

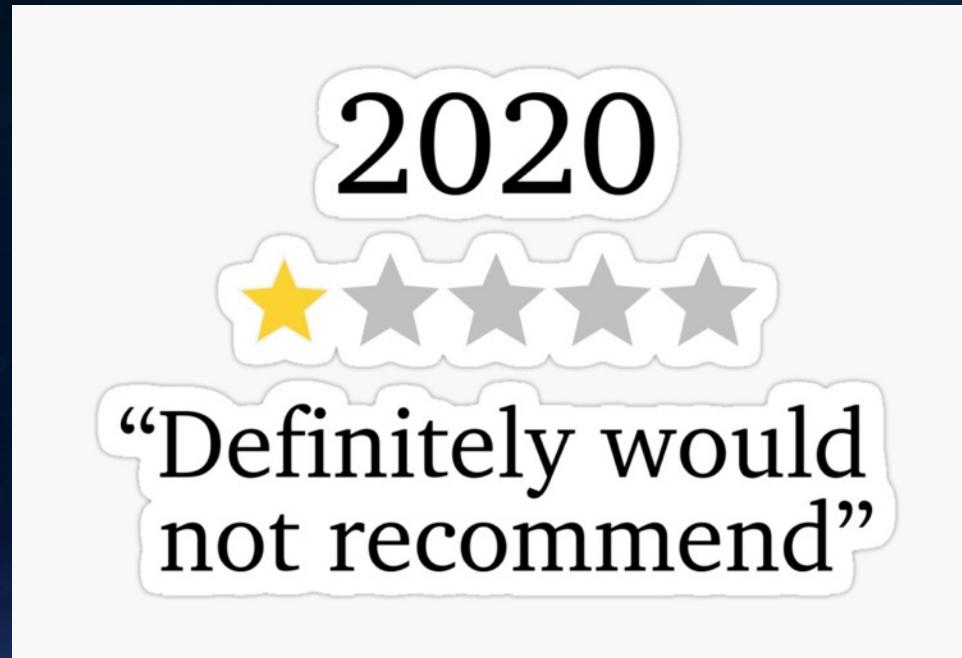


WELCOME

to the 2020 Imagery Summit

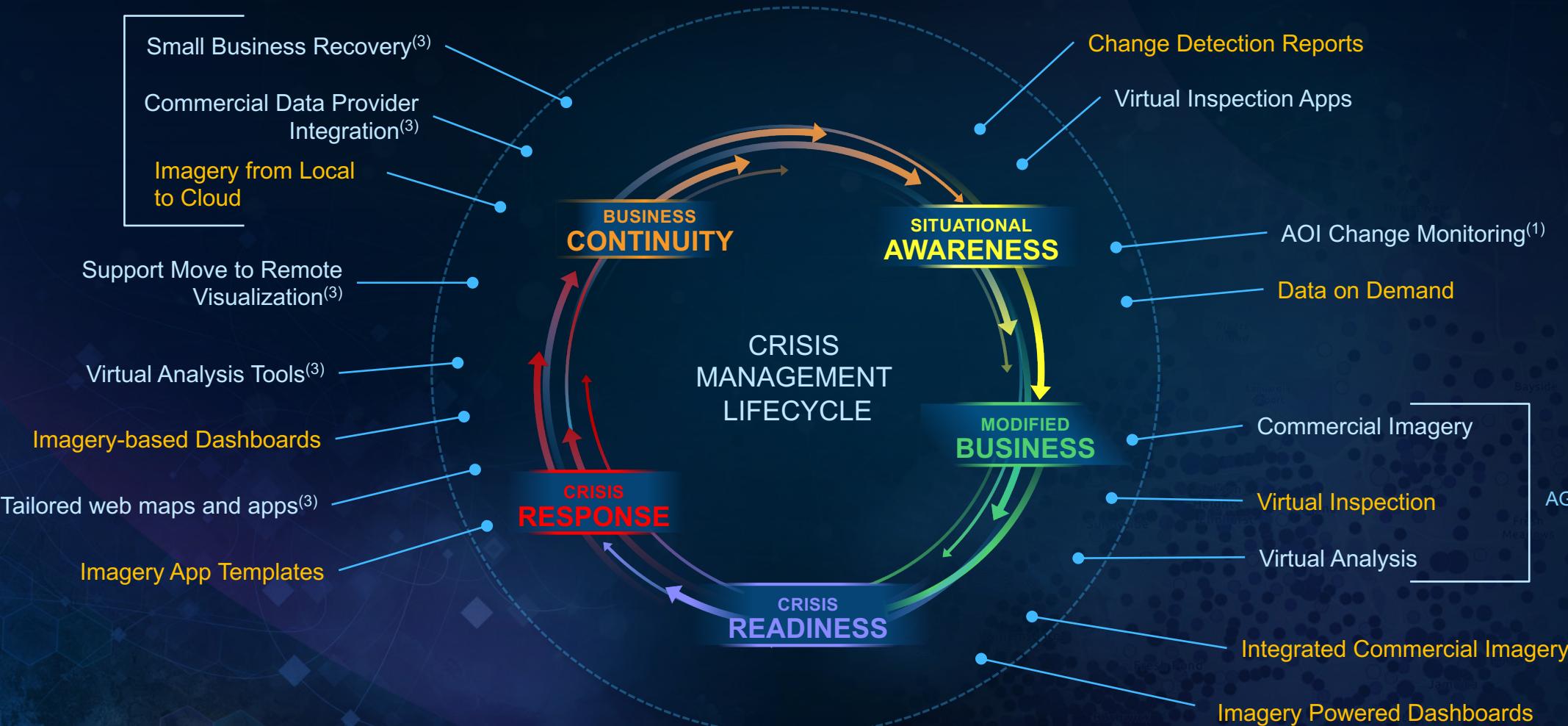
Richard Cooke
Director Imagery and Remote Sensing

The Jury is in....



...2020 has changed how we see our collective work

Seeing Our Work Through the COVID lens



We must reduce complexity, improve accessibility, and adapt to new patterns of work



VISION

Remote Sensing and
the Geospatial
Nervous System

Our World Resembles a Living Organism

A Complex and
Interconnected
Ecosystem

Self-Healing
and Resilient

... Always Changing

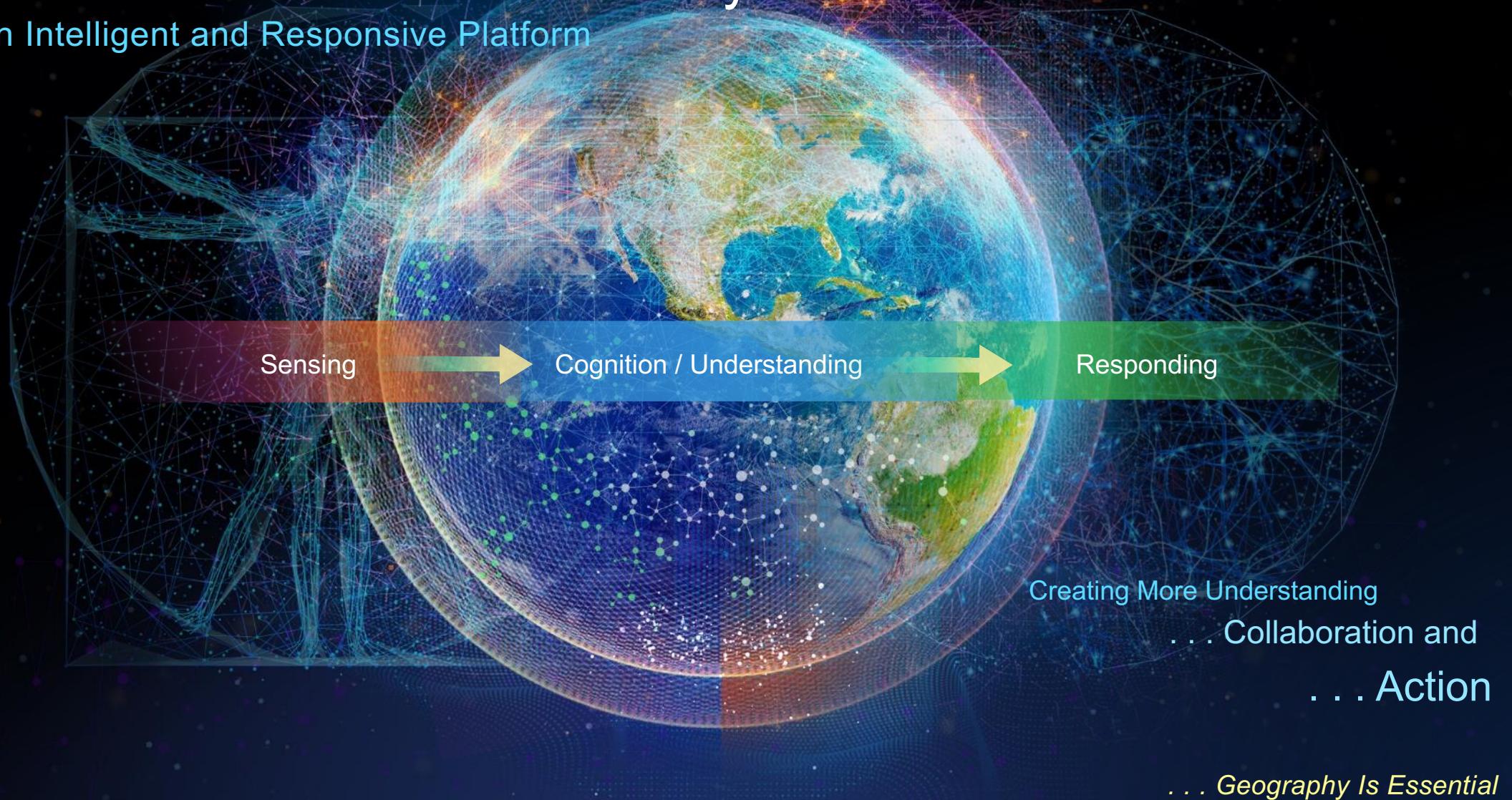
... And Humans
Are Part of It

Our Human Footprint Is Creating Many Challenges...



Our World Needs a Nervous System

An Intelligent and Responsive Platform



GIS

Provides the Framework . . .
. . . And Process

Geospatial
Infrastructure

Measurement

Visualization &
Mapping

Analysis &
Modeling

Planning &
Design

Decision-
Making

Action



GIS

Provides the Framework . . .
. . . And Process

Geospatial
Infrastructure



Sensing

Understanding

Responding

The Foundation for a Geospatial Nervous System

Integrating All Types of Data

Geospatial
Infrastructure

Creating a Common Language

Maps
Scenes
Layers



Imagery



Multidimensional



Tabular

Unstructured



Vector

3D

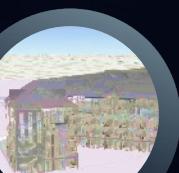
Real-Time
(IoT)



Big Data

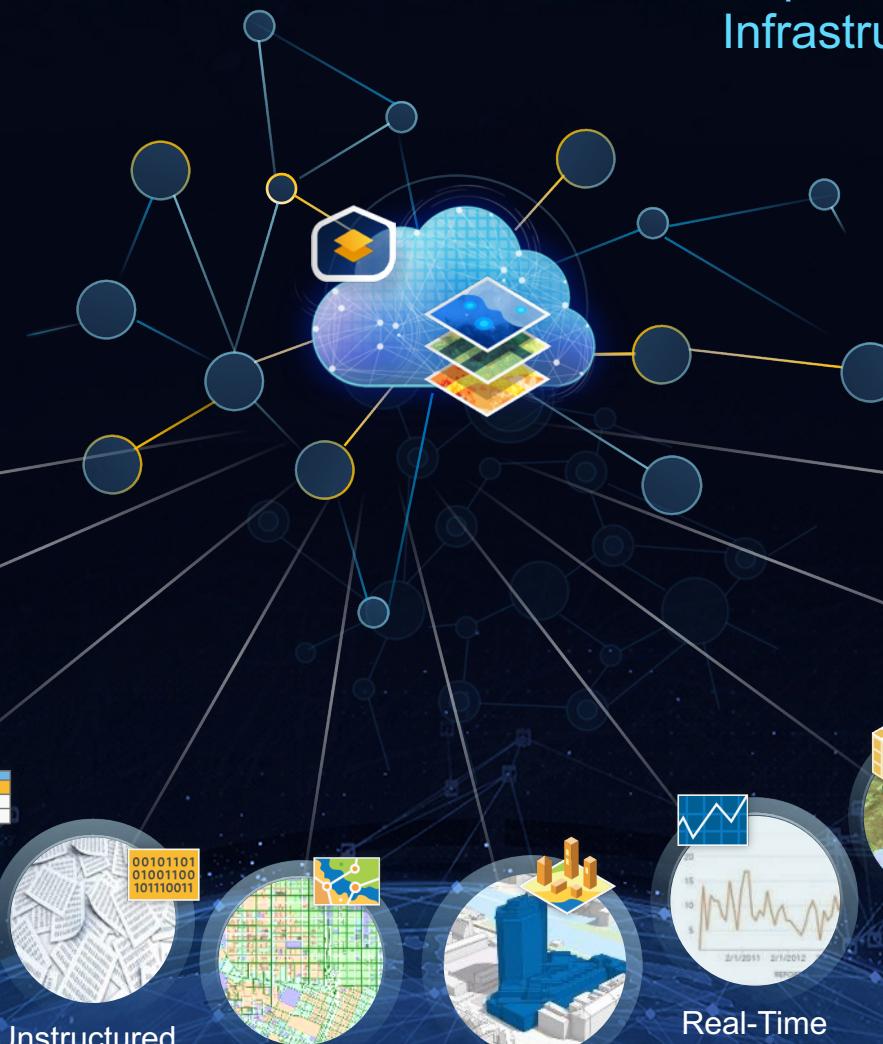


Lidar



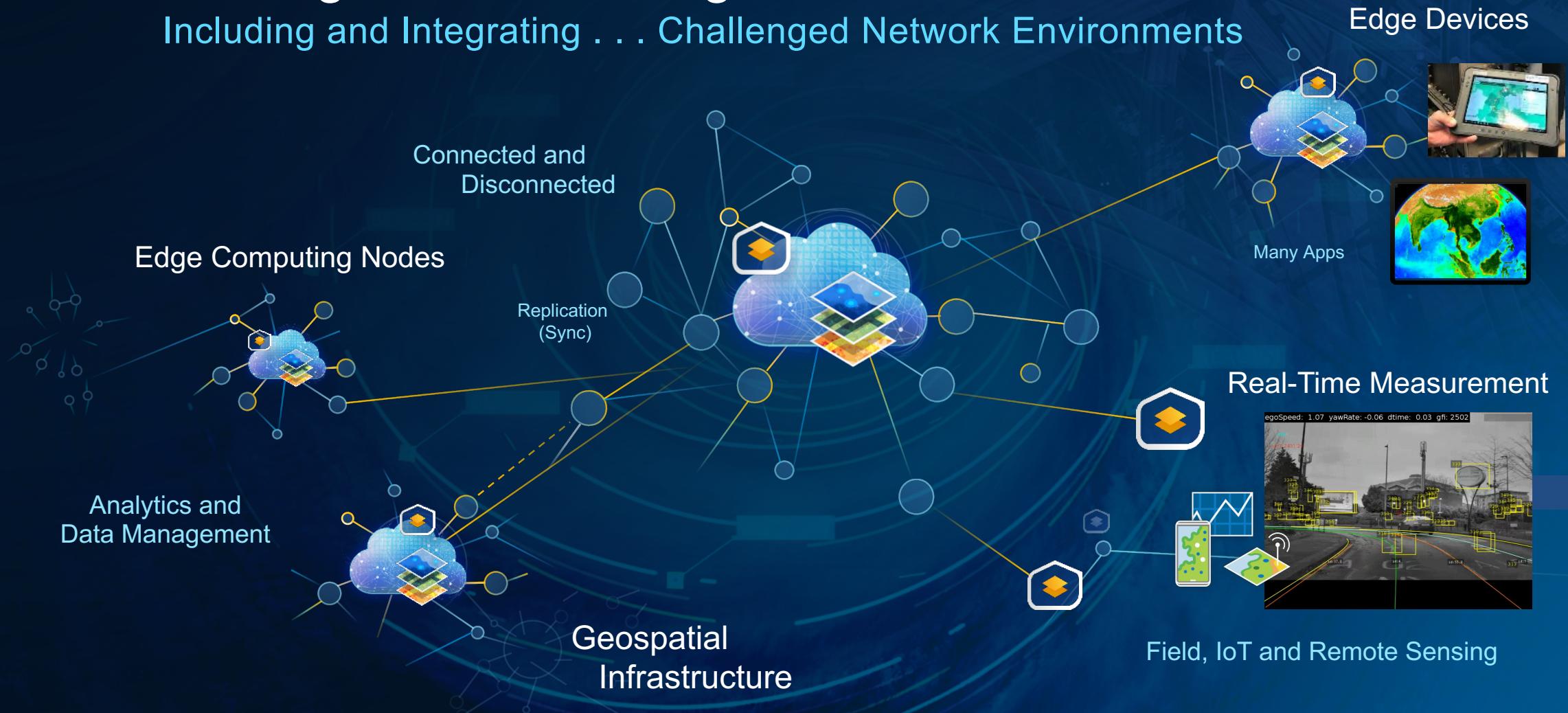
CAD / BIM

Shared Services



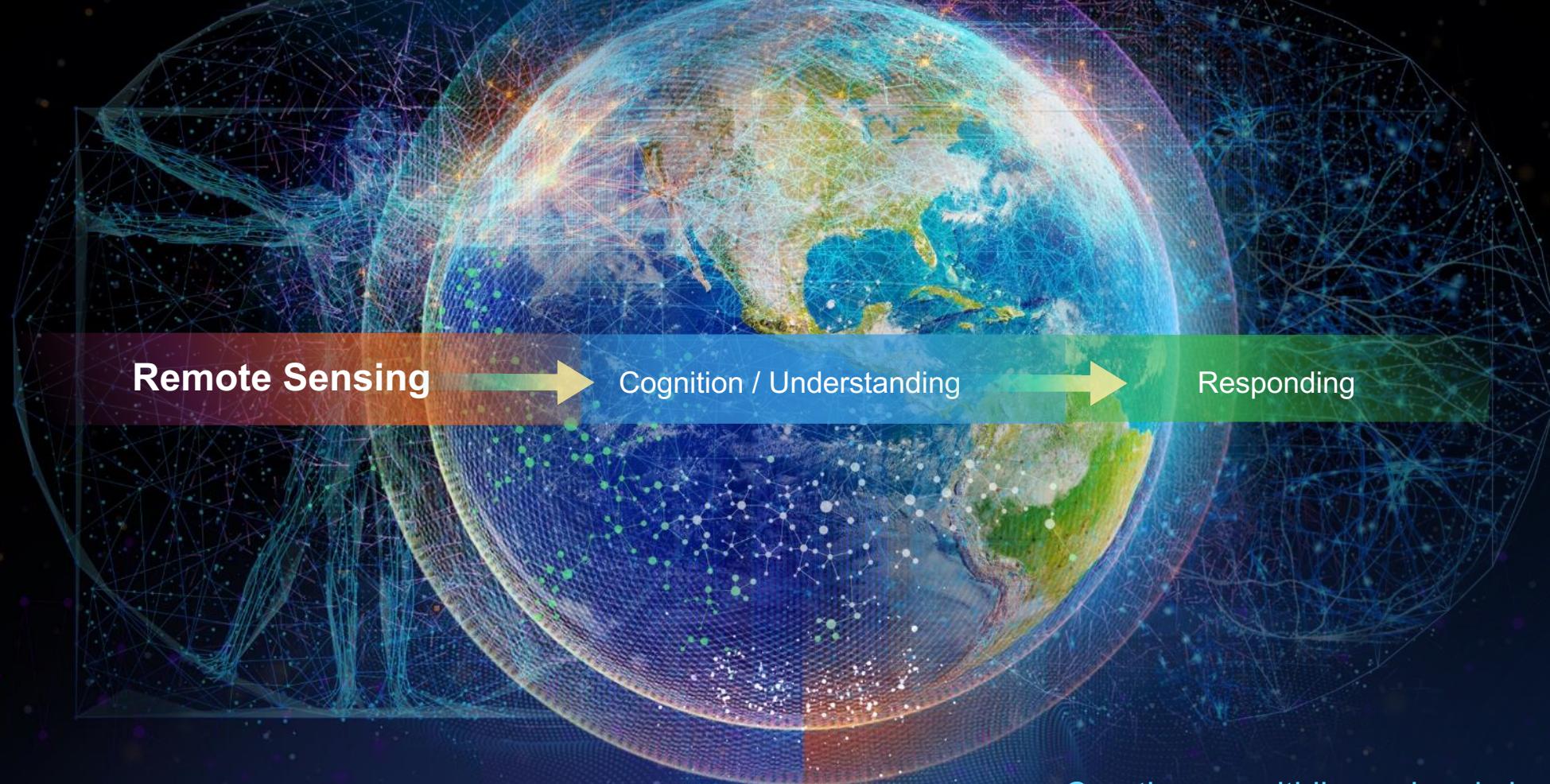
Extending GIS to the Edge

Including and Integrating . . . Challenged Network Environments



Supporting GIS Workflows in All Environments

A Geospatial Nervous System for our Planet begins with...



The Geospatial Revolution Is Just Beginning . . .

The Geospatial Nervous System . . .

. . . That Emerges

. . . Will Profoundly Transform Our World



Your Work Across Industries

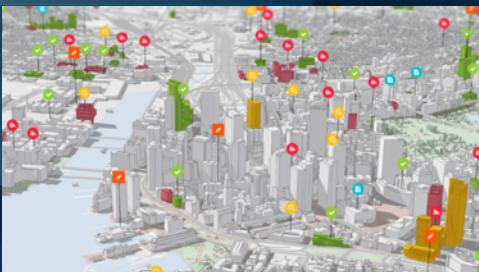
Building Detection

- Roof Types
- Height



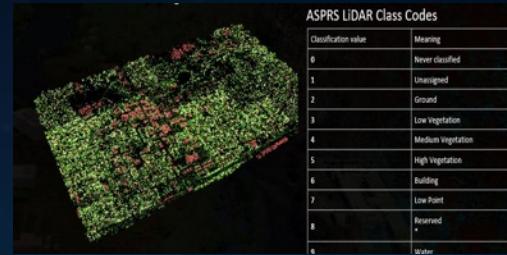
Urban & Community Planning

- 3D Basemaps
- 3D City Modeling



GeoAI
Automate Manual
LiDAR classification

Land use Land Classification



Emergency Management

- Flood Mitigation
- Damage Assessment



Public Safety

- Threat Assessment



Your Work with Site Scan for ArcGIS

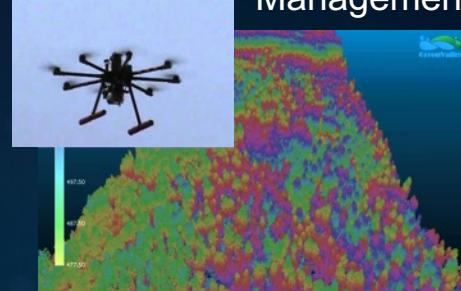
Assessment Changes



Events Planning



Natural Resource Management



Land Use Planning

Infrastructure Inspections



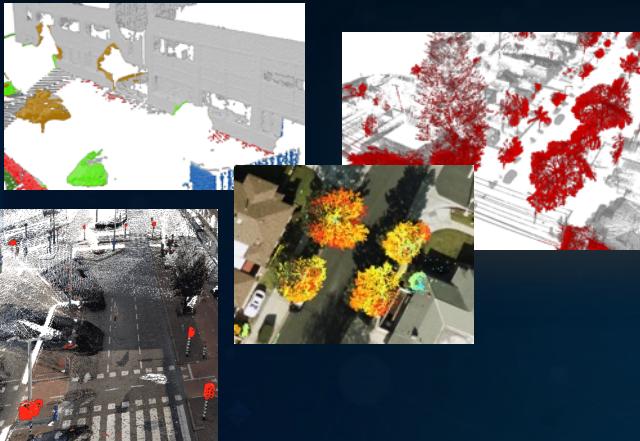
Emergency Management

- HazMat
- Damage Assessment



Your Work in Raster and GeoAI Analytics

Asset Extraction from Lidar



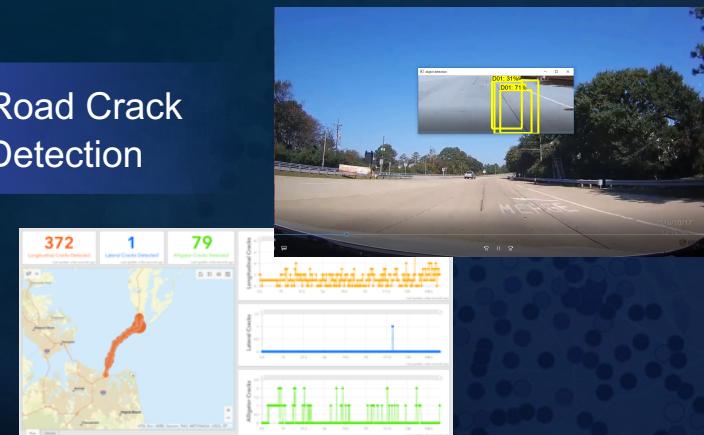
Road Asset Extraction from Oriented Imagery



Building Footprint/Parcel Change Detection



Road Crack Detection

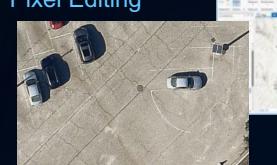


Our Work: Imagery and Remote Sensing

ArcGIS is a Comprehensive Imagery Platform

Map Production

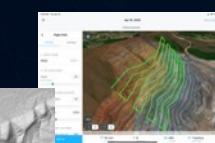
Pixel Editing



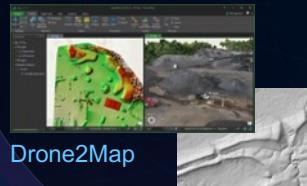
Ortho Mapping



Stereo Feature Capture



Drone2Map



Site Scan

DTM Generation

Imagery & Raster Content

All Raster Types:

Formats



Platforms



Modalities



Services



Analysis & AI

Raster Processing



Segmentation



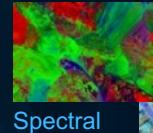
Deep Learning Tools



Object Detection



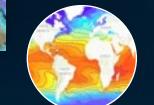
Spectral Indices



Classification



Multidimensional



Change Detection



Streaming Multiband Tiles



Image Management

Mosaic Datasets



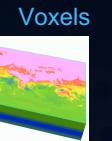
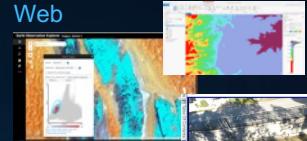
Image Cubes

Dynamic

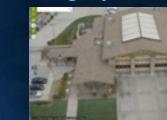
Pre-Processed

Visualization & Exploitation

Pro



Oriented Imagery



Motion Imagery



Excalibur

Focused on helping you do your work better

The ArcGIS Imagery Platform

Transforming Remotely Sensed Content Into Information

Mapping in Multiple Dimensions

Analytics On Demand

The diagram illustrates the integration of AI and machine learning across five key sectors:

- Construction Progress:** Shows a 3D rendering of a construction site with various structures and materials.
- Asset Management:** Displays a dashboard with a map, bar charts, and a table of data.
- Natural Disaster:** Shows a 3D terrain model with a red and blue color gradient.
- Public Safety:** Features a 3D map with a yellow rectangular overlay and a zoomed-in view of a specific area.
- Inspection:** Shows a 3D rendering of a bridge or large structure with inspection data overlaid.

Finding Spatial Patterns

Built Environments

Natural Environments

Urban Growth

Impervious Surfaces

Crop Yields

National Statistics

Habitat Loss

Land Cover

Platform

Photogrammetry

GeoAI

Raster Analytics

Image Mgmt

Search & Discovery

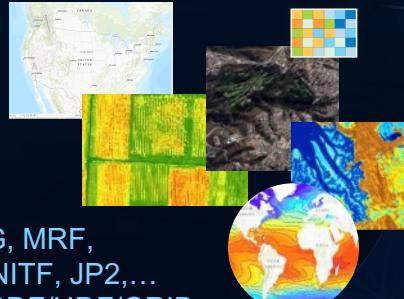
Mosaic Datasets

Image Cubes

Time

Content – Support for All Imagery and Rasters

Formats



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

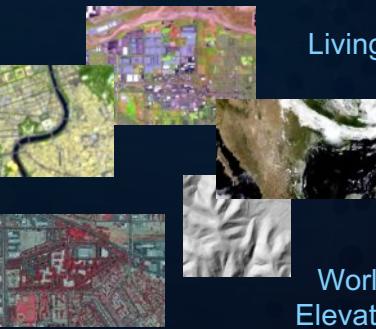
150 Formats
75 Raster Types
+Python Raster Type

Platforms



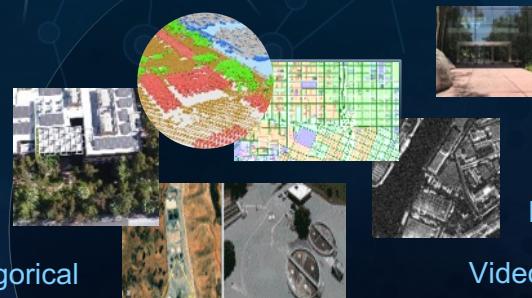
As: Local Files, Cloud Storage, Web Services

Services



Living Atlas
Landsat
Sentinel
Bayside
World Elevation
MODIS
NAIP

Categorical



Radar
Lidar
Video
Natural Color

Multi-dimensional



Modalities

The ArcGIS Imagery Platform

Focused On the Problems You are Trying to Solve

Reality Capture and 3D Data from Imagery and Lidar



Collection, Processing, Data Management and Analysis

Observations and Spatial Patterns



Visualization, Analysis, GeoAI

Remote Monitoring and Inspection

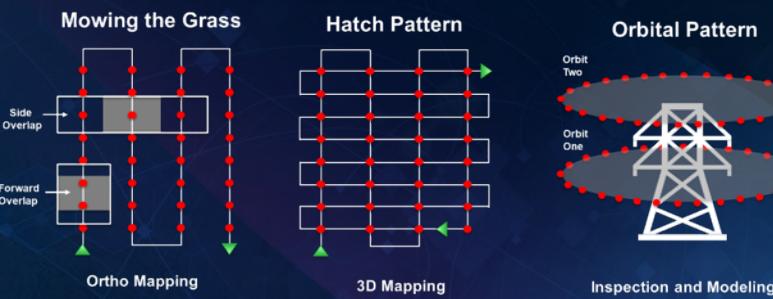
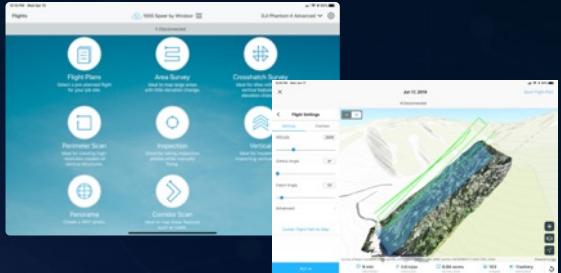


Situational Awareness, Automation of Data Collection, Asset Management, Urban Planning

Site Scan for ArcGIS

Plan, Collect, Process, Analyze and Share

Site Scan Flight Planning



Drone Flight Planning
Point Clouds
Orthomosaics
Fleet Management
3D Integrated Mesh
Analysis Tools



ArcGIS Pro



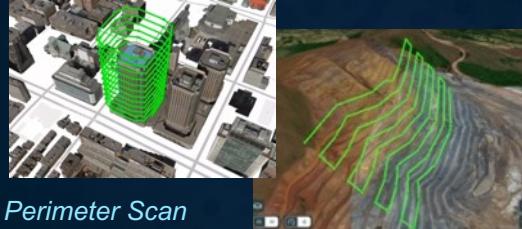
Image Analyst



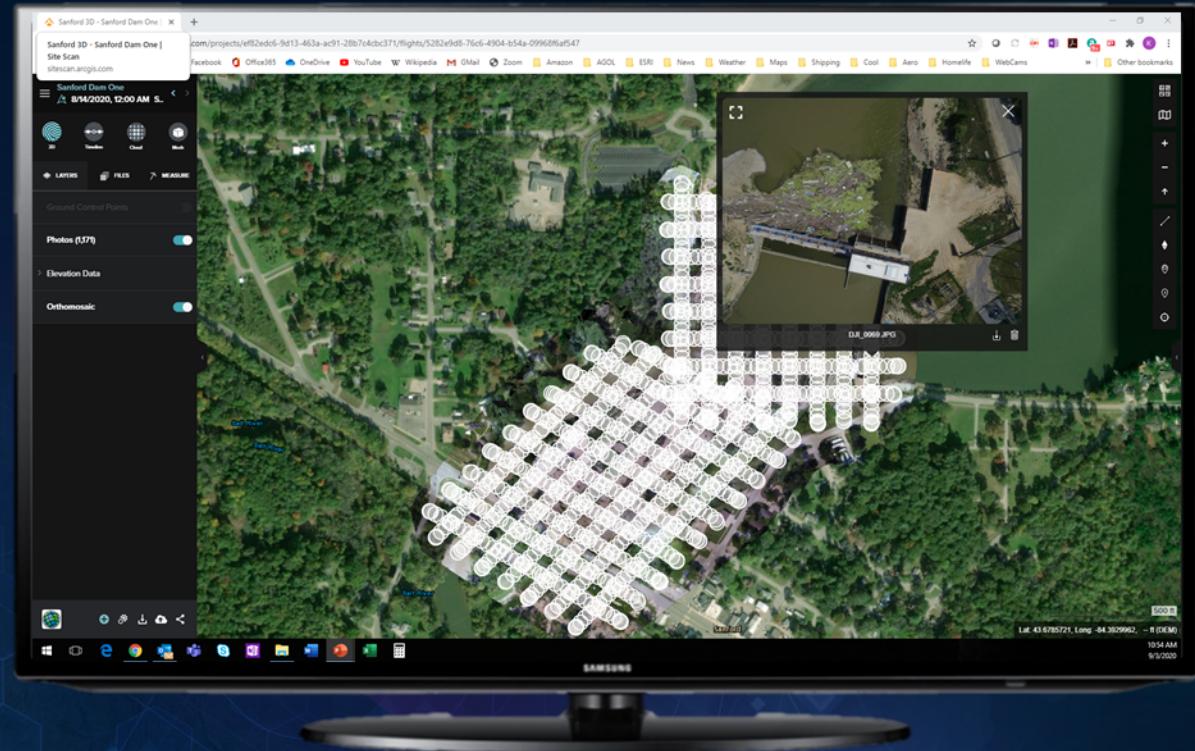
ArcGIS Online/Enterprise

New

Site Scan for ArcGIS



A complete platform for integrating drones into your workflows



Demonstration Site Scan for ArcGIS

Jeremiah Johnson

SURE for ArcGIS

Automated Data Production System for Mapping and 3D

Inputs



Image Files



Lidar



Orientation Data

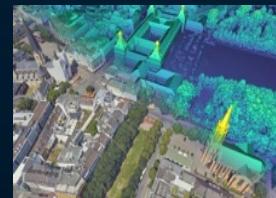


ArcGIS

- Pro
- Enterprise
- Online



True Orthophotos



Textured Meshes



Point Clouds



Digital Surface Model

Data Products

Applications

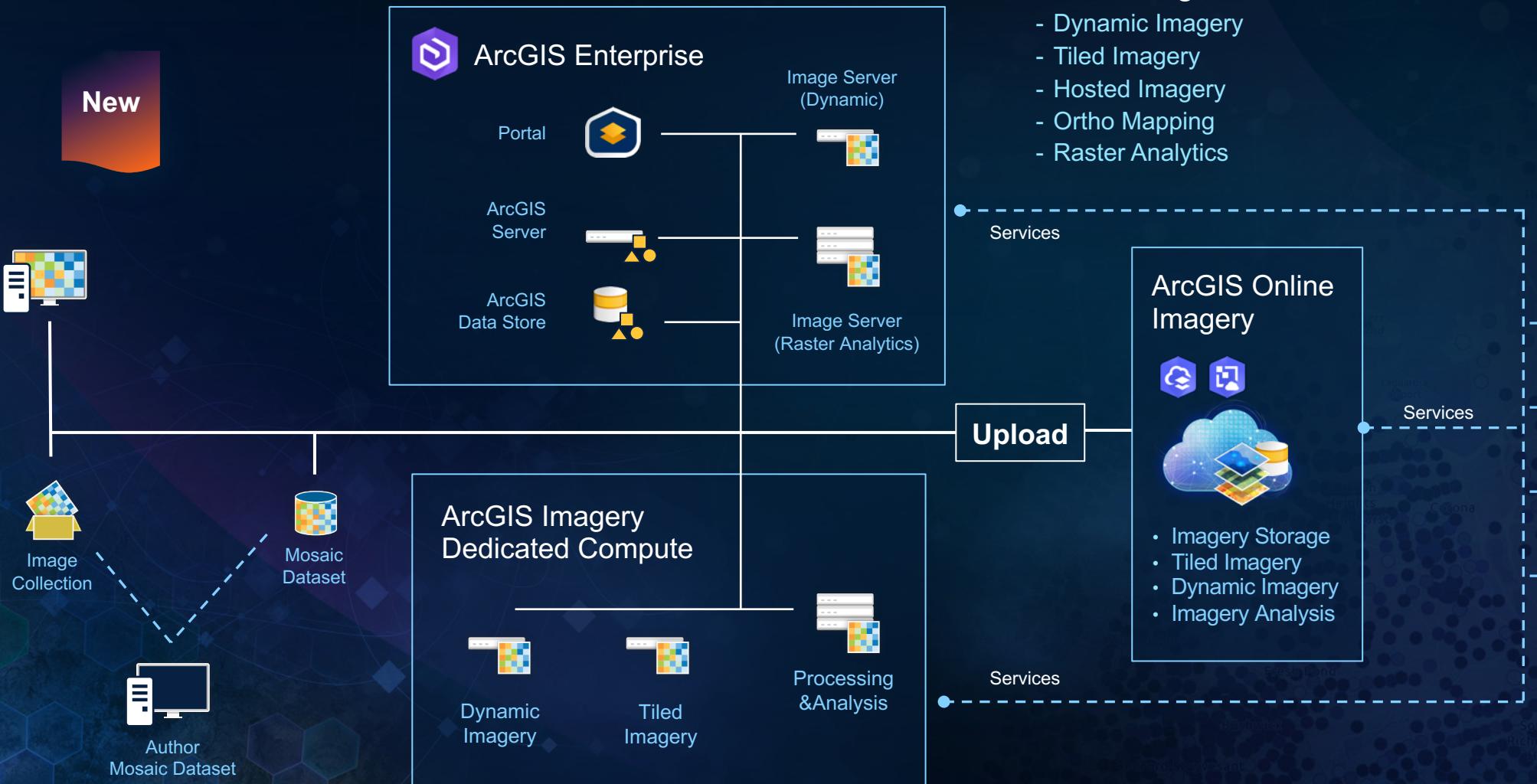
- Mapping
- 3D Visualization & Simulation
- Change Detection
- Surface Analytics

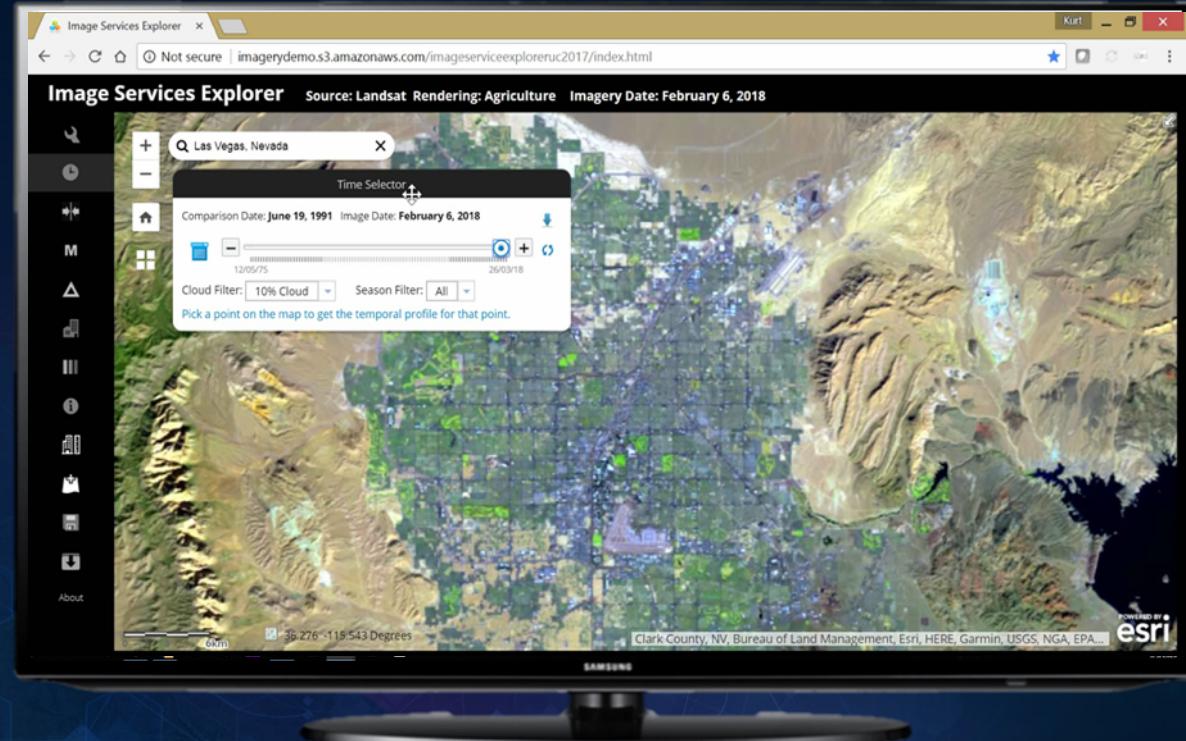
Fully Integrated with ArcGIS

Fast, Highly Accurate, Massively Scalable, and Cost Effective

ArcGIS Imagery

Image Management and Raster Analytics in the Cloud



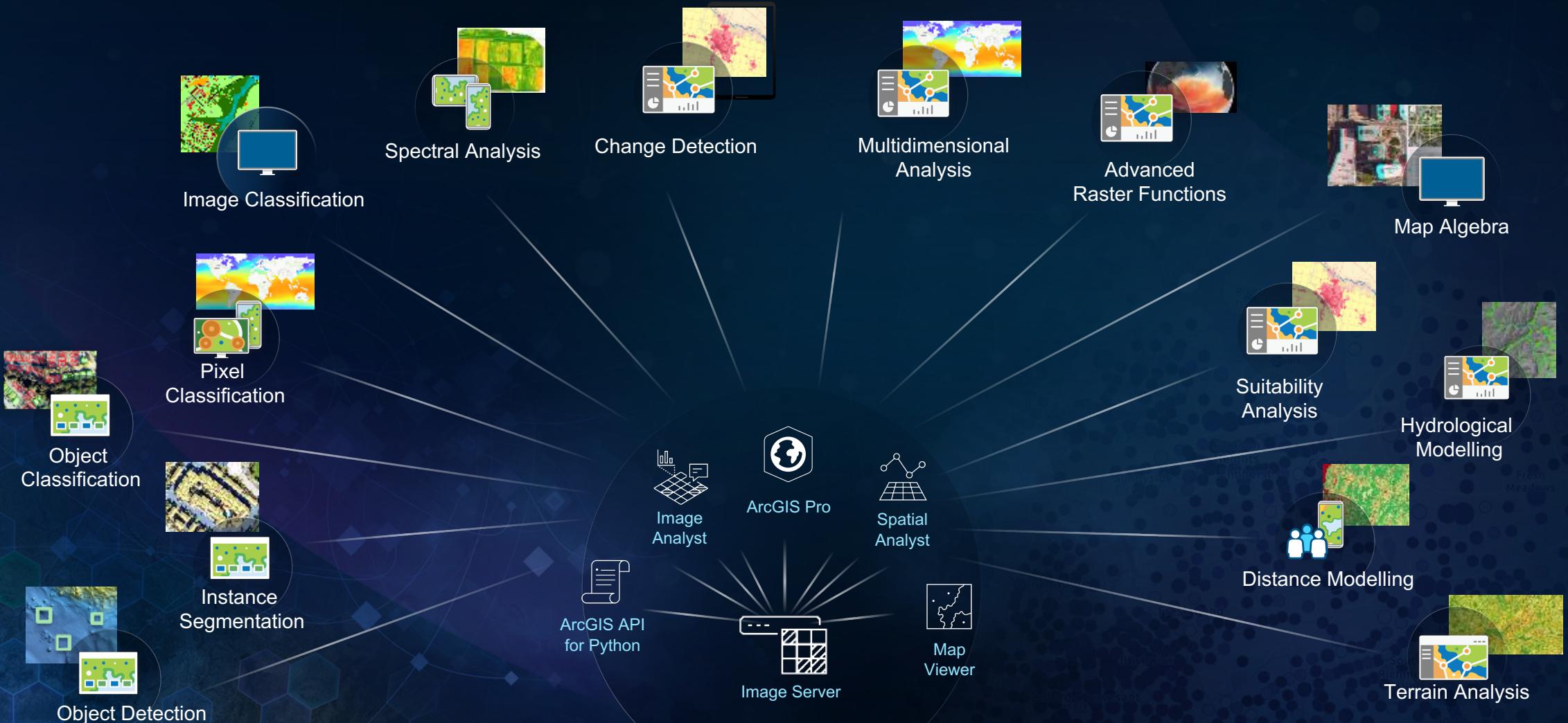


Demonstration ArcGIS Imagery

David Wright

Image Analysis

Extracting Information from Imagery



Deep Learning in ArcGIS

Different data types, tasks and integration



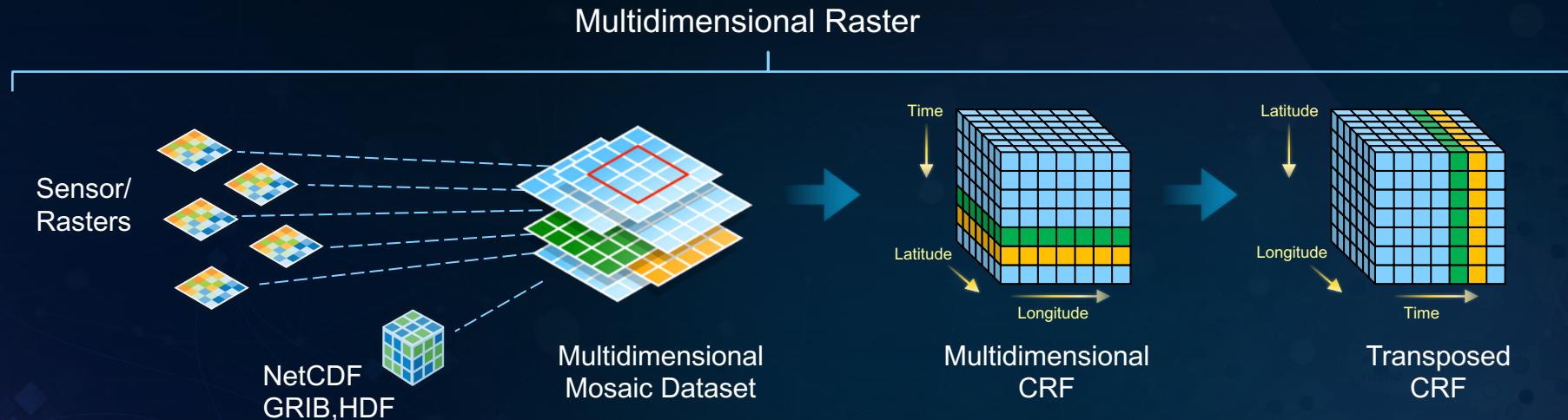
Deep Learning models on the living atlas:

Building footprint extraction
Tree classification from LiDAR
Land cover classification

New

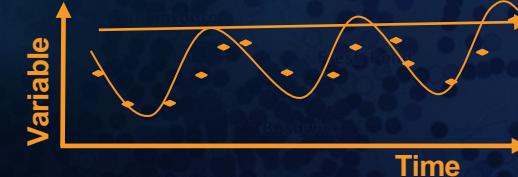
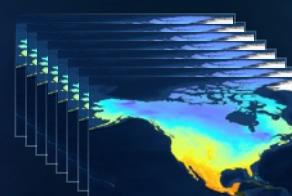
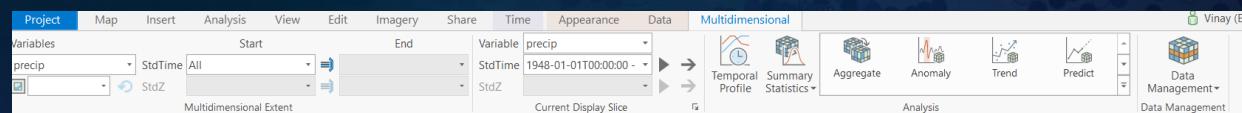
Identifying Change with Multidimensional Data

Increasing Demand to Handle Large Scientific Datasets, Deep Temporal Data Stacks, Image Cubes, Data Cubes



- Management of large datasets
- Contextual Multidimensional Tab
- Charting tools
- Map Viewer supports multidimensional analysis workflows
- Multidimensional Raster Functions and Python functions
- ArcPy enhanced to work with Multidimensional rasters

Geoprocessing
Anomaly detection, Aggregate data, Detect anomalies, Predictive analysis, Trend analysis



Visualization & Exploitation

Enable Human Interpretation of Imagery & Derived Data

**Straightforward user experiences
for web and desktop**

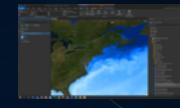
**Exploit all kinds of
imagery and rasters**



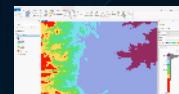
Oriented Imagery



Motion Imagery



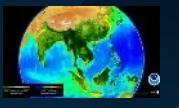
Multidimensional Data



ArcGIS Pro



ArcGIS Excalibur



ArcGIS Earth



Field Operations apps



Story Maps



Configurable templates



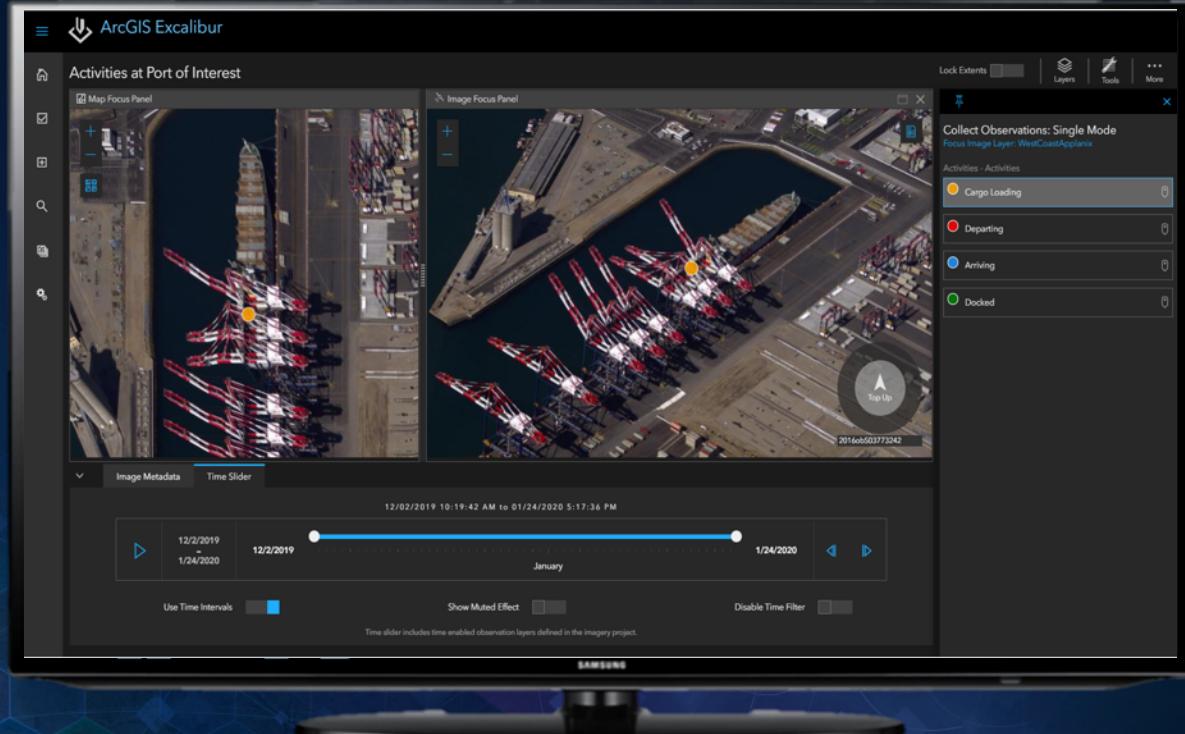
Web App Builders



Custom web apps

**Use imagery to
share your story**

Make Informed Decisions



Demonstration Excalibur and ArcGIS Image Analyst

Kyle Talbot

Capabilities vs Complexity

The Challenge of Making Complex Things Easy

Complexity
Capabilities

Flattening the
Imagery Complexity Curve

