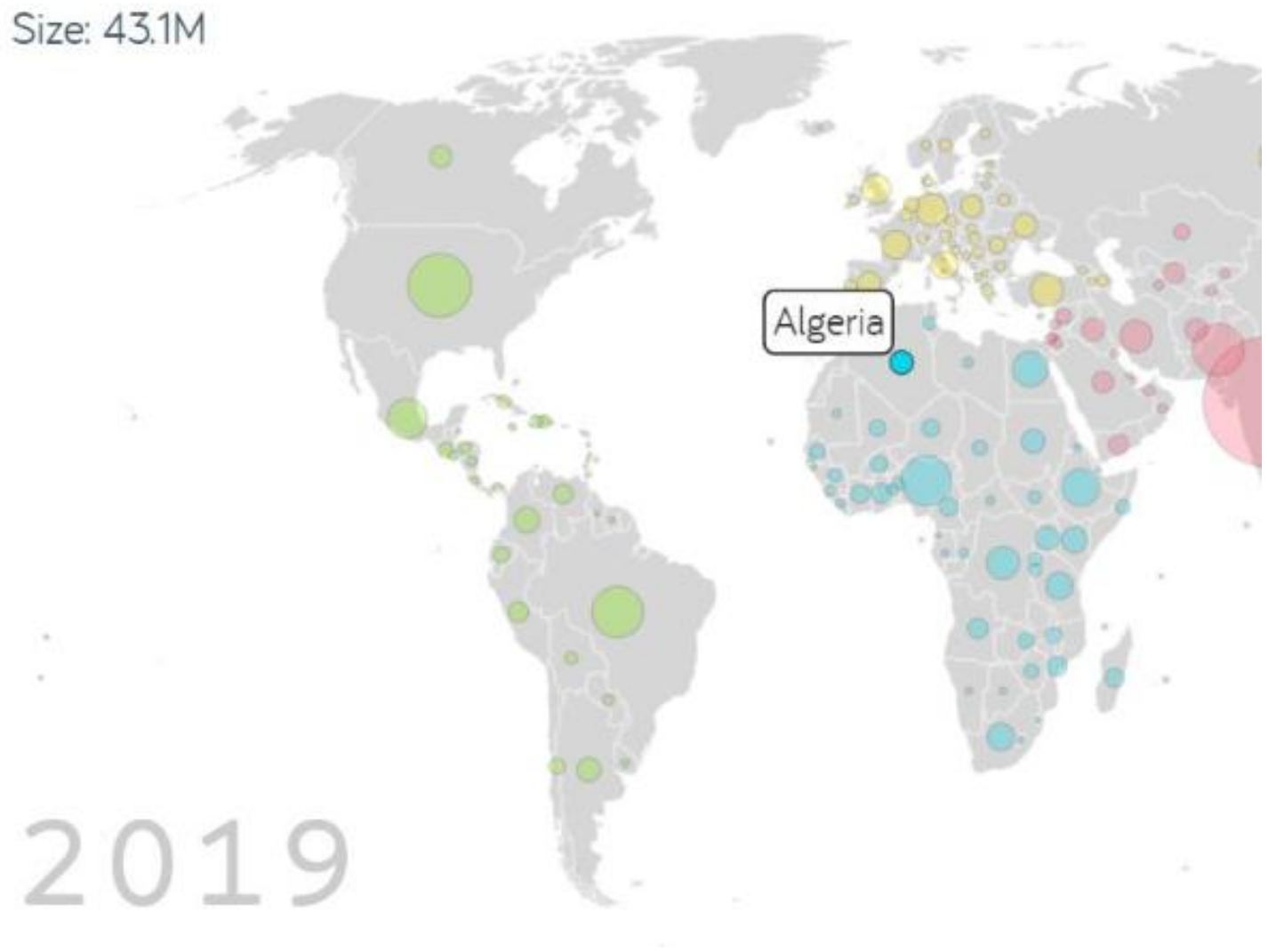
Why "Where" Matters in Climate Research and Resiliency

Future City Colorado

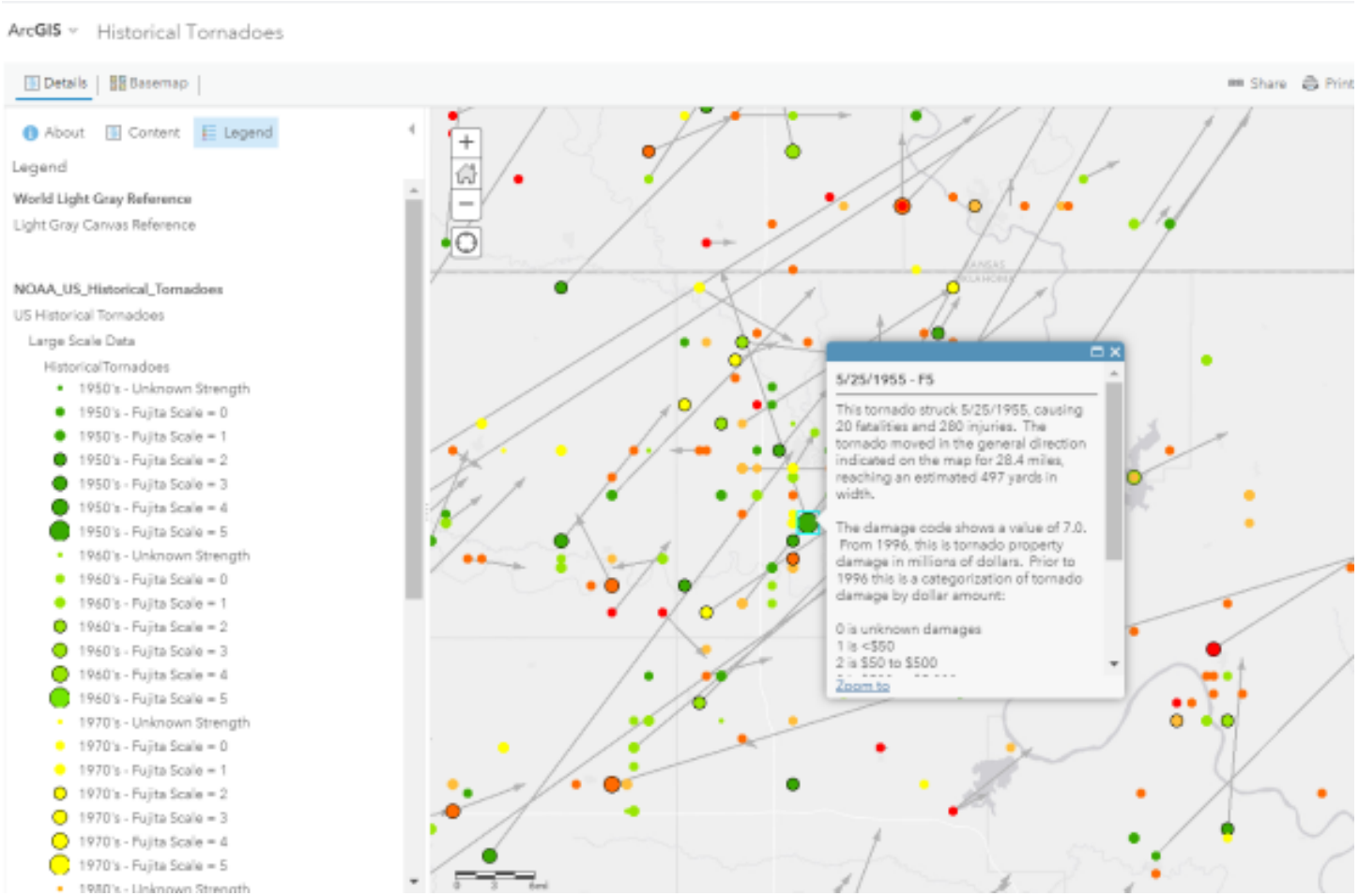
Joseph Kerski
18 January 2023

1 Why "Location as a Framework for study?"

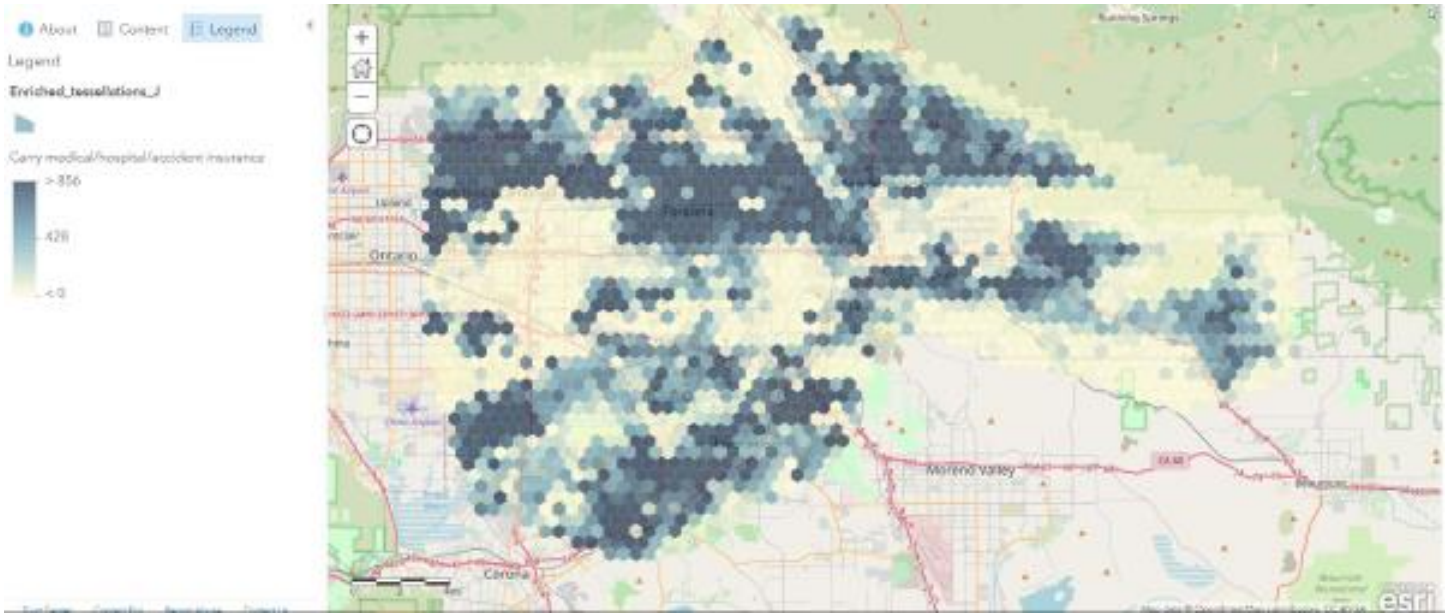


2 What are maps?

3 Maps are representations of reality

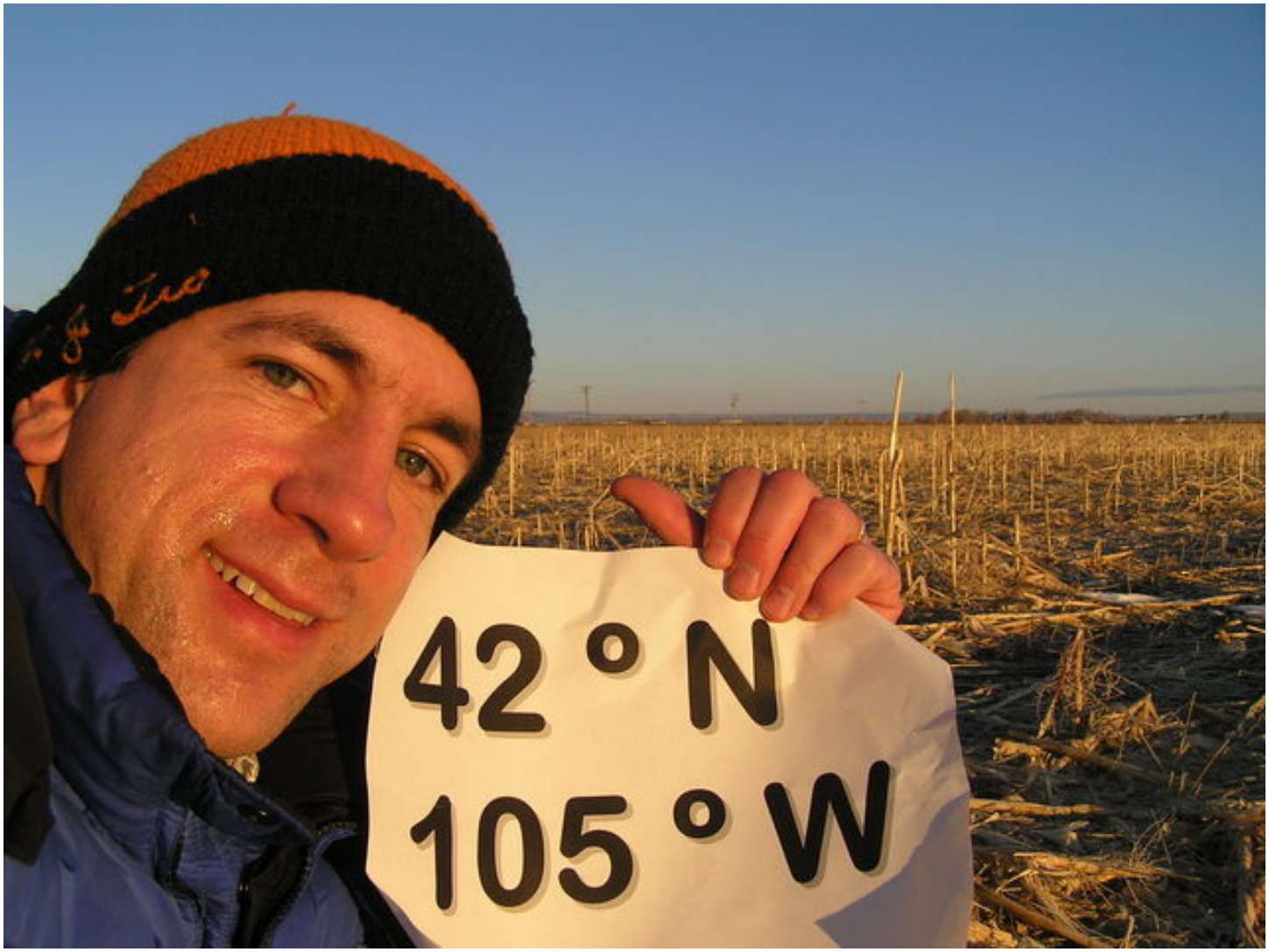


4 Mapping and spatial analysis give you superpowers!



For your career and empowering positive change.

5 42 North 105 West

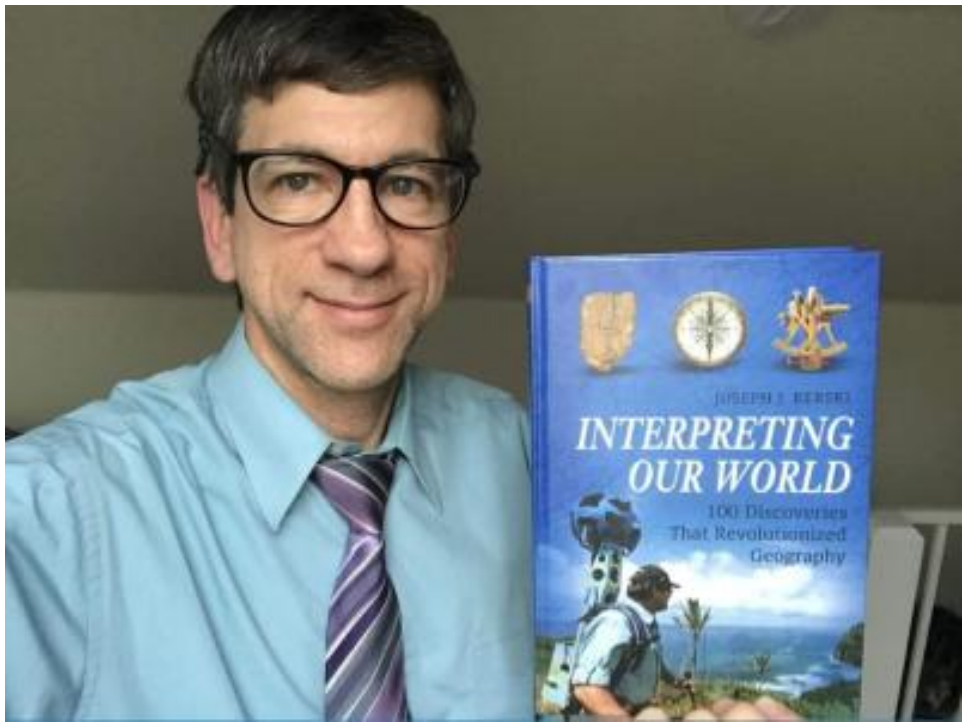


Maps are tied to real locations, real data, and real issues.

6 Who is a leader here?

My pathway. What will your pathway be?

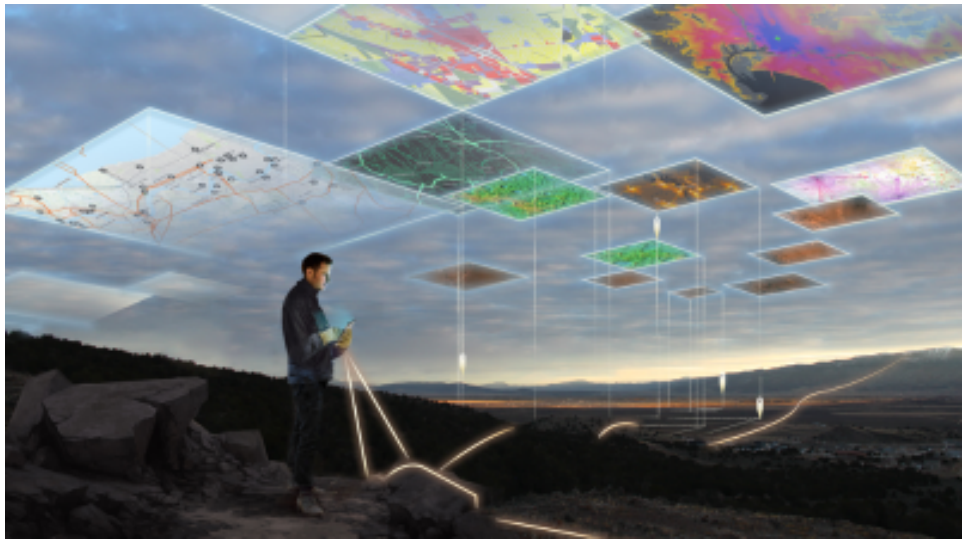
Joseph Kerski PhD GISP | Geographer | Education Manager | Esri



One of my books - Interpreting Our World.

What do you care about?

What do you want to see in society?



At no time in history have we been so empowered, and yet so challenged.

Geotechnologies includes GIS, remote sensing, web mapping, GPS/GNSS.

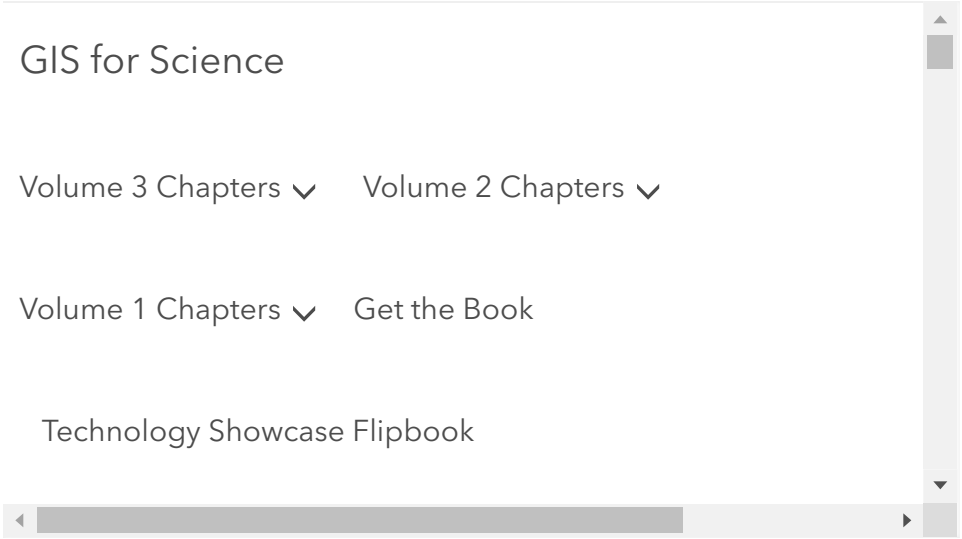
GIS helps users understand patterns, relationships, and geographic context, making connections more clear and new solutions possible.

Geotechnologies is a relevant set of tools, data, and methods that will help us enable a more resilient, equitable, sustainable world.

A geographic information system (GIS) is a computer system for creating, managing, analyzing and displaying data on a map. GIS connects data to a map, integrating location data with all types of descriptive information.

GIS and spatial thinking is fundamental to all science. Why?

All 21st Century societal issues are spatial issues.

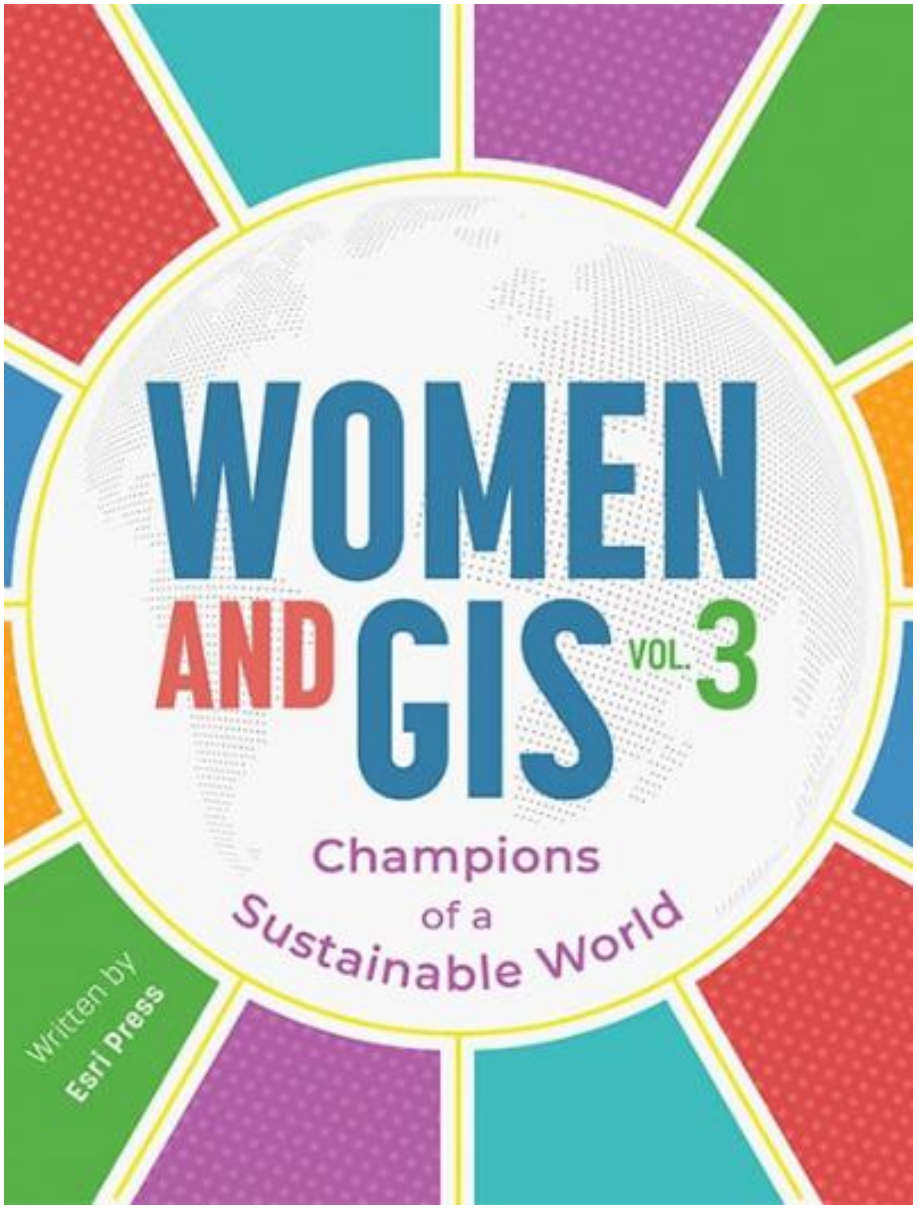


GIS for Science

Women and GIS: Mapping Their Stories | ...

Twenty-three stories about how ordinary girls with very different passions have become extraordinar...

https://www.esri.com/en-us/esri-press/browse/women-and-gis-mapping-their-stories


WOMEN
AND GIS
VOL. 3
Champions
of a
Sustainable World
Written by
Esri Press

5 reasons why GIS skills are importnat in climate science.

5 reasons why GIS in education is relevant and important.

6 Investigations with Geotechnologies

1. Examining the oceans via the Ecological Marine Units

EMU - Explorer

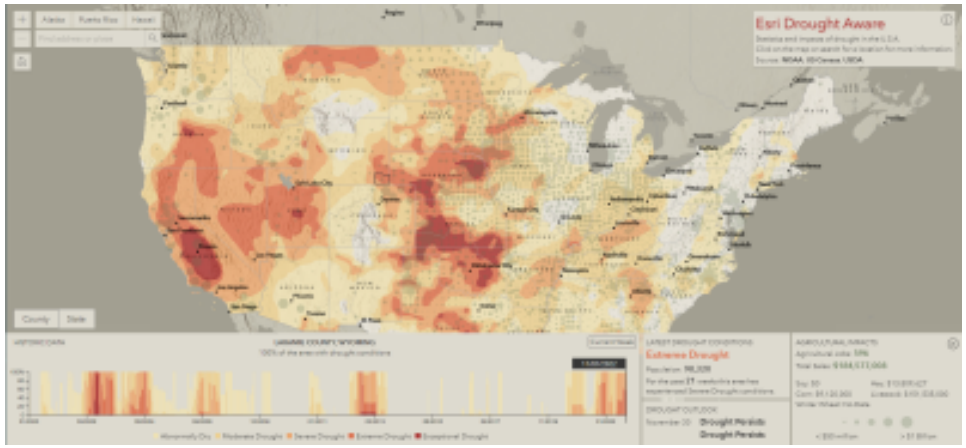
2. Investigating change over space and time with the Wayback Imagery Comparisons

https://livingatlas.arcgis.com/wayback/#active=7110&ext=-115.35995,36.03552,-115.23705,36.09248

Esri Wayback imagery.

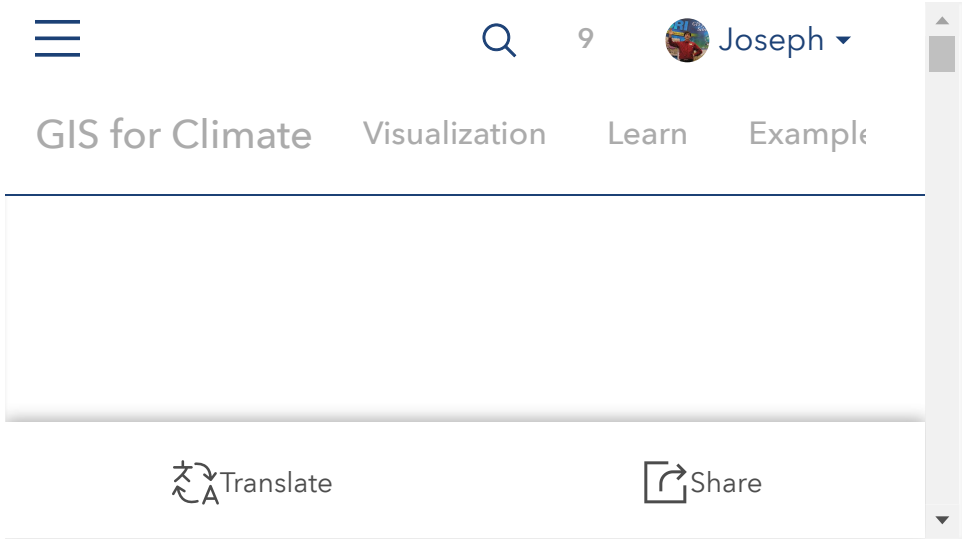
3. Investigating water issues via the Drought Aware app

https://livingatlas.arcgis.com/droughtaware/drought/index.html?admin=county&xmin=-15080422.196397102&ymin=4207177.018887754&xmax=-6362931.994531637&ymax=6658053.893822993



Esri Drought Aware app.

4. Examining the Esri GIS Climate Hub



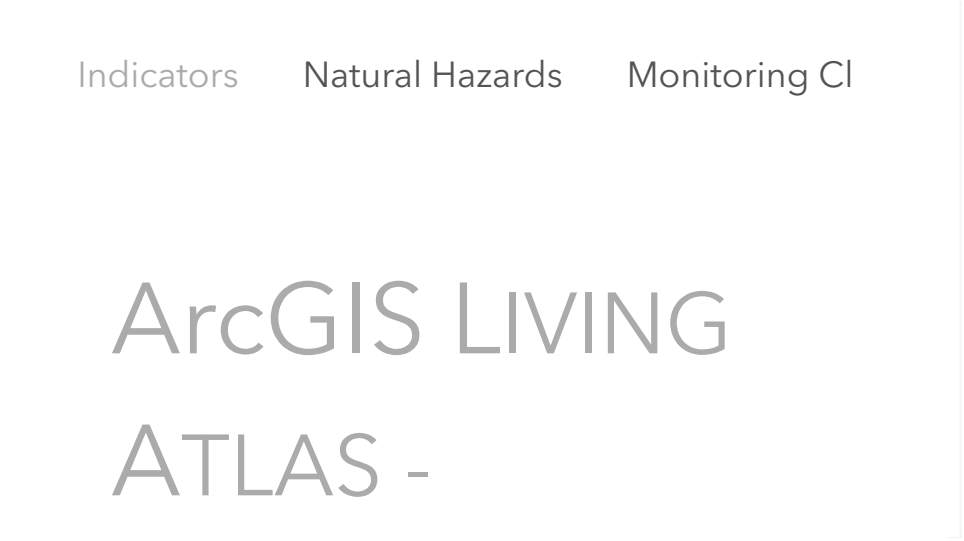
GIS for Climate

Climate Change Solutions | Climate Actio...

At Esri, our priority and focus have always been to support our users' important global work with a...

https://www.esri.com/en-us/about/climate-change/overview

5. Exploring the Living Atlas Indicators of Planet Earth



6. Mapping and analyzing your own Field Data

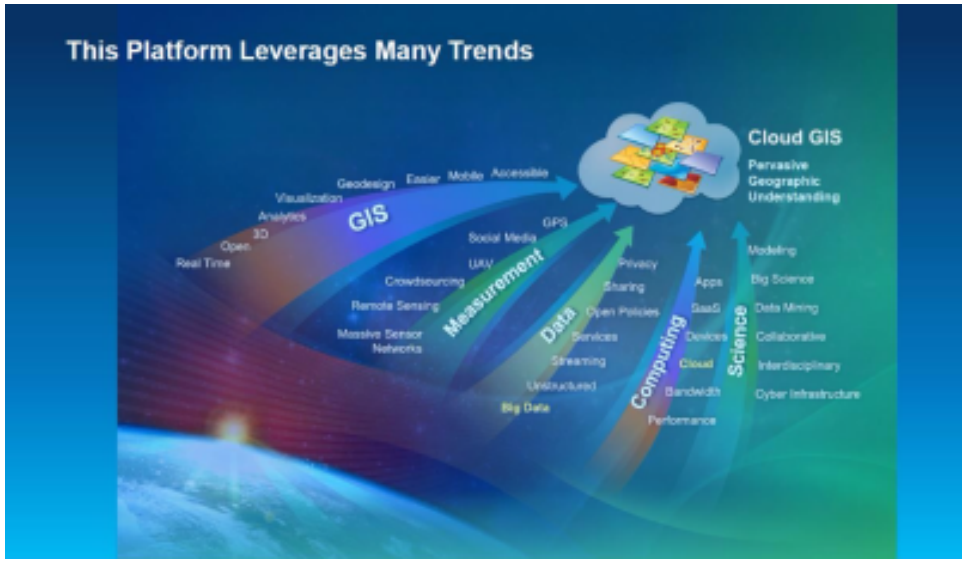
Map Viewer

5 forces that bring us to a pivotal moment in geotechnologies in education and society.

5 forces that bring us to a key moment in GIS in education and in society.

We are living in the *measured world*

With real time data feeds related to weather here and more weather here and here, wildfires.

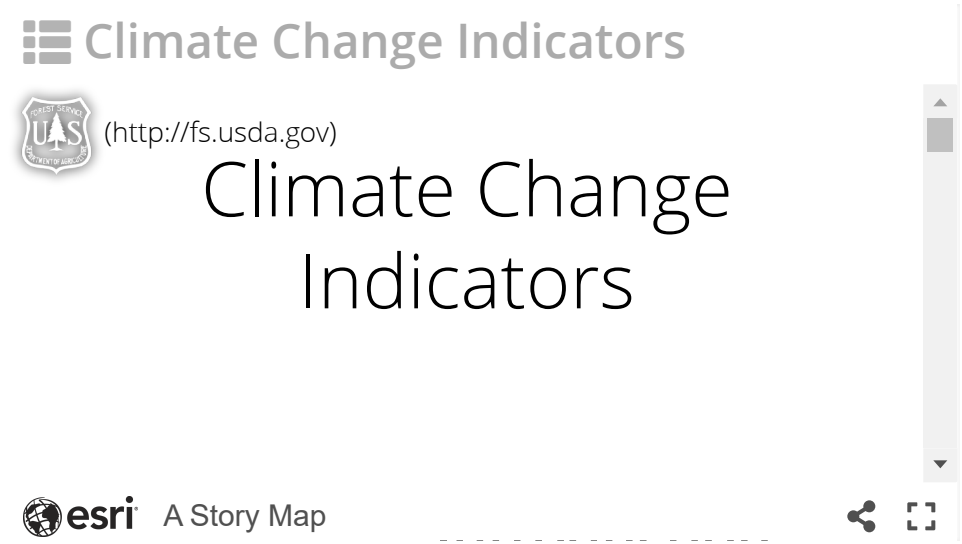


GIS is no longer a niche technology and set of methods.

GIS helps us see things in new ways.

Analyzing traffic accidents in space and time.

Explore Story Maps. This presentation is a story map as well!



Story Map: Climate Change Indicators

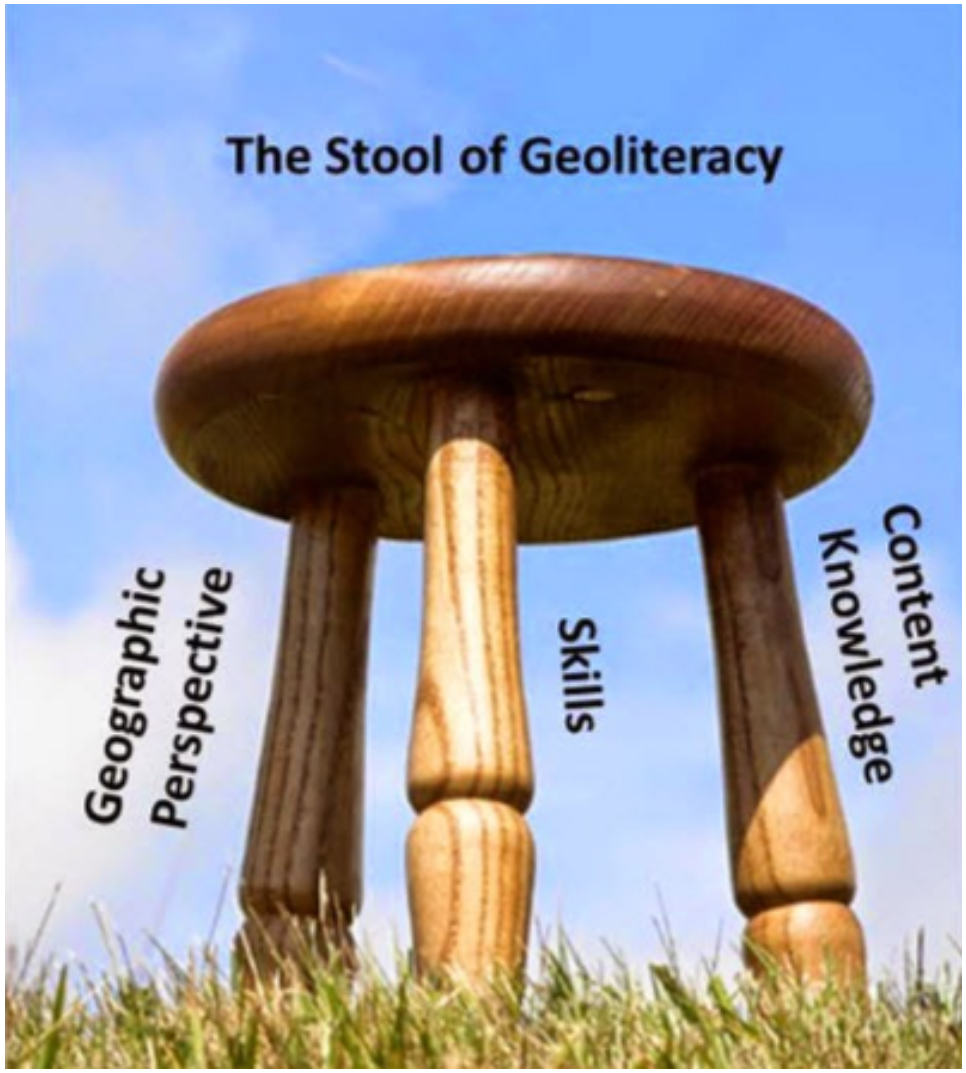
3 guidelines for all learners

1) Don't stop at the *map*.

2) Don't get *too* attached to the tools!

*Don't get **too** attached to your tools.*

3) All 3 legs of geoliteracy matter.

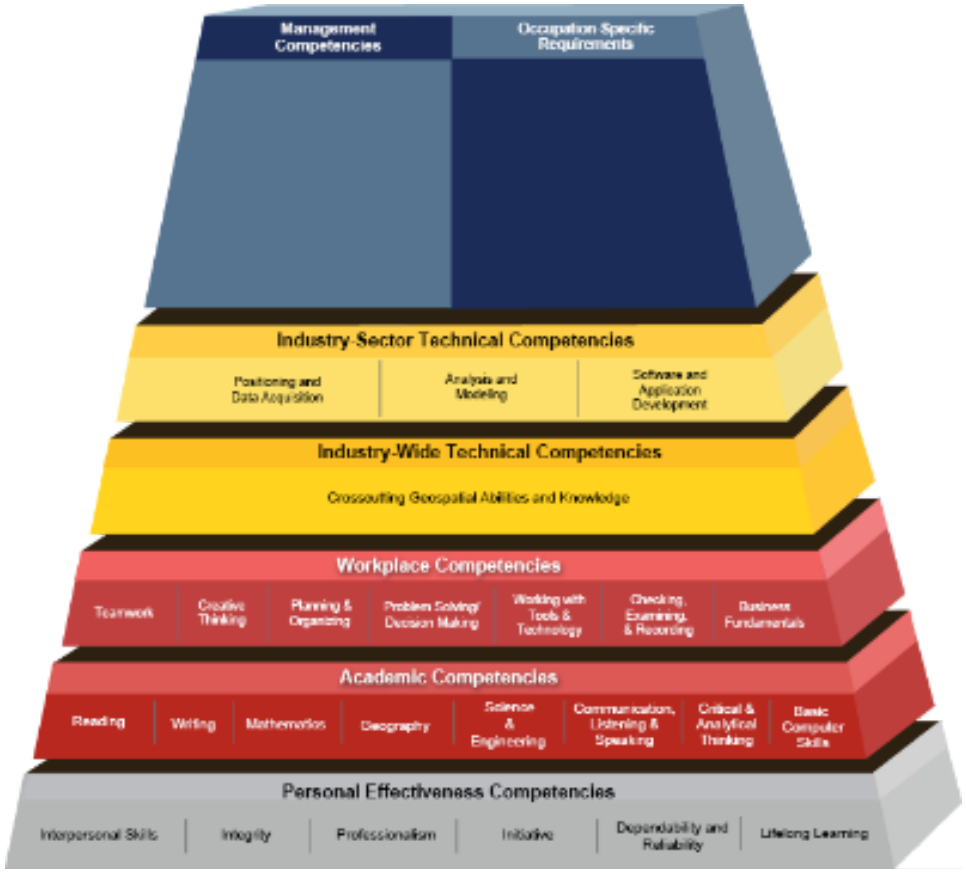


3 legged geoliteracy stool (Kerski).

Why and how should students learn geotechnologies in the 2020s?

Problem Solving | Learning How to Learn

Use the **GTCM**:
https://www.careeronestop.org/competencymodel/competency-models/geospatial-technology.aspx

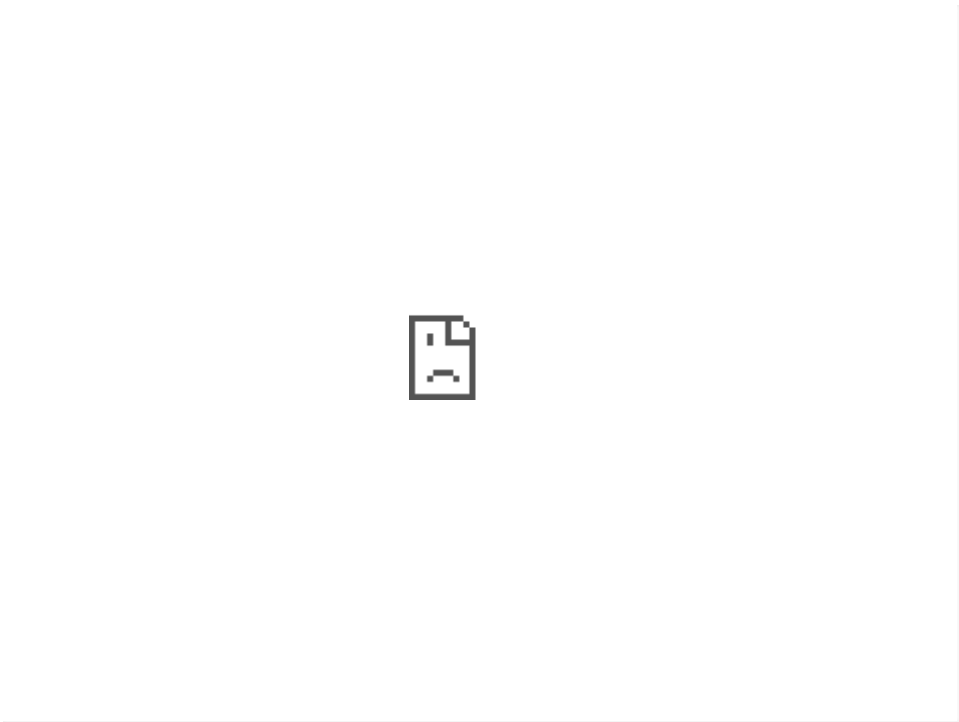


The GTCM.

Examples of Student Work with GIS

Storymap from HS student capstone. UAVs and GIS > create campus

map. https://storymaps.arcgis.com/stories/0556cbdd4d894a1bb06867c5b0020b54



Drones and GIS

Why are right whales dying?

Why are Right Whales Dying in the Gulf of St. Lawrence?

One teacher who lets the students fly!

GeoInspirations: Erik Bushland, Letting S...

Editor's note: Thank you for joining us for this edition of GeoInspirations. Today our distinguishe...

https://www.directionsmag.com/article/9001

What is the tiny little secret? Just like GIS is too valuable for 1-2 departments in a city, GIS is too valuable for just 1 or 2 departments or programs on a school, college, or university campus!

In primary and secondary schools:

Slow steady progress in the use of GIS. Mostly as instructional tool in geography, math, history, science, and for content (teaching WITH GIS). Some use in primary-secondary is teaching ABOUT GIS.

K12 schools in the USA using ArcGIS.

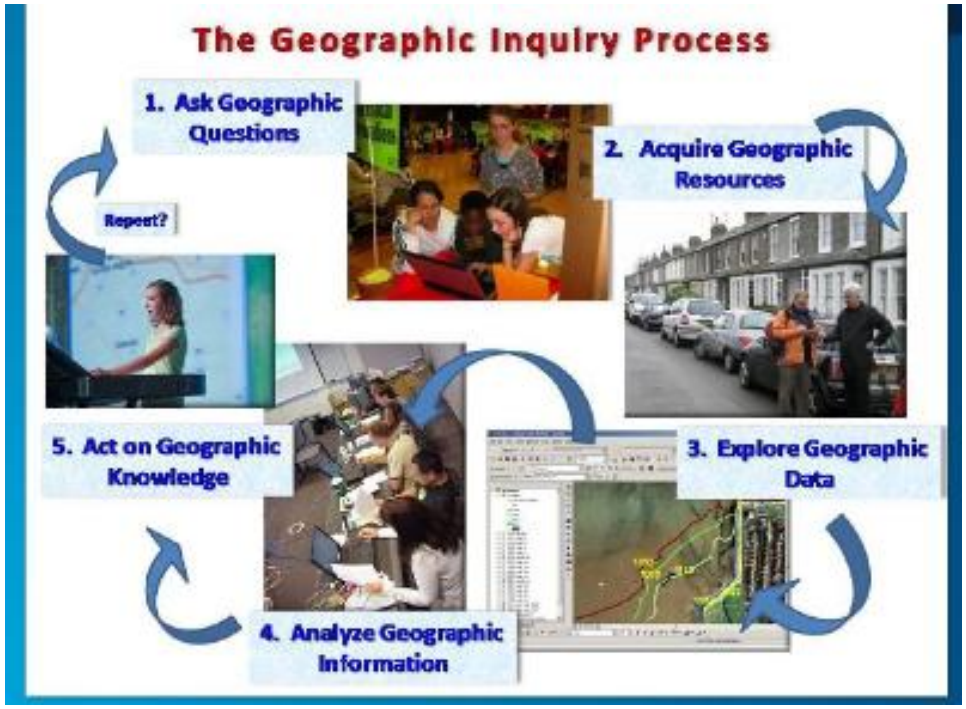
What should faculty do?

1) Teach with real-world examples and hands-on activities.
Goal: Creating students who can think spatially and critically, who can apply theory to practice across disciplines and problems.

2) Don't overstress about using the latest-and-greatest version of X software, but by the same token, don't teach like it is 1999.

What are the 7 Most Important Skills for students?

1. Be curious. Leads to >>> Tenacity. Asking Good questions is part of the Inquiry Process.



Geographic Inquiry model.

2. Get a free ArcGIS Online subscription for your school. Get your OWN personal ArcGIS Online subscription, too. Explore, create, make maps and apps! Explore the links on this story map.

3. Be able to work with data and be critical of it!

Geospatial data book and blog: **http://spatialreserves.wordpress.com**

Spatial Reserves

Understand the ethical implications of what you are doing!

Be critical of data that even YOU generate!

For more, see my **recent presentation on data quality.**

And **my article in Directions Magazine.**

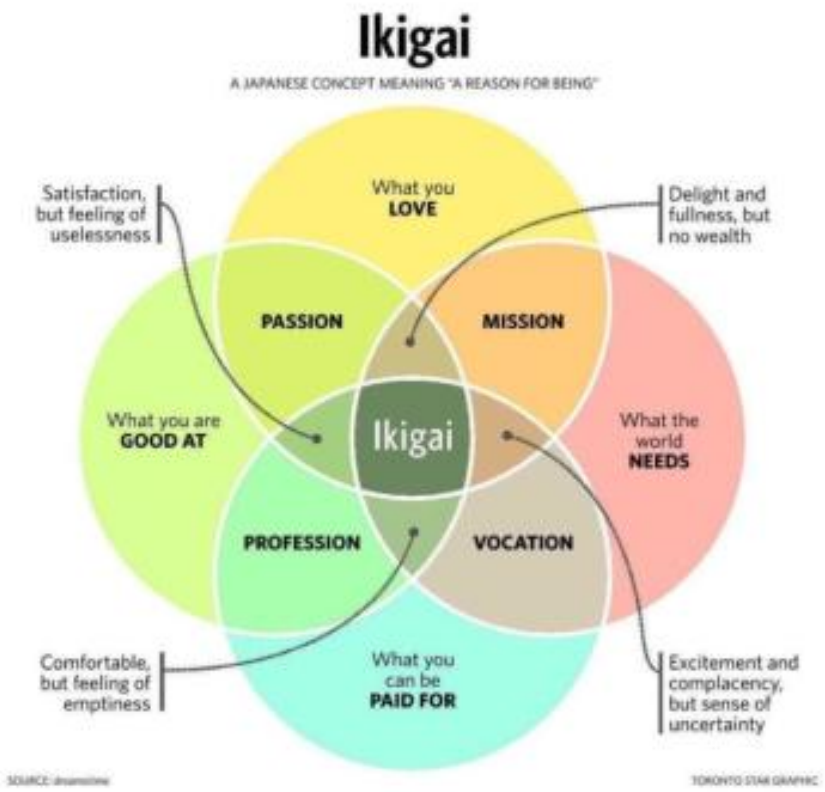
Maps are easy to create, maps tend to be *believed*, maps are often used to generate views on web

pages, maps are often attached to fun posts, maps are representations of reality.

4. Know **Geographic and Geotechnical Foundations**: Skills (spatial stats, coding, web, projections, analysis, classification, etc.), but content knowledge as well **and** the geographic perspective (scale, systems thinking).

Where are your gaps? Use the GTCM: Identify gaps and make plans to fill your gaps!

5. Be adaptable and flexible. Be willing to go international; or at the very least, outside of your "disciplinary comfort zone"!



Seek the Center, Luke.

6. READ.

My favorite books that I read in 2022.

7. Cultivate good communications. Do you have an elevator speech?

Elevator speech on why GIS matters to society

5 Recommendations

1) Be inspired by these geo-inspirations!

Directions Magazine Geoinspirations: https://www.directionsmag.com/playlist/6651

GeoInspirations - Articles and Podcasts

Directions Magazine has been privileged to work with some of the most influential minds in the geospatial industry. Over the years,...

https://www.directionsmag.com/playlist/6651

2) Listen to my Thinking Spatially podcast: https://podcasts.apple.com/us/podcast/thinking-spatially/id1441426924

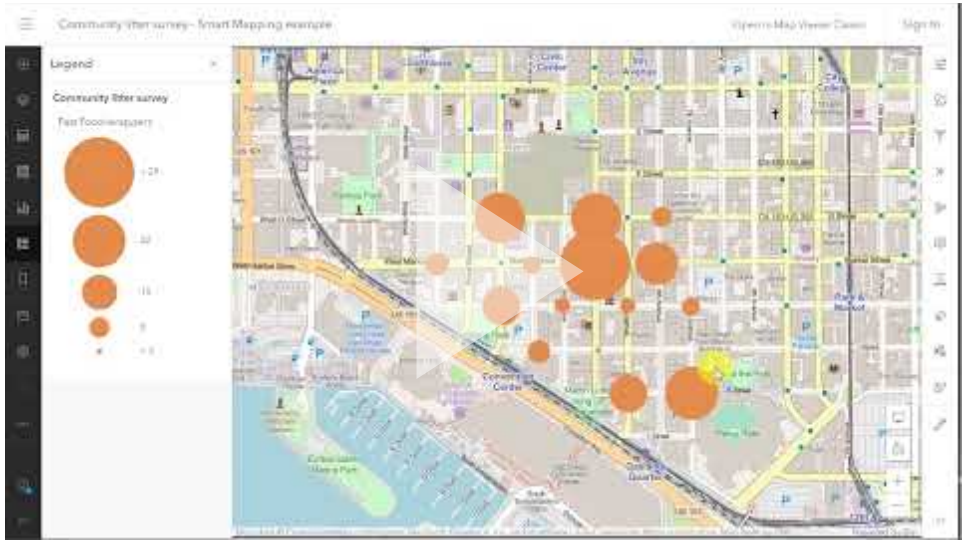
Thinking Spatially on Apple Podcasts

Why does thinking spatially and geographically still matter in our 21st Century world? Join geographer...

https://podcasts.apple.com/us/podcast/thinking-spatially/id1441426924

3) View some of my Our Earth videos! Space, place, Earth, education, STEM, geography, geotechnologies.

Our Earth: https://esriurl.com/ourearth = > 6,000 geo-videos.



Understanding data by creating graduated symbol, predominance, and pie chart maps in ArcGIS Online

4) Get an ArcGIS Online free subscription for your school. Explore, investigate, make maps and apps! Or - Get your own free ArcGIS Online free subscription!

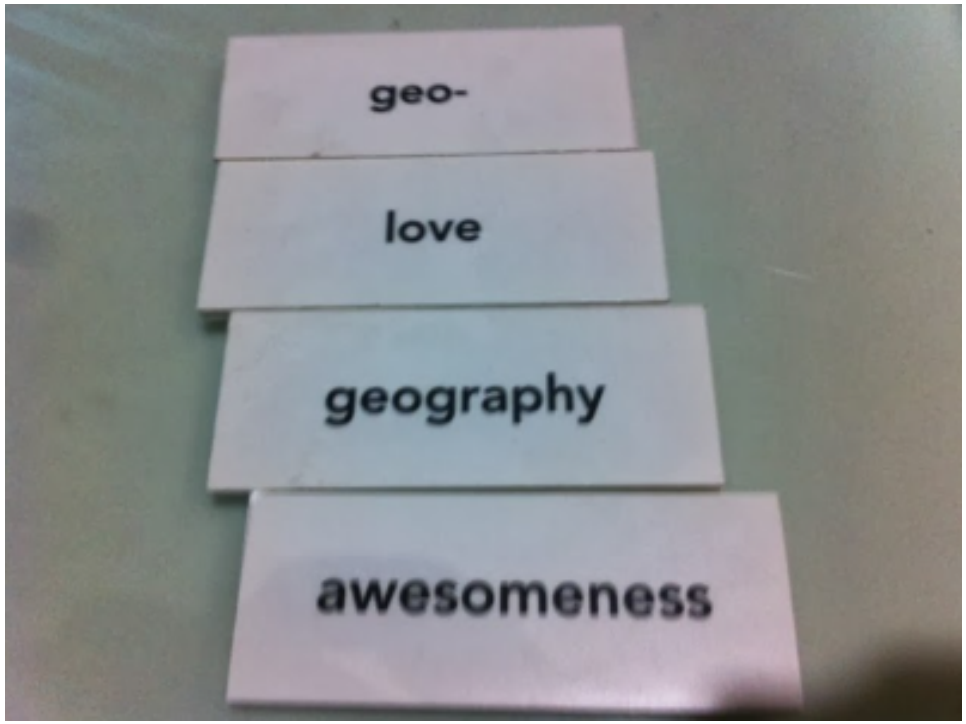
5) Go through some lessons from Esri on:

Esri Climate Learning Hub

Learn

This decade will be exciting for geotechnologies, and you have a key role in achieving the goal.

The goal: That wise decisions will be made with the spatial perspective and the use of geotechnologies for a healthier, happier, and more sustainable future.



Guess where? Place matters.

Credits

All	from Joseph Kerski with sources cited.