advanced qgis2

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outline

more ps3 comments

sql practice and styling matching elements

geo-processing

Extra/bonus

classroom

- cannot stay in the classroom after class, sorry

outline

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Extra/bonus

merging

- if you don't like merging in qgis
- you are not alone, i don't like it either
- we will do it again in GeoDa
- why did we do it in qgis?
  - wanted to stick just wih one softwae
- but almost always there are things that are done easily in one piece of software, but are difficult in another software
  - qgis is great with most things, less good with merging
- may also try MMQGIS-Combine
  - (Py plugin, may need to install first)

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Extra/bonus

styling matching elements

- we will sql-select some features
- export them as a new shapefile
- load them back and style them
- reference (1.7!):

  `http://qgis.spatialthoughts.com/2012/02/styling-vector-data-in-qgis-using-size.html`

data (same as in the past)

- let's get some NJ data
- it all comes from

  `https://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp`

- (and there's more than we use here–hospitals, satellite pictures etc)
- I re-posted them on my website:

  `http://people.hmdc.harvard.edu/~akozaryn/myweb/bounds_nj_shp.zip`

  `http://people.hmdc.harvard.edu/~akozaryn/myweb/hsip_colleges.zip`

steps

- load:
  - NJ_COUNTIES
  - 2007_11_30_NJ_COLL_UNIV_NJSP
- 2007_11_30_NJ_COLL_UNIV_NJSP-OPEN ATTRIBUTE TABLE and hit 'Advanced Filter'
- from 'Fields and Values' select "DEGREE"
  - and under "Values" hit "all unique"
  - it will list all the values that a variable takes
  - " or 'NULL' means missing data; type in:
  - DEGREE LIKE 'MASTER"S DEGREE' OR DEGREE LIKE 'DOCTOR"S DEGREE'
  - hit "ok" it'll select 21 features

saving and loading back

- right click in table, and ctrl-a to select all
- (remember you can (de)select features "by hand" on map or in table)
- now we can save selection as a new shapefile
- 2007_11_30_NJ_COLL_UNIV_NJSP-SAVE AS
- remember to check 'Save only selected features'
- also check 'Add saved file to map'
- save as say "maPhd.shp"
- MA_PHD-PROPERTIES-STYLE
- and change the symbol to something else

same thing in a different way

- note that you can achieve the same result
  - 2007_11_30_NJ_COLL_UNIV_NJSP-PROPERTIES-STYLE
  - select ramp as "Categorized"-"DEGREE"-"Classify"
  - double click the symbol and select something else
- "Categorized" is good for few categories, for categorial data
- "Graduated" is good for continous data
- can someone give examples of each?

saving selection necessary

- but saving the selection is necessary when you want to get rid of some U/As
- say, we just want to focus on South Jersey
  - and keep in mind simplicity principle–drop all unnecessary clutter
  - NJ_COUNTIES-OPEN ATTRIBUTE TALE-ADVANCED SEARCH
  - "categorized"-
  - REGION LIKE 'SOUTHERN' OR REGION LIKE 'CENTRAL' OR REGION LIKE 'COASTAL'
  - "save selection as" say south.shp and load it back

outline

more ps3 comments

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Extra/bonus

this is a whole bag of tools

- we switch gears a little and discuss
  - more advanced topics beyond mapping
  - more like typical gis/it stuff
- we will just cover few tools
- there are dozens of them
- you may present some of those for extra credit
  - do let me know which one(s)!– some may not be very useful for this class
- those that i think are especially useful are covered below
- most are under 'Vector', 'Processing', 'MMQGIS', and also 'Plugins'

dissolve

- dissolve into a larger area
  - (get rid of inside boundaries)
- Vector-Geopocessing Tools-Dissolve
  - nj_counties
- "dissolve field:" region

dissolve your way

- can dissolve into your own catgories/definitions
- let's take regions and dissolve into south and north jersey
- create new variable 'southNorth':
  - Open attribute table-toggle editing-New column-integer
- mark southern regions with 1, and the rest with 0
  - highlight the row to see which is where
- Vector-Geopocessing tools-Dissolve
- "Dissolve field:" southNorth

dissolve your way

- and now we have a shapefile for south an north jersey
- ofen you will have to do something like this
- there is no way you'll find a shapefile for south jersey online!
- so this tool, like other geoprocessing tools discussed here, is very useful!

simplify polygons

- remember from graphing principles: simplify as much as possible
- simplifying polygons means dropping vertices, so that polygons are defined by fewer coordinates
- it reduces size of a file
- Vector-Geometry tools-Simplify Geometries
  - Input: 'nj_counties'
- you can play with "tolerance" to simplify it to the point that is needed
  - let's try 1000–see the difference?
  - for tolerance value, just play with different numbers

simplify polygons

- it is useful if you email things to people, or upload say to google maps
  - your data cannot be too big (gmail<10M or so)
  - also, you can simplify lines (fewer nodes)
- and i guess you can also simplify points (fewer dec points)
  - reference `http://gis.stackexchange.com/questions/25914/how-to-smooth-generalize-a-polygon-in-qgis`

`http://stackoverflow.com/questions/1849928/how-to-intelligently-degrade-or-smooth-gis-data-simplifying-polygons`

centroids

- calculate a center of a polygon
  - turn polygon into a point
  - useful when merging non-overlapping polygons–say congressional districts and counties
  - then you can calculate centroid of one of those and merge with polygons of the other layer if a centroid is in that polygon using spatial merge
- draw a picture
- Vector-Geometry tools-Polygon centroids
  - Input: nj_counties

centroids

- note: the new shapefile will have the same data
- can now map another variable and overlay on another variable
- can map both points and polygons with some symbology
- let's map population for polygons
  - and population density for points
  - note: make points bigger to see symbology well
- this solves the problem of showing 2 vars in one map

buffering

- kind of opposite of centroids:
  - make a buffer (circle) around a point
- say, need a 'dry zone' around schools
- load 2007_11_30_NJ_COLL_UNIV_NJSP
- Vector-Geoprocessing tools-Buffer
- use 20,000 feet (buffer size is in map units)
- save as 'colBuf'
- Properties-Metadata or even -General
  - unit is us feet
- note: buffer is a new layer and then can spatially merge it with another layer

example: environemntal problems around univ

- download and add to qgis
  - `http://www.nj.gov/dep/gis/digidownload/zips/statewide/Envr_mon_gw_KCSL.zip`
- Vector-Data Management Tools-Join Attributes By Location
- Target: colBuf
- Join: Envr_mon_gw_KCSL
- Take summary of intersecting features
  - say 'mean'; but we only care about counts, which is automatic
- Keep all records

do here 'select by location tool !'

investigate

- open attr table of merged shaefile
- go to last column 'COUNT' and click 2x to sort descending
- under 'NAME' we find that 'NEW JERSEY MEDICAL SCHOOL'
  - has biggest problem! over thousand contaminated sites
- select say 3 rows at top
- click at the top 'zoom map to selected features'
  - a lot of overlap there
- but from the table can select schools with greatest problems
  - and take some measures to help with the situation

buffering: applications

- why would you do buffering?
- sex offenders and schools
- liquor stores and schools
- waste processing plants and houses
- 2-mile heavy pollution around hwy
- walkability to healthy stores, etc
- many applications!

references

- http://maps.cga.harvard.edu/qgis/wkshop/buffer.php
- can select by location:
  - (1.7!) http://qgis.spatialthoughts.com/2011/12/tutorial-performing-spatial-queries-in.html
  - (1.8!) http://gis.stackexchange.com/questions/61753/how-to-select-points-within-a-polygon-from-another-layer
  - more towards bottom:

    http://www.qgistutorials.com/en/docs/performing_spatial_queries.html

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Extra/bonus

other things/later

- analysis tools contains many useful tools
- can calculate line lengths: e.g. railroads
  - http://qgis.spatialthoughts.com/2010/10/calculating-line-lengths-and-statistics.html
- spatial queries–e.g. select objects within a distance
  http://qgis.spatialthoughts.com/2011/12/tutorial-performing-spatial-queries-in.html
- calculate X,Y http://maps.cga.harvard.edu/qgis/wkshop/x_y_field.php

and there are many more

- mostly under vector menu
- but also using plugins
- you are more than welcomed to use things we did not cover in ps or final project
  - also you can have a presentation about some useful tool
  - just explore them and google them
- in any case it will be extra credit

next week is the last qgis class

- what would you like to cover ?
  - anything new ?
  - cover anything again?
- maybe use some new data for examples?
  - I have an impression that we should go to lower level
  - title of this class is also (cross-listed) “urban mapping”
  - maybe do tracts/blocks in Philly or Camden ?
  - maybe zoning or public transportation?
  - other ideas?