

Creating Transects for Field Maps

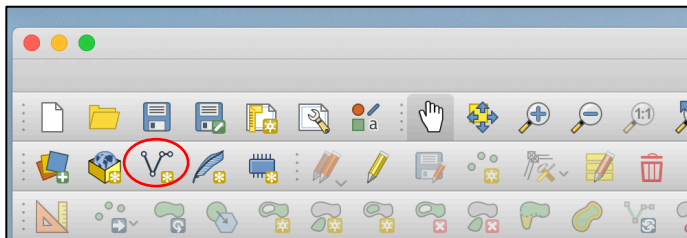
Transects are lines across an area of interest, and may be used to guide field work and identify sampling point locations. Topics covered in this tutorial include:

- Creating a new line vector layer
- Adding points at equal intervals along a line layer
- Saving multiple layers as a GeoPackage (optional step 1)
- Creating unique sample names (optional step 2)

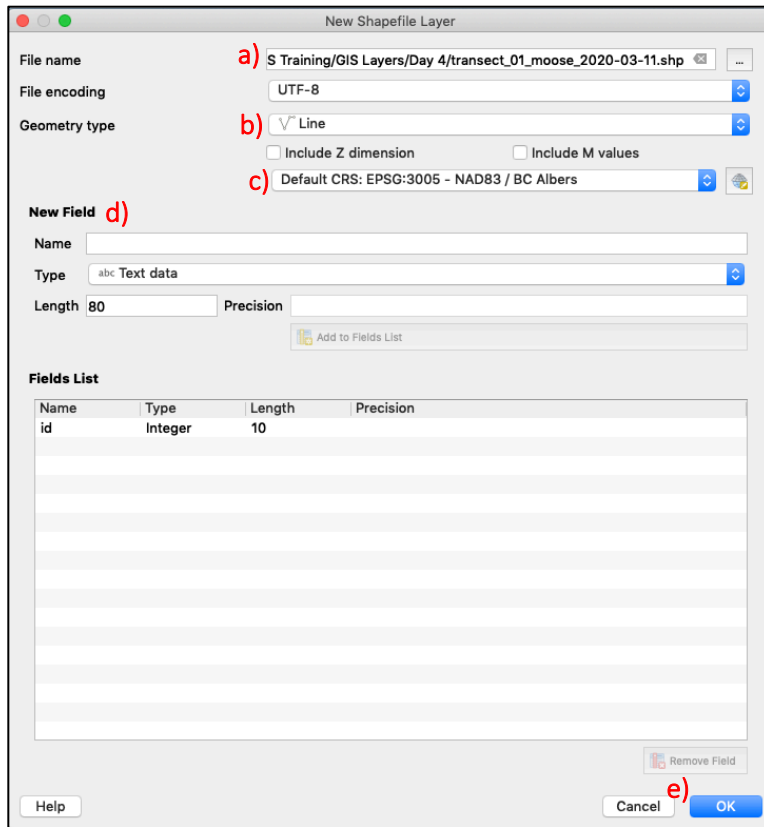
Tutorial

1. Open QGIS and add the base map you will be using to create your transect (e.g. a web map such as Bing Aerial)
2. Add a new line layer (either by adding a new shapefile or GeoPackage, see optional instructions at the end of the tutorial)

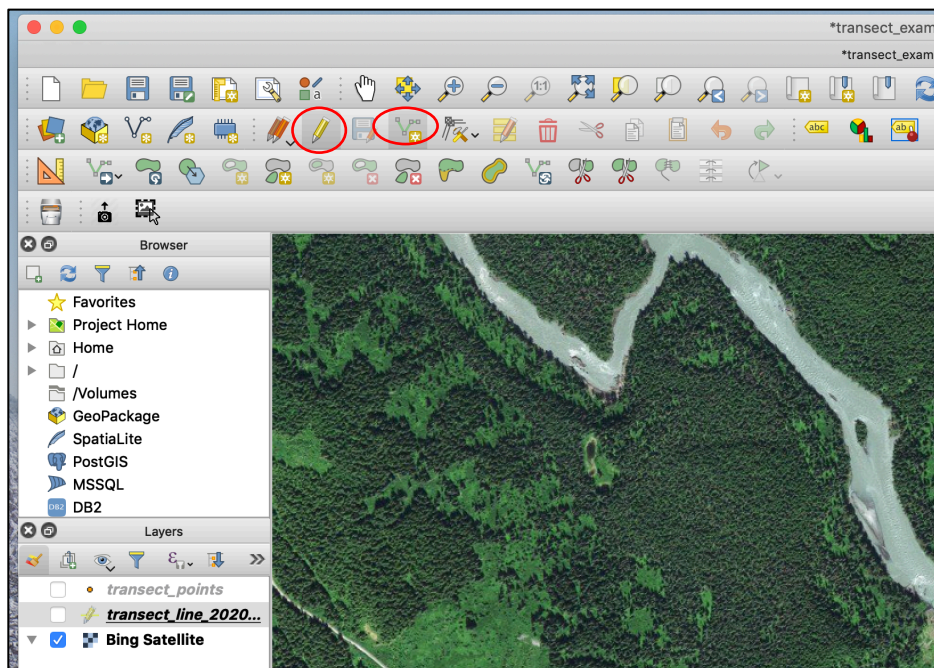
From the top menu select New Shapefile Layer



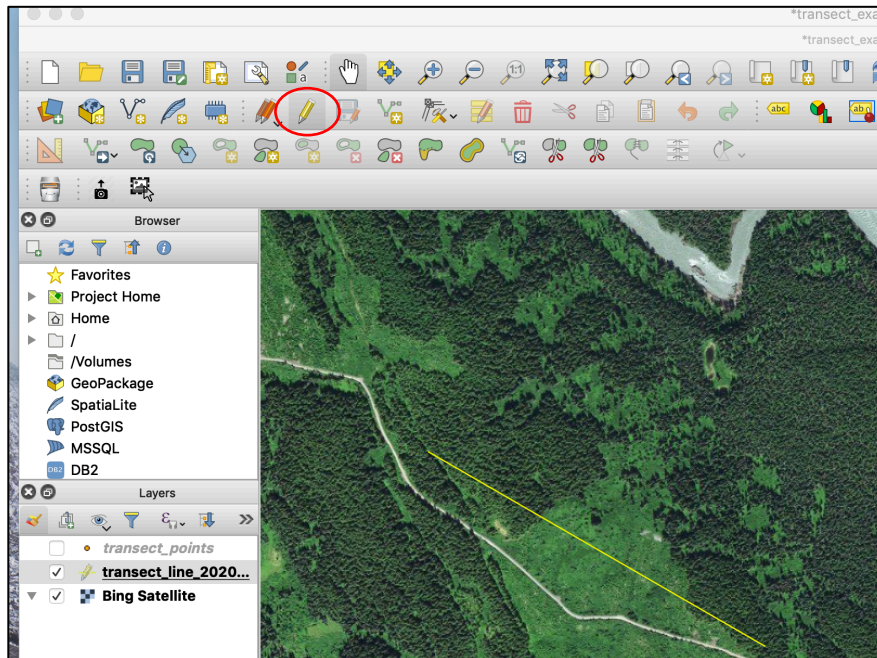
- a) Select file location and enter a file name for the line layer
- b) Select **Line** under Geometry type
- c) Set the CRS as EPSG:3005 – NAD 83 / BC-Albers
- d) Add any attributes you may want under New Field
- e) Select Ok



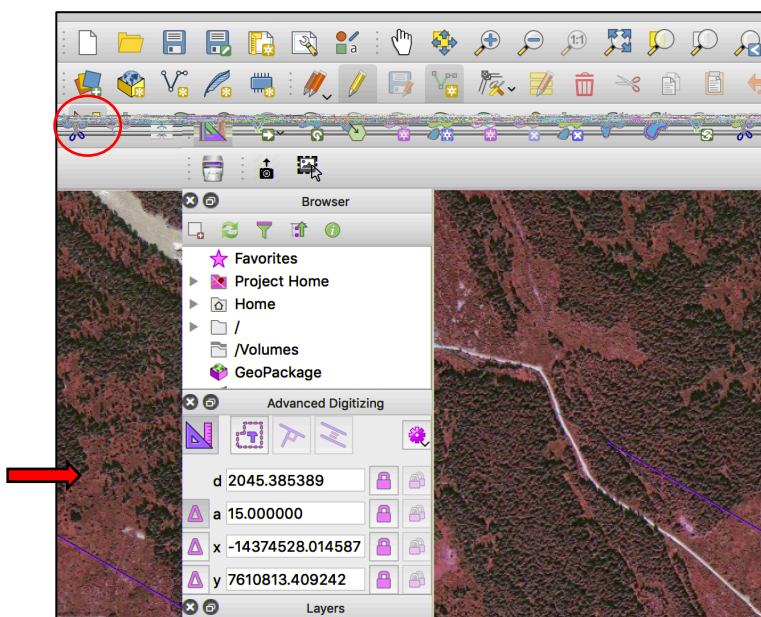
3. Add a new feature to the transect layer by selecting the layer in the Layers panel, toggling editing mode, and selecting the Add New Feature tool



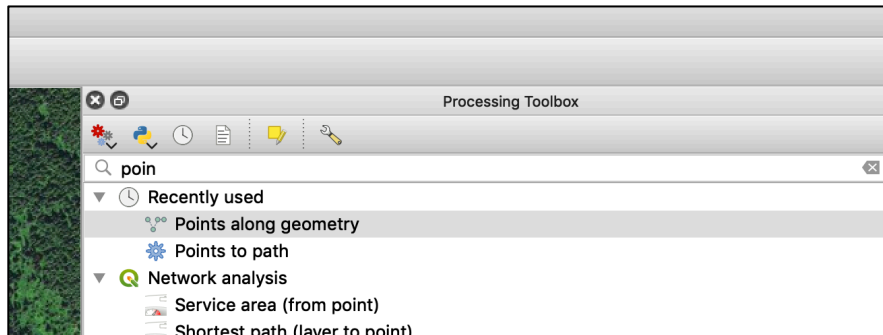
4. Click on the map canvas to start creating a new line. Right-click to create nodes in the line and left-click to finish the feature
5. Add any additional transects. Save your layer by re-toggling editing mode



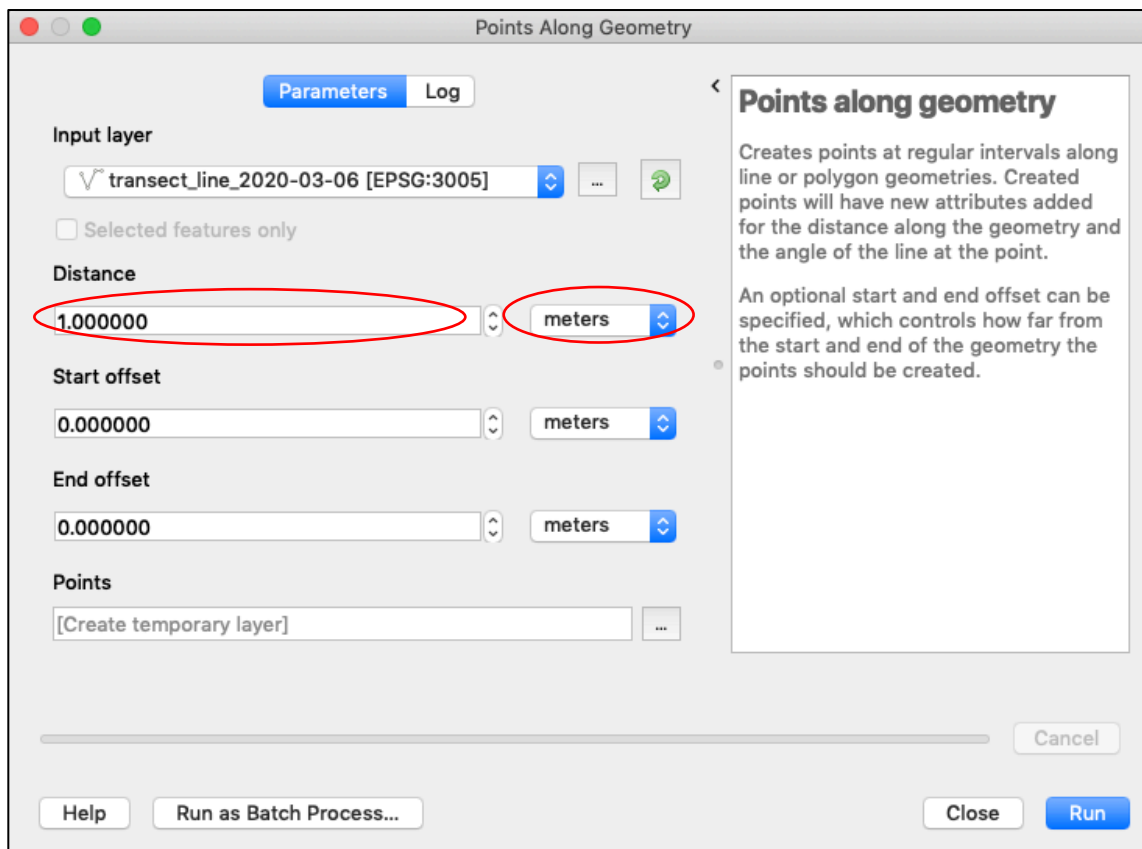
Tip: You can see the length of your transect as you are drawing it by enabling advanced digitizing tools



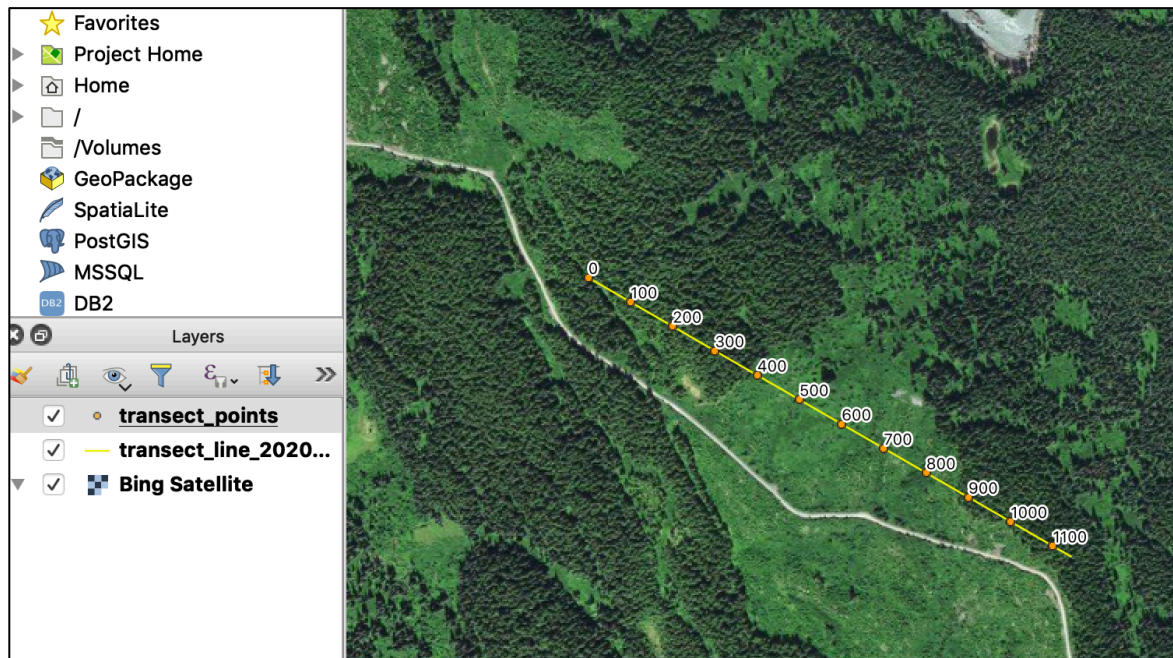
6. Add points at set intervals along the line(s) by selecting from top ribbon Processing > Toolbox > Points along geometry (start typing “points” into the search bar)



Select your input line layer, enter a distance and units for your points (e.g. 100 m) and any offsets you might want (i.e. start at 50 m), and select Run.



7. If you created a temporary points layer, export to save as a permanent file. Note: refer to the instructions at the end of this tutorial for how to add sample point names and save related layers as a GeoPackage
8. Format your line and transect points. The distance attribute is automatically added to the points layer



9. Create your final product (e.g. georeferenced pdf) using the print layout.

Optional step 1: Create a GeoPackage with several related layers

1. Create a new GeoPackage (either by creating a new layer or exporting either your points or line layer as a GeoPackage – you could even do this at Step 2)
2. Add your second layer to the existing GeoPackage by right-clicking > Export > Save Features as...
 - a. Select GeoPackage format
 - b. Select the existing GeoPackage
 - c. Under layer name, enter a description (i.e. transect points or lines)

Reference Video:

<https://freegistutorial.com/how-to-create-a-geopackage-on-qgis-3-2/>

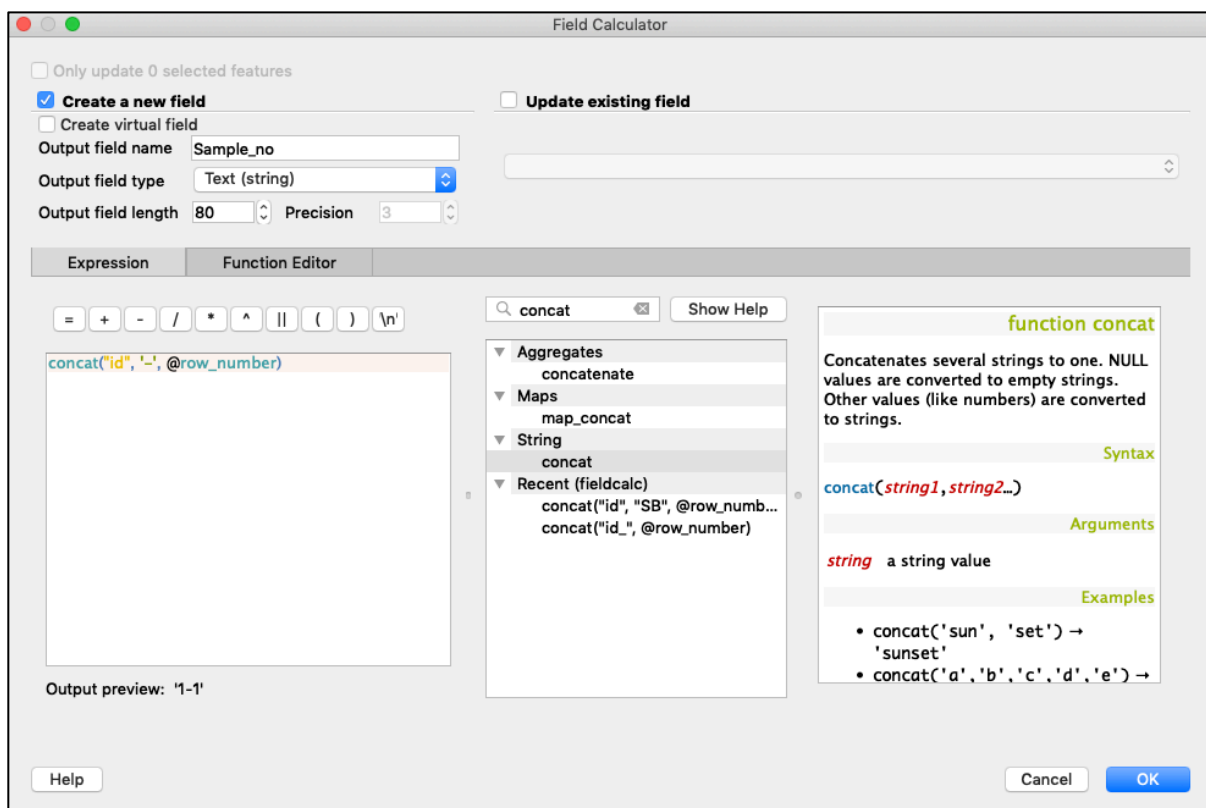
Optional step 2: Add sample point numbers

If you want to add a unique sampling point identification, you can add attributes in the attribute table using the “concat” function in the field calculator to make a new string field.

E.g. To combine transect line information (i.e. “id” attribute) and row number with a hyphen:

`Concat("id", '-', @row_number)` *For this example, returns 1-1, 1-2, 1-3, etc.*

Note: Use “” for attribute column and ‘’ for text

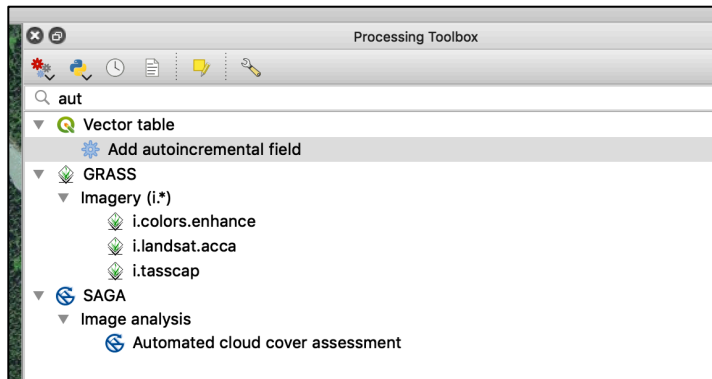


To name the attribute with the distance, simply replace @row_number with “distance”

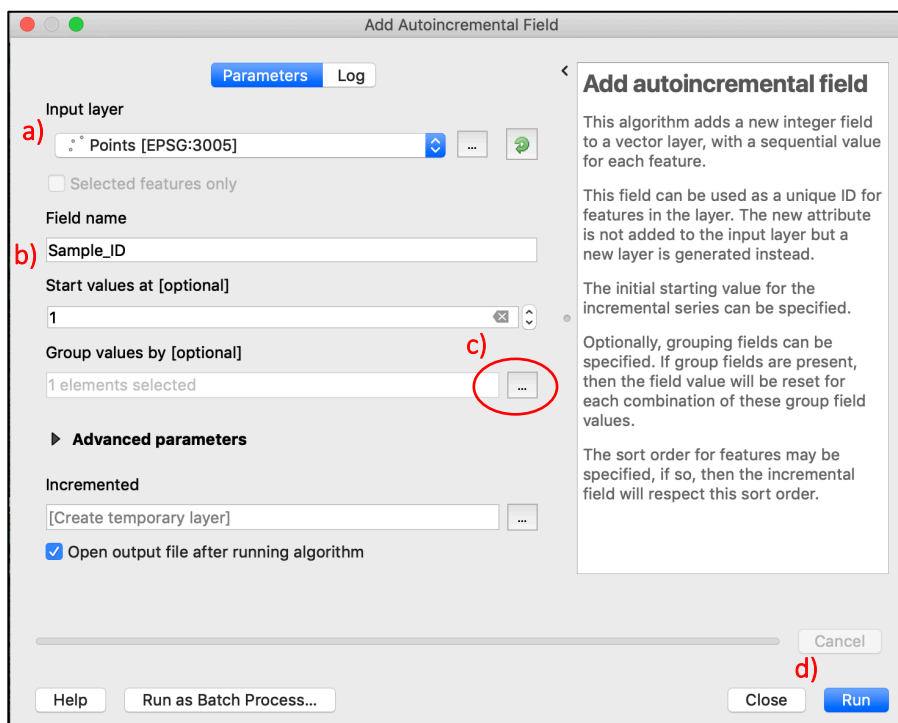
`Concat("id", '-', "distance")` *For this example, returns 1-0, 1-100, 1-200, etc.*

If you have several transects in the same layer and want to start re-numbering points for each transect (e.g. A-1, A-2, A-3, B-1, B-2, etc.) you can do this by using the Add autoincremental field function:

Processing > Toolbox > Add autoincremental field



- a) Select input layer
- b) Enter new attribute name under Field name
- c) Select the transect id attribute under Group values by (e.g. id)
- d) Click on Run

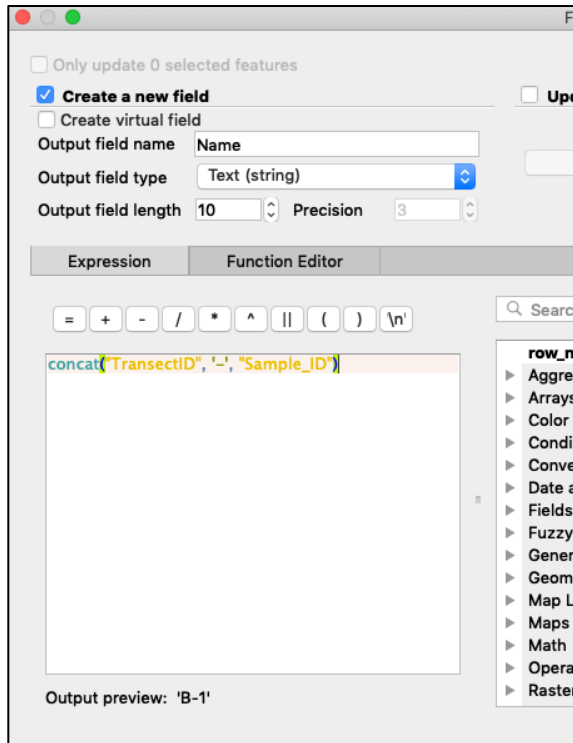


This will make a new point layer with the additional field Sample_ID. Note that the numbering re-started at 1 between transect A and transect B:

	TransectID ^	distance	angle	Sample_ID
1	A	0.00000	122.59802	1
2	A	100.00000	122.59802	2
3	A	200.00000	122.59802	3
4	A	300.00000	122.59802	4
5	A	400.00000	122.59802	5
6	A	500.00000	122.59802	6
7	A	600.00000	122.59802	7
8	A	700.00000	122.59802	8
9	A	800.00000	122.59802	9
10	A	900.00000	122.59802	10
11	A	1000.00000	122.59802	11
12	A	1100.00000	122.59802	12
13	B	0.00000	347.58767	1
14	B	100.00000	347.58767	2
15	B	200.00000	347.58767	3
16	B	300.00000	347.58767	4
17	B	400.00000	77.51751	5
18	B	500.00000	77.51751	6
19	B	600.00000	77.51751	7
20	B	700.00000	77.51751	8

To group the transect and sample identifiers together in one attribute, combine the two using the field calculator:

`Concat("TransectID", '-', "Sample_ID")` For this example, returns A-1, A-2, B-1, etc.



	TransectID	distance	angle	Sample_ID	Name
1	A	0.00000	122.59802	1	A-1
2	A	100.00000	122.59802	2	A-2
3	A	200.00000	122.59802	3	A-3
4	A	300.00000	122.59802	4	A-4
5	A	400.00000	122.59802	5	A-5
6	A	500.00000	122.59802	6	A-6
7	A	600.00000	122.59802	7	A-7
8	A	700.00000	122.59802	8	A-8
9	A	800.00000	122.59802	9	A-9
10	A	900.00000	122.59802	10	A-10
11	A	1000.00000	122.59802	11	A-11
12	A	1100.00000	122.59802	12	A-12
13	B	0.00000	347.58767	1	B-1
14	B	100.00000	347.58767	2	B-2
15	B	200.00000	347.58767	3	B-3
16	B	300.00000	347.58767	4	B-4
17	B	400.00000	77.51751	5	B-5
18	B	500.00000	77.51751	6	B-6
19	B	600.00000	77.51751	7	B-7