ArcGIS Pro for Natural Resources

Peter Will
Esri Global Business Development Lead – Mineral Extraction Industries

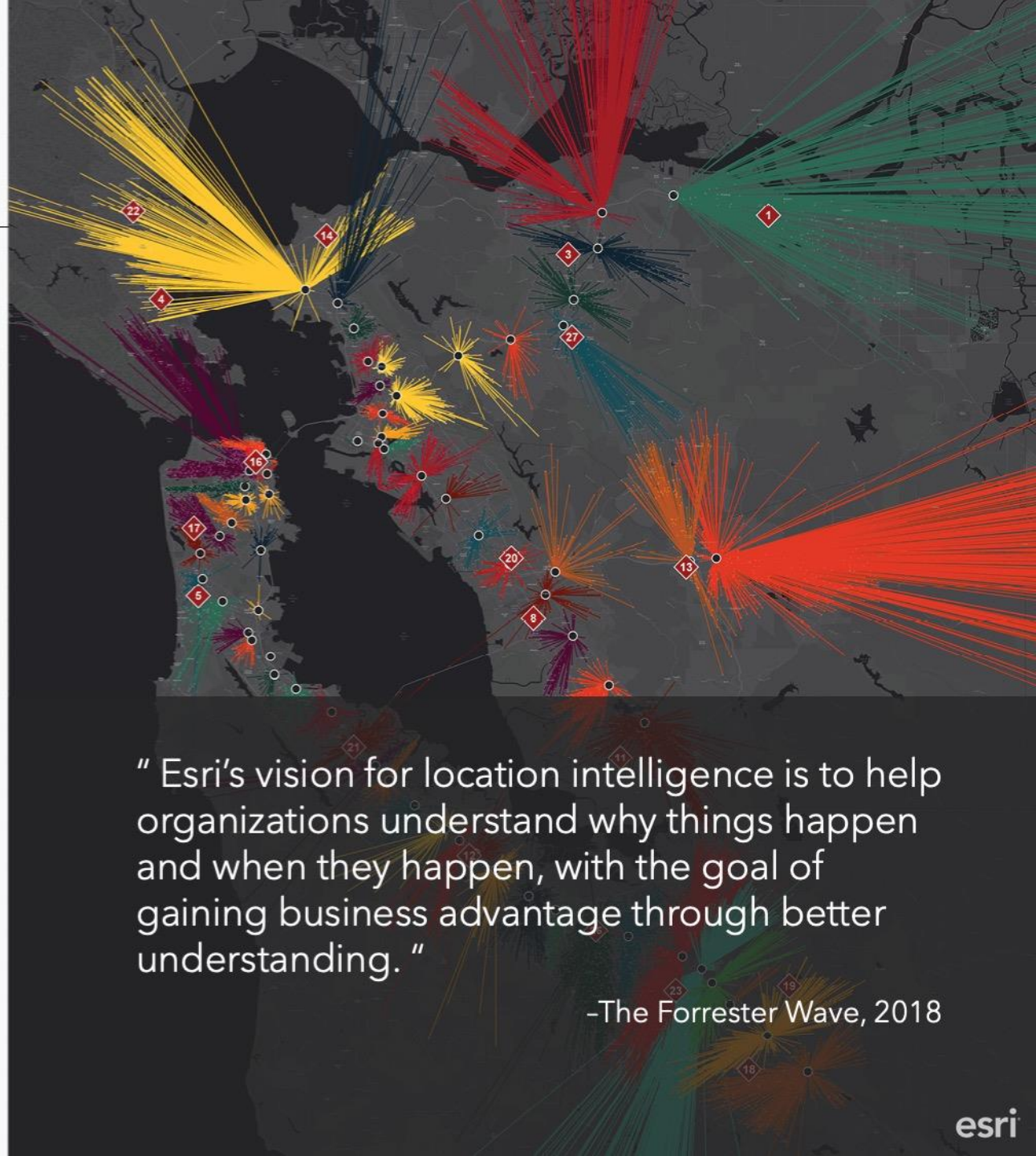
Agenda

- Overview of Esri
- History of the Trimble, Landfolio, & Esri Relationship
- The “ArcGIS System”
- An ArcGIS Pro Deep Dive
- Questions & Use-cases examples

WHO WE ARE

Esri is the **global leader** in geographic information systems (GIS) software, location intelligence, and mapping.

With more than **100** offices worldwide and professionals from **67** countries, Esri provides organizations of every size and industry the tools to get deeper insights from their geographic and transactional data to improve operational and business results.



" Esri's vision for location intelligence is to help organizations understand why things happen and when they happen, with the goal of gaining business advantage through better understanding. "

–The Forrester Wave, 2018

esri

OUR BUSINESS AND MARKETS

Business

Retail

Manufacturing

Banking

Insurance

Real Estate

Transportation

Utilities & Communications

Telecommunications

Electric

Water

Gas

Pipeline

Natural Resources

Agriculture

Petroleum

Mining

Oceans

Water

Forestry

Renewables

Government

Federal

State

Local

Defense

Intelligence

Health & Human Services

Logistics Operations

Infrastructure

Network Management

Supply Chain

Marketing and Sales

Service Delivery

Underwriting and Risk

Finance

Public Safety

Public Works

Public Health

Policy

Planning and Administration

OUR TECHNOLOGY

Esri builds ArcGIS, the leading mapping and spatial analytics software for desktop, software as a service, and enterprise applications. ArcGIS is the heart of the Esri ***Geospatial Cloud***. With the geospatial cloud, people can create maps that can represent thousands of relationships between hundreds of data layers including ***IoT*** streams. Esri ArcGIS products are designed to deliver ***location intelligence*** and meet ***digital transformation*** needs for organizations of all sizes.

Geospatial Capabilities

- Mapping & Location Enablement
- Field Operations
- Spatial Analytics & Data Science
- Imagery Management & Analytics
- Real-Time Visualization & Analytics
- 3D Visualization & Analytics
- Developer Tools & Services
- Data Management
- Location Analytics & Spatial BI

Esri offers "some of the most extensive capabilities for capturing spatial data and the analyses, presentation, and delivery of spatial insights."

– Forrester

esri

The Esri, Landfolio, & Trimble Business Partner Story

The partnership between Esri, Spatial Dimension (now Landfolio), and Trimble goes back more then 20 years…

- **Spatial Dimension was a Esri Business Partner since 2003**
- **Trimble has been a Esri Business Partner since 2001**

Esri Natural Resources

What is a GIS to a Nat Resource Company?

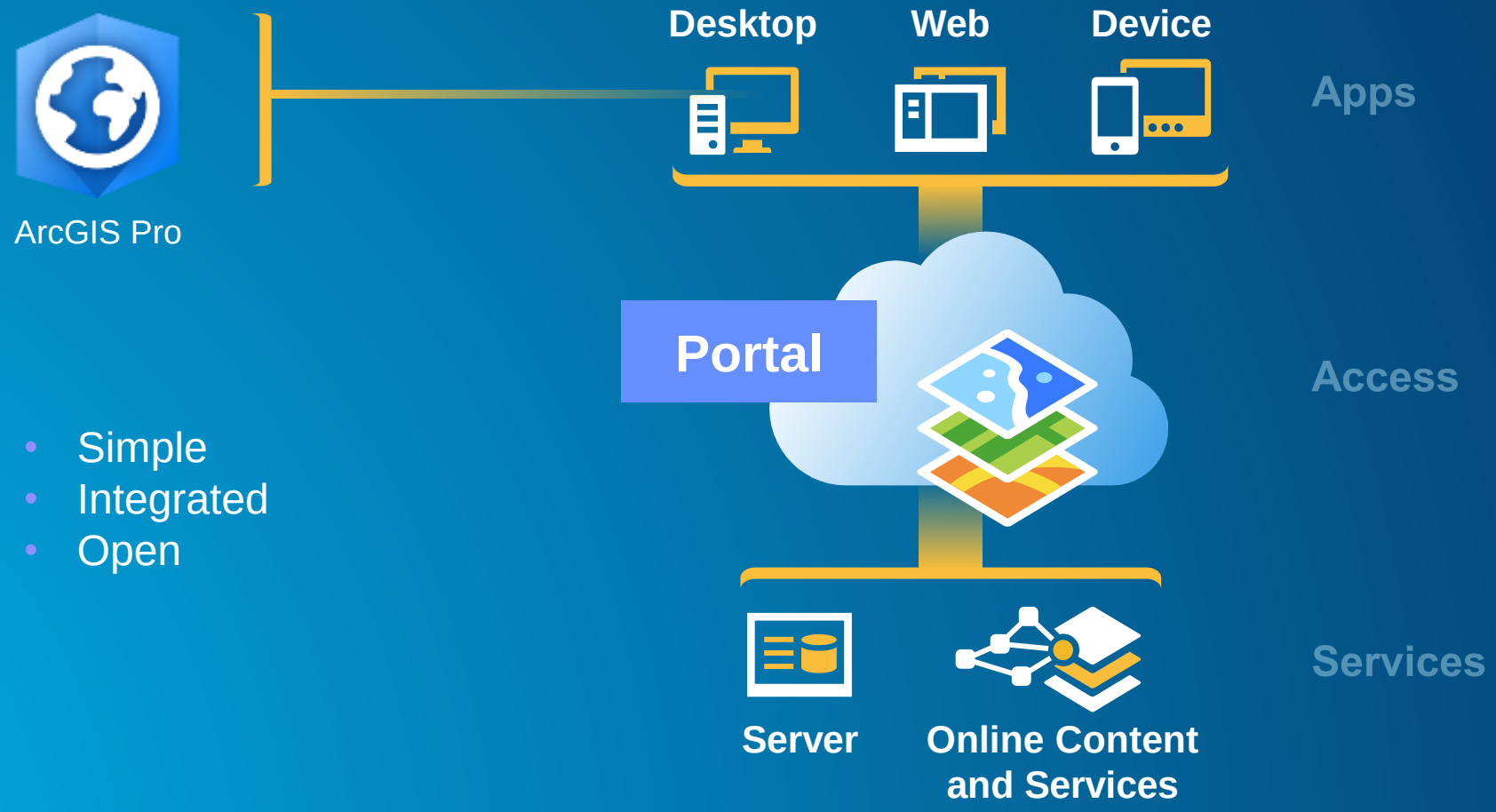
- Mining
- Petroleum
- Pipeline
- Renewables
- Agriculture
- Forestry

What

When
100
150
200
250
2000
3000
bar
psi

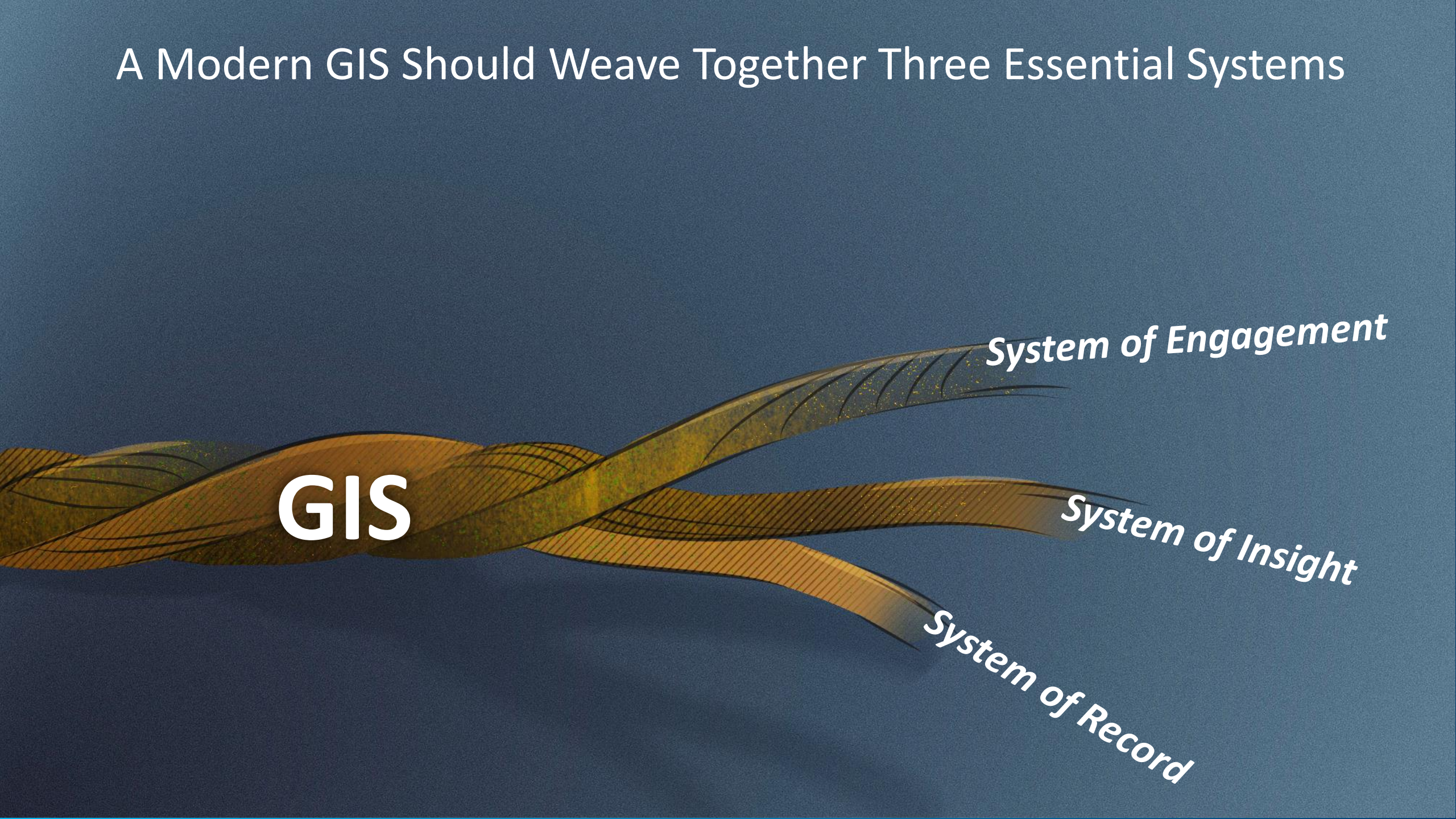
Where

The ArcGIS System | Simple, Integrated & Open



- Simple
- Integrated
- Open

A Modern GIS Should Weave Together Three Essential Systems



ArcGIS | Common Patterns of Use

Mapping & Visualization

Understand locations and relationships with maps and visual representations

Data Management

Collect, organize, and maintain accurate locations and details about assets and resources

Field Mobility

Manage and enable a mobile workforce to collect and access information in the field

Monitoring

Track, manage, and monitor assets and resources in real-time

Analytics

Discover, quantify, and predict trends and patterns to improve outcomes

Design & Planning

Evaluate alternative solutions and create optimal designs

Decision Support

Gain situational awareness, and enable information-driven decision making

Constituent Engagement

Communicate and collaborate with citizens and external communities of interest

Sharing & Collaboration

Empower everyone to easily discover, use, make, and share geographic information

Enabling Location Across the Natural Resources Industries

Exploration

- Satellite Imagery
- Paleo-mapping
- Soil Sampling
- Drill Program Planning

Feasibility Assessment & Permitting

- Permitting
- Environmental feasibility
- Surveying

Operations

- Mine Planning & Design
- Digital Twin
- Mine Wall Safety
- Heap Leach Modelling
- Blast hole mapping

Logistics & Sales

- Supply Chain Mapping
- Market Analysis
- Inventory Management

HSE & Compliance

- Tailing Dam Inspections
- Monitoring Wells

Reclamation

- Invasive Species Monitoring
- Top soil cover Monitoring
- Reseeding Monitoring

External Communication

- Investor Relations
- Community Engagement
- Corporate website map

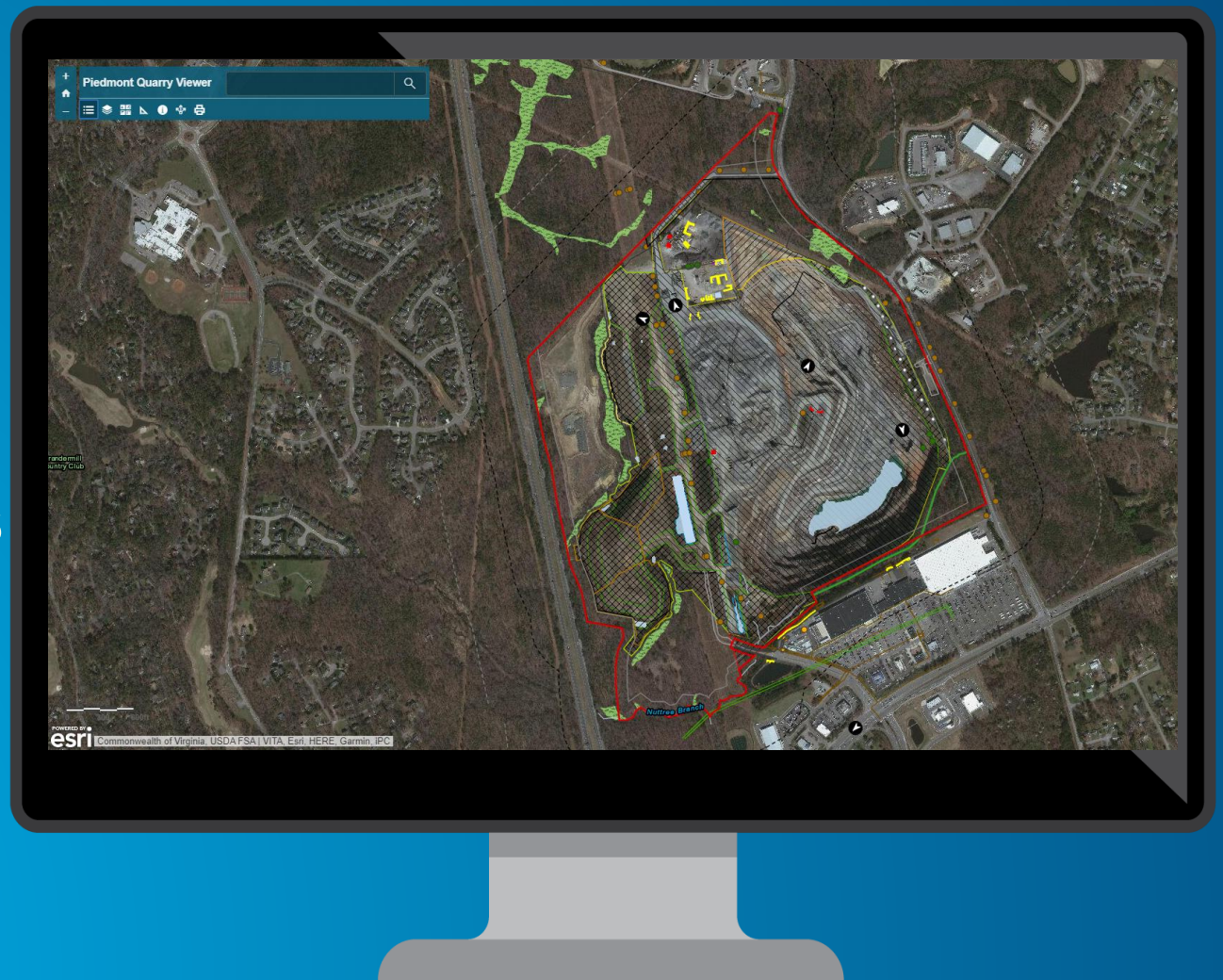
Develop the Atlas of Your Organization

Map all aspects of your business

Land

Engineering

Operations



Environmental

Exploration

Geoscience

The Spatial Journey to ArcGIS Pro

Embracing Modern Esri GIS Technology

1982

1992

1999

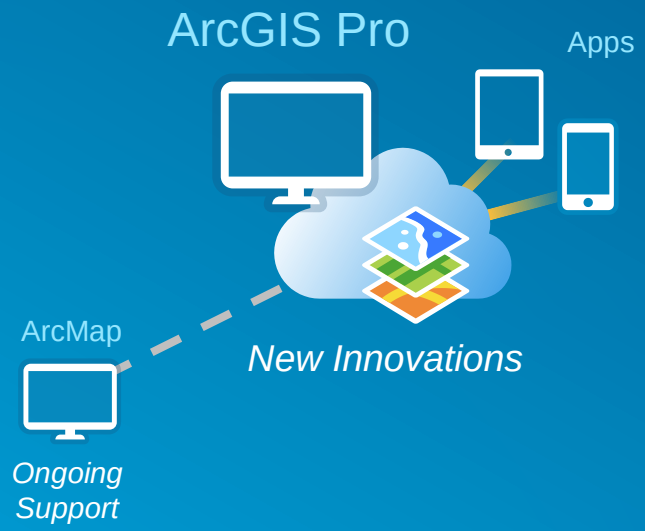
ArcGIS Pro

2015

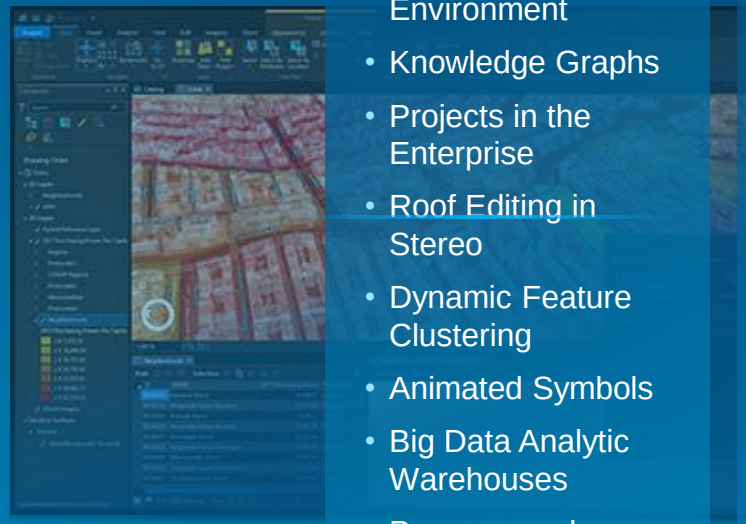
ArcMAP Retired? | NO not yet

- Is ArcMap going away? - NO
- Has ArcMap Equivalency been achieved? – Yes (?)
- Are Esri's BP's plugins Upgraded? – Most (?)
- Is there a defined Migration Path I can follow – YES
- Is ArcGIS Pro a separate license – NO
- Can I still contact Technical Support – Yes, until March 01, 2026

ArcGIS Pro | Continuous Improvements & Developments



Pro 3.0



Near Term

- Upgrade Python Environment
- Knowledge Graphs
- Projects in the Enterprise
- Roof Editing in Stereo
- Dynamic Feature Clustering
- Animated Symbols
- Big Data Analytic Warehouses
- Presence-only Prediction
- Change Point Detection
- Suitability Modeler Sharing
- Parcel Fabric 3D Cadaster
- **Voxel Layer Sharing**
- Reality Mapping Extension

Mid-term

- Catalog Layers
- Point Cloud Scene Layer Data Management
- Simulation Modeling
- Presentations
- Spatio-temporal Density Analysis
- Multiscale GWR
- Scientific Data Ingestion
- **Parcel Lineage Visualization**
- **Parcel Fabric Coordinate Based**
- Cadaster
- Managed Indoor Data Pipeline
- ENC Chart Viewing
- Enhanced Radar data support

Long-term

- Terrain Editing
- Materials Authoring
- High Fidelity Rendering
- 3D Mesh as Ground
- Integrated Mesh Scene Layer Data
- Management
- 64-Bit Object ID
- New Data Types (BigInteger,Timestamp with Time zone)
- **Cloud Drive support**
- **Mobile Geodatabases**

ArcGIS Pro | Integration Focused

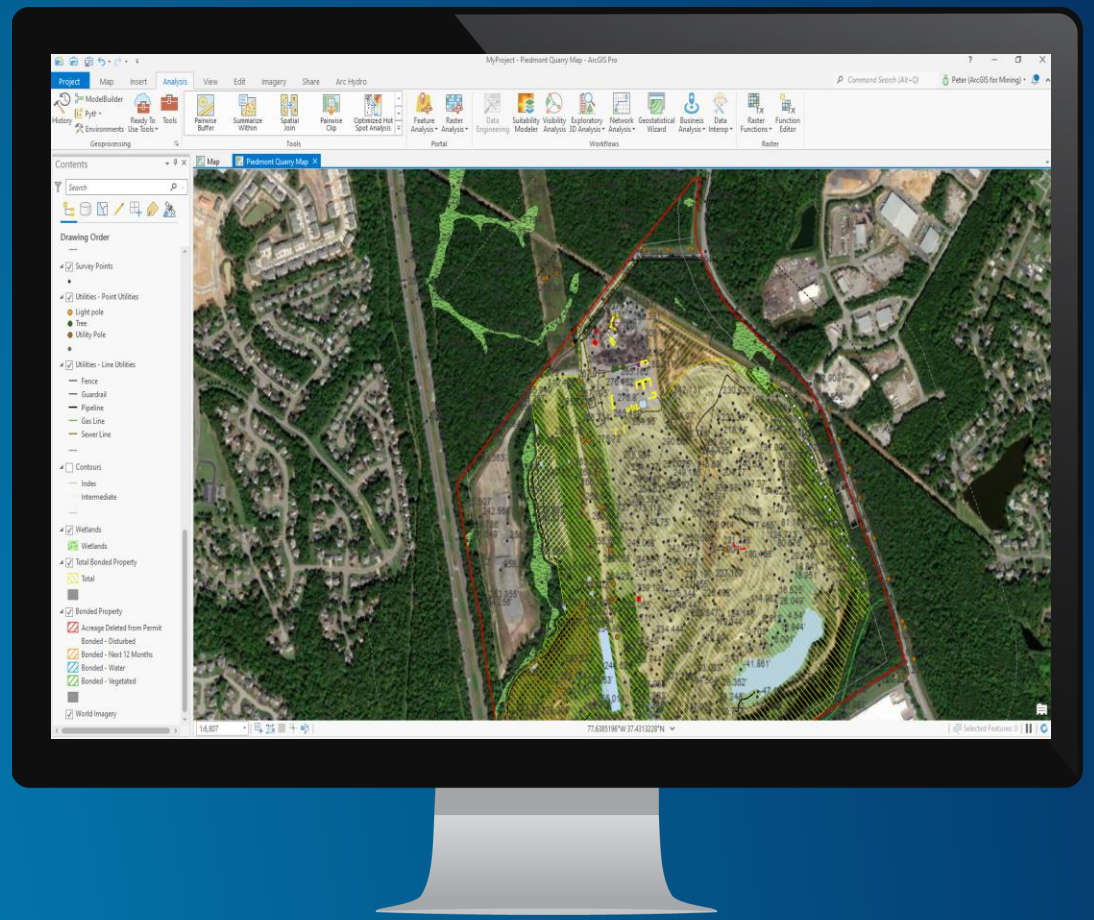
Spatial Analytics & Visualization

Data Management

Sharing & Collaboration

ArcGIS Pro | Spatial Analytics & Visualization

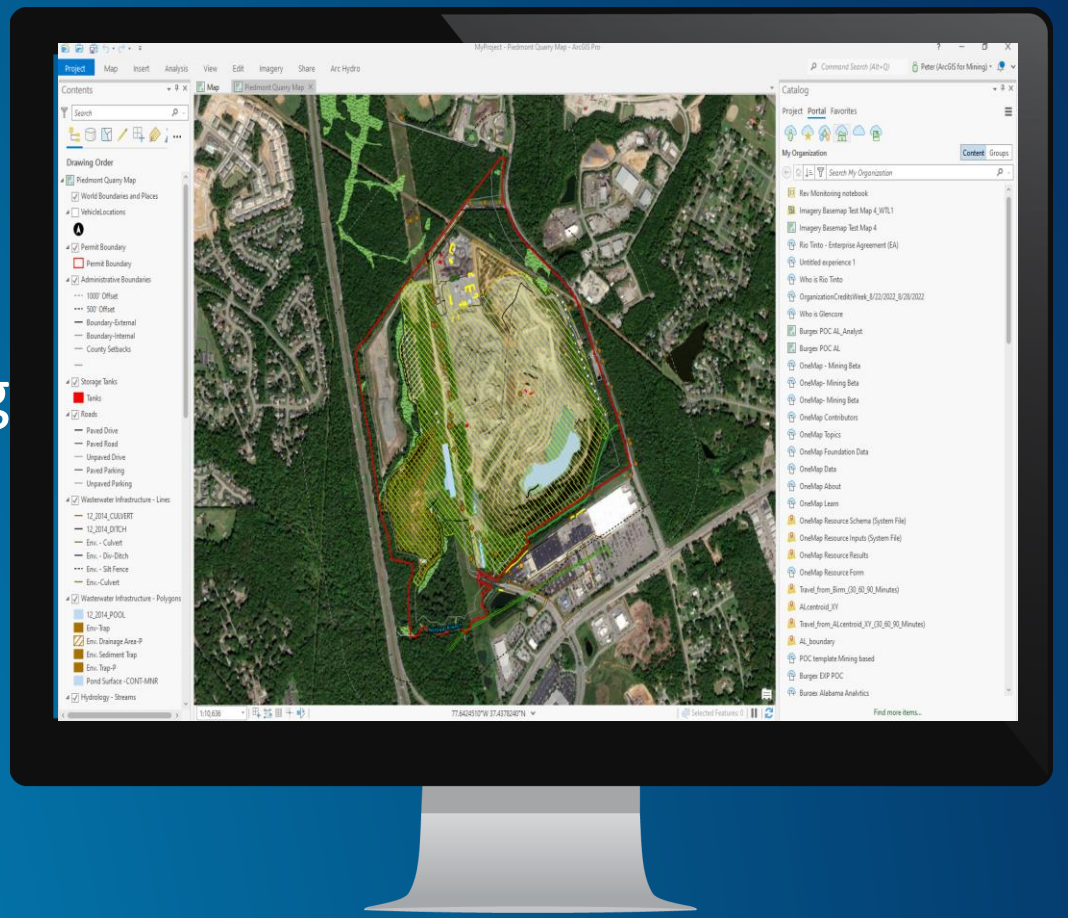
- 200 tools in 25 toolsets for performing spatial analysis and modeling
- New charting and statistics tools…
- Integrated 2D, 3D, & 4D visualization
- Complete image management, visualization, and analytics
- Industry-specific plugins extend functionality



Data Analysis

ArcGIS Pro | Data Management

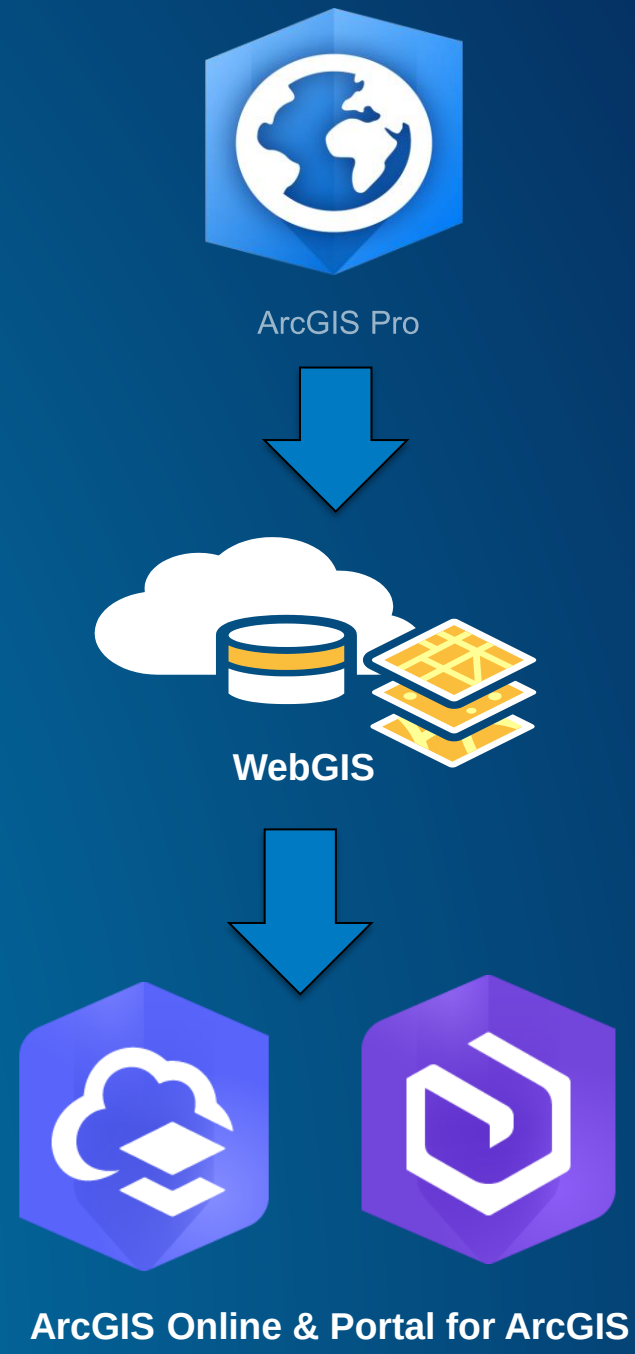
- **Over 20** Data Management toolsets
- **Simplified** data editing experience
- **New** project-based folder structure
- **Single** application for managing data & running analysis (no more ArcCatalog)
- **Pro** is a connected application w/ the ability to connect to outside web-services connecting key reference layers



Data Management

ArcGIS Pro | Sharing & Collaboration

- ArcGIS Pro is a connected desktop
- Communicate and share this information effectively
- Leverage web services architecture
- Standardize access to authoritative data and resources



ArcGIS Pro | Top 10

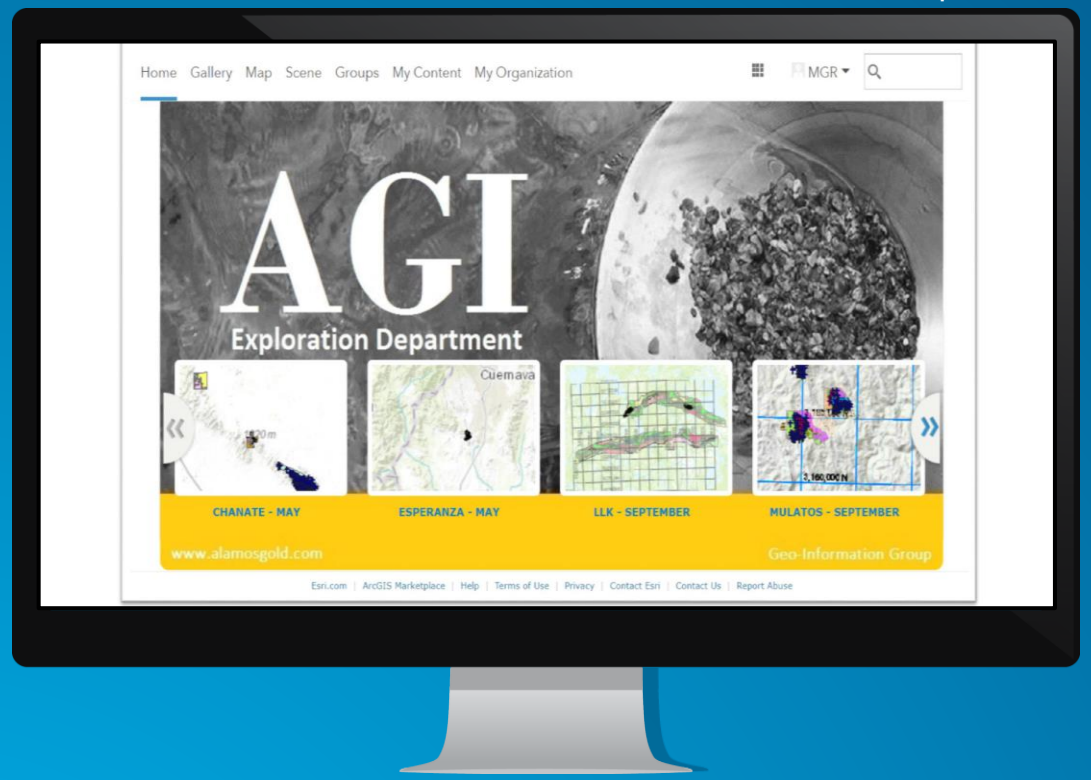
1. **Speed –** ArcGIS Pro is multi-threaded, 64-bit & made to run processes fast
2. **Ribbon Interface -** GIS meets Microsoft Office
3. **Improved Editing -** enables you to MacGyver your data in unique ways.
4. **Remote Sensing & Imagery -** image classification wizard, AI, ML, & a Deep Learning framework
5. **Scripting -** Put it in cruise control
6. **Rater Analysis -** impressive 1500+ geoprocessing tool count
7. **Labeling –** much improved labeling
8. **Statics & Reporting -** chart types like data clocks, rose diagrams, temporal charts, and calendar heat maps make your stats stand out.
9. **Animation -** make temporal data that maps can come alive
10. **3D -** Full 3D editing plus **l**ine of sight, shadow, and skyline.

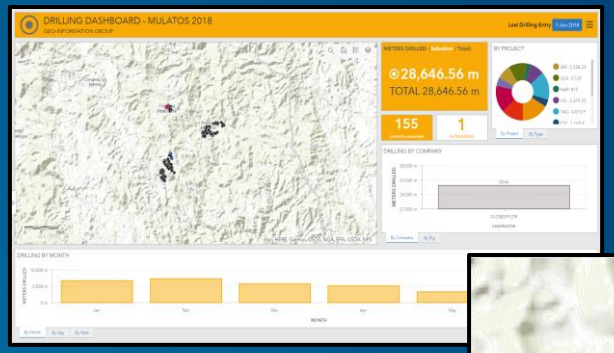
Embrace Change

- Software companies need to evolve or go extinct so we keep evolving
- The only constant on the face of the earth is change

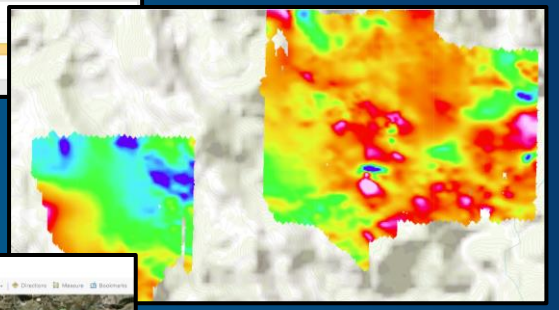
Thank You!

Collaborative Geospatial Portal

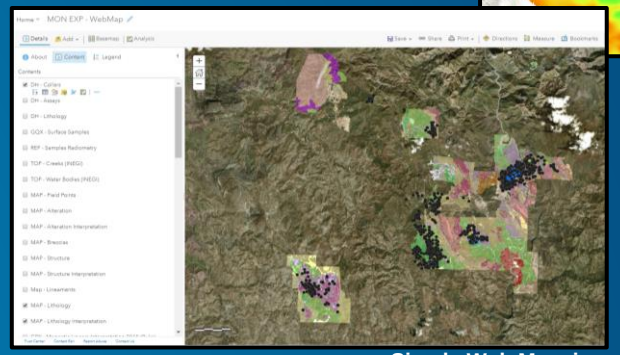




Drilling Activity Dashboard



Geophysical Survey Mapping

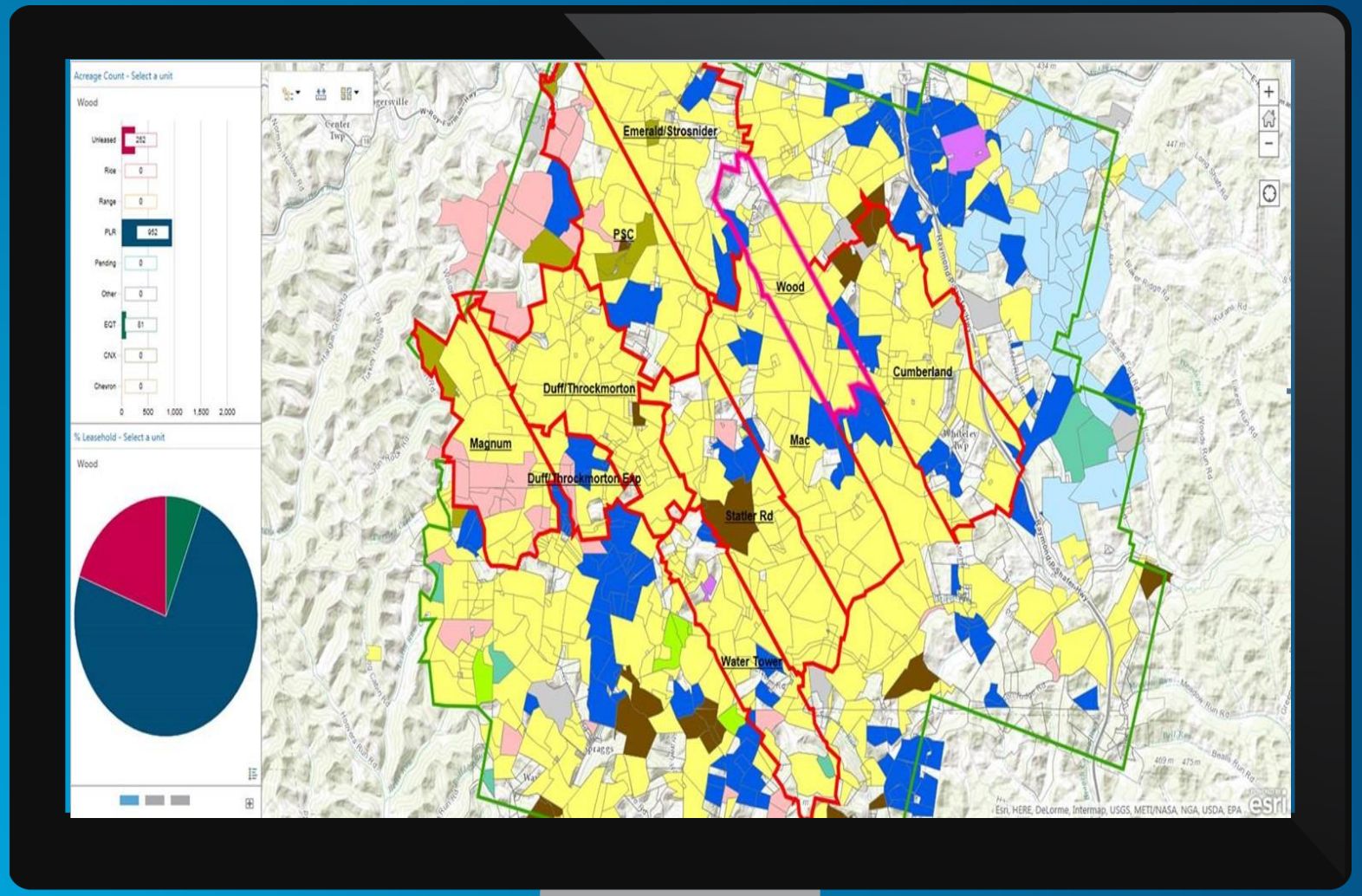


Simple Web Mapping

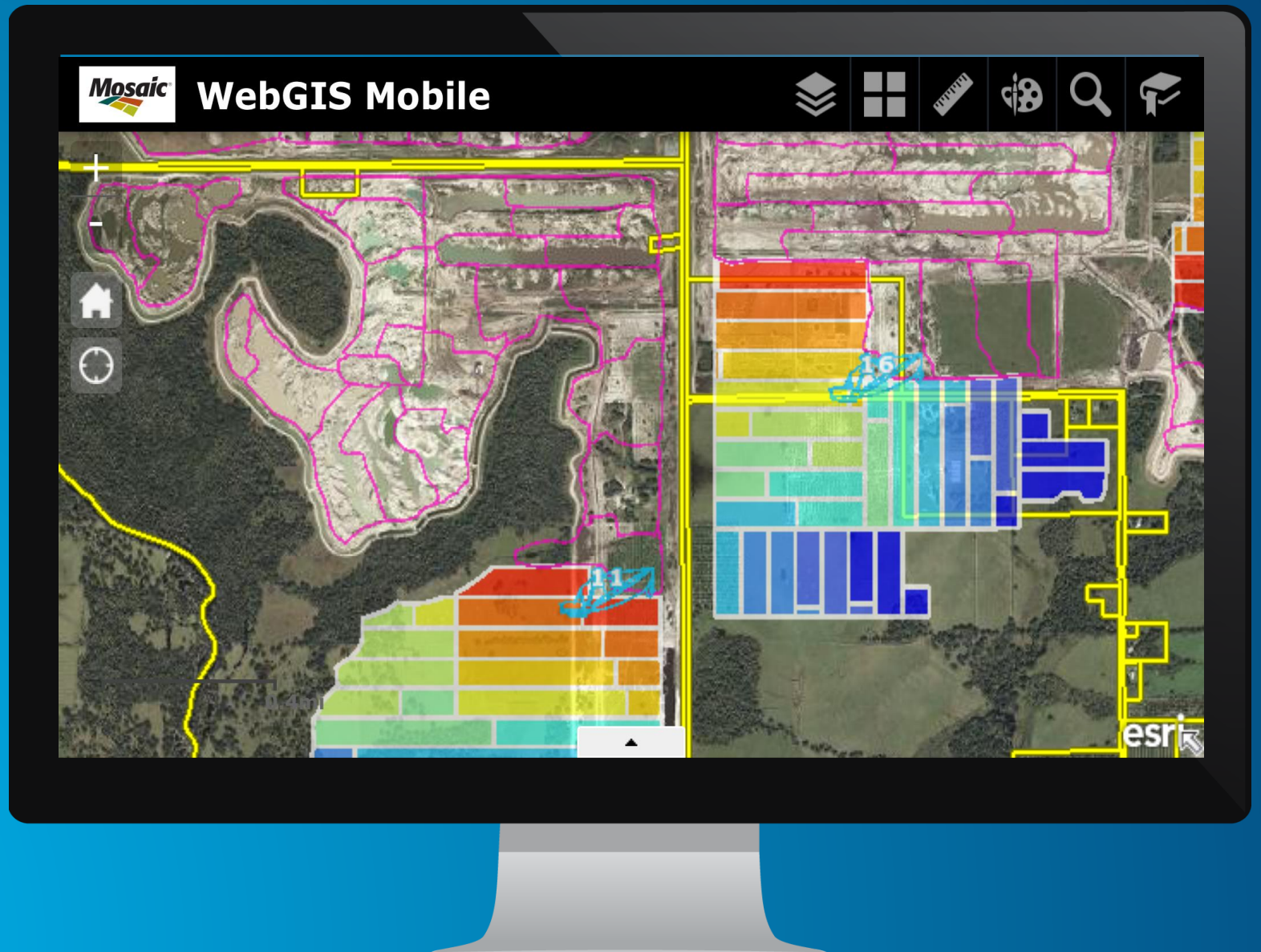
Data-driven Decision Making and Collaboration

Alamos Gold Inc.

Underground Mining Use-case | Leases in Relation to Longwall Mining



Underground Mining Use-case | Brownfield Leases in Relation to Bond Release

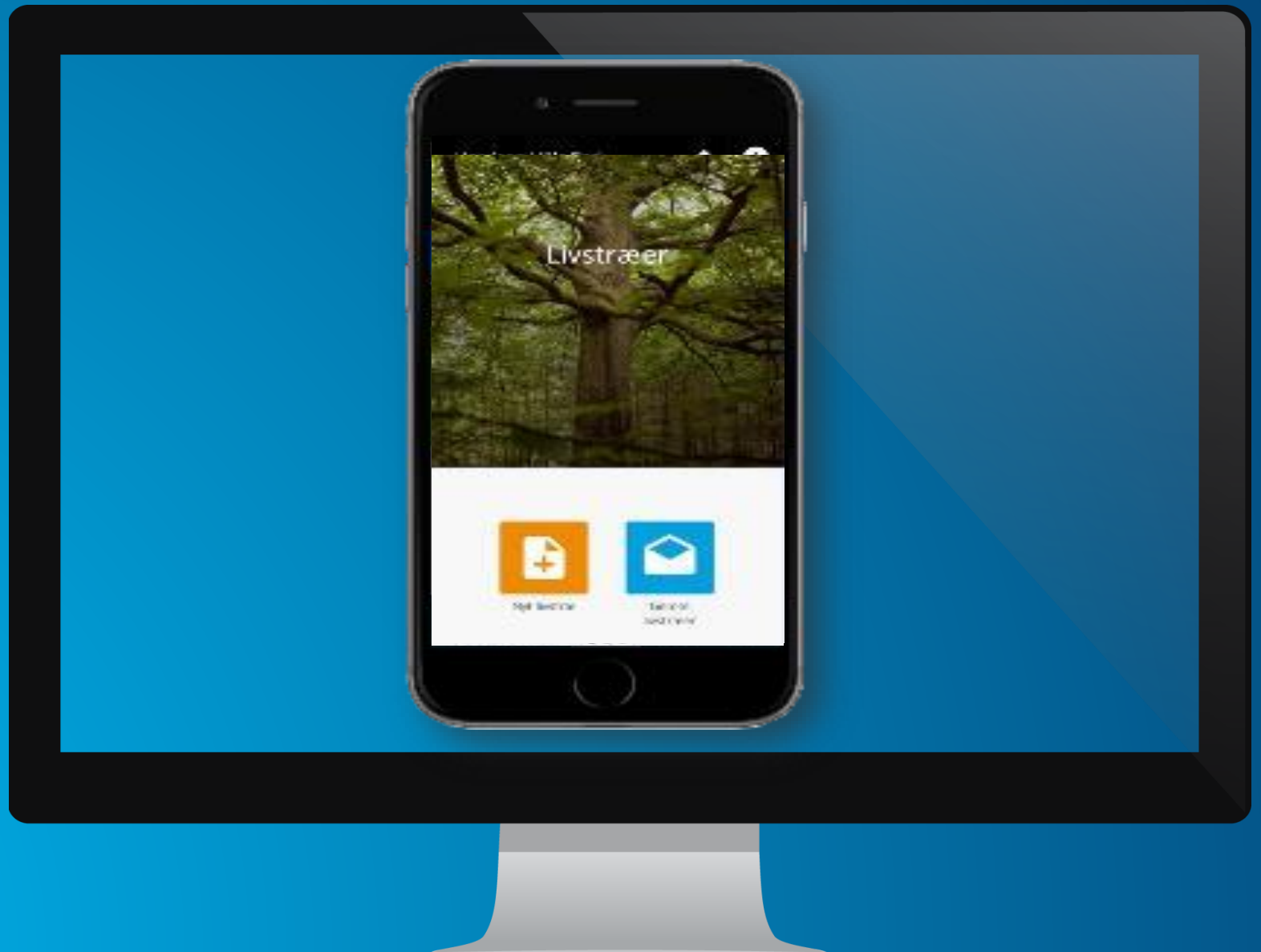


Sharing and Collaboration | *Cotton Harvest Monitoring*

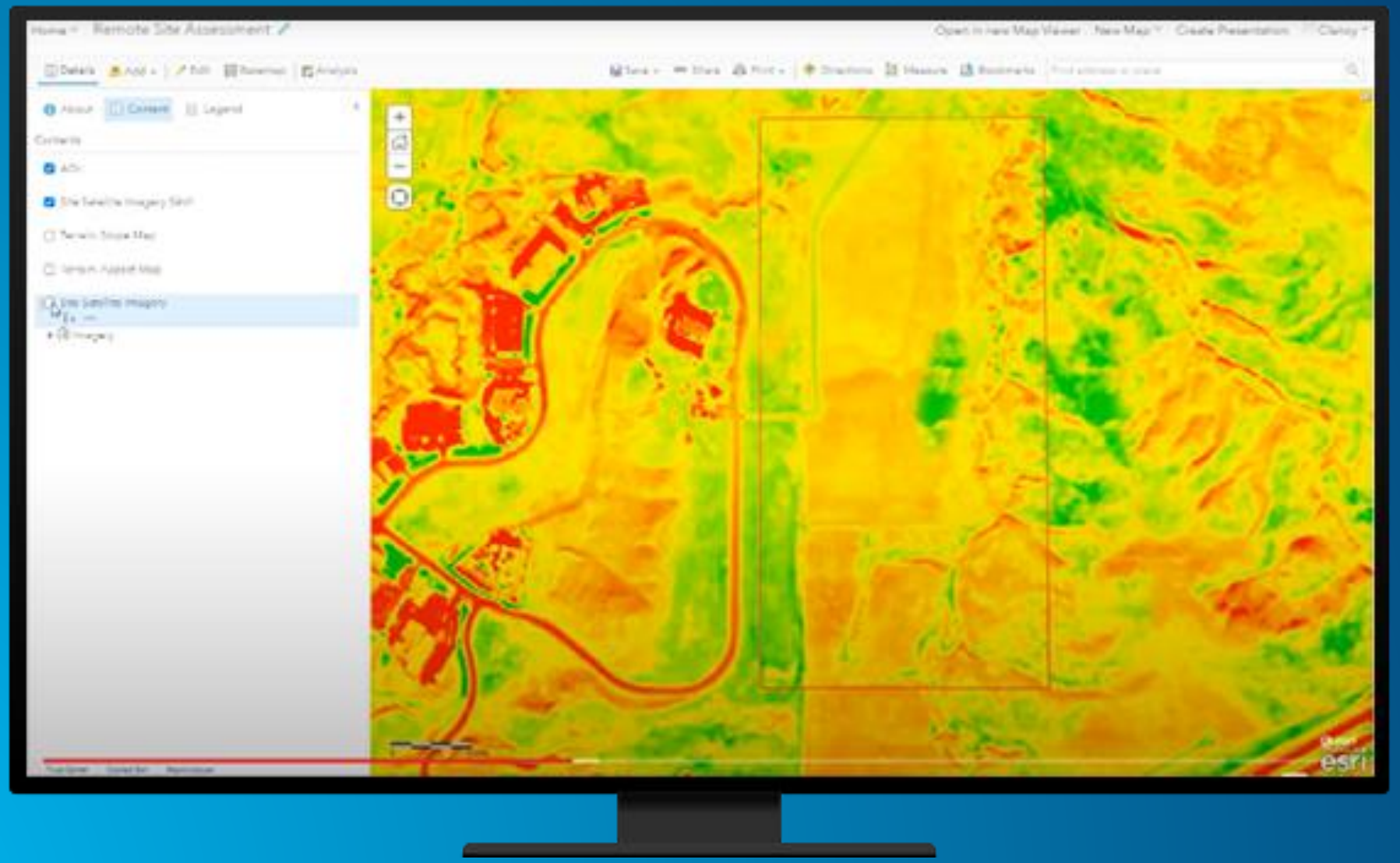
Production Monitoring | Summary Viewer Precision Data Management

Sharing and Collaboration | Timber Harvesting

Field Operations | Tree Inventory using Survey123

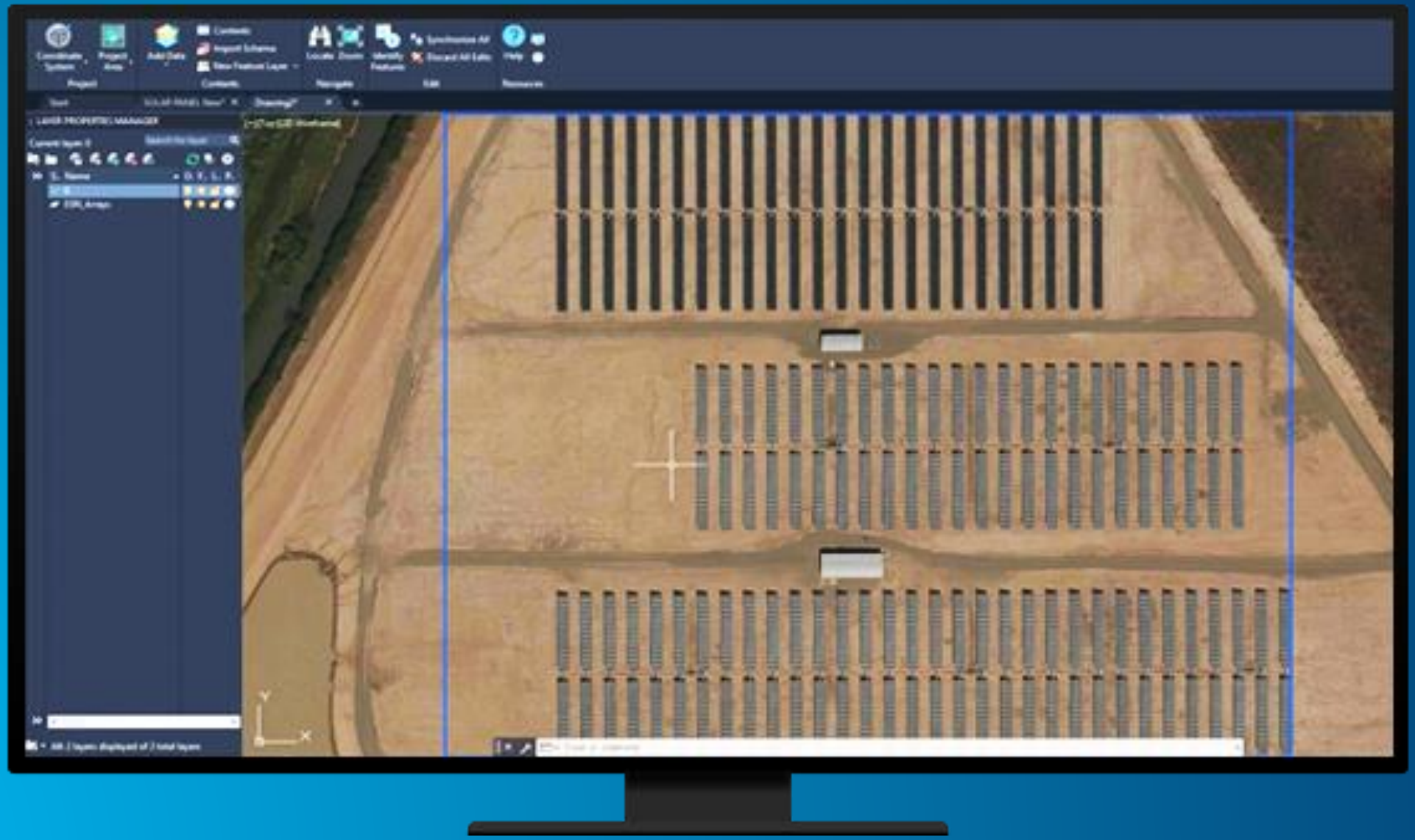


Prospect Assessment | Real-time interactive Dashboards

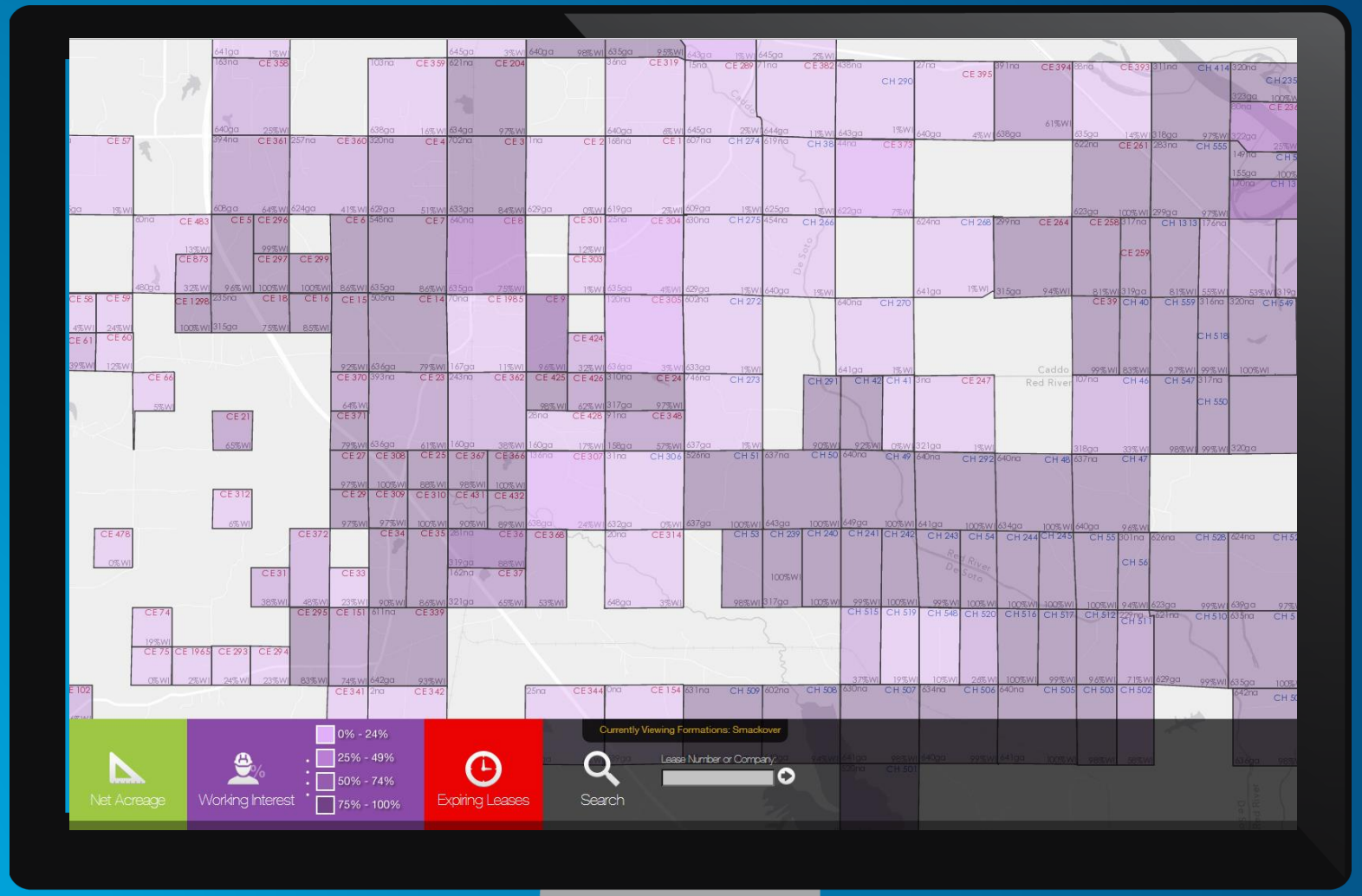
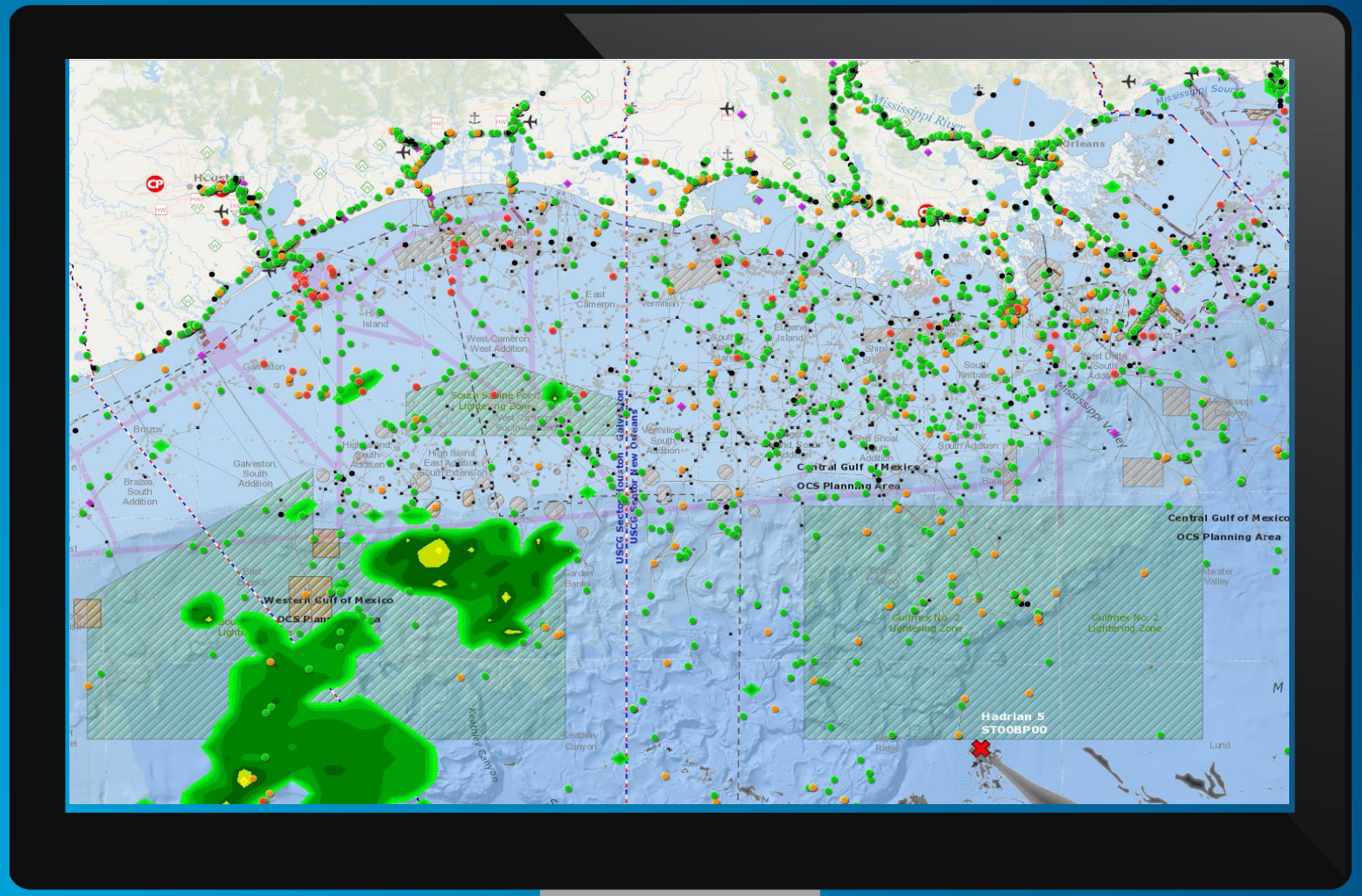


Project Visualization

3D Model Visualization for Solar Panel Placement



Sharing and Collaboration | Land Lease Summary Viewer



Productivity Mapping | Producing Field Delineation, Large Data Sets