

Getting to Know ArcGIS

Chapter 1: Introducing GIS

GIS = geographic information system

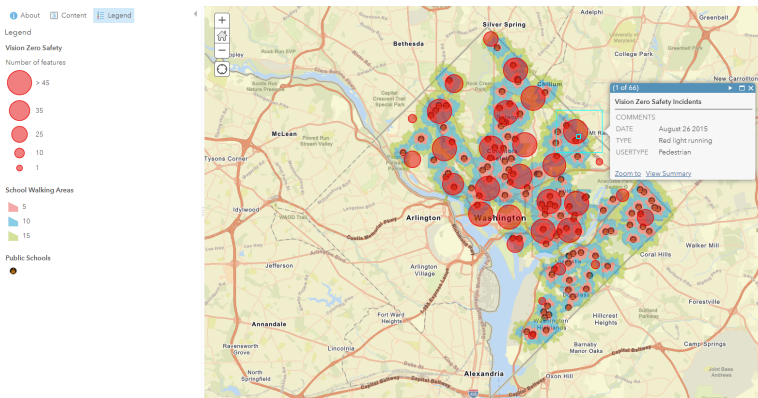
- Composed of five interacting parts: hardware, software, data, procedure, and people
- Captures, stores, and manages data by allowing you to visualize, question, analyze, and interpret data to see relationships, patterns, or trends

I enjoyed seeing examples of GIS in action: helping to fight hunger and wildfire response.

Important definitions:

- Vector: a coordinate-based data model that represents geographic features as points, lines, or polygons
- Raster: a spatial data model that defines space as an array of equally sized cells arranged in rows and columns composed of single or multiple bands

Exercise 1:



This was honestly pretty difficult to do based on the instructions from the book. Then I realized I did this all on ArcGIS (not Pro).

Chapter 2: A First Look at ArcGIS Pro

The chapter 2 exercises were made to provide a good overview of ArcGIS Pro. Straight forward exercises.

Exercise 2A: Learn some basics

- Q1) PM concentrations are highest on the continent of Africa.
- Q2) You restore your contents and catalog panes and find the geoprocessing tool under the tab "View".
- Q3) The city with the largest population is Shanghai, China.

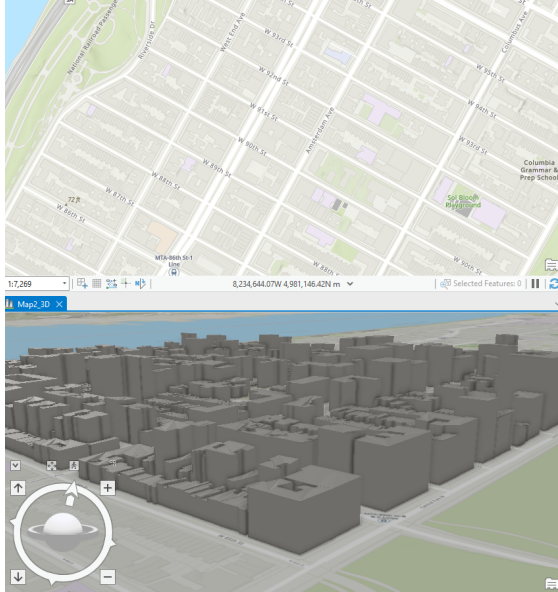
Exercise 2B: Go beyond the basics

Customized the appearance of the map and used the Measure tool.

Exercise 2C: Experiencing 3D GIS

- Q1) The height of the tallest building is 339.758

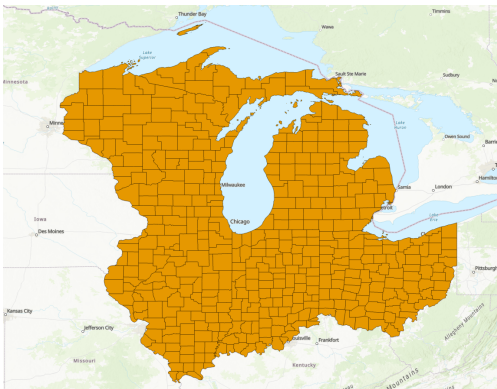




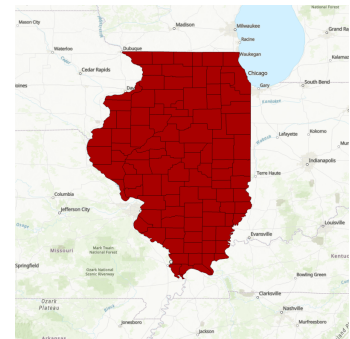
Chapter 3: Exploring Geospatial Relationships

This chapter focuses on how GIS can go beyond just exploring digital maps. It can combine datasets, enrich them with new attributes, derive statistics from them, and obtain information based on their relationships.

Exercise 3A: Extract part of a dataset

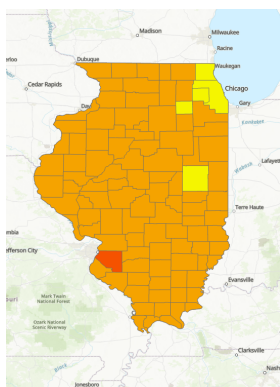


Q1) County features are located under county_fips, and Residents between 22 and 29 in Wayne County are 10,575 people.



Exercise 3B: Incorporate tabular data

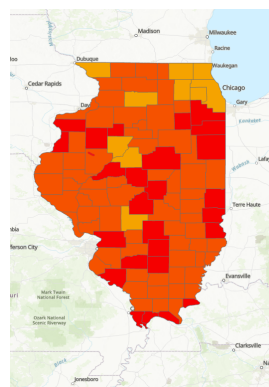
Q1) There are 7 years of data represented in the table (2004-2010).



2004

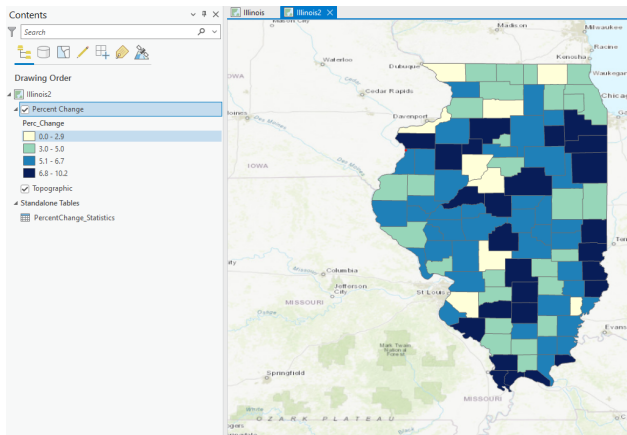


2010



Q2) From the IL_med_income layer file, I don't see a clear correlation between income and 2010 obesity.

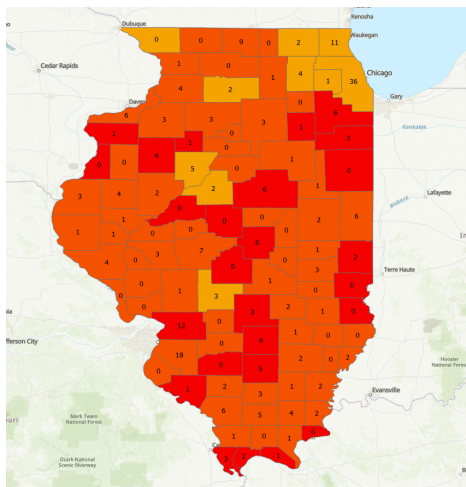
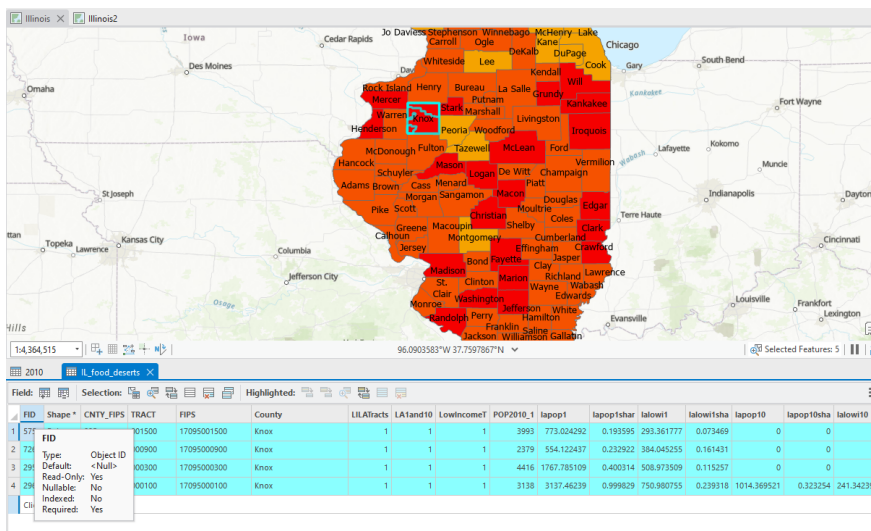
Exercise 3C: Calculate data statistics



Q1) 20.7% of households have an income of less than \$15,000 per year.

Exercise 3D: Connect spatial datasets

Q1) There are four food deserts in Knox County, Illinois.



Spatially joined data to label how many food deserts are in each Illinois county.

Another straightforward chapter.

Chapter 4: Creating and Editing Spatial Data

Geodatabase = a storage container where sets of features are grouped into feature classes

- Feature class: a collection of geographic features that have the same geometry type (ex: point, line, polygon), the same attributes, and the same spatial reference
 - Feature classes can be grouped into a feature dataset

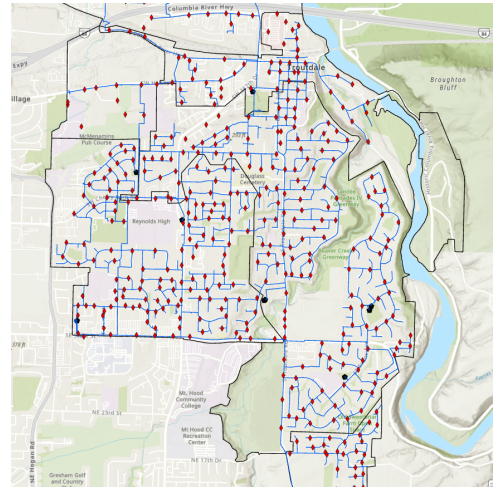
Advantages to using a geodatabase: the ability to store multiple datasets, create an attribute domain, create subtypes, and store behavior rules

Exercise 4A: Build a geodatabase

-Converted shapefiles to to geodatabase feature classes:

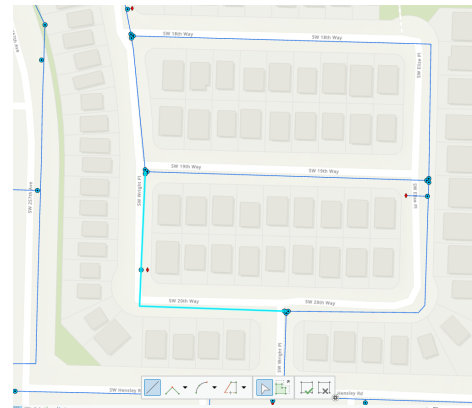
-Then mapped x,y points creating a new layer labeled “valves”.

-After doing that, I established an attribute domain so when waterline feature attributes are entered or edited, it will be constrained to pipe diameters of 4, 6, 8, or 12.



Exercise 4B: Create features

I had the hardest time with this exercise for some reason. The first part specifically. I figured out how to make a new water line resembling an L shape and enter its new attributes into the attribute table.



Exercise 4C: Modify features

When it came time to split water pressure zone 2, I could not get GIS to select the zone as an error made the selection invalid. I tried everything to fix it but I kept getting a dashed line instead of GIS selecting the whole area. Because I couldn't get the tool to work and I searched google and youtube for advice, I came up empty. I spent a lot of time figuring it out and decided to move on for my sanity.

Modifying lines and points: I ran into another issue of dragging the vertexes to the new location (shown w/ arrows). I am convinced that this chapter has a bone to pick with me or something.

Chapter 5: Facilitating Workflows

Three ways in which you can store and automate-operation workflows: using tasks, ModelBuilder, and automate work with Python.

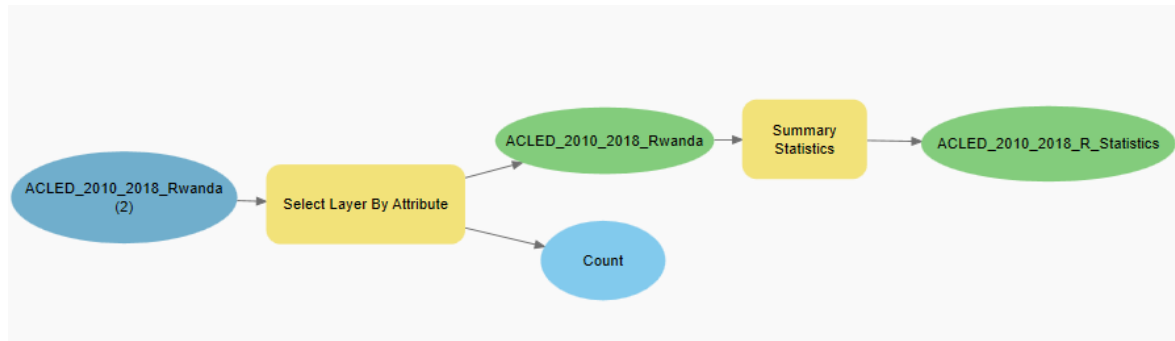
Example: Mapping the walkability of Canadian neighborhoods

Exercise 5A: Manage a repeatable workflow using tasks

Q1) Conflict events recorded in the table: battle (no change of territory), riots/protests, violence against civilians, strategic development, remote violence, etc.

Exercise 5B: Create a geoprocessing model

I successfully created the model using the ModelBuilder:



However, when it was time to see a new table in the catalog pane titled “ACLED_Rwanda_statistics”, I could not find it. I was able to add “expression” above layer by attribute and “statistics fields” above summary statistics. Then when it came time to open the model tool under the conflict toolbox, it just read “no parameters”.

Exercise 5C: Run a Python command and script tool

I was able to execute a command in Python creating three lyrx files for ALCED_2010_2018_Nigera 1-3.

Q1) There appears to be two geoprocessing tools in the script. (Select layer by attribute and summary statistics).

Q2) There were 26,323 fatalities in Nigeria.

Overall, this exercise was straight forward.

