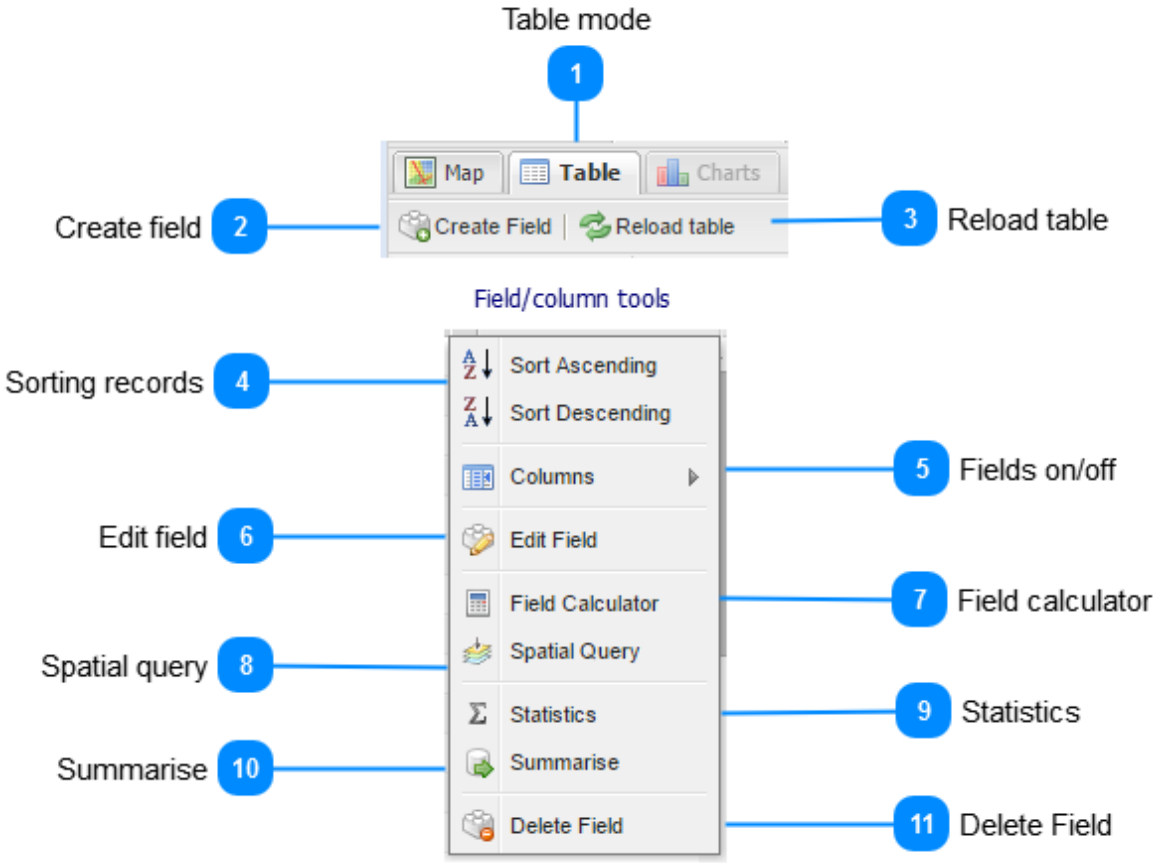
MapAble®

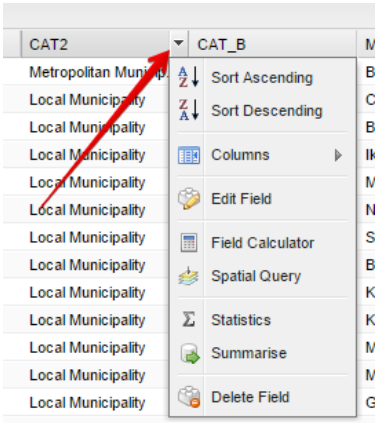
Visualize · Map · Collaborate

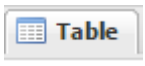
Manual: Table mode

Version 1: March 2017



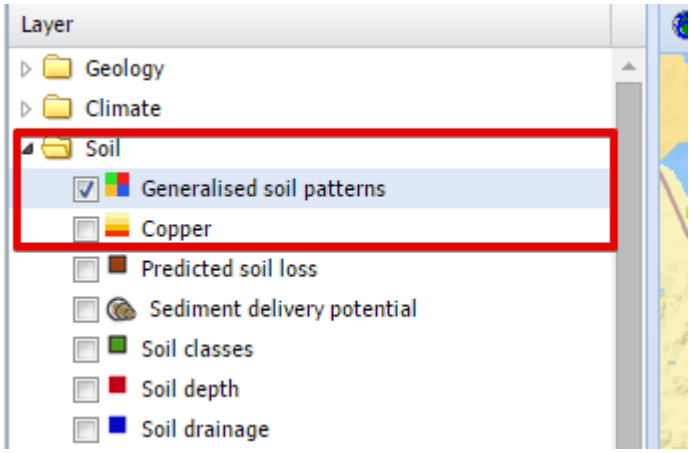
Please note: To access the Field Column tools, the user should select a specific field in the table and click on the dropdown arrow at the right of the field name:



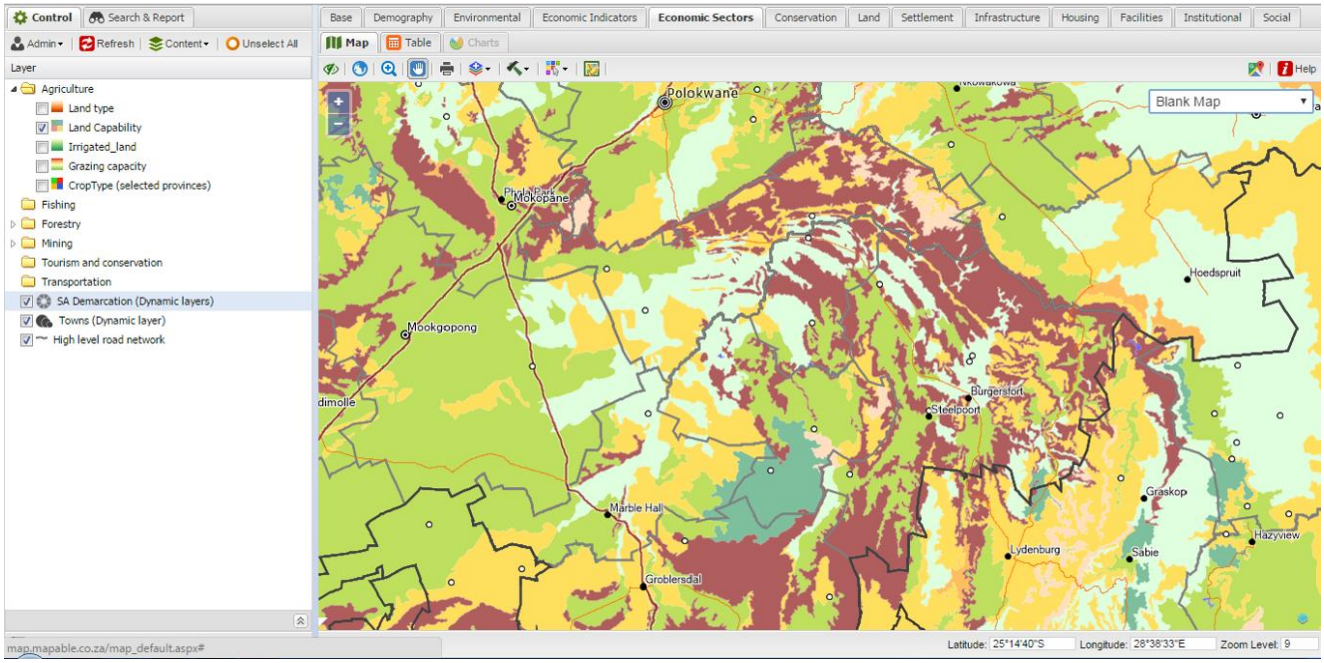
1 Table mode 

An attribute table of any of the layers displayed in the layer list can be displayed in the view pane. To be able to display a table a layer needs to be selected in the layer list.

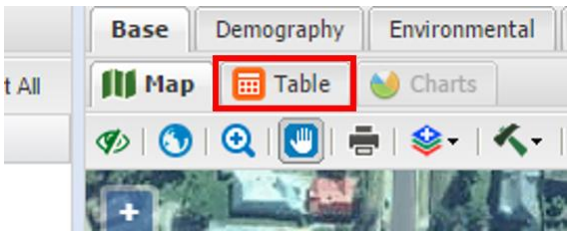
Once the layer is selected it will be colored in a blue band:



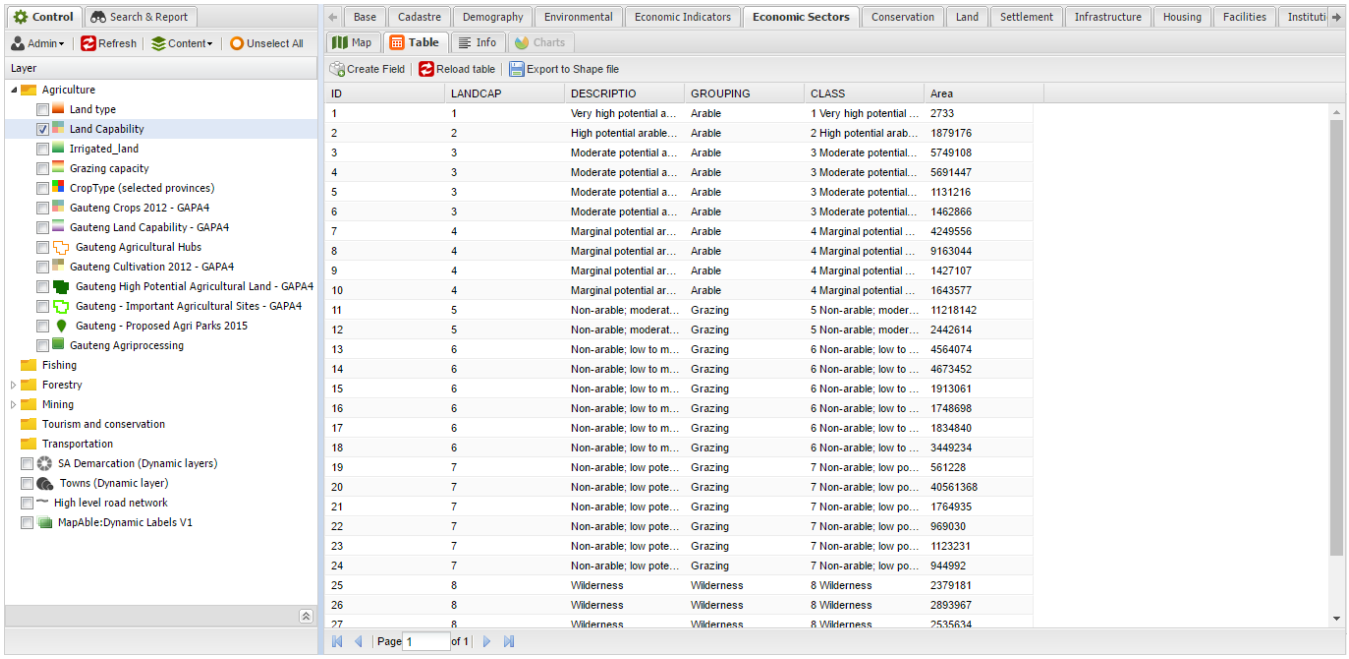
The view pane will show the specific map:



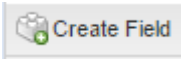
To show the selected layer's attribute table, select the "Table" button.



The attribute table of the selected data layer will now be shown in the view pane. This is how it will look:

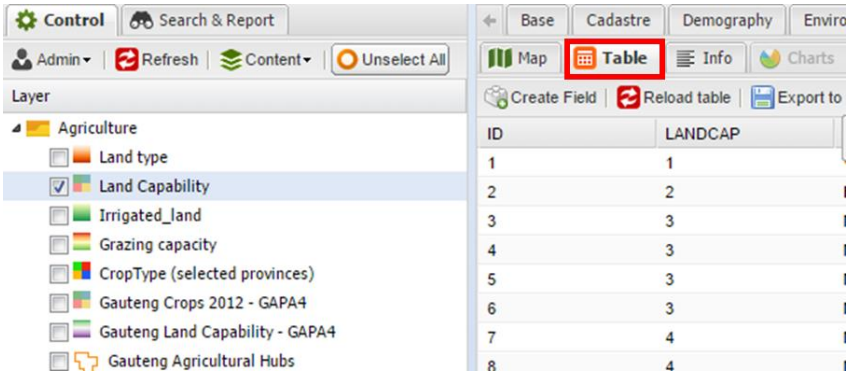


2 Create field

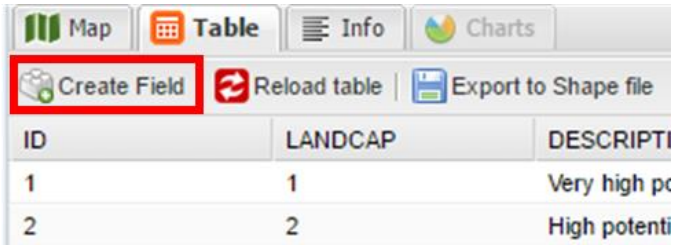


To add new data to an existing table, the user will need to create a new field. The following section explains how to create a new field in the table:

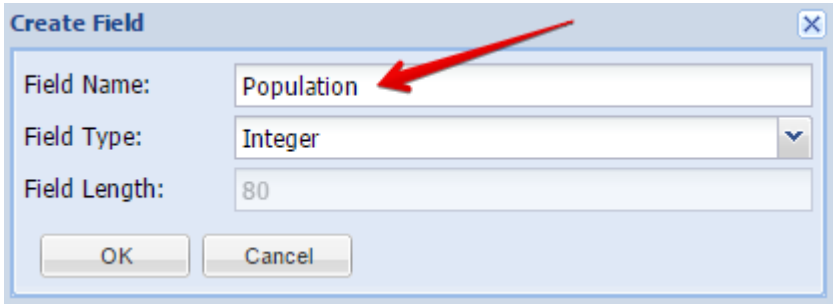
After highlighting the appropriate layer in the List of Layers, go to the Table mode to display the attribute table of the layer.



A sub-menu will appear where the user can select the "Create Field" menu item:



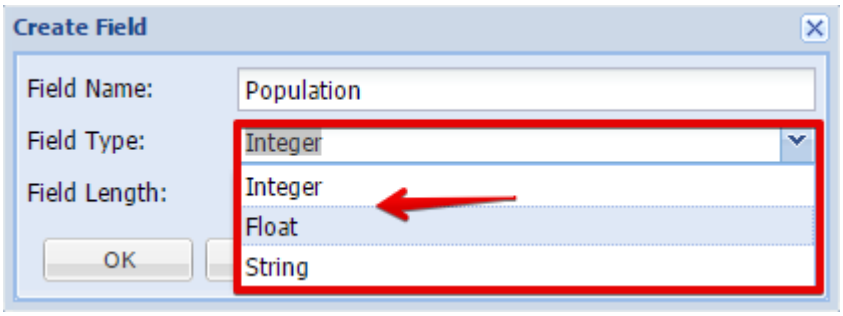
A new dialog box will appear where the user needs to specify the name and type of field to be created. The user can first add the new field name:



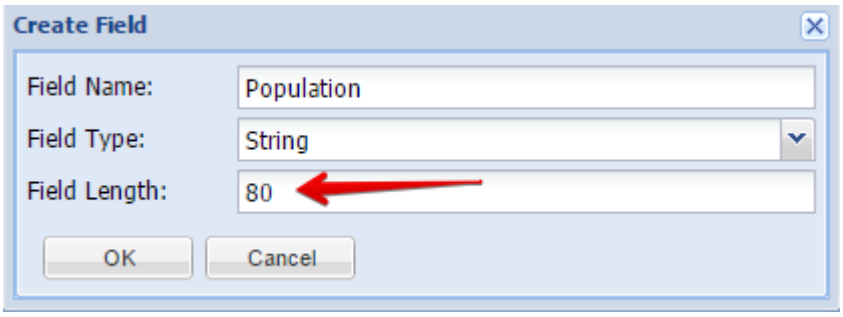
The field type needs to be selected from a dropdown box. There are three types of fields to be created:

- Integer - a number, for example: 2
- Float - a number with a . (dot), for example: 2.0 or 0.02
- String is text, for example both "2" ant "two" are strings, both are just text regardless one of these appearing to be a number for a human who reads it.
- Integers and floats are for math; strings are for managing text.

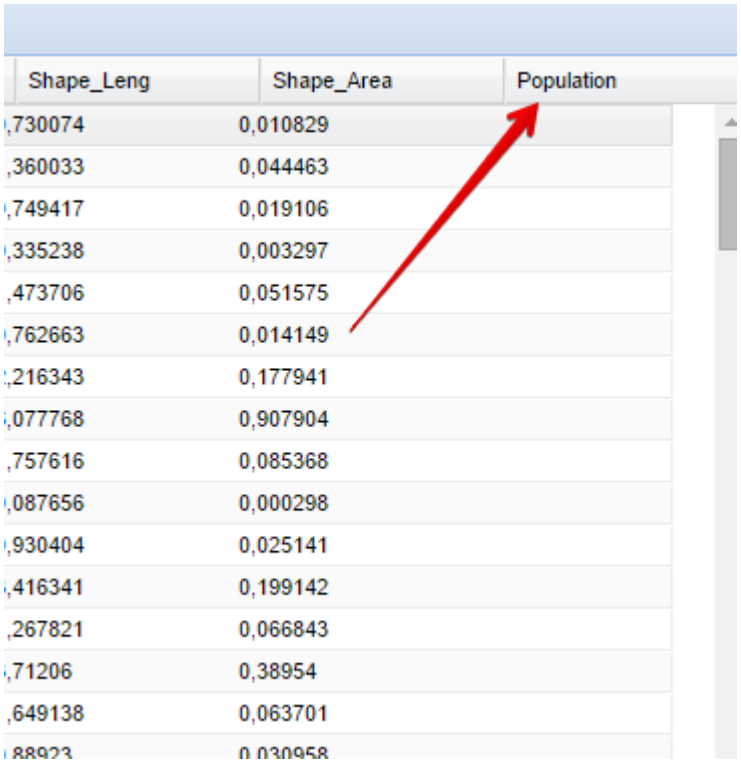
The user can now select the appropriate field type



Next the field length needs to be defined. The default value is 80 characters but can be changed if required.

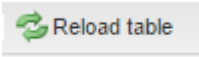


After clicking on the OK button, the new field will be added in the attribute table



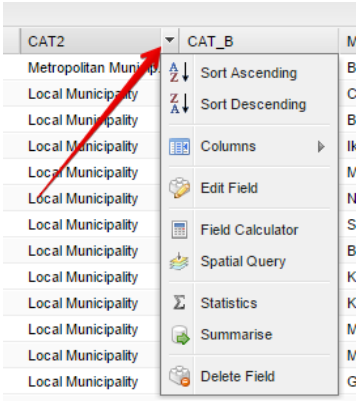
The next step is to populate the field with data with either the Field Calculator or the Spatial Analysis Tools.

3 Reload table



When communication with the server is slow a causes a break in communication, the user can reload the table.

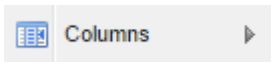
Please note: To access the Field Column tools, the user should select a specific field in the table and click on the dropdown arrow at the right of the field name:



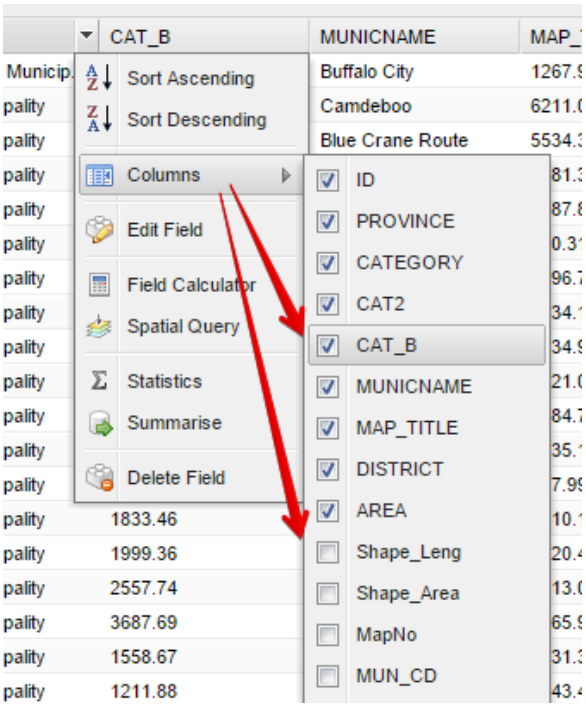
4 Sorting records

The user can sort the records in a field in either Ascending or Descending order. To access the Field Column tools, the user should select a specific field in the table and click on the dropdown arrow at the right of the field name. The dropdown list will appear and the user can sort the records.

5 Fields on/off

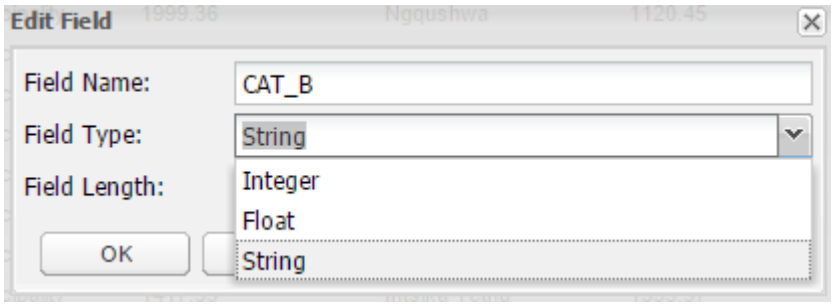


The user can choose which fields/columns in the attribute table needs to be visible on the screen. To access the Columns button, the user should select a specific field in the table and click on the dropdown arrow at the right of the field name. The dropdown list will appear and the user can click on the Columns menu. A new dropdown list with all the fields/columns will appear where the user can tick the visibility of each layer on/off.



6 Edit field

The user always has the option to change the name and type of field whenever necessary. Click on the Edit Field tool to open the editing dialog box.



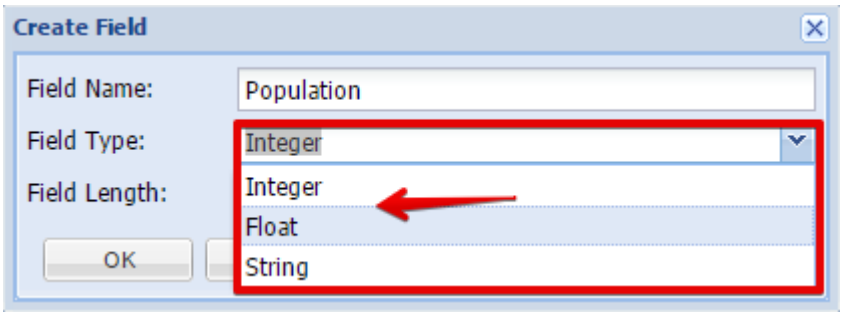
Here the user can change the name and type.

The field type needs to be selected from a dropdown box. There are three types of fields to be created:

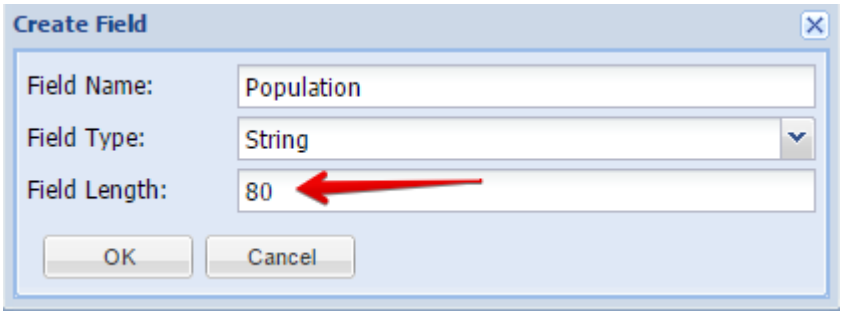
- Integer - a number, for example: 2
- Float - a number with a. (dot), for example: 2.0 or 0.02
- String is text, for example both "2" ant "two" are strings, both are just text regardless one of these appearing to be a number for a human who reads it.

Integers and floats are for math; strings are for managing text.

The user can now select the appropriate field type

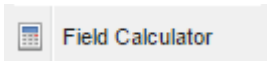


Next the field length needs to be defined. The default value is 80 characters but can be changed if required



After clicking on the OK button, the field will be changed

7 Field calculator



The Field Calculator is used for copying fields, concatenating (i.e., combining) strings, performing most mathematical calculations, and entering raw data. The Field Calculator can be used for conditional reclassification, complex mathematical calculations, and extracting geometric and geographic information. The following section explains how to use the field calculator to add new data in the attribute table.

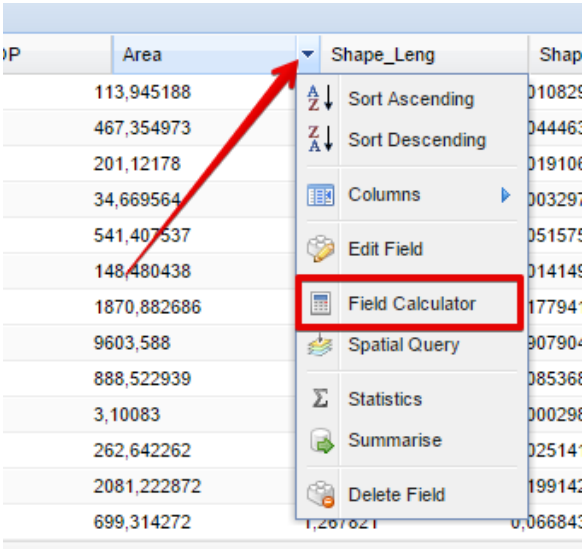
The Field Calculator is designed to assist the user in creating SQL expressions. SQL is the acronym for Structured Query Language. A syntax for retrieving and manipulating data from a relational database. SQL has become an industry standard query language in most relational database management systems.

The Field Calculator is used to construct SQL expressions to do calculations based on either the Geometry or the current attributes of the selected layer. By using a combination of Fields, Operators and Functions, an SQL expression can be built to do a specific calculation. It also allows the user to do general attribute management of the values in each field (e.g. to round a number or split text string in portions)

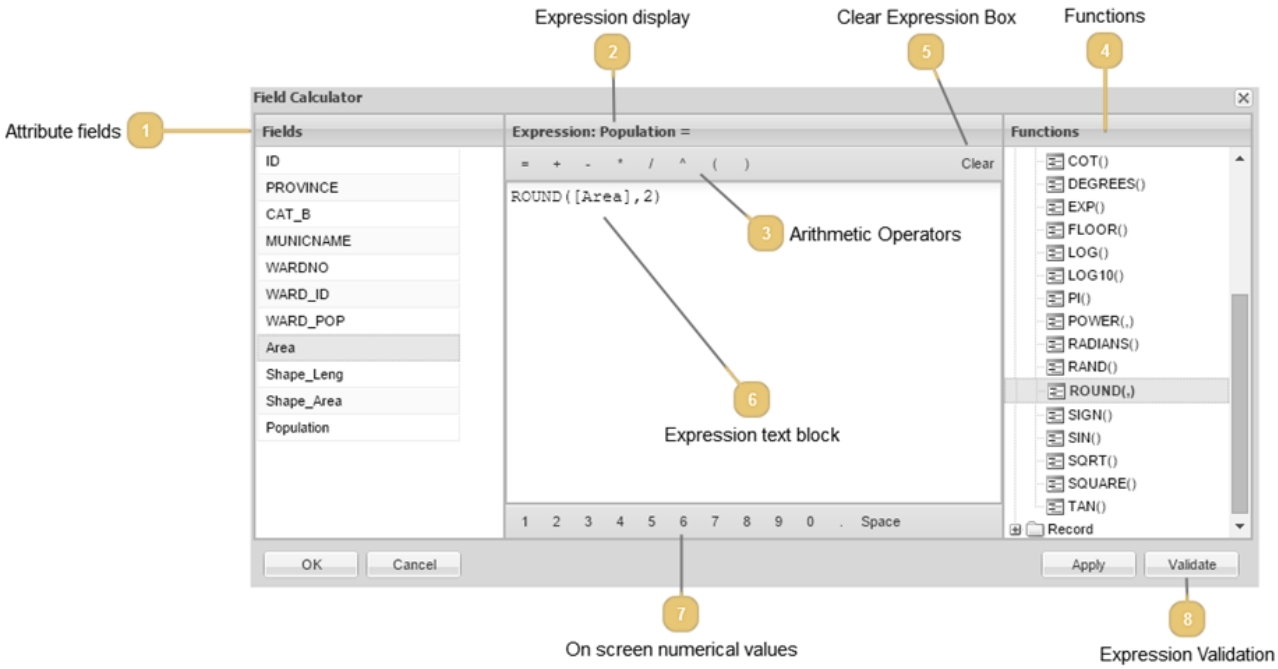
Please note:

Data fusion results can only be added to a user's own data layers and not on the MapAble spatial database. This is to ensure that the data from the various custodians in the MapAble database stay in its original state. The layers in the MapAble database can however be used for analysis purposes to add results to the users own data layers.

To access the Field Calculator, the user can click on the field in the attribute table in the Table Mode. Once the user clicked on the dropdown arrow of the field title, the following dropdown box will appear from which the user can select the field calculator:



The Field calculator dialog box which opens, is structured in the following way:



1 Attribute fields

The attribute field is a list of all the current fields in the selected layer's attribute table. Calculations can be done based on one or more of these fields if required.

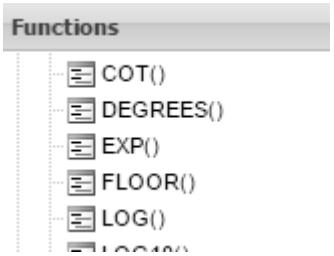
2 Expression display

The Expression Display shows the user how his expression is developed as he/she goes along constructing it.

3 Arithmetic Operators

Arithmetic Operators are used to specify conditions in an SQL statement and to serve as conjunctions for multiple conditions in a statement.

4 Functions



SQL has many built-in functions for performing calculations on data. SQL is the acronym for Structured Query Language. A syntax for retrieving and manipulating data from a relational database. SQL has become an industry standard query language in most relational database management systems.

The Field Calculator is used to construct SQL expressions to do calculations based on either the Geometry or the current attributes of the selected layer. By using a combination of Fields, Operators and Functions, an SQL expression can be built to do a specific calculation. It also allows the user to do general attribute management of the values in each field (e.g. to round a number or split text string in portions)

SQL is a special-purpose programming language designed for managing data held in a relational database management system (RDBMS) or Spatial databases, such as MapAble. SQL is the standard language for Relation Database System. All relational database management systems like MySQL, MS Access, Oracle, Sybase, Informix, postgres and SQL Server use SQL as standard database language.

When you are executing an SQL command for any RDBMS (which includes the MapAble Spatial Database with its spatial relations), the system determines the best way to carry out your request and SQL engine figures out how to interpret the task.

SQL Functions in MapAble:

The following is a classification of the available SQL function in the MapAble Field Calculator and describes for what purpose to use them:

- Conversions

Converting string to numbers and vice versa. The following is a list of String functions in MapAble:

Each function has a link to more detailed descriptions and applications. The ones used often in the GIS environment has short descriptions.

ToString(FieldName)	Function Use	Returns a string that represents the current object. To change a number field to an alphanumerical string
ToNumber(FieldName)	Function Use	Returns a number that represents the current object. To change a string field to a number which can only be used if the string field only consists of numerical values

- String Functions

To manipulate string or alphanumerical fields. The following is a list of String functions in MapAble:

Each function has a link to more detailed descriptions and applications. The ones used often in the GIS environment has short descriptions.

CHAR(Integer_Expression)	Function Use	Converts an ASCII code to a character. To change a number field to an alphanumerical string.
LTRIM(Character_Expression)	Function Use	Returns a character expression after it removes leading blanks. In the case of blank spaces before the text.
SPACE(Integer_Expression)	Function Use	Returns a string of repeated spaces. To include spaces.
CONCAT (string_value1, string_value2 [, string_valueN])	Function Use	Returns a string that is the result of concatenating two or more string values. To combine several other string fields into one.
REPLACE (string_expression, string_pattern, string_replacement)	Function Use	Replaces all occurrences of a specified string value with another string value. To replace the values of one text field with another text field.
SUBSTRING (expression, start, length)	Function Use	Returns part of a character, binary, text, or image expression in SQL Server. To take part of a text string in add to the new field
REPLICATE (string_expression, integer_expression)	Function Use	Repeats a string value a specified number of times. As above.
LEFT (character_expression, integer_expression)	Function Use	Returns the left part of a character string with the specified number of characters. As above.
REVERSE (string_expression)	Function Use	Returns the reverse order of a string value. As above.
UPPER (character_expression)	Function Use	Returns a character expression with lowercase character data converted to uppercase. As above.
PROPERCASE (string_expression)	Function Use	Returns a character expression with lowercase or uppercase character data converted to proper case. As above.
LEN (string_expression)	Function Use	Returns the number of characters of the specified string expression, excluding trailing blanks. As above.
RIGHT (character_expression, integer_expression)	Function Use	Returns the right part of a character string with the specified number of characters. For example, the last part of a property code or number.
LOWER (character_expression)	Function Use	Returns a character expression after converting uppercase character data to lowercase. As above.
RTRIM (character_expression)	Function Use	Returns a character string after truncating all trailing blanks. As above.

Other functions: FORMAT( ); QUOTENAME( ); STUFF( ); DIFFERENCE( ); CHARINDEX ( ); ASCII( )

- Geometry

To calculate area, length, diameter and x,y coordinates. The following is a list of Geometry functions in MapAble:

Each function has a link to more detailed descriptions and applications. The ones used often in the GIS environment has short descriptions.

CalcSquareMeters	Function Use	Calculates the area of the polygon in square meters. To establish the size of a parcel.
CalcHectares	Function Use	Calculates the area of the polygon in hectares. To establish the size of a parcel.
CalcLenght	Function Use	To calculate the length of a line segment in meters. To calculate the length of roads.
CalPerimeter	Function Use	To calculate the perimeter of a polygon in meters. To calculate the fence of a farm or erf.
CalcCentreLatitute	Function Use	To calculate the latitude of the centroid of an object. As above.
CalcCentreLongitute	Function Use	To calculate the longitude of the centroid of an object. As above.

- Mathematical Functions

To calculate new values based on number fields. The following is a list of Mathematical functions in MapAble:

Each function has a link to more detailed descriptions and applications. The ones used often in the GIS environment has short descriptions.

POWER (float_expression, y)	Function Use	Returns the value of the specified expression to the specified power. As above.
RAND ([seed])	Function Use	Returns a pseudo-random float value from 0 through 1, exclusive. As above.
ROUND (numeric_expression, length [, function])	Function Use	Returns a numeric value, rounded to the specified length or precision. To remove decimal points at the end of a number.
SIGN (numeric_expression)	Function Use	Returns the positive (+1), zero (0), or negative (-1) sign of the specified expression. To indicate negative /positive numbers with a + or -
SQRT (float_expression)	Function Use	Returns the square root of the specified float value. To reclassify from a power function.
SQUARE (float_expression)	Function Use	Returns the square of the specified float value. As above.
Other functions: ACOS (float_expression); ASIN (float_expression); ATAN (float_expression); ATN2 (float_expression, float_expression); CEILING (numeric_expression); COS (float_expression); COT (float_expression); DEGREES (numeric_expression); EXP (float_expression); FLOOR (numeric_expression); LOG (float_expression [base]), LOG10 (float_expression); PI (); RADIANS (numeric_expression); SIN (float_expression); TAN (float_expression).		

- Record functions

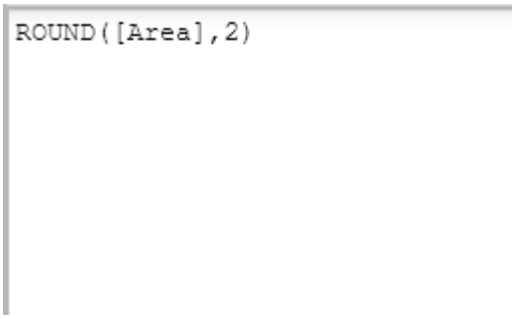
To create unique values for objects in a layer. The following is a list of Record functions in MapAble:

GenGUID	Function Use	Creates unique IDs for the fields in a column. As above.

5 Clear Expression Box

The Clear expression menu item lets the user clear the Expression Box and start over again

6 Expression text block

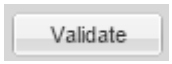


The Expression Box is the same than the Expression Display but also lets the user edit the expression at any time during construction.

7 On screen numerical values

The on-screen numerical values let the user use the mouse to select values as an alternative to the keyboard.

8 Expression Validation



To check if an expression is correctly constructed, the user can click on the Validate button to test the expression and establish the correctness thereof.

8 Spatial query

Spatial Query

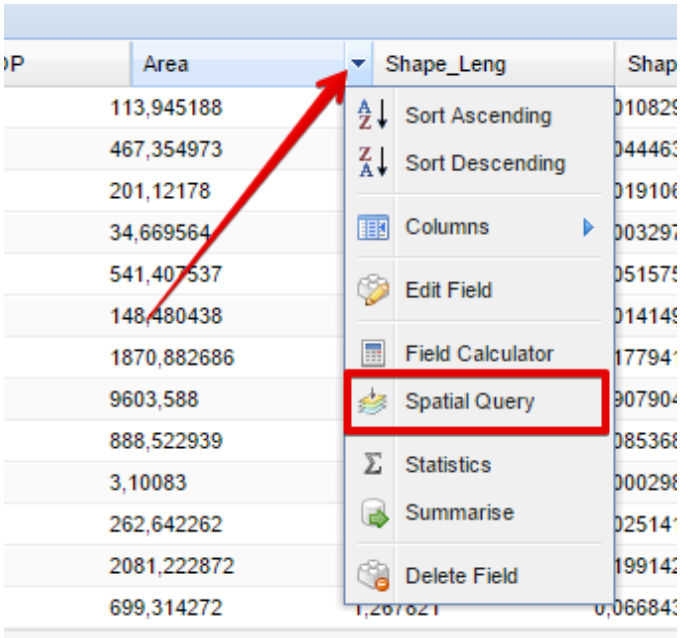
The Spatial Analysis Toolbox is the same as the Spatial Analysis Toolbox for Spatial Report and can be used in the same way. The only difference is that the result will be permanently added to the selected field in the attribute table of the selected layer and added to the spatial database.

Spatial analysis is the process of examining the locations, attributes, and relationships of features in spatial data through overlay and other analytical techniques to address a question or gain useful knowledge. Spatial analysis extracts or creates new information from spatial data.

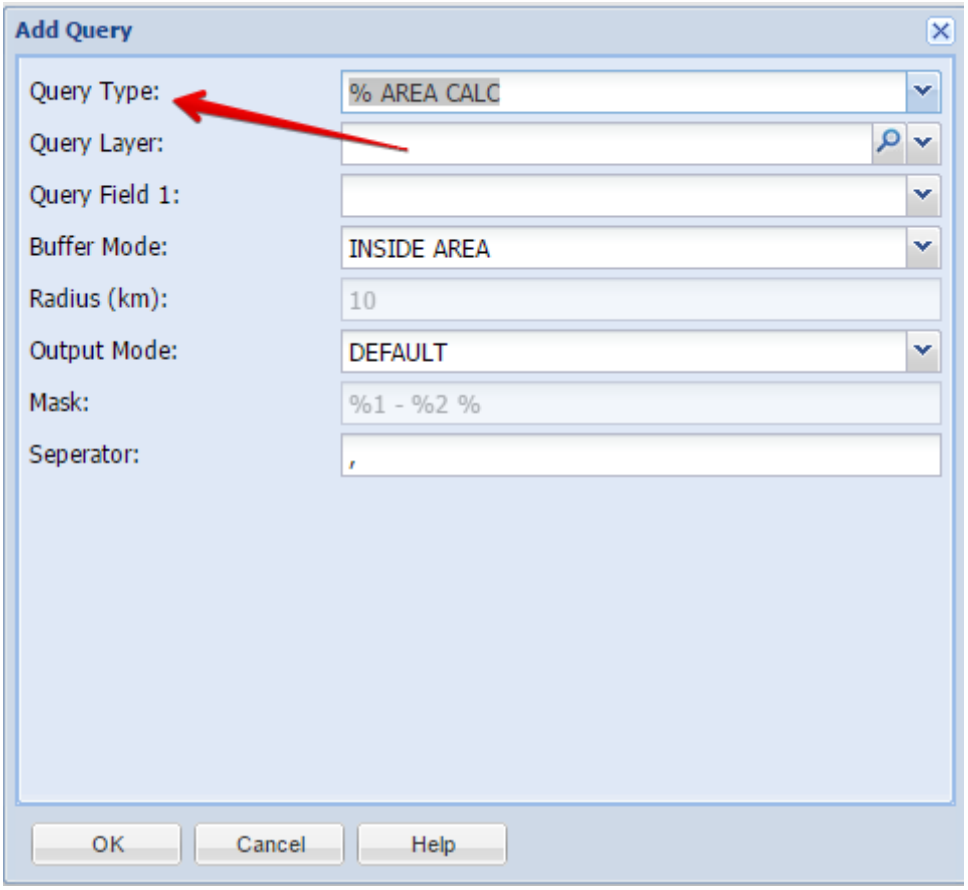
Please note:

Data fusion results can only be added to a user's own data layers and not on the MapAble spatial database. This is to ensure that the data from the various custodians in the MapAble database stay in its original state. The layers in the MapAble database can however be used for analysis purposes to add results to the users own data layers.

To access the Spatial Analysis Toolbox, the user can click on the field in the attribute table in the Table Mode. Once the user clicked on the dropdown arrow of the field title, the following dropdown box will appear from which the user can select the Spatial Query Toolbox:



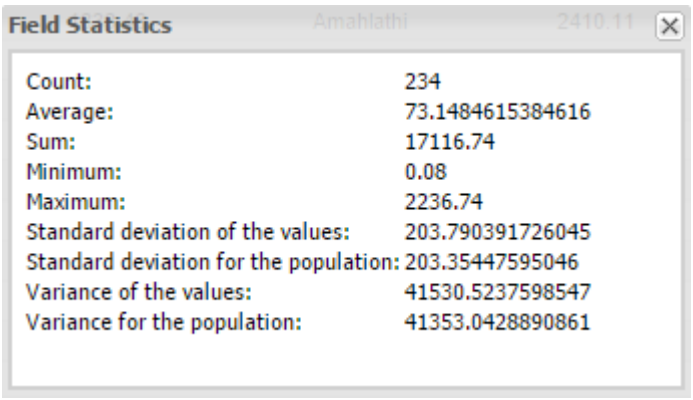
After selecting the Spatial Query menu item in the dropdown box, the Spatial Query Toolbox dialog box will appear:



From here, the user can select the type of query based on any other layer in the spatial database to be done. For more information on the different queries, please refer to the Query Toolbox section (see end of the manual).

9 Statistics Σ Statistics

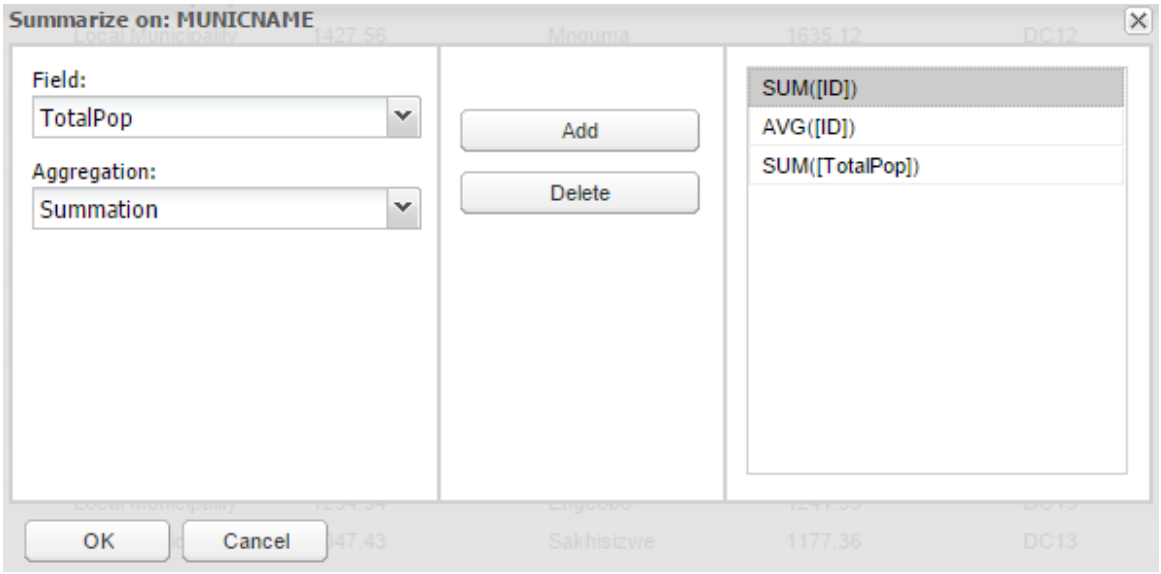
Statistical analysis is often used to explore your data - for example, to examine the distribution of values for an attribute or to spot outliers (extreme high or low values). Having this information is useful when defining classes and ranges on a map, when reclassifying data, or when looking for data errors. The user can have the statistics of a selected numerical field which will be displayed like the following example.



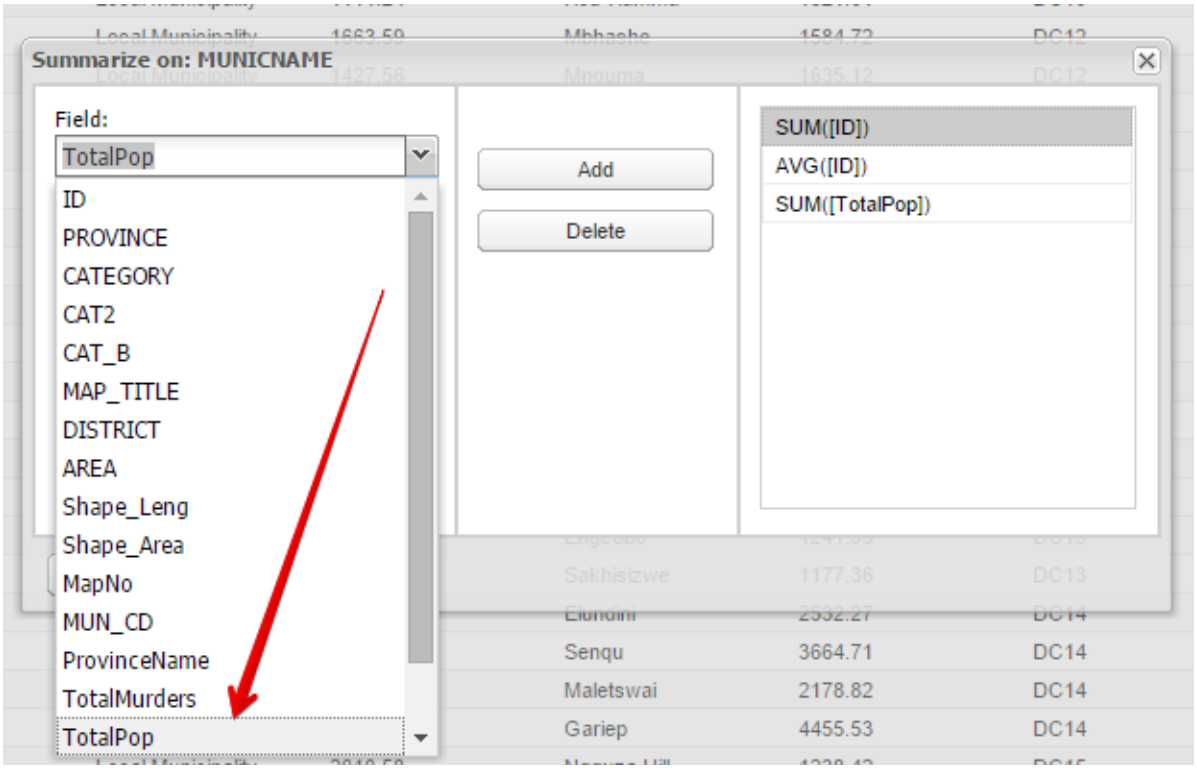
10 Summarize

The summarize function is a very handy tool to aggregate data into a summary table, where records in a field share a specific alphanumerical or classification values. (e.g. Municipal names or codes)

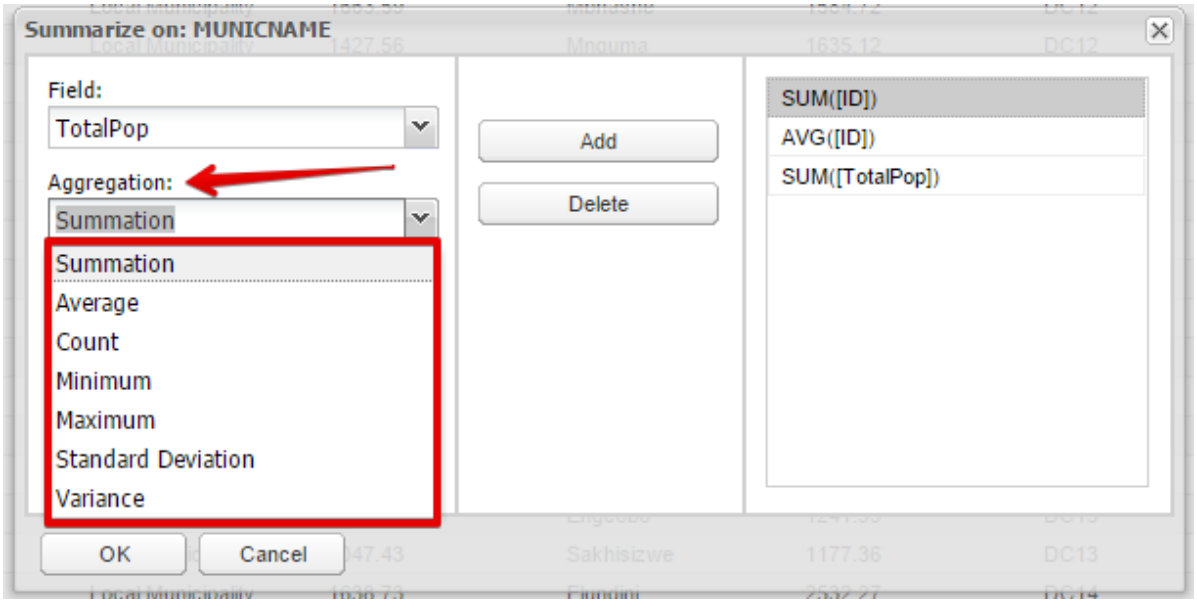
The user select the desired field and in the drop-down box select Summarize. The following dialog box will appear:



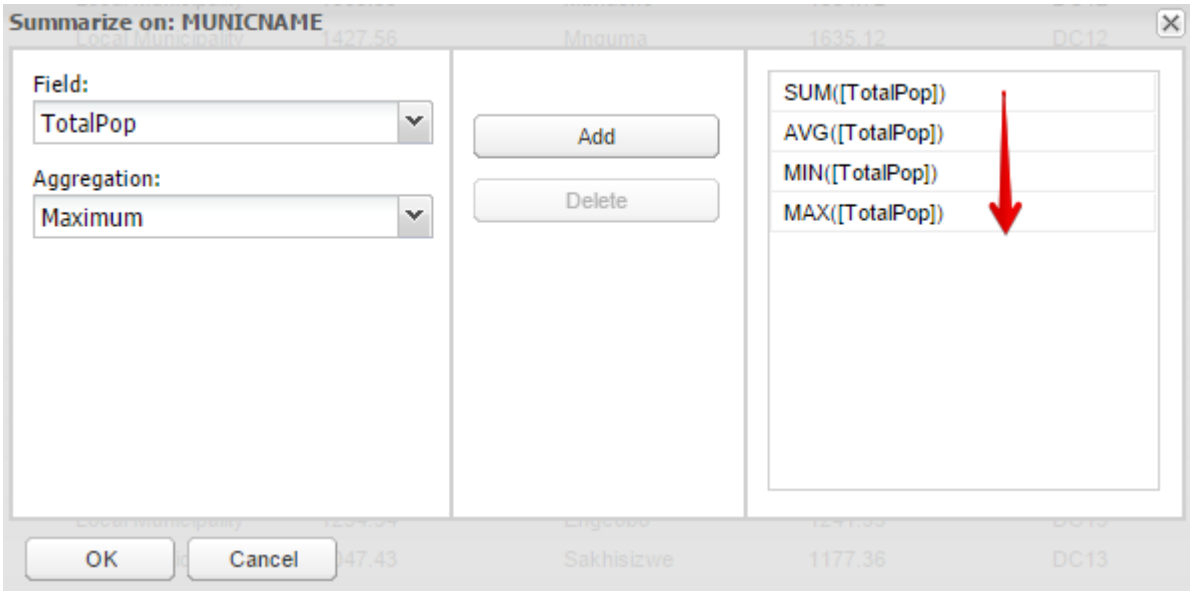
In the Field dropdown box, the user can select any relevant numerical field:



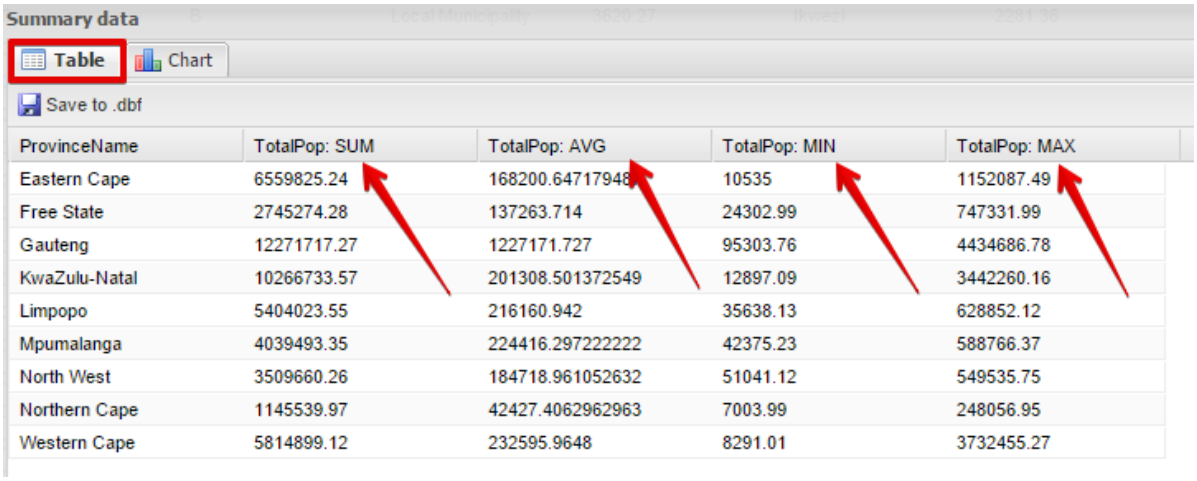
The next step is to select the aggregation method:



Once the selection was made, the user can click on the add button and the aggregation method will be added to the right-hand list. The user can delete or add many more fields and methods.

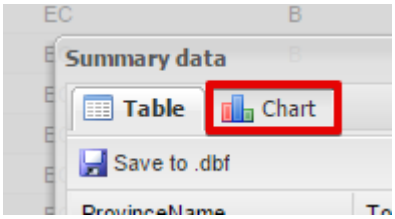


If all the choices were made, the user can click the okay button to create the summary table and safe it to the hard disk:

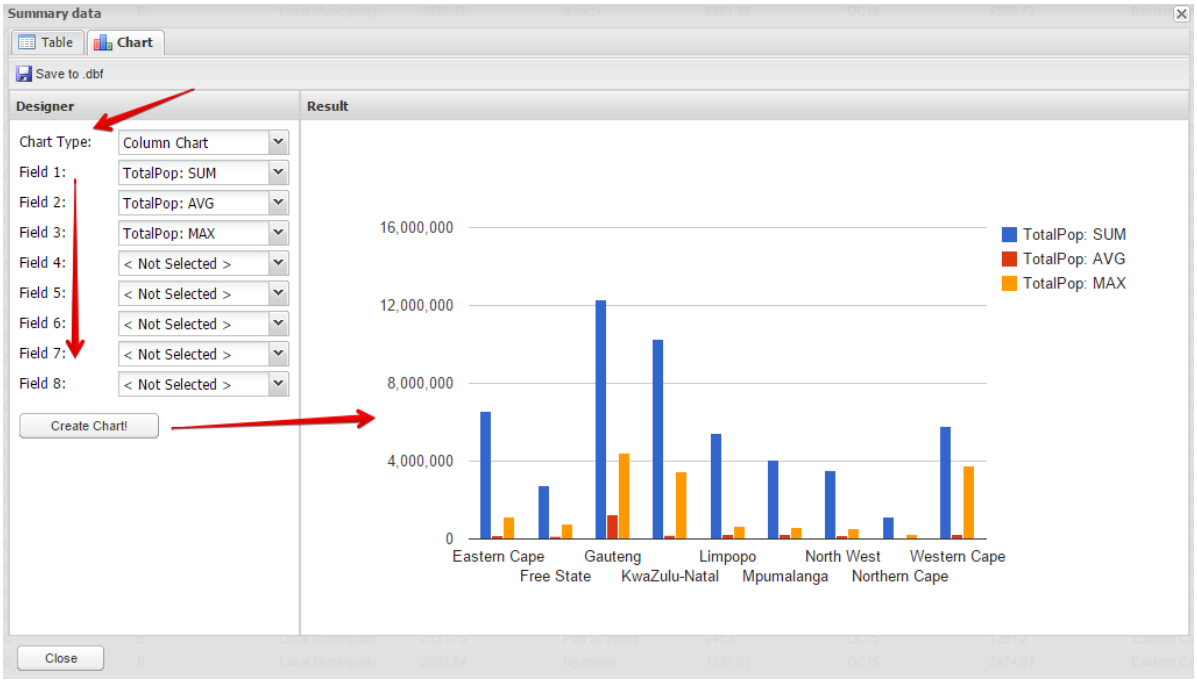


ProvinceName	TotalPop: SUM	TotalPop: AVG	TotalPop: MIN	TotalPop: MAX
Eastern Cape	6559825.24	168200.64717948	10535	1152087.49
Free State	2745274.28	137263.714	24302.99	747331.99
Gauteng	12271717.27	1227171.727	95303.76	4434686.78
KwaZulu-Natal	10266733.57	201308.501372549	12897.09	3442260.16
Limpopo	5404023.55	216160.942	35638.13	628852.12
Mpumalanga	4039493.35	224416.297222222	42375.23	588766.37
North West	3509660.26	184718.961052632	51041.12	549535.75
Northern Cape	1145539.97	42427.4062962963	7003.99	248056.95
Western Cape	5814899.12	232595.9648	8291.01	3732455.27

An additional function is to create a chart with the summary table results. First the user needs to click on the chart tab:



The Chart dialog box will open, where the user can select the chart type and all the fields to be displayed in the chart. The result will look like this:



11 Delete Field

At any stage the user can delete a field in the attribute table. Please note that once the field is deleted, it cannot be retrieved back.

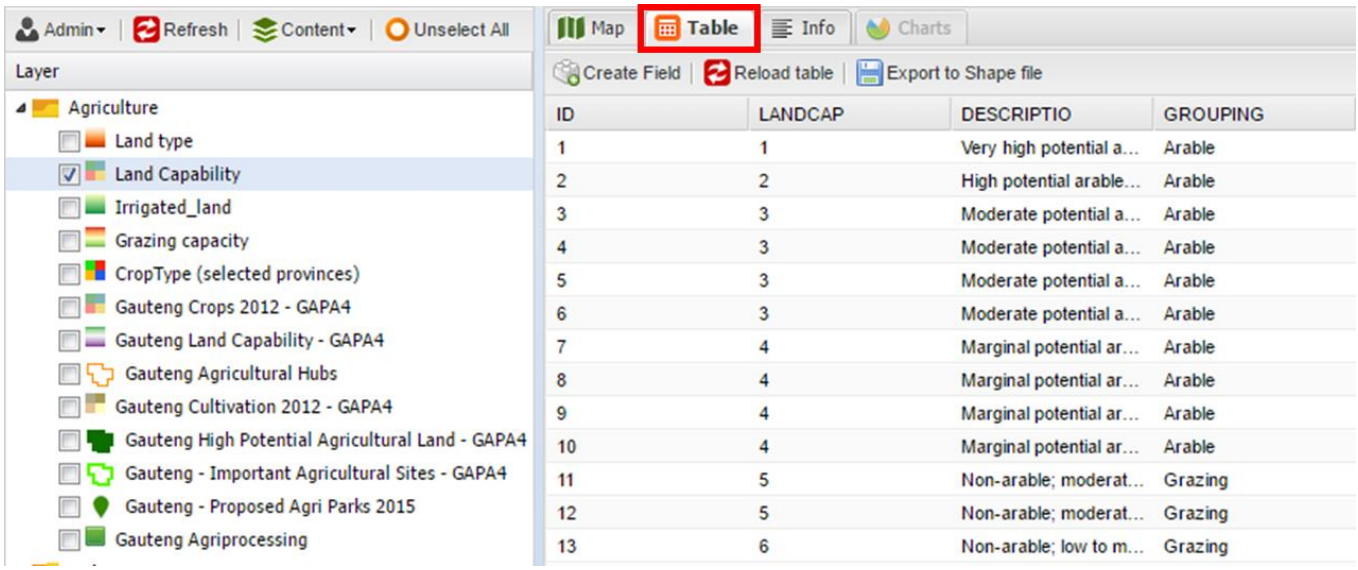
Downloading your data

Users can download their own data in Shapefile format directly out of their MapAble workspace. Before the user can download their own data, the desired layer must be selected. When the user wants to download their own data/layer, the user can simply the download button in the Table Mode. The following section explains how to download data from MapAble:

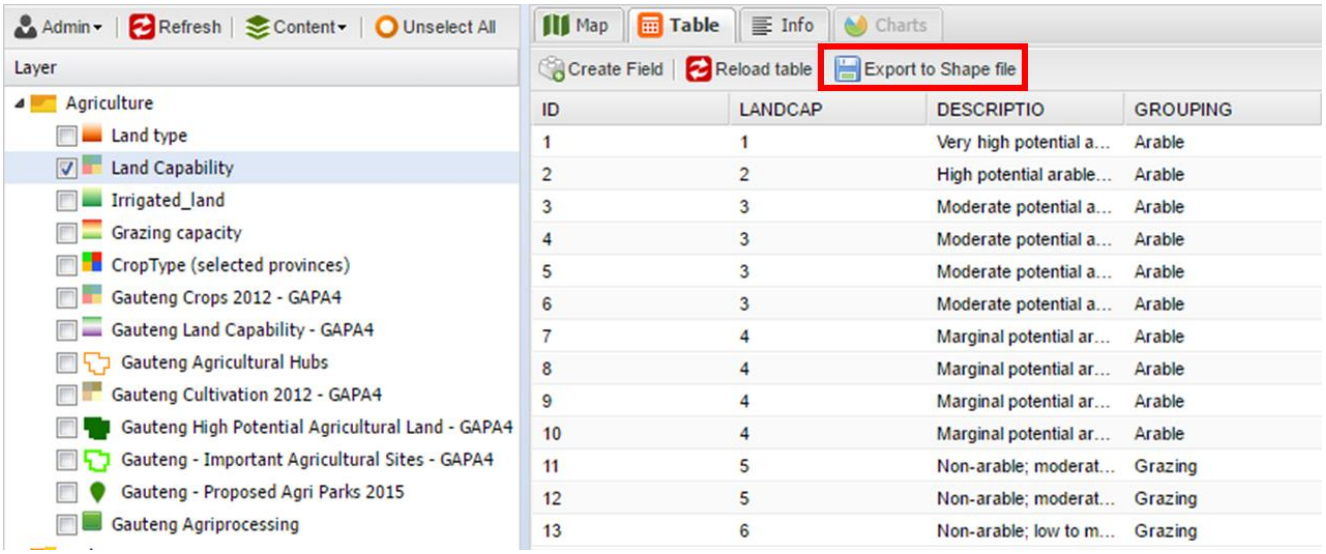
Please note:

You can only download your own data and cannot download MapAble Catalog data as the data ownership does not reside with MapAble. You can however enrich your data with MapAble Catalog data through the process of Data Fusion (see section).

After highlighting the appropriate layer in the List of Layers, go to the Table mode to display the attribute table of the layer.



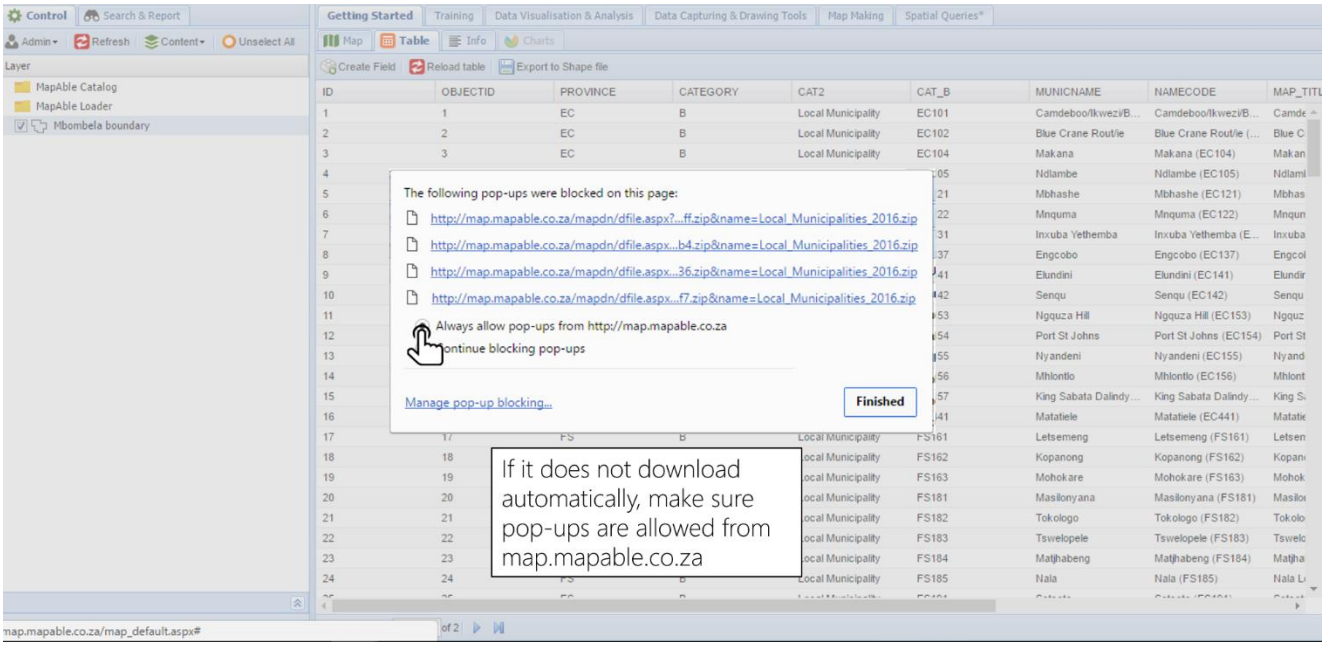
Click on the 'Export to Shape file' item above the layer's table:



The Shapefile of the selected layer will be downloaded to your default download folder.

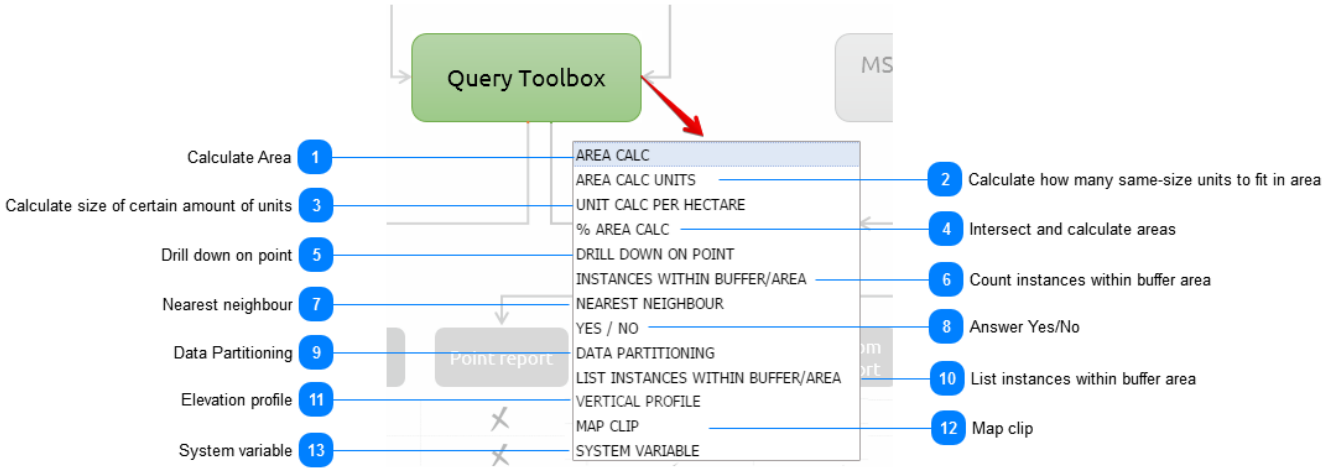
Please note:

Pop-ups should be allowed from map.mapable.co.za to download the selected layer/data.



The Shapefile (which includes all the files that comprises a Shapefile) will be downloaded in a Zip folder and can be outside of MapAble in GIS programs or alternatively brought back into MapAble utilising MapAble loader or directly importing the file into your workspace via the spatial database.

Query Toolbox

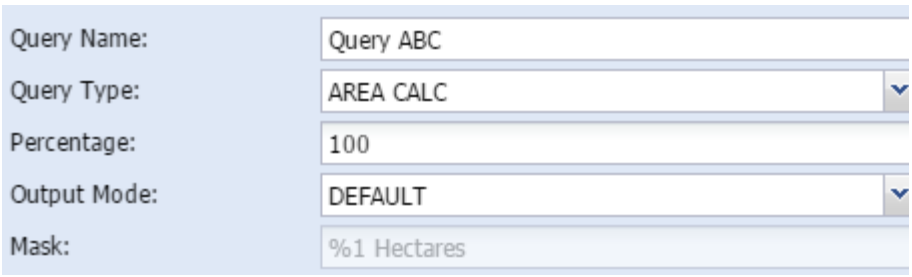


<TODO>: Insert description text here... And don't forget to add keyword for this topic

1 Calculate Area AREA CALC

Area calc is a simple calculation of the total area of the study area in hectares.

In addition, the user can either calc the total area of the study area or a portion of the area. In the parameters field the user can type in what percentage of the site the area should be calculated on.

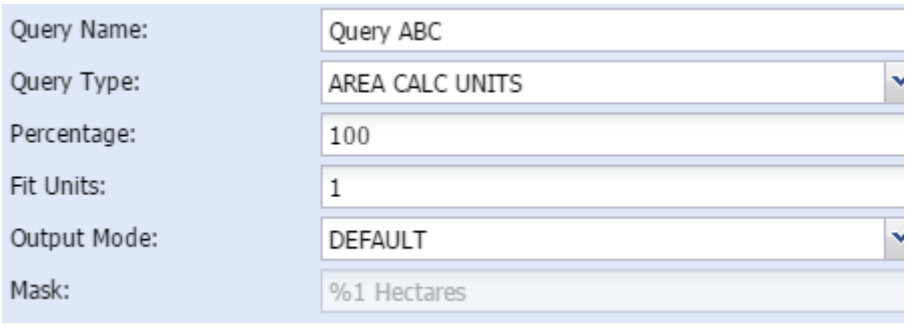


Query name - The user gives the query a short, unique and descriptive name.
Percentage - The user can decide how big a portion of the area should be displayed
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed

When to use:
When the area of a land parcel needs to be calculated and reported on.

2 Calculate how many same-size units to fit in area AREA CALC UNITS

This method assist the user to calculate the average size of parts if it is to be split in a certain amount of parts. Yet again, the user can do the calculation on only a certain percentage of the total study area as well.



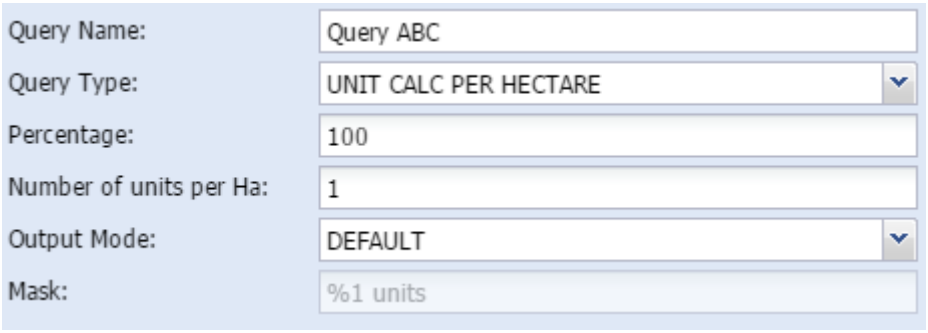
Query name - The user gives the query a short, unique and descriptive name.
Percentage - The user can decide how big a portion of the area should be displayed
Fit units - user type in how many units needs to be fit in the area
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed

When to use:
To calculate the average size of the area if it is to be split in a certain amount of parts.

3 Calculate size of certain amount of units

UNIT CALC PER HECTARE

With this method, the user can calculate how many units will fit in the study area if it is to be of a certain size. The user can do the calculation on only a certain percentage of the total study area or the full area.



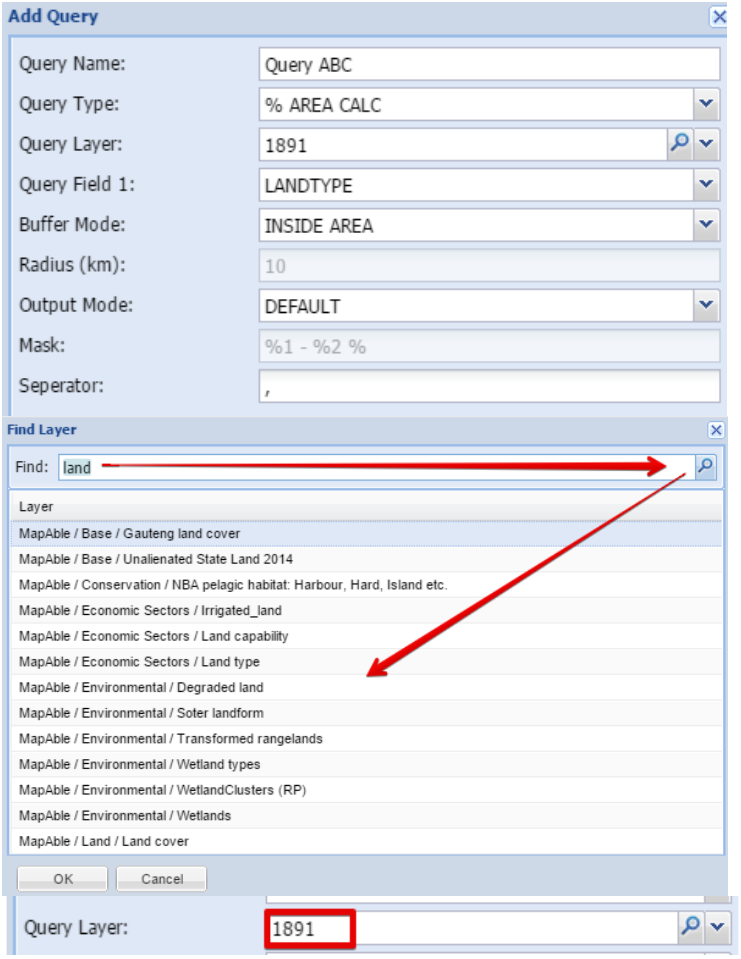
Query name - The user gives the query a short, unique and descriptive name.
Percentage - The user can decide how big a portion of the area should be displayed
Number of units per Ha - user type in how many units per hectare needs to be fit in the area
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed

When to use:
To calculate how many units will fit in the study area if it is to be split by a certain unit per hectare ratio.

4 Intersect and calculate areas

% AREA CALC

The percentage area calculation tool intersects the study area with a chosen theme and calculate the percentage of each part of the chosen theme which intersects the study area.



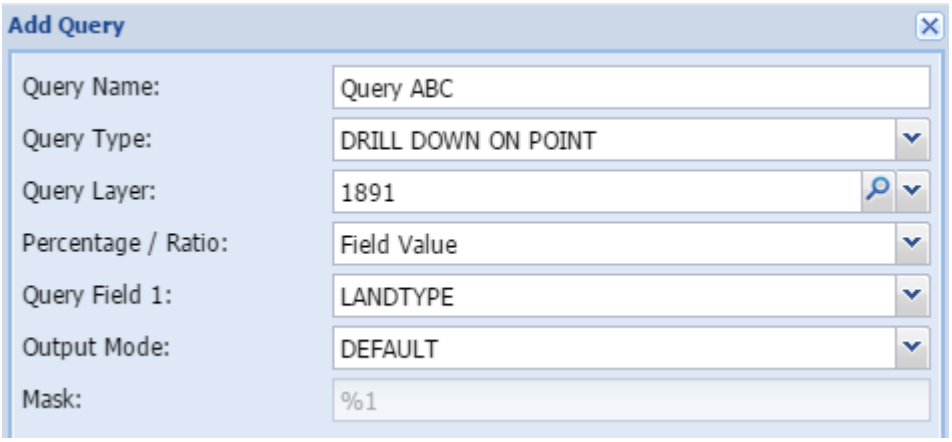
Query name - The user gives the query a short, unique and descriptive name.
Query layer - Select the layer to be queried in the spatial database
Query field 1- Select the column in the attribute field of the queried layer
Buffer mode - select Buffer Mode
Radius (km) - add the buffer distance in km
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed
Separator - see Separators

When to use:
Percentage of different land use in the study area.
The same as above for any other relevant polygon layer like geology, waterbodies, wetlands etc.

5 Drill down on point

DRILL DOWN ON POINT

Drill down on point is a simple overlay analysis based on the point of the centroid of the study area. If a polygon is used as the study area, the tool calculates the centroid of the polygon and establish the value of the specified layer at that specific point. It then reports on it.



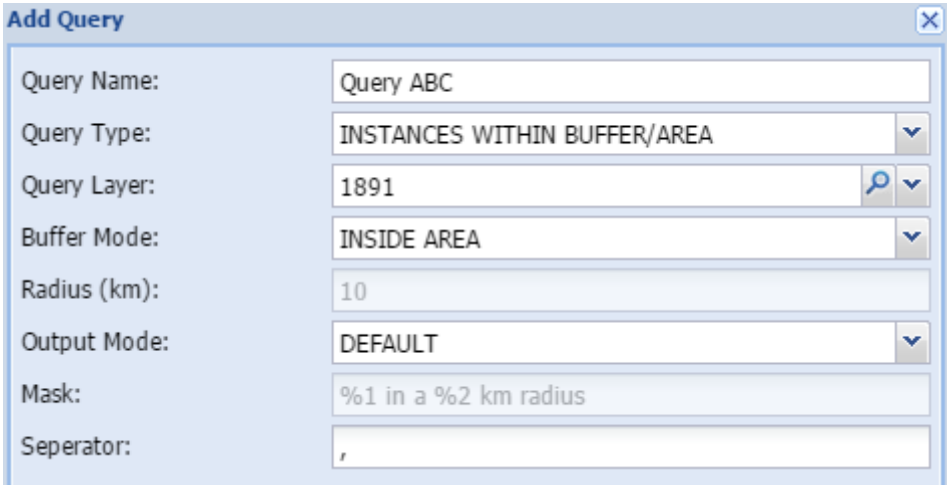
Query name - The user gives the query a short, unique and descriptive name.
Query layer - Select the layer to be queried in the spatial database
Percentage/ Ratio - see Percentage/Ratio
Query field 1- Select the column in the attribute field of the queried layer
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed

When to use:
Whenever the user want to establish in which broader area the study area falls. When the study area is very large, it is not advisable to use this with detailed layers like land cover or environmental constraints etc. It can be typically used to establish the administrative boundaries of the area (e.g. Municipality, ward, province, suburb)

6 Count instances within buffer area

INSTANCES WITHIN BUFFER/AREA

This tool calculates the number of instances of another layer that can be found within a specified distance from the study area.



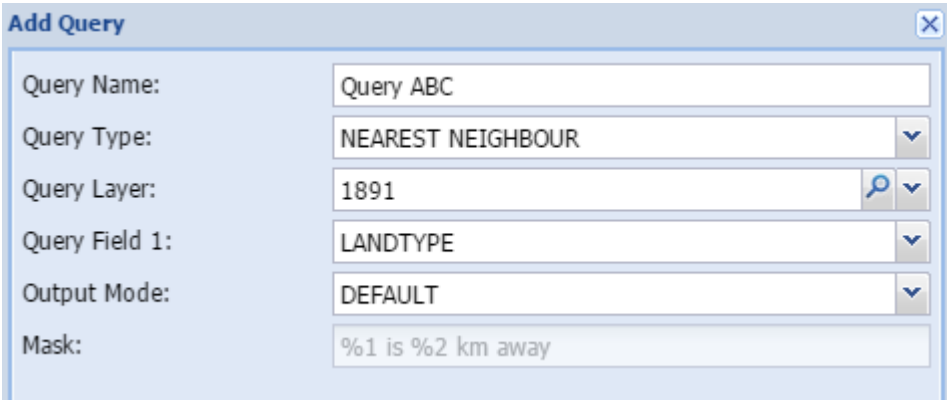
Query name - The user gives the query a short, unique and descriptive name.
Query layer - Select the layer to be queried in the spatial database
Buffer mode - select Buffer Mode
Radius (km) - add the buffer distance in km
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed
Separator - see Separators

When to use:
Calculating the incidences of any type of layer within distance. Typically, schools, hospitals, heritage sites, informal settlement, housing workspaces etc.

7 Nearest neighbour

NEAREST NEIGHBOUR

The nearest neighbour calculation will determine the nearest instance of the specified layer. It will report on it by indicating the distance in kilometre and indicating the name

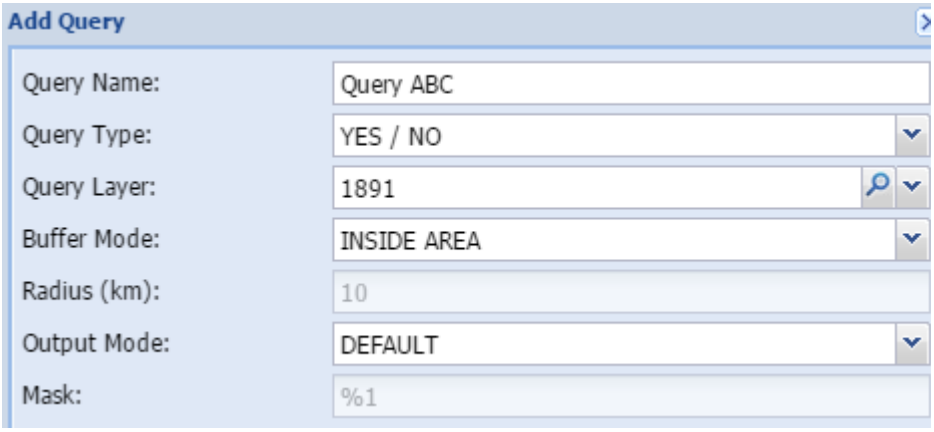


Query name - The user gives the query a short, unique and descriptive name.
Query layer - Select the layer to be queried in the spatial database
Query field 1- Select the column in the attribute field of the queried layer
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed

When to use:
Typically used for public facilities like schools, hospitals, public transport stations.

8 Answer Yes/No YES / NO

The YES/NO method does a quick check by means of an intersection, and simply reports on the presence of a specific entity that are present on the property. The answer is either YES or NO.



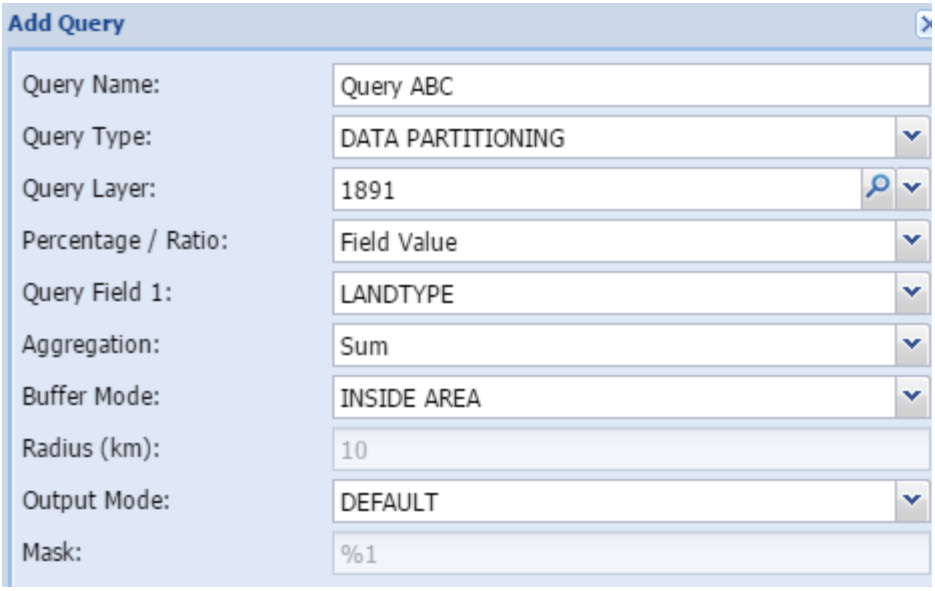
Query name - The user gives the query a short, unique and descriptive name.
Query layer - Select the layer to be queried in the spatial database
Buffer mode - select Buffer Mode
Radius (km) - add the buffer distance in km
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed

When to use:
Normally you would use this when detailed information on an entity is either not available or not necessary. This will just raise a red flag if a specific entity occurs on the site.

9 Data Partitioning

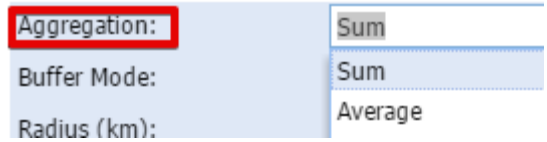
DATA PARTITIONING

Data partitioning can be used to calculate demographic or other data proportionately based on another polygon theme. For example, people often need information on census demographics for areas that are not coincident with the census boundaries themselves, things like catchment areas or service areas. This tool makes that process easy. The proportions are based on the area of the intersecting themes.



Query name - The user gives the query a short, unique and descriptive name.
Query layer - Select the layer to be queried in the spatial database
Percentage/ Ratio - see Percentage/Ratio
Query field 1- Select the column in the attribute field of the queried layer
Aggregation - aggregation method (see below)
Buffer mode - select Buffer Mode
Radius (km) - add the buffer distance in km
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed
Separator - see Separators

The aggregation function has the following options:



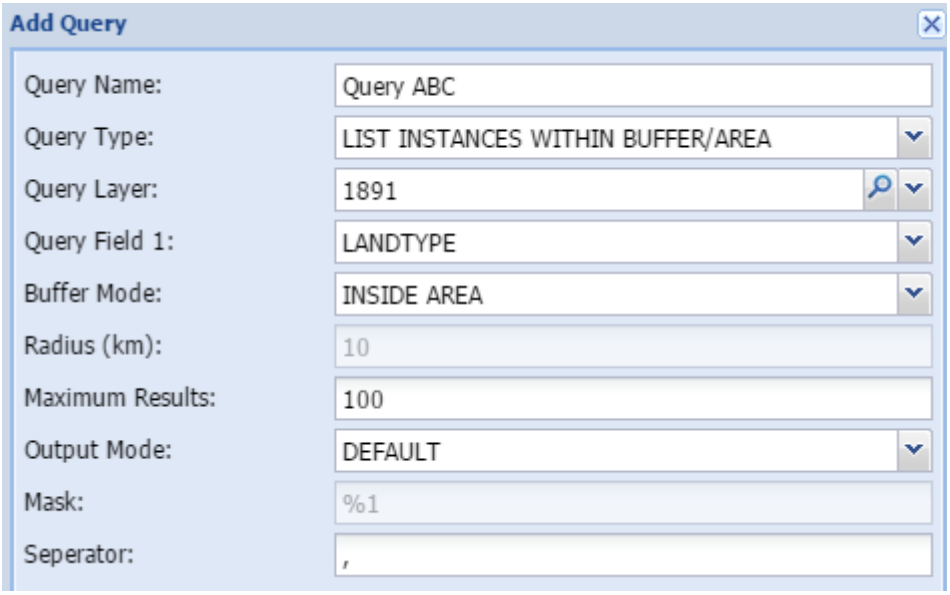
Sum - The sum of the same type intersecting parts
Average - Estimated average of the intersecting parts

When to use:
Demographics, census statistics.

10 List instances within buffer area

LIST INSTANCES WITHIN BUFFER/AREA

This tool does the same as the Instances within buffer zone, except that it does not count them but list them. This is very handy if you need to know the names of the objects you are studying.



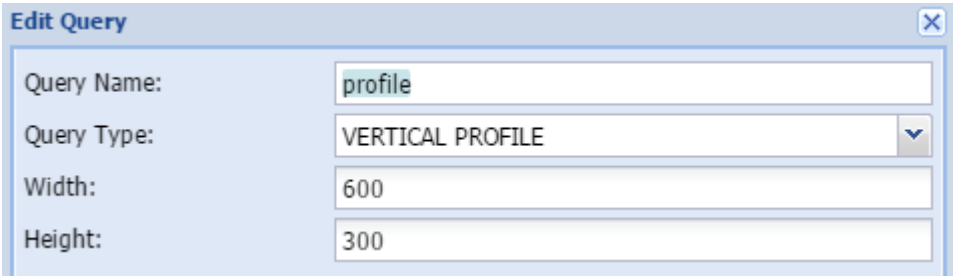
Query name - The user gives the query a short, unique and descriptive name.
Query layer - Select the layer to be queried in the spatial database
Query field 1- Select the column in the attribute field of the queried layer
Buffer mode - select Buffer Mode
Radius (km) - add the buffer distance in kilometer
Maximum results - maximum number of results in the case of very detailed layers
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed
Separator - see Separators

When to use:
Listing the incidences of any type of layer within a specific distance. Typically, schools, hospitals, heritage sites, informal settlement, housing projects etc.

11 Elevation profile

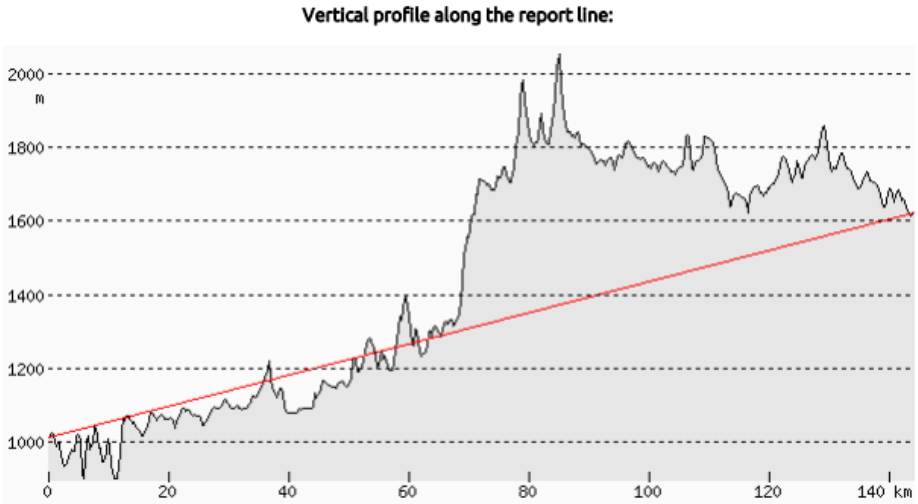
VERTICAL PROFILE

The user can view a graph of the elevations of a particular path through the Elevation Profile profile tool. This function is only applicable if a line is chosen as the study area. The result is given in km distance and meter in height.



Query name - The user gives the query a short, unique and descriptive name.
Width - Width of the graphic in pixels
Height - Height of the graphic in pixels

The result will typically look like this:

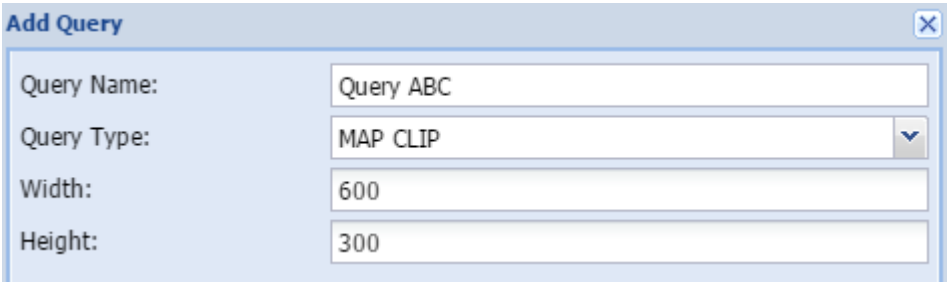


When to use:
When the elevation profile of a road or any other route needs to be shown in a graphic format.

12 Map clip

MAP CLIP

A clip of the study area can be added to the report.



Query name - The user gives the query a short, unique and descriptive name.
Width - Width of the graphic in pixels
Height - Height of the graphic in pixels

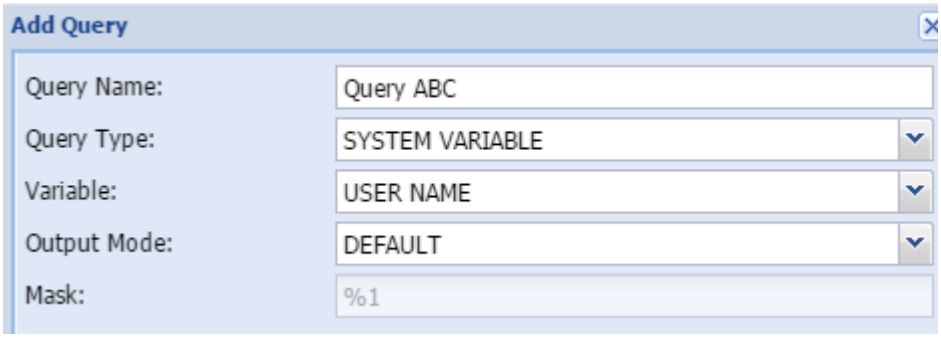
The result will typically look like this:

When to use:
When an overview map of the study area is required

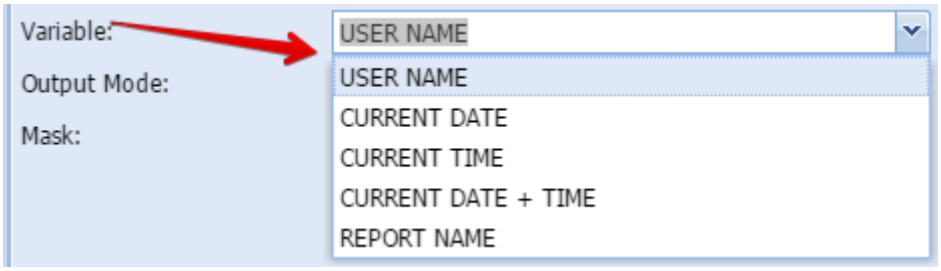
13 System variable

SYSTEM VARIABLE

Additional variables can be added to assist with administration and versioning of reports



Query name - The user gives the query a short, unique and descriptive name.
Variable - Type of variable to add (see below)
Output mode - see Output Modes and Charts
Mask - shows how the output are constructed
Separator - see Separators



The result will typically look like this:

This report was generated by: *Willem Badenhorst*
Date and time: *13 January 2015 02:15*

When to use:
Mostly for administrative purposes to keep record of authors and versioning of maps.