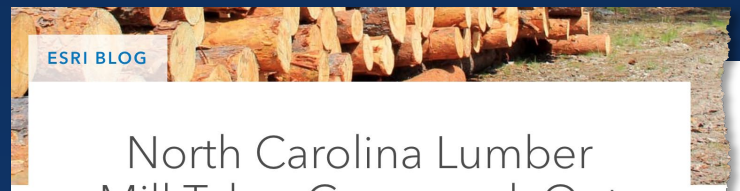
Intelligent Operations

Scott Noulis and Adam Pittman

Stories of **Intelligent** Operations



ESRI BLOG

North Carolina Lumber Mill Takes Guesswork Out of Operations with GIS

Operational Intelligence
July 13, 2021

Audrey Lamb

A Real-Time Framework for Winter Weather Operations Using ArcGIS Velocity

Real-Time Visualization & Analytics
March 24, 2022

Suzanne Foss
Ryan Nosek
Akshaya Suresh

Digital Twin Helps Airport Optimize Operations

FOCUS
Fall 2019

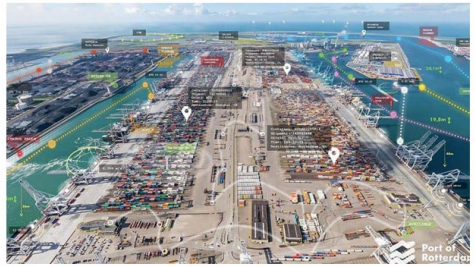
Jim Baumann

Download article
PDF 349 KB

Modernizing Infrastructure & Facility Operations with ArcGIS GeoBIM

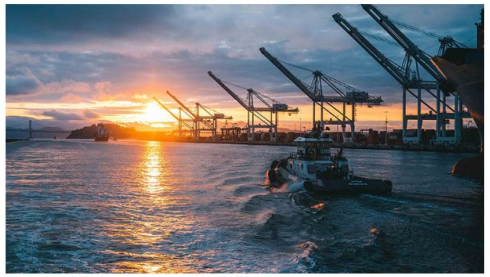
Architecture, Engineering, and Construction
January 18, 2022

Anthony Renteria
Geoff Cook



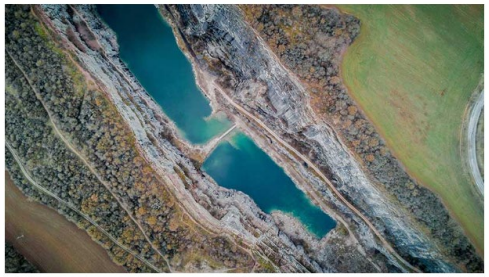
August 7, 2018 | Chris Cappelli | Tech Trends

Inside Story: Europe's Largest Port Prepares for Autonomous Ships



March 9, 2021 | Multiple Authors | Sustainability

Digital Twin of the Globe Helps Companies Get Ahead of Climate Risk



May 3, 2022 | Geoff Wade | CXO Priorities

How Net Zero, Geopolitics Are Reshaping Natural Resource Industries

April 18, 2017 | Bill Meehan | CXO Priorities

Get More from Your Assets: Five Steps to Operational Intelligence

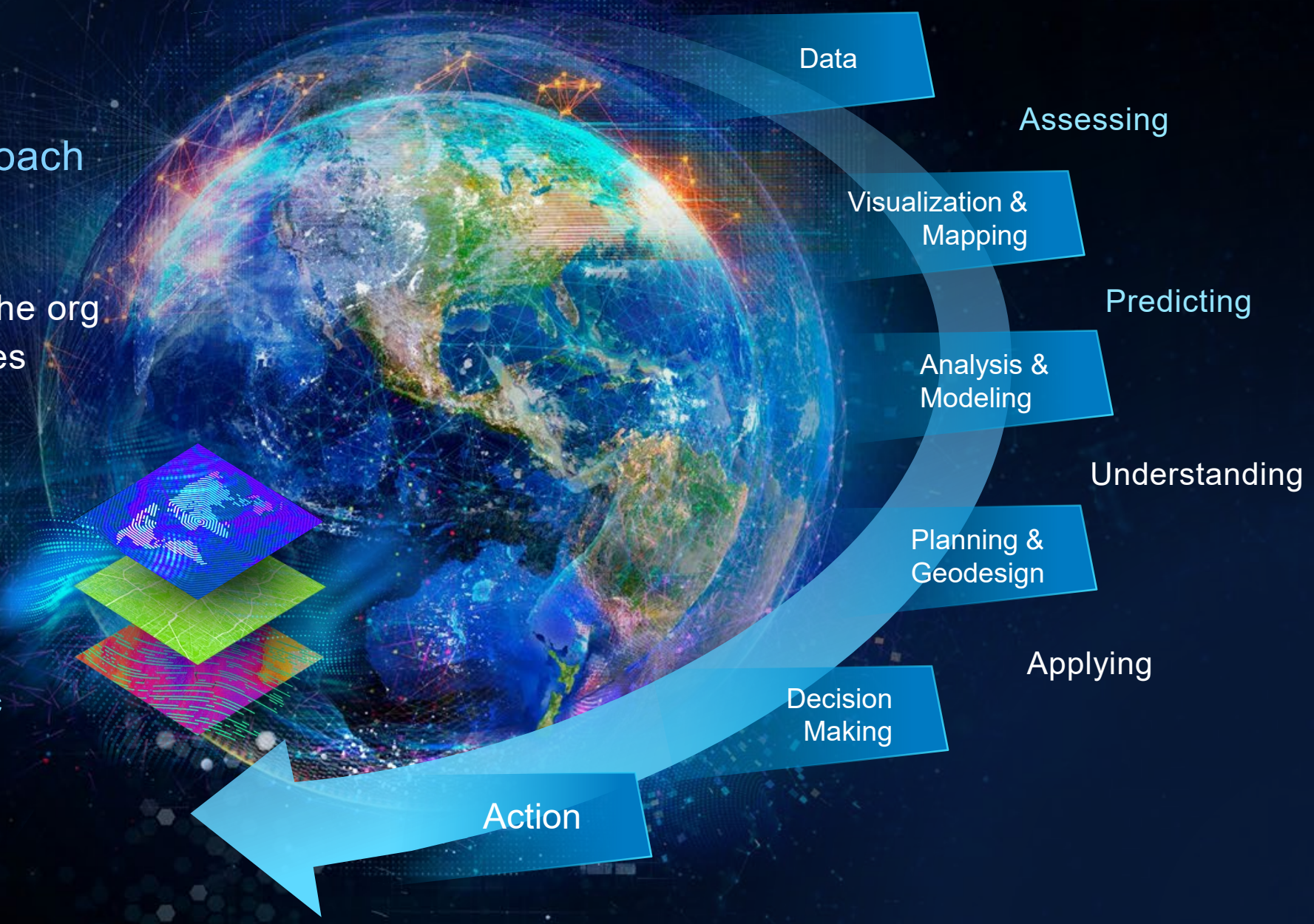
GIS

Enables The Geographic Approach

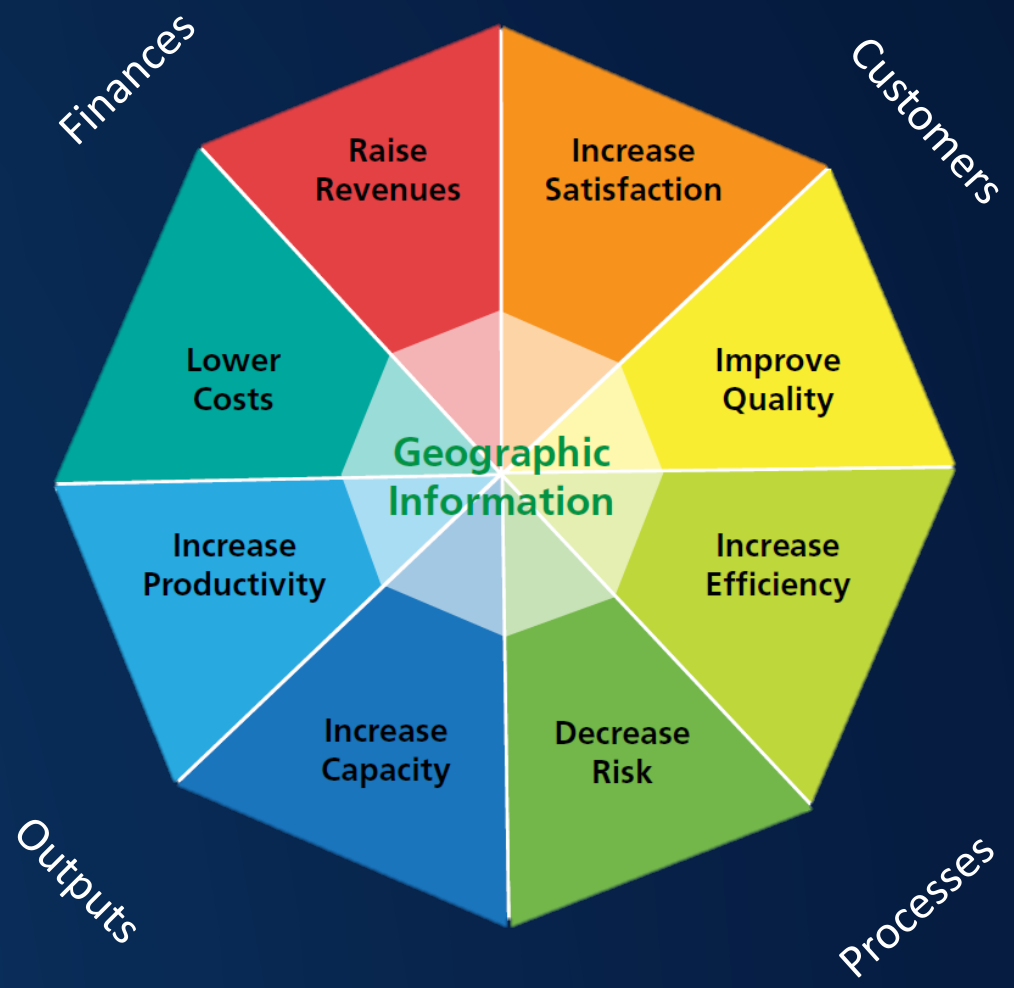
1. Map your assets
2. Connect data across the org
3. Define operational rules
4. Share intelligence
5. Optimize fieldwork

Providing a Process and Framework . . .

. . . For Applying Geographic Knowledge Widely

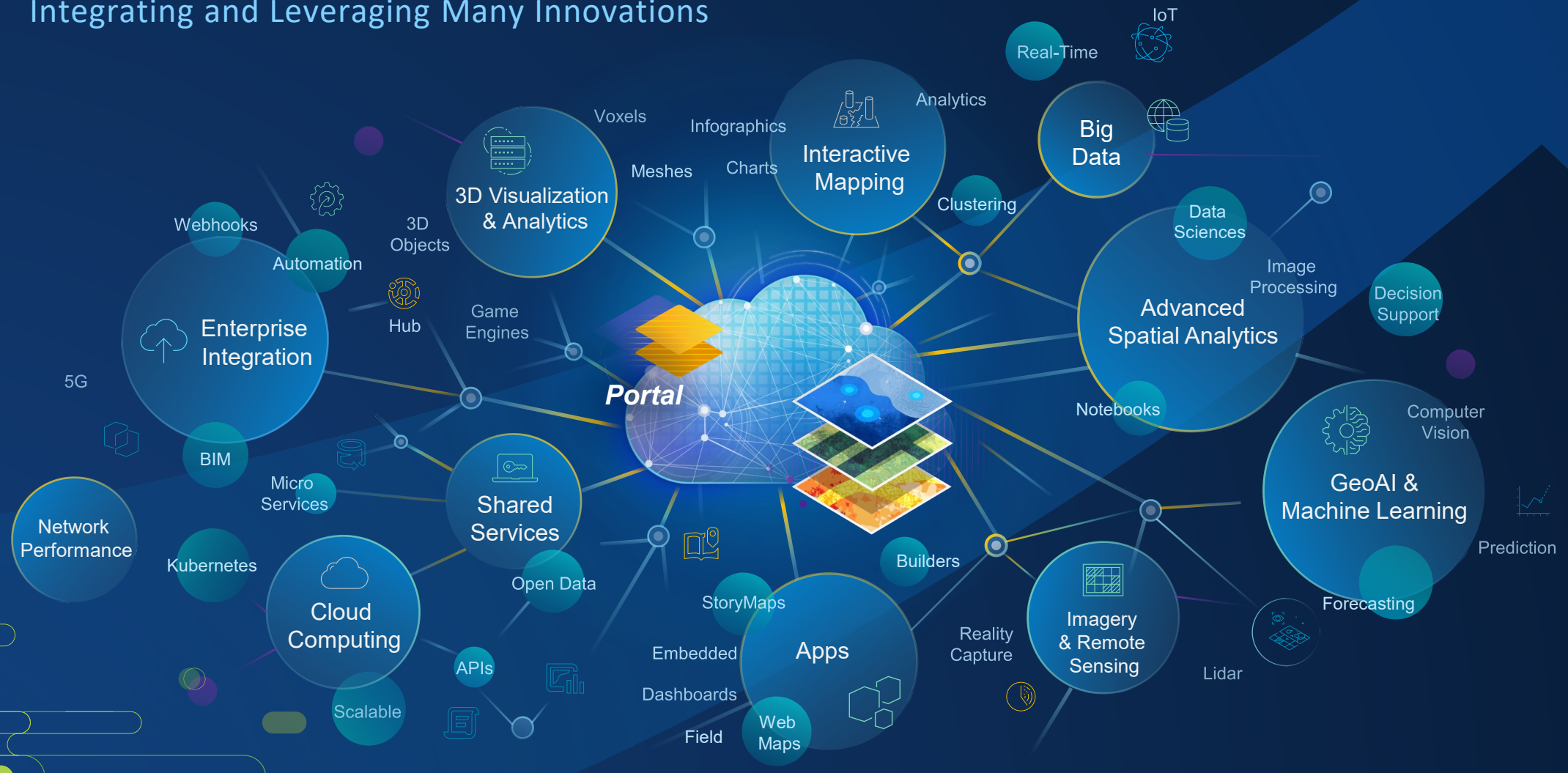


GIS Benefits to Operations



ArcGIS Is Advancing Rapidly

Integrating and Leveraging Many Innovations



Helping Us Scale Up Our Collective Efforts

The Technology

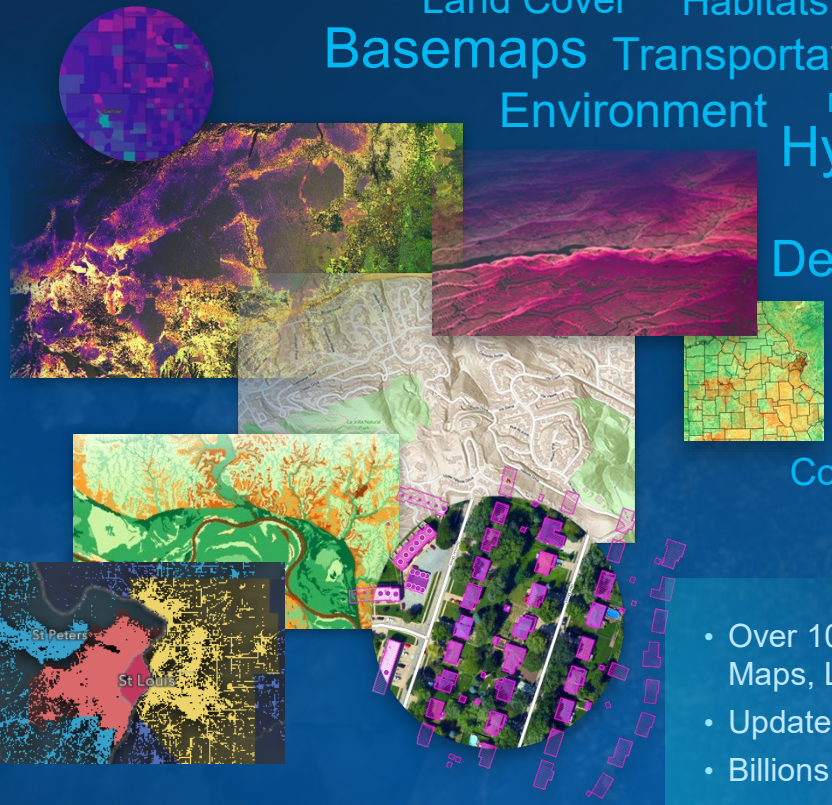
…supporting intelligent operations

ArcGIS Includes Ready-to-Use Content

Petabytes of Basemaps, Imagery, Demographics and Thematic Content . . .

ArcGIS
Living Atlas

Land Cover
Habitats
Biodiversity
Basemaps
Transportation
Landscape
Environment
Movement
Infrastructure
Hydro
Traffic
Business
Elevation
Boundaries
Demographics
Imagery
POI
Oceans
Hazards
Weather
Soils
Authoritative
Community Content



- Over 10,000 High-Quality Maps, Layers and Datasets
- Updated Regularly
- Billions of Requests Daily

User Shared
Maps & Data

Monthly Unemployment Statistics (BLS)

Real-Time Observations

OpenStreetMap Layers

New & Improved

- NGDA Open Datasets (A-16)
- Enhanced OSM Offerings
- Analysis-Ready Imagery
- Census 2020 Data Layers
- New Content
  - 2020 NAIP Imagery
  - 2020 / 2021 Land Cover
  - 2050 Land Cover Projections
  - FEMA National Risk Index
  - Drought Conditions
  - Biodiversity
  - Air Quality
  - Global River Flow
  - Wildfire Risk
  - . . . and Many More

Global & Local Geographic Content . . .
About Everything

ArcGIS Field Apps

Location-Enabling All Aspects of Field Work

Comprehensive Field App

ArcGIS Field Maps

Geocentric Workflows

Collection, Updating, Tracking, Viewing & Markup

Specialized Data Collection

ArcGIS Survey123

ArcGIS QuickCapture

Form-Centric Collection

Fast Observation
Location Sharing
Oriented Imagery

Operational Awareness

Dashboards

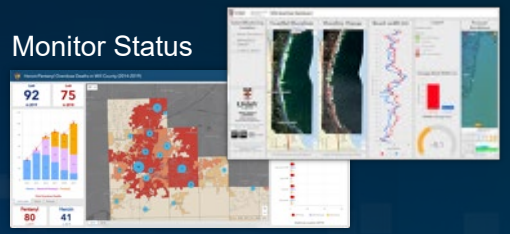
Transforming Mobile Workflows

Dashboards Dynamic Visual Reporting

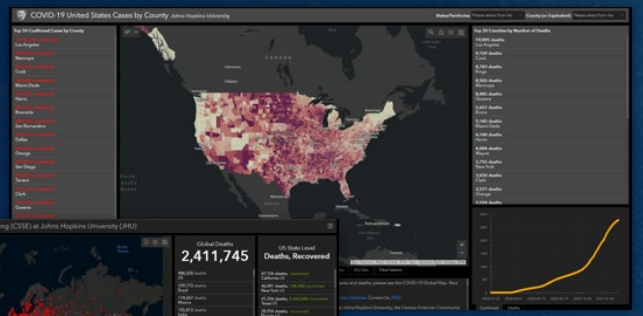
- Easy to Configure
- Ready to Use
- Interactive
- Flexible
- Highly Scalable
- Embeddable

Visualize Trends

Monitor Status



Manage Performance



New & Improved

- Mapping
- Data Expression
- Authoring Tools
- Summary Statistics
- Data Download
- Visualization
- Filtering
- Performance

Coming Improvements

- Mobile
- Accessibility
- Filtering
- Visualizations
- Charts

Providing Situational Awareness . . .
Anywhere, Anytime and on Any Device

Real-Time Visualization and Analytics

Integrating Sensors, IoT & GIS

Enterprise &
SaaS Solutions

Ingestion

Visualization

Analysis

Alerting
& Actuation

Data
Management

GeoEvent Server

- Optimized Workflows
- Improved Performance

Velocity

- Easy Real-Time Data Ingestion
- Many Sensors (AVL . . .)
- Real-Time Analytics (Geofencing . . .)

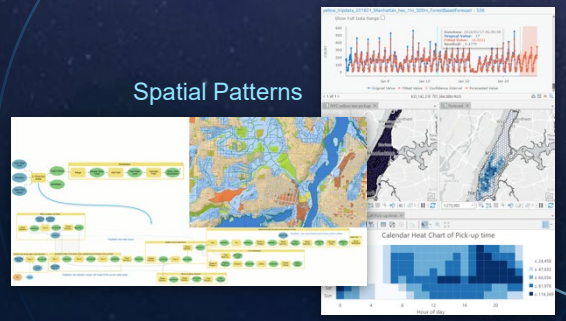
Supporting Many Types of Dynamic Applications

ArcGIS Spatial Analytics Are Advancing

Creating New Insights and Understanding

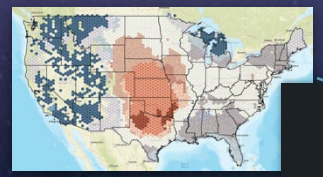
Predictive Modeling

Spatial Patterns



Trends

Spatiotemporal

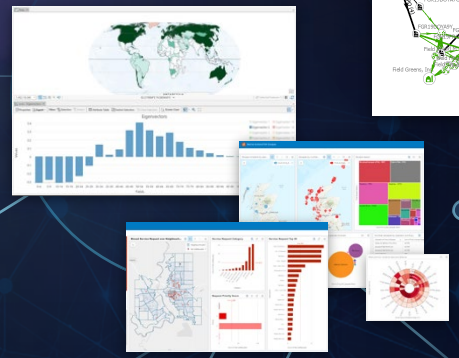


Hot Spot / Cold Spot

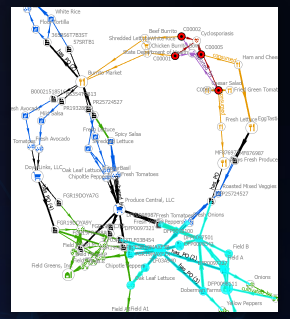
Data Cube

Real-Time

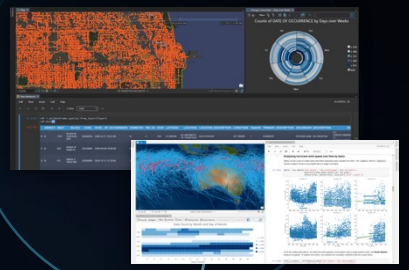
Interactive Visual Analytics



Graph Analytics

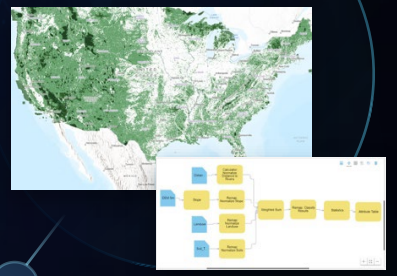


Big Data



Raster Analytics & Modeling

(In the Cloud)



. . . Bring It Together

GeoAI & ML

Leveraging Many Technical and Scientific Innovations

ArcGIS Knowledge Modeling & Analyzing Entity-Relationship Networks

Graph Analytics

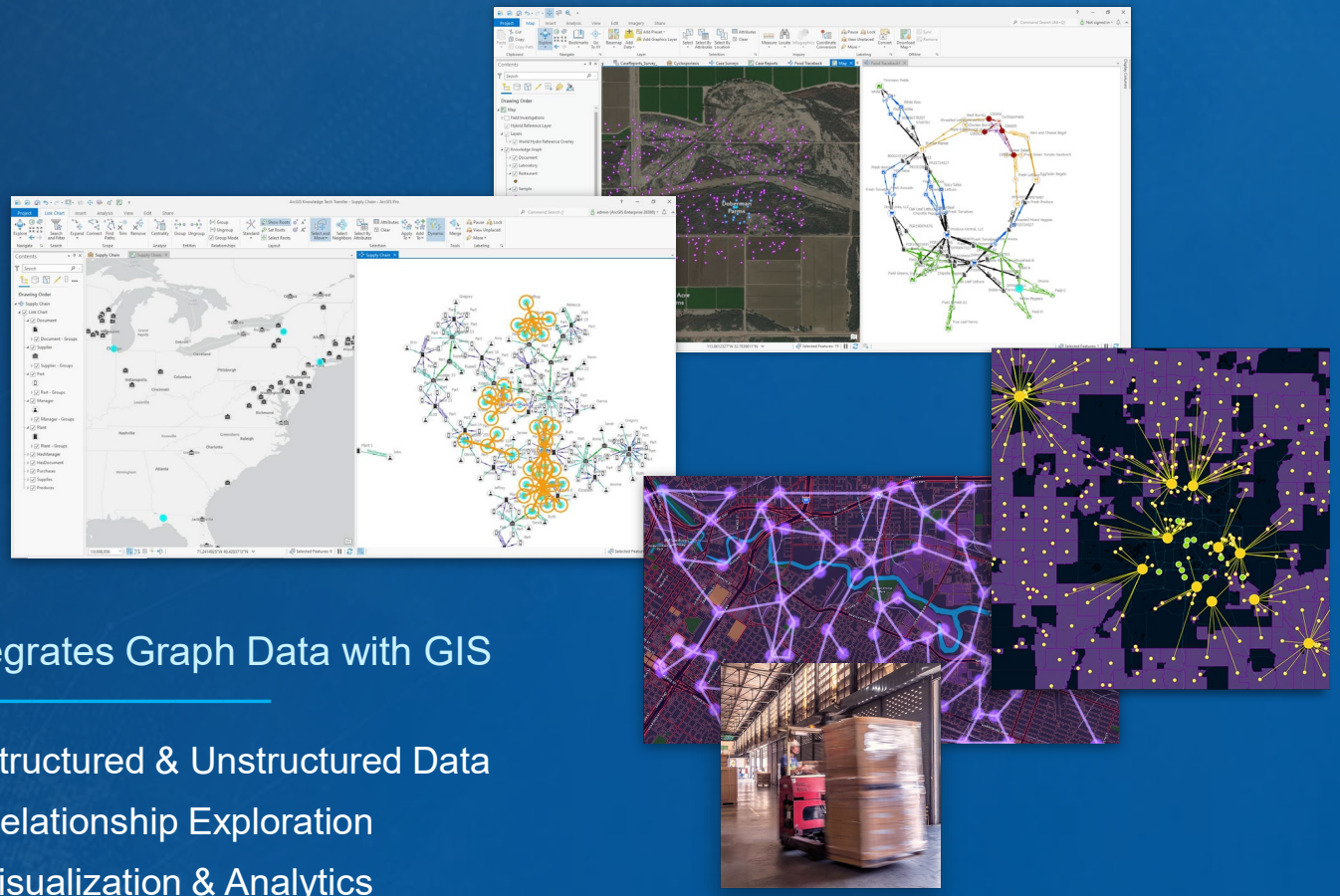
Supports

- Link Chart Visualization
- Powerful Analytics

Applications

- Supply Chain, Disease Tracking, Crime Analysis, Intel, Financial Services . . .

ArcGIS Pro & Enterprise



Integrates Graph Data with GIS

- Structured & Unstructured Data
- Relationship Exploration
- Visualization & Analytics
- Spatial & Nonspatial Data

ArcGIS Is a Comprehensive and Integrated Imagery System

Many New Tools & Capabilities

Analysis

- Classification, Change, Extraction
- AI, ML & DL
- Raster Analytics

Map & Data Production

- Ortho Mapping
- Stereo Imaging
- Reality Capture
- Drone Management

Visualization & Exploitation

- 3D & FMV
- Temporal
- Voxels
- Oriented Imagery
- Feature Capture

Management & Dissemination

- SaaS Hosting
- Supporting Workflows at All Scales

All Types & Formats

Drone, Aerial, Satellite, Terrestrial, Full Motion Video (FMV)

Living Atlas Imagery

ArcGIS Image Image Hosting & Raster Analytics in the Cloud

Providing Data Management, Analysis & Visualization Services

Two New Capabilities

Image Services

Capabilities

- Image Processing
- Raster Analytics & Modeling
- AI Workflows & DL Tools

- 175+ Functions & Tools

Enables Massive Image Processing & Raster Analysis

Supporting Value

…communicating the value of intelligent operations

Return on Investment | Route Optimization

Creating Value using Maps and Spatial Analysis

40 employees
20k miles/year (~80 miles/day)
15 miles/gallon @ $5/gallon

Annual Fuel Cost

$266K

Potential Efficiency

20% = $54K

Economic

Opportunity Cost

Exception Based Route

Reduced Fleet Maintenance

Environmental

~92 metric tons CO2 saved

*EPA Greenhouse Gas Calculator

Social

Reduce Chance of Vehicular Injury

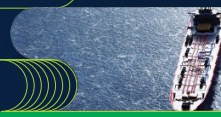
Better Working Environment

esri
Home
Upstream
Midstream
Downstream
HSE
Renewables
Tech & Innovation
ArcGIS for Petroleum
Supporting the entire energy value chain
Upstream
Midstream
Downstream
Health Safety & Environment
Renewable Energy
Technology & Innovation
Learn More
Learn More
Learn More
Learn More
Learn More
Learn More

SCAN ME

Demonstrations

Scott Noulis



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