

Living Atlas: Introducing a GIS of the World

Deane Kensok

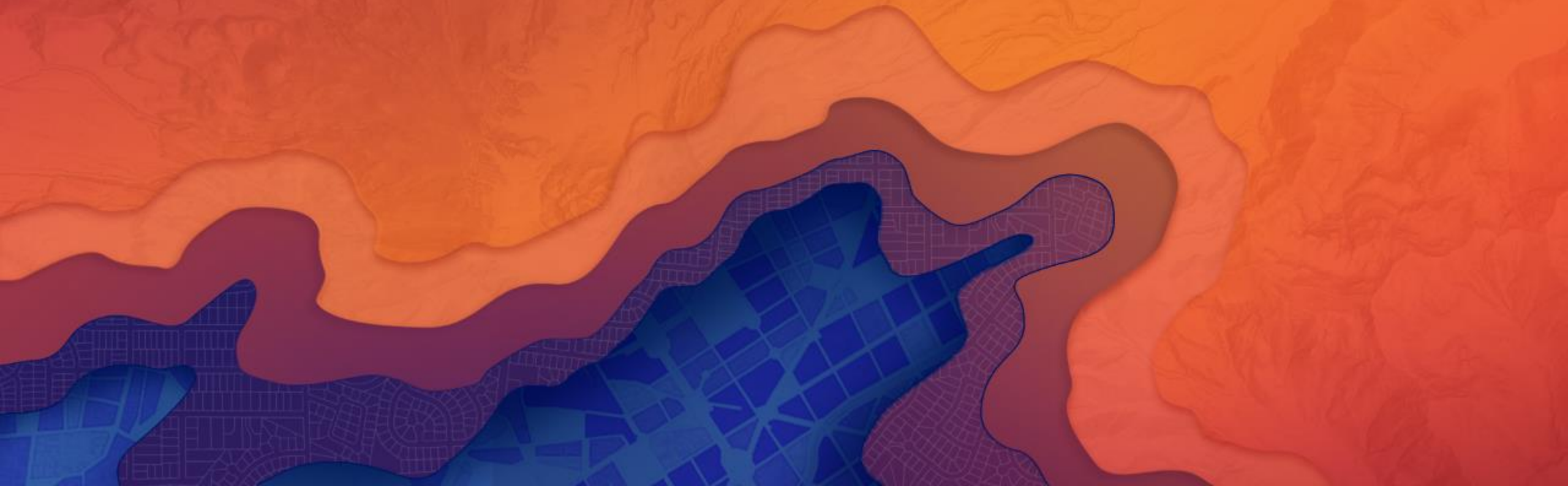
Sean Breyer

Workshop Agenda

Subhead Here

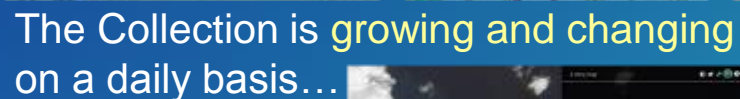
- Overview of the Living Atlas
 - **Demo:** Accessing the Living Atlas
- Esri Content Portfolio
 - **Demos:** Updates on New Content
- How to Participate
- Questions & Answers

Overview of the Living Atlas



Maps and Layers from Esri and Thousands of Contributors

Maps and Layers from Esri and Thousands of Contributors



The Collection is **growing and changing** on a daily basis...

Content is Published by Esri, Users, and Partners

Built by the ArcGIS Community and Curated by Esri

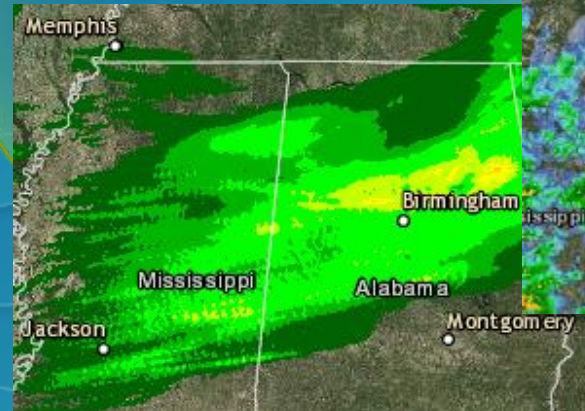
Esri
Content
COMMUNITY

7cm **nearmap** imagery



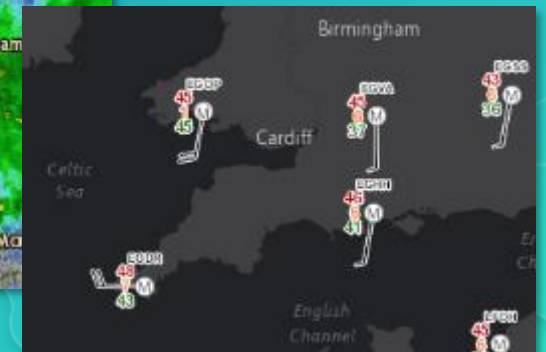
AccuWeather Severe Weather

NOAA Precip. Estimates



Weather Radar

Real-Time Observations



Accessing the Living Atlas through ArcGIS

Multiple ways to Experience the Living Atlas through ArcGIS Apps

- **ArcGIS Online & ArcGIS Enterprise (Portal) 10.5+!**

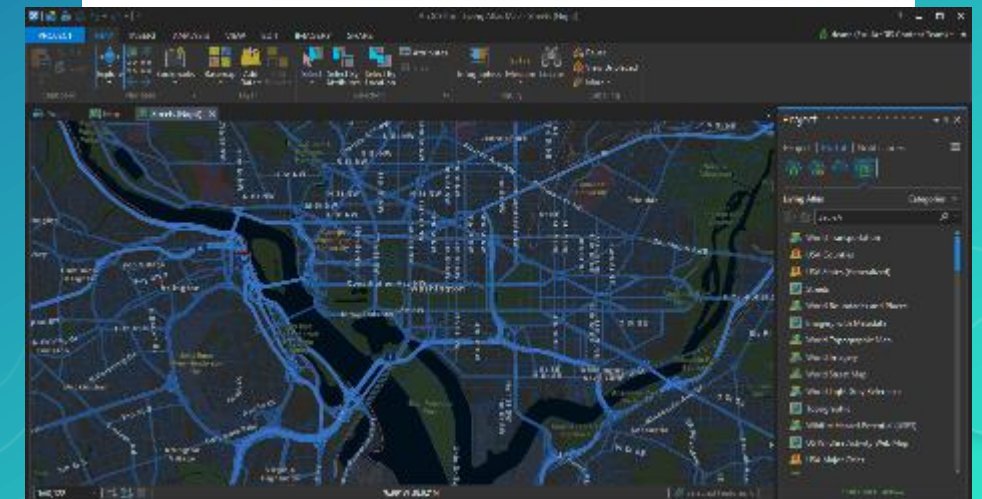
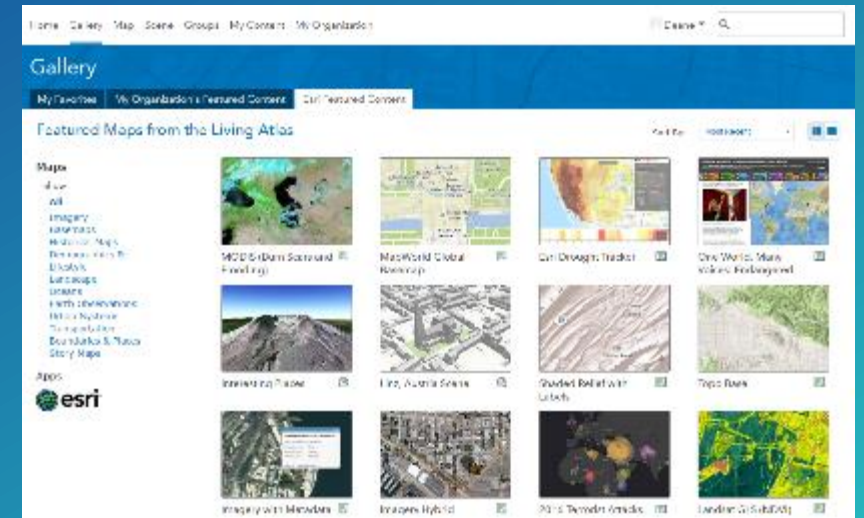
- Gallery: Esri Featured Content
- Add Data: Browse Living Atlas Layers
- Analysis: Choose Living Atlas Layers

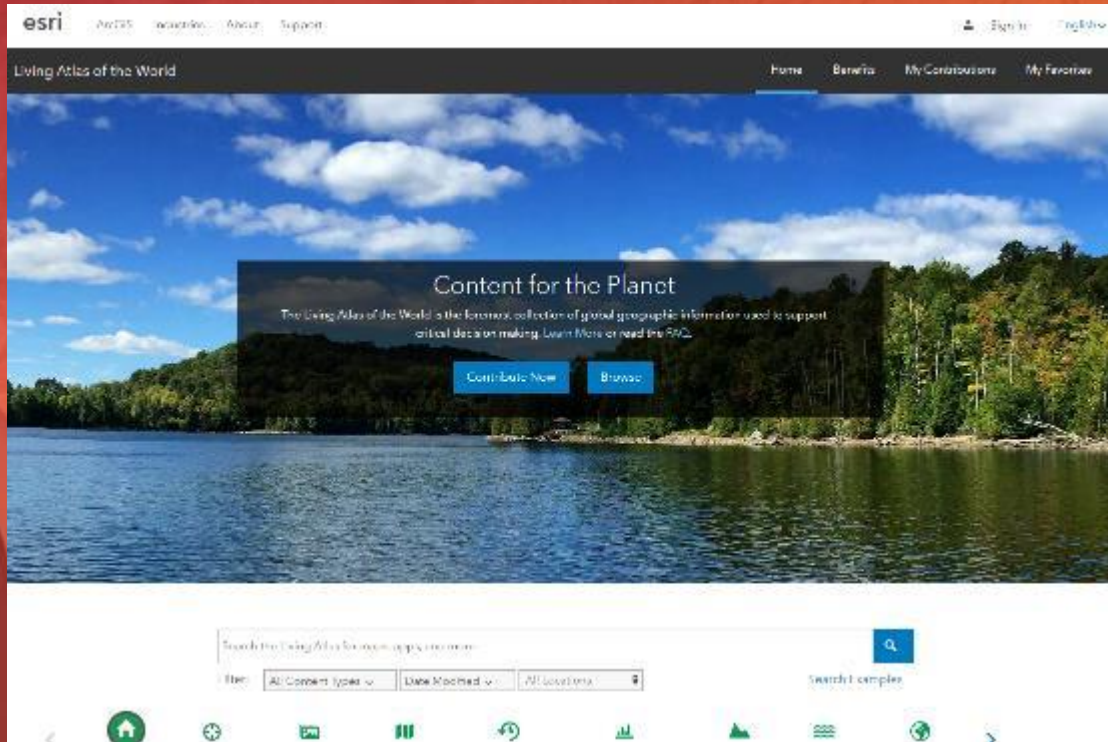
- **Living Atlas of the World Website**

- livingatlas.arcgis.com
- Browse and preview maps, layers, and tools
- Contribute maps, layers, and data

- **ArcGIS Desktop**

- ArcGIS Pro 1.2+
- Open Maps, Add Layers, Perform Analysis



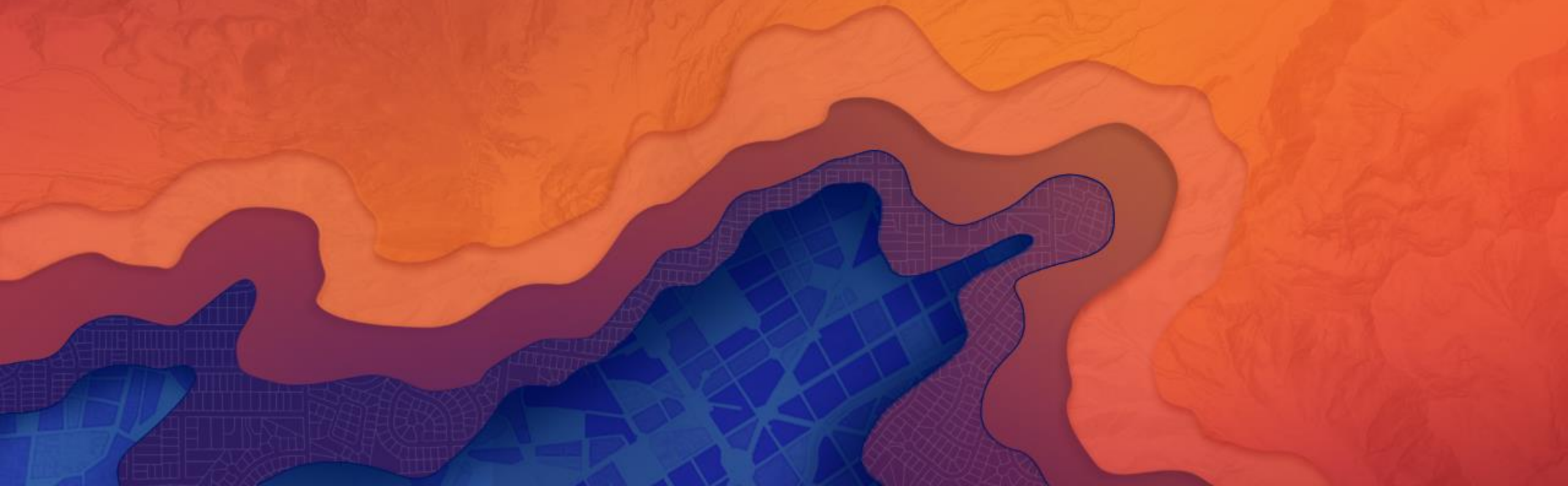


Accessing the Living Atlas

Sean Breyer

Esri Content Portfolio

Maps and Layers by Esri



Esri Content Portfolio within Living Atlas

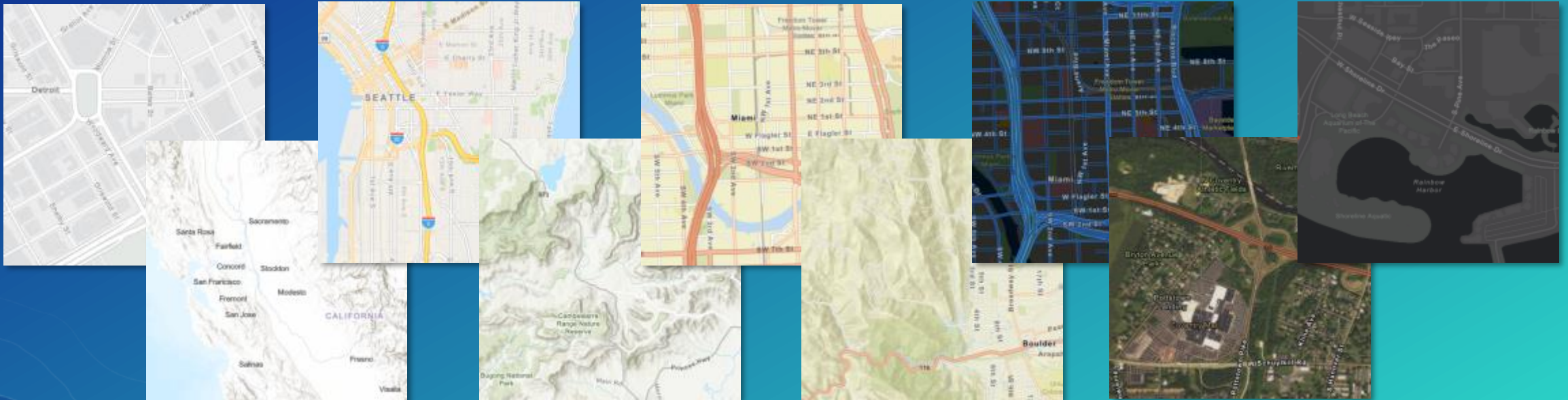
Esri Content Portfolio within Living Atlas



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, emphasizing human or physical worlds



- Now Available in both 'Vector' and 'Raster' Format!

Reference Maps for our World and Context for Your Work

Esri Vector Basemaps

What's New

- Initial Version (v1) Now Released and Available to Use in Your Maps & Apps
 - Configure to use in your Organization's Basemap Gallery
- Includes 9 'Core' Styles and other 'Custom' Styles to use as-is or customize
- Now Includes Global Coverage of large-scale street data
 - Using best available data from HERE, OpenStreetMap, and GIS Community
- Localization: ongoing efforts to localize the maps for different regions
 - Global and Local Labels: vector tiles include labels in 2 languages for many places
 - Disputed Places: existing maps enable different treatments of disputed places

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 Designers & 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 = Latest Data**
 - 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 WGS84)
 - Client-side re-projection of tiles
- **Better Support Disconnected Use**
 - Store larger areas on small devices

Esri Vector Basemaps (WGS84)

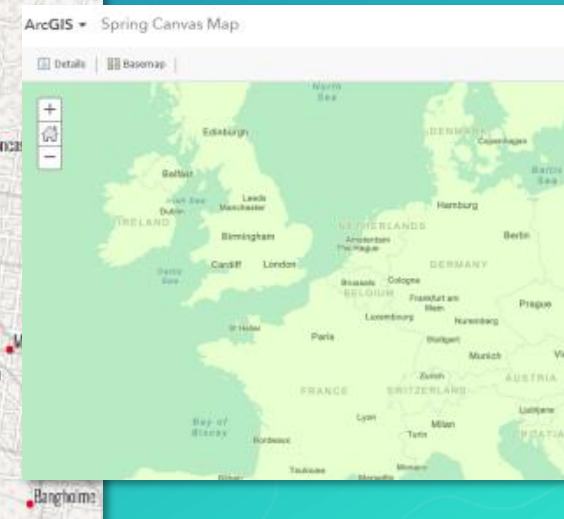
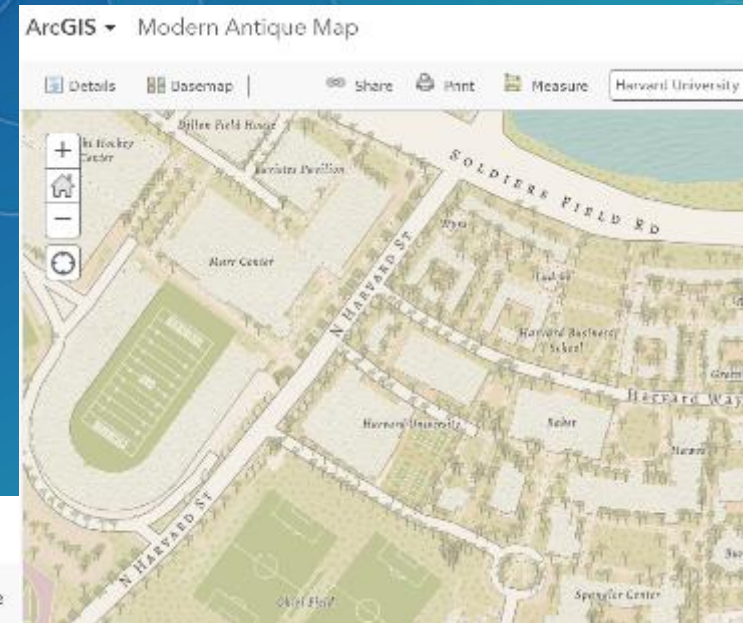
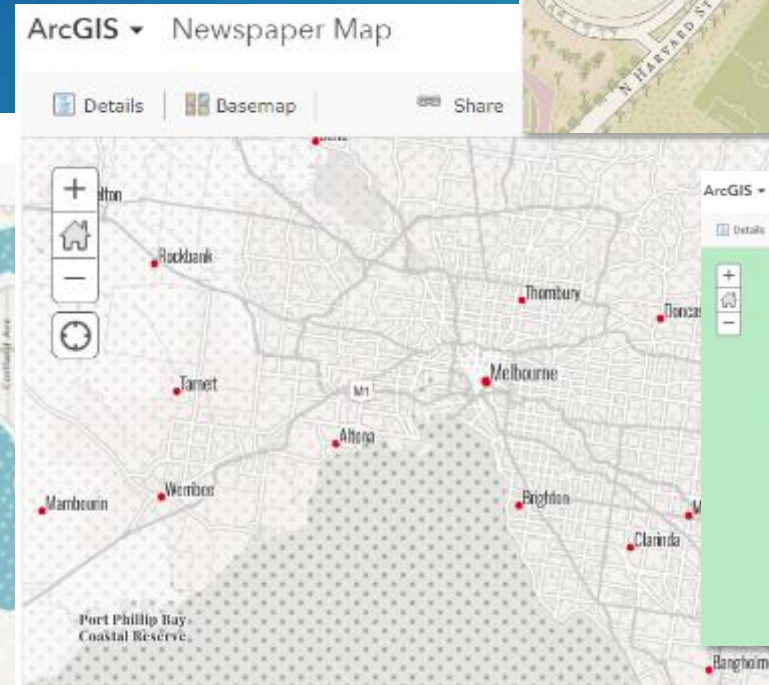
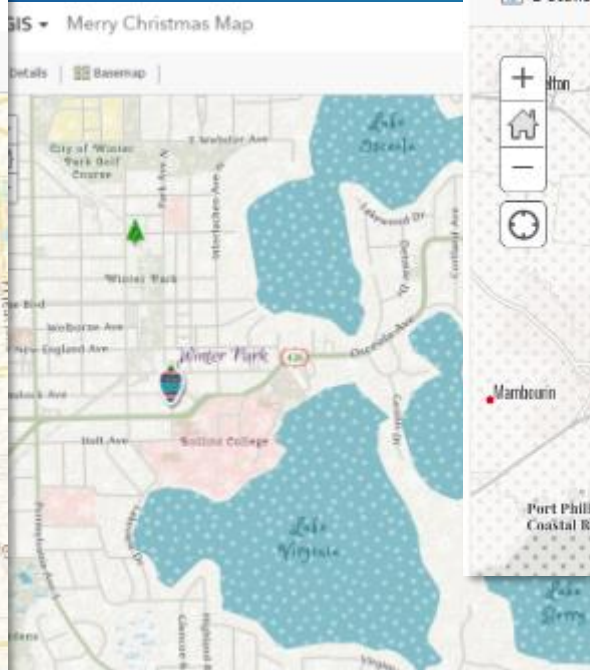
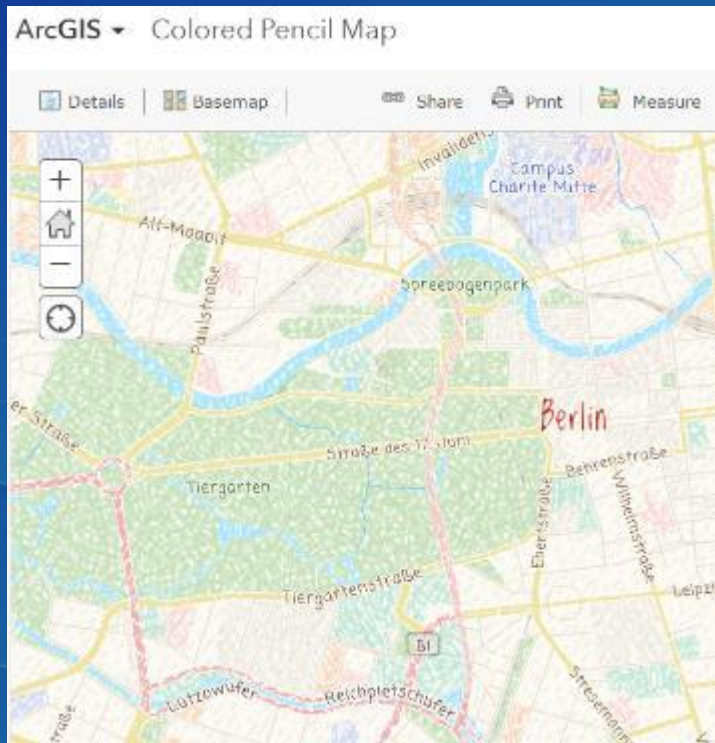
Alternative view of vector basemaps in different tiling scheme (now in Beta release)

- Esri Vector Basemaps in GCS WGS84 Tiling Scheme
 - Uses improved tiling scheme “WGS84 Geographic, Version 2”
 - More precise than earlier tiling schemes in GCS WGS84
 - Accessible in [Vector Basemaps \(WGS84\) Group](#)
- Features the Same Content as the Esri Vector Basemaps
 - Vector tiles area cached in different tiling scheme
 - Vector tiles will be updated on the same release schedule
- Designed for Different Orgs and Use Cases that Require GCS WGS84
 - Coordinate system required by many Defense/Intel organizations
 - Useful for 3D display to include basemap content to the poles



Custom Vector Basemaps

- Several custom vector basemaps available as well
 - Topical and seasonal variations, designed by Esri cartographers
 - May be used 'as is' or customized by users
 - Available in the Living Atlas

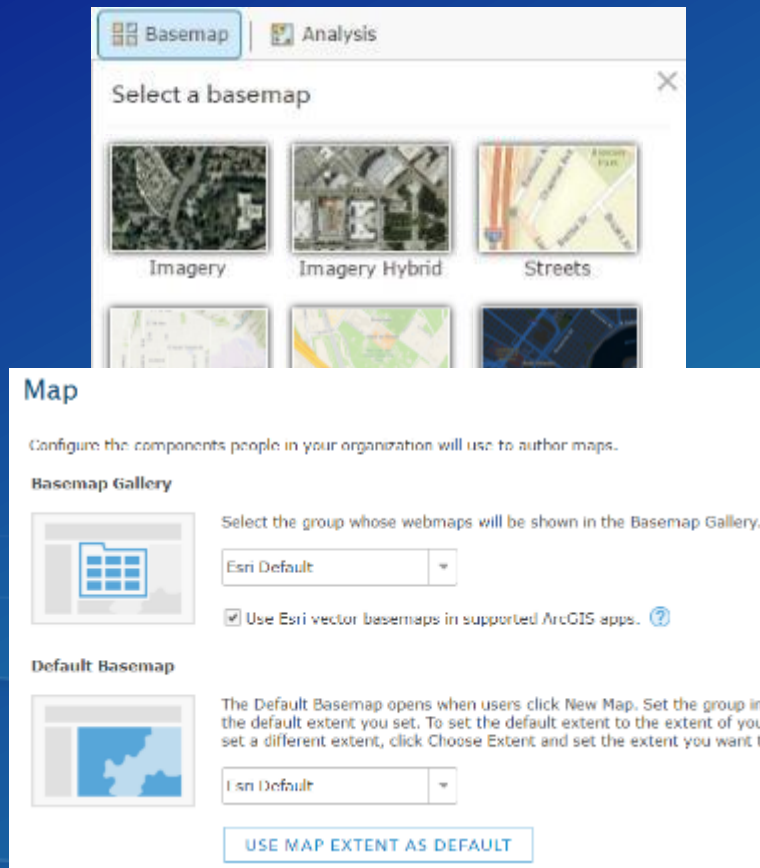


Custom Styled Vector Basemaps from Esri

How to Access Esri Vector Basemaps?

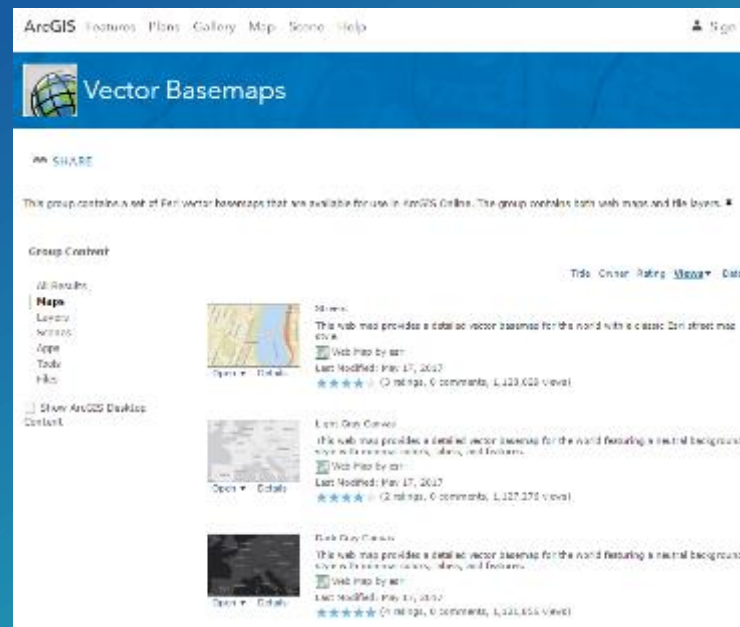
1. Configure Basemap Gallery

Admin can Enable in Org Settings



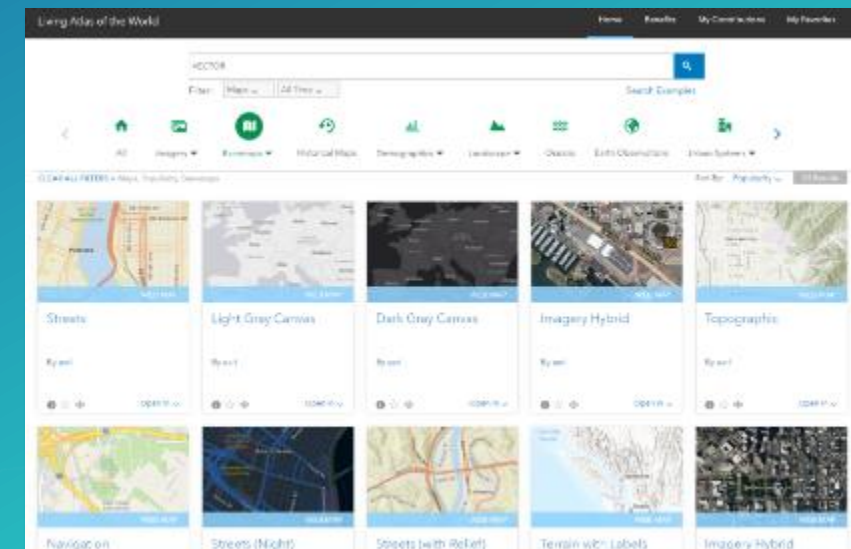
2. Vector Basemap Group

Browse Maps and Layers



3. Living Atlas Website

Select 'Esri Basemaps' Category and Search for 'Vector' and Favorite



How are Esri Vector Basemaps delivered?

Availability

- Tile layers

- Add to existing maps either as basemap or overlay layer
- Make a copy into your AGOL account to **customize style**



Tile Layer

- Web maps

- Use as basemap for adding other layers
- Use in apps (Story Maps)
- **Most current vector tile layer** included



Web Map

Esri Content Portfolio within Living Atlas

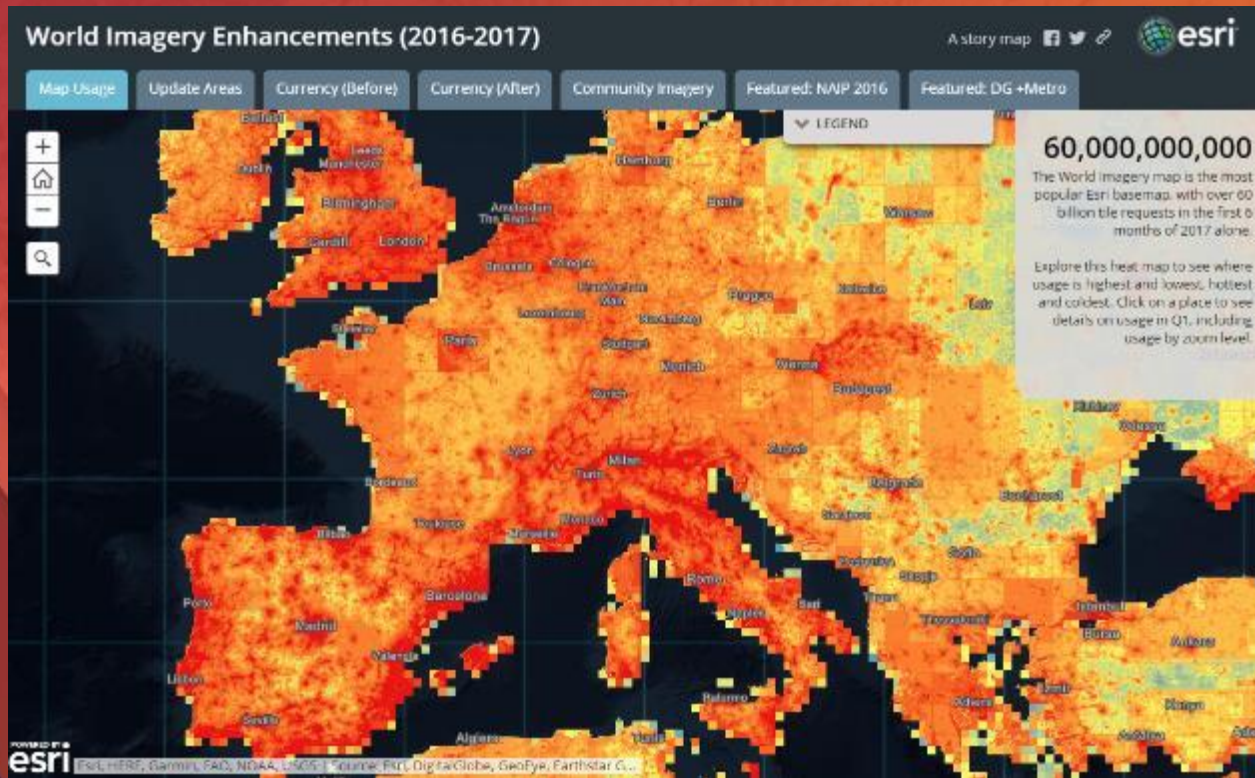


World Imagery

Esri's flagship imagery basemap

- Multi-scale map **featuring Most Recent**, High-res imagery from Best Available Sources
 - Goal is to provide 1m or better imagery within **3-5 years** of currency
 - Major updates to World Imagery map in 2016-2017
- **Updates with DigitalGlobe basemap imagery (began Q3 2016)**
 - Over **100 million sq. km.** of imagery updated in past year
 - Update will continue in remainder of 2017 and beyond ...
- Updates from GIS User imagery through Community Maps
 - Hundreds of contributions from national, provincial, and local sources
 - Austria, Netherlands, New Zealand, Spain, Switzerland, City of Berlin, Many U.S. & Canadian Cities, ...
 - Deployment of U.S. **NAIP 2016 imagery** (updates for 24 states)
 - Provided courtesy of USDA Farm Services Agency (FSA)





World Imagery

What's New

World Imagery (WGS84)

Alternative view of the World Imagery map

- View of the World Imagery Map in GCS WGS84 Tiling Scheme
 - Uses improved tiling scheme “WGS84 Geographic, Version 2”
 - More precise than earlier tiling schemes in GCS WGS84
- Features the Same Imagery as the World Imagery map
 - High-res imagery is re-tiled ‘on the fly’ to ensure consistency
- Designed for Different Orgs and Use Cases that Require GCS WGS84
 - Coordinate system required by many Defense/Intel organizations
 - Useful for 3D display to include imagery content to the poles



World Imagery (Clarity)

Alternative view of the World Imagery map (now in Beta release)

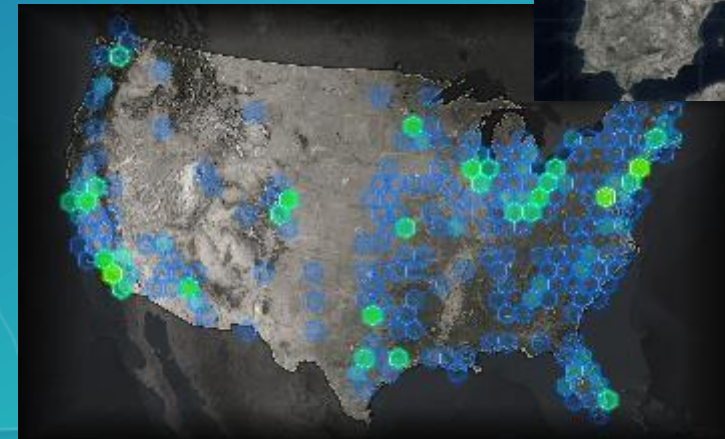
- View of World Imagery featuring Alternative Imagery from Archive
 - Reveals a curated set of imagery from Esri's multi-year archive
- Optimized for **Image Clarity and Accuracy**
 - Less haze or cloud cover, higher positional accuracy
 - Typically **less current** than default imagery content
 - May feature most recent imagery, if also clearest and/or most accurate
- Designed for 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 (now in Beta release)

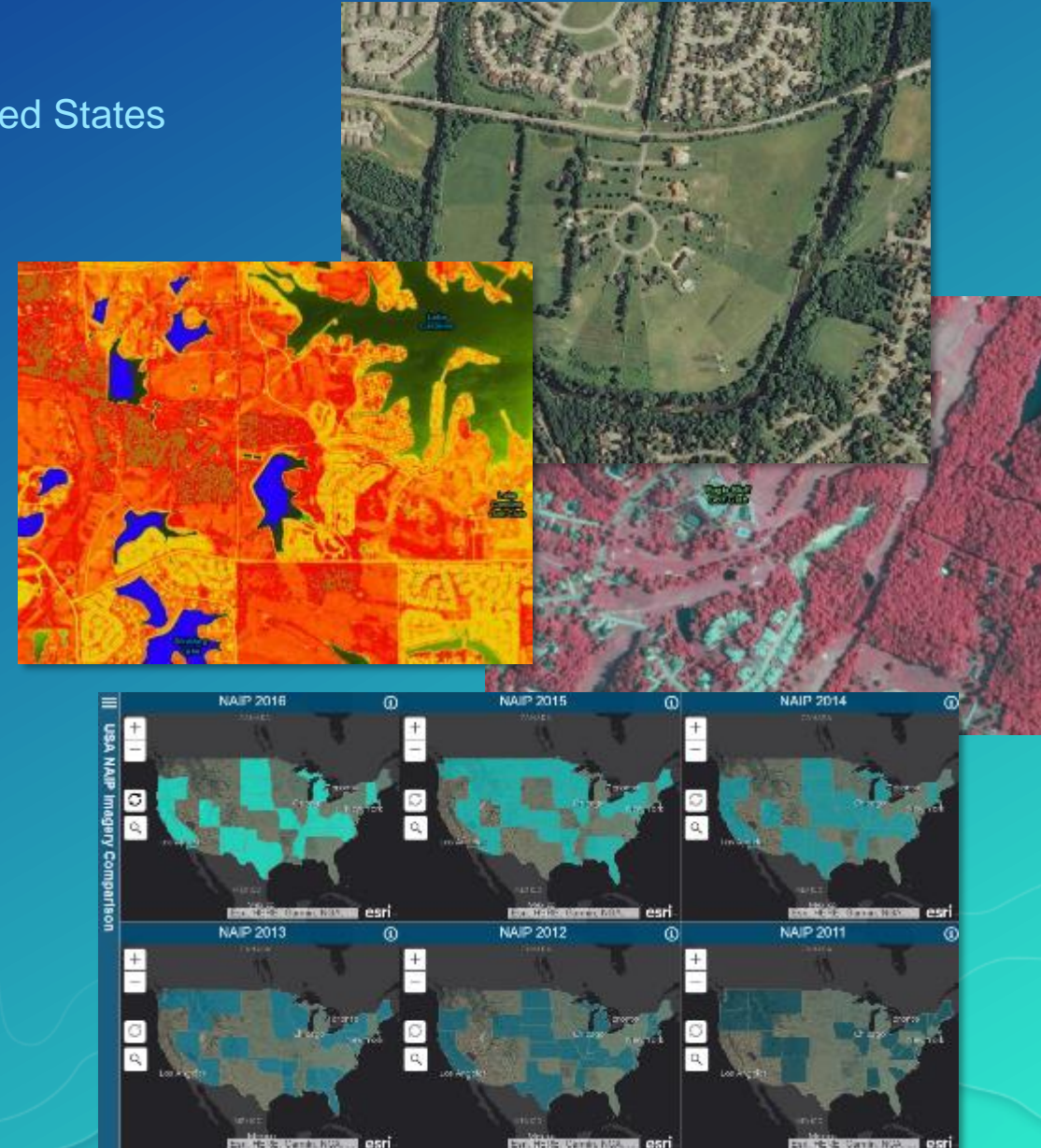
- View of World Imagery for use as Neutral Background
 - Stylized to de-saturate color so it doesn't compete with overlays
- Features the Same Imagery as the World Imagery map
 - Transitions to standard full-color imagery at large scales
- Designed for Use Cases that Require Imagery with Muted Color
 - 'Firefly cartography', maps with bright overlays, etc.
 - Includes the texture and richness of imagery



NAIP Imagery

Nationwide 1m or better resolution imagery for the Continental United States

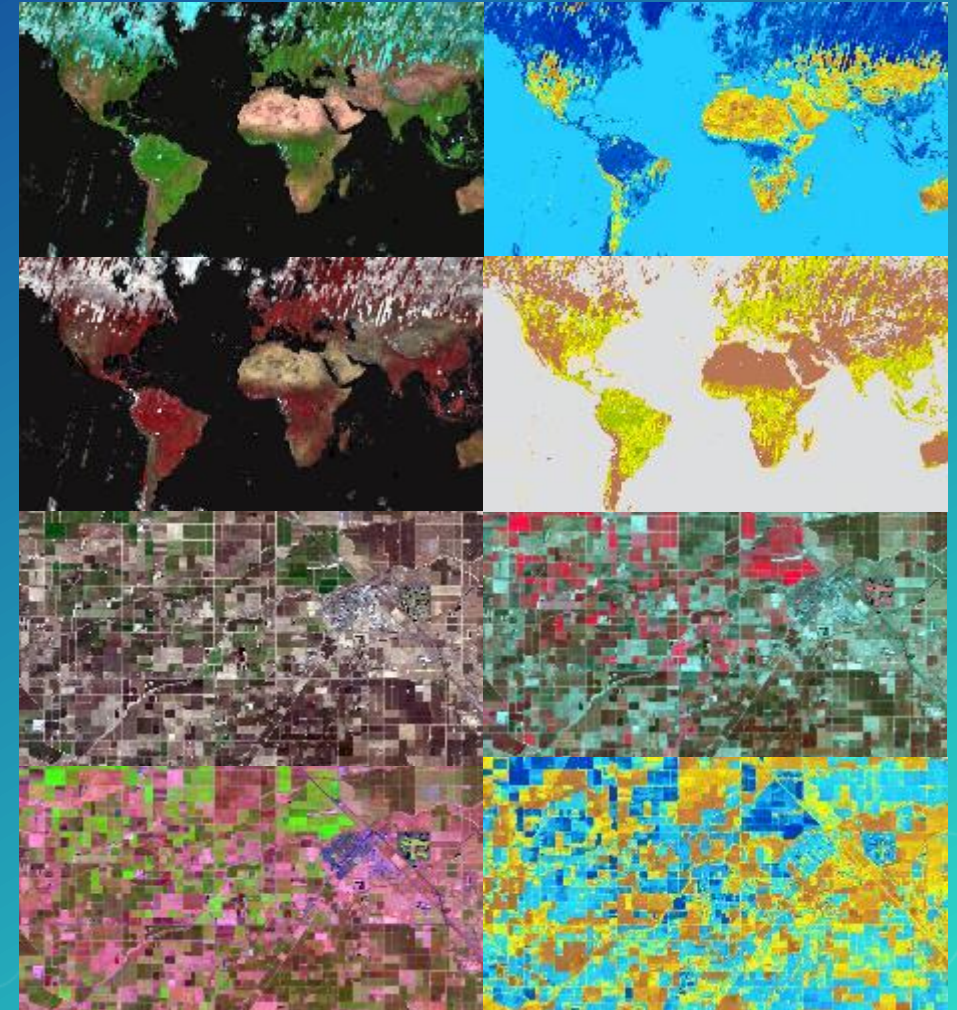
- Nationwide Image Service
- Multi-band (4-band) Imagery
 - Supports Natural Color, False Color, NDVI
- Imagery available for the Past 7 Years
 - Currently NAIP 2010-2016
 - Now Hosted on Amazon Web Services (AWS)
 - Updated with All NAIP 2016 Imagery Now!
- Imagery provided courtesy of USDA FSA
- Available with ArcGIS Online Subscription
- Road Ahead: Expose for Raster Analytics



Landsat 8 Imagery

Global 15m imagery for regional land analysis

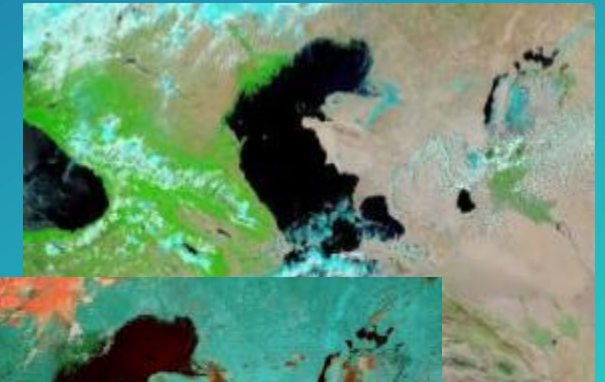
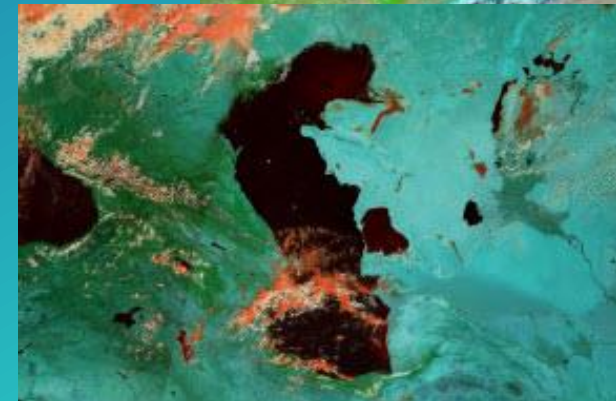
- Global: Multi-temporal, Multi-spectral
- New scene every 16 days (cloud permitting)
 - Updated daily with approx. 400 scenes
- Dozens of scenes available per location
 - Now Hosted on Amazon Web Services (AWS)
- **Freely Accessible by all ArcGIS Users!**
- Landsat GLS Imagery also Available
 - Multi-epochs available from 1975 to 2010
- **New Polar Landsat Services Now Available!**
 - Image services in Arctic and Antarctic projections



MODIS Imagery

Global 250m imagery layers to support visualization and analysis

- Image Layers referencing NASA Global Image Browse Services
 - GIBS are a set of standard services to deliver global satellite imagery
 - Esri publishes the highest resolution and most used info products
 - Global imagery updated daily
 - Near real time, less than 3 hours latency after capture
 - Daily collection goes back 5 years to May 2012



Esri Content Portfolio within Living Atlas

Esri Content Portfolio within Living Atlas



Esri Boundary Layers

Current Status and the Road Head

- Boundary Layers available in ArcGIS Online for Visualization and Analysis
 - Boundary Layers for over **130 countries** available now!
 - Featured in Living Atlas and Optimized for Use in Analysis Tools
 - Updates published (as available) as part of ArcGIS Online releases
 - Updates published in June for 45 countries (e.g. Poland)
- Boundary Layers **available now in ArcGIS Enterprise** for Visualization and Analysis
 - Enterprise users can download SD files from MyEsri and publish with Portal
 - 10.5 Release: includes boundaries for World and United States
 - 10.5.1 Release: includes boundaries for over 130 countries
- **Road Ahead:** additional boundary layers by country from local authoritative sources
 - Additional levels of geography, updated more frequently (as required)

Esri Content Portfolio within Living Atlas

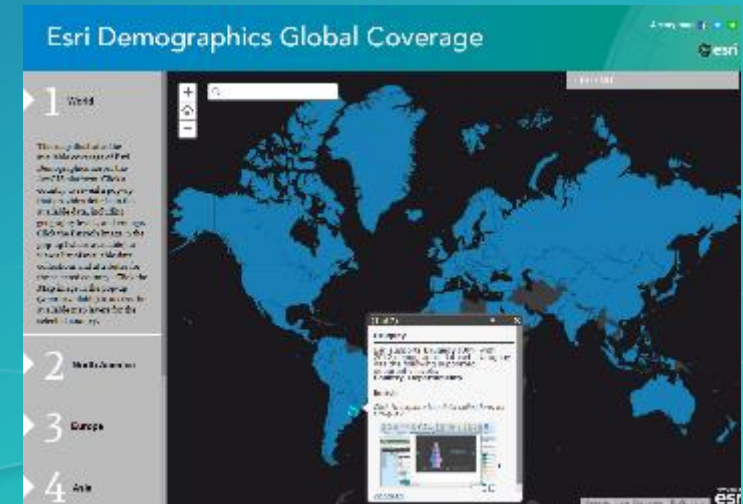
Esri Content Portfolio within Living Atlas



Demographics and Lifestyle Maps: What's New

Demographic layers and tools available for use in ArcGIS Platform

- Demographics are Integrated into the ArcGIS Platform
 - Mapping, Data Enrichment, Infographics, Reporting
 - Access in ArcGIS.com, Explorer for ArcGIS, and ArcGIS Pro
 - Premium Content Available with an ArcGIS Online Subscription
- Latest 2017 / 2022 Data Available for the United States
 - Over 50 Ready-to-Use Maps for Demographics and Lifestyle Data
 - Thousands of Variables to Create Custom Maps and Popups
- Now Offering a Global Solution
 - Foundation Data for over 130 Countries now available
 - Updates released this year for 68 countries
 - More Detailed Data for Selected Countries (e.g. Canada)



Esri Content Portfolio within Living Atlas

Esri Content Portfolio within Living Atlas



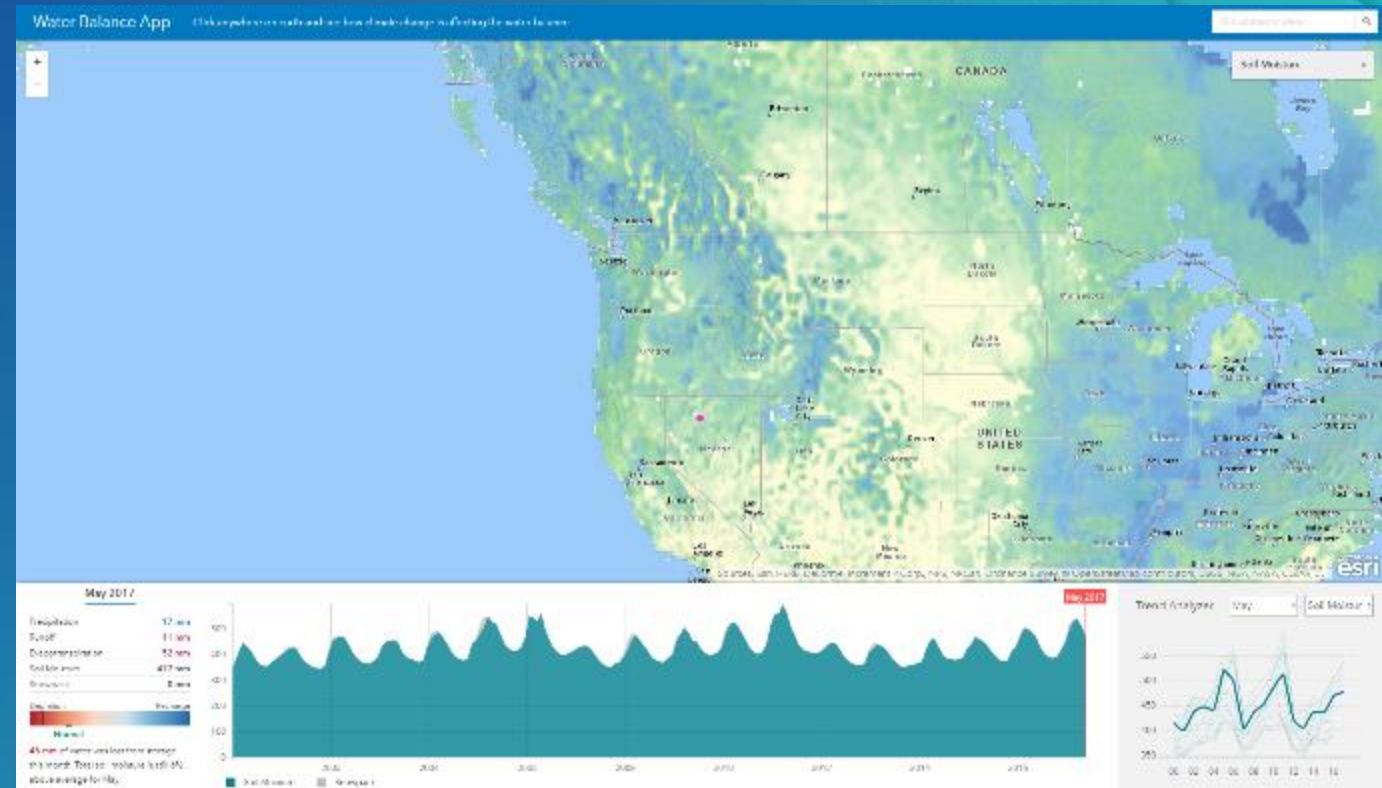
Landscape - GLDAS

Global Land Data Assimilation System (GLDAS)

GLDAS Monthly from 2000-present is the global dataset that provides a true global water balance. It includes:

- Soil Moisture
- Snowpack
- Precipitation
- Evapotranspiration
- Runoff

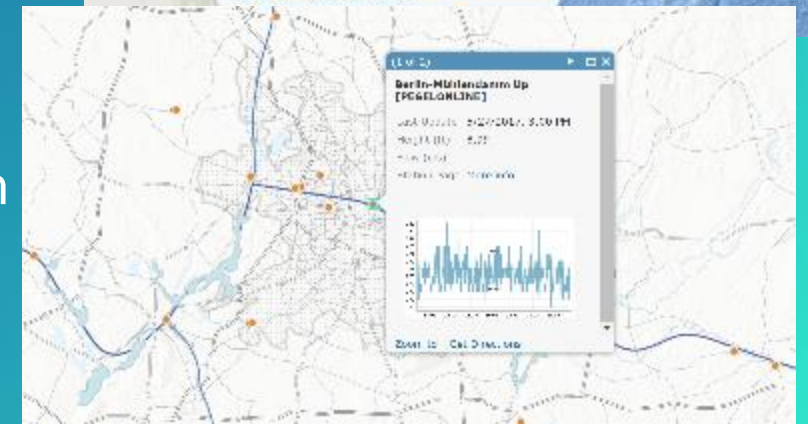
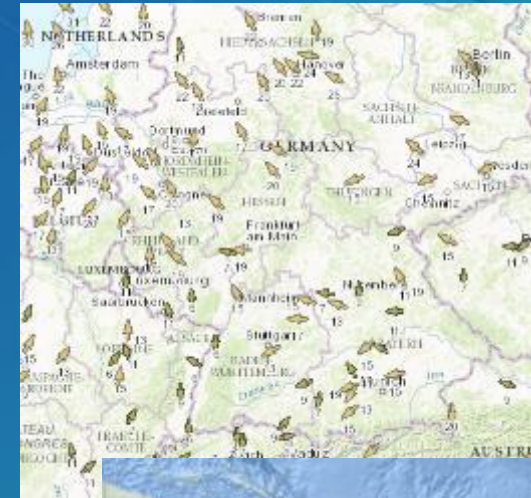
Demo app to show time enabled data
(Water Balance)



Landscape – Live Feeds

Global Weather and Observations Live Feeds

- The [Current Wind and Weather Conditions](#) map is created from hourly METAR/TAF data provided from NOAA.
- This map, [Hurricanes and Tropical Cyclones](#), features live feed sources for hurricanes and cyclones around the world, as well as recent weather radar imagery for the United States.
- Community [Live Stream Gauges](#) feeds, Real-time stream gauge observations of stage height and discharge.



Landscape – Global Landcover

World Landcover Layers 2013 updated

MDA: a quality update in February 2017. An improved selection of cloud-free images was used to produce the update, resulting in improvement of classification quality to 80% of the tiles for this service.

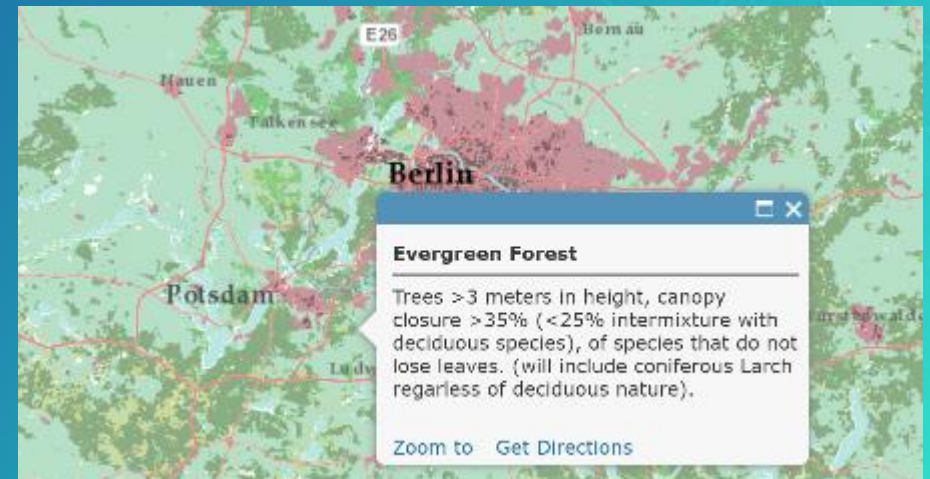
Layers derived from this dataset include:

[World Land Cover 30m BaseVue 2013](#)

[World Forests 30m BaseVue 2013](#)

[World Surface Water 30m BaseVue 2013](#)

MDA World Landcover 2016 will be released in Q4



Landscape – World Population Estimates

World Population Estimate 2015 Released

The world population estimate and associated layers now to include islands that were missing from the original layers.

[World Population Estimated 2015](#)

[World Population Estimated Density 2015](#)

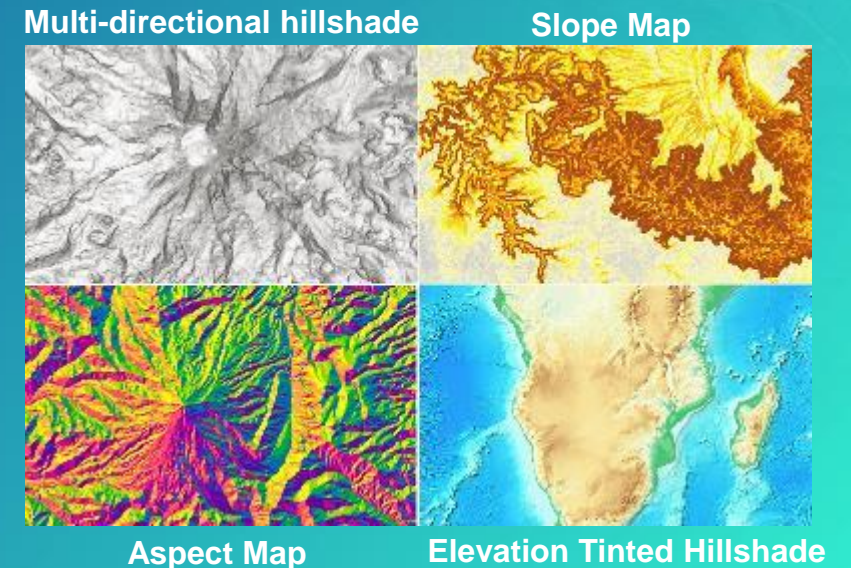
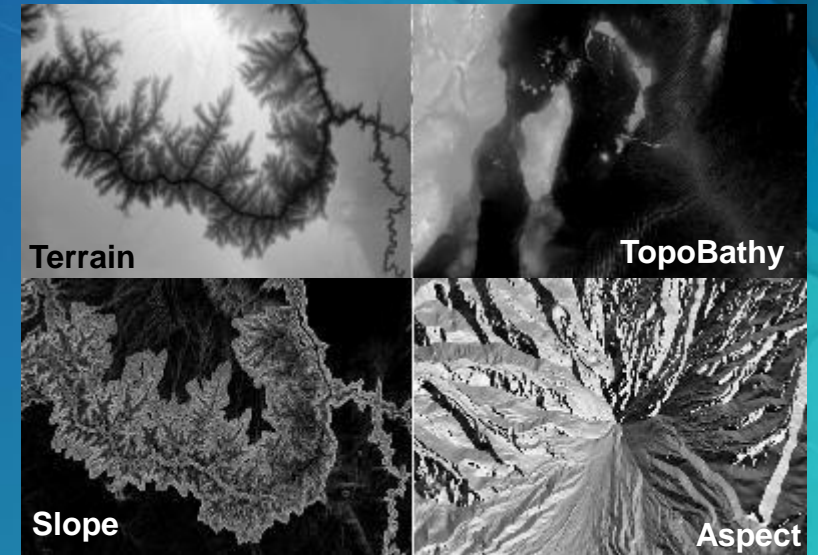
- WPE 2015 will be updated in Q3 with new UN estimates from 2015.



Landscape - Terrain and TopoBathy Layers

Elevation

- Global collection of multi-resolution & multi-source
 - 1000 meters to 2 meters
 - 47000 rasters (~ 830 GB)
- Best public and community data
 - USGS, NASA, NGA, CGIAR and national mapping organizations
 - 15 authoritative data provides
- Ready to use maps and tools
 - Visualization and Analysis
 - 2D and 3D
- Included with Online Subscription
 - No credits
 - No download



Landscape - Community Elevation

Terrain and Topobathy Layers

- Elevation Community Program
 - 10m resolution or better bare earth. Lidar preferred or Bathymetric data better than 1KM GEBCO
 - Content becomes part of the Terrain and Topobathy services, Cached hillshade, 3D Cache, and Data appliance.
 - Lidar is now being used to create bare earth city areas where GIS pros can add 3D services.
 - The community elevation program is also now taking lidar and creating 2D building footprints and providing them back to communities. This is a jump start for many communities thinking about creating 3D cities.
- New Communities
 - Spain 5-10m, Finland/Denmark 3m and 10m, Austria 10m, Netherlands 3m, Wales 2m, England 2m, France Grand Geneva 0.5m. USA Lidar program called 3DEP.

Landscape

What:

Airbus WorldDEM4Ortho Product
24m Global dataset with 4m Vertical accuracy

This is a massive improvement over other products like SRTM

Export Exceptions

Kosovo, Senegal coming later 2017
Not available due to export restrictions
Ethiopia, DR of the Congo, Ukraine,
Eritrea, Azerbaijan, West-bank, Gaza-strip

When:

Q4 2017



Esri Content Portfolio within Living Atlas

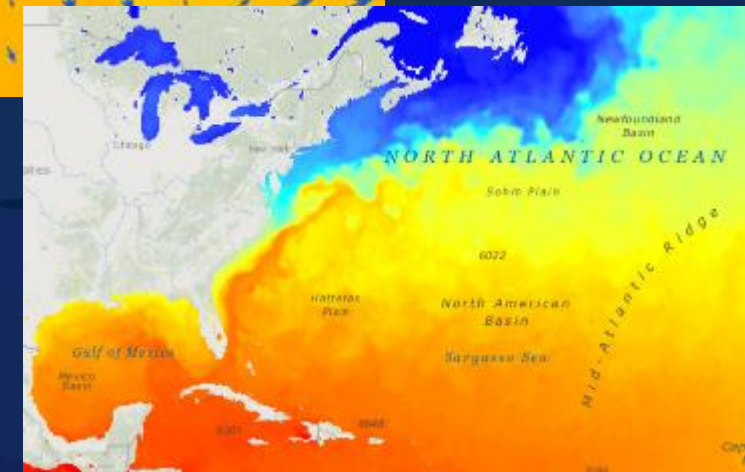
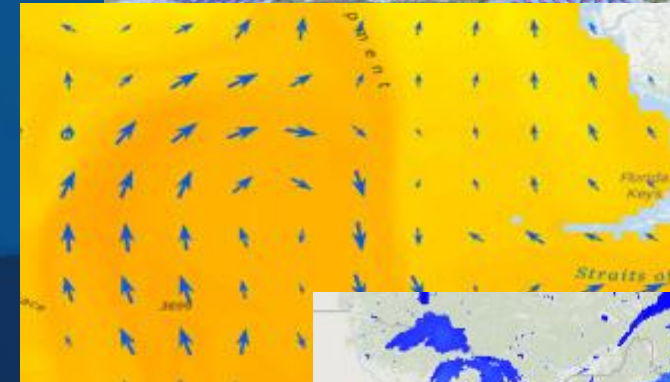
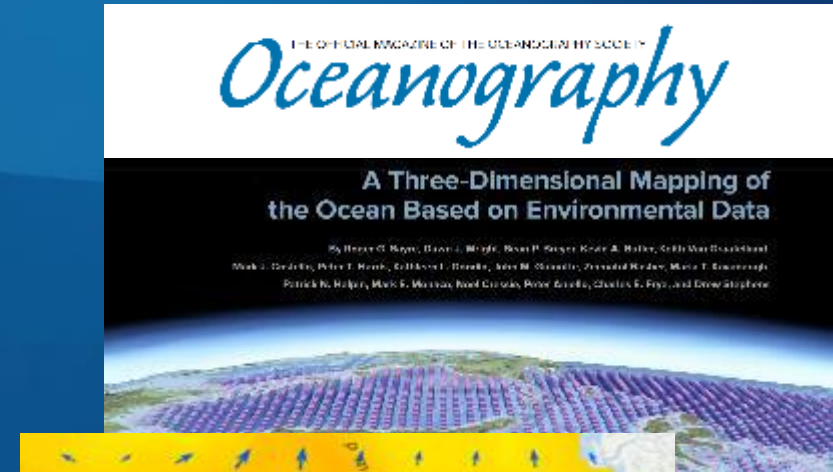
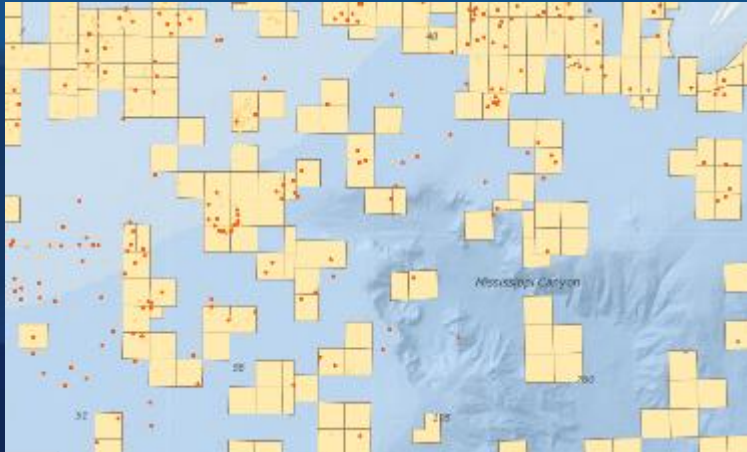
Esri Content Portfolio within Living Atlas



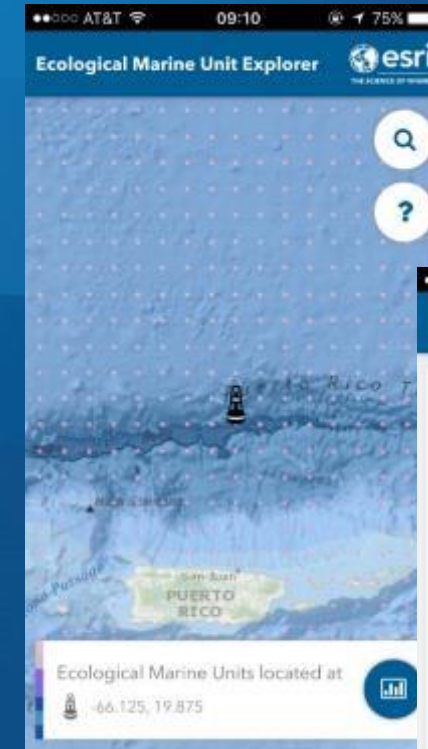
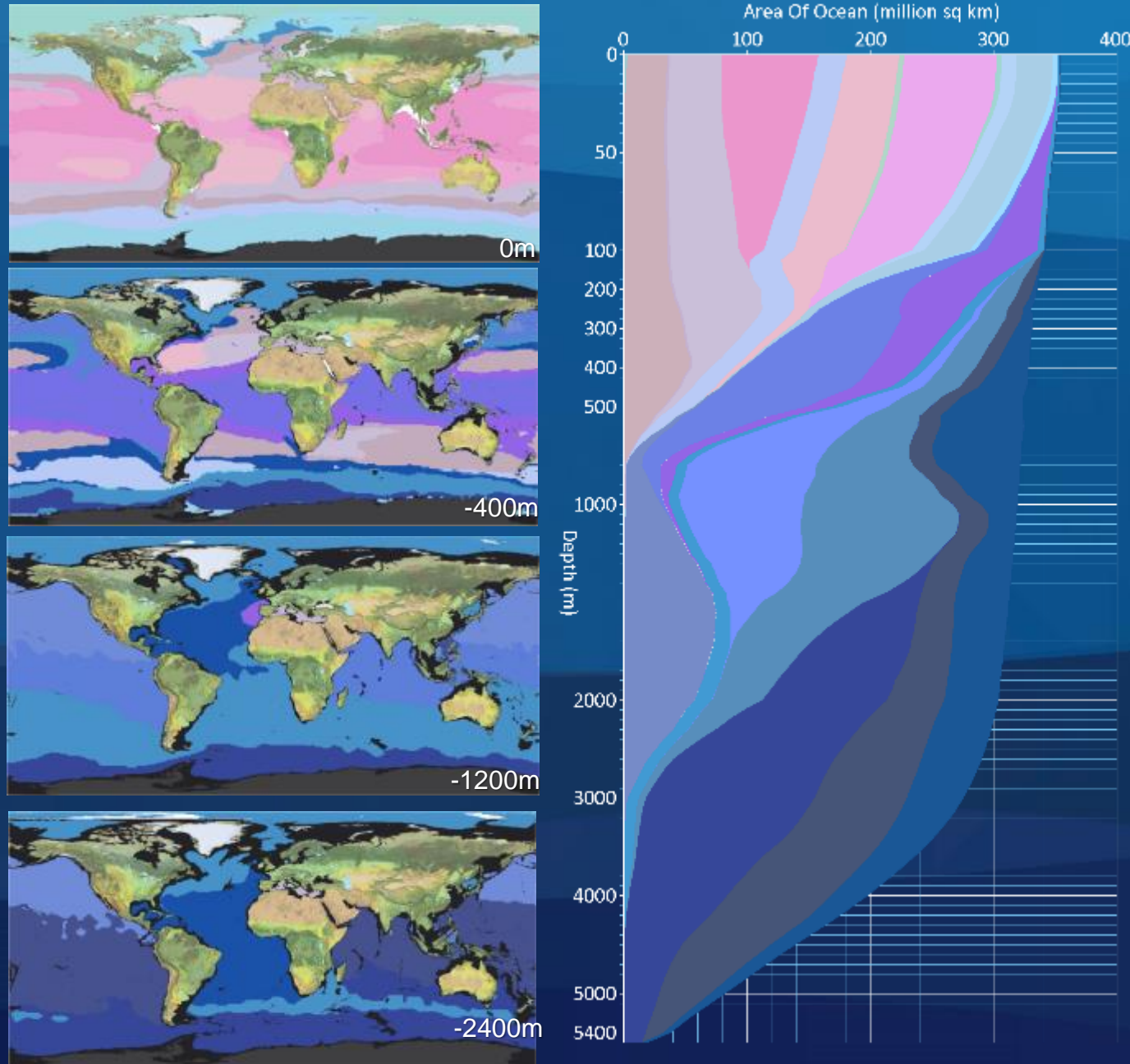
Oceans

- **New Layers**

- **Ecological Marine Units**
- **Daily Sea Surface Temperatures**
- **Transitioning to BOEM to support existing layers**
- **New HYCOM 30 day history - 7 day forecast/ 3hr**



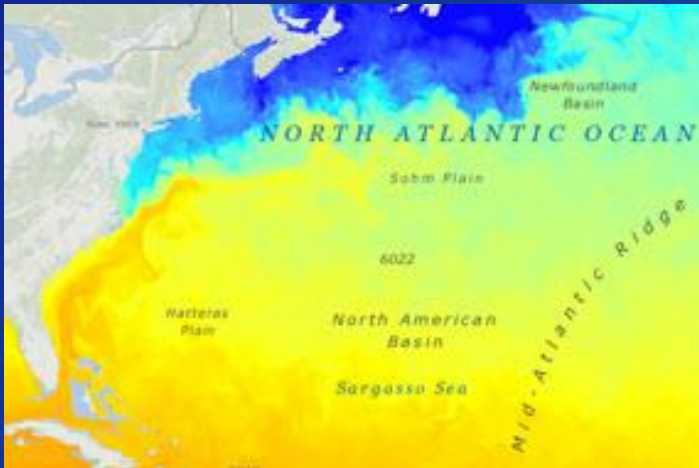
Oceans - Ecological Marine Units (EMUs)



EMU Story Map (New): <http://arcg.is/2rErPAI>
EMU Website: <http://www.esri.com/ecological-marine-units>

Oceans – HYCOM (HYbrid Coordinate Ocean Model)

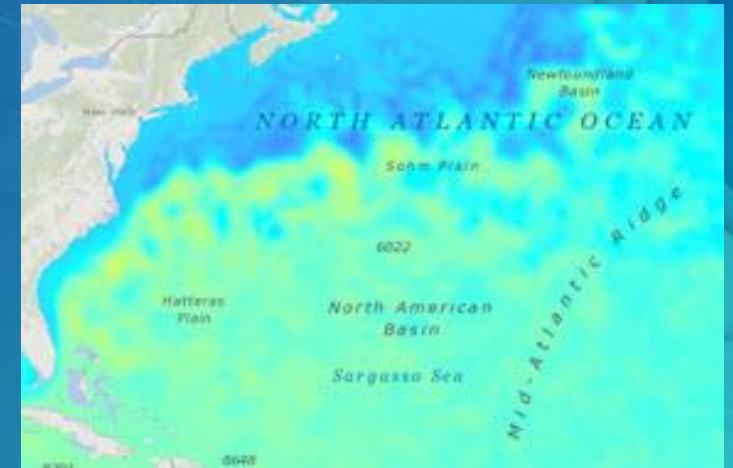
HYCOM Example - Beta



Sea Water Temperature (Available in Celsius and Fahrenheit).



Salinity (Practical Salinity Scale - PSS)



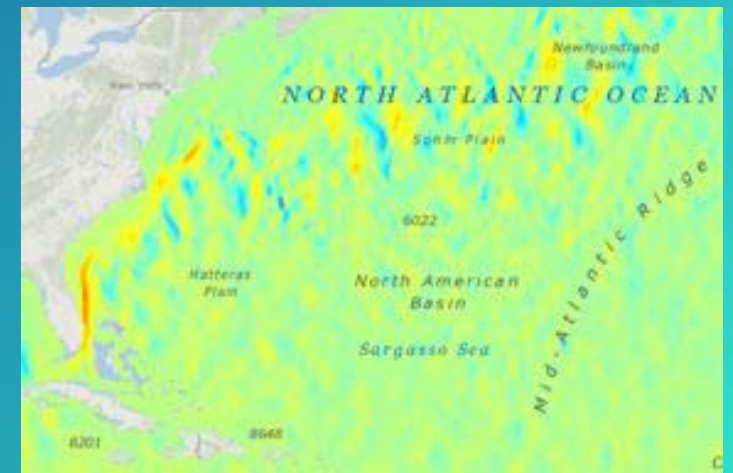
Sea Surface Elevation (Available in meters and feet)



Sea Water Current (As vector arrows for visualization)



Eastward Velocity (ms-1)



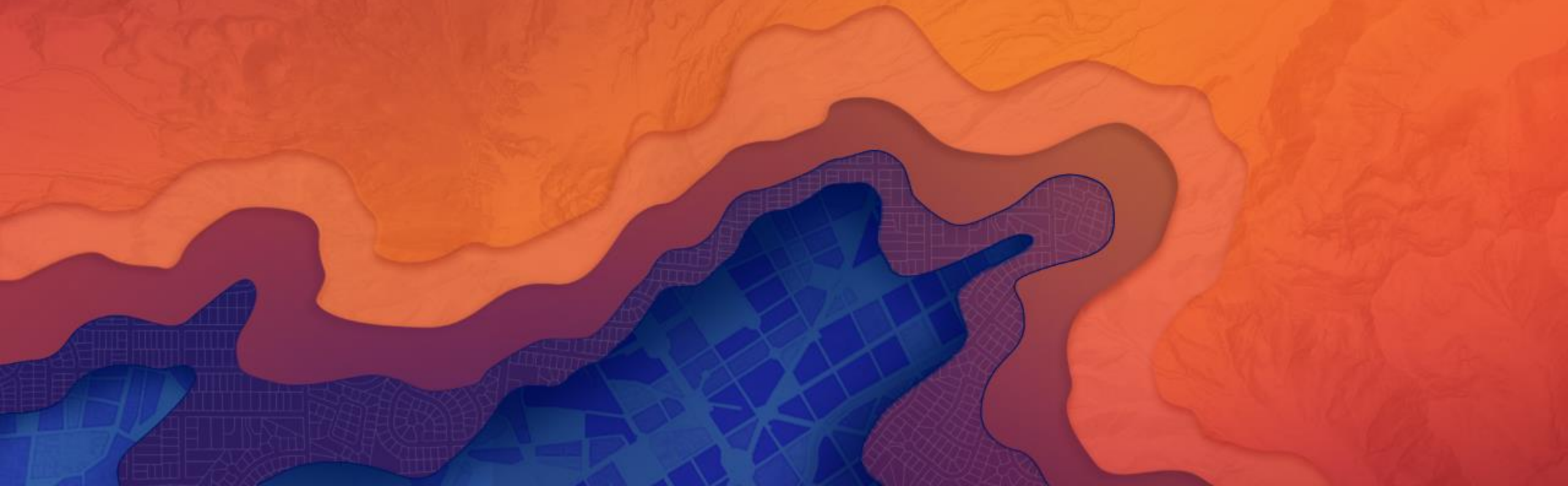
Northward Velocity (ms-1)

Oceans – HYCOM Next Steps

- Ocean Front detection.
- Route optimization against the current velocity and information for shipping vessels.
- Ability to use in emergency response operations such as rescue operations, and pollutant tracking to help determine probable areas for searching based on current conditions (implement message in a bottle capability).
- Field operations planning for maritime industry divers and survey equipment – provide ability to plan for safe operations.
- Incorporating other remotely sensed data – like chlorophyll, etc. to help identify hot spot areas for fishing, security, or fishery planning.

How to Participate

Contribute to the Living Atlas of the World



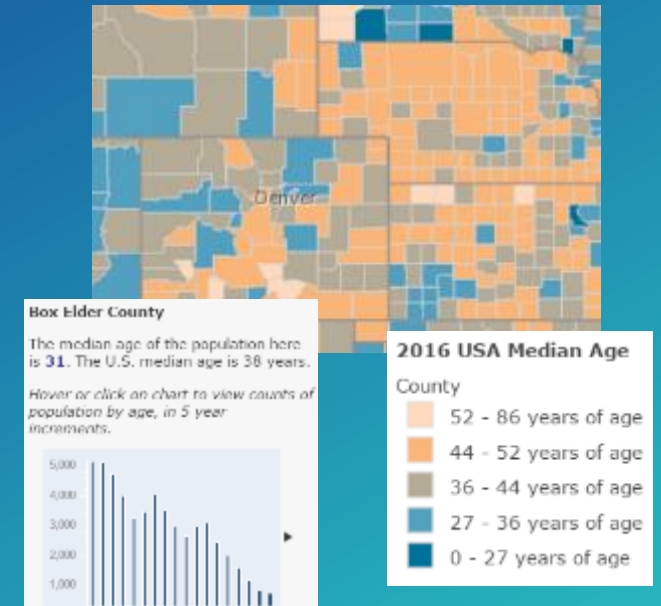
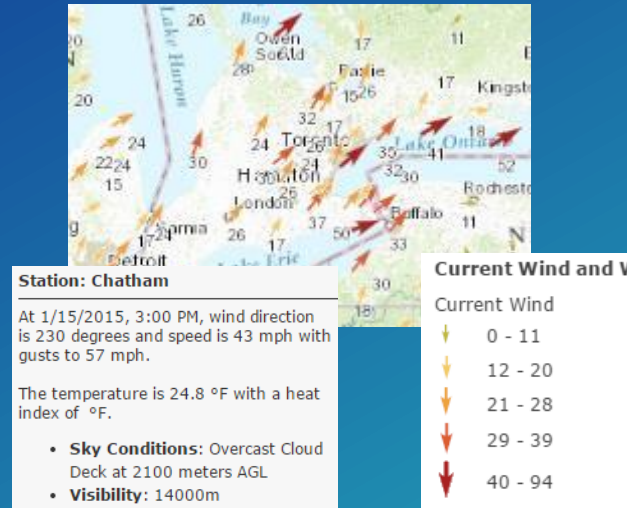
How to Participate in the Living Atlas Community

- Living Atlas Community includes:
 - **Contributors**: who **publish content** that is included in the Living Atlas
 - **Curators**: who **review, approve, and organize content** that is included in the Living Atlas
- Living Atlas Contributors can participate by:
 - a) Publishing content directly through ArcGIS Online
 - b) Publishing content indirectly through Community Maps
- Go to **livingatlas.arcgis.com** to Get Started!

Acceptance Criteria for Items in the Living Atlas

Minimum Requirements for Consideration and Inclusion

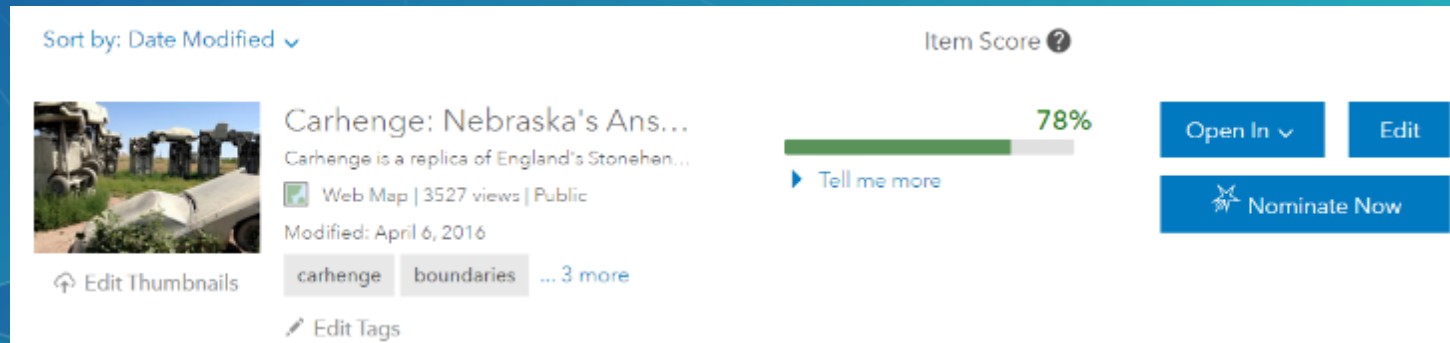
- ✓ Well-designed cartography
- ✓ Reliable and performant
- ✓ Well-configured pop-ups
- ✓ Well-defined legend
- ✓ Well-maintained data
- ✓ HTTPS enabled in item
- ✓ Follows Best Practices for Sharing
 - ✓ Attractive thumbnail, informative item details, descriptive user profile
- Online Resources: [Contribute to the Living Atlas](#), [Best Practices for Sharing](#)
 - Sample Maps: [2016 Median Age in USA](#), [Current Wind and Weather Conditions](#)



Living Atlas Contributor: Publish Content through ArcGIS Online

Publish and Share Your Maps and Apps through ArcGIS.com to Enrich the Living Atlas

1. Create Item in ArcGIS.com using your ArcGIS Online Account / Organization
 - Layers can reference ArcGIS Online hosted services, ArcGIS Server services, WMS, etc.
 - Create new items for ArcGIS Server services and layers if you host them
 - Web maps can reference these layers or other feature collections that you publish
2. Follow [Best Practices for Sharing](#) and Share Items with “Everyone (public)”
3. Nominate your Items using the new [Living Atlas Contributor app](#)

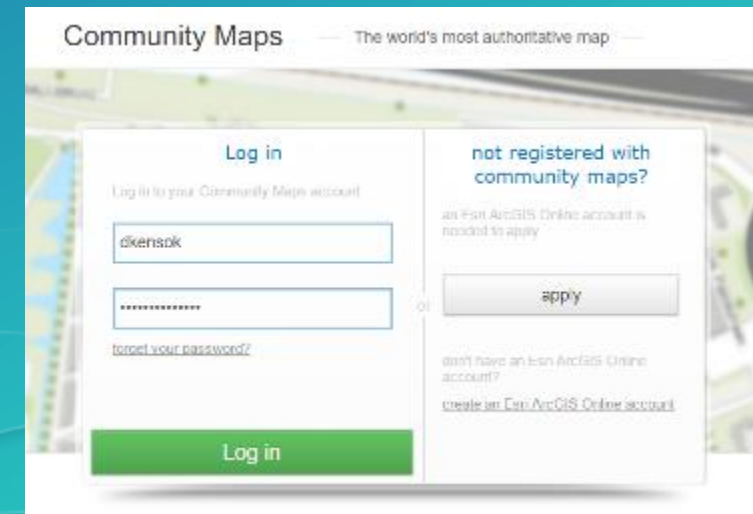


livingatlas.arcgis.com/contribute

Living Atlas Contributor: Publish Content through Community Maps

Help Us Make Community Maps better with Your Data

- Goal is to Blend Your Local, Authoritative Data into the Appropriate Community Map
 - Improve the maps and layers with better data
- Identify Community Map(s) you can Support
 - World Imagery, World Topo Map, World Street Map, Ocean Basemap, World Elevation, etc.
- Get Started by using our Community Maps Contributor App
 - Register at communitymaps.arcgis.com
- Contributor App being updated to Simplify Process
 - **New option to register hosted feature service to deliver data!**





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