Living Atlas of the World: An Introduction

Bern Szukalski
@bernszukalski
bszukalski@esri.com

Deane Kensok
@dkenso
dkensok@esri.com
ArcGIS includes a Living Atlas of the World
Maps and Layers from Esri and Thousands of Contributors

… with Curated Content on Many Topics
Content is Published by Esri, Partners, and Users
Built by the ArcGIS Community and Curated by Esri

- Nearmap 7cm Imagery
- Waze Traffic Incidents
- NOAA Real-time Weather
- EEA Land Cover
- Canal & River Trust
- Esri Content
- Community Content
- User Content
Accessing Living Atlas through ArcGIS

Multiple ways to Experience Living Atlas through ArcGIS Apps

- **ArcGIS Online & ArcGIS Enterprise (Portal)**
  - Content: Living Atlas Content
  - Add Data: Browse Living Atlas Layers
  - Analysis: Choose Living Atlas Layers

- **ArcGIS Living Atlas of the World Website**
  - Browse and Contribute @ livingatlas.arcgis.com

- **ArcGIS Pro**
  - Open Maps, Add Layers, Perform Analysis

- **Many Custom Apps by Esri and Users**
  - Wayback, Water Balance, Green Infrastructure, Drought Tracker, …
DEMO SUGGESTIONS:

• Accessing Living Atlas Content
  • Content Page, Map Viewer, LAW Website

DEMONSTRATION
Esri Content Portfolio within Living Atlas

- People
- Infrastructure
- Environment
- Basemaps
- Imagery
- Boundaries
- Trending
Esri Content Portfolio within Living Atlas

- Environment
- Infrastructure
- People
- Imagery
- Basemaps
- Boundaries
- Trending
Basemaps

Suite of basemaps to support your web maps and applications

- Variety of Basemaps for Different Maps and Apps
  - From neutral background maps to rich foreground maps, human or physical worlds

- Now Available in both ‘Vector’ and ‘Raster’ Format
Benefits of Vector Basemaps

Delivering basemaps in vector tile format provides several benefits to users

• More Styles Available
  - Currently 9 ‘core’ styles from Esri
  - Several more ‘custom’ styles

• Customizable by Users & Developers
  - Turn layers on / off
  - Change colors and other renderers
  - Change labels for different languages
  - Change treatment of disputed places

• Look Great on Hi-Res Displays
  - Vector features and labels look sharper

• Easier to Update
  - Cache updates in hours, not weeks
  - Smaller cache is faster to update

• More Interactive
  - Display at any scale with clearer rendering
  - Rotate the map / live text

• Support Other Map Projections
  - Available in other projections (GCS, BNG, …)
  - Client-side re-projection of tiles

• Better Support Disconnected Use
  - Store larger areas on small devices
Esri Vector Basemaps

What's New

• Default in Gallery for Anonymous, Public Account Users & New Orgs
  - Enable to use in your ArcGIS Online Organization’s Basemap Gallery

• New Map Styles Available!
  - Community, Navigation (Dark Mode), National Geographic Style
  - Esri Styles in GCS WGS84 Tiling Scheme

• Localization: maps localized for different languages and regions
  - Languages: now includes default plus 18 languages (12 new since last UC)
  - Disputed Places: vector basemaps enable different treatments of disputed places

• Vector Tile Style Editor available in Map Viewer to create custom styles
  - Browser based editor to create and save new vector basemaps
OpenStreetMap Vector Basemap
Esri hosted basemap featuring the latest OpenStreetMap data

• Basemap built using OSM data and cartography
  - Map is created with ArcGIS Pro and hosted in ArcGIS Online
  - Map is updated every 3 weeks with the latest OSM data
    - Over time, Esri intends to update more frequently

• Online Map is freely available to all users and developers!
  - Provided und Creative Commons by Attribution (CC BY 4.0) license
  - Map available in ArcGIS Online Basemap Gallery

• New Map Styles
  - OpenStreetMap (Esri Streets style)
  - OpenStreetMap (Esri Imagery Hybrid style)
  - GCS WGS84 Tiling Scheme styles
DEMO SUGGESTIONS:

- Vector Basemaps
  - Now the Default for Many; How to Enable in Your Org
- New Map Styles (pick ~3 to highlight)
- How to Access the Vector Tile Style Editor
- OpenStreetMap: now in the gallery, updated frequently
Community Maps Editor (New!)
New Web Editing App to Create and Edit Data for Esri Basemaps

- Enables Users to Contribute to Esri Basemaps
  - Enhance detail for high-priority AOIs (e.g. parks, schools, …)

- Users Create and Edit Features in Web Browser
  - Buildings, parking lots, paths, recreation areas, trees, …
  - Compiled from Esri World Imagery basemap

- Advanced Editing Tools for High-Quality Data
  - Snap to features, curves & angles, pre-built stencils, copy / paste

- New Data Created is Available to Export (once accepted)
  - Creative Commons by Attribution (CC BY 4.0) Open License

From the App …
… to the Map
Community Maps Challenges
Community Effort to Enhance Important Parts of the Map

• Focused and Fun Opportunities for Contributors

• Initial Challenges have Included:
  - Major League Baseball Stadiums (US, CA)
  - World Cup and World’s Best Cricket Grounds (UK, AU, IN, NZ, ZA)
  - Current: Most Iconic City Parks (Many Countries)

• Additional Map Challenges Planned in 2019 and Beyond
  - College & High School Campuses
  - FIFA Football Stadiums (World Cup)
  - American Football Stadiums (NFL, College)
  - Open to Community Suggestions
Community Maps Editor Learn Path

• New Learn Path to learn how to use Editor app using “Sandbox” version
  - Introduction to the Community Maps Editor, including how to access
  - Series of learn lessons teaching tools and tips to create and edit features
    - How to create an AOI, create buildings, cut and clip features, snapping, stencils, etc.

• Learn lessons focused on Use Case of Creating a School Campus
  - Can be used by colleges, high schools, and other students and educators
  - Can be applied to many other types of places (e.g. parks, malls, sports facilities, …)

• @ learn.arcgis.com (Digitize Your Neighborhood with Community Maps)
Esri Content Portfolio within Living Atlas

- People
- Infrastructure
- Environment
- Basemaps
- Imagery
- Boundaries
- Trending
World Imagery
Esri’s Flagship Imagery Basemap

• Map **featuring Most Recent**, High-res imagery from Best Available Sources
  - Includes metadata with source, acquisition date, resolution, accuracy, …

• **Updates with DigitalGlobe basemap imagery** (began Q3 2016)
  - Over 200 million sq. km. of imagery updated in past 3 years
  - Esri has extended partnership with DigitalGlobe …
    - Imagery being enhanced in **Currency, Clarity, and Accuracy**

• **Updates from GIS User imagery through Community Maps**
  - Hundreds of contributions from national, provincial, and local sources
    - Austria, Canada, Germany, Netherlands, Spain, Switzerland, United States, …
World Imagery: Small-Medium Scale Update (New!)

- Esri has updated with TerraColor NextGen from Earthstar Geographics
- NextGen provides improvement in currency, accuracy, and aesthetics

**Natural Color** - Processed using natural color RGB bands from Landsat 8. NextGen colors look truly realistic providing smooth transitions from low to high resolutions in World Imagery.

**Cloud-Free** - With less than 0.5% cloud cover globally, NextGen offers clear views of the earth.

**Seamless** - Thousands of Landsat 8 images were color balanced and stitched together to create a seamless view of the entire planet.

**Accurate** - 12m CE90 - 90% of the pixels are within 12 meters from their actual earth locations.

**Current** - Built from newer (2013-2018) Landsat 8 imagery at a spatial resolution of 15 meters per pixel.
World Imagery: Small-Scale Before and After

Current World Imagery - TerraColor v1

Update to World Imagery - TerraColor NextGen
World Imagery: Medium-Scale Before and After
DigitalGlobe Imagery Enhancements

Vivid and Metro Products are being enhanced in 2019-2020

- Earthwatch Vivid (global) and Metro (1,000 metros)

  - **Currency**
    - Cloud processing enables global annual updates to Vivid (>50% refresh)

  - **Clarity**
    - HD will enable expanded 30cm GSD coverage for all Metros

  - **Accuracy**
    - Large-area image bundling enables higher accuracy of Vivid (4-5m)

- First collection of Enhanced Vivid imagery has been published for CONUS
World Imagery (Clarity)
Alternative view of the World Imagery map

• View of World Imagery featuring Imagery from Archive
  - Reveals a curated set of imagery from Esri’s multi-year archive

• Optimized for Image Clarity and Accuracy
  - Less haze or cloud cover, higher positional accuracy
  - Typically less current than default imagery content
  - May feature most recent imagery, if also clearest or most accurate

• Supports Use Cases that Require Imagery of Highest Clarity
  - Feature collection and editing, change detection, etc.
World Imagery (Firefly)

Alternative view of the World Imagery map

- View of World Imagery for use as Neutral Background
  - Stylized to de-saturate color so it doesn’t compete with overlays

- Features the Same Imagery as the World Imagery map
  - Transitions to standard full-color imagery at large scales

- Designed for Use Cases that Require Imagery with Muted Color
  - ‘Firefly cartography’, maps with bright overlays, etc.
  - Includes the texture and richness of imagery
World Imagery (Wayback) – New!
Multiple Vintages of the World Imagery map from our Archive

- ~100 Versions of World Imagery going back 5+ years
  - Releases from January 2014 through Present
  - Published as performant and scalable basemap tile layers
  - Includes metadata with source, date, resolution, accuracy

- View Change over Time
  - Reveals typically 3-5 different views of an area

- Lock In to a Specific Version
  - Reference a specific version for your AOI
  - Preserve the ‘current state’ at the time of your analysis
Landsat 8 Imagery
Global 15-30m imagery for regional land analysis

- Global: Multi-temporal, Multi-spectral
- New scene every 16 days (cloud permitting)
  - Updated daily with approx. 400 scenes
- Dozens of scenes available per location
  - Now Hosted on Amazon Web Services (AWS)
- Freely Accessible by all ArcGIS Users!

- Landsat GLS Imagery also Available
  - Multi-epochs available from 1975 to 2010

- Polar Landsat Services also Available!
  - Image services in Arctic and Antarctic projections
Sentinel-2 Imagery (Beta)
Global 10-20m imagery for Earth observation

- Continuity with the SPOT & Landsat missions
- Multispectral
  - 13 spectral bands (4-10m, 6-20m, 3-60m)
  - 3 Red-Edge bands for vegetative analysis
- Multitemporal
  - Location revisit every 5 days
  - Last 14 months available via ArcGIS Online
  - Updated daily with latest available imagery
- Hosted in AWS - Frankfurt Region
- Full access with ArcGIS subscription
  - Open access via Sentinel Explorer app
DEMO SUGGESTIONS:

• World Imagery
  • How to access Imagery Metadata
  • Wayback Imagery (highlight interesting AOI, such as Mercedes-Benz stadium)
  • Firefly or Sentinel Imagery?
World Elevation: now includes Airbus WorldDEM4Ortho

What’s New

• Global pole to pole
  - exceptions Azerbaijan, DR Congo, Ukraine

• 0.8 arc sec (~ 24.7 meter) resolution
  - 4 meter vertical accuracy* at global scale

• Improvements to:
  - World Elevation Image Service (Terrain & TopoBathy)
  - Analysis Services (Profile, Viewshed, Summarize)
  - 3D Elevation (Terrain3D & TopoBathy3D)
  - World Hillshade

* Excluding urban areas (DTM like areas), substituted areas, areas of Antarctica
World Hillshade (Dark) – New!

- Dark version of our popular Multi-Directional Hillshade product
- Use as a backdrop to highlight feature layers and labels
- Now Available as a Cached Tile Service (basemap)
Live Feeds
What's New

• New Live Feed Feature Layers
  - Open Access, No Sign In Required!
  - Designed to be Highly Scalable during Events
    - Leverages ArcGIS Online capabilities

• Access in ArcGIS Online
  - Live Feeds Group
  - Living Atlas

• Use in Your Maps and Apps!
USA Landscape Content

**USA Croplands**
- Upgraded to 2018 data
- Full time series (2008-2018)
- Add major crop frequencies

**USA Soils**
- Upgraded to 2018 data
- Enhanced table attributes
- Upgrade downloader app to PPKX

**National Land Cover Database**
- Upgraded to 2016 data
- Full timeseries from (2006 – 2016)
- Data is harmonized for analysis

**USA Protected Areas**
- Upgraded to version 2.0
- Hosting image, feature layer views, & vector tiles
- Supporting USGS maps and apps
DEMO SUGGESTIONS:

• Environment
  • World Hillshade (Dark)
  • Time Enabled Cropland (web app in blog)
  • New Environmental Dashboards (Earthquake Monitoring, Active Fires, Coral Bleaching)
questions & answers
Please Share Your Feedback in the App

Download the Esri Events app and find your event

Select the session you attended

Scroll down to “Survey"

Log in to access the survey

Complete the survey and select “Submit”
Thank You!

Bern Szukalski
@bernszukalski
bszukalski@esri.com

Deane Kensok
@dkensok
dkensok@esri.com