

SPATIAL DESIGN NETWORK ANALYSIS

sDNA in QGIS

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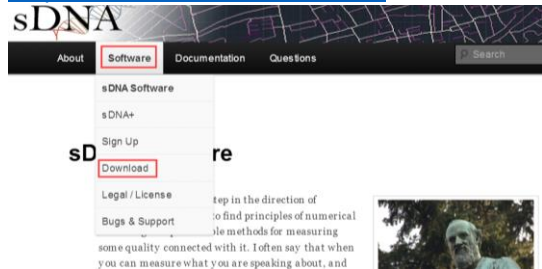
3D pedestrian network mapping & accessibility and flow analyses

1 Installing sDNA+ as plugin for QGIS

1.1 Download & Install sDNA

1.1.1 Get into sDNA official website, go to the download page

<http://www.cardiff.ac.uk/sdna/>



Download

Installation notes

1. You need a (free) serial number to run sDNA. You can get your serial number [here](#)
2. sDNA+ is the same download; but to unlock sDNA+ features you need an sDNA+ serial number. If you wish to obtain one please get in touch with us.
3. Run the downloaded file sDNA_setup_win.msi
4. If you have Symantec antivirus it may reports a threat of WS.Reputation.1. Note this is not a virus – it merely indicates sDNA does not show up as a Symantec product on Symantec's database.
5. Certain systems are known to report net errors when running sDNA.License Manager; these can safely be ignored (click 'continue'). If sDNA is failing to authorize, try running the license manager as administrator and authorizing again.
6. If using ArcGIS, QGIS or AutoCAD, you will need to manually add the sDNA toolbox. Either way, check your start menu for more documentation!

[Click here to go to the download page](#)


1.1.2 Choose the latest version (v3_4_6) to download
sDNA Downloads

Name	Last modified	Size	Description
sDNA_setup_win_v3_4_6.msi	20-Oct-2017 15:41	104M	Windows installer
documentation/	16-Aug-2016 16:52	-	
old_versions/	16-Aug-2016 16:21	-	
sDNA_setup_win_v3_4_5.msi	16-Aug-2016 15:26	104M	Windows installer
experimental/	13-Jun-2016 15:40	-	
gplsrc/	19-Jan-2016 14:49	-	

1.1.3 Run the downloaded file “sDNA_setup_win_v3_4_6.msi”, follow the installation instruction → “Next” → “Next” → “Next” → Tick box “I accept” → “Install” → “Finish”

1.1.4 License sDNA – you need to sign up to get a free sDNA license

1.1.5 From sDNA website: <http://www.cardiff.ac.uk/sdna/>



Sign Up

sDNA is free for all users

However, you need to register in order to use it; enter your details below.

Please ensure your email address is correct; your serial number will be emailed to the address entered here.

If you have registered in the past and now need another serial number, just fill out your email address – the rest of the form is not necessary for additional serials.

Full Name

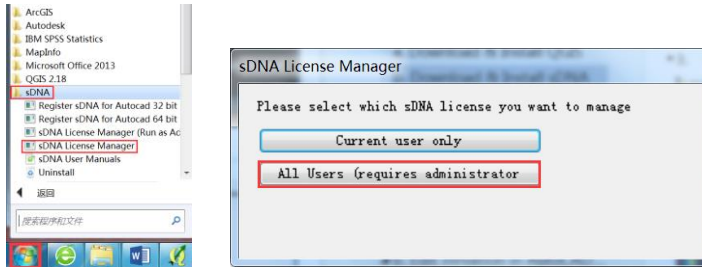
Organization

Please select...

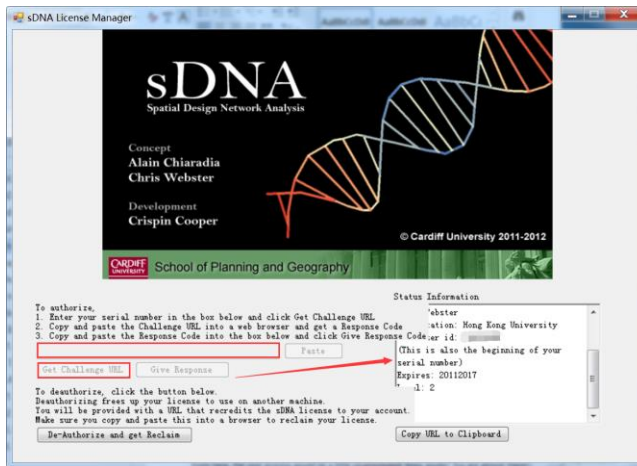
Email address

Address

1.1.6 From the Windows Start menu, find “sDNA License Manager” in the sDNA folder; Click and select “All Users”

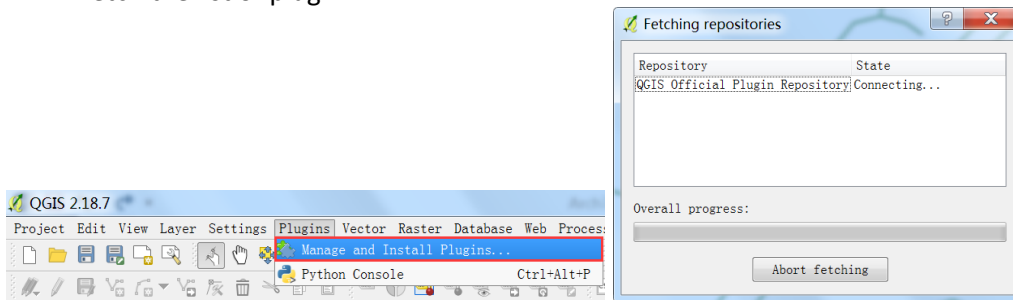


1.1.7 Follow the instructions show in “sDNA License Manager” window to authorize.

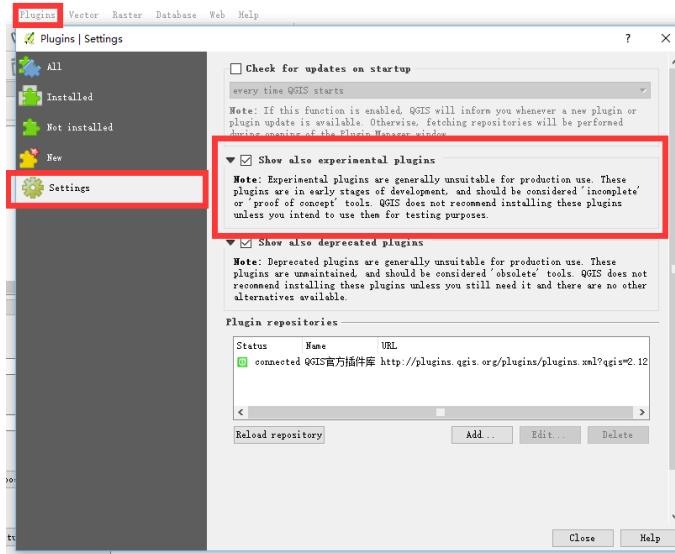


1.2 Setting up sDNA in QGIS

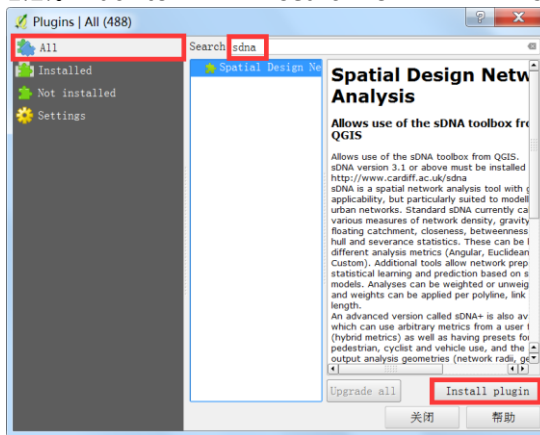
1.2.1 Open QGIS. “Plugins” tab→”Manage and install plugins”, it may take a bit of time to fetch the list of plugin



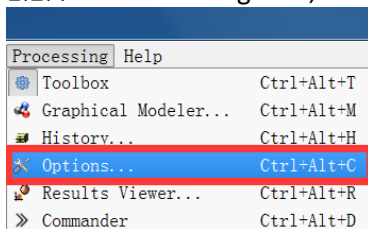
1.2.2 In “Plugins | Settings” window, under “Settings”, make sure you have checked the box ‘Show also experimental plugins’



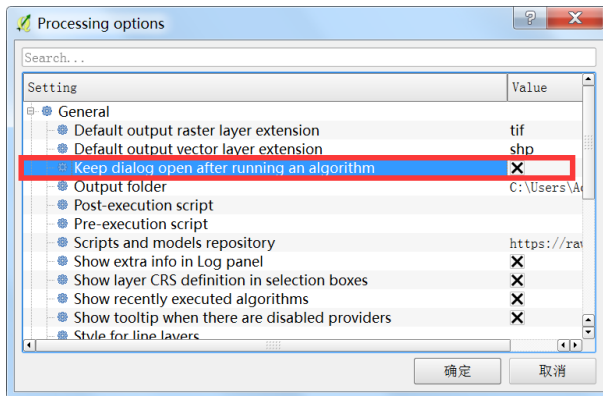
1.2.3 Back to “ALL” → search “SDNA” → “Install plugin”



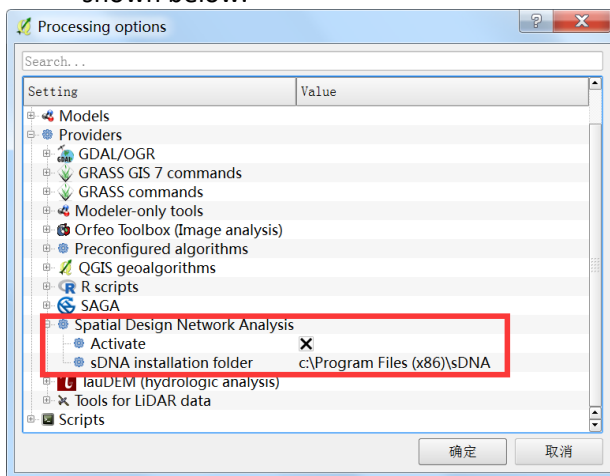
1.2.4 In “Processing” tab, Select “Options”



1.2.5 Select “General” and check the “Keep dialog open after running an algorithm”

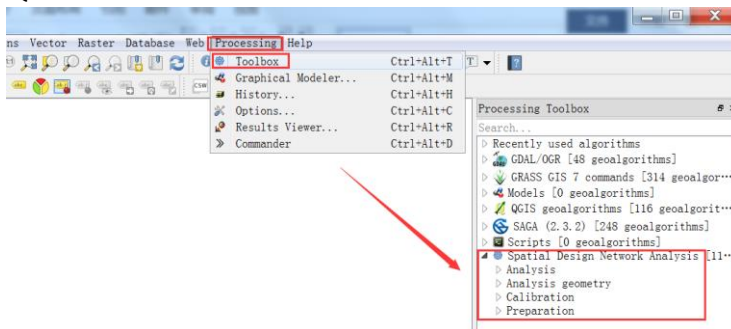


1.2.6 Then go into “Providers”, sDNA should show up as activate and the location should be as shown below.




1.3 Open the sDNA toolbox

Find the “Processing” tab → click **Toolbox**, a toolbox panel should show up on the right of the QGIS window.



2 sDNA in QGIS – Processing HK Vehicle network

2.1 Load the Transport vector layer

- click on the Add Vector Layer toolbar button , load “HKisland_Centreline.shp”

2.2 Running sDNA prepare

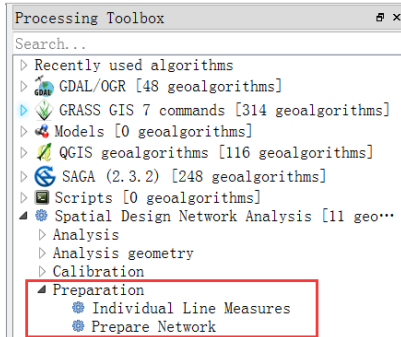
This is a stage to take care of error in the network. For more details see:

<http://www.cardiff.ac.uk/sdna/wp>

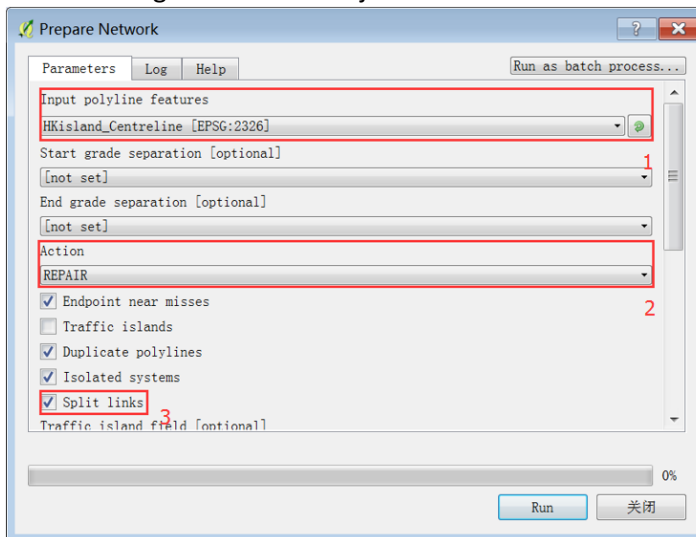
[content/downloads/documentation/manual/sDNA_manual_v3_4_5/network_preparation.html#pri](http://content/downloads/documentation/manual/sDNA_manual_v3_4_5/network_preparation.html#principles)

nciples

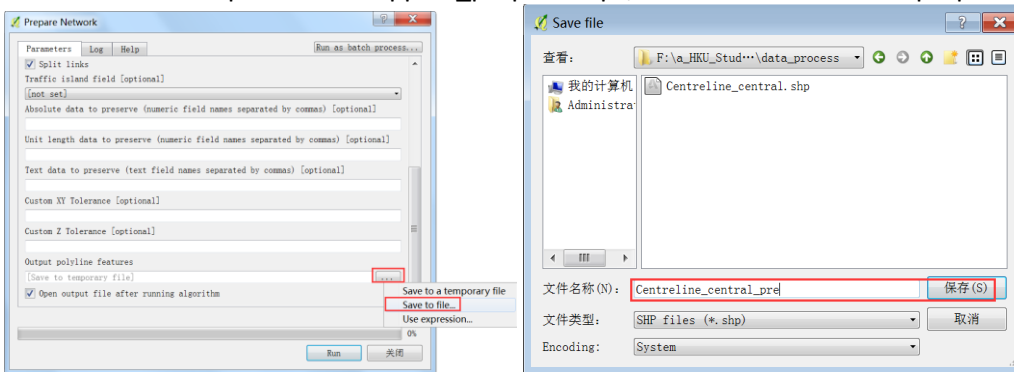
2.2.1 In “Processing toolbox” on the right, in sDNA toolbox click “Preparation” and double-Click “Prepare Network”.



2.2.2 In **Input polyline features** select the layer “HKisland_Centreline” ① (if only one it is automatically selected); change the **Action** set to “Repair” ②; tick “Split links” to join all the segments between junctions into one continuous segment ③.



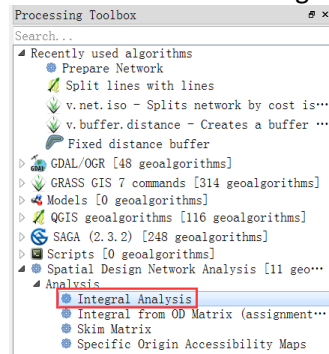
2.2.3 save the output file as “clipped_prepare.shp”, then click on “RUN” to prepare network.



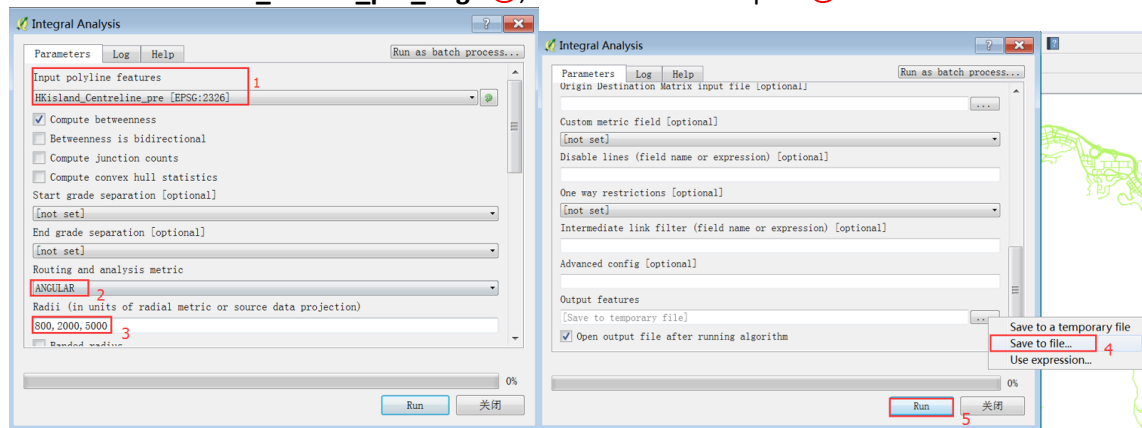
2.2.4 Close Prepare Network window

2.3 Using sDNA Integral Analysis

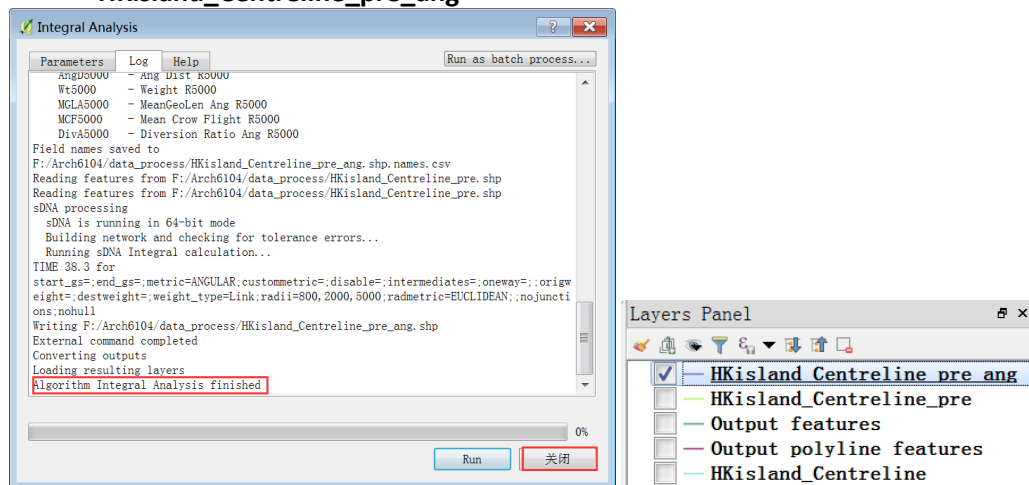
2.3.1 Double click “Integral Analysis” In “Processing toolbox” on the right



2.3.2 Select the prepared layer as input dataset ①; select “Angular” analysis metric ②; set the analysis radii: “800, 2000, 5000” ③; specify output dataset location, name the new layer as “Centreline_central_pre_ang” ④; click “Run” to compute ⑤.

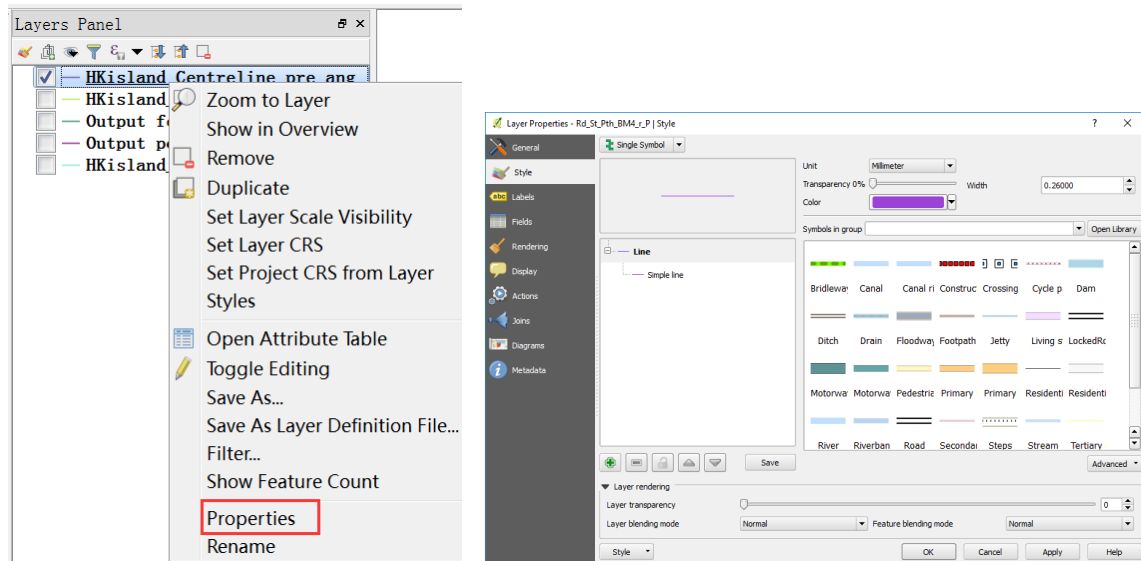


2.3.3 Once processing is finished, close the Integral Analysis and rename the output layer to “HKisland_Centreline_pre_ang”

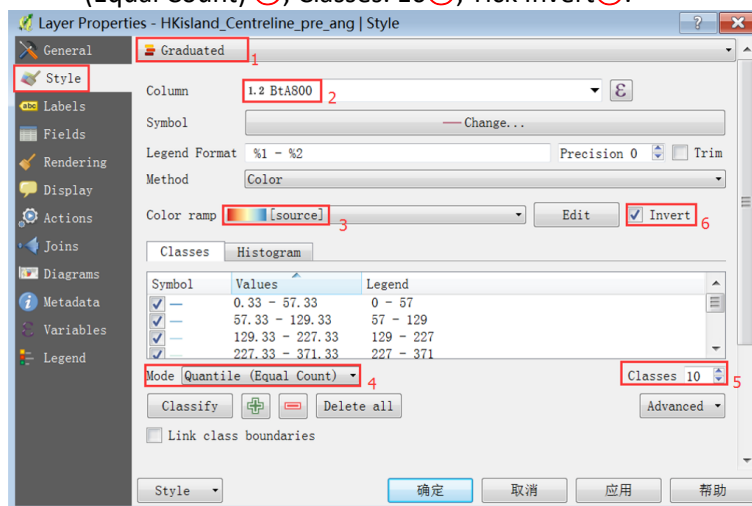


2.4 Displaying sDNA Results

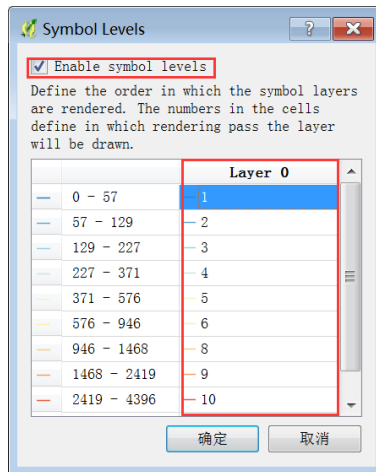
2.4.1 Right click on the layer → Properties



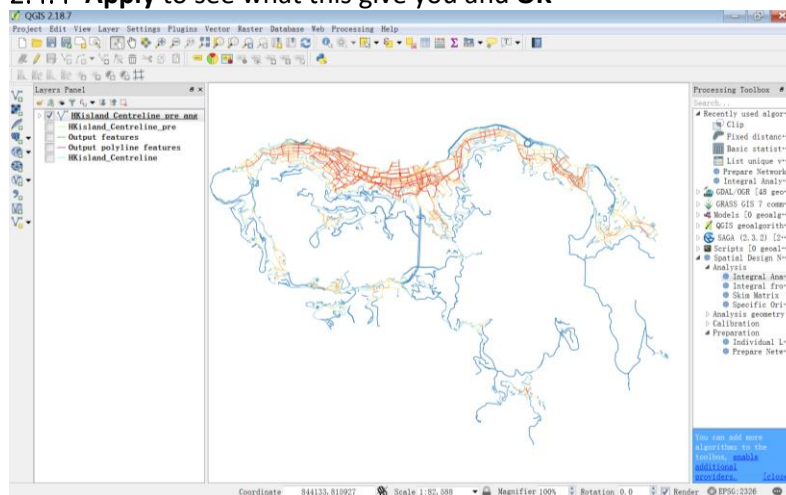
2.4.2 In **Style**, change the Single Symbol to “Graduated” ①; Column: select BtA 800 (Betweenness Angular 800m) ②; Change Color ramp to “RdYlBu”③; Mode: Quantile (Equal Count) ④; Classes: 10⑤; Tick Invert⑥.



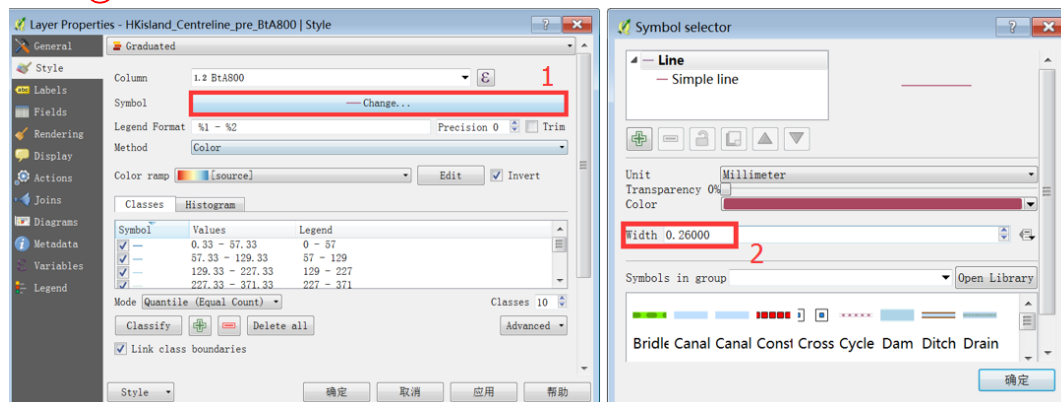
2.4.3 In **Advanced**, select **Symbols Levels**, Tick **Enable Symbols Level**, and then from blue to red, number the layer 0 from 1 to 10. OK



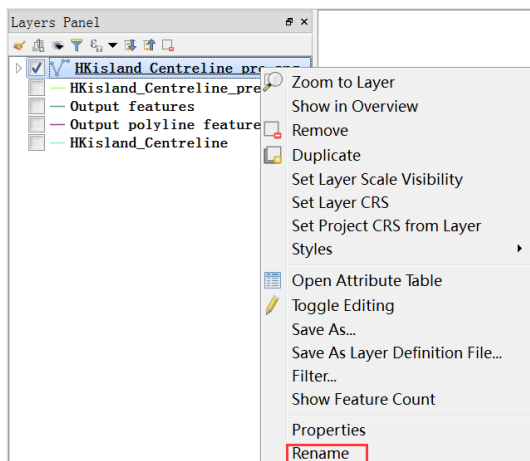
2.4.4 Apply to see what this give you and OK



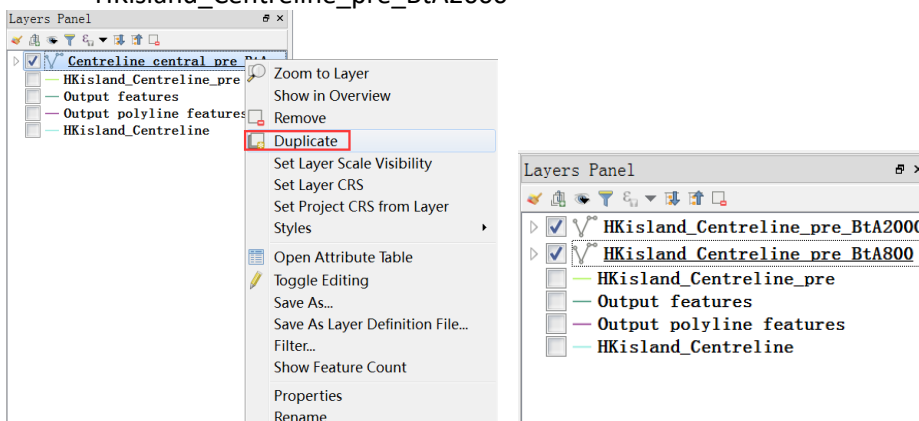
2.4.5 Set the line thickness through the Layer Properties→Style→Symbol①, set the line width ②



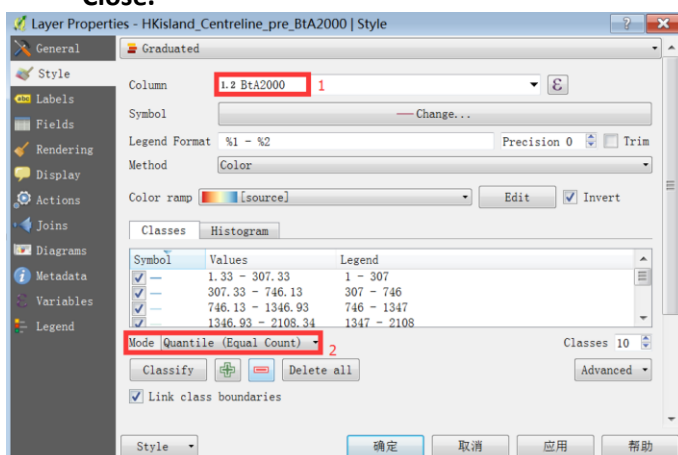
2.4.6 Right click on the layer, and “Rename” the layer as “HKisland_Centreline_pre_BtA800”



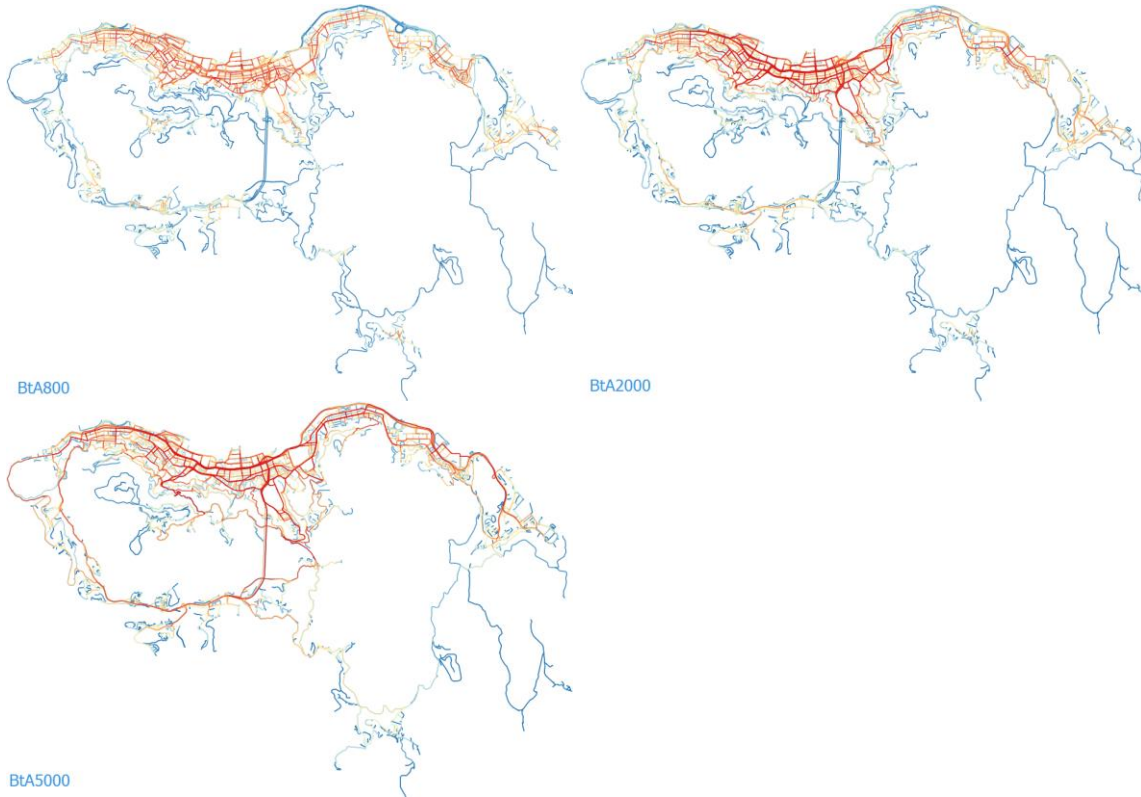
2.4.7 Copy the layer by Right clicking on the layer → “Duplicate” ; Rename the layer as “HKisland_Centreline_pre_BtA2000”



2.4.8 Right click the “Centreline_central_pre_BtA2000” layer → **Properties** → **Style** and change **Column** to BtA2000 ①. To make the change to happen toggle **Mode** between Equal Interval and back to **Quantile** ②. Then the legend change and you can **Apply** and **Close**.



2.4.9 Do the same for layer 5000. SO you have 3 graphic + 3 legends.



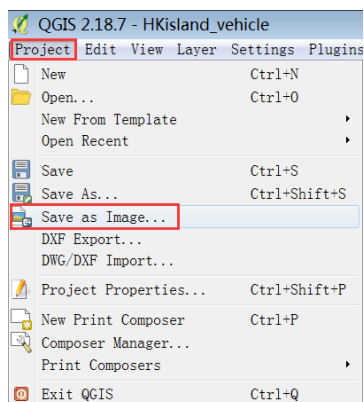
2.5 Save project

- Go to menu, Project → Save → choose the name for your project (e.g., HKIsland_vehicle) and the location to save it

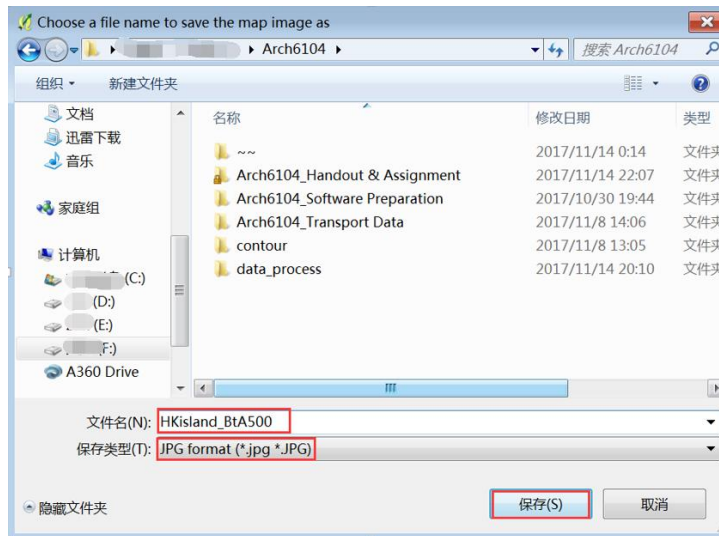
3 Exporting an image from QGIS

3.1 Use “Export as Image”

3.1.1 Project > "Save as Image".



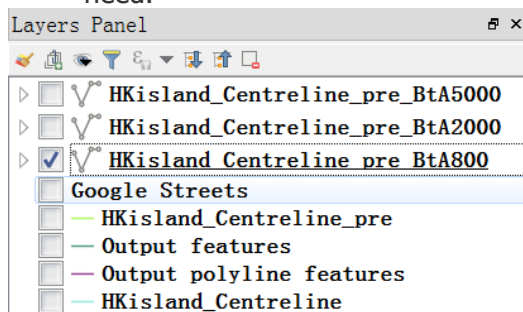
3.1.2 Save in the desired format (png, jpg, tiff)



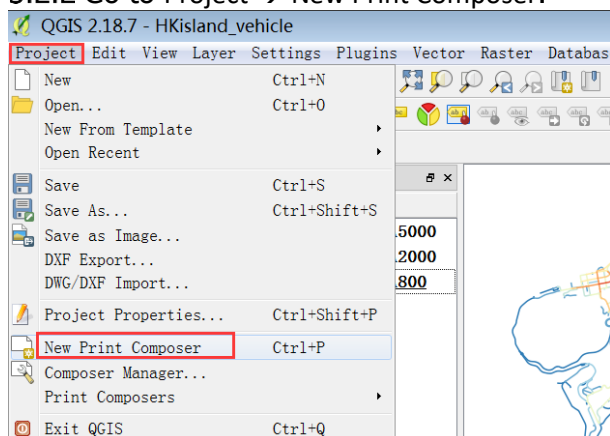
3.1.3 "Save as Image" simply saves the currently visible map. It's not possible to adjust the resolution of an output image

3.2 Use "Print Composer" to create high-resolution output

3.2.1 Un-check the box next to layers to turn off some map layers for data that we do not need.



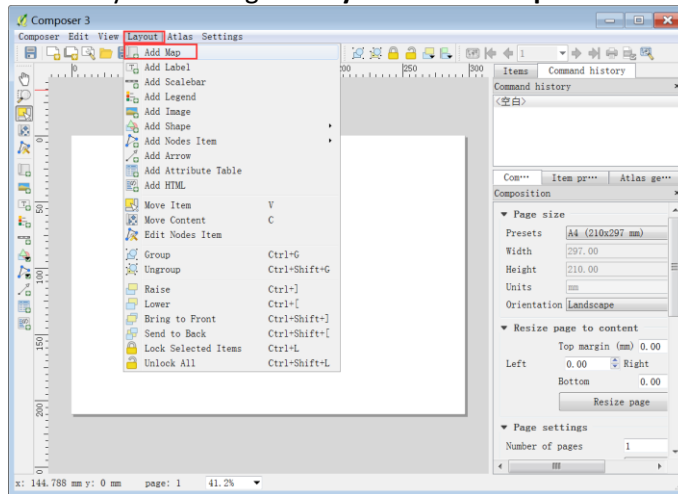
3.2.2 Go to Project → New Print Composer.



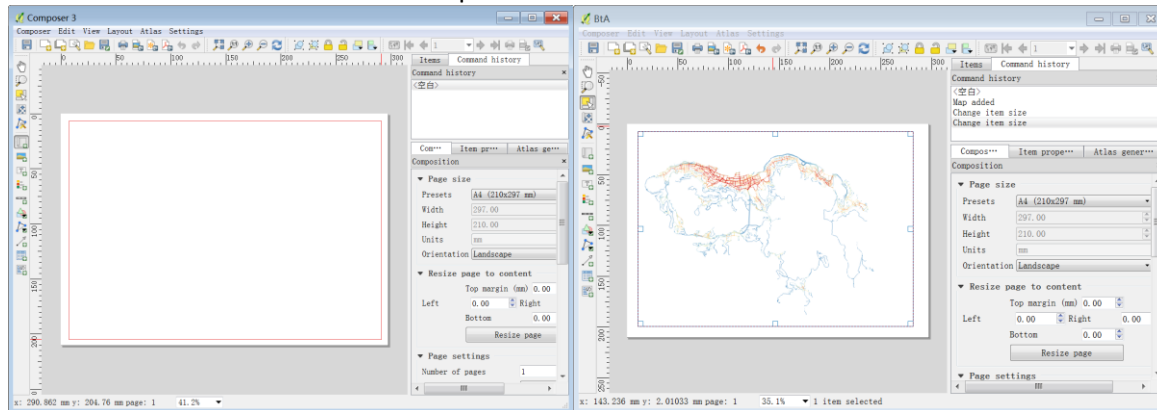
3.2.3 You will be prompted to enter a title for the composer. You can leave it empty and click Ok.



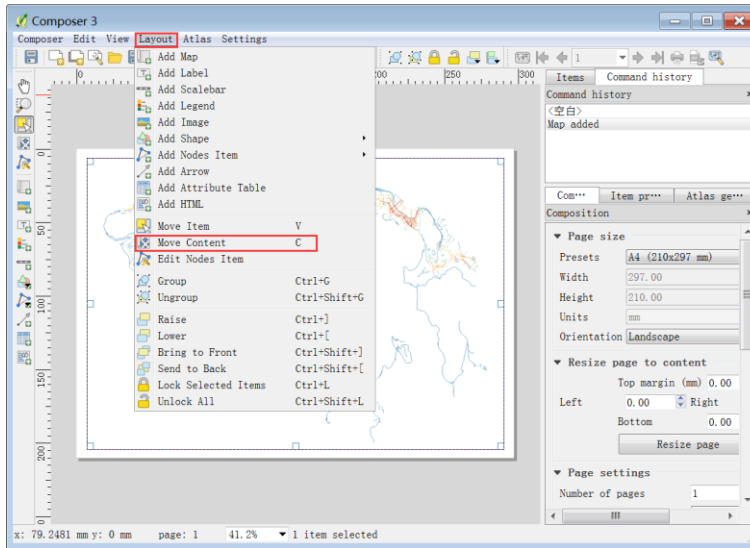
3.2.4 In the Print Composer window, click on **Zoom full**  to display the full extent of the Layout. Then go to **Layout → Add Map**.



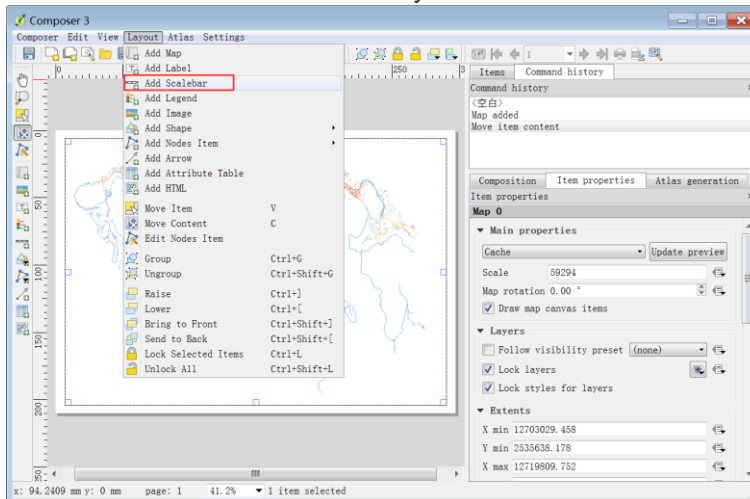
3.2.5 Once the Add Map button is active, hold the left mouse button and drag a rectangle where you want to insert the map. You will see that the rectangle window will be rendered with the map from the main QGIS canvas.



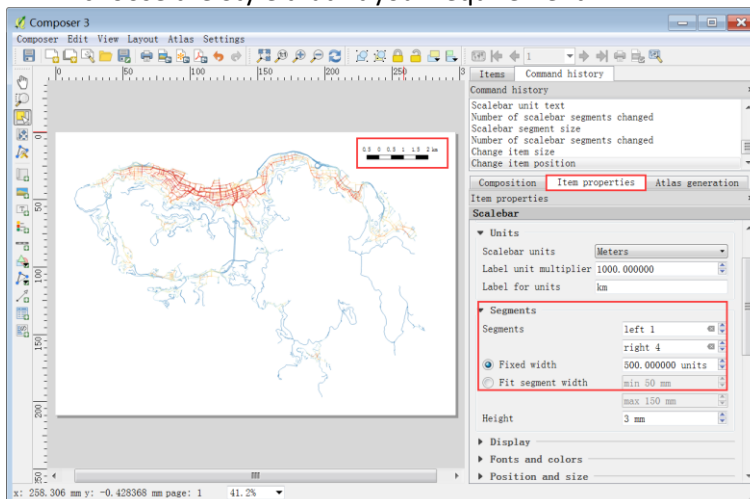
3.2.6 Use **Layout → Move item content** to pan the map in the window and center it in the composer.




3.2.7 Add a Scalebar. Click on Layout → Add Scalebar

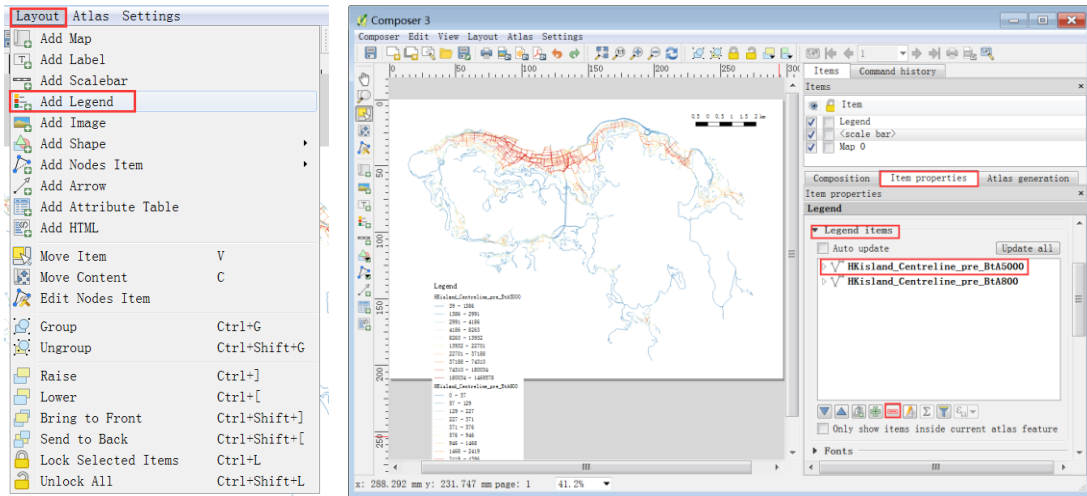


3.2.8 Click on the layout where you want the scale bar to appear. In the Item Properties tab, choose the Style that fit your requirement.

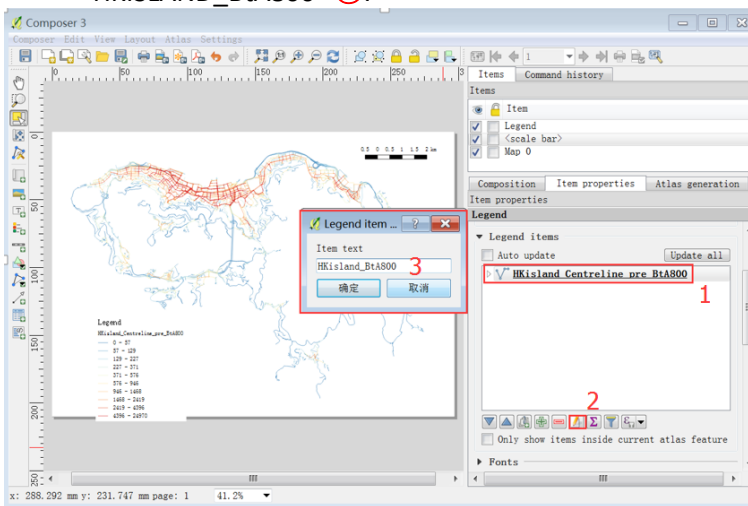




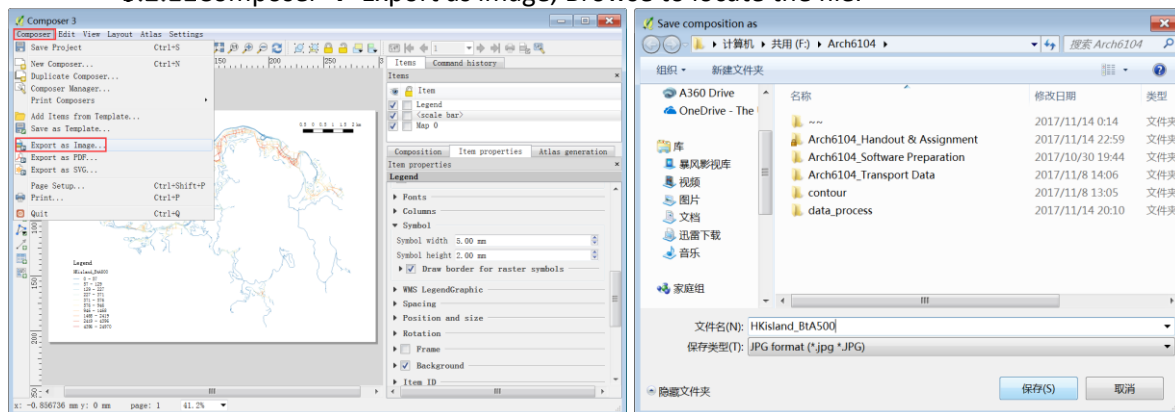
3.2.9 Layout → Add Legend. In the **Item properties** tab, find **Legend items** panel. Use minus button  to remove unwanted items.



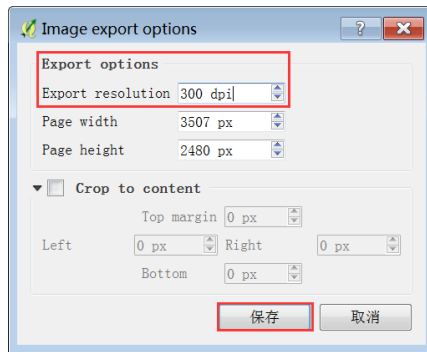
3.2.10 Select a layer from the same list **①**, Click the Edit button **②**; Re name the layer to “HKISLAND_BtA800” **③**.



3.2.11 Composer → Export as image, Browse to locate the file.

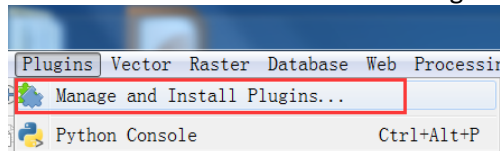


3.2.12 Set the output image resolution, and save

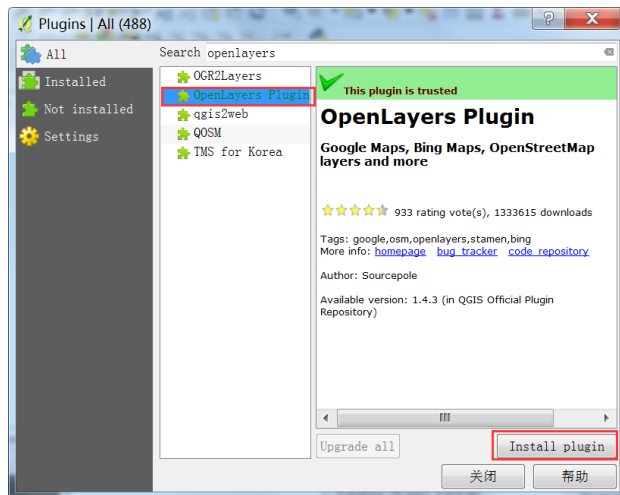


4 Adding Basemaps (Google, OpenStreetMap, Yahoo!, Bing)

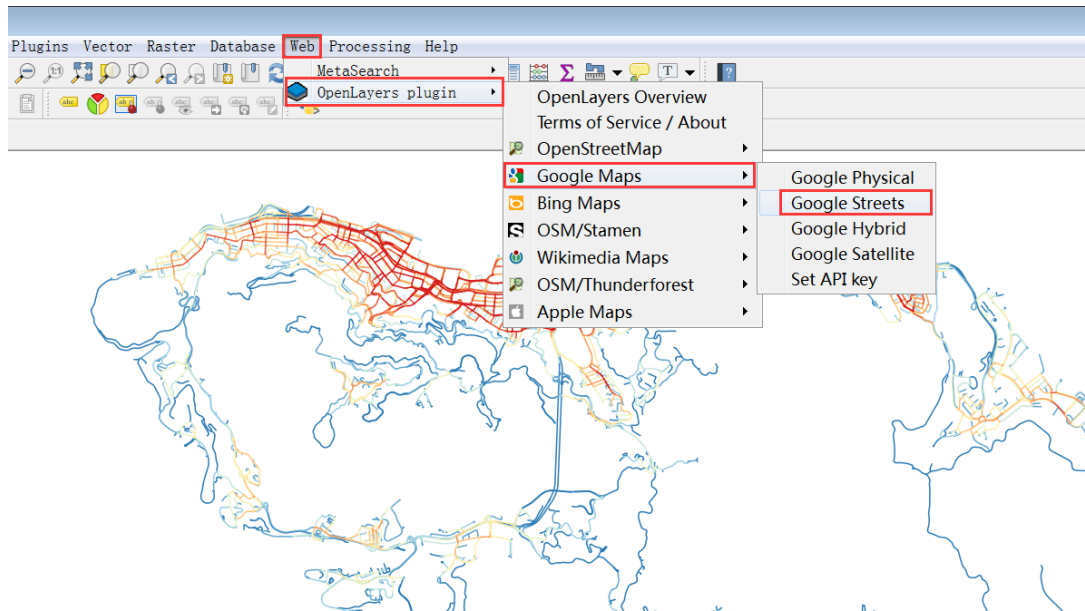
4.1.1 From the main menu click “Plugins” → “Manage and Install Plugins”



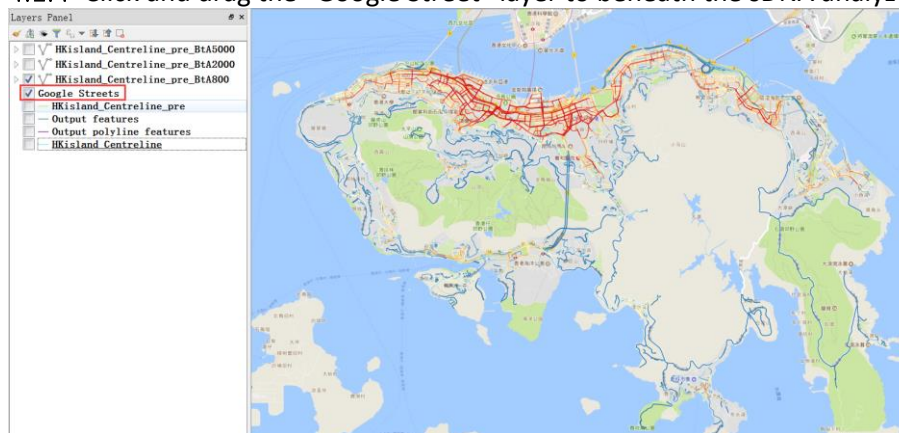
4.1.2 Search “openlayers” to filter plugins, select “OpenLayers Plugin” → “install plugin” → CLOSE the Plugins window after you see "successfully installed" dialog box.



4.1.3 Click “Web” → “OpenLayers Plugin” → “OpenStreetMap”



4.1.4 Click and drag the “Google Street” layer to beneath the sDNA analyzed layers.

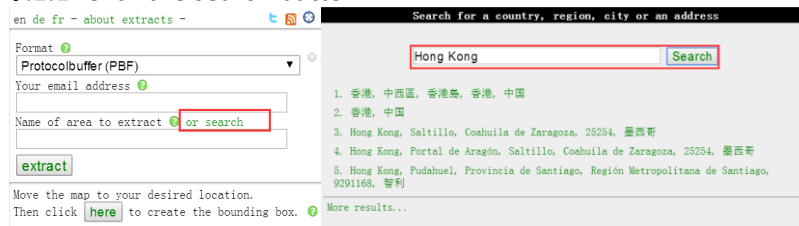


5 Appendix: How to use OSM data for sDNA analysing

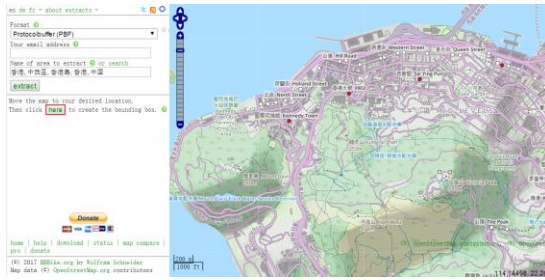
5.1 Download OSM data extract from Mapzen/Geofabrik/BBBike

<http://extract.bbbike.org/>

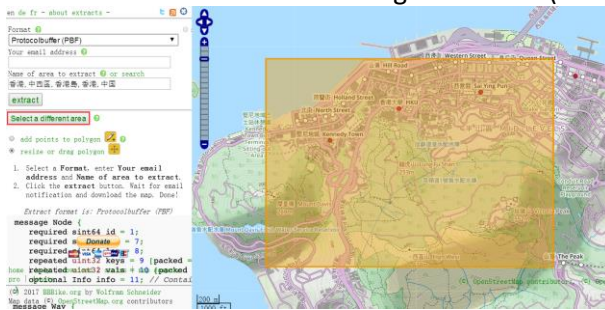
5.1.1 Click the search button



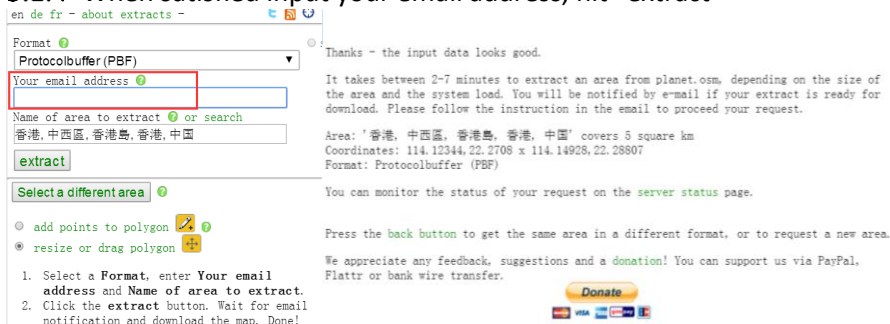
5.1.2 Move the map to the desired position using the zoom function on your mouse, click “here” to create a bounding box when satisfied.



5.1.3 If the bounding box does not cover the area required, you can cancel the selection by clicking on “select a different area”. Repeat the process of navigating till you are satisfied with the area the bounding box covers (data extracted will fall within the bounding box).



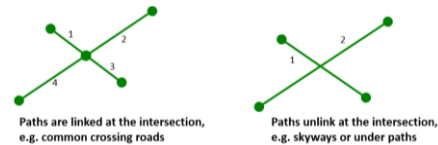
5.1.4 When satisfied input your email address, hit “extract”



5.1.5 After the arrival of the email with a link that directs to your data download. Save your OSM data extract in a folder. The OSM data comes in a zip folder, unzip the contents.

5.2 Clean OSM map for processing

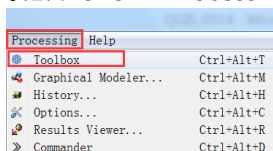
5.2.1 Difference between Link & unlink intersections



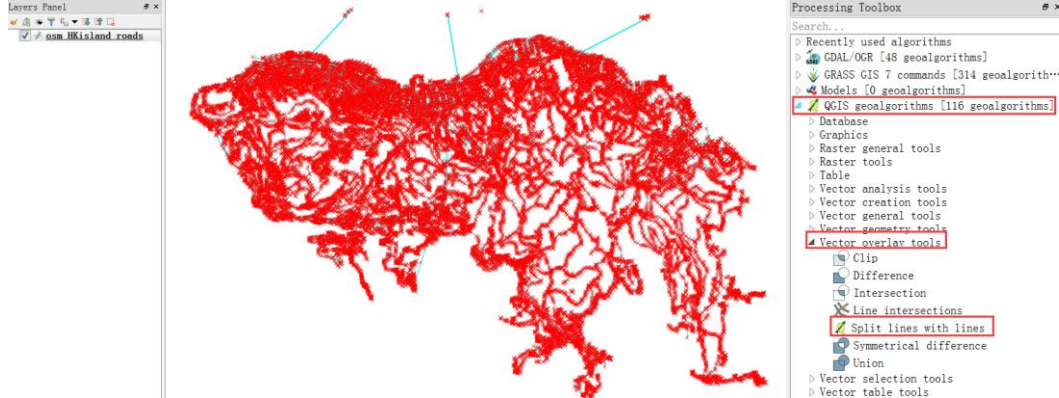
5.2.2 Break all of the “link” intersections at once (or you can use “Cleanup” in AutoCAD Map 3D to do the same)

5.2.3 Select **the road layer**, then click “Edit” mode

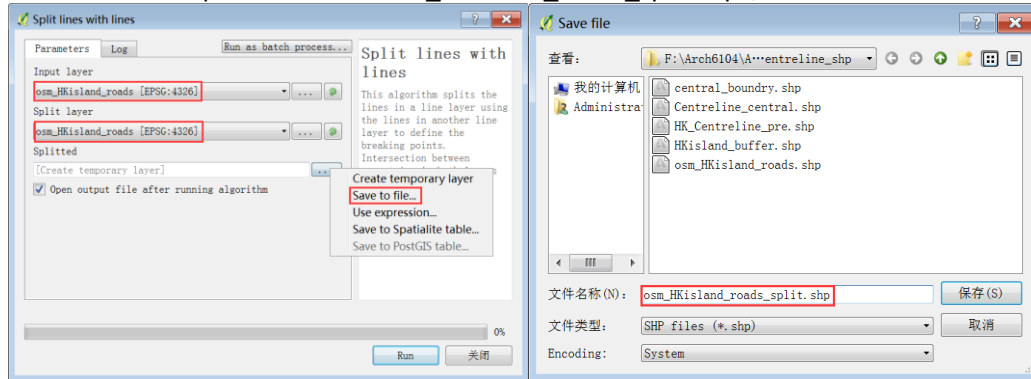
5.2.4 Show “Processing Toolbox”



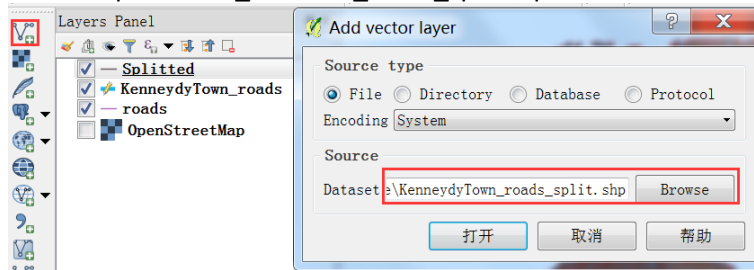
5.2.5 “Processing Toolbox” → “QGIS ge algorithms” → “Vector overlay tools” → “Split lines with lines”



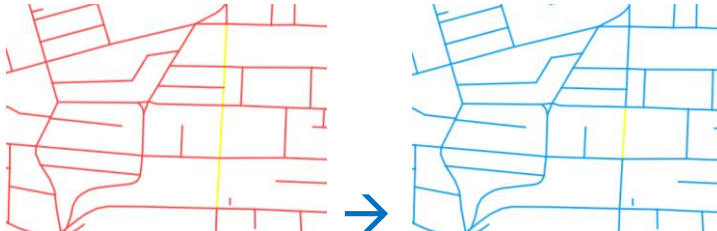
5.2.6 Double-click to open “Split lines with lines” dialog, set “Input layer” and “Split layer”, save the splitted file as “osm_HKisland_roads_split.shp”, click “Run”



5.2.7 Import “osm_HKisland_roads_split.shp” into QGIS



5.2.8 Use “Select Feature” to check that all of the intersections were broken.



5.3 Repeat 2.2 to 2.4 to process the map using sDNA.