Data Mining and Analysis in ArcGIS Online

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Goals for this workshop

1. **Understanding how to use data portals and to use ArcGIS Online for data mining.**

2. **Loading data into ArcGIS Online.**

3. **Analyzing data for solving problems in ArcGIS Online.**

Finding and Using Spatial Data

Old Paradigm

--Download data→ Unzip→ Format→ Project→Tabular Manipulation→ Use.

New Paradigm

--Access data in cloud→ Use.

We are not *quite* to the point of fully using the new paradigm … yet.

Thus, best practice today is still the hybrid model:

1. Start with ArcGIS Online to search for data.

2. Search local, state, national, international data depositories and portals.

Examples:

> **Local: Boulder County CO, Los Angeles County CA**
> **State: www.tnris.org (Texas), CASIL (California), RIGIS (RI)**
> **National: USGS, NASA, Census Bureau, NOAA, EPA, US**
> **   DOT, USFWS, BLM, USFS, FAA, National Atlas,**
> **   LINZ (New Zealand), IBGE (Brazil), OS (UK)**
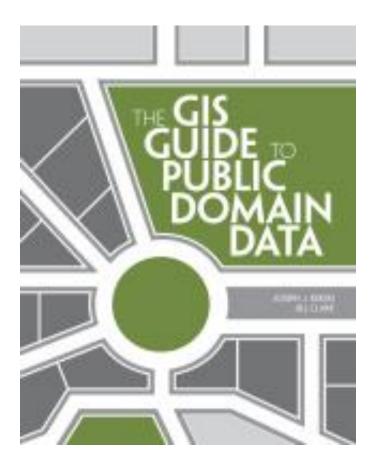> **International: WRI, WWF, UNEP, World Bank, Natural Earth**
> **   Data**

What kinds of data can you add to ArcGIS Online?

Data Type	Open in ArcGIS Online	Open in ArcGIS Desktop
Map Notes	X	
Tables (CSV)	X	X
Zipped Shapefiles	X	X Unzip first
Zipped other data	X after unzipping and serving	X after unzipping
Images (JPG, PNG, TIF)	X	X
Feature services	X	X
Layer package, map package		X

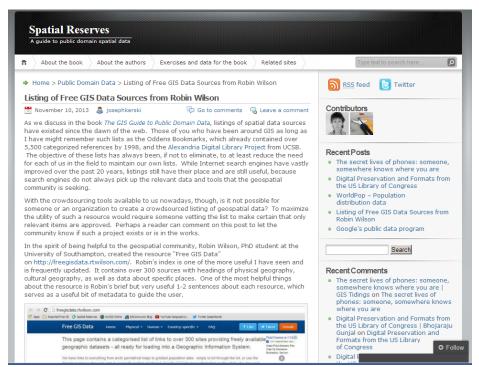# Data Types and Sources

1) Vector: Shapefiles, geodatabases, feature services, other vector formats.

2) Raster: ArcGrids, GeoTiffs and other images, Tiled image services.

3) Tabular: Excel tables, CSVs, TXT files, other formats.

4) Ground images: Wikipedia and other creative commons sources.

Data Sources and Issues (privacy, crowdsourcing, cloud vs. desktop, copyright, and how to use).

- *The GIS Guide to Public Domain Data*, by Joseph Kerski and Jill Clark, Esri Press

- **http://spatialreserves.wordpress.com**

10 Analytical Exercises in Public Domain Data Book

◆ **Finding and using data on ArcGIS Online**

 --**Often helpful to narrow the search, such as:**
 quotes "riparian zones"
 --**Keywords:**
 <search string> owner:jjkerski or tags: "bike
   lanes"
 --**Use Boolean operators:**
   "recent fires" OR fires
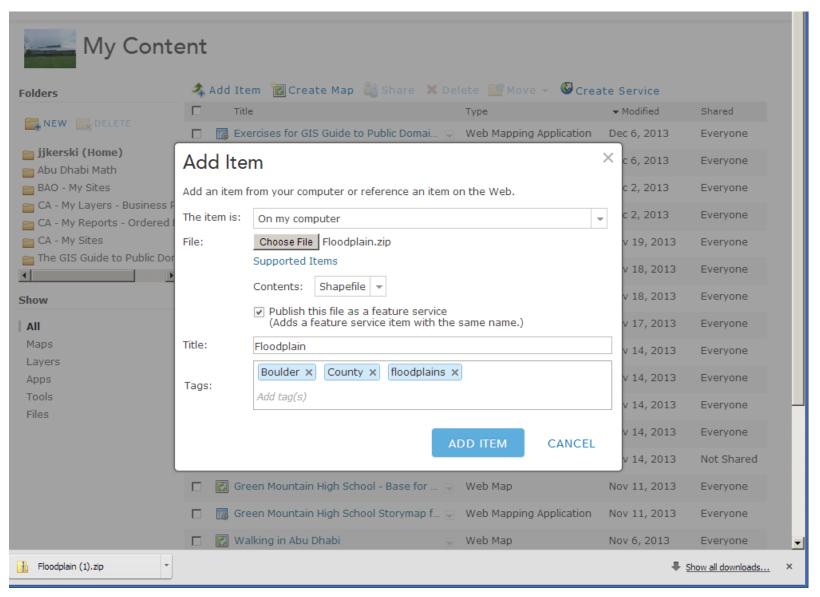   **owner:esri AND tags:streets**
 --**search in your specific map extent or in your**
   organization

 More tips on: Using Search – Fields:
http://resources.arcgis.com/en/help/arcgisonline/index.html#/
/010q0000000n000000

◆ **Accessing and using data portals**

Access Boulder County GIS Portal

Save data sets locally, Add to ArcGIS Online via "My Content"

Uploading Your Data into ArcGIS Online

◆ Why upload? For data that you have either created (Joseph's ocean currents example) or obtained and it is not already on ArcGIS Online {OR} you wish to have more control over the data (Joseph's tornado example.)

◆ You can publish data to ArcGIS Online from ArcGIS Server, from within ArcGIS Desktop, or directly from "My Content" in ArcGIS Online.

Using ArcGIS Online Analytical Tools

◆ ArcGIS Online is a cloud-based GIS, not just an online set of web maps. Hence, you can use it for conducting spatial analysis.

◆ The spatial analysis capabilities of ArcGIS Desktop still far exceed that of ArcGIS Online, given its 30 year head start, but more analytical capabilities are being added quarterly to ArcGIS Online.

◆ The spatial analytical tools in ArcGIS Online are easy to use. They are accessed from the arrows to the right of specific layers. Whether you see the analytical tools depends on (1) if you are using an ArcGIS Online organizational subscription, and (2) how the data are served in ArcGIS Online (i.e. ideally, as services)
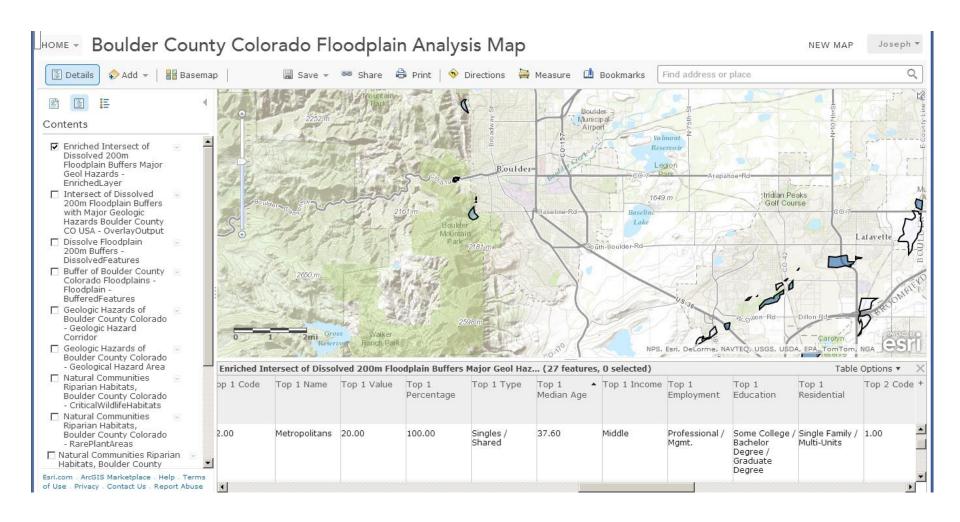
Live Demo

◆ **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, hearing of your excellent GIS skills, 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, land cover, soils, and demographics in your assessment.

Analysis Workflow

◆ 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.

◆ 6. Data Enrichment, with Tapestry, Landcover, and Soils. Sort on % wetlands and Top 1 Median Age.

Analysis Results

Next Steps

◆ **How to teach with the ArcGIS Platform. Includes video on spatial analysis tools:**

http://www.esri.com/landing-pages/industries/education/higher-education/teach-with-arcgis-platform

◆ **Deeper Dive with ArcGIS Online:**
See playlist of videos on:
http://www.youtube.com/geographyuberalles

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