QGIS Workshop Instructor Notes *2015-Mar*

Technical Training Workshop Series

Center for Geographic Analysis, Harvard University

Schedule: 2 hours

1:00 – 1:35pm Basic Navigation of QGIS

part one

User Interface, Menus and Toolbars, Plugin Manager

- *install 5 mins UI Navigation 5 mins*
- *Toolbar (toggle on and off) - now has LAYERS toolbar on left side vertical by default*
- *Layer List (now can toggle between layer list and folders for adding data)*
- *Map View (same, though dropped compass rose)*
- *Status Bar (coordinate-extent toggle, scale, stop render render toggle, epsg, CRS button)*

Opening Layers, Layer Order 5mins

- demo vector layers from part_1 contents + airports - show layer order for visibility, CRS
- *Saving a Project*

Identify, Select, and Quering Attributes with Query Builder

- note Identify only works for ACTIVE layer
- show selection tool options – rectangle, radius
- **expression button** in QGIS 2.0 all functions available. search for function, definition + usage shown
- select by location (select aftrica, then airports in africa, output to shape) vector / research / location
- add africa airports, and natural earth countries, now **join by location** (country attrib to africa airports) SPATIAL JOIN
- in att table SELECT BY EXPRESSION ADMIN LIKE 'Algeria' zoom to selection

Layer Properties

- quick click through, then Fields (get NAME format length)
- att table, toggle editing - edit a field value, open Field Calculator

- update existing global EDITABLE / Calculator replace (SOVEREIGNT, 'Algeria','Rep of Algeria')
- SAVE as NEW SHAPE algeria_air.shp
- suggest power of calculator functions: create $rownum
- http://hub.qgis.org/wiki/quantum-gis/List_of_Field_Calculator_Functions

Projections and Coordinate Reference Systems

- CRS Button or Project Properties - Turn OFF on the fly
- Open CHINA-PROV Layer zoom to layer, activate NE COUNTRIES, turn OFF on the fly again
- zoom to China, should be floating
- turn ON THE FLY back on as WGS 84
- zoom to china again, should be ok
- demonstrate export to SELECTED CRS wgs84

Saving your project

- Remove China Layer, save as qgis project

Styles, Labels, Symbolization

- open project, zoom to airports, select algeria
- label airports by name add color buffer
- adjust transparency add another borders for carto fun

Exporting in various formats

- print composer
- map view, legend, title (item properties), scalebar
- export to jpg Project Save Image As

1:40pm – 2:15pm Importing from CSV, Heatmap, Point in Polygon Summary

part two

Import X, Y data from CSV (comma separated values)

- download from GNS Country files (or see ag.zip in Part_Two)
- algeria example import (TAB) save to shape
- Declaring Field Formats for CSV Imports with CSVT (example in part three TW pop)

Heat Maps QGIS 2.0 Core Plugin!

Point in Polygon

- zoom out to Africa_air
- turn on continent select africa, select from countries by location africa only, then save as
- areal calcuation (PROJECTION!) - save as CRS Gall-Peters EPSG 54016 with units M
- vector – analysis – pt in polygon
- add col calc $area real 20 4
- add col calc $area / 1000000 = sqkm real 20 4
- add col calc airp / sqkm **real 20 10 very small number**

Calculated Pop Density

- same as above, just divide EST _POP by sqkm
- *http://hub.qgis.org/wiki/quantum-gis/List_of_Field_Calculator_Functions*

Table Manager

- *Plugins installed list, search, get more, install done!* ***example: Delete meters field***

2:20pm – 2:50pm Calculating New Fields, Joins and Spatial Analysis

part three

Distance Matrix of Point Layers

- TW carma, stations (Tw_Stations is UTF8 and has to be projected into xian80!)
- must be projected for distance calc
- Vector | Analysis | Distance Matrix (choose nearest 5 output to .csv !!!!) don't do too many!

Statistical Summaries and Spatial Joins of One to Many Values

- add csv of dist matrix as plain table to QGIS, tabular join carma table to get x, y (plant ID)

- export to new csv, import using CSV tool to create point features, export to SHP
- add SHP then use Table Manager to delete all fields except the Distance values, save XIAN80 shp
- CARMA Vector – Data Management – **Join by Location** (Spatial Join) TAKE SUMMARY
- target = CarmaPlants   Join=distance values
- SUMMARY - MEAN > newSHP with mean distances
- symbolize by mean distance classes

<u>Geoprocessing: Buffers, Difference, Clipping</u>

- begin with tw_pop_xian80,   tw_railways, taiwan_carma_xian80
- TASK: find all areas in TW > 10km from PowerPlant < 5km from railway
- buffer carma check units = m, vector geoprocess buffer 10000 m
- buffer railcheck units = m, vector geoprocess buffer 5000 m
- vector analysis difference input RAIL minus ppbuf   (part of rail farther than the clip, safer for housing?)
- clip   input difference result clip by tw_pop-xian   (so that you are on land not in water)

2:50pm ~ 3:00pm   wrap up and Q&A