



AfricaGIS 2017

Creating the Africa We Want

Agriculture

Nature
Conservation

Science & Technology
Water Resources

Pollution

Climate
Change

Social Conflicts

Natural
Disasters

Infrastructure

Urbanization &
Development

Energy

Business

Natural
Resources

National
Security

Environment

Economic
Development

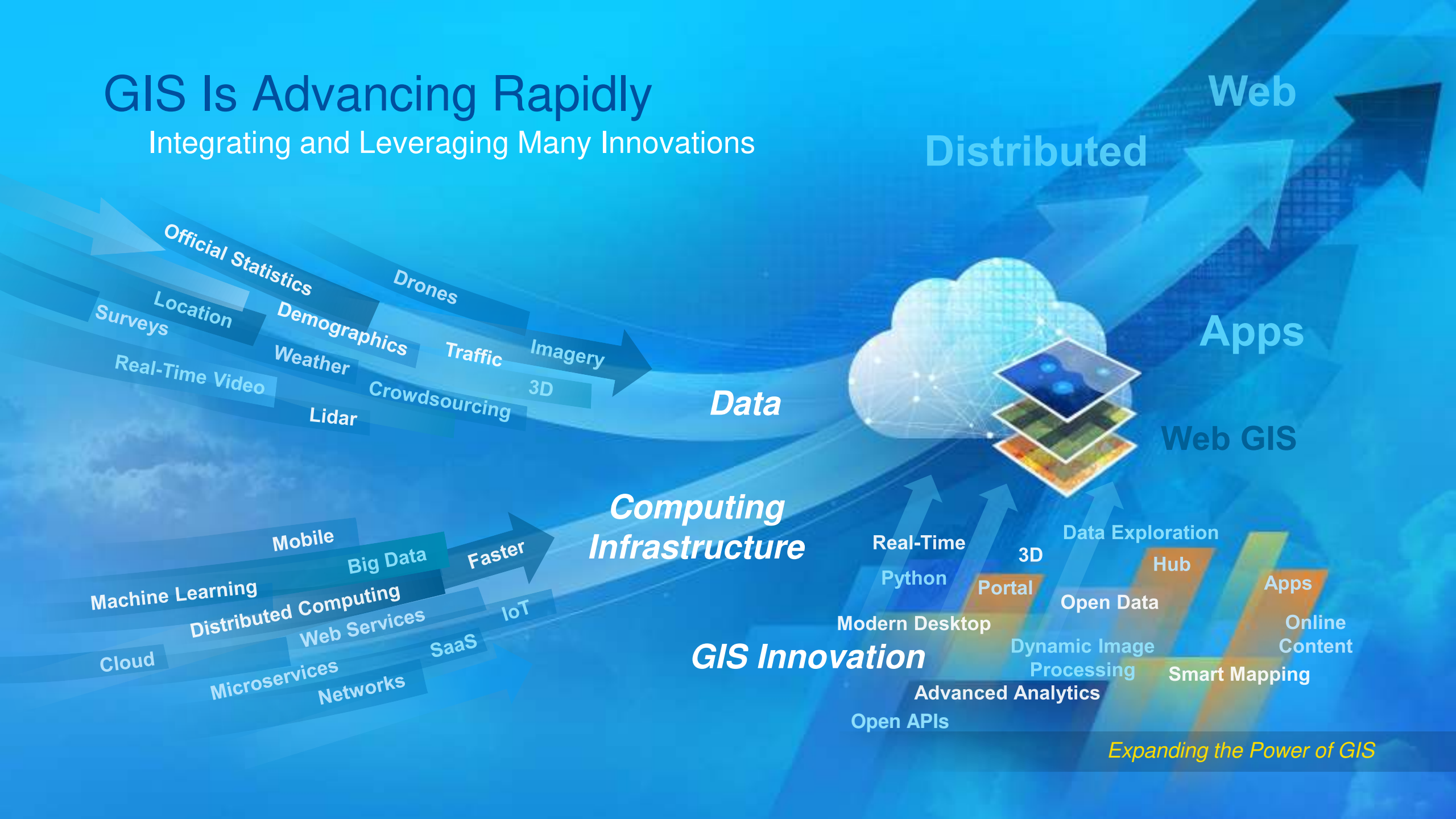
Transparent
Government

Lawrie Jordan
Director of Imagery and Remote Sensing, Esri

Addis Ababa - November 2017

GIS Is Advancing Rapidly

Integrating and Leveraging Many Innovations

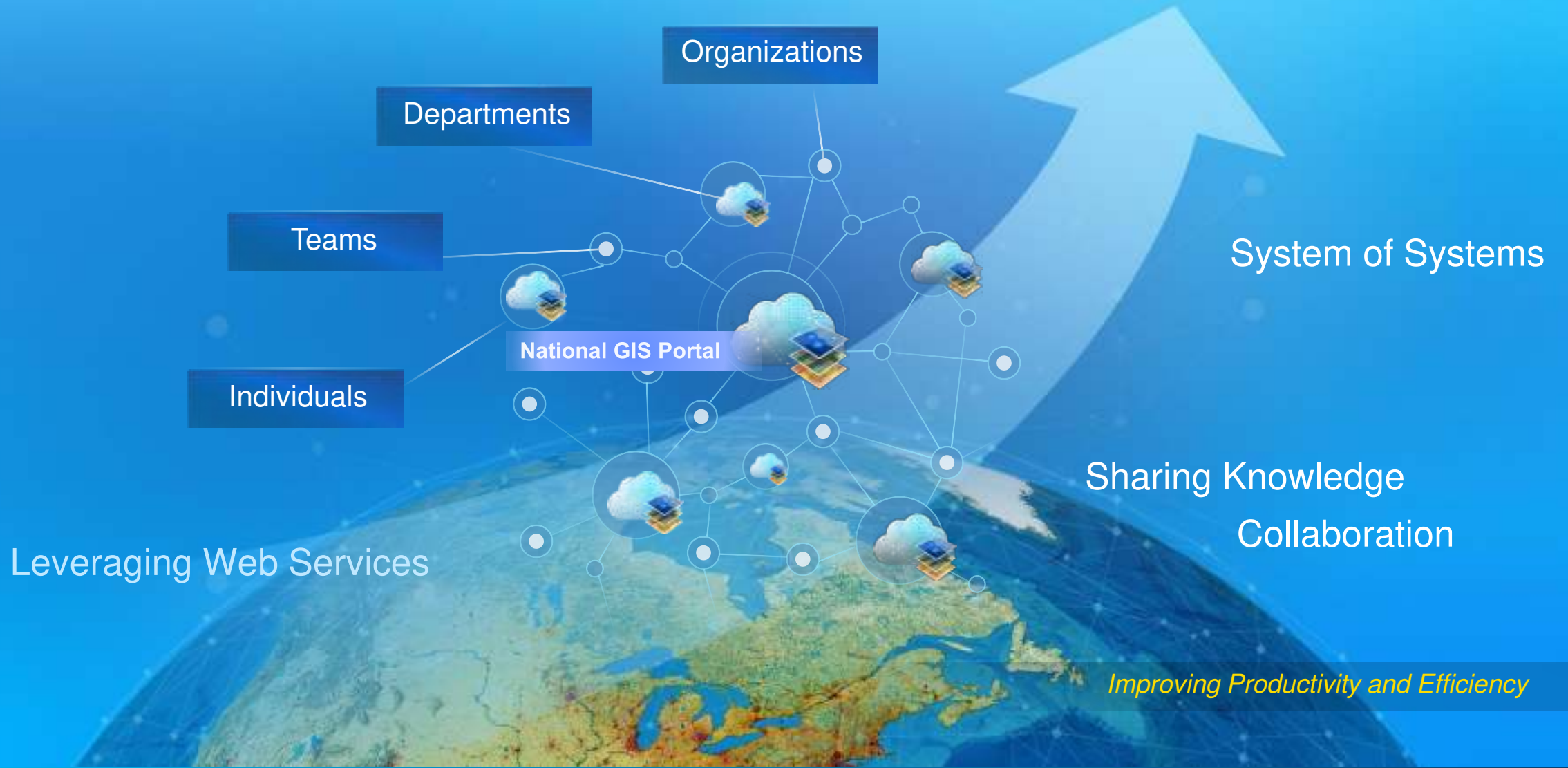


GIS Innovation

Expanding the Power of GIS

WebGIS Enables a Whole New Scale of GIS

Helping Everyone do Their Work Better



Apps Make the System Come Alive

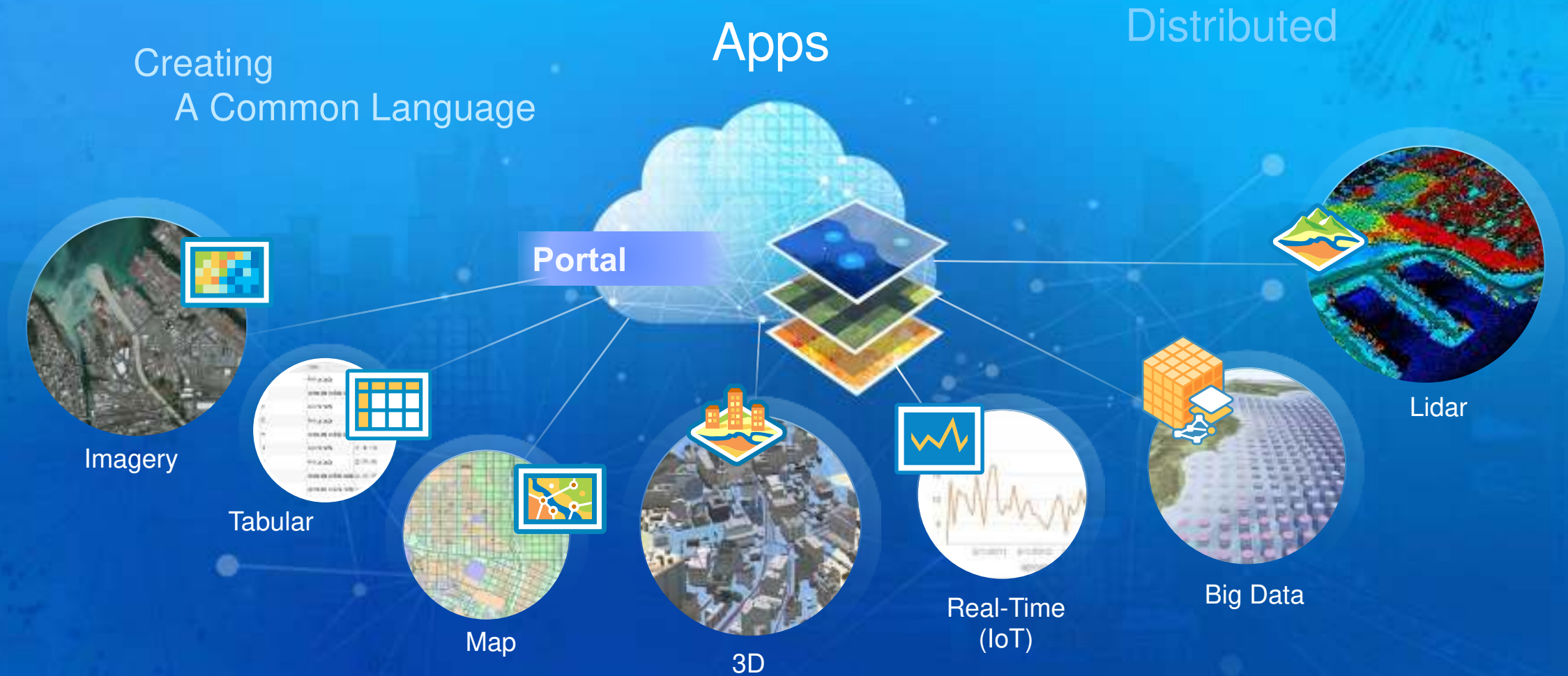
Leveraging Open Data and Services



Across Organizations and Beyond

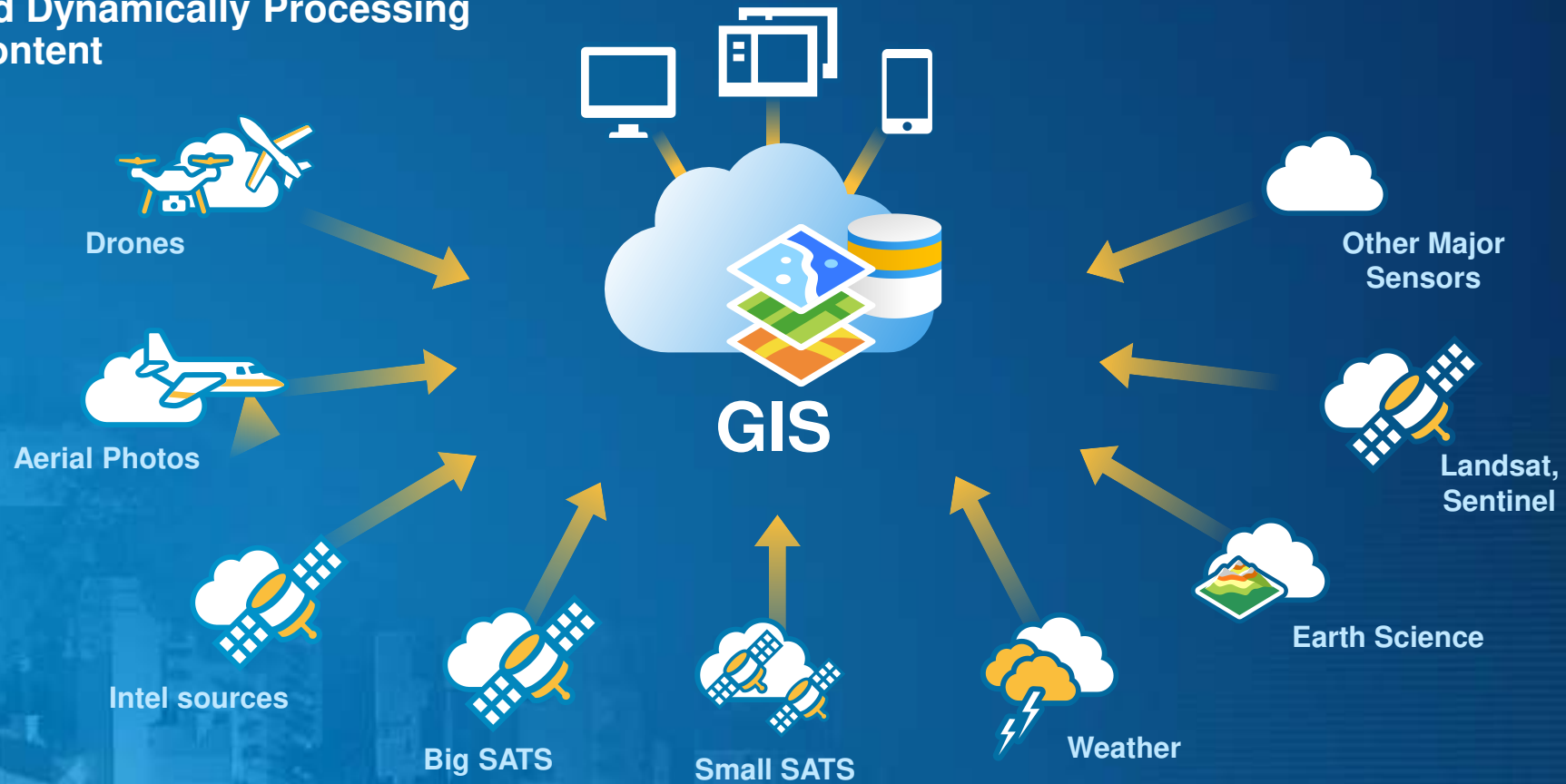
WebGIS Simplifies Working With All Types of Data

Using Web Maps, Scenes, and Layers



WebGIS Integrates All Types of Imagery

Accessing and Dynamically Processing
Distributed Content

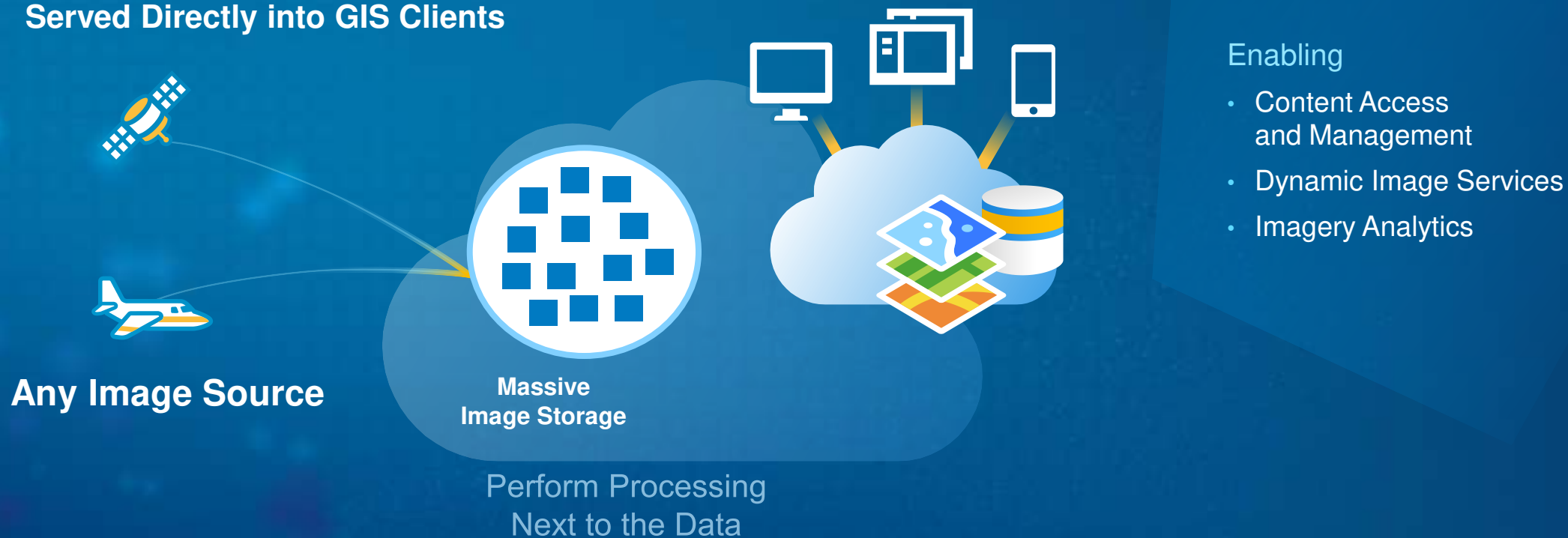


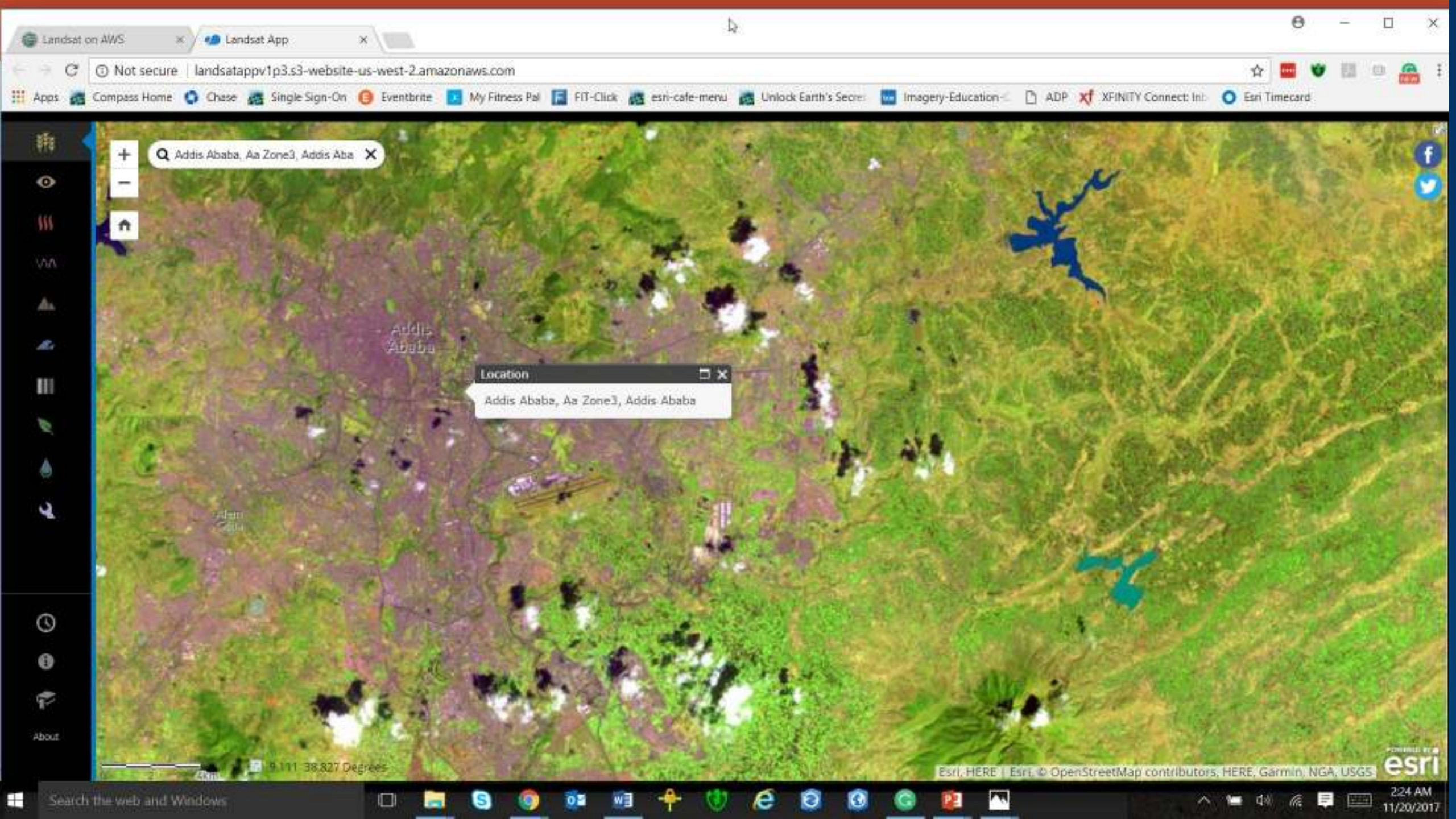
*Enabling GIS Users . . .
. . . to Easily Integrate Many Sources of Data*

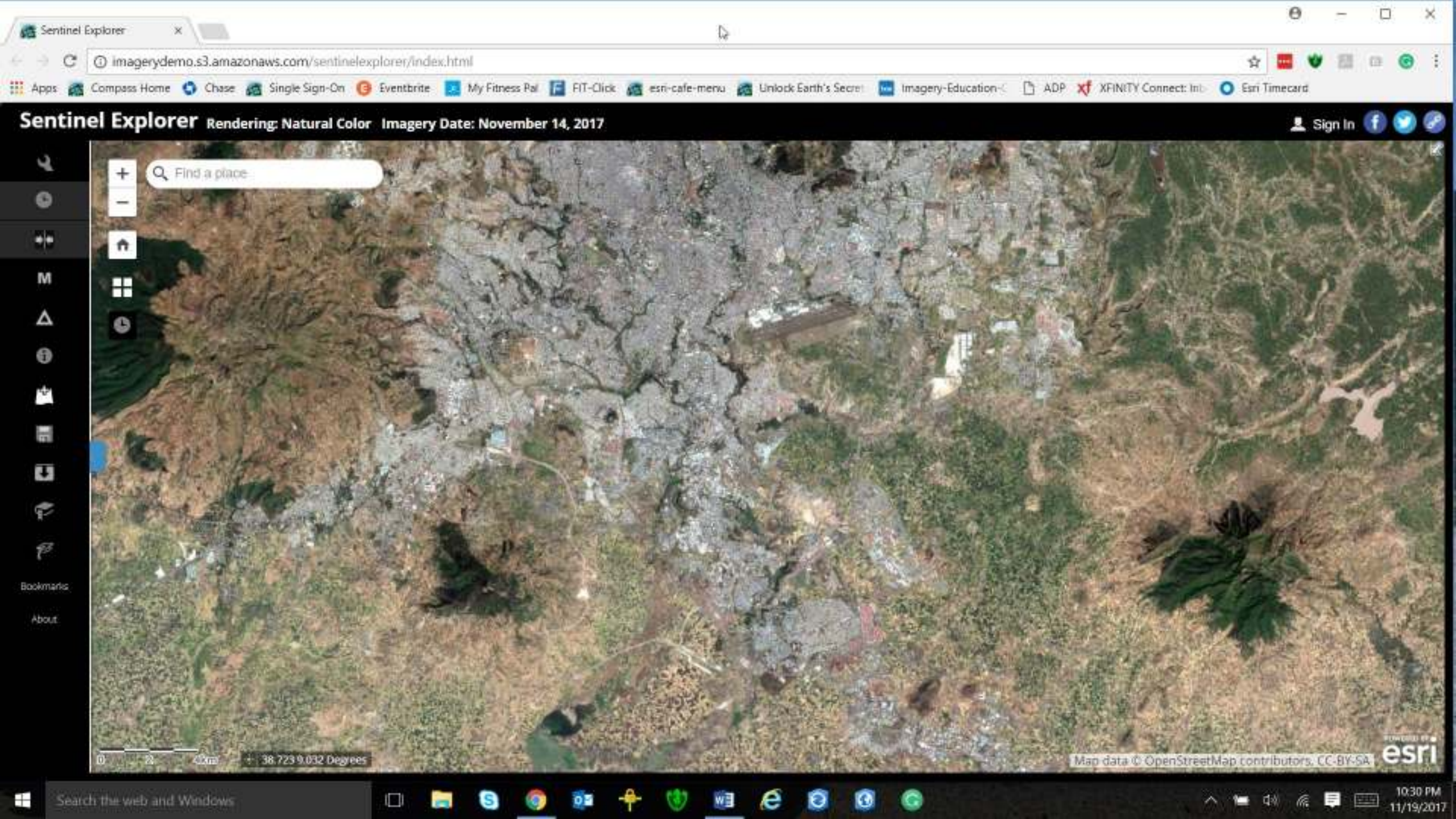
Process Massive Imagery in the Cloud

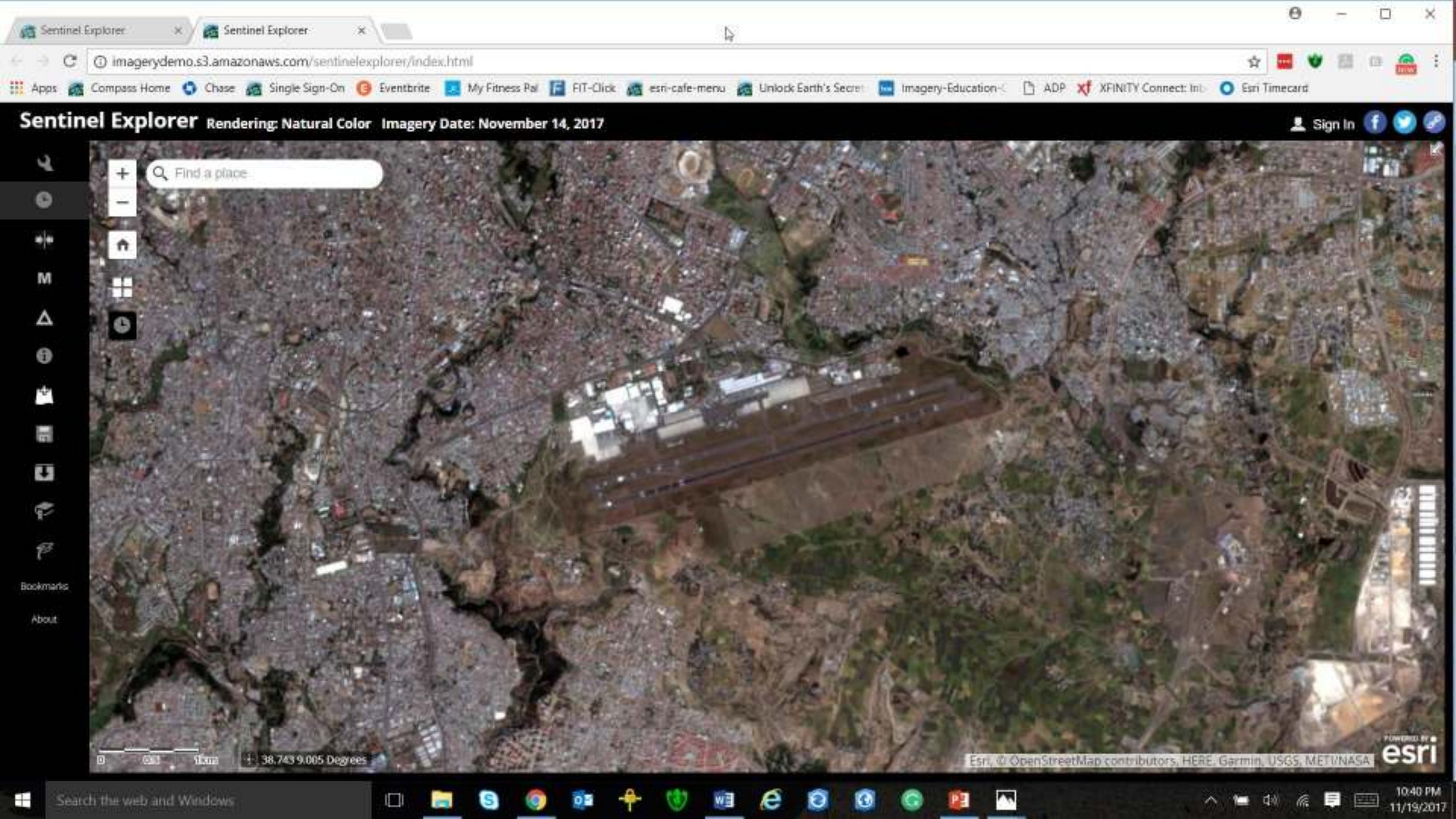
Dynamically Process Imagery

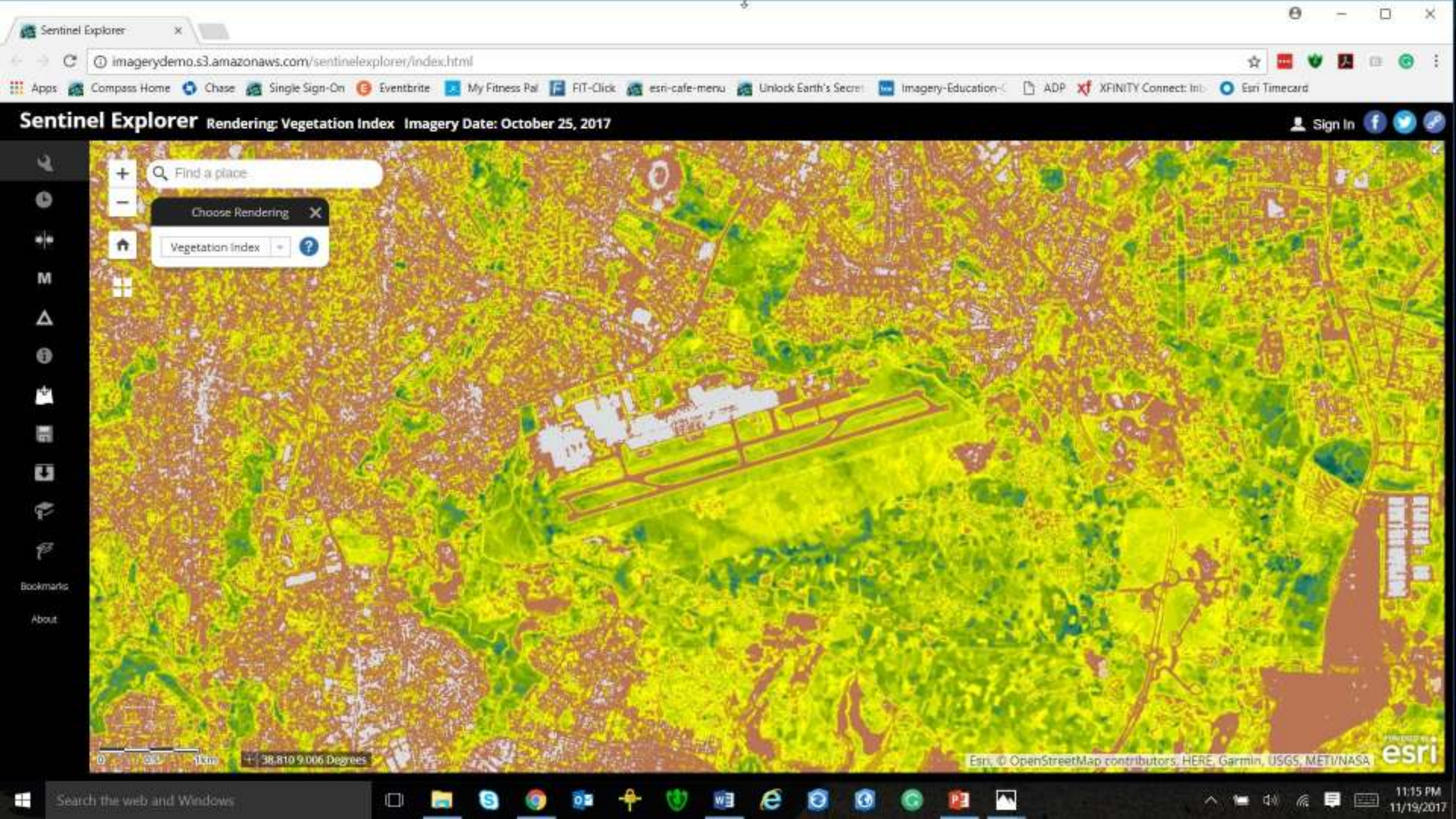
Served Directly into GIS Clients











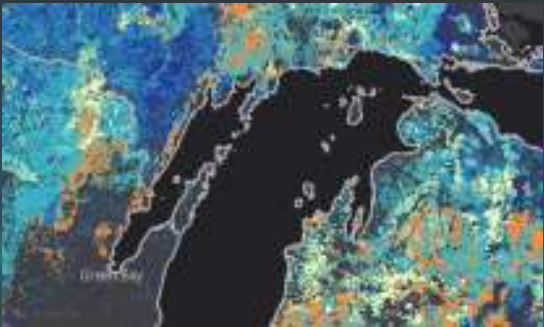
For Earth Observation and Conservation

Environmental Clean-up



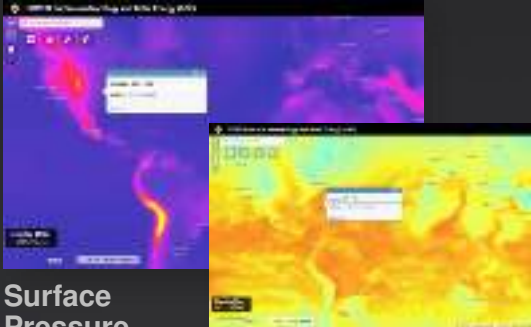
INTERA
Washington

Forest Acidification



Midwestern US

Surface Meteorology
and Solar Energy



Surface
Pressure

Thermal Energy
NASA

Industrialization



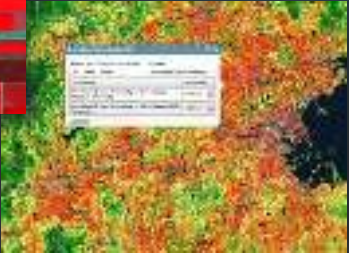
DigitalGlobe

Tracking the Rural
Edge



Planet
Labs

Effects of
Climate Change



Clark Labs

Measuring Urbanization



Singapore Land Authority
Singapore

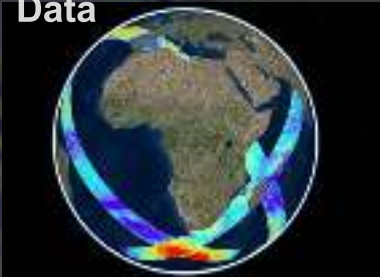
Loss of Habitat



Central Africa

Blue Raster

EO Scientific
Data



NASA

For Managing Natural Resources

Bark Beetle
Monitoring



INTEND
Geoinformatik
Canada

Managing Harvests
and Timber Sales



North Point Geographic Solutions
Minnesota

Forest Inventory

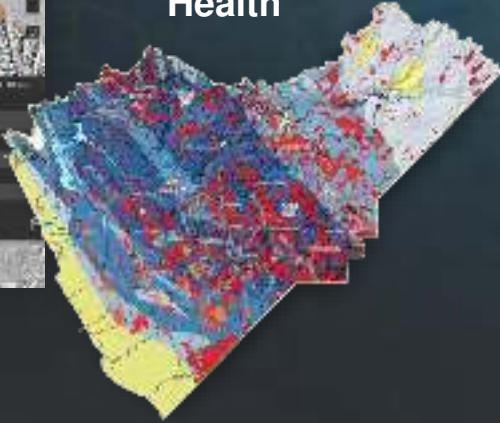


Lim Geomatics
Canada

Forest Restoration
Planning



Forest
Health



Farm Management



New Zealand

Agricultural Dashboard



New Zealand

GPS-it

Crop
Production



Swova
Indiana

Crop Rotation



USA

Vineyard Irrigation



Scheid Vineyards
California

For Public Safety and Defense

Assessing Vulnerable Populations

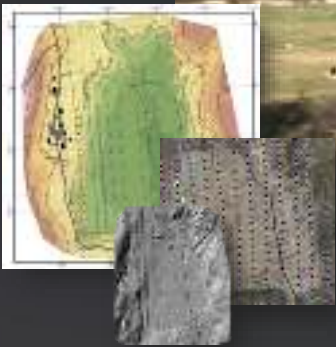


FEMA

Reconnaissance



Base Management



US Military

Situational Awareness



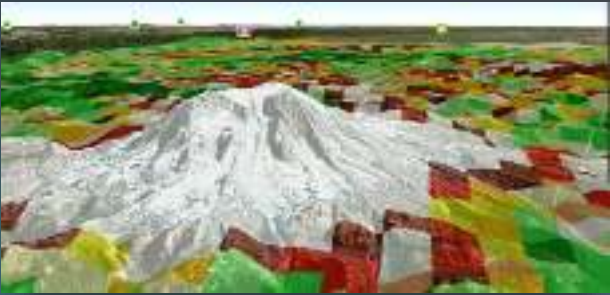
US Army
Europe

Coastal Monitoring



Remote GeoSystems
Canada

Wildfire Monitoring



Washington

Natural Disaster Recover







Glacial Melt



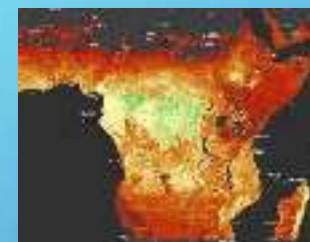
Bhutan (ICIMOD)

Desertification Survey



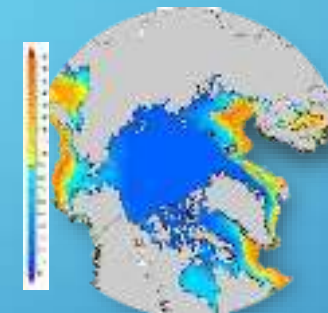
Turkey

Biomass Assessment



Africa

Calculating First Ice Freeze



Sea Level Rise



South Carolina

Monitoring Drought



NOAA



San Francisco

Forest Carbon Reserves



South America

Groundwater Change



California

Forest Restoration



Wallowa-Whitman NF



Wildlife Conservation



South Africa

Wilderness Tour



Steens Mountain Wilderness, Oregon

Habitat Corridors



Atlanta

Invasive Species



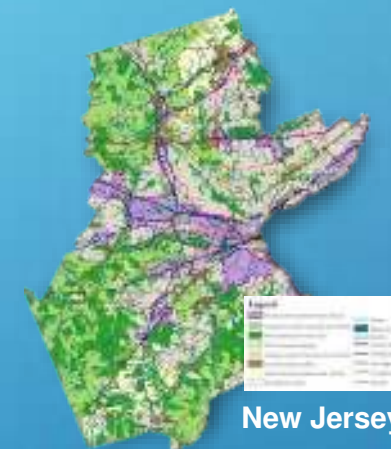
Southwest, USA

Ecosystem Sensitivity



Bolivia

Green Infrastructure



New Jersey

Watershed



Alaska

Wildlife Imagery



California

Habitat Monitoring



USA

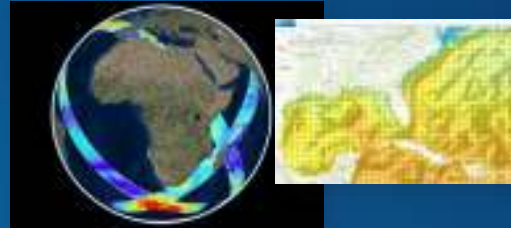
Imagery Analytics

Transforming imagery into information

Supporting Production and Research

- Powerful Analysis
- All Major Sensors
- Desktop and Web

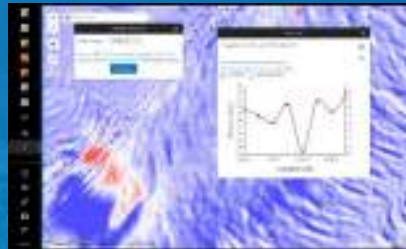
Scientific Data



Dynamic Processing Chains



Change Analysis



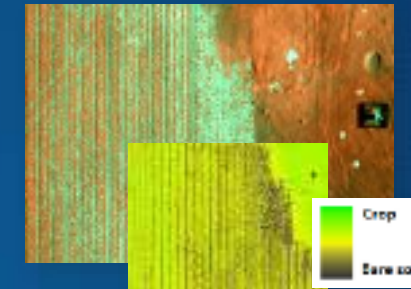
Visualize & Measure



Image Classification and Segmentation



Multispectral Analysis



Oblique Imagery and Measurement



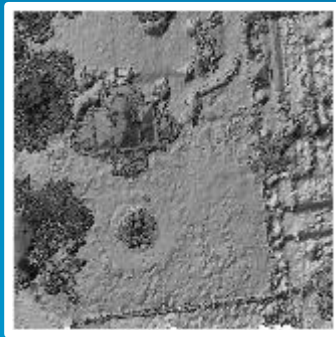
*Processing Single Scenes . . .
. . . and Massive Collections*

Ortho Mapping Information Products

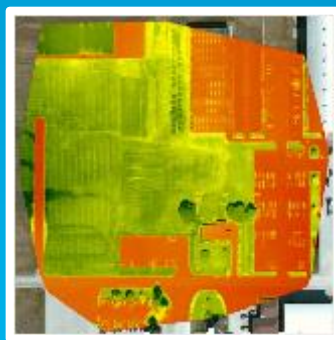
Base Mapping



Orthomosaics
(.TIFF & .TPK)



Digital Surface
Model (DSM)

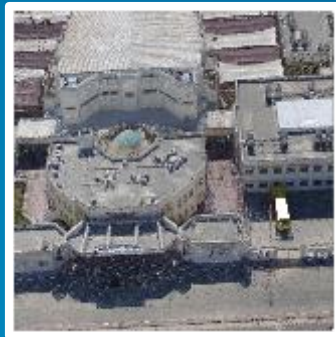


NDVI



Contours

Site Modeling



Point Cloud (LAS)
(imagery derived)



Scene Layer Package
(.SLPK)



3D Mesh (.OBJ)



3D GeoPDF

Inspect & Measure



Annotate Images



Inspection Viewer



Volumetric



3D Measure*

New Tools Recently added.....

Image Space

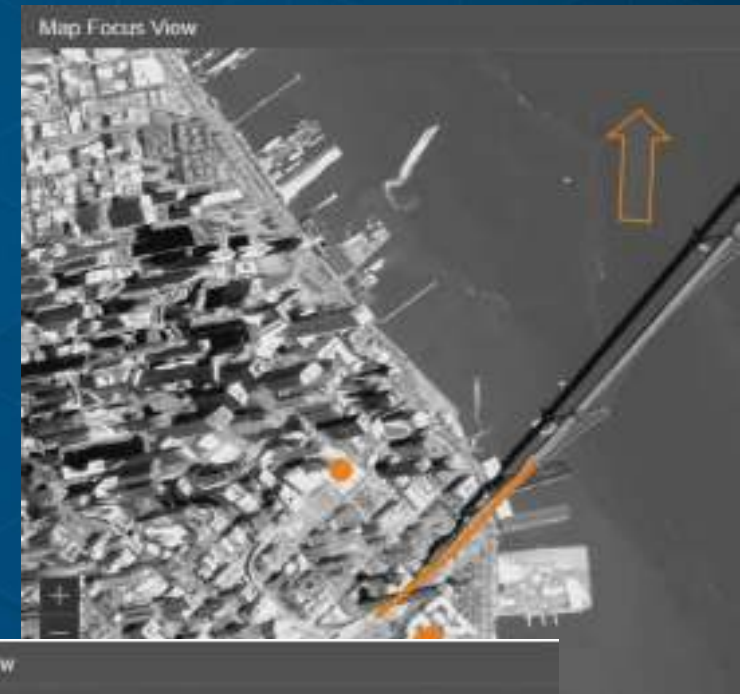
View and analyze imagery in its native space, free of distortions

Capabilities:

- Image Coordinate System (ICS) based display and UX
- Overlay other GIS data layers in image space
- Create and edit features in image space
- Perform precise image mensuration in image space
- Geolink views in image space with views in map space

Audience:

- Defense and intel - Image analysts performing Image interpretation
- Insurance – Damage assessment and property valuations
- Commercial businesses - review rooftops/pavement quality
- Anyone using imagery for situational awareness
- Drone imagery inspection



Precision Measurement

Enables accurate measurements of features directly from georeferenced / sensor model based imagery

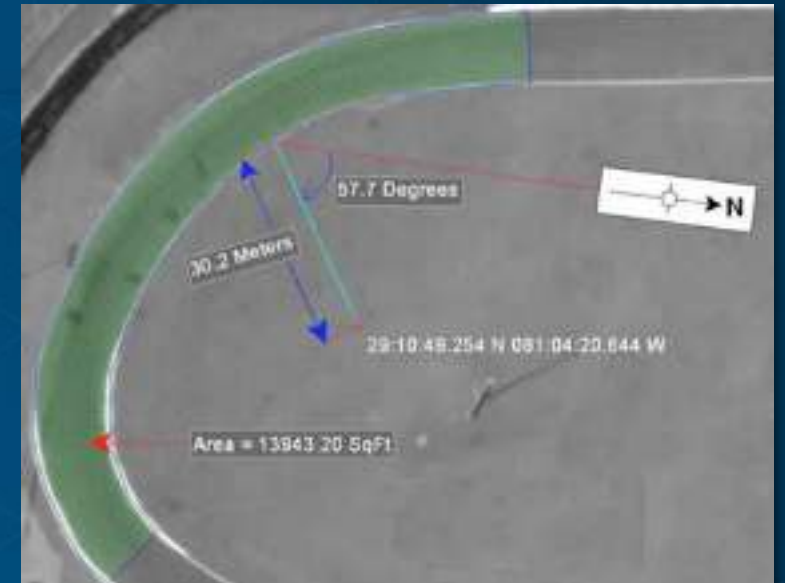
Capabilities:

- Measure distance, area, centroid – *with georeferenced imagery*
- Measure height – *requires sensor model*
- Measure height from shadow – *requires sun angle*
- 3D measurement support – *with user configurable DEM*
- Make measurements in both map and image space
- Style and annotate measurements
- Track, store, and manage measurements
- Report generation for decision makers

Note these capabilities will also be available without extension for Map view

Audience:

- Defense and intel – Capturing feature measurements
- Insurance – Property valuations
- State and Local Govt – Asset inspections
- Law enforcement/911 responders
- Commercial businesses – Assess asset measurements
- Forestry



Stereo

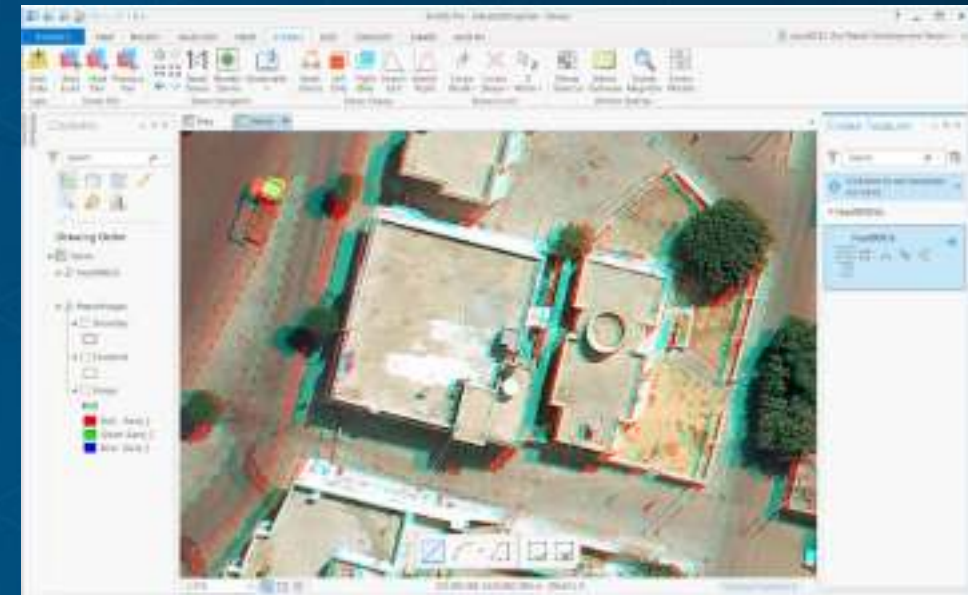
Visualize data and Data capture in 3D using stereo imagery

Capabilities:

- Works with aerial, satellite, and drone imagery
- Leverages Mosaic Datasets to work with large collections of stereo pairs
- Consistent Pro editing UX – familiar tools, feature template support, etc.
- New cursor modes, and shapes
- Shutter glass, and anaglyph stereo viewing

Audience:

- Defense and Intel – Better interpretation
- National Mapping – QC and some feature collection
- State and Local - Permitting and better asset inspection
- Natural resources – Image Interpretation and measuring heights/volumes
- Forestry - Measuring tree heights



Classification and Machine Learning

Create meaningful thematic maps, analyze landcover and examine spatial relationships using image classification and machine learning

Capabilities:

- Simplified user experience to generate a classified product – Wizard in Pro
- Supervised/unsupervised classification
- Object based and pixel based segmentation
- Accuracy assessment
- SVM, random trees, ISO clustering, MLC

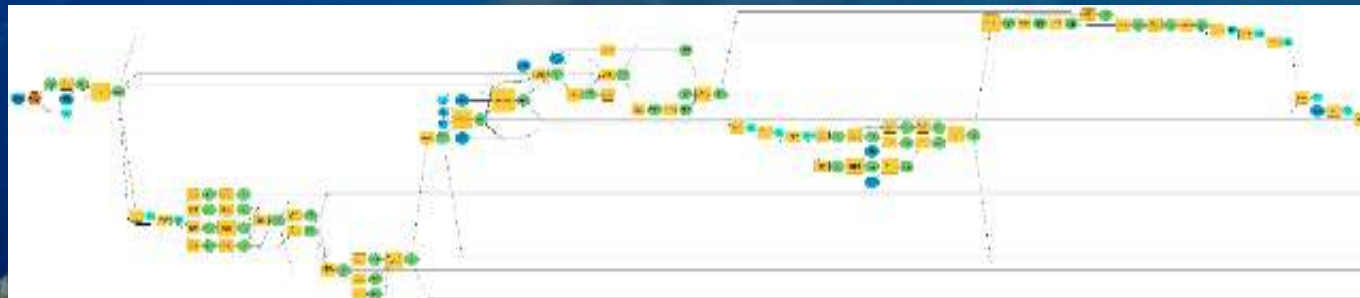
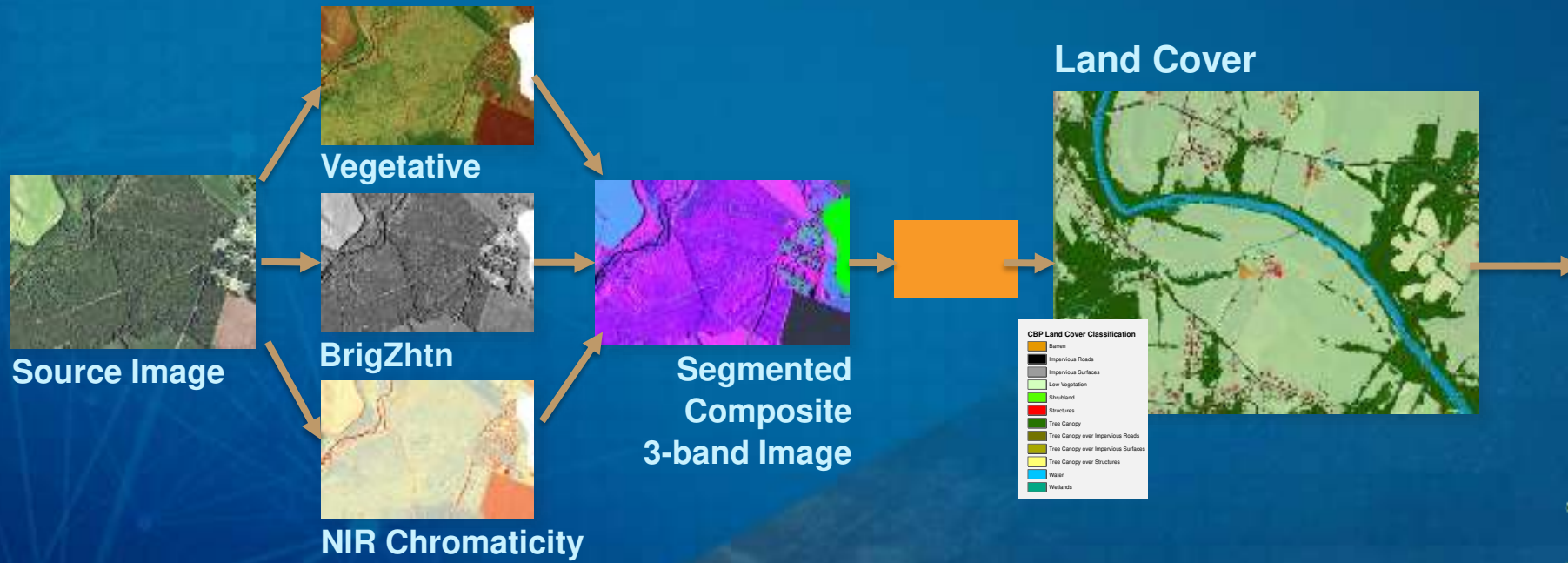
Audience:

- Agriculture – Identify landcover types and trend analysis
- State and Local Govt – Tax assessment
- Emergency Management – Change in Landcover
- Forestry – Landcover assessment
- Environmentalists – Suitability analysis. Habitat assessment



Imagery

Massive Automated Extraction



Geoprocessing Model



Brief Summary : Trends Emerging in GIS and Remote Sensing :

• R.S. vs GIS	→	<i>R.S. + GIS</i>
• Complex & Slow	→	<i>Simple & Quick</i>
• Raw Data Pixels	→	<i>Info Products</i>
• File Download	→	<i>Connect to Live Services</i>
• Static, 2D	→	<i>Dynamic 3D / 4D</i>
• Image Basemap	→	<i>“ Living Planet “ experience</i>

What Should We Do Next?

*Envision
What's Possible*

Explore New
Applications

Share and
Collaborate

Adopt the
New Patterns

Learn the
New Technology

Encourage
New Users

Communicate
Your Successes

... and Create the Africa We Want

Thank You

