

Spatial Analysis in ArcGIS Online

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Our Earth Video Channel: <https://esriurl.com/ouearth>

Today's Workshop

1. What is spatial analysis?
2. Data for analysis.
3. 5 Simple but Powerful Spatial Analysis tools.
4. Cholera -- Classic Overlay -- Statistical Analysis
Tessellations -- Interpolating Surfaces -- Joining to ArcGIS Online

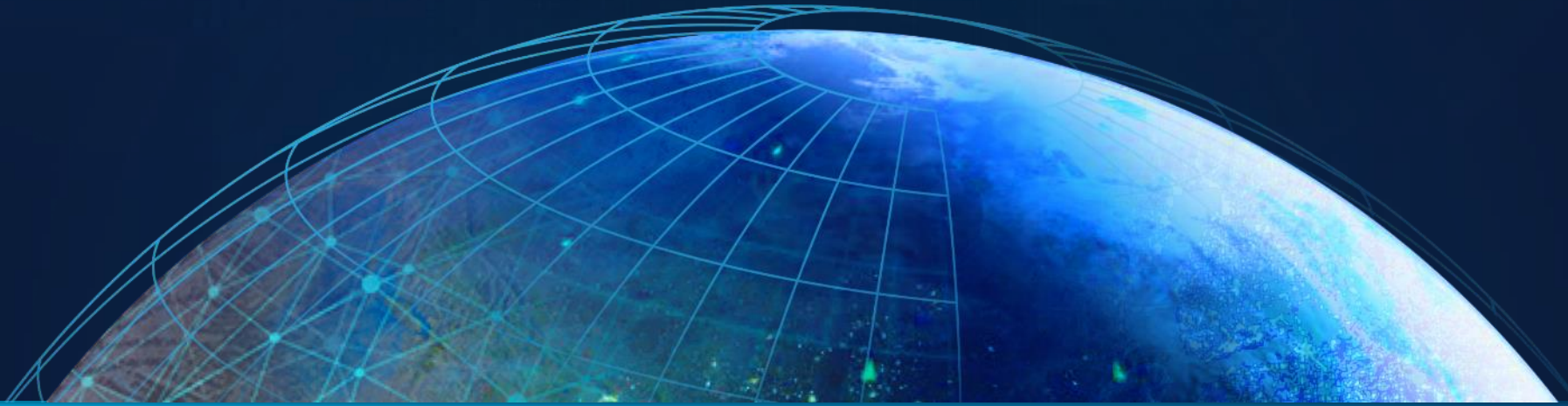


Threading throughout the workshop...



*Why teach and do research
with analysis tools?*

How to teach with analysis tools?



GIS objectives:

Analysis, databases, field methods, expressions, media fluency, classification, measurement ...

Content objectives: population, crime, weather, hazards, watersheds, ecoregions, ocean currents ...

Thinking objectives: scale, systems, permissions, giving presentations, solving problems ...



Spatial Thinking | Spatial Analysis | Defined

My definition of spatial thinking:

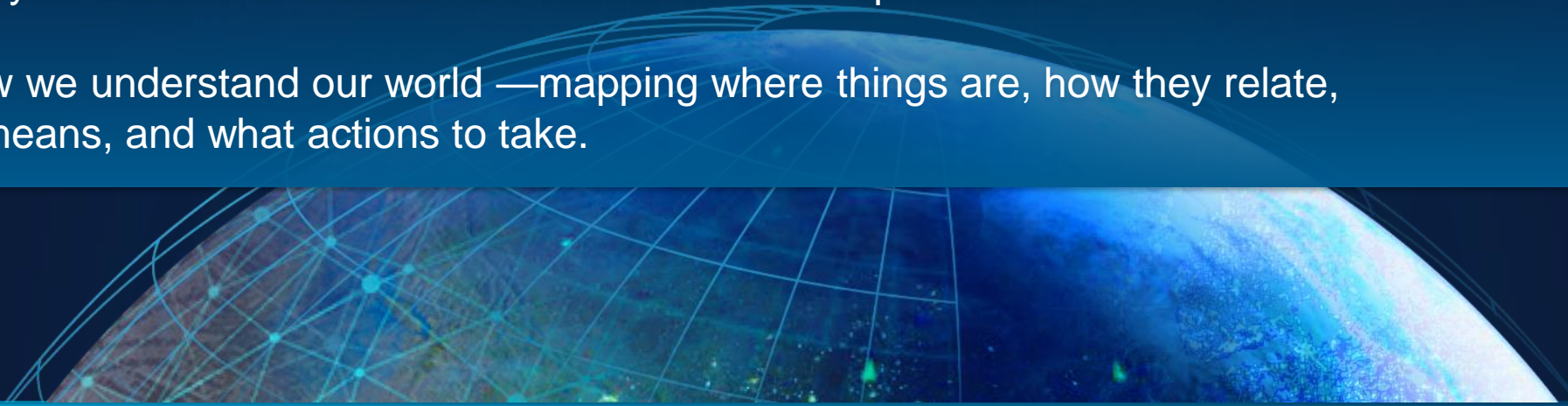
“Identifying, analyzing, and understanding the location, scale, patterns, and trends of the geographic and temporal relationships among data, phenomena, and issues.” (Kerski)

Esri Definition of Spatial Analysis:

“The process of examining the locations, attributes, and relationships of features in spatial data through overlay and other analytical techniques in order to address a question or gain useful knowledge.

Spatial analysis extracts or creates new information from spatial data.

Or: It is how we understand our world —mapping where things are, how they relate, what it all means, and what actions to take.



Components of Spatial Analysis

- Understanding where.
- Measuring size, shape, distribution.
- Determining how places are related.
- Finding the best locations and paths.
- Detecting and quantifying patterns.
- Making predictions.

THE LANGUAGE OF SPATIAL ANALYTICS

Using *The Science of Where* to understand our world—mapping where things are, how they relate, what it all means, and what actions to take.

Understanding where

- 1 Understanding where things are (location maps).
- 2 Understanding where the variations and patterns in values are (comparative maps).
- 3 Understanding where and when locations and values change.

Measuring size, shape, and distribution

- 4 Calculating individual feature geometries.
- 5 Calculating geometries and distributions of feature collections.

Determining how places are related

- 6 Determining what is nearby or coincident.
- 7 Determining and summarizing what is within an area(s).
- 8 Determining what is closest.
- 9 Determining what is visible from a given location(s).
- 10 Determining overlapping relationships in space and time.

Finding the best locations and paths

- 11 Finding the best locations that satisfy a set of criteria.
- 12 Finding the best allocation of resources to geographic areas.
- 13 Finding the best route, path, or flow along a network.
- 14 Finding the best route, path, or corridor across open terrain.
- 15 Finding the best supply locations given known demand and a travel network.

Detecting and quantifying patterns

- 16 Where are the significant hot spots, anomalies, and outliers?
- 17 What are the local, regional, and global spatial trends?
- 18 Which features/pixels are similar, and how can they be clustered, classified, and identified?
- 19 Are spatial patterns changing over time?

Making predictions

- 20 Given a success case, identifying, ranking, and predicting similar locations.
- 21 Finding the factors that explain observed spatial patterns and making predictions.
- 22 Interpolating a continuous surface and trends from discrete sample observations.
- 23 Predicting how and where objects spatially interact (attraction and decay).
- 24 Predicting how and where objects affect wave propagation.
- 25 Predicting where phenomena will move, flow, or spread.
- 26 Predicting what-if.

esri | THE SCIENCE OF WHERE™

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The Language of spatial ANALYSIS

Vocabulary

making PREDICTIONS



26. Predicting what-if.
25. Predicting where phenomena will move, flow, or spread.
24. Predicting how and where objects affect wave propagation.
23. Predicting how and where objects spatially interact (attraction and decay).
22. Interpolating a continuous surface and trends from discrete sample observations.
21. Finding the factors that explain observed spatial patterns and making predictions.
20. Given a success case, identifying, ranking, and predicting similar locations.

detecting and quantifying PATTERNS



19. Are spatial patterns changing over time?
18. Which features/pixels are similar, and how can they be grouped together?
17. What are the local, regional, and global spatial trends?
16. Where are the significant hot spots, anomalies, and outliers?

finding THE BEST LOCATIONS AND PATHS



15. Finding the best supply locations given known demand and a travel network.
14. Finding the best route, path, or corridor across open terrain.
13. Finding the best route, path, or flow along a network.
12. Finding the best allocation of resources to geographic areas.
11. Finding the best locations that satisfy a set of criteria.

determining HOW PLACES ARE RELATED



10. Determining overlapping relationships in space and time.
9. Determining what is visible from a given location(s).
8. Determining what is closest.
7. Determining and summarizing what is within an area(s).
6. Determining what is nearby or coincident.

measuring SIZE, SHAPE, AND DISTRIBUTION



5. Calculating geometries and distributions of feature collections.
4. Calculating individual feature geometries.

understanding WHERE



3. Understanding where and when things change.
2. Understanding where the variations and patterns in values are (comparative maps).
1. Understanding where things are (location maps).

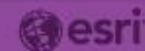
how we understand our world—
mapping where things are,
how they relate, what it all means,
and what actions to take

- Ask questions
- Explore the data
- Analyze and model
- Interpret the results
- Repeat as necessary
- Present the results
- Make a decision

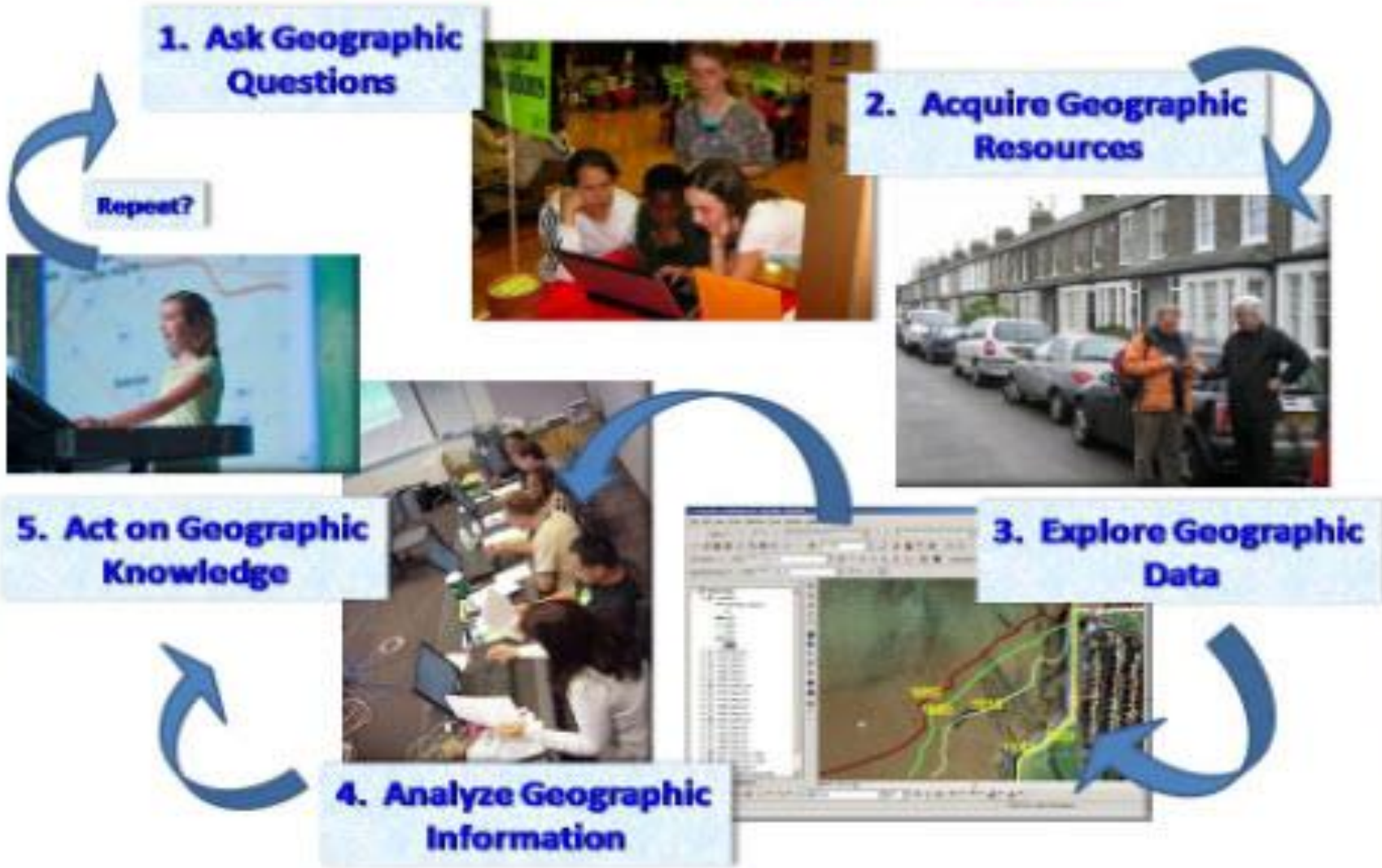
process

- Achieve objectives
- Improve program outcomes
- Reduce costs
- Avoid costs
- Increase efficiency and productivity
- Increase revenue
- Assure revenue
- Protect staff and citizens
- Support regulatory compliance
- Improve customer service
- Enhance customer satisfaction
- Enhance competitive advantage

benefits



The Geographic Inquiry Process



Is this spatial analysis?

<https://www.urbanobservatory.org/compare/index.html>

The screenshot displays the Urban Observatory interface. On the left is a navigation menu with categories: Themes, Work (Commercial, Industrial, Predominant Occupations), Movement (Highway Access, Roadspeed, Traffic, Transportation Noise, Airports, Railroads, Transit Access, Ports), and People (Housing Density, Population Density, Senior Population, Youth Population, Population Growth). The 'Senior Population' option is selected. The main content area shows a comparison of three cities: New York, Accra, and Tokyo. Each city has a map showing a dot distribution of seniors (age 65 and over) and a descriptive text box below it. The text for each city is identical: 'This map shows where seniors reside in the city, and emphasizes areas where seniors are more than 10% of the total. The map layers show a dot distribution to represent the population, where each dot represents a number of people age 65 and over in that area. The dot values are adjusted by scale to get the best representation of the distribution. The value...'. The maps include scale bars (10km/6mi for New York and Tokyo, 20km/10mi for Accra) and zoom controls. The city names are highlighted in red above their respective maps.

Is this spatial analysis?

<https://livingatlas2.arcgis.com/landsatexplorer/>

The screenshot displays the Landsat Explorer web application interface. At the top, the title "Landsat Explorer" is followed by "Rendering: Agriculture", "Comparison Date: April 24, 2020", and "Imagery Date: February 4, 2000". On the right side, there are "Sign In" and social media icons for Facebook, Twitter, and LinkedIn.

The main interface features a search bar with the text "Find a place". Below it is a "Time Selector" overlay with the following options:

- Comparison Date: April 24, 2020
- Image Date: February 4, 2000
- Cloud Filter: 10% Cloud
- Season Filter: All

A tooltip on the map says "Click to add a point". A blue square on the map indicates a selected point. The map shows a satellite image of agricultural land with various colored circles (green, purple, red) overlaid, representing different data points or features. A scale bar at the bottom left shows 0, 1.5, and 3 km. The bottom center displays coordinates: "43.829 26.860 Degrees". The bottom right corner includes the text "POWERED BY esri" and "FarsiGeotech, Esri, HERE, Garmin, USGS, NGA".

Is this spatial analysis?

<https://livingatlas.arcgis.com/wayback>

The screenshot displays the 'World Imagery Wayback' interface. On the left, a sidebar contains a search bar, navigation controls (zoom in, zoom out, home), and a list of historical dates. The main map area shows a satellite view of a residential neighborhood with a grid of streets. A blue overlay box labeled 'Wayback 2014-02-20 preview' is positioned over a portion of the map, showing a different view of the same area. A 'reference label overlay' checkbox is visible in the top right corner of the map area.

World Imagery Wayback

Find address or place

Wayback 2019-06-26

Click map for imagery details

Only versions with local changes

Date	Share	Refresh
2019-06-26		
2018-06-27		
2018-01-08		
2016-06-13		
2015-04-30		
2014-02-20		

Wayback 2014-02-20 preview

reference label overlay

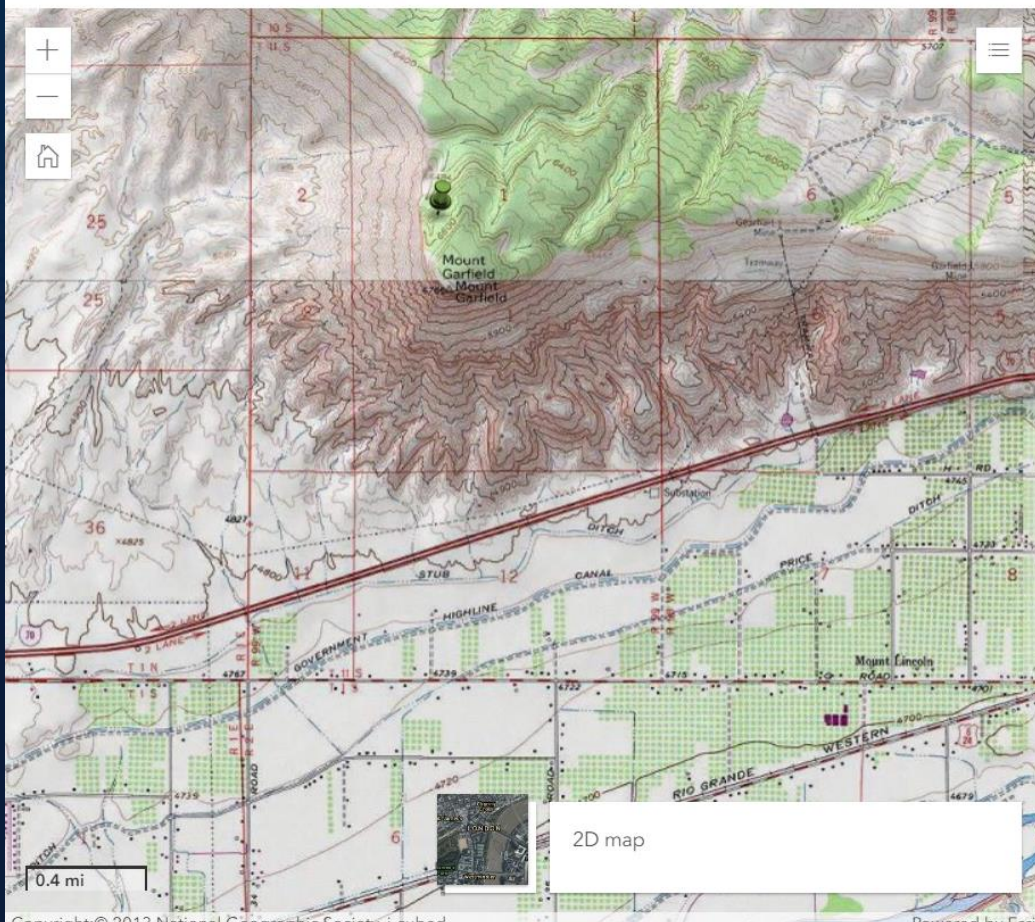
Clark County Dept of Aviation, Esri, HERE, Garmin, SafeGraph, INCREMENT P, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

Powered by Esri

Is this spatial analysis?

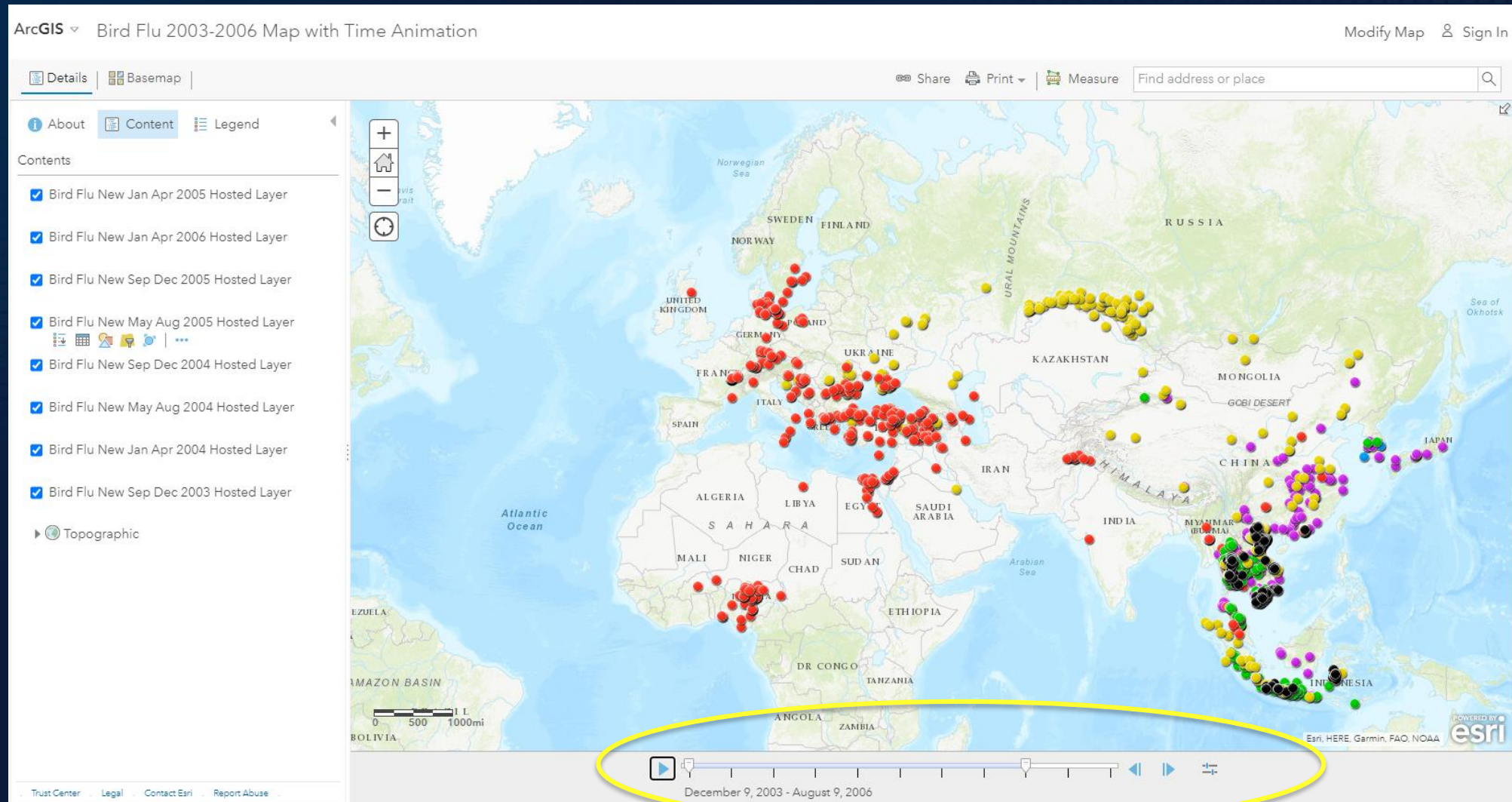
<https://k12.maps.arcgis.com/apps/Compare/index.html?appid=2dde635eef79449caffbf6a0f71e4c11>

Palisade and Mt Garfield Colorado 2D and 3D compare app



Is this spatial analysis?

<https://www.arcgis.com/home/webmap/viewer.html?webmap=c83b8aed9ee244a7ae17c1d3147f2431>



Is this spatial analysis?

Arcade scripting:

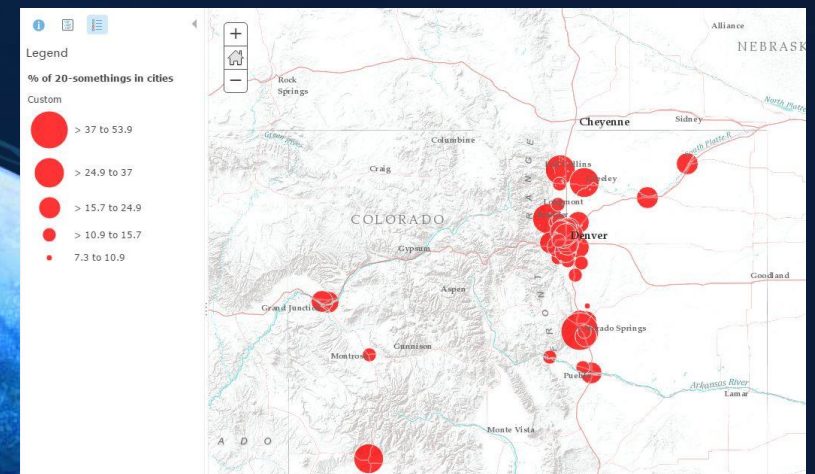
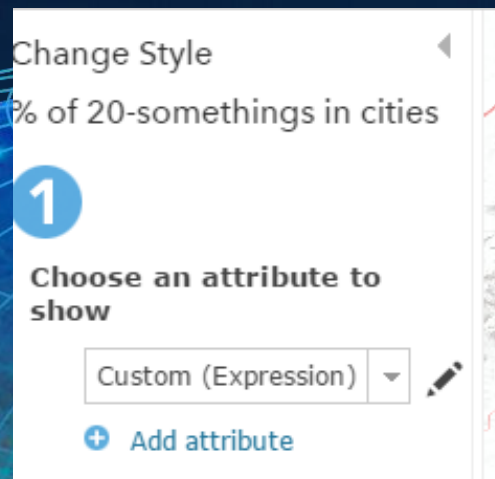
Under "Change Style" is where you enter the expression, under "Custom (Expression)" (below):

Calculate the percentage of 18 to 21 plus 22 to 29 year olds out of the total population for each city in data set:

Round ((($\$feature.AGE_22_29 + \$feature.AGE_18_21$) / $\$feature.POP2000$) * 100, 2)

Resulting map:

<http://www.arcgis.com/home/webmap/viewer.html?webmap=b90ad50f16ec4af6bac778bda7aec5ac>



About lessons and tools



Photo
by
Joseph
Kerski

Taken in
an
actual
High
School.

Your role as instructor is critical



This mobile home was destroyed by a relatively weak EF0 tornado.

What is the most important tool of all?

Considering data

Old school but still viable: Download data > Process Data > Analyze

New paradigm: Stream data > Analyze

Example 1: Local government GIS portal:

<https://opendata-bouldercounty.hub.arcgis.com/datasets/floodplain-fema-regulated>

Boulder County Geospatial Open Data

Overview | **Data** | API Explorer

Download | APIs

FEMA DFIRM (Digital Flood Insurance Rate Map) floodplain effective December 18, 2012, created for Boulder County and all municipalities within under the direction of the FEMA Map Modernization project. This data supercedes all other flood data.

About
Boulder County Open Data 2.0
Content
Shared By: BoulderCountyAdmin
Data Source: maps.bouldercounty.org
View Metadata
Create Webmap
Create a Story Map

AR_REVERT	AR_SUBTRV	BFE_REVERT	DEP_REVERT	DEPTH	DFIRM_ID
-----------	-----------	------------	------------	-------	----------

denver.maps.arcgis.com/home/webmap/viewer.html?panel=gallery&suggestField=true&url=https%3A%2F%2Fmaps.bouldercounty.org%...

Home | My Map | New Map | Joseph

Details | Add | Basemap | Analysis | Share | Directions | Measure | Bookmarks | Find address or place

Legend

FLOODPLAIN_FEMA_REGULATED - FEMA Regulatory Flood Risk Zones

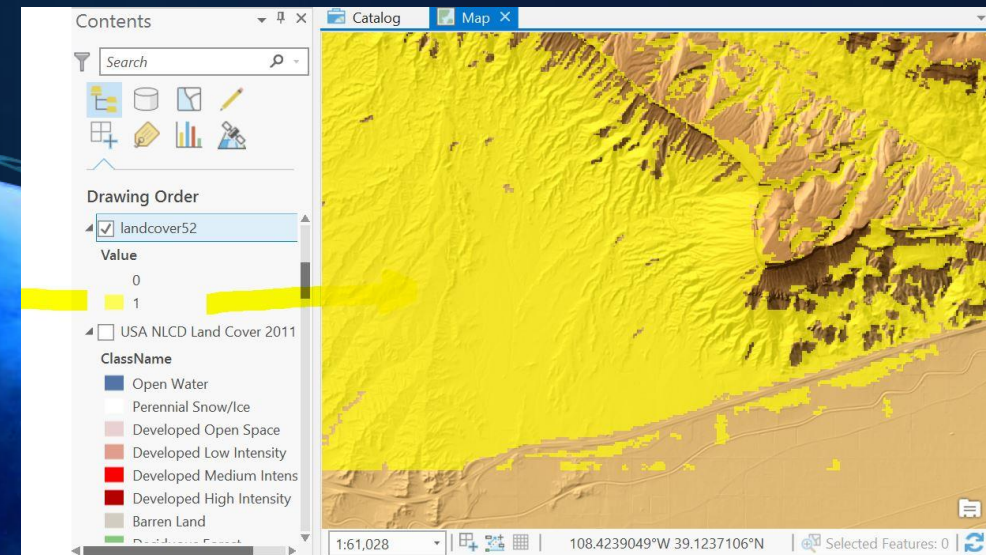
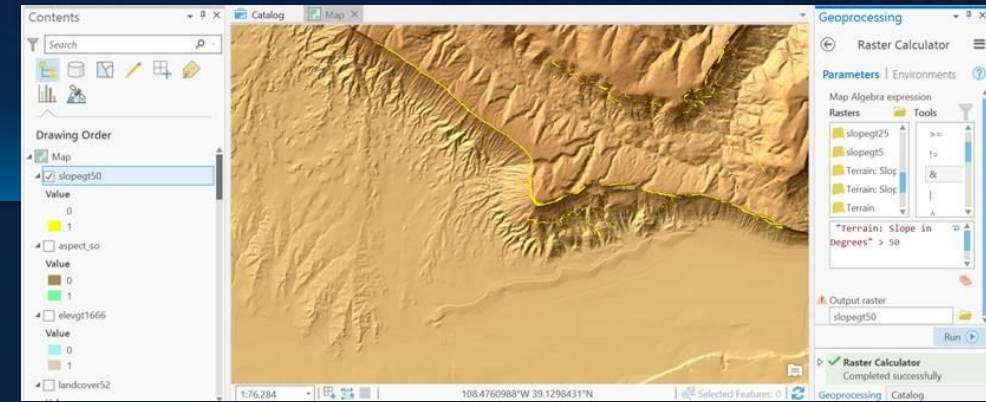
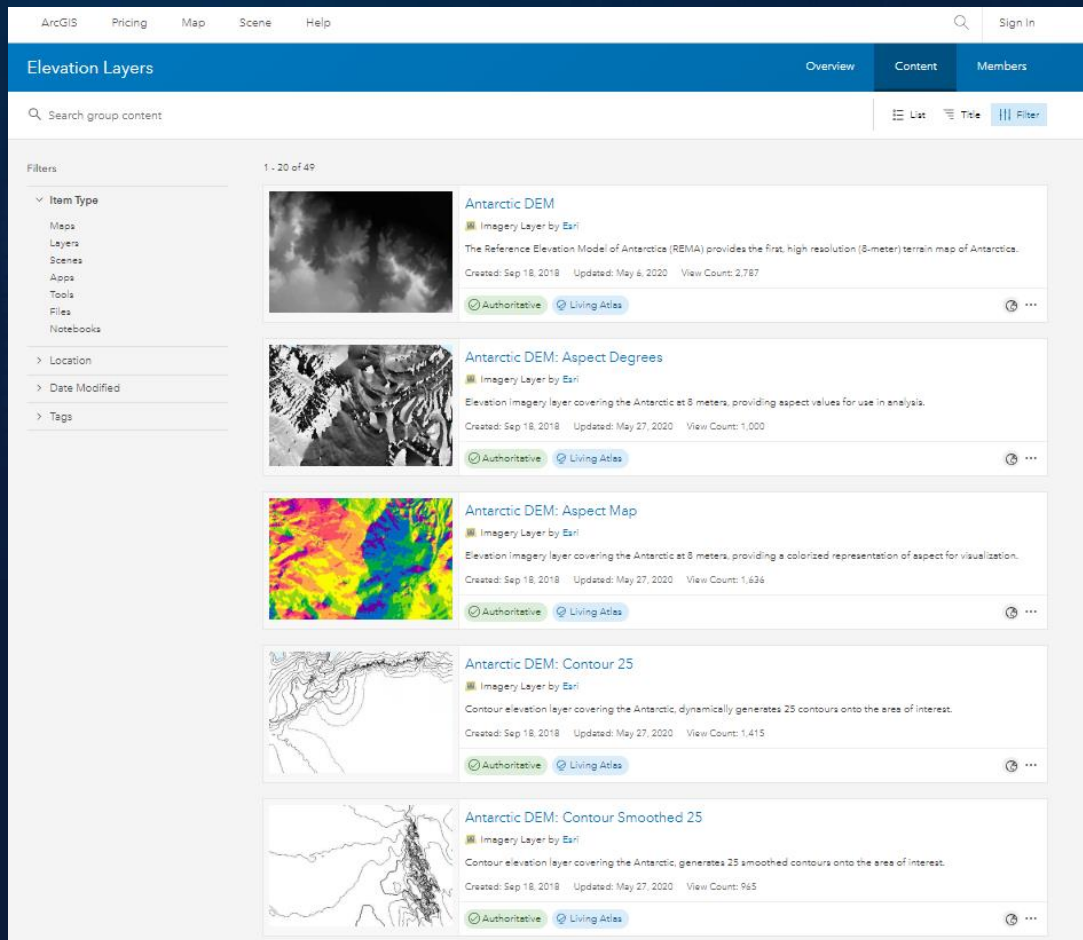
- Floodway (FEMA)
- 100-Year Floodplain - Zones AE, A, AO and AH (FEMA)
- 500-Year Floodplain - Zone X500 (FEMA)

Trust Center | Contact Esri | Report Abuse

Considering data

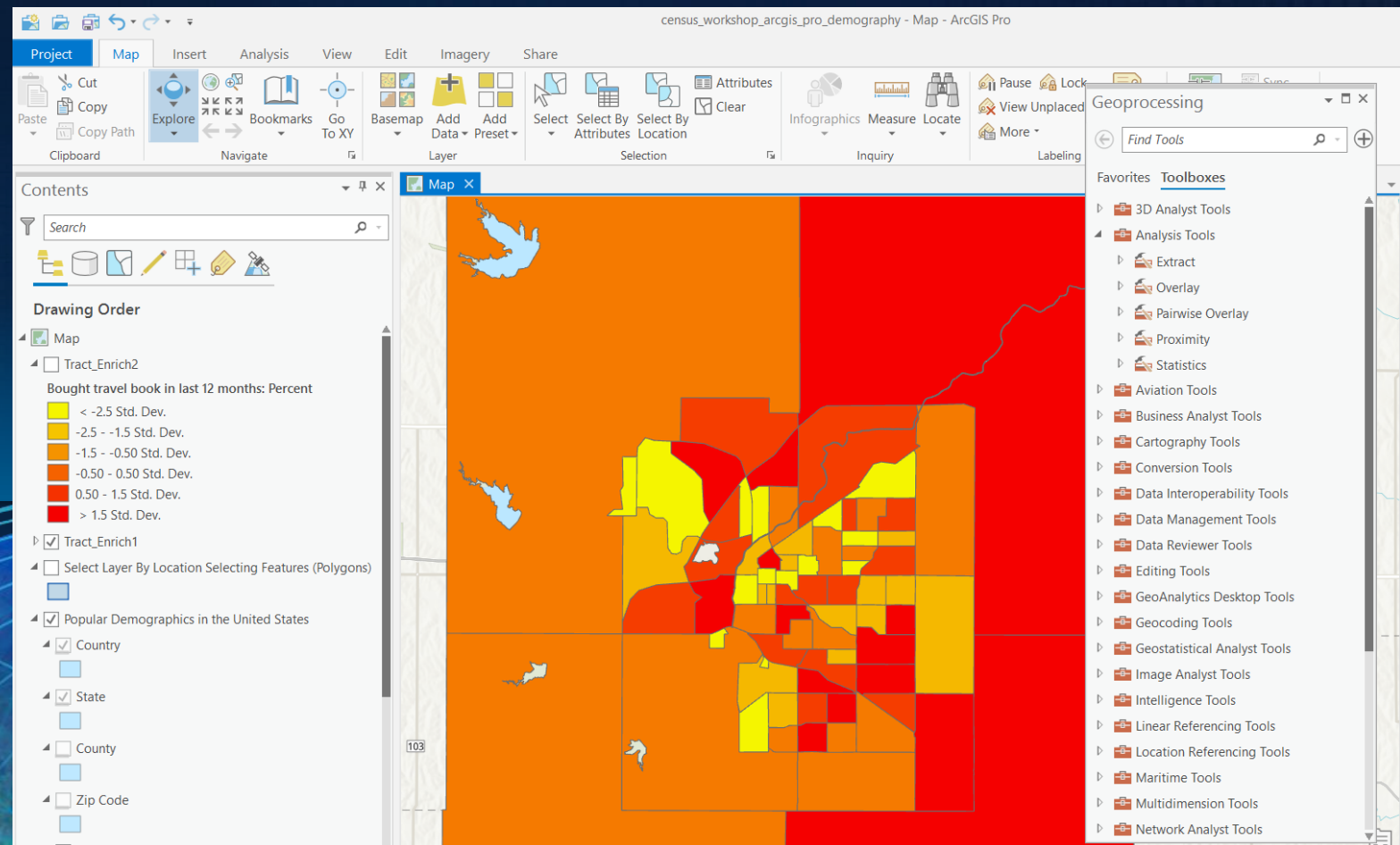
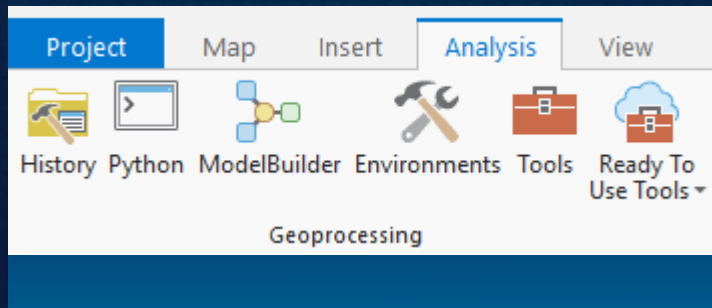
Example 2: Elevation and land cover services.

<https://community.esri.com/community/education/blog/2018/06/22/paradigm-shift-using-raster-data-in-the-cloud-for-your-gis-analysis>



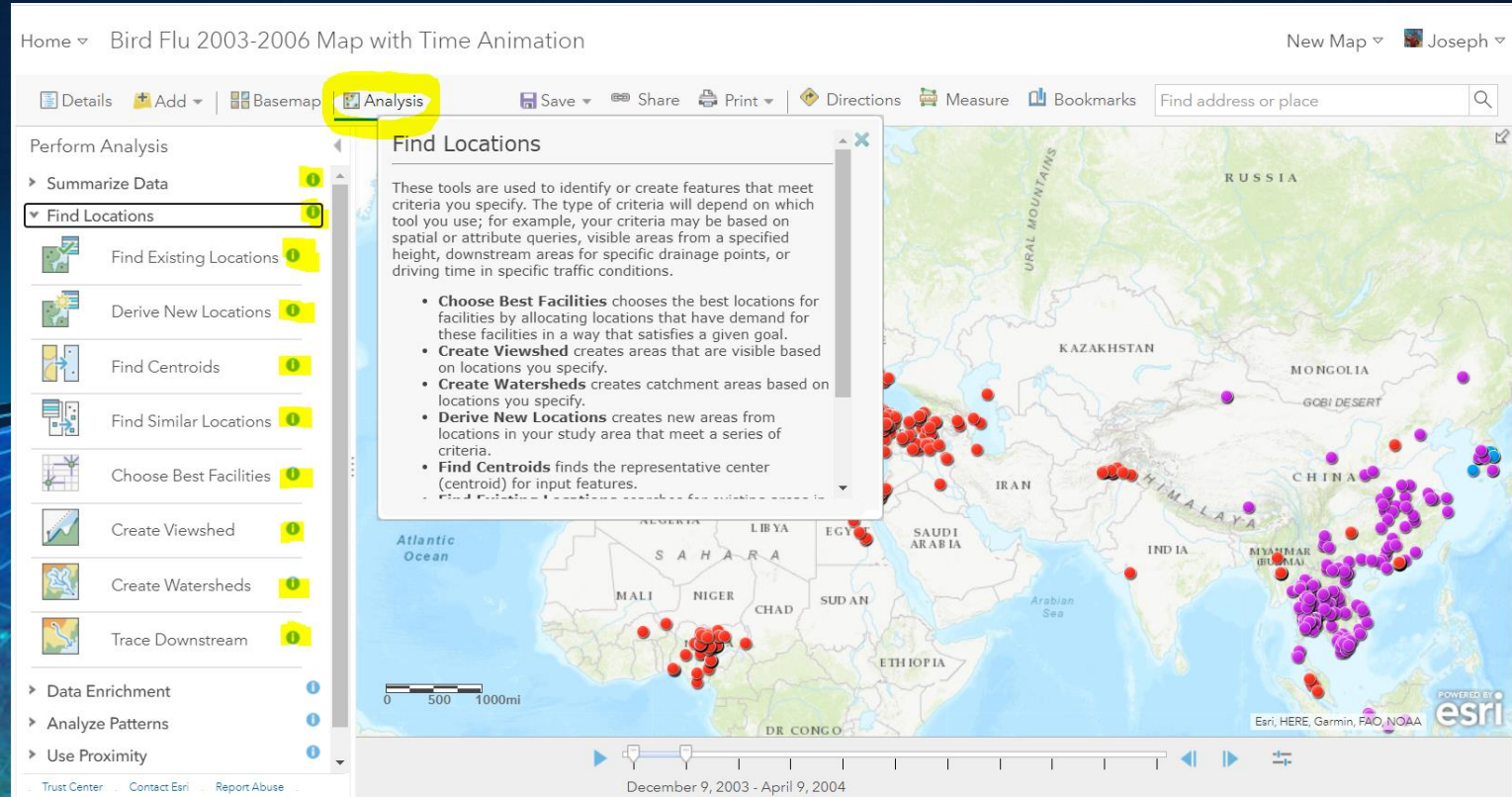
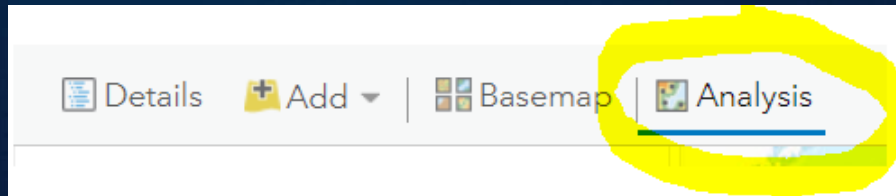
Use the most appropriate toolset for the job I

ArcGIS Pro: 1,100 tools.



Use the most appropriate toolset for the job II

ArcGIS Online: 45 tools.



ArcGIS Online analysis considerations

- Analysis creates layers!
- Creator/Publisher role
- “Use Map Extent” (or not!)
- Data size, bandwidth
- Naming; folders
- Problem-solving; tenacity
- Credits
- Sharing
- Know what you are doing!
- Consider level and background of students
- Consider goals of the course and program.

5 Simple but powerful analytical tools in ArcGIS Online

1. Proximity – Buffer
2. Viewshed
3. Trace Downstream and Create Watersheds
- 4. Mean Center and Standard Deviational Ellipse
5. Enrich



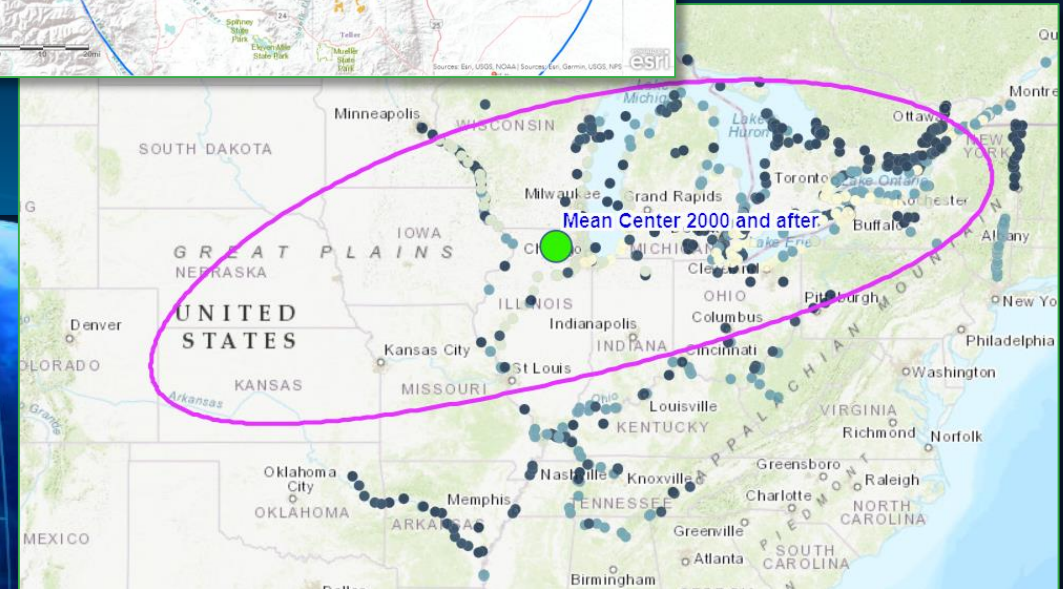
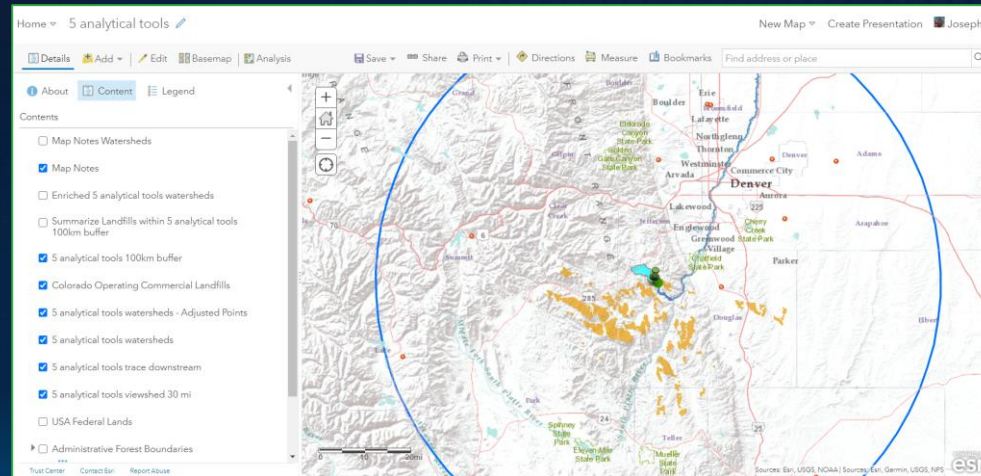
5 Simple but powerful analytical tools in ArcGIS Online

5 analytical tools

<https://arcg.is/1v9TW1>

- Zebra mussels:

<https://arcg.is/8GKyb>



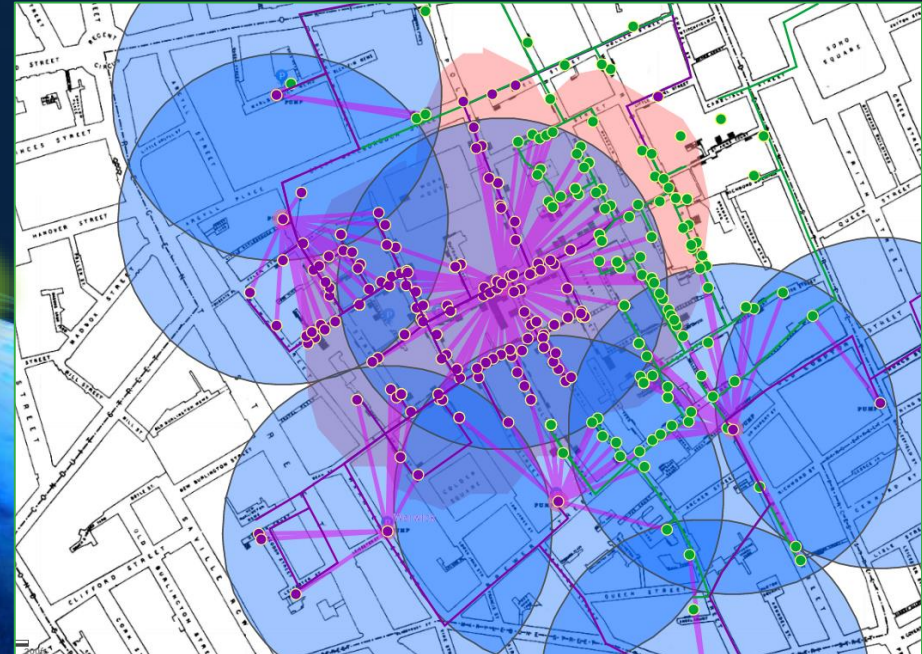
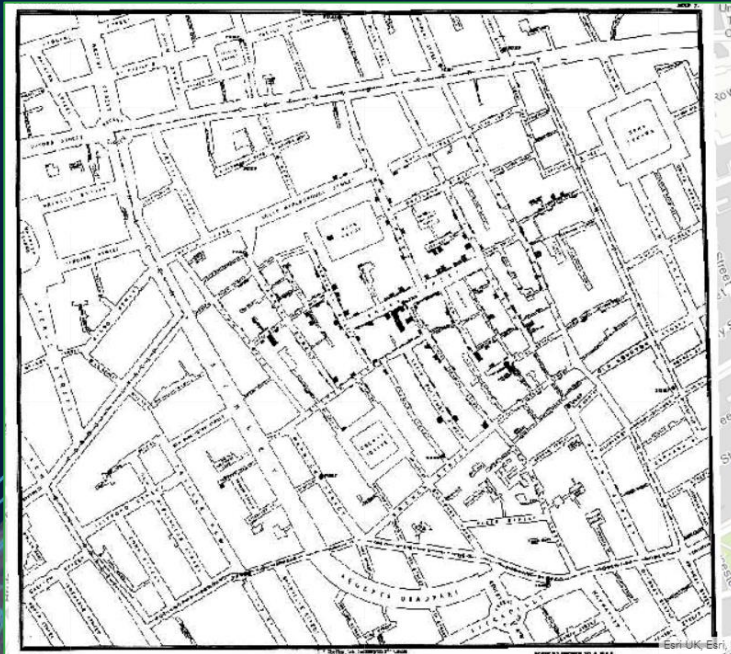
Analysis where it all started

Starting point:

<https://arcg.is/1WKS0C>

Results:

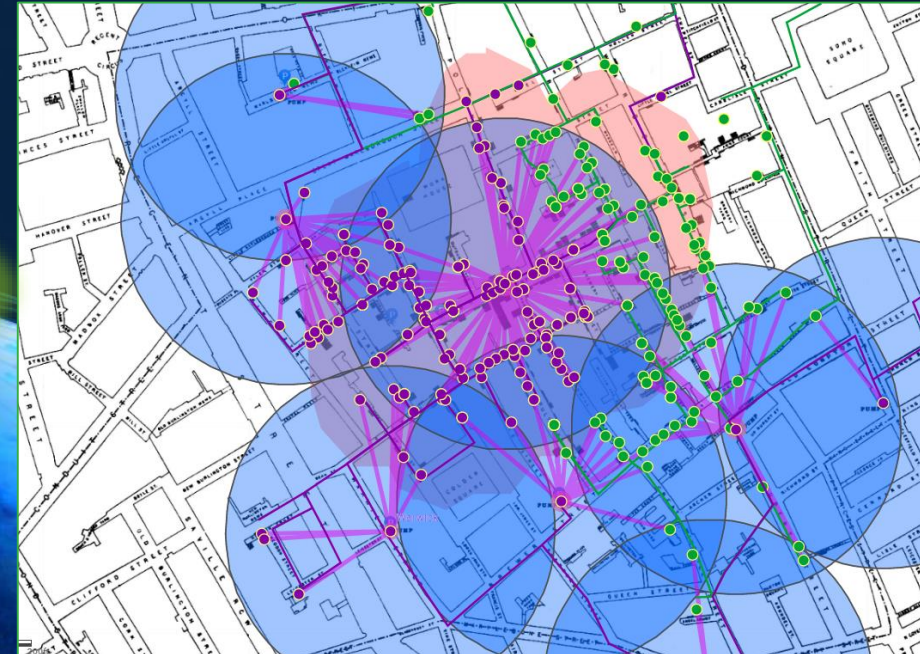
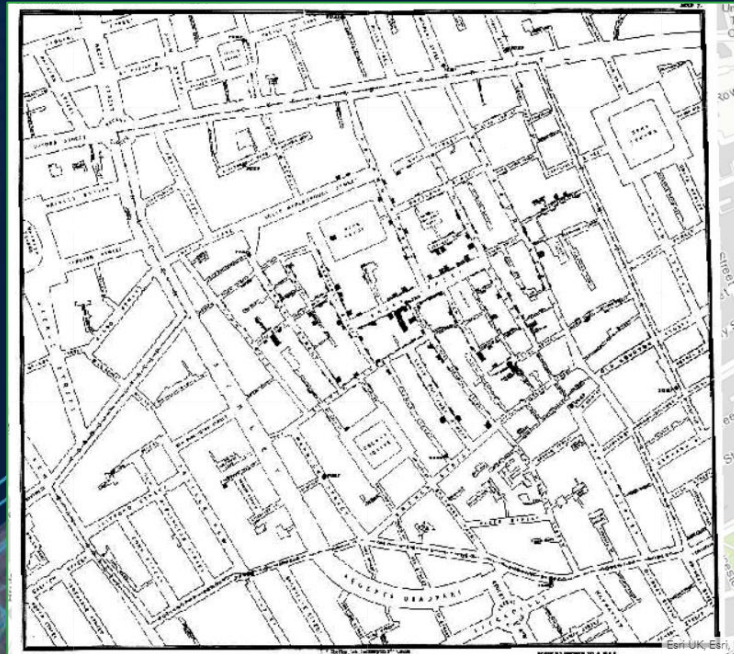
<https://arcg.is/18WP991>



Analysis where it all started

Symbolize | Buffer | Summarize Within | Route

Plus: Walk Time | Find Nearest



Classic Overlay Analysis: Double Local Hazards

Boulder County Flood Analysis

- Using Analytical capabilities in ArcGIS Online
- Problem Statement: Because of recent devastating floods that occurred in September 2013, the Boulder County Office of Emergency Preparedness has asked you to prepare an assessment of the most vulnerable lands in the county to future flooding and the people on those lands.

You will consider:

--floodplains, geologic hazards, wetlands, and group quarters in your assessment.


Starting Point:











<https://arcg.is/niCfD>

1. **Filter** Floodplains layer to only consider the true floodplains. Filter geologic hazards layer to only consider Major Hazards.
2. **Proximity**→ Buffer floodplains by 200 meters.
3. **Dissolve** the buffer's internal polygons.
4. **Manage Data**→ **Overlay**→ Intersect the dissolved floodplain buffers with Major Geologic Hazards.
5. **Sort** on Analysis Area and only consider the largest polygons.

Filtering "True" floodplains

HOME ▾ Boulder County Colorado Hazards Analysis Final Results

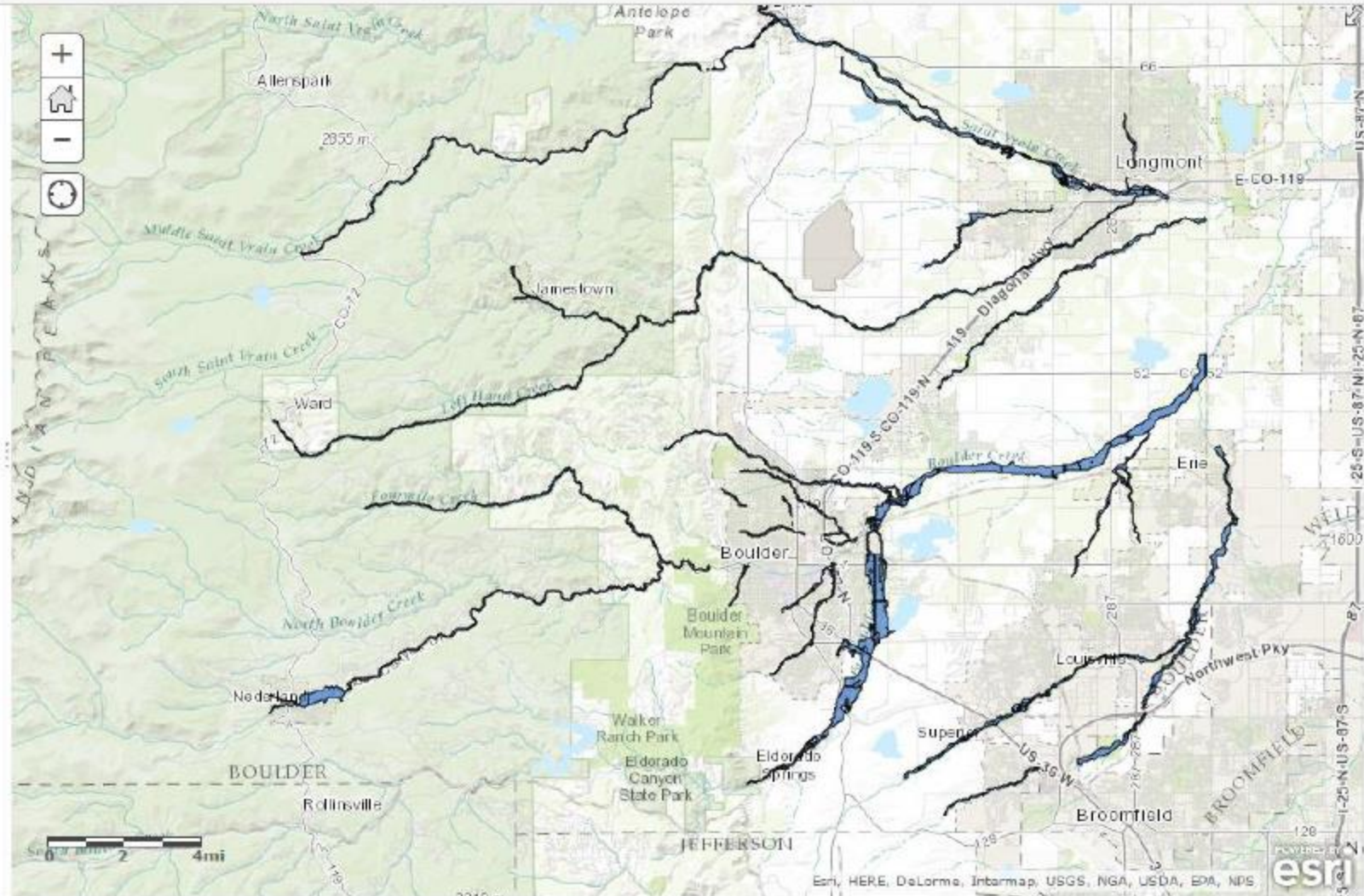
NEW MAP CREATE PRESENTATION  Joseph ▾

 Details  Add ▾ |  Basemap |  Save ▾  Share  Print |  Directions  Measure  Bookmarks 



Contents

- Enriched Intersect Floodplains Major Geologic Hazards
- Intersect Floodplains Major Geologic Hazards
- Floodplains 200m Buffer Dissolve
- Floodplains 200m Buffer
- Geologic Hazards Layer
- Floodplains Layer
- Topographic



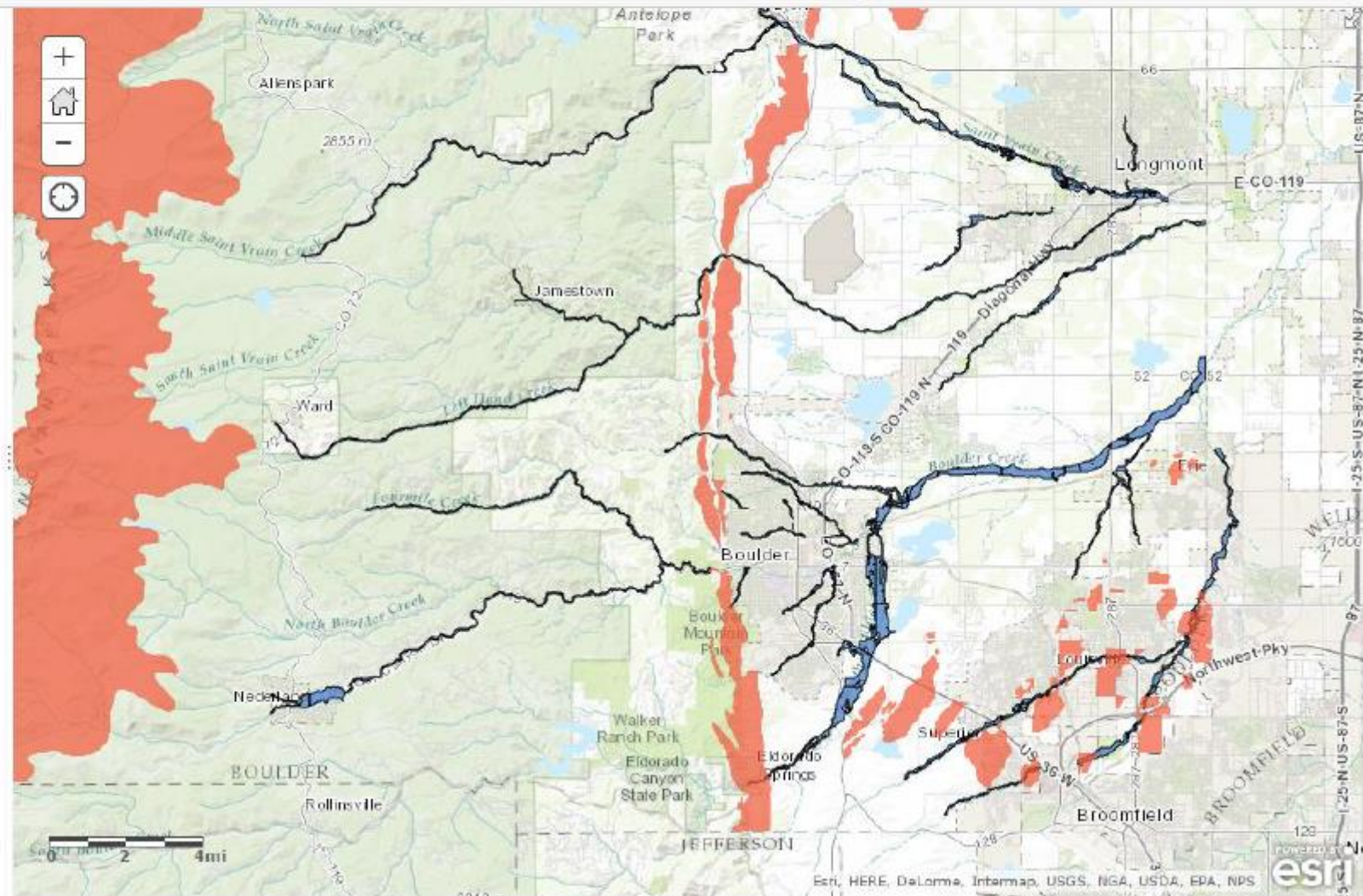
Filtering Major Geologic Hazards

HOME ▾ Boulder County Colorado Hazards Analysis Final Results

NEW MAP CREATE PRESENTATION  Joseph ▾


- Home
- Gallery
- Scene
- Groups
- My Content
- My Organization




basemap | Save ▾ Share Print Directions Measure Bookmarks Find address or place 




- Floodplains 200m Buffer Dissolve
- Floodplains 200m Buffer
- Geologic Hazards Layer
- Floodplains Layer
- Topographic

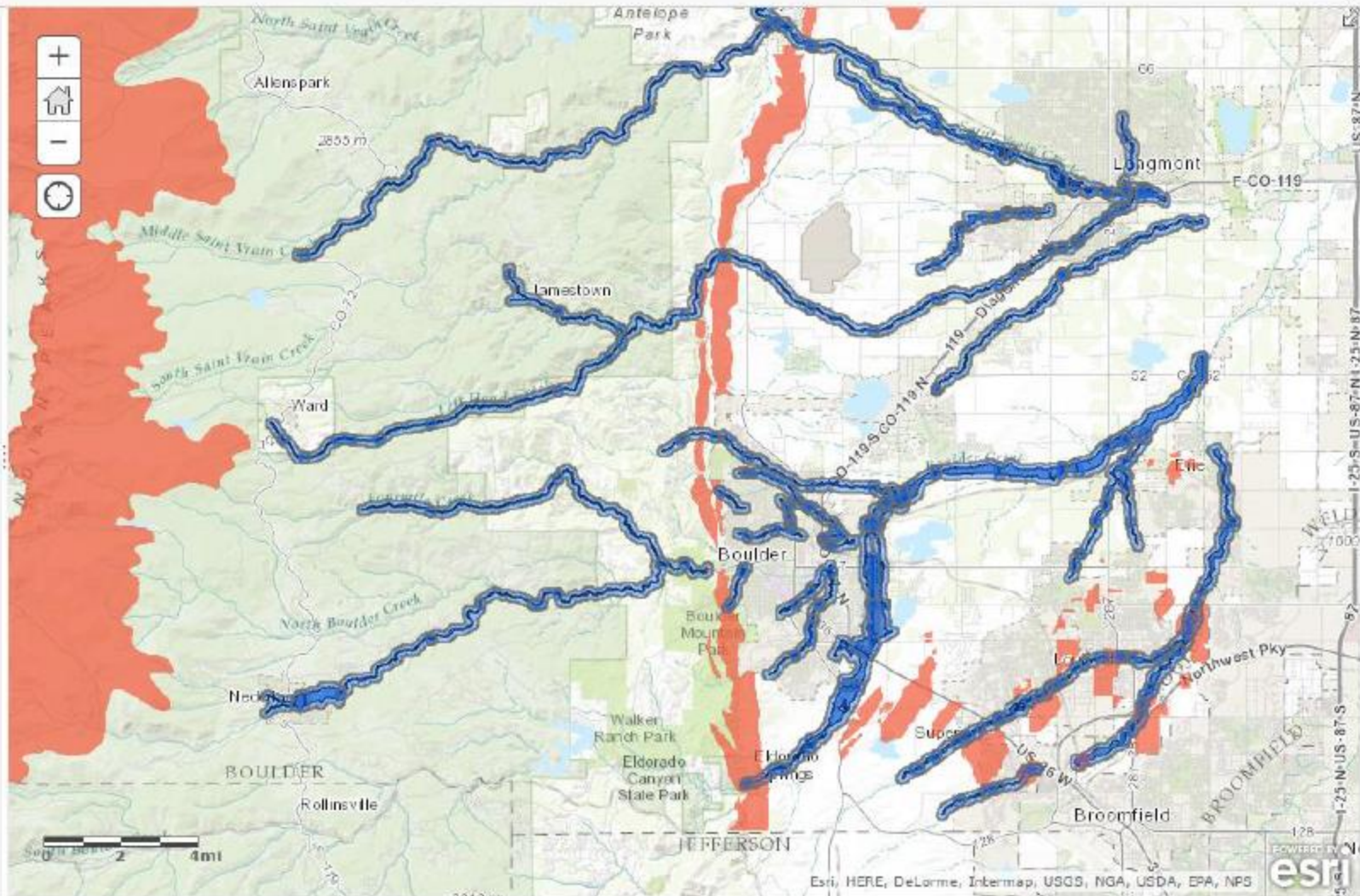
Buffering Floodplains

 Details  Add ▾  Basemap  Save ▾  Share  Print  Directions  Measure  Bookmarks 

Contents


- Enriched Intersect Floodplains Major Geologic Hazards
- Intersect Floodplains Major Geologic Hazards
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- Floodplains Layer
-  Topographic



Dissolving Floodplains

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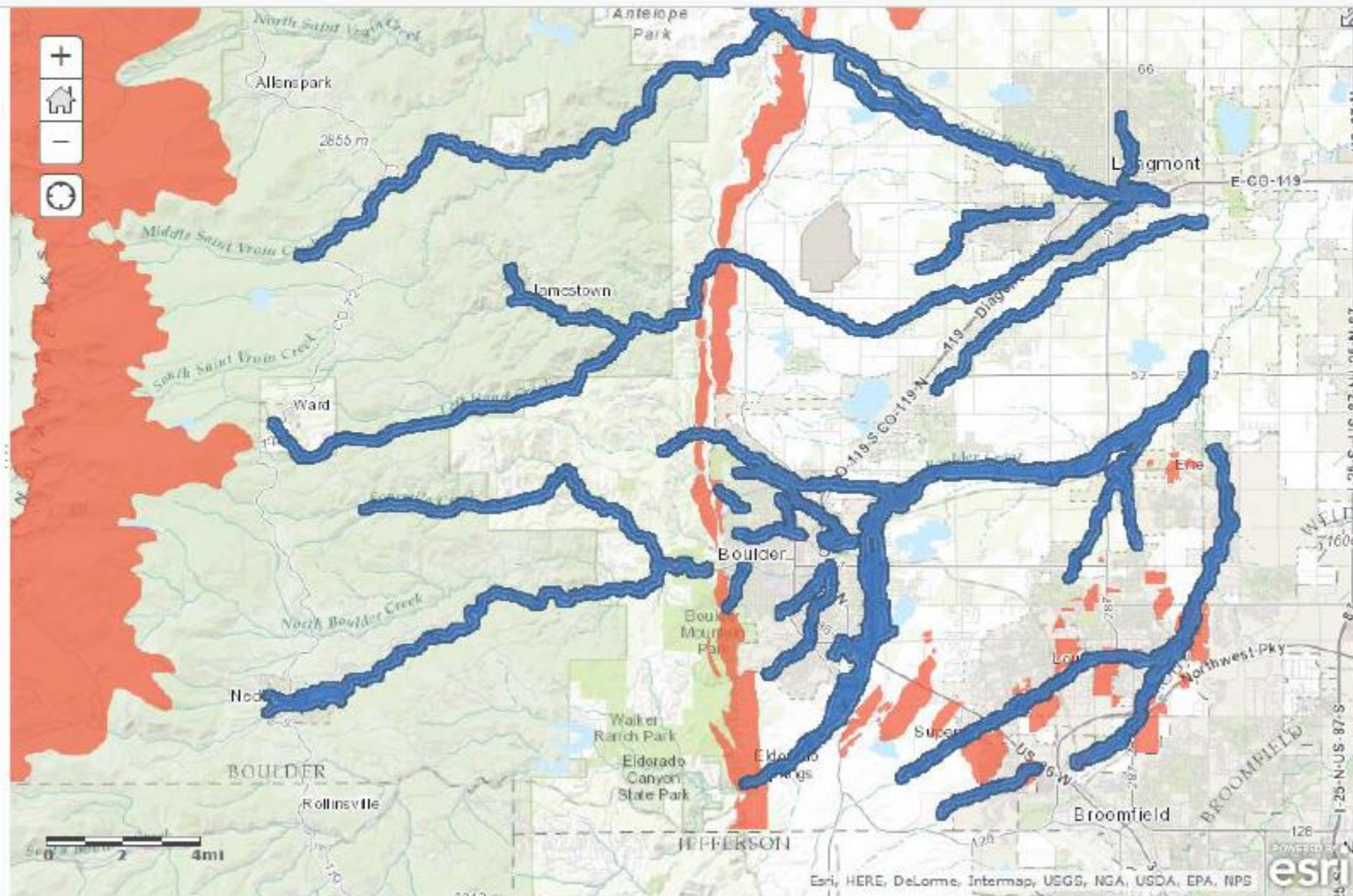
NEW MAP CREATE PRESENTATION  Joseph ▾

 Details  Add ▾  Basemap  Save ▾  Share  Print  Directions  Measure  Bookmarks 



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- Floodplains Layer
- Topographic



Intersecting Floodplains and Major Geologic Hazards

HOME ▾ Boulder County Colorado Hazards Analysis Final Results

NEW MAP CREATE PRESENTATION

Joseph ▾

Details

Add ▾

Basemap

Save ▾

Share

Print

Directions

Measure

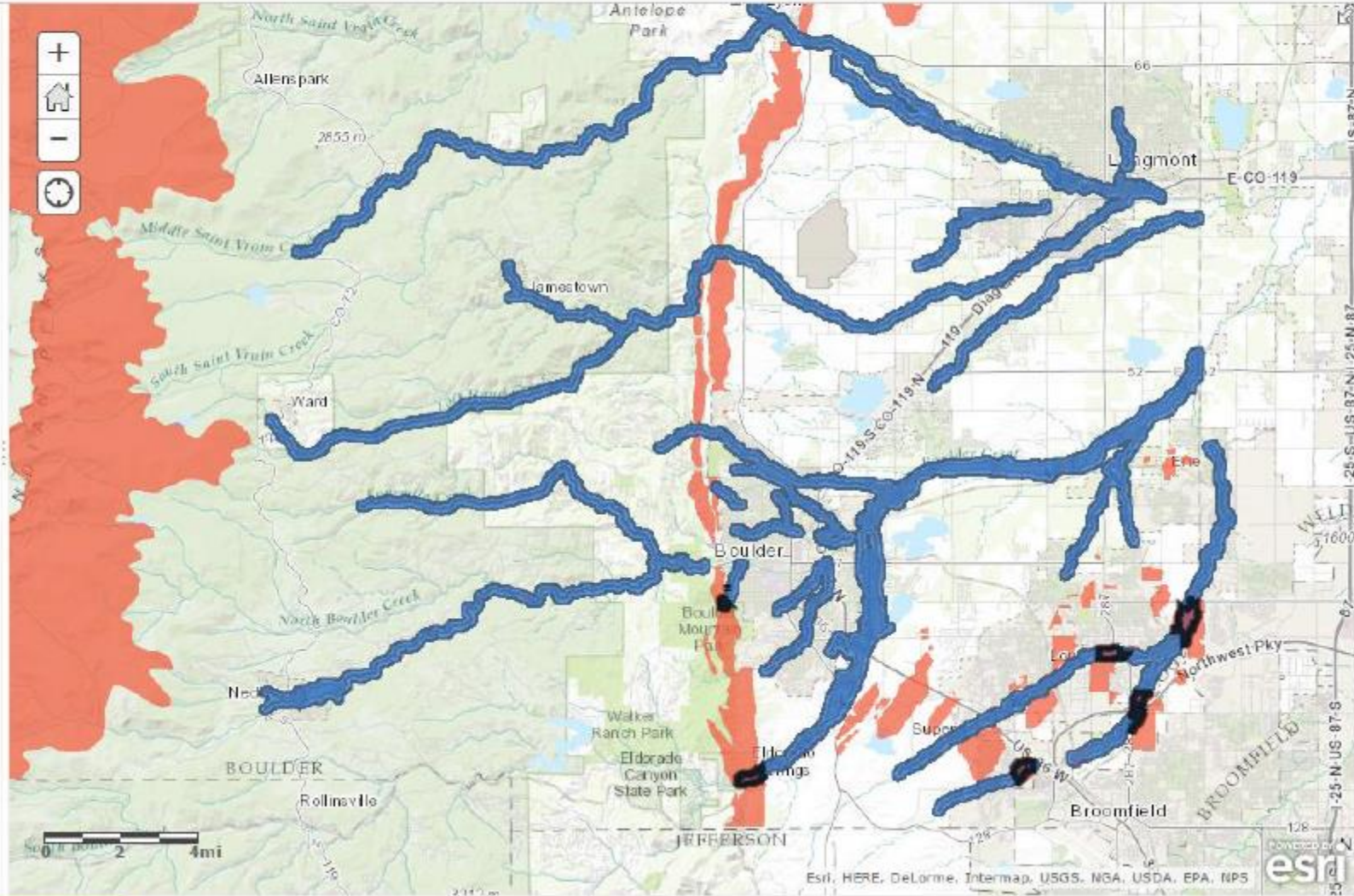
Bookmarks

Find address or place



Contents

- Enriched Intersect Floodplains Major Geologic Hazards
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Selecting the Largest Polygons

HOME ▾ Boulder County Colorado Hazards Analysis Final Results

NEW MAP CREATE PRESENTATION  Joseph ▾

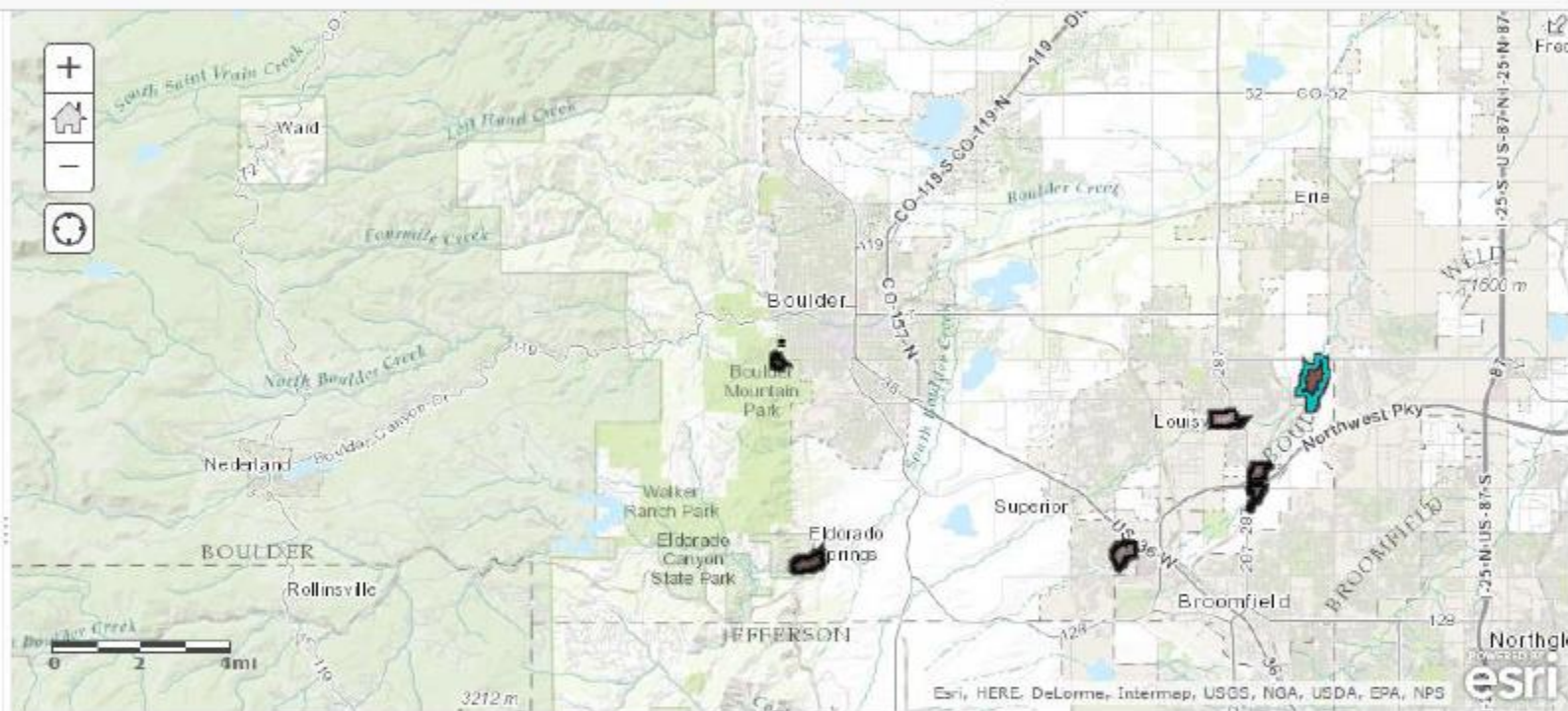
Details
Add ▾
Basemap
Save ▾
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Print
Directions
Measure
Bookmarks





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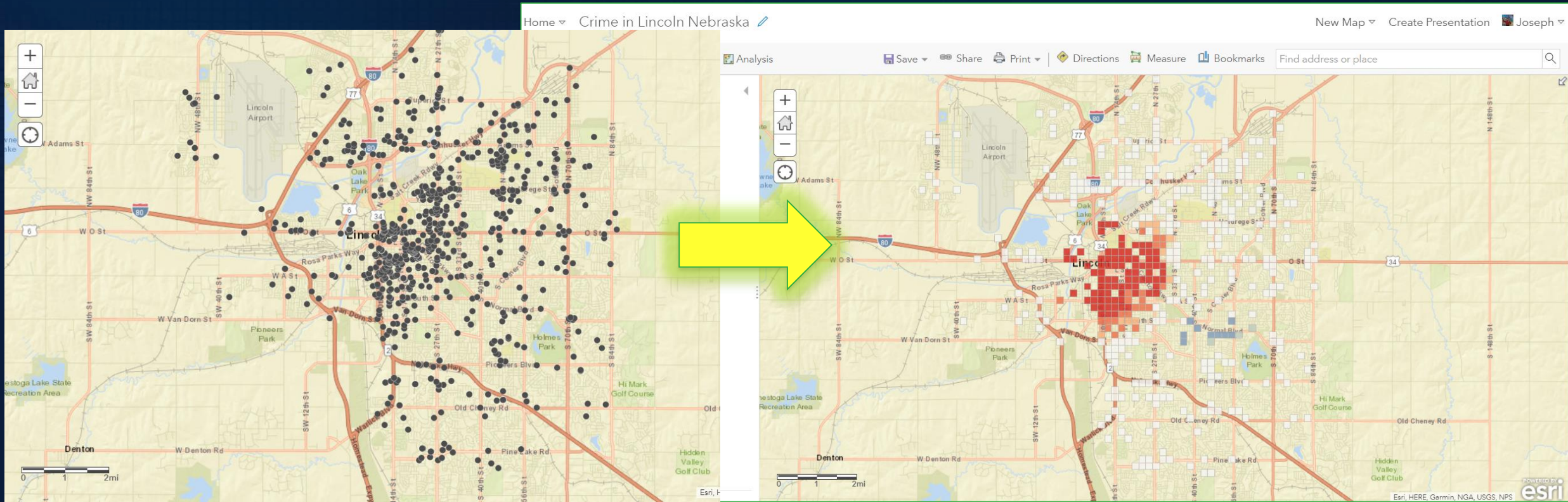
Enriched Intersect Floodplains Major Geologic Hazards (5 features, 1 selected) Table Options ▾

ID	SHADE	DESCRIPTIO	ENRICH_FID	ID	sourceCountry	HasData	% Wetlands (NLCD)	2010 Population in Group Qtrs	2013 Dominant Tapestry Segment
1.00		Major Hazard	2	1	US	1	2.74	0.00	22.00
1.00		Major Hazard	3	2	US	1	9.73	2.00	9.00
1.00		Major Hazard	4	3	US	1	5.00	0.00	41.00

Statistics: Crime Analysis

Map:

<https://arcg.is/1OaPGX>

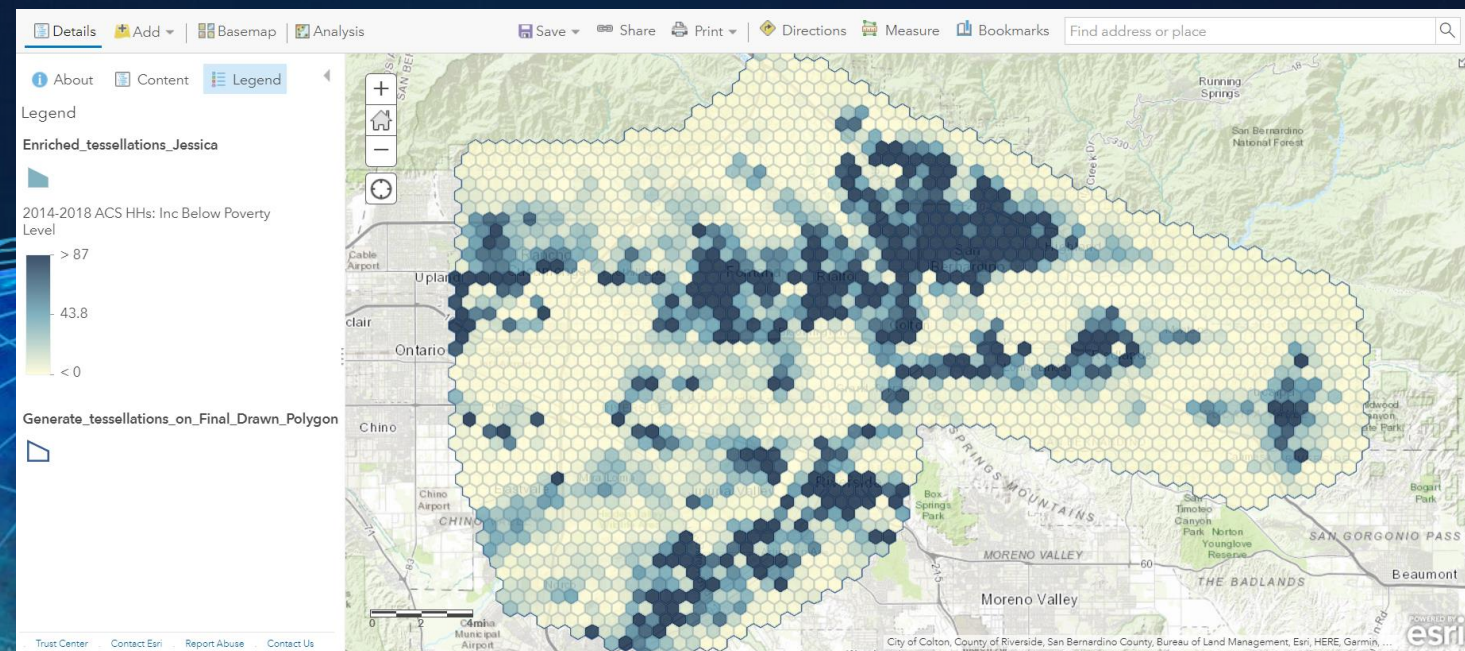
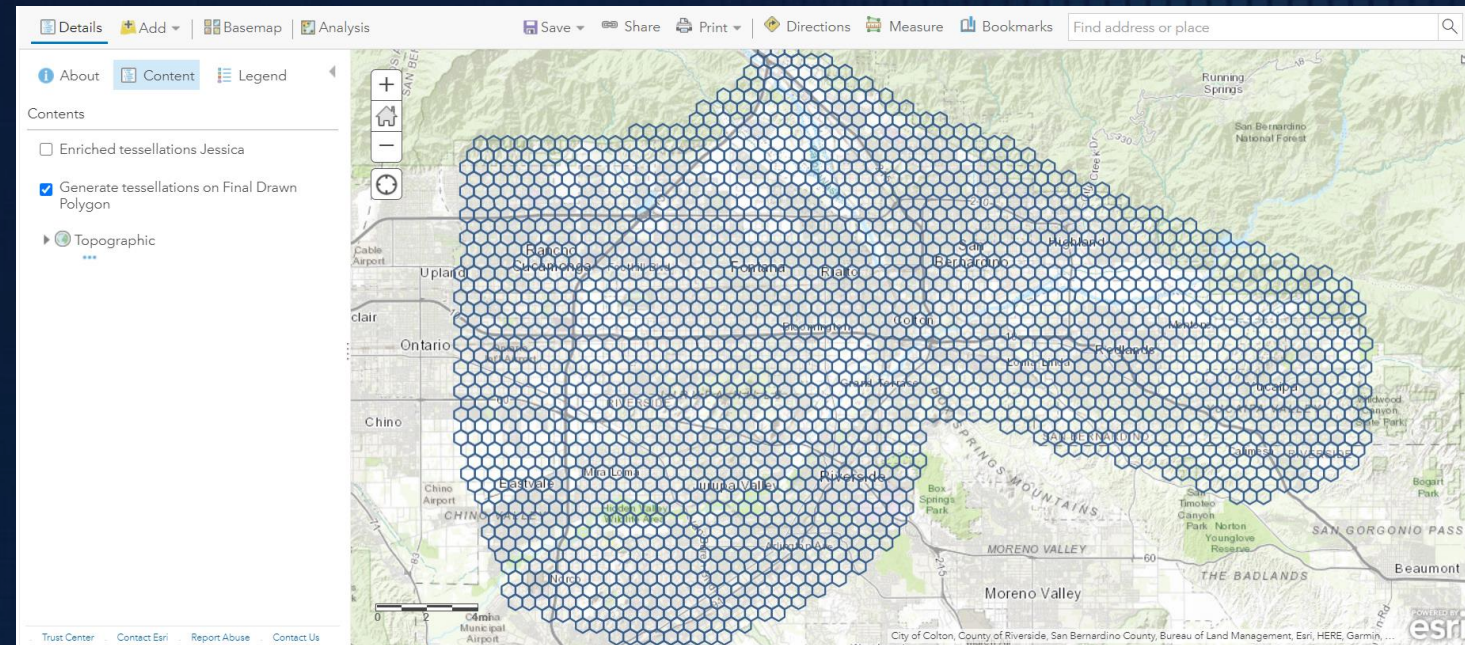


Tessellations

The Generate Tessellations tool creates tessellations, or bins (tiles), determined by a specified extent, shape, and size.

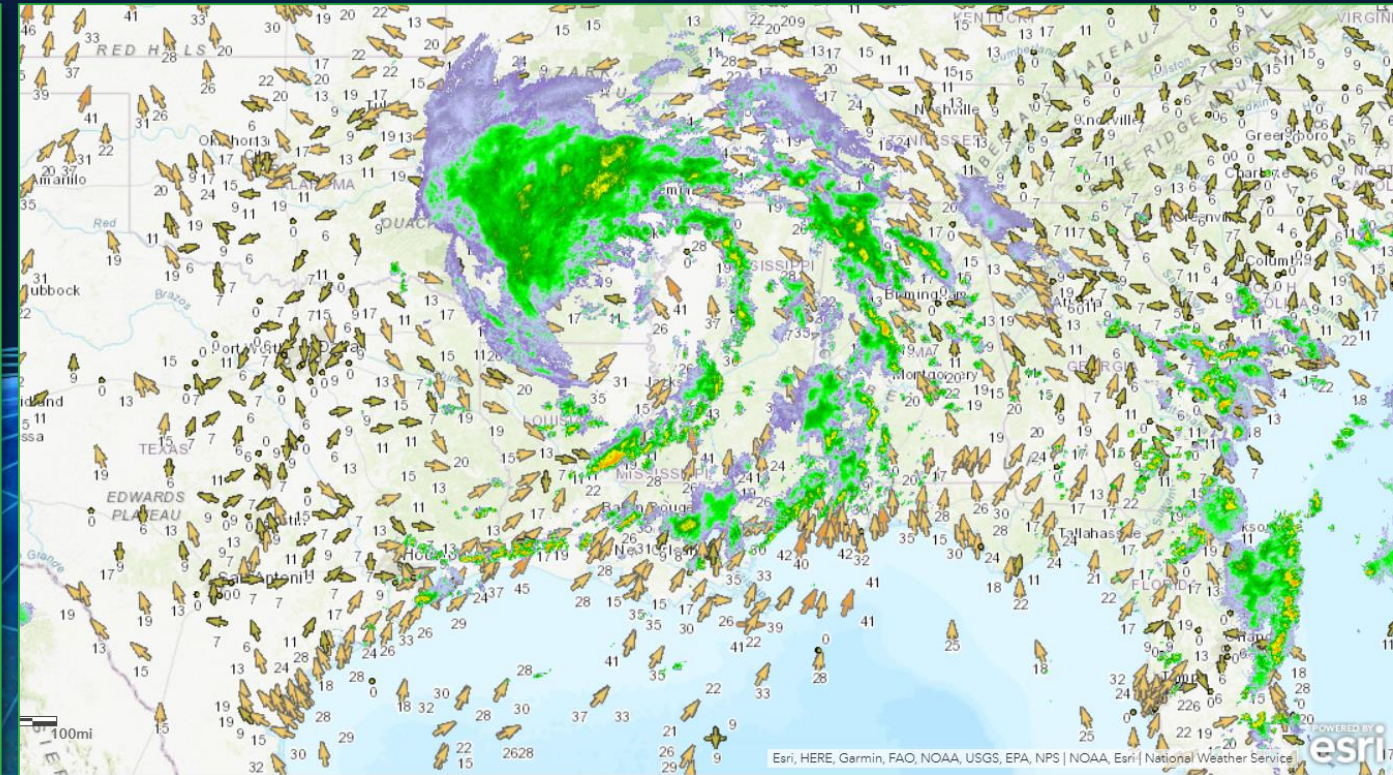
Map:

<https://arcg.is/0OLCm9>



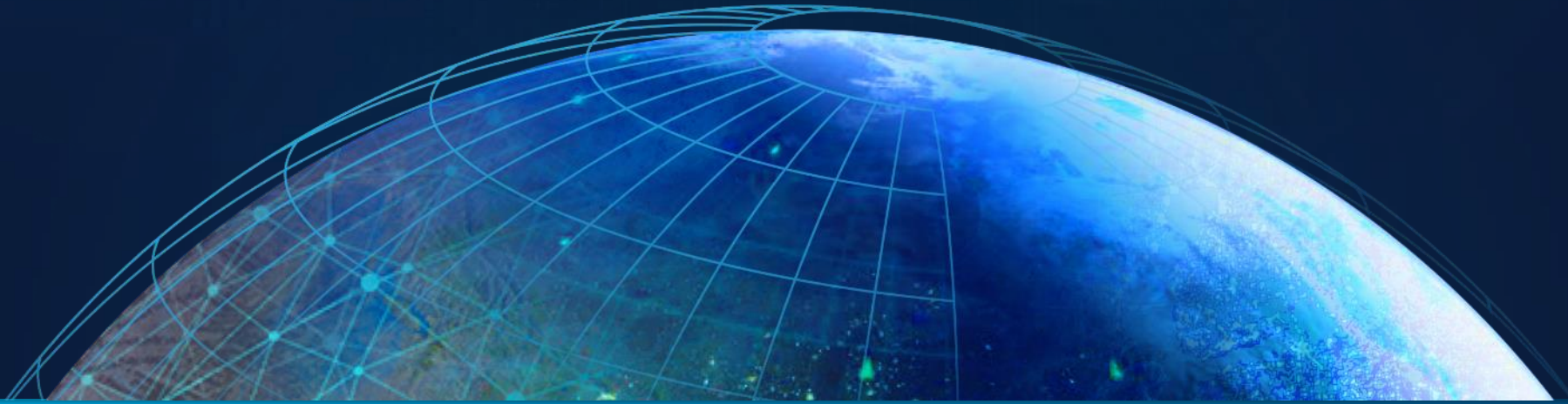
Interpolating Surfaces: Weather

Map: <https://arcg.is/19PaDa>

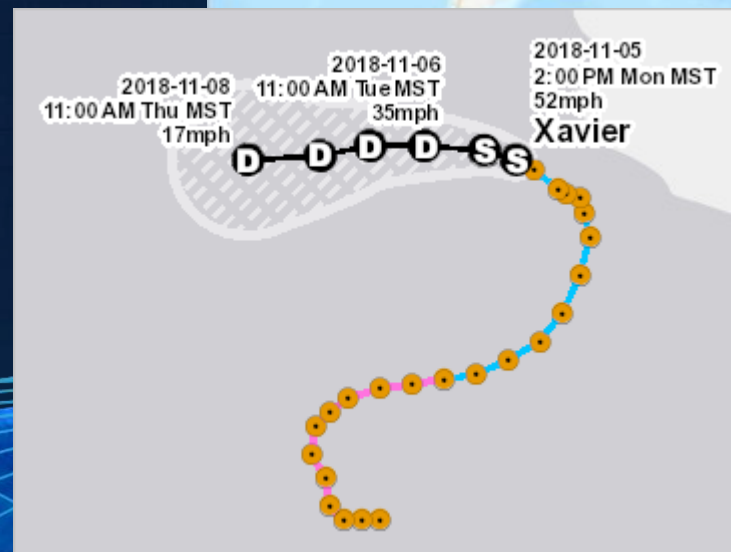
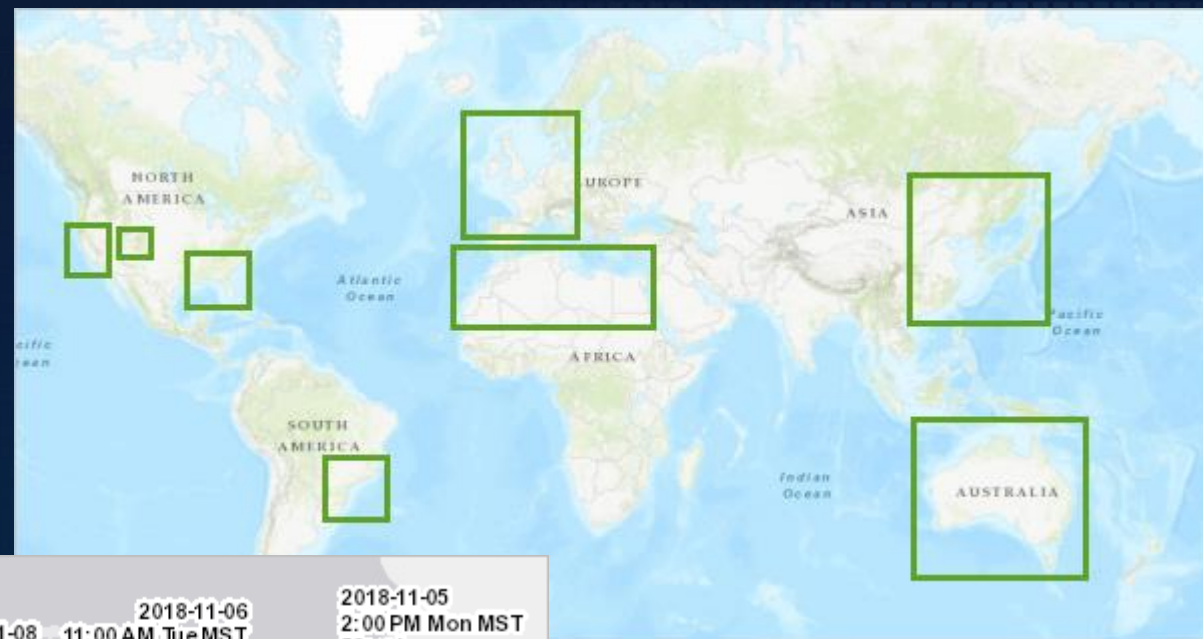


3 activity components

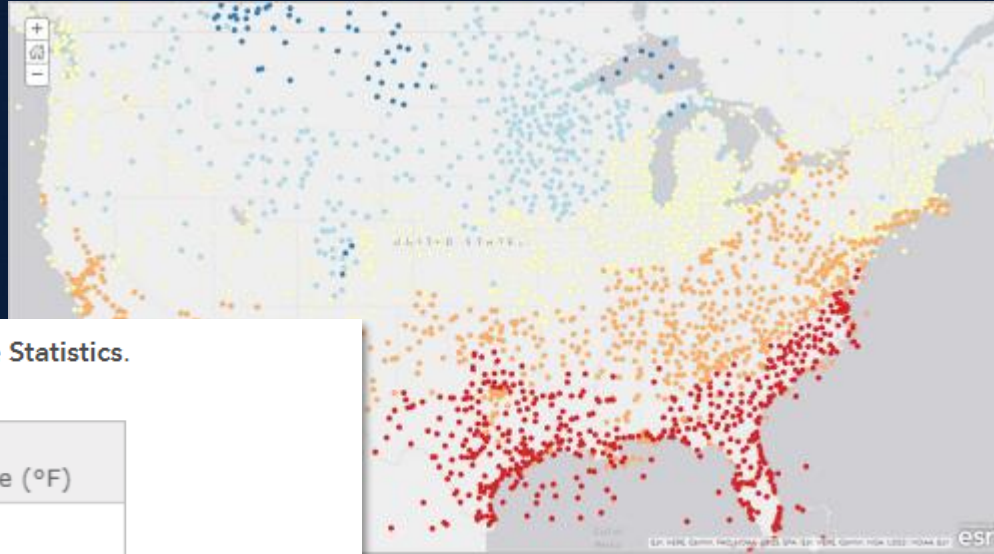
1. Examining weather patterns.
2. Predicting the weather.
3. Interpolating weather surfaces.



Add data, set bookmarks



Change style Analyze



Legend

NOAA_METAR_current_wind_speed_direction

Stations

- ◆ 0 km/h (Calm / No Reading)
- < 12 km/h (Light Breeze)
- < 39 km/h (Moderate Breeze)
- < 62 km/h (Strong Breeze)
- < 89 km/h (Gale Force)
- < 118 km/h (Storm Force)
- >= 118 km/h (Hurricane Force)

16 In the table, click the **Air Temperature** field and choose **Statistics**.

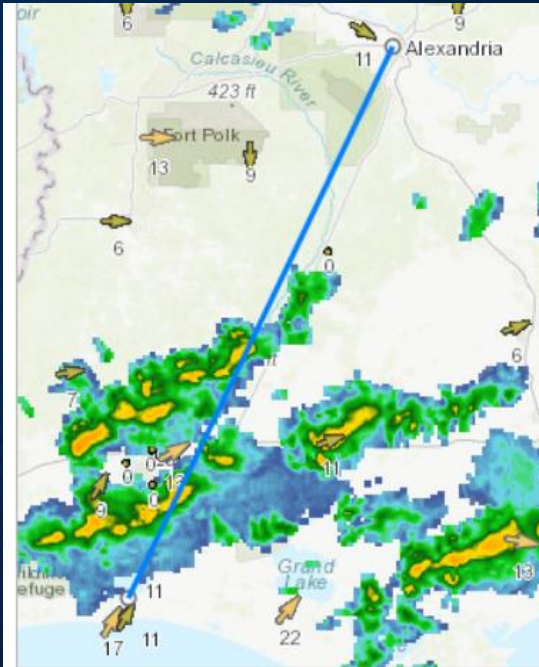
Station Elevation (Meters)	Air Temperature (°F)	Dew Point Temperature (°F)
3,807.00	<ul style="list-style-type: none">Sort AscendingSort DescendingStatistics	40

The **Statistics** window appears.

Field: Air Temperature (°F)	
Number of Values	4,780
Sum of Values	240,394.7999959
Minimum	-18.4
Maximum	96.8
Average	50.6
Standard Deviation	19.96

Analyze extremes

Predict weather



A screenshot of a web application interface. A dropdown menu is open, listing several options: 'Show Selected Records', 'Center on Selection', 'Clear Selection', 'Show/Hide Column', and 'Filter'. The 'Center on Selection' option is highlighted with a green border. The number '360' is visible below the menu. The interface includes a hamburger menu icon and a close icon in the top right corner.



In the example image, a northeastern arrow with a wind speed of 17 kilometers per hour is about 180 kilometers away from Alexandria. At this rate, it would take over 10 hours for rain to reach the city. Additionally, other stations in the area record either no wind, slower wind, or wind that is more easterly. It's possible the precipitation will pass south of the city altogether.

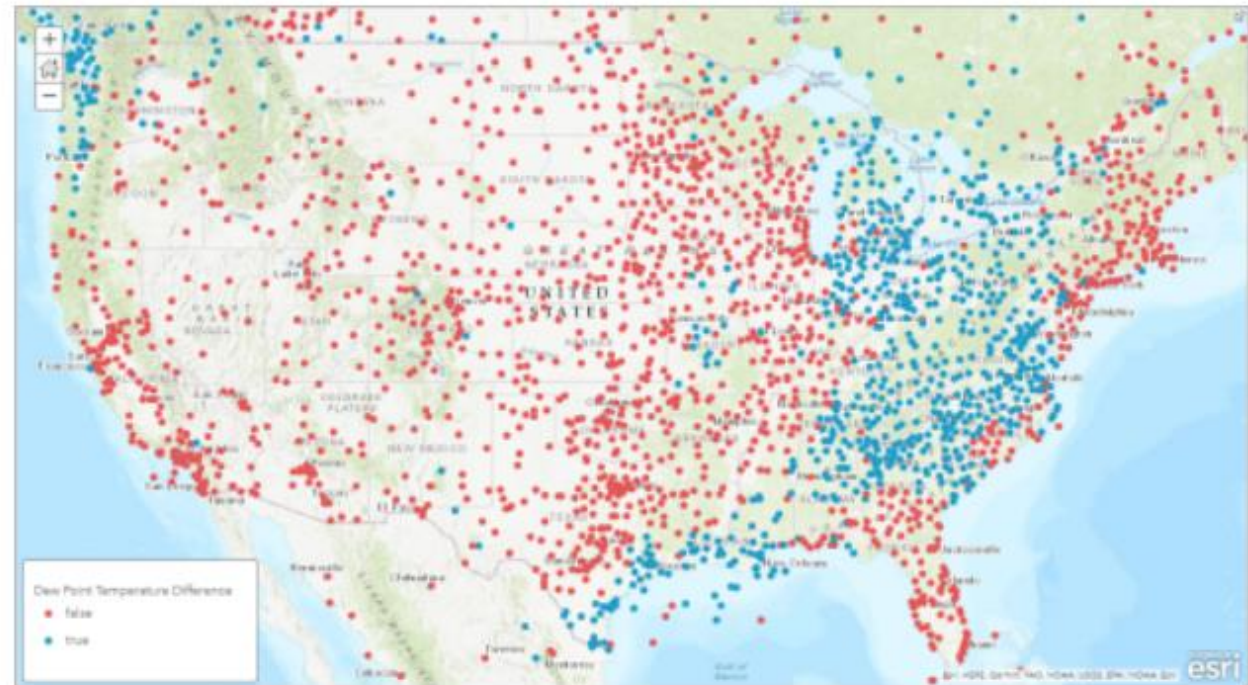
- How far away is rainfall from the city you found?
- How long would it take rainfall to reach the city given the wind speed and direction?
- Are there other winds that might cause the rainfall to avoid your city?
- Overall, how likely would you say it is that your city receives rain?

Predict weather...

```
1 // Write a script that returns a value that will be used to
2 // For example, find the percentage of males:
3 // Round(($feature.MalePop / $feature.TotalPop) * 100, 2)
4
5 ($feature.TEMP - $feature["DEW_POINT"]) < 4
```

10 Click **OK**.

The expression is saved and the map is automatically styled based on it.



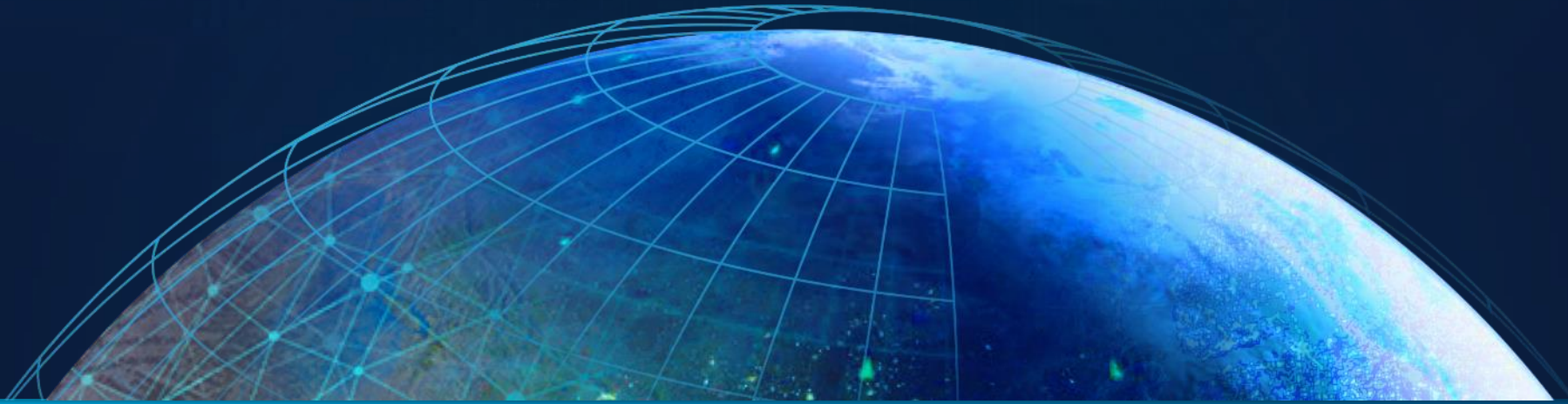
Labeling

Building expressions

Air Temperature (No Decimals) [Edit](#)

Expression

```
1 // Write a script that will be used to label features.  
2 // For example, append the value of two fields:  
3 // $feature.name + " " + $feature.status  
4  
5 Round($feature.TEMP, 0)|
```








Interpolating Surfaces



► Data Enrichment ⓘ

▼ Analyze Patterns ⓘ

-  Calculate Density ⓘ
-  Find Hot Spots ⓘ
-  Find Outliers ⓘ
-  Find Point Clusters ⓘ
-  **Interpolate Points** ⓘ

► Use Proximity ⓘ

3 Optimize for ⓘ

Speed Accuracy

Output prediction errors ⓘ

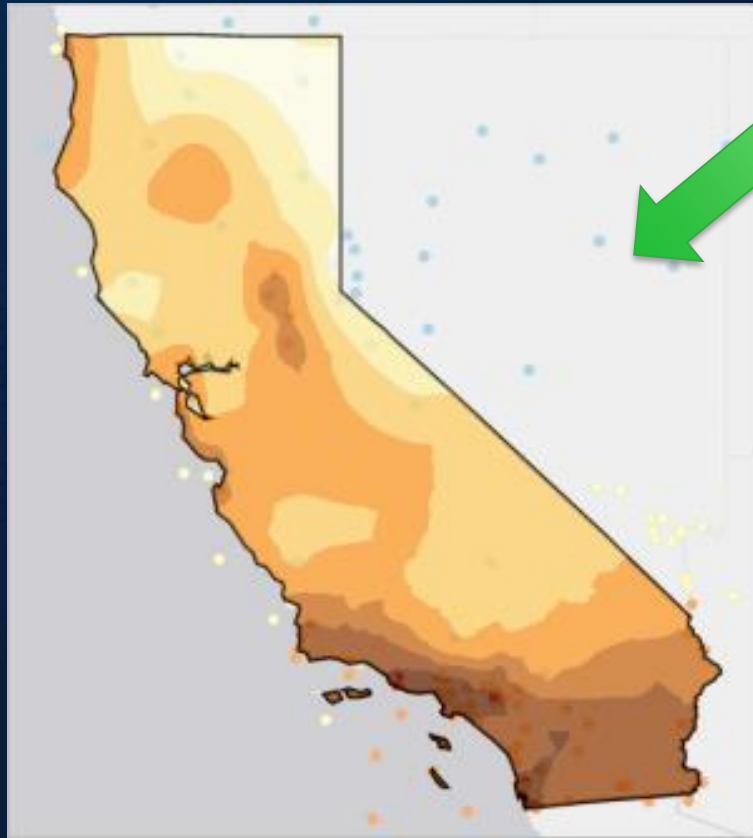
Options ⓘ

Clip output to ⓘ

States ⓘ

Interpolating Surfaces: Considerations

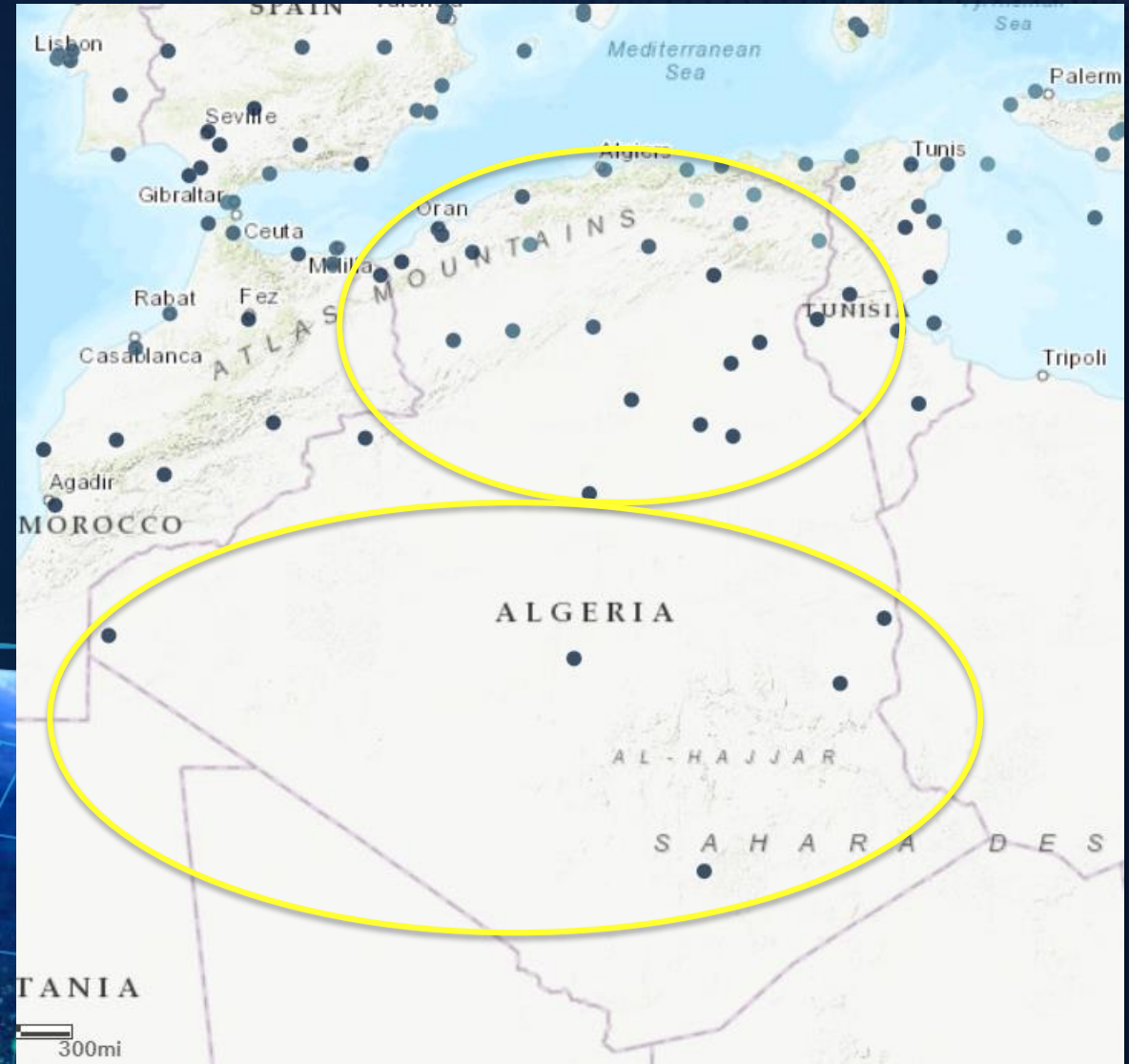
CA



CA + NV



Algeria



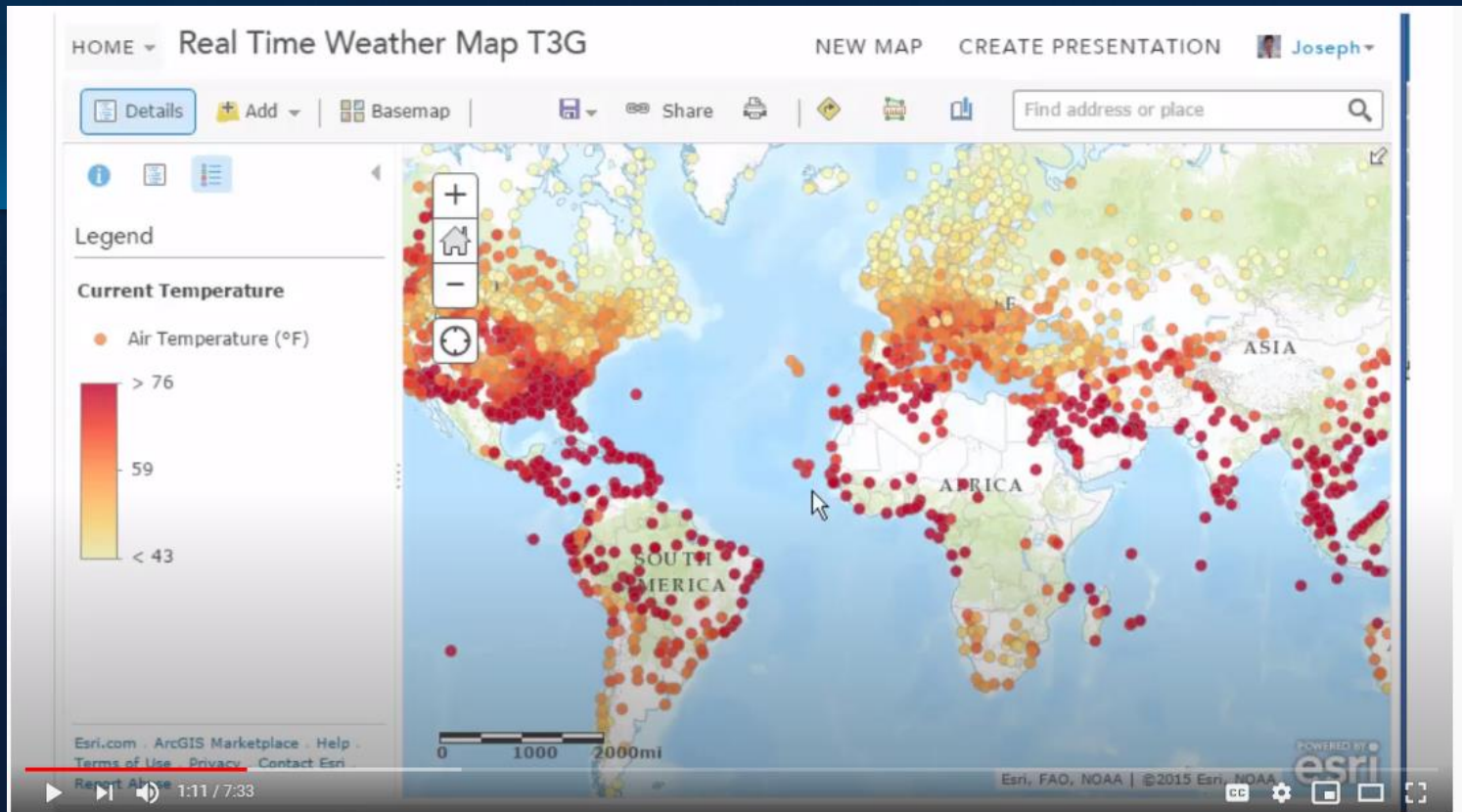
Presentation

<https://edteam.maps.arcgis.com/apps/presentation/index.html?webmap=5de6cf3b6dd845f4d8e87a0a18c2e99aa>



Video on the Our Earth channel

<https://www.youtube.com/watch?v=AOL4FLonCj0>



Analyzing real time weather data in ArcGIS Online

4,160 views • May 14, 2015

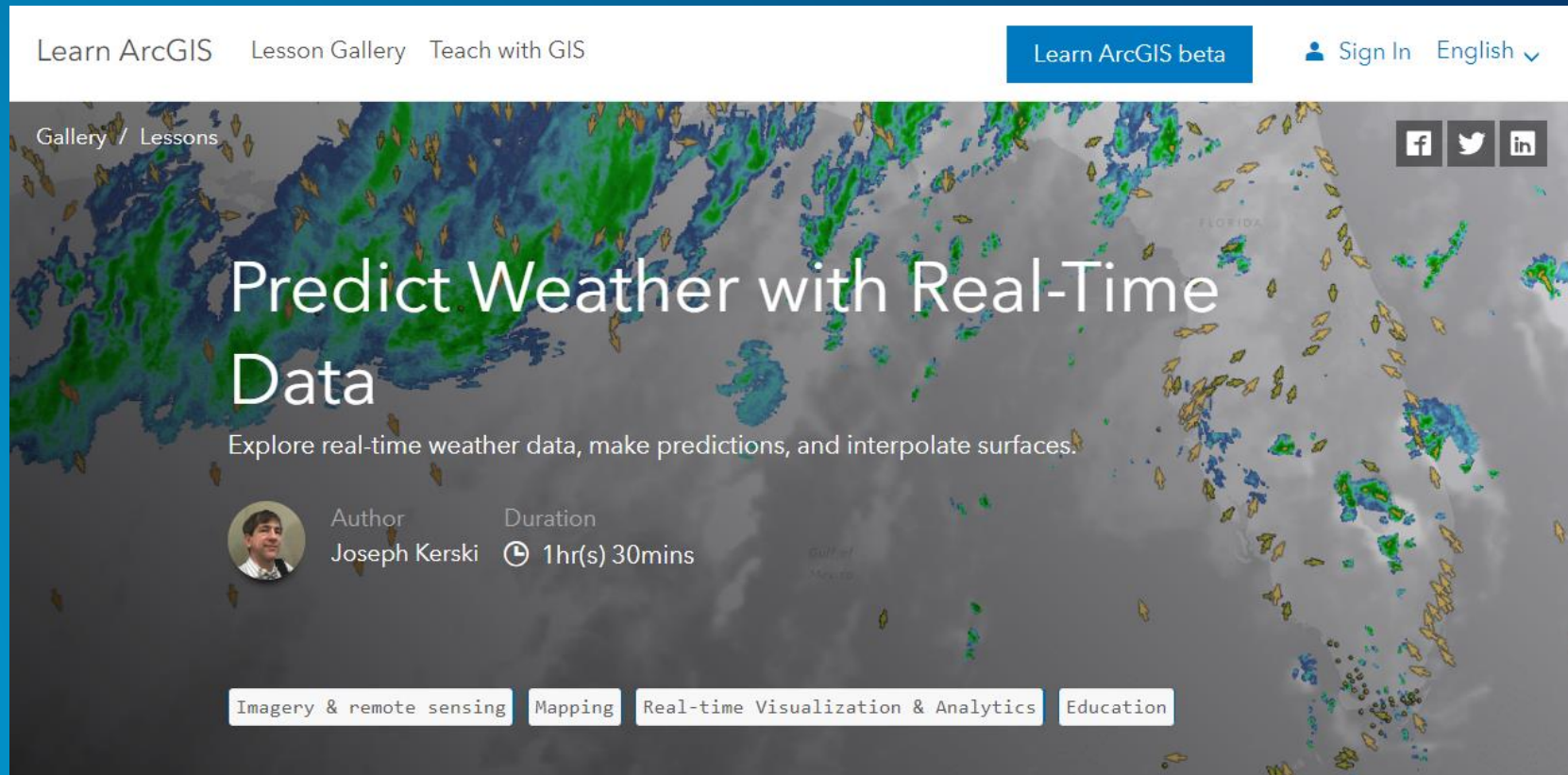
23 1 SHARE SAVE ...

Dig Deeper

Lesson: Predicting the Weather

Search Learn ArcGIS Lesson library under

“Predicting the Weather” <https://learn.arcgis.com>



The screenshot shows the Learn ArcGIS website interface. At the top, there are navigation links for 'Learn ArcGIS', 'Lesson Gallery', and 'Teach with GIS'. A blue button labeled 'Learn ArcGIS beta' is on the right, along with 'Sign In' and 'English' options. Below the navigation is a breadcrumb trail 'Gallery / Lessons' and social media icons for Facebook, Twitter, and LinkedIn. The main content area features a weather map of Florida with the title 'Predict Weather with Real-Time Data' and a subtitle 'Explore real-time weather data, make predictions, and interpolate surfaces.' Below the title, there is a profile picture of the author, Joseph Kerski, and the duration '1hr(s) 30mins'. At the bottom, there are four tags: 'Imagery & remote sensing', 'Mapping', 'Real-time Visualization & Analytics', and 'Education'.

Learn ArcGIS Lesson Gallery Teach with GIS [Learn ArcGIS beta](#) Sign In English

Gallery / Lessons

Predict Weather with Real-Time Data

Explore real-time weather data, make predictions, and interpolate surfaces.

Author: Joseph Kerski Duration: 1hr(s) 30mins

Imagery & remote sensing Mapping Real-time Visualization & Analytics Education

Joining to ArcGIS Online

<https://community.esri.com/community/education/blog/2018/02/23/more-power-for-your-gis-analysis-through-joining-features-to-arcgis-online>

The screenshot shows the ArcGIS Online interface for a 'Join Features Analysis Tool Demonstration'. The map displays agricultural land by country, with a data table below it. A yellow arrow points from the table to the map. The table lists countries like Aruba, Afghanistan, and Angola with their agricultural land percentages for 1960, 1961, and 1962.

Country Name	Country Code	Indicator Name	Indicator Code	1960	1961	1962
Aruba	ABW	Agricultural land (% of land area)	AG.LND.AGRI.ZS		11.11	11.11
Afghanistan	AFG	Agricultural land (% of land area)	AG.LND.AGRI.ZS		57.75	57.84
Angola	AGO	Agricultural land (% of land area)	AG.LND.AGRI.ZS		45.86	45.88

The map shows a world map with agricultural land by country. The legend indicates the following categories:

- > 44.7 - 62
- > 28.9 - 44.7
- > 13.7 - 28.9
- 0 - 13.7

The new ArcGIS Online map viewer

The screenshot displays the ArcGIS Online map viewer interface. At the top, the title "Untitled map" is visible. The user's profile, "Joseph Kerski", is shown in the top right corner. The left sidebar contains navigation options: Layers, Basemap, Legend, Bookmarks, Save, Create new map, Open existing map, Share map, Print, Feedback, and What's next?. The main map area shows a map of Colorado with various ecoregion layers. A layer titled "North American Ecoregions - Level I" is selected and highlighted with a blue border. Below the map, there are navigation controls: a home button, a zoom in (+) button, and a zoom out (-) button. The right sidebar contains the Properties panel, which is currently open to the "Properties" tab. The Properties panel shows the layer name "North American Ecoregions - Level I" and a toggle for "Enable legend for this layer" which is turned on. Below this, there is a "Level 1 Key" with a list of ecoregions and their corresponding colors: 0 WATER (light blue), 1 ARCTIC CORDILLERA (dark blue), 2 TUNDRA (medium blue), 3 TAIGA (light blue), 4 HUDSON PLAIN (teal), 5 NORTHERN FORESTS (light green), 6 NORTHWESTERN FORESTED MOUNTAINS (dark green), 7 MARINE WEST COAST FOREST (medium green), 8 EASTERN TEMPERATE FORESTS (light green), and 9 GREAT PLAINS (orange). The bottom of the map shows the text "Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | U.S. Environmental Prot... Powered by Esri".

Untitled map



Joseph Kerski
jjkerski

Layers

North American Ecoregions - Level I

+ Add layer

Properties

North American Ecoregions - Level I

Information

Symbology

Enable legend for this layer



North American Ecoregions - Level I

Level 1 Key

- 0 WATER
- 1 ARCTIC CORDILLERA
- 2 TUNDRA
- 3 TAIGA
- 4 HUDSON PLAIN
- 5 NORTHERN FORESTS
- 6 NORTHWESTERN FORESTED MOUNTAINS
- 7 MARINE WEST COAST FOREST
- 8 EASTERN TEMPERATE FORESTS
- 9 GREAT PLAINS

Properties

Styles

Filter

Configure pop-ups

Configure attributes

Labels

Table

Search

Measurement

Directions

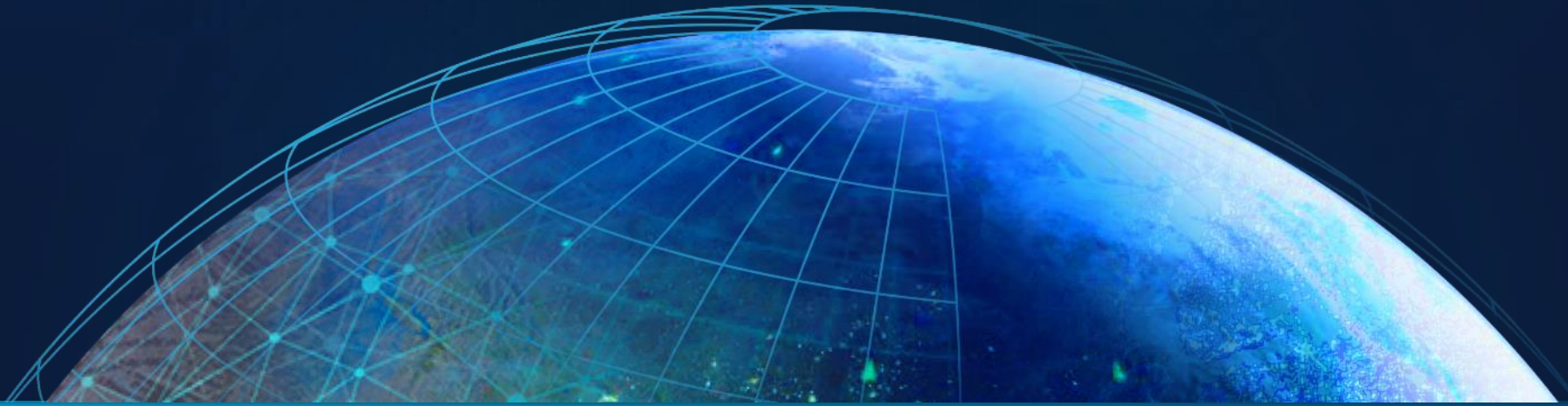
Location

Edit

Time

2 powerful platform points:

1. You can create web mapping *applications* from all of your analysis: Story Maps, compare apps, web app builder/experience builder, and Presentations. And your students can do the same!
2. You can bring the results of your analysis and your maps and layers into ArcGIS Pro, ArcGIS Insights, Business Analyst Web, and other parts of the platform *for further analysis*.



Keep Learning!

1. **Data sources, data quality, and societal issues:** <http://spatialreserves.wordpress.com>
2. **Learn ArcGIS Library:** <https://learn.arcgis.com>
3. **GeoInquiries Level 2:** <https://www.esri.com/geoinquiries>
4. **Middle school student map competition on Legionnaires' Disease:**
<https://www.arcgis.com/apps/MapJournal/index.html?appid=cf41427b31094b47b00bb33fade617b3>
5. **Esri spatial analysis posters:** <https://community.esri.com/docs/DOC-11530-the-language-of-spatial-analytics-poster>
6. **GeoNet Education Community blog:**
<https://community.esri.com/community/education/pages/education-blog>





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**THE
SCIENCE
OF
WHERE**

