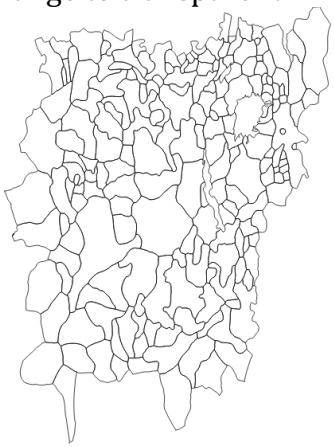
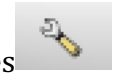
Exercise 2A – Validating Topology:

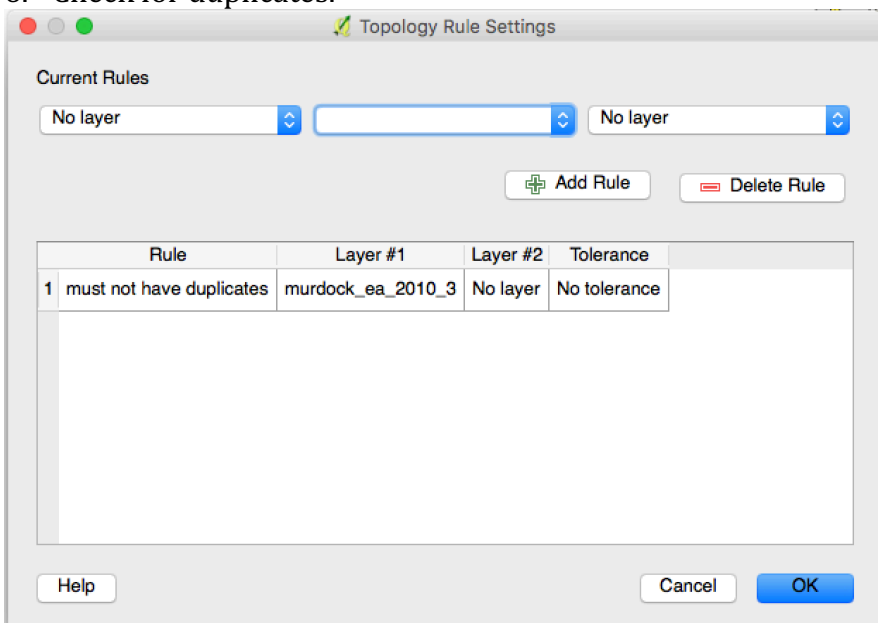
1. Install plugin **Topology Checker**.
   [Note: If is already installed, but you cannot find the button go to Plugins | Manage and Install Plugins and see if the box in front of the Topology Checker is checked.]
2. From folder Exercise 2 load shapefile murdock_sample.shp
3. Change to transparent fill



4. Click on Topology Checker

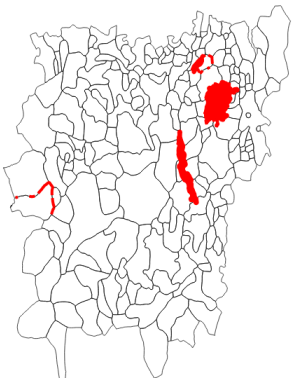
5. Click on Configure to set topology rules 

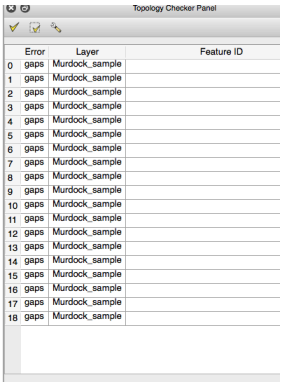
6. Check for duplicates.



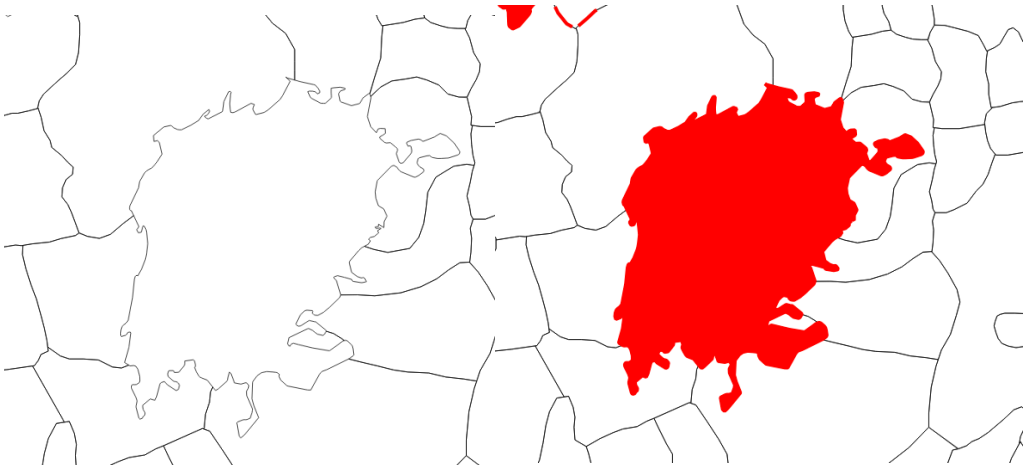
7. Click OK and then click “validate All”

8. No errors.
9. Click on Configure
10. Select rule 1 and “Delete Rule”
11. Add new rule “must not have gaps”
12. Click OK and then click “validate all”
13. Errors

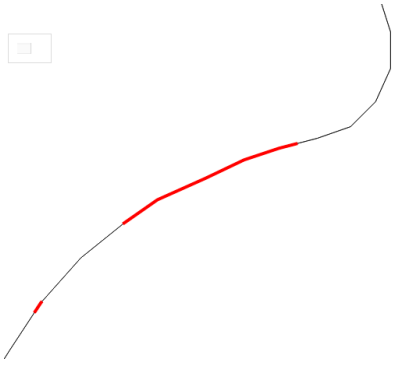




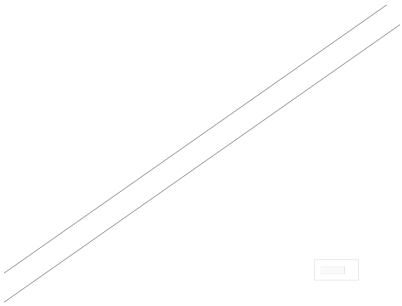
14. Some Gaps are fine



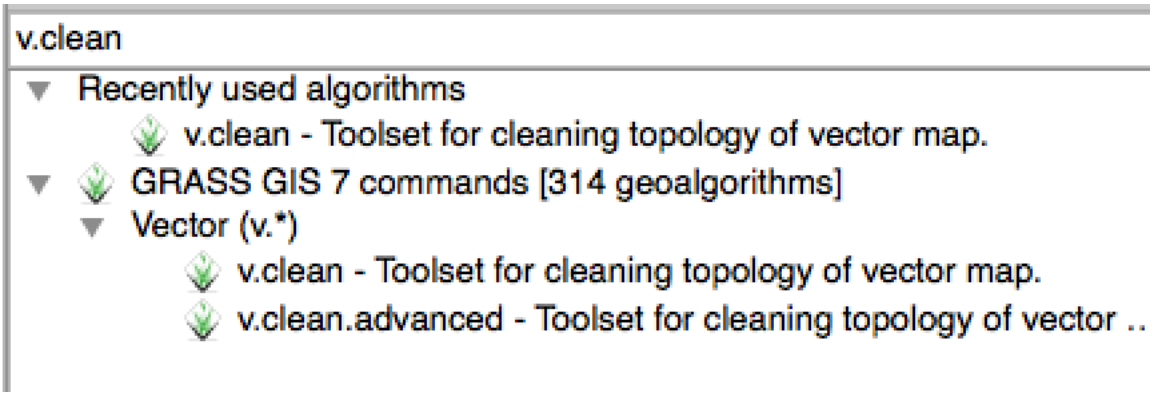
… others are not



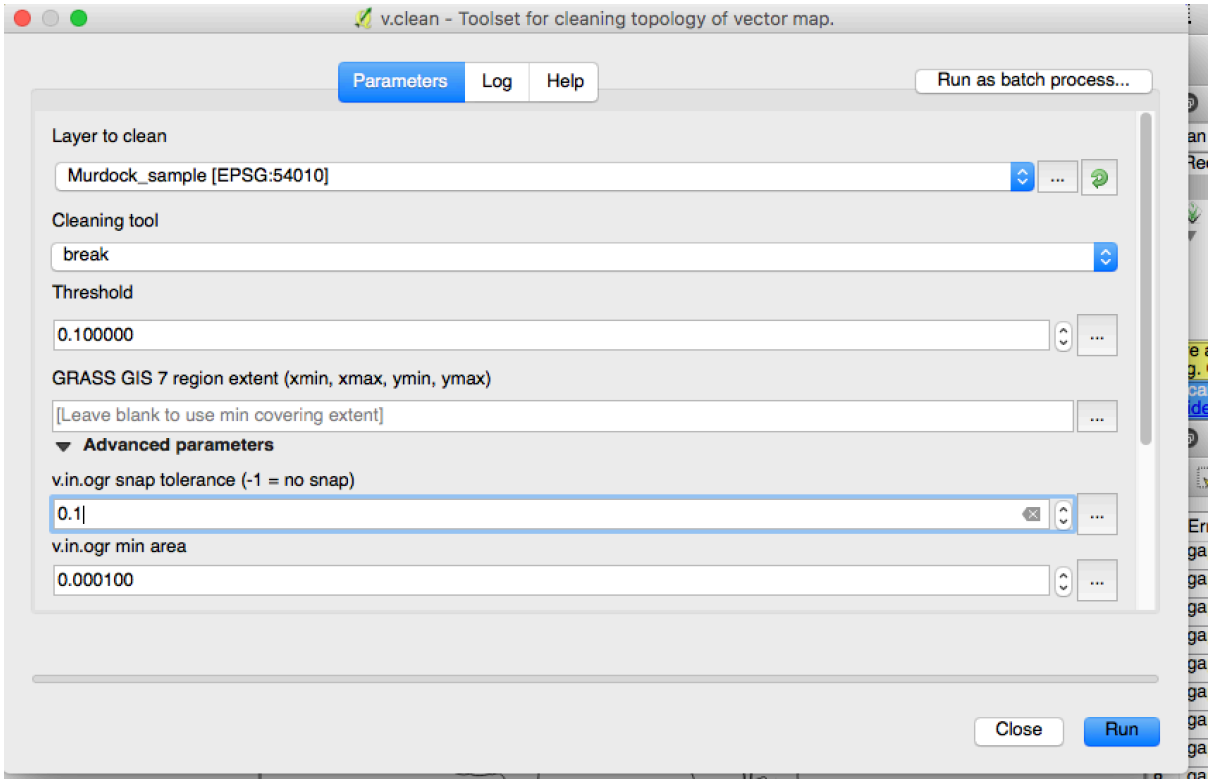
zoom in (a lot)



15. Processing | Toolbox
    Search for “v.clean”



16. Set v.in.ogr tolerance to 0.1



17. Creates new layer cleaned

18. Save as Murdock_nogaps.shp

19. **Try for yourself:**
    Check if there are still gaps in Murdock_nogaps.shp

20. **Try for yourself:**
    Check for
    - invalid geometries
    - multipart geometries
    -overlaps.

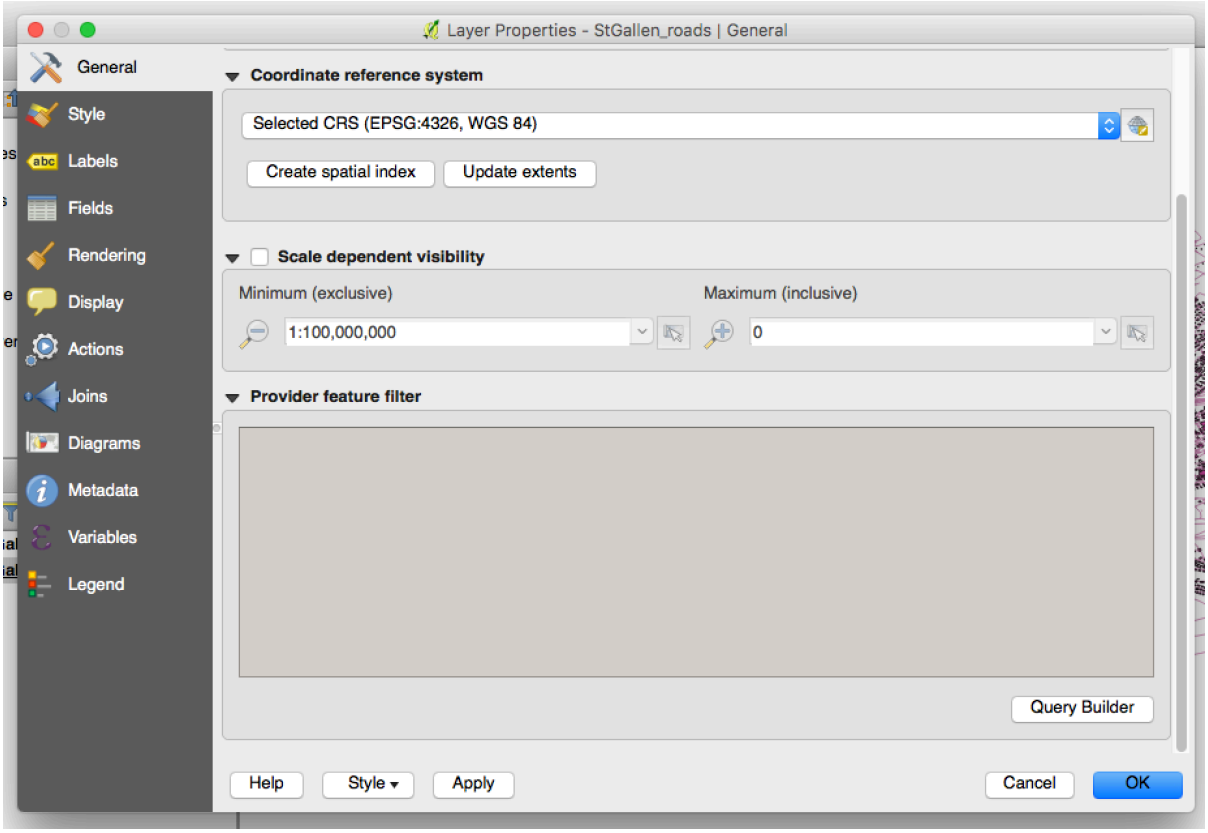
Exercise 2B – Query Builder:

1. From the folder Exercise 1 load shapefile StGallen_roads.shp and StGallen_buildings.shp.

2. Double Click on StGallen_ buildings.shp

3. Open Tab “General”

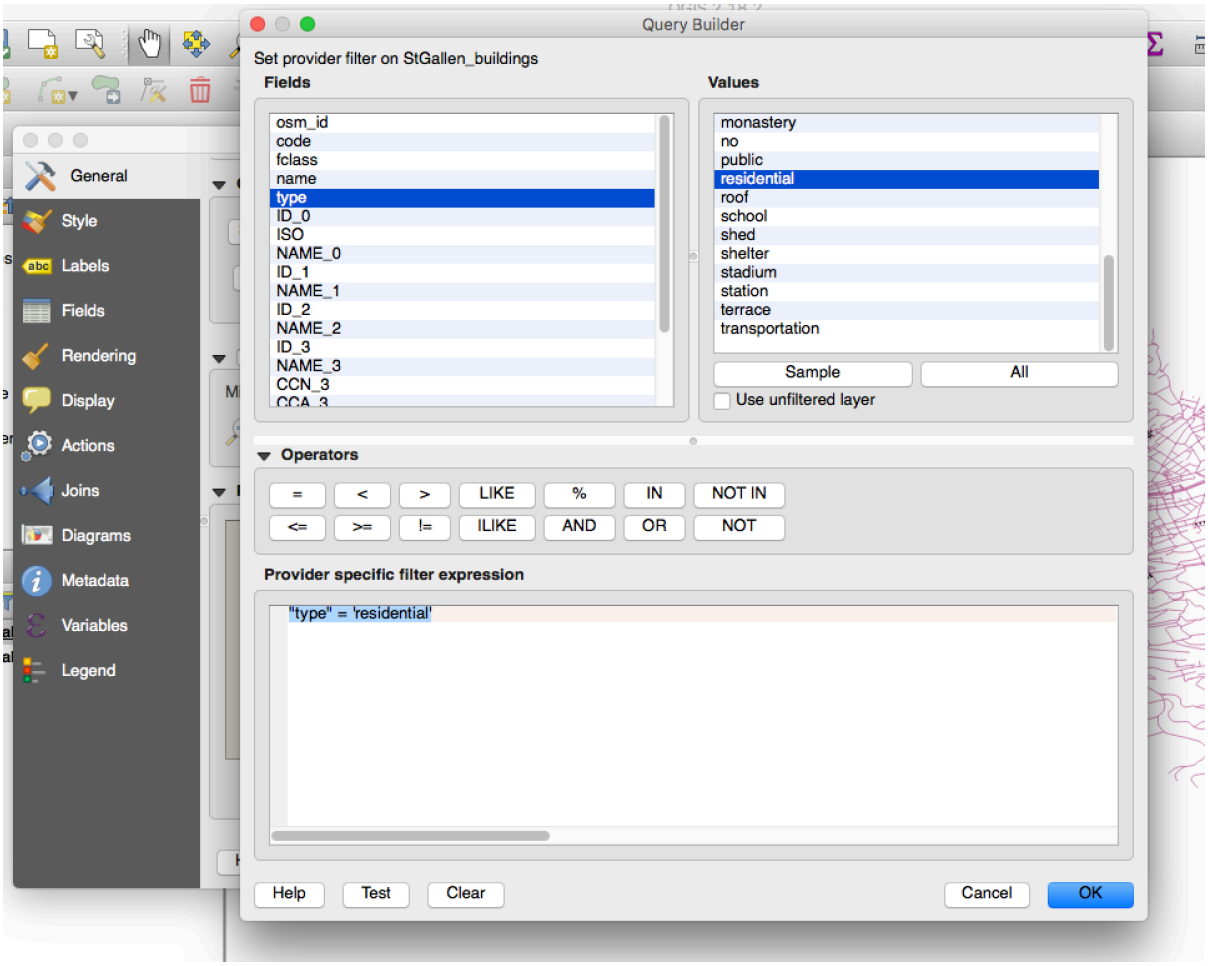
4. Click “Query Builder”



5. In “Fields” click on type and in “Values” click on “All”

6. Set a filter that only displays residential buildings

"type" = 'residential'

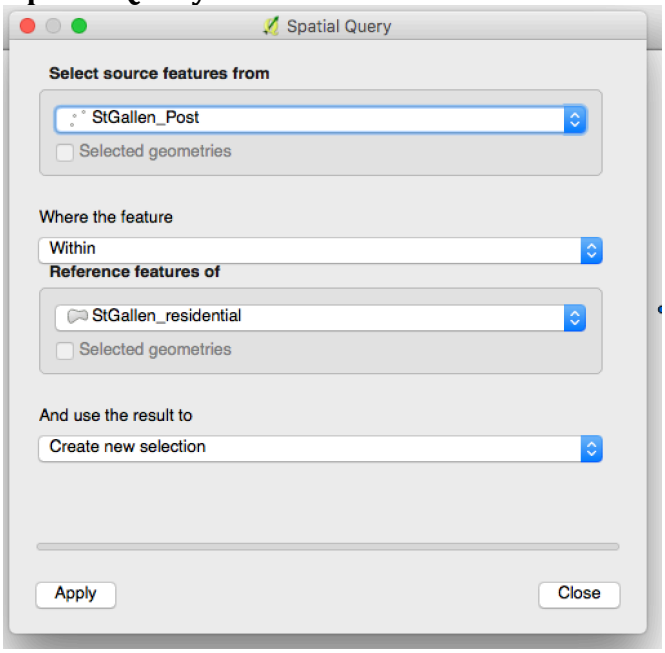


7. Click test
8. Click Ok and Ok
9. Duplicate StGallen_buildings.shp
10. Save duplicate as “StGallen_residential.shp
11. Remove StGallen_buildings.shp
12. Repeat steps 2-11 for StGallen_roads.shp.

    In steps 5 and 6 use fclass and set a filter that displays “motorway” and “primary”.

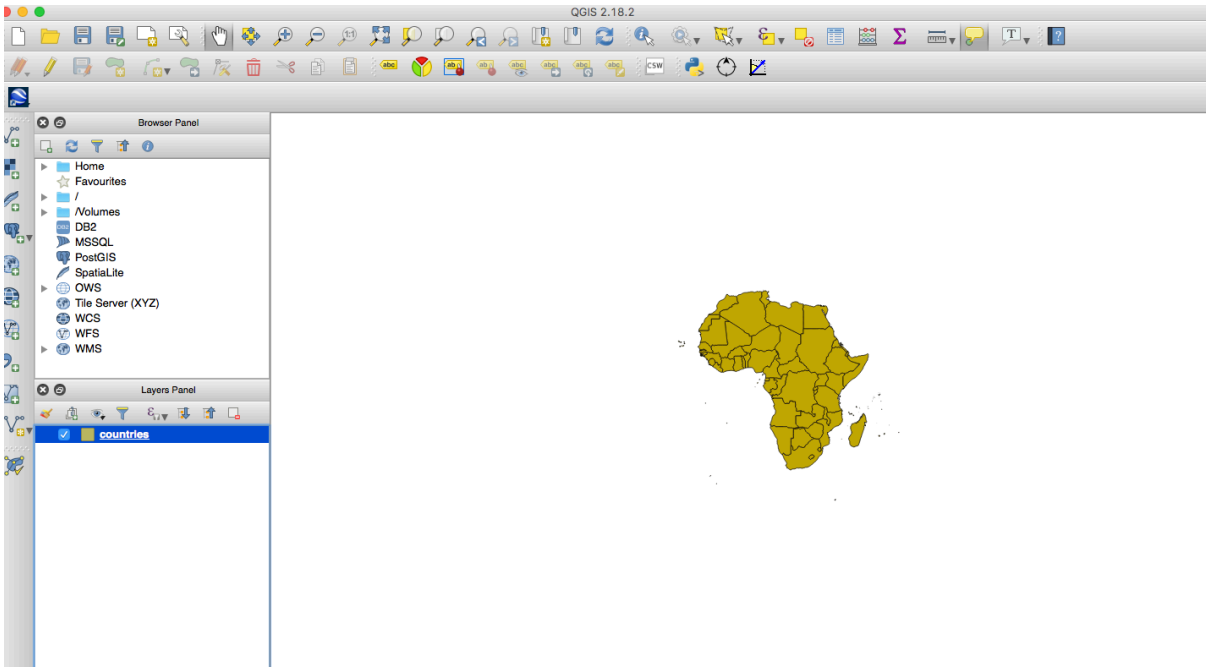
13. Export the image StGallen_Homes_near_Motorway.png

Spatial Query



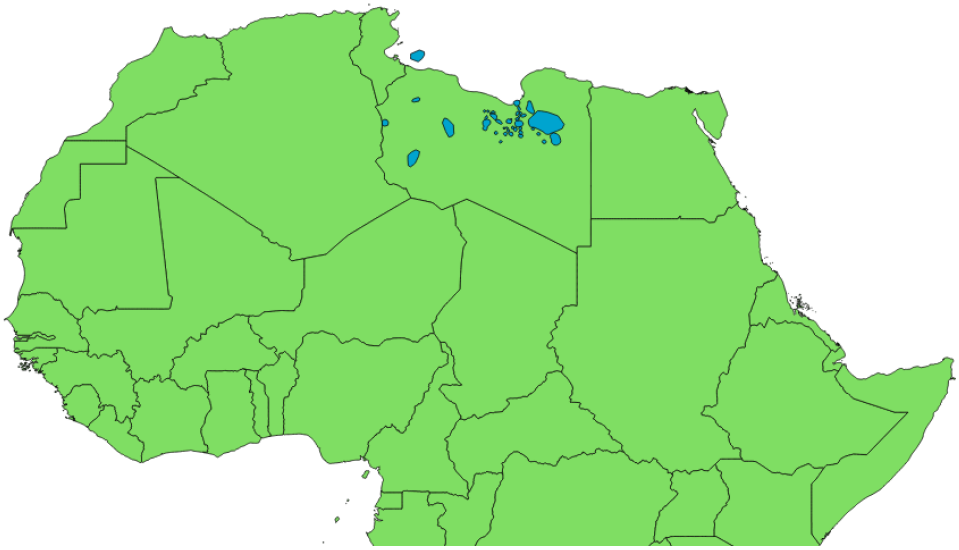
Exercise 2C – Erase Gas Flares:

1. From the folder Exercise 1 load shapefile countries.shp.
2. Create a Query that filters only African countries (continent = Africa)



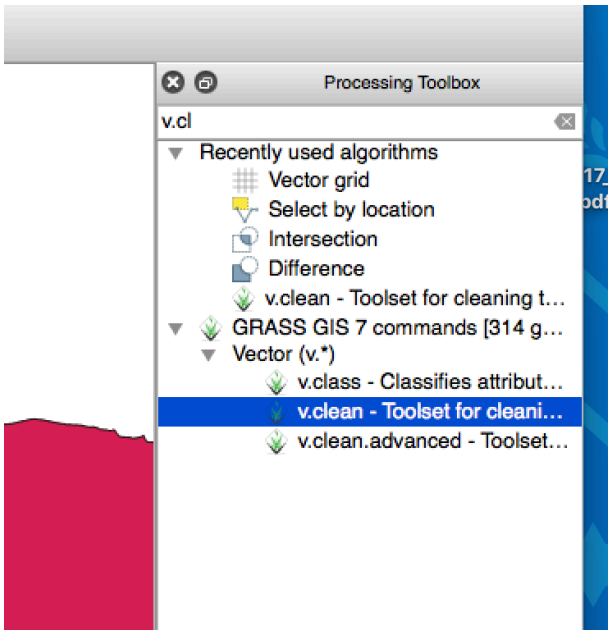
3. Save as Africa_country_bnd

4. From the folder Exercise 2 load shapefile Flares_Lybia1.shp.

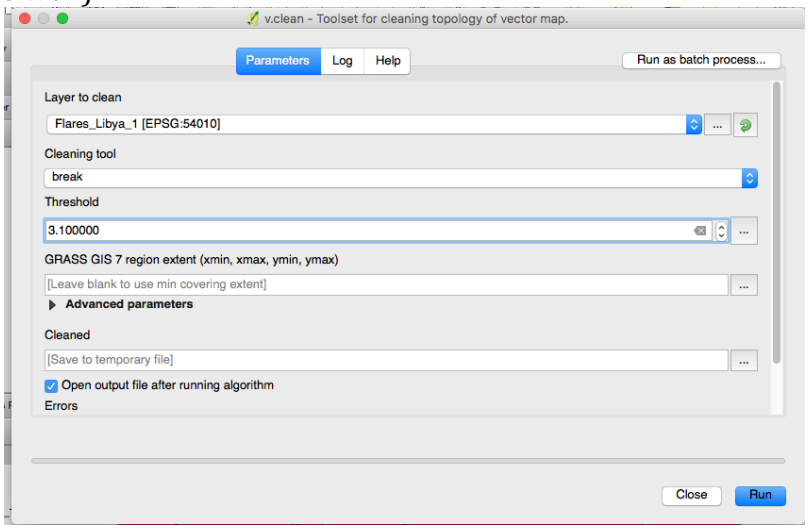


5. Change the CRS of both Layers to World Eckert VI

6. Clean Flares_Lybia1.shp
   - Processing | Toolbox
   - Search for v.clean

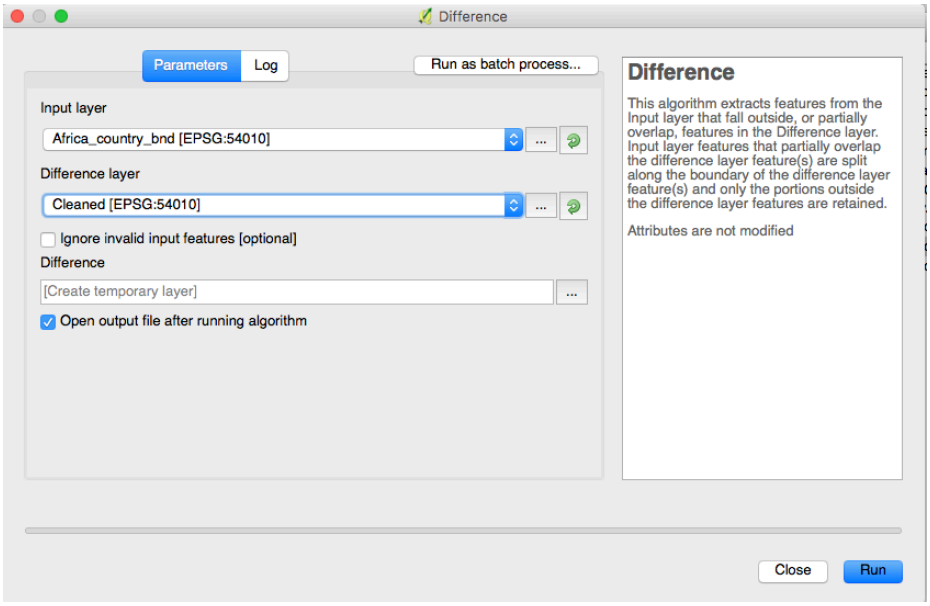


   - Select Gas flares layer and increase threshold to 3.1 (smaller values might work as well)



   -

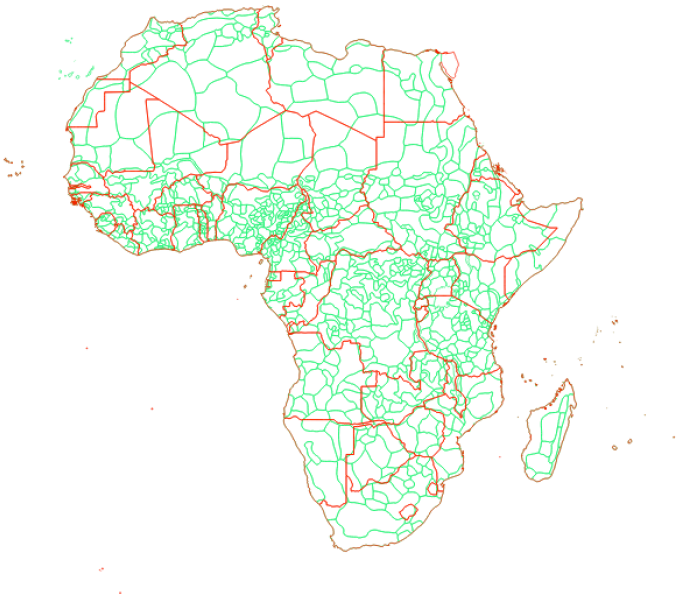
7. Vector | Geoprocessing Tools | Difference
   - Input Layer “Africa_country_bnd”
   - Difference Layer “cleaned”



8. Save new layer “Difference” as Lybia_Clipped
9. Export Image Lybia_Clipped.png

Exercise 2D – Union: Murdock Ethnic Homelands and African Country Boundaries

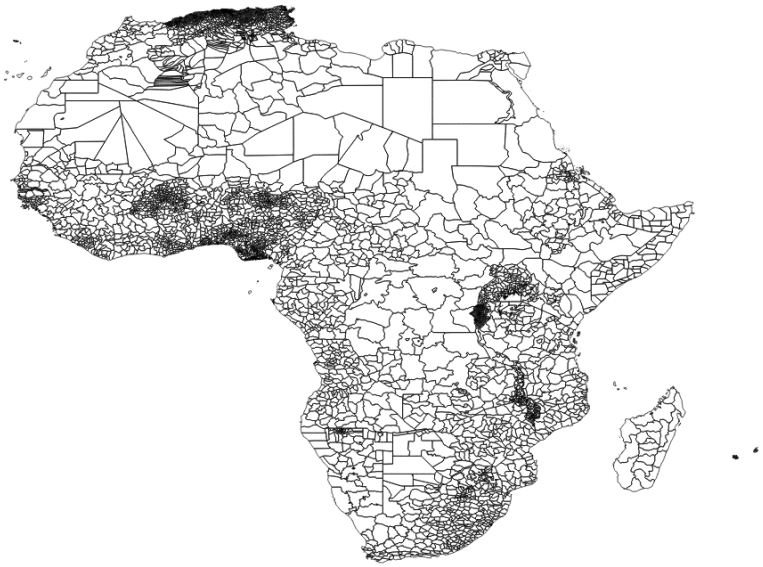
1. From Exercise 1 folder load shapefile Africa_country_bnd.shp
2. From Exercise 1 folder load shapefile murdock_ea_2010_3.shp
3. Check if CRS of both shapefiles is consistent.
4. Generate transparent fill for both shapefiles.
5. Change to different boundary colours.



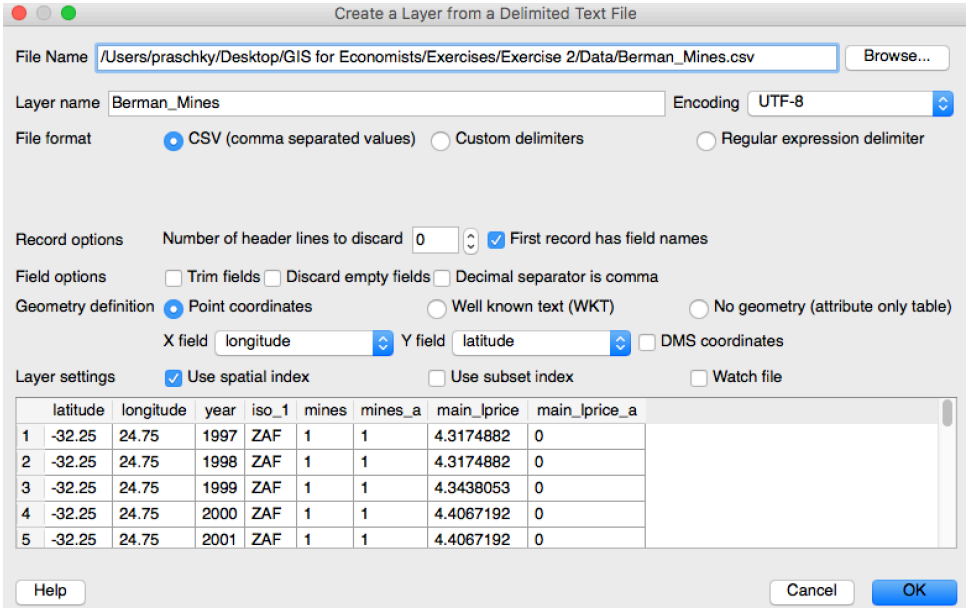
6. Vector | Geoprocessing Tools | Union
7. Input 1 Africa, Input 2 Murdock.
8. Check Results
9. Slivers?

Exercise 2E – Spatial Join: Conflict, Mines, and ADM2

1. From Exercise 2 folder load shapefile admin_Merge_Corrected_Africa.shp
2. Transparent Fill
3. Check CRS (World Eckert VI)



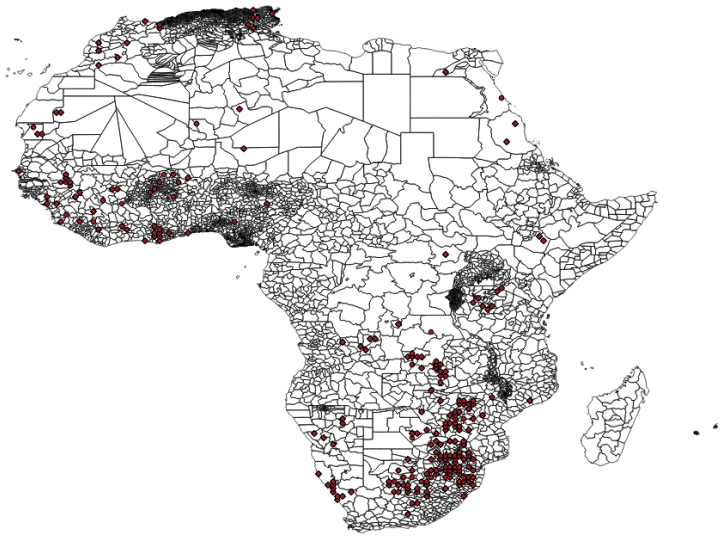
4. Add XY Data
   Layers | Add Layer | Add Delimited Text Layer



5. From Folder Exercise 2 import

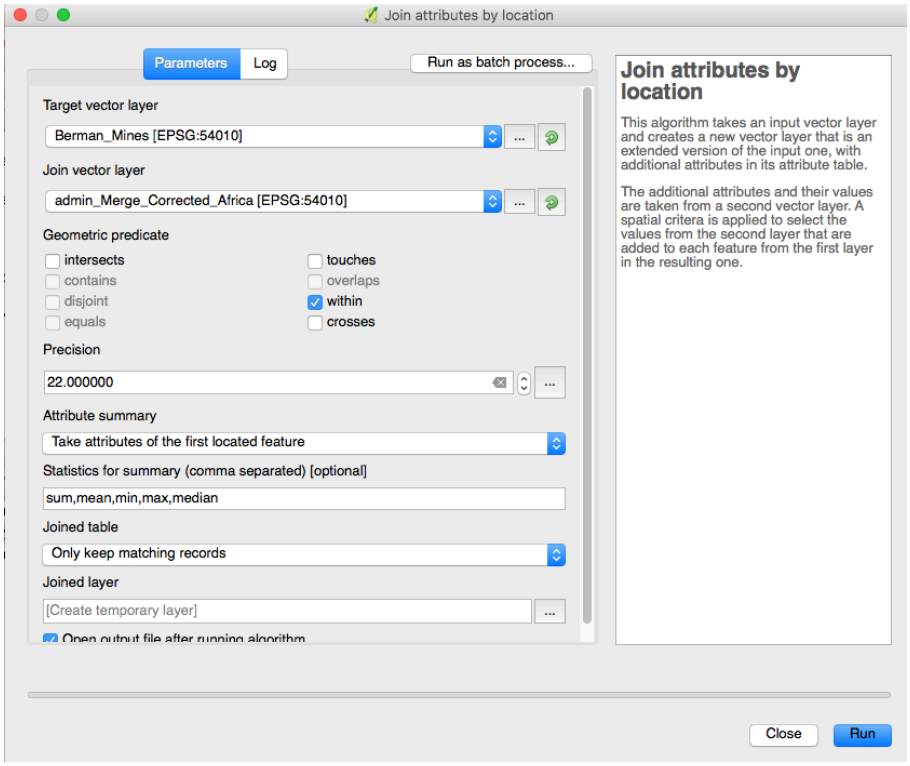
   - Berman_Mines.csv
   -Berman_Acled.csv

IMPORTANT, pick World Eckert VI CRS.



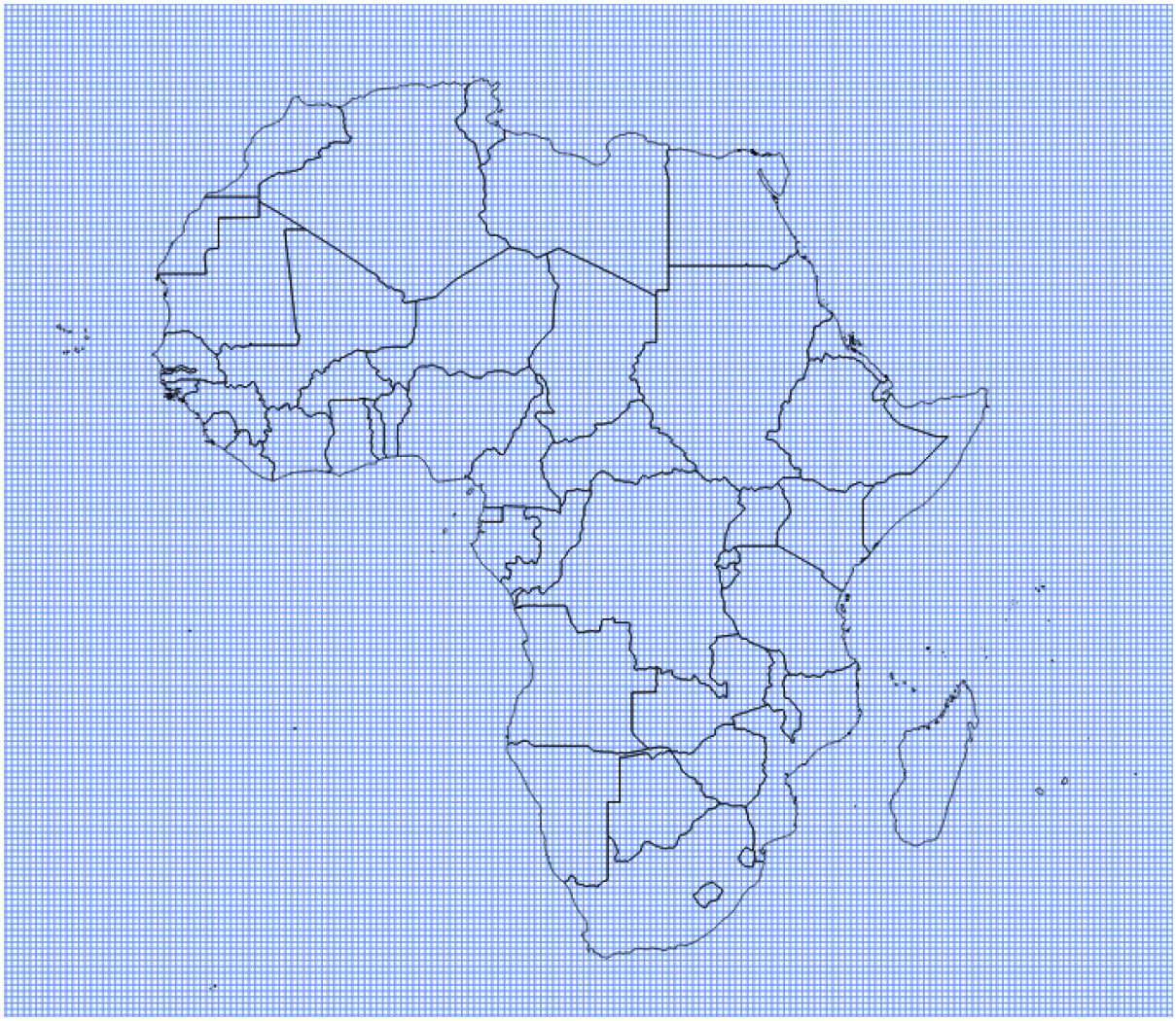
6. Save Berman_Mines and Acled as layers. (CRS!!!)

7. Vector |Data Management Tools | Join Attributes by Location



8. Save new Layer

9. Save as .. | Change File type to .csv | OK to save the attribute table.

Classroom Discussion 1:
If you would like to replicate Table 2 of Berman et al (2017) at the ADM2 level, how would you proceed?

Classroom Discussion 2:
If you would like to replicate Table 2 of Berman et al (2017) at the grid cell level, what would you do?