

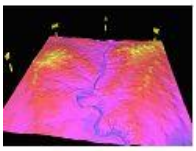



Spatial Thinking and Geotechnologies Workshop: Cherry Creek School District – 13 Dec 2017

Summary:
Two-hour workshop led by an Esri education manager and geographer on integrating spatial thinking and geotechnologies (GPS, remote sensing, Geographic Information Systems (GIS)) into Cherry Creek School District curricula, with a focus on geography, history, and STEM. Content includes investigations in: Local to global population change and demographics; mapping trees and other physical objects on campus; natural hazards, weather, climate, and ecoregions; spatial analysis in mapping human health and disease. Skills include using, symbolizing, classifying, saving, and sharing web maps; field tools; creating multimedia web-based story maps and other web mapping applications.

Points of Contact:
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Joseph Kerski, Ph.D., GISP - jkerski@esri.com 303-625-3925. http://About.me/josephkerski
http://blogs.esri.com/blogs/gisedcom and http://geonet.esri.com and about spatial data on http://spatialreserves.wordpress.com and 4,000 videos on http://www.youtube.com/geographyuberalles.

Course Goals:
1. Develop **knowledge and skills** in geotechnologies: Technical skills and foundational underpinnings, pertinent issues surrounding geotechnologies, (analytics, cloud, data sources, data formats, multimedia, data quality; map projections, symbolizing, measurement, classification, databases, smartphone-to-map workflows).
2. Develop **teaching skills** with the spatial perspective and geotechnologies that foster critical thinking and problem-based learning in different knowledge domains and subjects.
3. Develop **confidence** that you can use these skills and perspectives to move forward with **your own** instruction.

Course Philosophy:
1. This is **your** course. Let me know how I/we can help you today and in the future as you use geotechnologies.
2. It is important that you **network** with your colleagues so that GIS is a sustained part of your curriculum.
3. Using geotechnologies effectively is a *journey*. You're not going to learn ALL of it in this workshop.
4. We will not work with every tool or approach but will build foundations > You: Empowered and confident.
5. We will not have time to fully complete each exercise, but you can go through each exercise on your own, later.
6. The activities for the workshop include core themes and skills that can be used in many disciplinary areas—history, social studies, geography, economics, biology, environmental studies, mathematics, art, PE, CTE.

Agenda: Day 1
- Introductions. What is GIS video: http://video.esri.com/watch/3623/what-is-gis_question_ Why Get excited about web maps? See Joseph's video: https://www.youtube.com/watch?v=8WpxgVJXwbk
- Introductions and Goals. Why mapping? Paper vs. digital maps; maps as reference documents vs. maps as investigative tools; table of data vs. a map of that same data.
- Fill out your own data in Crowdsource Story Map (view out your window) and data about you in ArcGIS Online: and discuss: What is crowdsourcing? What are geotechnologies, how do geotechnologies (GIS, GPS, remote sensing, web mapping) work, cloud vs. desktop tools, data quality, scale, map projections, metadata.

- What is my role and what is Esri? https://www.esri.com/about-esri and my role: https://denverro.maps.arcgis.com/apps/Cascade/index.html?appid=c84bb188001746d1a5ca43f83b366c66
- Penn State Geospatial Revolution: Trailer video. Penn State. Trailer. If time, watch all full segments. https://www.youtube.com/watch?v=8WpxgVJXwbk -- Why geotechnologies matter in society and in education.
- Discuss: How are geotechnologies used in society? How are they evolving? How is GIS becoming a platform? What career opportunities exist? US Dept of Labor report. What is GIS? What is ArcGIS?
- Investigation 1: Web Mapping Applications: Urban Observatory, Change Matters Viewer, Migration 2D and 3D map via "10 Things you can do in ArcGIS Online" - https://sway.com/IRBNL3fT5WQnB2iw, plus Mapping Starbucks. Also Examine food expenditures, at home vs away from home for economics and math integration.
- Investigation 2: The Dust Bowl GeoInquiry. This is 1 of > 100 geoinquiries: 1 page lessons tied to interactive web maps. Part of the Esri Schools Program. Other lessons: http://learn.arcgis.com and the Instructional Guide to the ArcGIS Book (start here: https://esripress.esri.com/storage/esripress/images/303/agbig_ch1.pdf).
- Discuss: ArcGIS Online use: (0) Anonymous (no login). (1) Free Developer account via http://developers.arcgis.com; (3) An organizational subscription for your school (public, private, homeschool).
- Investigation 3: Colorado Precipitation Activity. Part of the Colorado Digital Atlas, a series of lessons and maps: http://education.maps.arcgis.com/apps/PublicGallery/index.html?appid=bede0ef880d0411eaac9b0af4c1eb5be
- Investigation 4: National – to-local investigation: Demographics of the USA. Focus on: Denver Metro. Median age, median income, population change, diversity, tapestry (lifestyle).
- Investigation 5: Historical investigation of Aurora. Using historical USGS topographic maps.
- Investigation 6: The Basics: Log in to your ArcGIS Online account. Add World Hydro and Ecoregions of the World. Create bookmarks. Zoom to Colorado. Save and share maps.
- Investigation 7: Investigating storymaps. http://storymaps.arcgis.com Investigate the gallery. Create Map Tour storymap – using the APPS section on the story maps page. Easy to create, powerful; use storymaps as a presentation and assessment tool! For guidelines and activities, see Joseph's story maps section #2 in https://community.esri.com/community/education/blog/2017/07/26/10-things-you-can-do-with-arcgis-online-story-maps-apps-and-spatial-analysis-workshops.
- Investigation 8: Examine recent earthquakes in 2D: esriurl.com/recentquakesmap 3D: Map in 3D Scene. Consider what **else** you could map in 3D – population change, water quality, precipitation, and more.
- Investigation 9: Discuss: Methods of collecting, mapping, and analyzing field data. Focus: Survey123.
  Survey123: Input data into a form, such as campus vegetation mapping: https://survey123.arcgis.com/snare/933b03f8109e411cab344453dbd7a865/form – then map and analyze the result in ArcGIS Online, such as here: http://www.arcgis.com/home/webmap/viewer.html?webmap=a5db62455ff64f01a9c5331994f6bc99&extent=-105.2723,39.9849,-105.2267,40.0132
- Investigation 10: Analyzing cholera using the analysis tools in ArcGIS Online. Cholera, London 1854. Starting Point: Lesson. Map Starting Point. Map Results are here.

Next Steps: See 1 page flyer that Joseph brought; discuss integration challenges, plans.

- (1) Esri Schools Program: Lessons, PD, & online mapping accounts to any US K12 school: http://www.esri.com/schools. (2) GeoInquiries: 15-minute online lessons; no background, login, install: http://www.esri.com/geoinquiries (3) GIS in US K12 Education: Access, support, & GeoMentors: http://esriurl.com/usk12gis (4) Guidance and Resources for teaching with GIS: http://esriurl.com/k12gis
  (5) The ArcGIS Book: GIS intro & online instruction http://www.thearcgisbook.com
  (6) Jan – Feb 2018: Telling your story with Story Maps – online course for educators: http://www.enetlearning.org/register-for-courses/telling-your-story-with-esri-story-maps/

- Evaluation: Final Q&A. Critical Incident Questionnaire. https://goo.gl/forms/NzqbdPzhkDnsUhRy1