



## Spatial Thinking and Geotechnologies Workshop: University of Colorado Environmental Program – Spring 2022



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### Workshop Goals and Philosophy:

1. Develop **knowledge and skills** in geotechnologies focusing on environmental applications: GIS, remote sensing, and GPS/GNSS, technical skills and foundational underpinnings, cloud, data sources and formats, communications, data quality; projections, symbolizing, georeferencing, measurement, classification, databases, and mobile workflows.
2. Develop **workforce awareness** of pathways in environmental careers that use GIS and how to prepare for them.
3. Develop **confidence** that you can use these skills and perspectives to move forward with **your own** career.
  - This is **your** workshop. Let me know how my team can help you today & the future as you use geotechnologies.
  - Using geotechnologies effectively is a journey that will require building a **network** with your colleagues.
  - We will not work with every tool but we will build a foundation so that you will be empowered and confident.
  - The activities include core themes and skills that can be used in many aspects of environmental work.

### Agenda:

- Introductions. Seeing the future through GIS: <https://www.esri.com/videos/watch?v=y9ptLTiJT6g>. What is GIS? See video: [http://video.esri.com/watch/3623/what-is-gis\\_question](http://video.esri.com/watch/3623/what-is-gis_question)
- Fill out your own data via this course [Survey123](#) and check this [dashboard](#) for the results.
- What is Esri? <http://www.esri.com/about-esri#what-we-do> and [Joseph's and education team's role?](#)
- How are geotechnologies [perceived and evolving in society?](#) What career opportunities exist?
- How is GIS becoming a platform? What is [ArcGIS?](#)
- **Investigation 1:** How is GIS used at CU? > [CU's web GIS campus map.](#) & [CU GIS/CAD.](#) & [CU Trees story map.](#)
- **Investigation 2:** Analysis introduction: Explore the [green infrastructure landscape analysis app.](#)
- **Investigation 3:** Explorations using relevant web maps: (1) [Coronavirus JHU dashboard.](#) (2) [Spratly Islands Fiery Cross Reef](#) and [Hughes Reef.](#) (3) [Wayback imagery app.](#) (4) [Landsat Explorer.](#) (5) [Water Balance App.](#) (6) [Elevation profile app.](#) (7) [Urban Observatory.](#) (8) [Migration Over Space & Time.](#) (9) [Esri USGS historical maps.](#)
- **Investigation 3:** [Examine ecoregions, population density, and imagery.](#)
- Discuss: ArcGIS Online use: (0) Anonymous. (1) Developer; (2) Organizational subscription. (3) Personal Use.
- **Investigation 4:** Colorado Precipitation investigation: Filtering, overlay. Part of the Colorado Digital Atlas: <http://education.maps.arcgis.com/apps/PublicGallery/index.html?appid=bede0ef880d0411eaac9b0af4c1eb5be>
- **Investigation 5:** Natl- to-local investigation: [Demographics of the USA map.](#) [Multivariate map of population change.](#) [USA Demographics map](#) (requires sign in to ArcGIS Online) and [USA Demographics app.](#)
- **Investigation 6:** Log in to ArcGIS Online; add Esri world hydro layer. Analysis > Trace downstream.
- **Investigation 7:** [Examine global plate tectonics:](#) Plates, volcanoes, earthquakes. Map last 30 days of activity.
- **Investigation 8:** Spatial Analysis with Boulder County hazards. [Starting point: Map.](#)
- **Investigation 9:** Investigating [storymaps.](#) Multimedia interactive web maps. Explore gallery.
- **Investigation 10:** Build a [storymap of geomorphology field trip with images, maps, analysis results, and text.](#)
- **Investigation 11:** Collect and map tree data on University of Colorado campus grounds using Survey123. Discuss: Methods of collecting data including field apps. How Location Services works; accuracy. **Outside:** Collect data with smartphones using Survey123: Take photo. [Survey is here.](#) [Map is here.](#) Long [URL for map is here.](#) Dashboard is [here.](#) Build your own survey, map, dashboard, and story map.
- Next Steps: [Resources,](#) [curriculum,](#) [maps and data,](#) [networking,](#) online and F2F [courses](#) + opportunities.
- **Evaluation:** Final Q&A. <https://goo.gl/forms/NzqbdPzhkDnsUhRy1> Critical Incident Questionnaire.
- **Extensions:** Investigation 12: Map [soil pH data from a spreadsheet:](#) [Save and share.](#) Investigate spatial patterns of point data in an area. [Classify it.](#) [Symbolize \(style\) it.](#) Then, map your *own* data.
- **Investigation 13:** My [siting a wind farm analysis in ArcGIS Online lesson.](#)
- **Investigation 14:** Analyzing cholera data. <http://arcg.is/1Gj08e> using analysis tools in ArcGIS Online. ♦