5 Ways to Teach about Scale using ArcGIS Online

Use these interactive maps in short, powerful activities to foster discussion about the importance of scale over space and time.

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9 April 2024

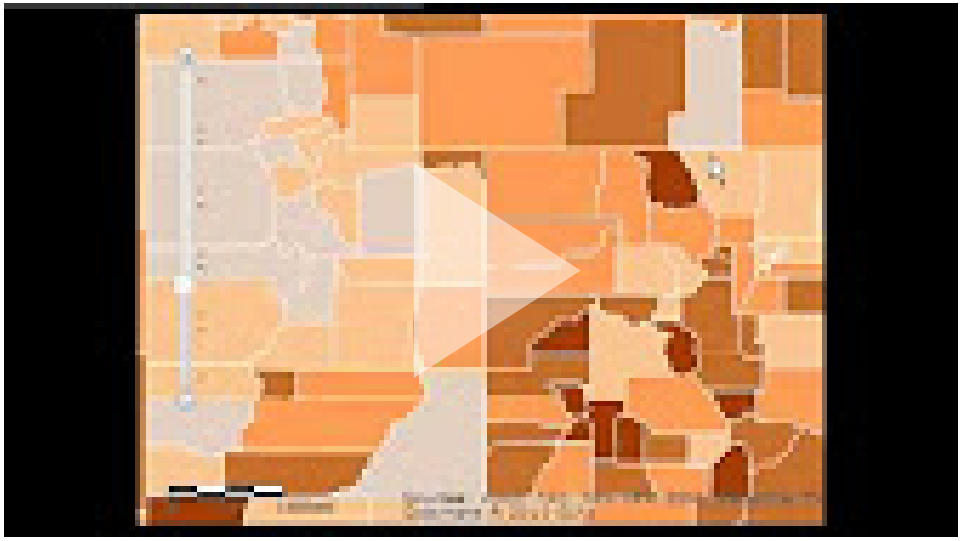
Why teach about scale?

1. Addresses change over space and time.
2. Addresses place and space: Topophilia (Tuan).
3. Grapple with key 21st Century issues: Energy, population change, water, equity, natural hazards, health.
4. A fundamental theme in geography. Patterns evident at one scale may not be evident at another scale, and vice versa.
5. Illustrates the importance of geographic thinking across and in other disciplines.

Why teach about scale with mapping tools through GIS?

1. Teaching with the interactive maps involves the learners in an engaging, problem-based, active approach.
2. GIS allows the "what if ..." questions to be pursued: What if we changed the ___ scale, variables, location, symbology, classification method, ...___.
3. Fosters data fluency and "can I trust the data"? considerations.
4. Connects to real-time data feeds and current events.

Playlist of 12 videos: Scale Matters. On the *Our Earth* video channel.



Scale Matters

1. Analyze basemaps and using Measure tools in ArcGIS Online

1. Access www.arcgis.com > ArcGIS Online.

2. Pan to an area in the USA > Change basemap to USA Topo. Or add USA topo so you can adjust transparency.

3. Examine the differences in symbology, detail, generalization techniques, metric vs imperial units, and more.

4. Use the measure tool to measure distances, perimeters, areas. Zoom out and examine the great circle route!

2. Analyze population and demographic patterns at state, county, census tract, and block group scales.

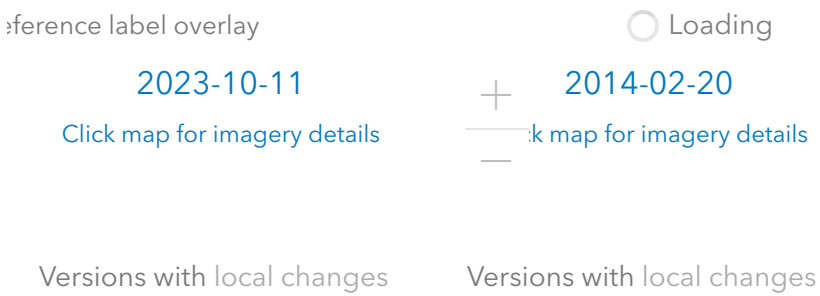
1. Examine the differences between the geographic units and the patterns of demographic variables in those units.
2. Go to the full ArcGIS Online map viewer for this data: https://www.arcgis.com/apps/mapviewer/index.html?webmap=7400d4e56d8343a9854278bac327c243 > Style > change variables.
3. Add 1 variable to make a bi-variate map.

3. Analyzing river systems

1. In ArcGIS Online, add the Esri World hydro layer.
2. Analyze river systems from small to large scale.
3. For the USA, examine the relationship between river systems and watersheds.
4. Use Trace Downstream tool to trace the course of a river you are interested in (trace downstream requires sign in to ArcGIS Online).

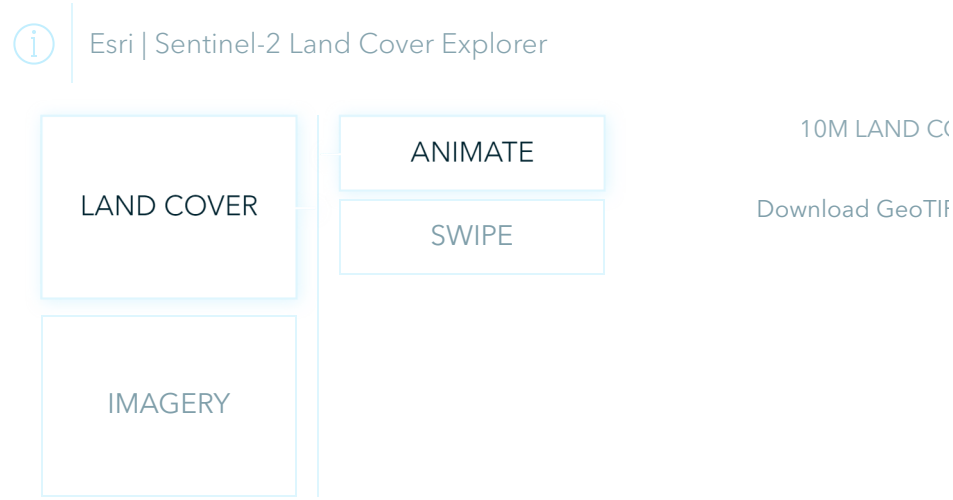
4. Analyze change over time with a variety of tools.

Wayback Imagery web mapping application:



World Imagery Wayback

Sentinel-2 Land Cover Change app.



Esri | Sentinel-2 Land Cover Explorer

Zebra Mussels 1986-2010 Time animation:

Map Viewer

Maldives Shoreline Change:

Geospatial Analyses of Maldivian Reef Island Shoreline Change

5. Compare the sizes of political areas with this ArcGIS 3D web mapping application.

Summary of tool with short lessons:

https://community.esri.com/t5/education-blog/compare-the-sizes-of-countries-with-this-new-3d/ba-p/1174275

Compare Greenland to Brazil, Wyoming to Colorado, Mongolia to Austria, and more!

World Sizes

Explore Mars with 3D GIS! Use this web mapping application to compare scale with political areas (France vs Olympus Mons!) **and natural features** (Grand Canyon vs Valles Marineris!).

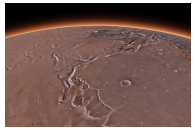
Summary of tool with short lessons:

https://community.esri.com/t5/education-blog/explore-mars-with-gis/ba-p/1043493

Explore Mars

Have you always dreamt of being an astronaut? Come close by exploring Mars, with this 3D globe app that…

https://explore-mars.esri.com/



All content | Joseph J. Kerski PhD GISP