HANDS-ON EXERCISES

Data Acquisition, Preparation, Processing

PRESENTED BY: FOR. ARNAN B. ARAZA

October 14, 2014
OVERVIEW

• This module is basically where we do the ‘nitty-gritty’ part of the GIS training to come-up with final outputs

• You will learn how to obtain, create, manipulate, edit geospatial data by series of tools and commands

• The exercises will be done step by step, along with actual demonstration

• The exercises will make you “connect” the theoretical part of GIS to its actual applications
Because this module is a step-by-step process...

You need to do GIS!

- **G** – ıve attention to details
- **I** – t’s as easy as 1, 2, 3
- **S** – tay focused but relaxed
Data Acquisition

**DATA SOURCES**

**Primary Data**
- GPS readings
- Google Earth captures
- surveys, traverse

**Secondary Data**
- existing maps
- digital maps (old maps, scanned maps)
- topo maps

**KEY WORDS**
- Primary Data
- Secondary Data
This part is where data is exported to QGIS, edited, processed, projected into UTM, and clipped, buffered, intersected to area of interest.
EXER 1 GEOREFERENCING

WE WILL NOW TRANSFORM OUR SCANNED MAP TO A GIS MAP BY PUTTING ITS ACTUAL LOCATION ON EARTH!

OBJECTIVE
To georeference a scanned map to be used in digitizing

STEPS
1. Click Raster > Georeferencer *it will open a new window
2. Click Open Raster and load the image
3. Click add points

4. Zoom to the coordinates and encode

5. Click Transformation settings
BE CAUTIOUS!

WE NEED DECIMAL DEGREES FORMAT OF COORDINATES, EXAMINE THE TOPO MAP

6. Convert coordinates to Decimal Degrees using MS Excel (coordinate_converter)

7. Re-enter the coordinates to the add points

8. Start Georeferencing when done
NOTE:
THERE CAN BE ERRORS FROM UPLOADING CONTROL POINTS, MOSTLY TYPOGRAPHICAL

TIP:
TO CHECK FOR THE CONSISTENCY OF THE GEOREFERENCED MAP, OPEN OTHER PROJECTED MAPS FOR COMPARISON
EXER 2 DIGITIZING

USING OUR NEWLY GEOREFERENCED MAP, WE WILL NOW EXTRACT FEATURES FROM IT!

OBJECTIVE
To digitize polygons, lines, points from the georeferenced topo map

STEPS
1. Open georeferenced map
2. Click new shapefile layer
3. Select type
4. Zoom to area of interest
CHOOSE LINE IF YOU WILL DIGITIZE RIVERS

CHOOSE UTM_ZONE51N
4. Click ‘Toggle Editing’

5. Click ‘Add Features’

6. Trace

7. Save edits
Note
Digitizing is basically tracing the features from the base map

Tips:
Zoom as much as possible and stay focused, use a better mouse and try adjusting mouse cursor speed at the control panel

You can switch buttons to pan or zoom the map, just click again the ‘add features’ to get back from digitizing
EXER 3  CAPTURING FROM GOOGLE EARTH

Now, we will go to the globe to capture features and put it to our map layer!

OBJECTIVE
To obtain spatial features from Google Earth and import it to QGIS

STEPS
1.  Save our area of interest as .kml

Resulting icon will be like this

2.  Open it to Google Earth
3. Navigate and zoom to area of interest

4. Add features

5. Save and open to QGIS

6. Save the kml as .shp by clicking ‘save as’ after right clicking the kml
#Note
Captures from Google Earth are not yet projected into UTM

Tips:
Make it a practice to check and project every new entry
EXER 4a Clipping a Raster

Now that we have features, we will add more map layers to our project! Let’s now clip some features from the surface! This time it’s a raster.

OBJECTIVE
To clip a DEM raster to the scale of interest

STEPS
1. Add DEM file
2. Click ‘Raster’, Extraction, Clipper
EXER 4b Clipping a Vector

WE WILL BASICALLY DO THE SAME CLIPPING, THIS TIME IT IS A VECTOR FILE!

OBJECTIVE
To clip land cover map to area of interest

STEPS
1. Add vector files
2. Click Vector > Geoprocessing tools > Clip
3. Fill-in the clip window
#Note:
There are various raster processing from DEM including slope, elevation, contour, and so on

Tips:
Explore the ‘terrain analysis and other raster commands
EXER 5 INTERSECTING

We will continue to add map layers to our scale of interest! This time, we will overlay two features

OBJECTIVE
To overlay sub basins and land cover 2010

STEPS
1. Add vector files
   - subbasin_srtm_utm
   - landcover2010_llda_utm

2. Click vector > geoprocessing tools > intersect
2. Fill-in the intersect window

3. Save
EXER 6 BUFFERING

Buffering is creating easements from a line (i.e. river) and perimeter. It is important in defining buffer zones for policy implementation and planning.

Now, we will generate buffer zone from our main rivers!

OBJECTIVE
To create buffer of varying distances

STEPS
1. Open river of interest
2. Click Vector > Geoprocessing tool > Buffer
3. Fill the buffer window

- **Input vector layer**: pagsanjan_river_utm
- **Use only selected features**: unchecked
- **Segments to approximate**: 5
- **Buffer distance**: 500 meters
- **Buffer distance field**: id
- **Dissolve buffer results**: unchecked
- **Output shapefile**: Browse
- **Add result to canvas**: selected

**River (or any) line or polygon**
**Buffer distance in meters**
**Directory of output file**
STEPS
4. Repeat this procedure for other buffer distance
EXER 7 EDITING THE ATTRIBUTE TABLE

OBJECTIVE
To add data on lake and compute density of fish pens/cages

STEPS
1. Insert zoning map of LL
2. Open attribute table, toggle editing
3. Add columns on number of fish pens, cages, ponds (if necessary)
4. Compute for its density
4. Add column (encode data on fisheries)  

5. Save edits

**Added field/column**

**What to enter (whole number, with decimal, text)**

**Length of character**
ADDING COLUMN FOR AREA

COMPUTING FOR AREA

COMPUTING FOR HECTARES (default area is in sq.m)
#Note
Computed areas for a political entity (i.e. barangay, municipality, city, province) can vary from its official area

Tip:
Use the GIS computed area of political jurisdiction for computation purposes only to avoid inconsistencies of attributes
EXER 8 RASTER OPERATIONS

OBJECTIVE
To perform common raster operations from DEM

STEPS
1. Insert srtm_90m
2. Create contours by clicking Raster > Extraction > Contour
3. Define contour interval and save
OBJECTIVE
To perform common raster operations from DEM

3. Convert into vector (polygon) by clicking Raster > Conversion > Polygonize
THANKS FOR YOUR TIME