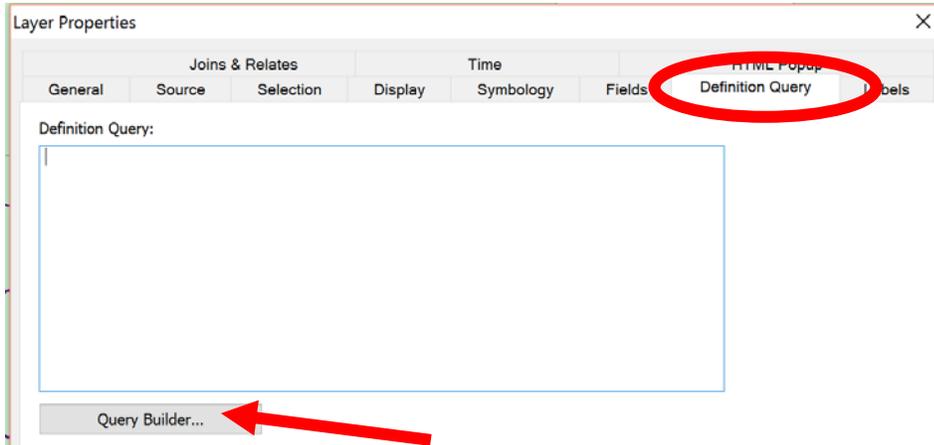


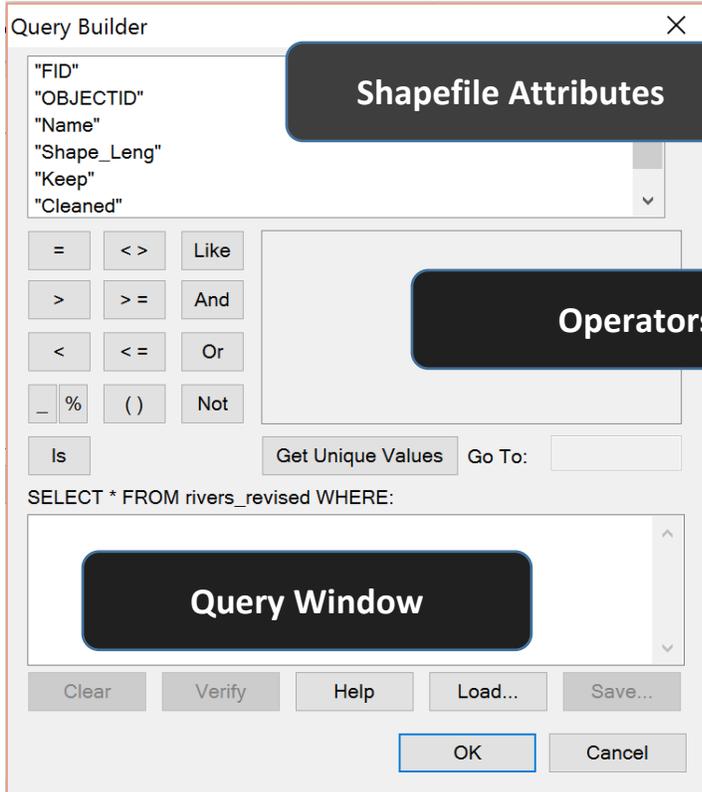
SQL in ArcMap

SQL (structured query language) is a non-destructive way to edit your shapefiles. SQL queries tell ArcMap what parts of the shapefile to display, rather than selecting (and exporting) features from the map or deleting features from the shapefile. The SQL query is stored within the .MXD file, reducing the need to create new shapefiles.

SQL queries can be entered from the **Definition Query Tab** in the layer properties menu (right click on layer -> properties). Click on the “**Query Builder...**” button on the bottom of the tab.



The window that results provides a graphical interface for entering your SQL query.



A SQL query is comprised of three clauses: SELECT, FROM, and WHERE.

SELECT (the features you want)

FROM (location of the features: in ArcMap, this is always an individual shapefile or layer)

WHERE (the condition the features need to meet)

Many database programs use SQL to construct complex queries; however, SQL in ArcMap is limited to editing the WHERE clause, which specifies the conditions that the selected features should meet.

In Lab 2 you are looking for specific cities from a list of world cities, therefore, the condition that you want the cities to meet is based on name. (Some of you may be realizing that in lab 1, we sorted cities using SQL queries about population!) You can populate the query window by double-clicking on text and clicking on buttons. An example is below.

The screenshot shows the ArcMap Query Builder dialog box. It has a list of attributes on the left: "OBJECTID", "Name", "Shape_Leng", "Keep", and "Cleaned". A callout points to "Name" with the instruction: "1. Select Attribute to sort by. Double-Click to put it in the Query Window." Below the attributes is a grid of operators: "=", "<>", "Like", ">", ">=", "And", "<", "<=", "Or", "_", "%", "()", "Not", and "Is". A callout points to the "=" operator: "2. Click on desired operator." To the right is a list of unique values: "'Alabama River'", "'Allegheny River'", "'Altamaha River'", "'Apalachicola River'", "'Arkansas River'", "'Bayou Lafourche'", and "'Bear River'". A callout points to the "Get Unique Values" button: "3. Click on Get Unique Values and double click on list items you want to populate the window below. Do NOT enter names by hand!". Below the operators and unique values is a text box containing the query: "SELECT * FROM rivers_revised WHERE: 'Name' = 'Allegheny River'". A callout points to the "Verify" button: "4. Click 'Verify' to check for errors." At the bottom are buttons for "Clear", "Verify", "Help", "Load...", "Save...", "OK", and "Cancel".

This query would select ONLY the river called the "Allegheny River." However, you may need more than just the Allegheny River to display. You can chain the queries together using the "OR" operator to select multiple rivers by name.

For example, "Name" = 'Allegheny River' OR "Name" = 'Arkansas River' OR "Name" = 'Bayou Lafourche' will cause the Allegheny, Arkansas, and Bayou Lafourche rivers to display. As you can imagine, queries for Lab 2 can get very long! It is extremely important that you click "verify" after every few entries to ensure that you have not made a mistake such as forgetting an

operator. Hunting for the missing operator or missing attribute name in a query that is 50 items long can be extremely difficult.

You may be wondering why the “OR” operator increases the number of features displayed, instead of the “AND” operator. The AND operator is a restrictive operator, which means that you can use it to specify two conditions that must be satisfied for a feature to display. A query for “Name” = ‘Allegheny River’ AND “Name” = ‘Arkansas River’ would return no results because in order to be displayed, a feature would need to have the names Allegheny River and Arkansas River. But if multiple rivers were named “Allegheny River” and you wanted the Allegheny River that was specifically located in Pennsylvania, you could specify the state of Pennsylvania as the second condition:

```
“NAME” = ‘Allegheny River’ AND “State” = ‘Pennsylvania’
```

The best way to learn SQL queries in ArcMap is to use them and see what they return!

To remove a query that you no longer want to use, you can simply delete it from the query window and press OK.

Here are some sample queries that you can try for Lab 2 (view at scale of world)

- A query returning two microstates:

```
“name” = ‘Vaduz’ OR “name” = ‘Valletta’
```

- A query returning only megacities:

```
"megacity" = 1
```

- A query returning only megacities with a max population over 15 million:

```
"megacity" = 1 AND "pop_max" > 15000000
```