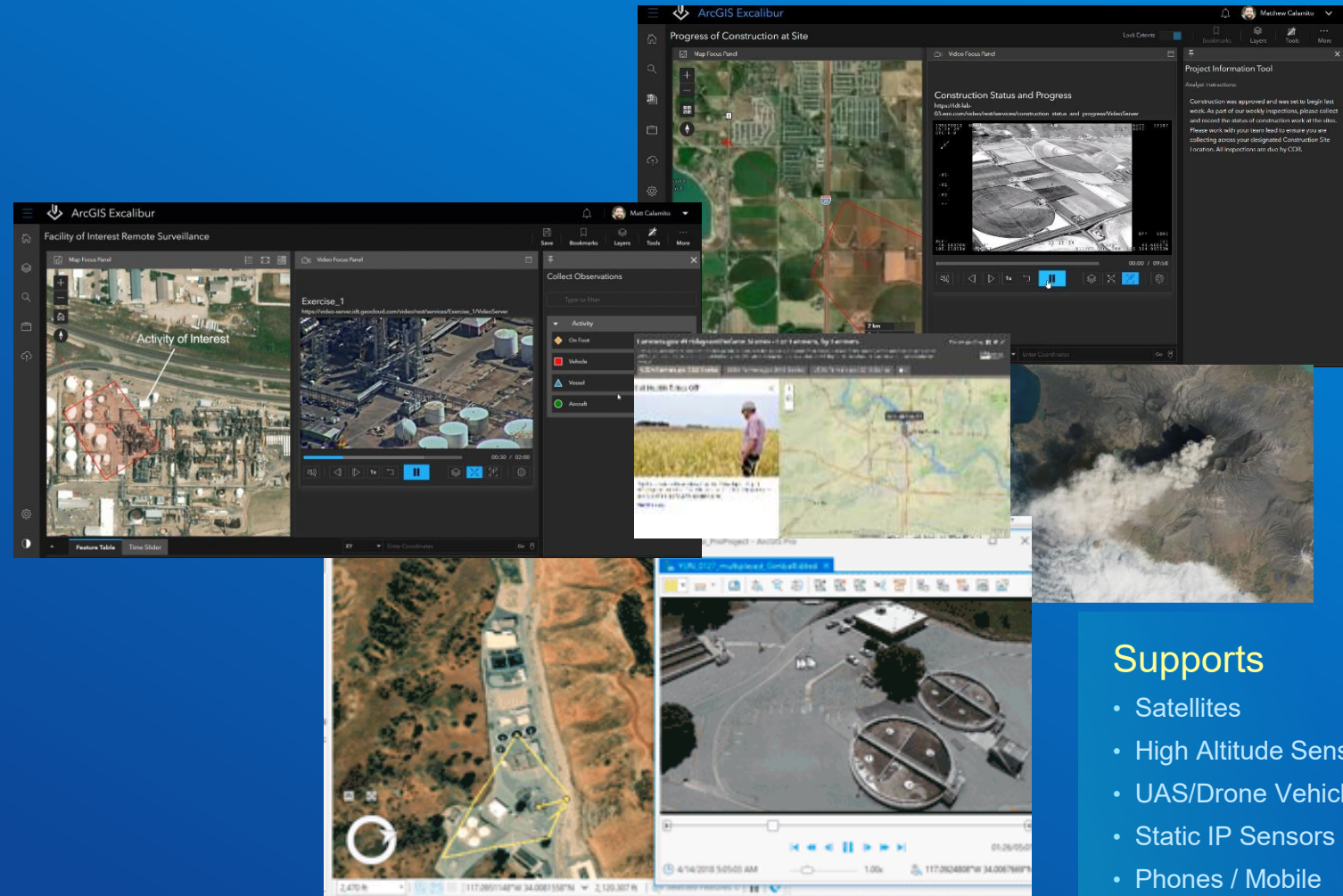
## Georeferenced Video for Smarter Decision Making

### Applications

- Remote Inspections
- Situational Awareness
- Damage Assessments
- Security Monitoring
- Logistics
- Structured Observations

### Features

- On-Demand Video Services
- Connection to Live Streams
- Discovery and Search
- Adaptive Bitrate Streaming



### Supports

- Satellites
- High Altitude Sensors
- UAS/Drone Vehicles
- Static IP Sensors
- Phones / Mobile Devices

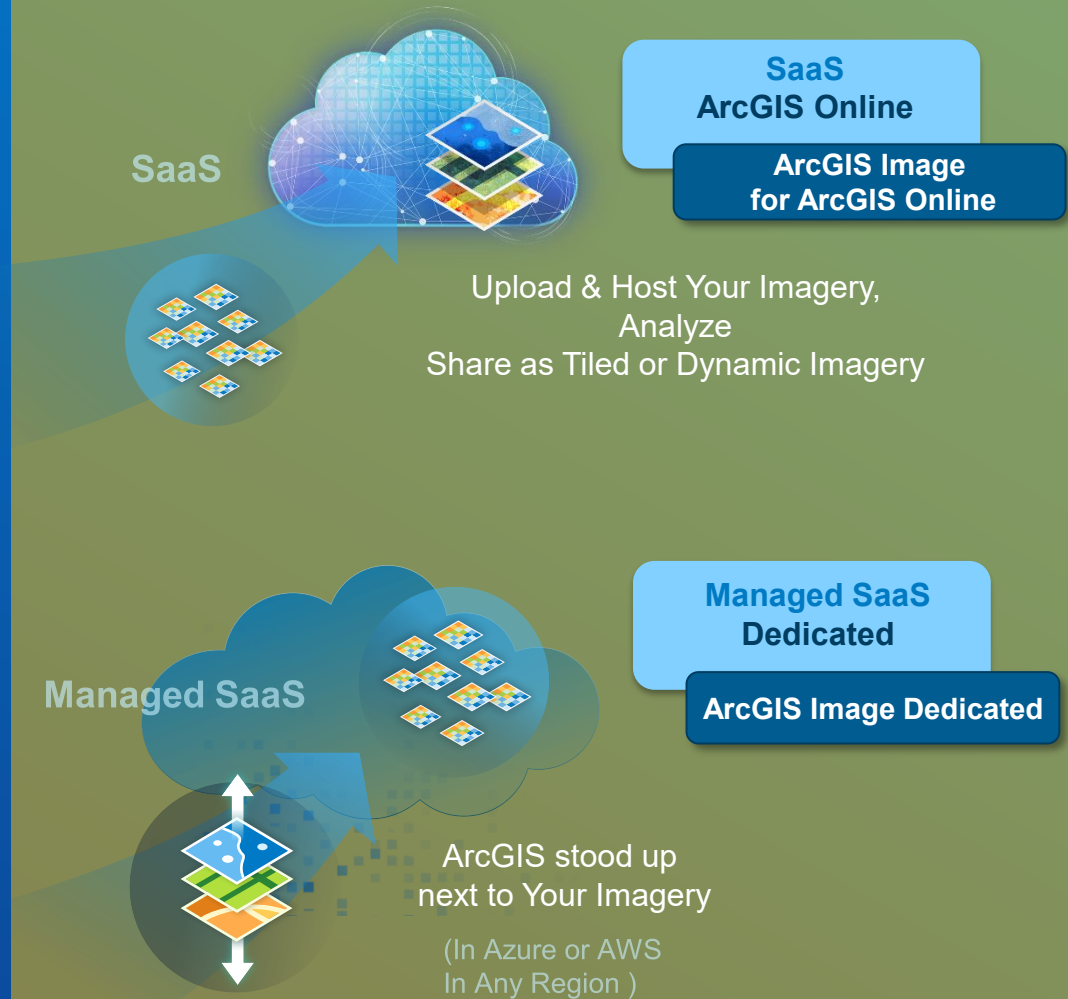
Delivering geospatial video as a web service to any device on any network...

# Deployment options for ArcGIS Image

Cloud-Deployable



Cloud-Native



Enabling Massive Image Processing & Raster Analysis

# Enabling the Imagery Capabilities of ArcGIS

## ArcGIS Image Suite

**Desktop**  
ArcGIS Pro<sup>1</sup>

ArcGIS Image Analyst

**Enterprise**  
ArcGIS Enterprise

ArcGIS Image Server

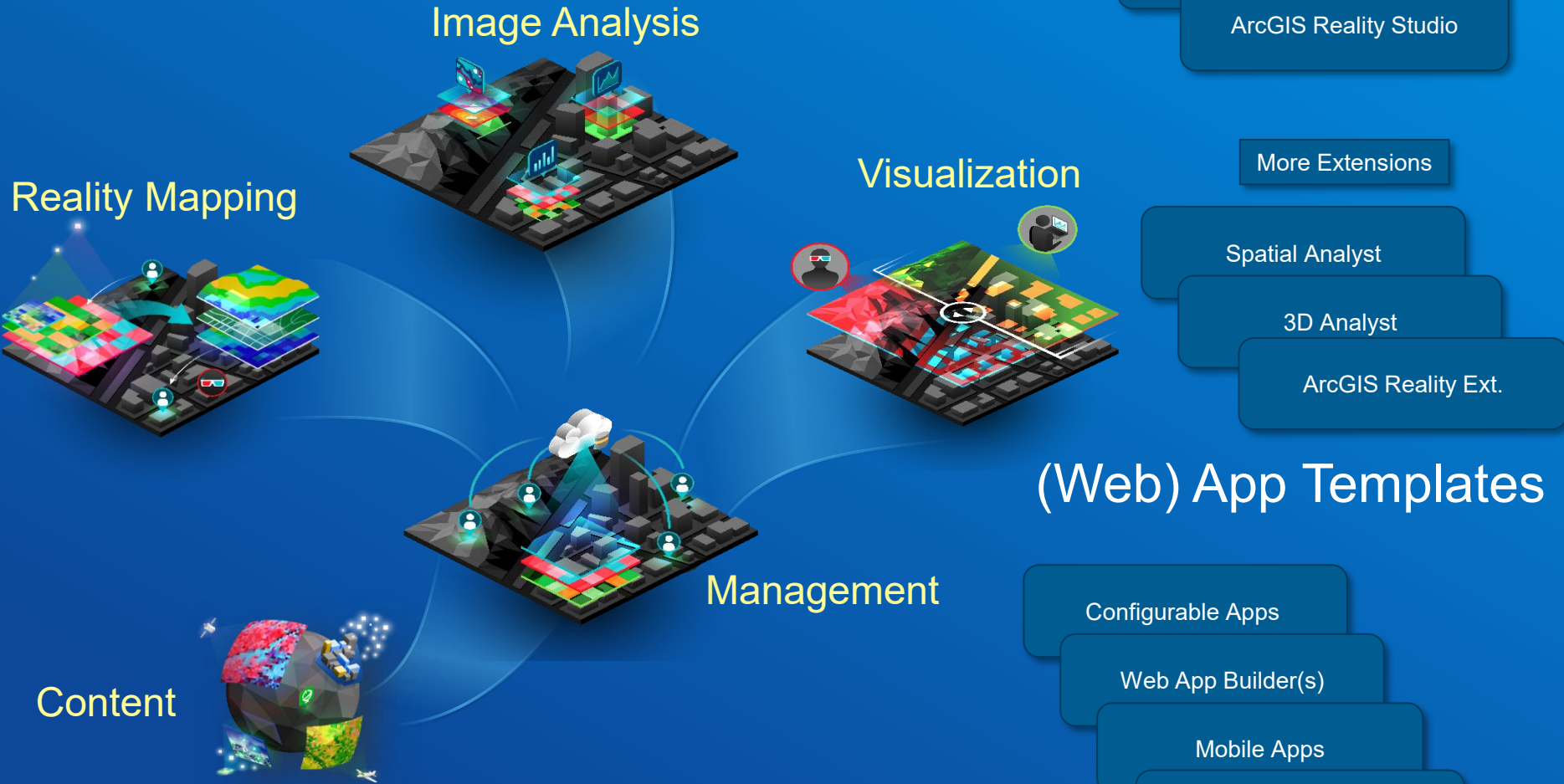
ArcGIS Video Server

**SaaS**  
ArcGIS Online

ArcGIS Image  
for ArcGIS Online

**Managed SaaS**  
Dedicated

ArcGIS Image Dedicated



## Focused Apps

Site Scan for ArcGIS

ArcGIS Drone2Map

ArcGIS Excalibur

ArcGIS Reality Studio

More Extensions

Spatial Analyst

3D Analyst

ArcGIS Reality Ext.

## (Web) App Templates

Configurable Apps

Web App Builder(s)

Mobile Apps

Story Maps

<sup>1</sup> Standard or Advanced for full use of Imagery capabilities



**esri**<sup>®</sup>

**THE  
SCIENCE  
OF  
WHERE**<sup>®</sup>