





## Selection and Queries

- What are selections?
- Select Features Interactively
  - From the Map
  - From an Attribute Table
- Selection by Criteria
  - the Query Builder
  - Layer subsets
- Select By Location

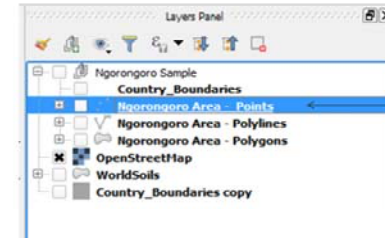


## What is a Selection?

- A selection is a record or records that you pick from your dataset for further examination or analysis
- Records can be selected by:
  - their position on the map
  - their attribute information

## Setting the Active Layer

- Before attempting to select a layer make sure that it is highlighted in the Layers window – it is then called the Active layer



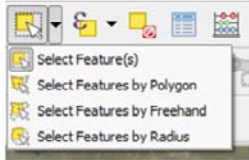
This is the layer which is currently active

To set which layer you want to select from, select it in the Layers window.

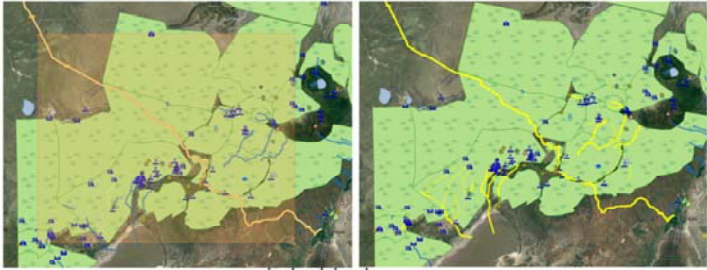
Different layers can have active selections at the same time.

## Select Features Interactively

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Various interactive selection tools. E.g Select features selects all features that intersect the rectangle.



Select features

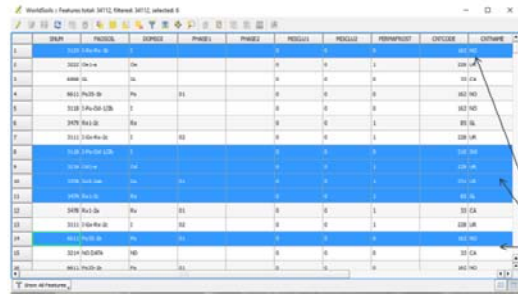
The rectangle drawn intersects both the points layer and the line layer, however only features from the line layer have been selected as this is the currently active layer.

Features may also already be selected in others layers in the map, but as they aren't the active layer then these selections won't be modified

## Selecting from a table

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- To select a continuous sequence of records, left click on the grey box to the left of the record, hold down the shift key and left click on the last record in the sequence.
- To select non-sequential records, hold down the Ctrl key instead of the shift key.



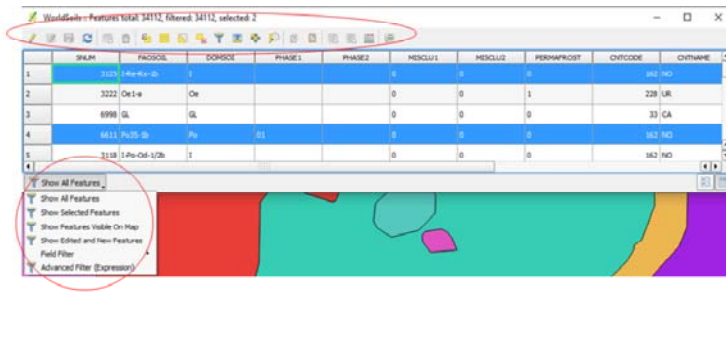
Selected records

Selected records appear in blue in the table.


If you are selecting records in the attribute table, you will see that the corresponding map object becomes selected in the map. Likewise, if you select a record in the map, the record also becomes selected in the layer table.

## Selecting from a table cont

- When you have made your selection, you can then further interact with it using the toolbar at the top of the attribute table window and the button at the bottom right of the table window.

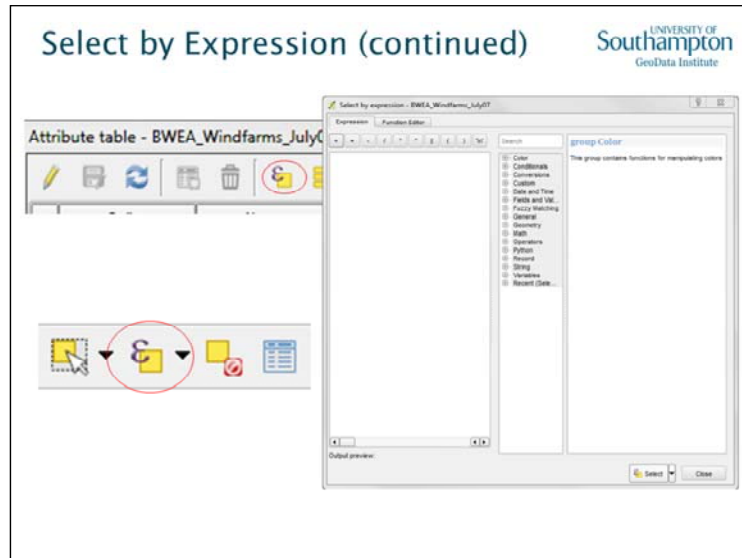


## Selecting by Expression

- Select records from a table or layer that meet your criteria
- Examples of criteria:
  - Population > 5,000,000
  - Land\_use = 'urban'
  - Polpulation > 5,000,000 AND Land\_use = 'urban'
- Criteria are defined using the Query Builder which is accessed through the button  in the attribute table

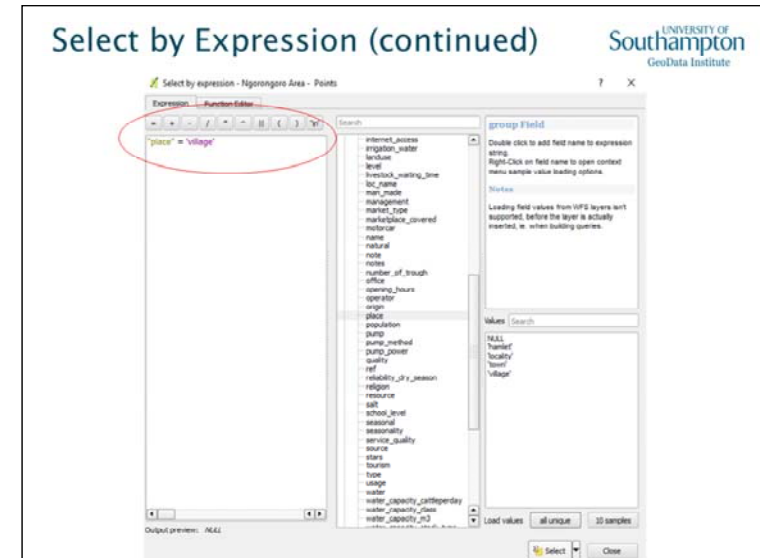
Selecting by criteria enables you to choose particular records from your data, depending on the values contained in the attributes. For example, in a table of land use areas, you may want to select all areas with the land use "urban". As another example you may have data for states in the whole of the US. You might want to select all the states that have a population greater than 5,000,000.

The most basic way to select records using criteria is to use the **Search** box at the bottom of an Attribute Table.



The Select by Expression button can be accessed from within the attribute tables or from the toolbar in the map window as shown above.

The Select by Expression query builder will open upon clicking on the button and allows users to generate queries to filter selections within the map window and table.



In the example above, a search has been done to select all the wind farms for which the developer is npower renewables


When creating criteria, the following syntax rules apply:

Text enclosed in **double** quotes references a field

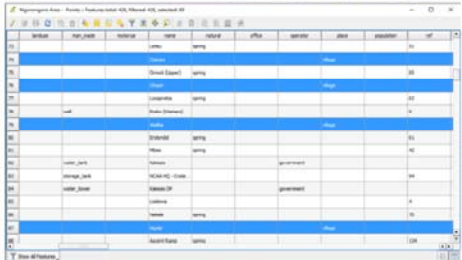
Text enclosed in **single** quotes denotes a static value

The first row of the attribute table will be used to test the expression, and the result will be shown at the bottom of the dialog after the text 'Output preview:' Expressions that are true will return 1, those that are false will return 0.

## Displaying Selected Records



On the map

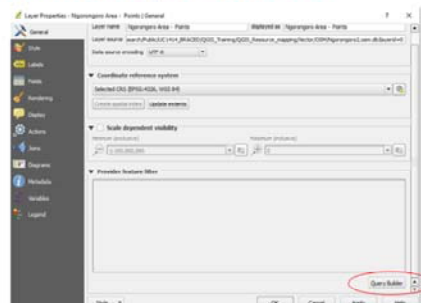


In the Attribute table

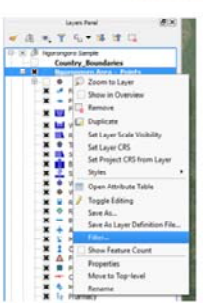
Selected records are displayed in the selection colour (blue by default) in both the table and view documents. Un-selected records are still displayed but are not highlighted.

If you make a selection in the view, you will see that the appropriate records are selected in the theme table, and vice versa.

## Creating Layer Subsets



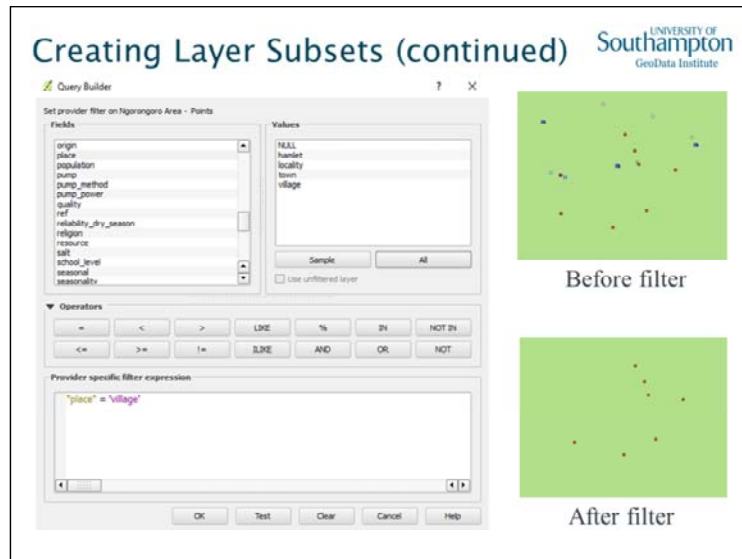
Accessed from the General Tab in the Layer properties.  
Or by right clicking on the layer name and selecting Filter.



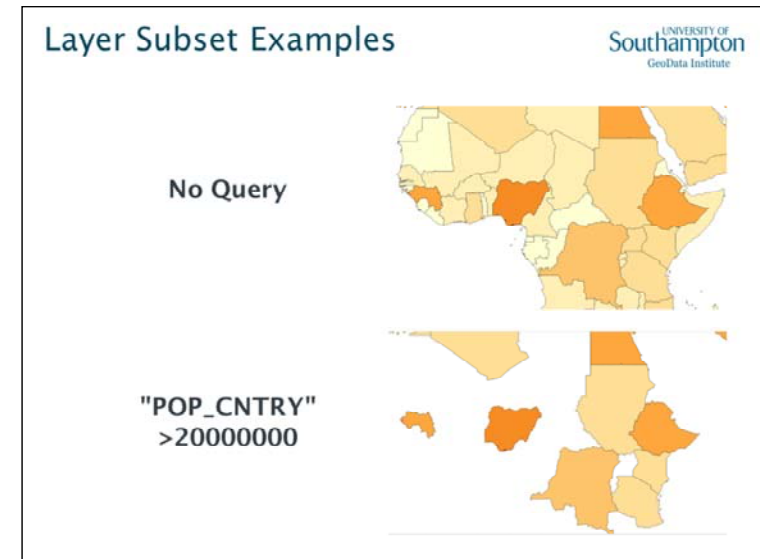
The query builder allows you to select which features should be drawn within a dataset.

By default, all features display when you draw a layer. Defining a layer subset means that only certain features are displayed when you draw the layer, based on the attribute data stored relating to each feature. For example, if you had a town point layer with population data you could choose to display only towns with a population over a particular size. This is called a **Layer Subset**.

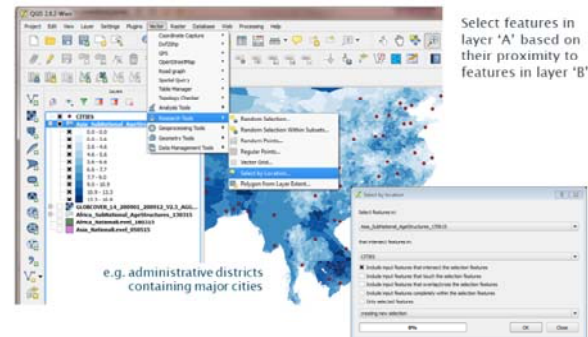
The **Query Builder** is used to define criteria for the subset using an expression containing a field, an operator and a value. You can combine expressions to define criteria based on more than one field or more than one set of values.



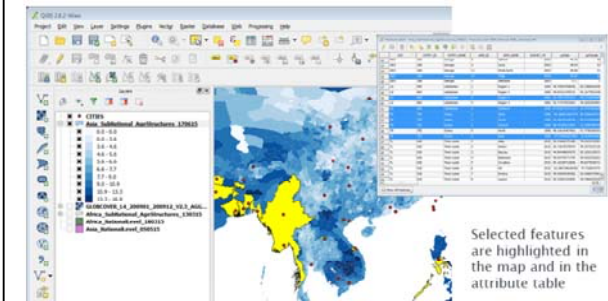
Whilst the dialog looks slightly different to that of the Select by Expression command, the syntax is very similar



## Location-based Queries



## Queries – Viewing Results



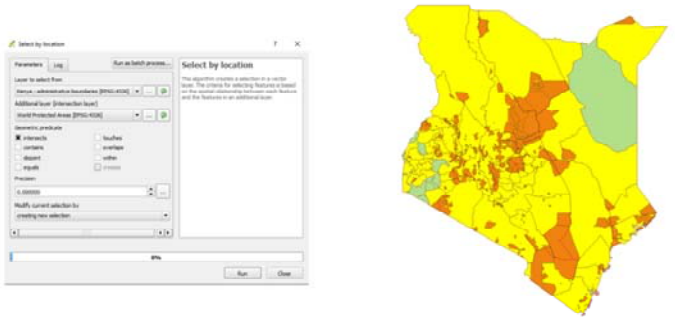
Previous slides show different methods of selecting features. Whichever method is used, features will be highlighted on the map and in the table



## Select By Location

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- The Select by Location tool allows you to select features on your map which intersect other features.
- Found under *Vector > Research Tools > Select by Location...*



Source: © ProtectedPlanet 2014-2017 Source: © GADM 2017

The Vector menu is part of a core plugin called fTools that is installed by default, although it may not be loaded. If the menu isn't visible, load the fTool plugin using *Plugins > Manage Plugins...*


Here we are selecting administrative regions in Kenya that intersect a designated protected site.

## Combining Selections

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Imagine that you wanted to select all the windfarms over a specific capacity that fell within a national park.

- This requires a Select by Attributes and a Select by Location
- How can you combine these two commands?



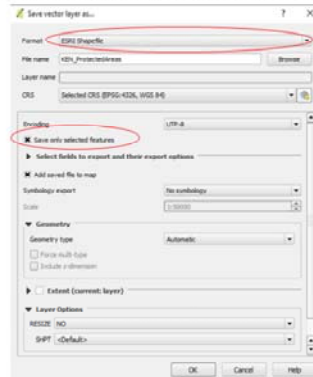
Each command allows the existing selection to be modified rather than overwriting it. This allows commands to be daisy chained in sequence to achieve more complex selections.

If you are combining a spatial and attribute query with the AND operator (as per the example above) then you will need to use the 'Select within selection' option. If using the OR operator then use the 'Add to selection' option.

## Export selection as a new layer/table UNIVERSITY OF Southampton GeoData Institute

Selected features can be exported as a permanent layer by choosing *Save As...* from the layer context (right click) menu

Check this to save only the selected features



Select the file type you want to save to from this dropdown menu. Options include .shp, .tab and .kml for vector files and .csv to just save the attributes.

Whenever you create a selection in QGIS, you have the option to export it as a new layer.

The Save Vector Layer as dialogue allows you to save in many different formats, including ESRI .shp, MapInfo .tab and Google .kml formats.

You can also export the layer as a .csv file. This will export the attributes of the selected features, but it won't export any geographical information.

Another option is to copy the selected attributes to the clipboard from where they can be pasted into another application.

The default behaviour in QGIS is that the geometry will also be transferred as an additional attribute column in this process, called *wkt\_geom*. This can be disabled through the QGIS options: *Settings > Options > Data Sources* 'Copy geometry in WKT representation form attribute table'