

advanced qgis2

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outline

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 with one software
- ◇ 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 will 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

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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-GEOPROCESSING TOOLS-DISSOLVE
 - nj_counties
- ◇ “dissolve field:” region

dissolve your way

- ◇ can dissolve into your own categories/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-Geoprocessing 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: environmental problems around univ

- ◇ download and add to qgis
 - http://www.nj.gov/dep/gis/digidownload/zip/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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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?