GEOG 653: Lab 1 (Vector Analysis)

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Overview

As the first lab of the course, this assignment was a nice refresher of some of the
capabilities of the ArcGIS suite. I chose to use ArcGIS Pro to familiarize myself
with the new software. As a point of reference, I decided to upload my work on
GitHub, you can find the repository here: `https://github.com/Argentum133/`
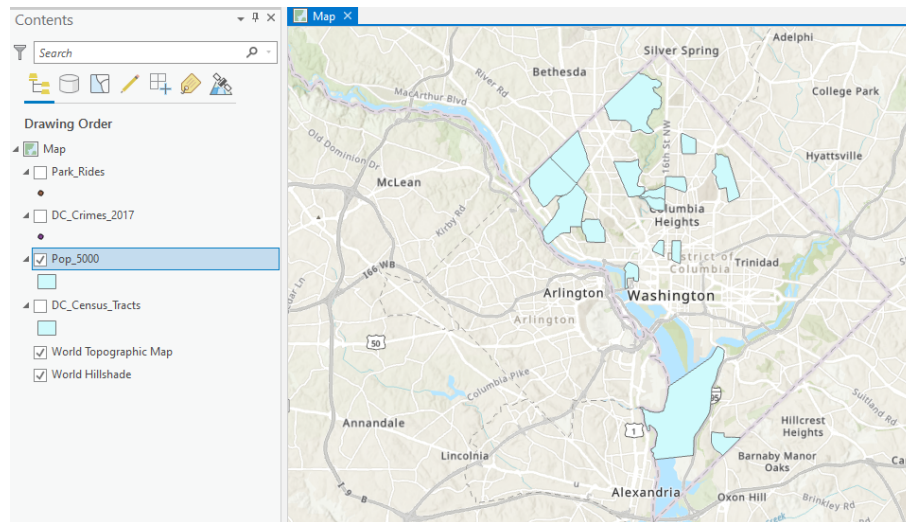`GEOG653`.

Question 1.

Figure 1: Population layer showing DC Census Tracts with a population of at
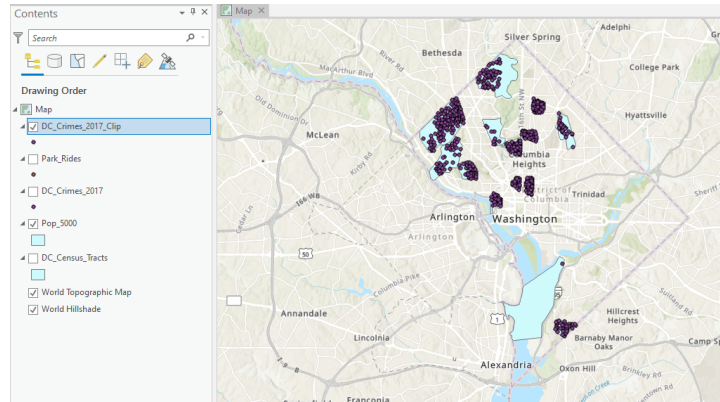least 5,000

Question 2.

Figure 2: Clip layer, featuring crimes within the Tracts with populations of at least 5,000
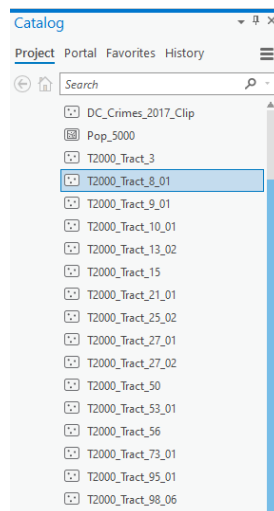
Question 3.

Figure 3: Split layers viewed in ArcGIS Pro's built in Catalog pane
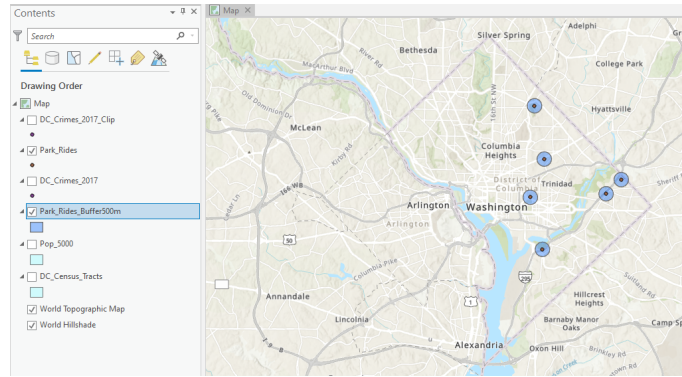
Question 4.
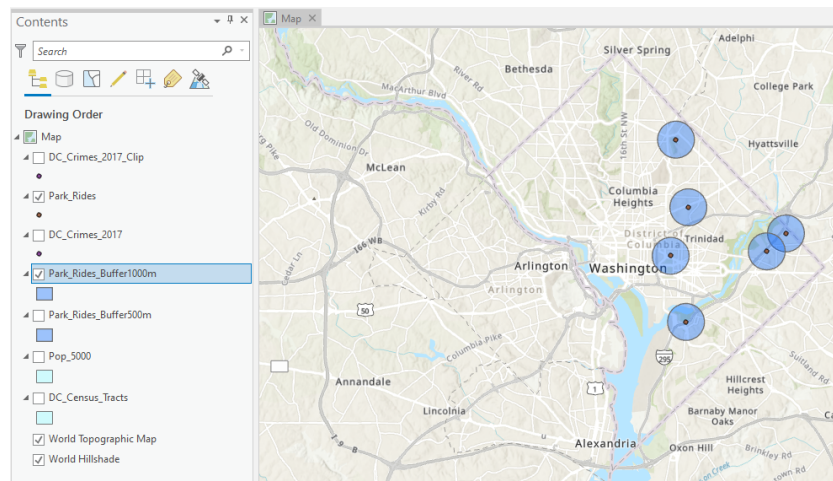

Figure 4: Park and Ride with buffer distance of 500 metres

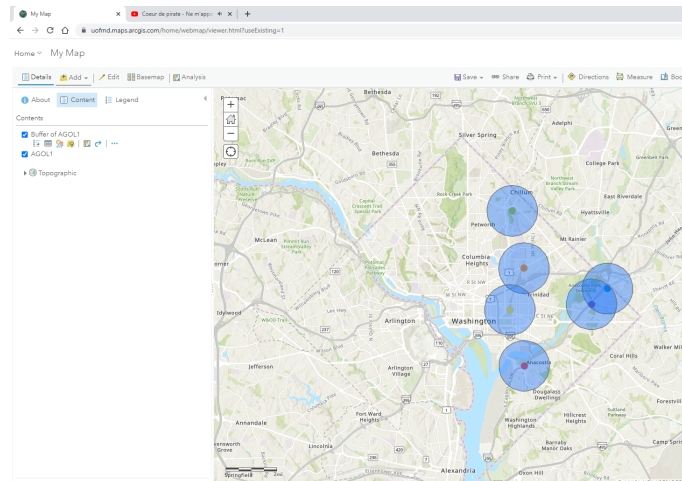Figure 5: Park and Ride with buffer distance of 1000 metres

Question 5.

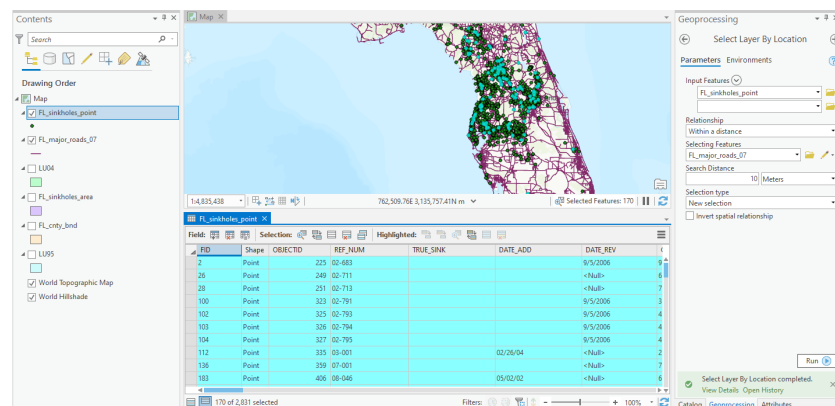Figure 6: Buffer Map on ArcGIS Online

Question 6.

Figure 7: Spatial Query of sinkholes within 10 m. of major roads in Florida (170 total)
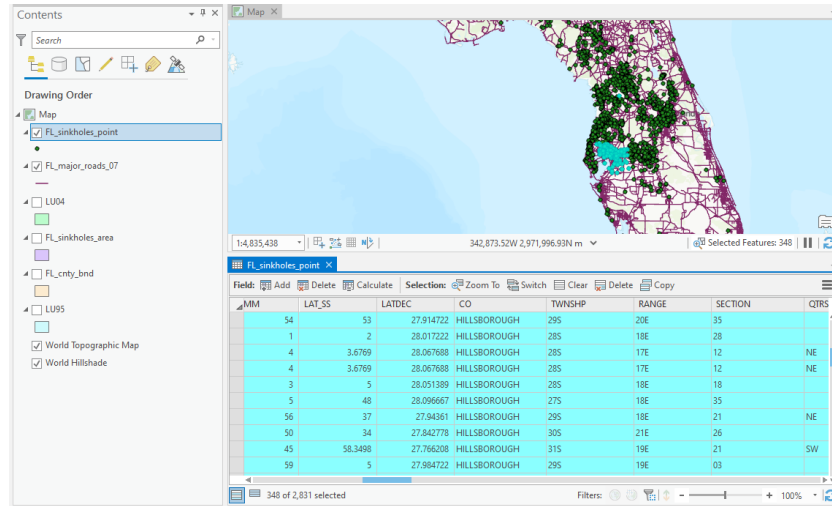
Question 7.

Figure 8: Sinkholes located within Hillsborough County (348 Total)

Question 8.

The Spatial Join procedure actually gave me some trouble in the beginning. ArcGIS Pro puts "Intersect" as the default option, but obviously the spatial distributions of a sinkhole would rarely perfectly coincide on a road. The correct option is by "Closest", however unlike ArcMaps, ArcGIS Pro will not correctly render the join unless a "distance" field is named. I neglected this part as I didn't realize I had to scroll down to find the field naming box. The total I came up with was 145, I will try to attach the exported table as an excel file on ELMS.

Figure 9: Partial screenshot of the joined table

Question 9.

Figure 10: Summary Table of the Containment procedure

Question 10.

Figure 11: Summary Table featuring the Spatial Join by Area types

Question 11.

In the Intersect method, we yield 2,831 total results. From Question 10, if we add up all 4 areas, we see that the spatial join method yields 2,828 results, a discrepancy of 3 points. This is probably due to the fact that spatial join will not "split" features inside other areas unlike the Intersect method.

Figure 12: Table results from Intersect Method
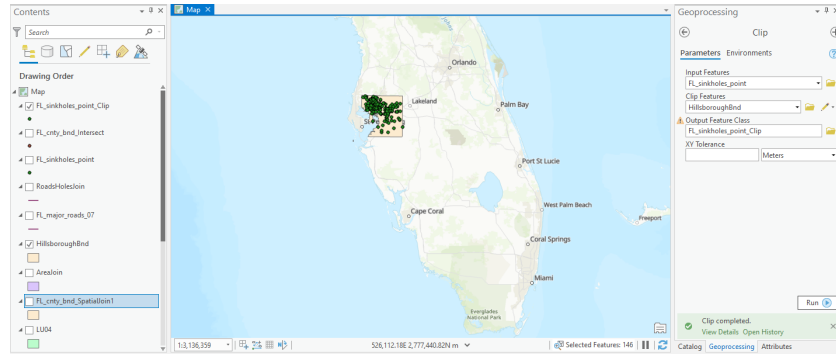
Question 12.

Figure 13: Clipped Layer of sinkholes within Hillsborough County

Question 14.

Question 14 was an interesting exercise. I think compared to my colleagues, I may have arrived at a slightly different approach. With the 2 LULC layers, I selected only for the 4 categories of land. Seeing that the area was in strange units, I used the "Calculate Geometric Attributes" feature to arrive at square kilometres. I immediately performed an "Erase" overlay to calculate land changes between the years. This operation could easily yield land changes only between the same type of land area. For the rest of the LULC boxes, I decided to create layers according to year and land area type. A simple intersection between all the combinations of LULC areas would yield the amount of changes. From a logical point of view, we could expect land dedicated to crops to result in more changes as population growth has created more demand for food. As we can see in the 2004 column for Row Crops, we see the largest amounts of land change, almost far larger than any other column.

		LULC 2004			
		Crop/Pasture Land	Mixed Rangeland	Row Crops	Shrub and Brushland
LULC 1995	Cropland and Pastureland	0.13272089 km^2	0.000038 km^2	14.10403021 km^2	5.96149497 km^2
	Mixed Rangeland	0 km^2	0.00355294 km^2	.00740822 km^2	0 km^2
	Row Crops	2.71750663 km^2	0 km^2	.17349491 km^2	4.91389698 km^2
	Shrub and Bushland	3.81669167 km^2	0.20999014 km^2	11.29303541 km^2	1.33101916 km^2

Figure 14: LULC Table showing changes from 1995 in 2004