

Exercise 4-1: Lime prescription mapping

Mapping objectives:

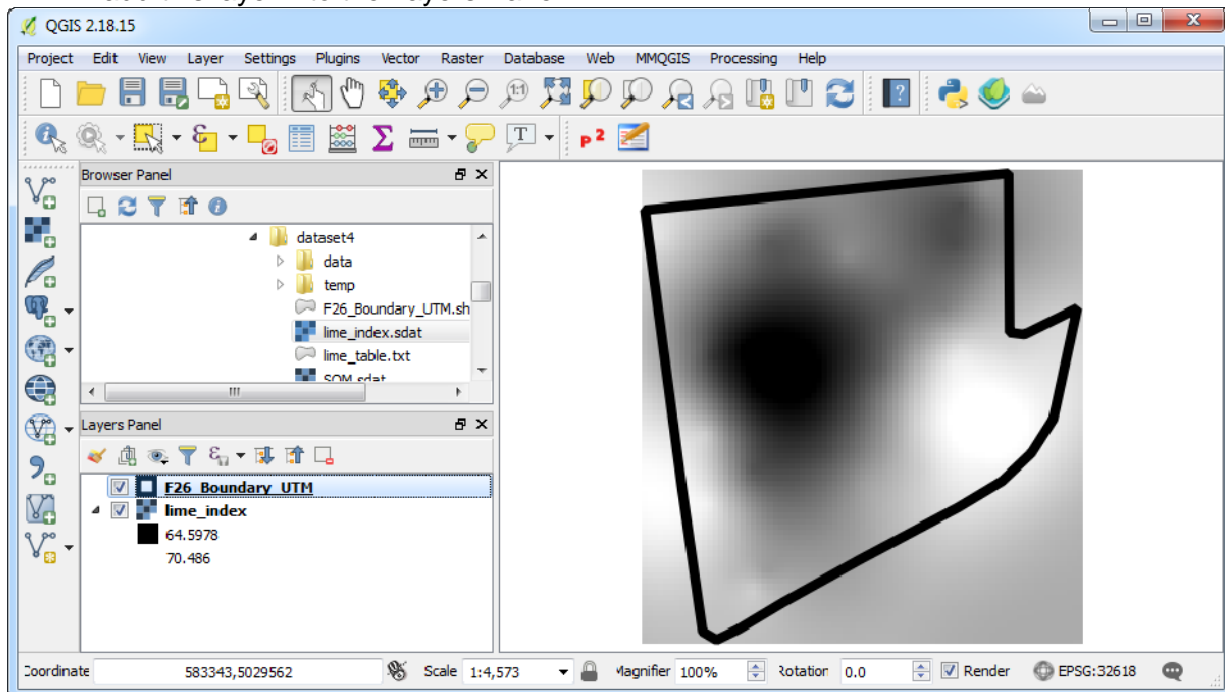
- Create a lime prescription map based on the variability of soil buffer pH

Data folder: Dataset4

F26_Boundary_UTM.dbf
F26_Boundary_UTM.prj
F26_Boundary_UTM.qpj
F26_Boundary_UTM.shp
F26_Boundary_UTM.shx
lime_index.mgrd
lime_index.prj
lime_index.sdat
lime_index.sgrd
SOM.mgrd
SOM.prj
SOM.sdat
SOM.sgrd
soybeans.tif
soybeans.tif.aux.xml

Part 1: Add the interpolated soil buffer pH map to QGIS

1. Open a new project
2. In the Browser Panel, double click **lime_index.sdat** and **F26_Boundary_UTM.shp** to add this layer into the Layers Panel



Part 2: Create a lime prescription map according to soil buffer pH

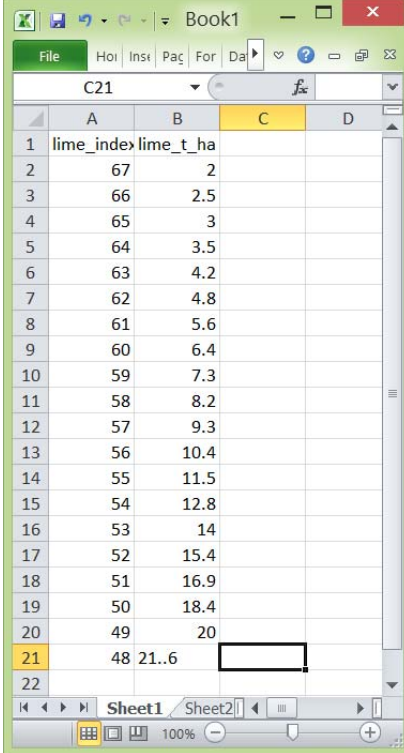
1. **Creating a table to assign lime prescription rate (t/ha)**

*** In this tutorial dataset, the lime index is the soil buffer pH multiply by 10 to make sure one decimal value is considered during raster operation, i.e.,

$$\text{lime_index} = \text{Buffer pH} * 10$$

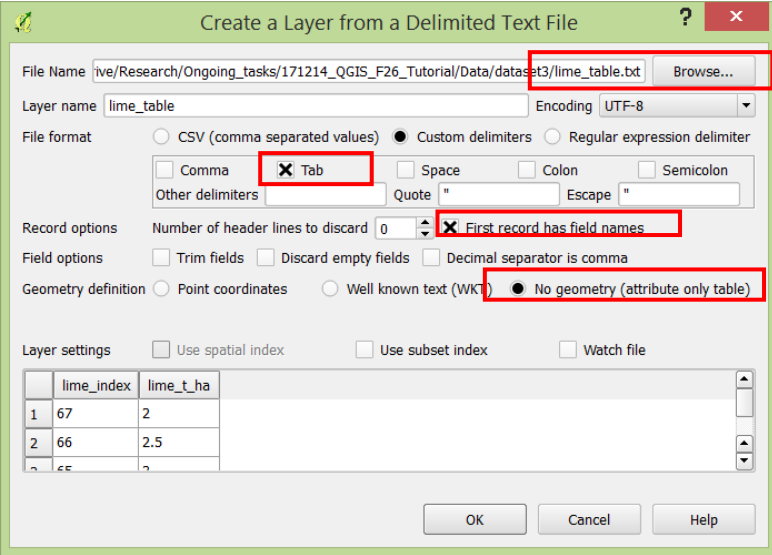
- In EXCEL, open a new sheet and enter values as shown
- Save this file in the project folder as lime_table.txt (Tab delimited)

File name:	lime_table.txt
Save as type:	Text (Tab delimited) (*.txt)



	A	B	C	D
1	lime_index	lime_t_ha		
2	67	2		
3	66	2.5		
4	65	3		
5	64	3.5		
6	63	4.2		
7	62	4.8		
8	61	5.6		
9	60	6.4		
10	59	7.3		
11	58	8.2		
12	57	9.3		
13	56	10.4		
14	55	11.5		
15	54	12.8		
16	53	14		
17	52	15.4		
18	51	16.9		
19	50	18.4		
20	49	20		
21	48	21.6		
22				

2. **Adding the lime_table.txt as a layer in QGIS.** Click Add Delimited Text Layer icon to add this table as a layer without geometry



Create a Layer from a Delimited Text File

File Name: /ive/Research/Ongoing_tasks/171214_QGIS_F26_Tutorial/Data/dataset3/lime_table.txt **Browse...**

Layer name: lime_table Encoding: UTF-8

File format: ☐ CSV (comma separated values) ☒ Custom delimiters ☐ Regular expression delimiter

☐ Comma ☒ **Tab** ☐ Space ☐ Colon ☐ Semicolon

Other delimiters: Quote: " Escape: "

Record options: Number of header lines to discard: 0 ☒ **First record has field names**

Field options: ☐ Trim fields ☐ Discard empty fields ☐ Decimal separator is comma

Geometry definition: ☐ Point coordinates ☐ Well known text (WKT) ☒ **No geometry (attribute only table)**

Layer settings: ☐ Use spatial index ☐ Use subset index ☐ Watch file

	lime_index	lime_t_ha
1	67	2
2	66	2.5
3	65	3

OK Cancel Help

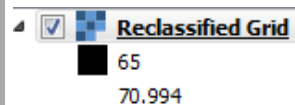
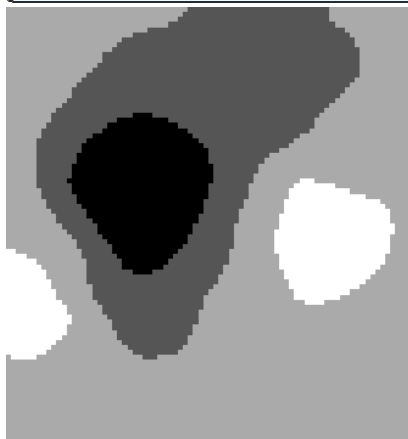
3. **Classifying buffer pH values into zones.** In the Processing Toolbox, enter "reclassify" and click SAGA > Raster tools > Reclassify values

- In Reclassify values

Use default values, except the following exceptions

Grid = **lime_index**
Method = single table
Lookup Table = Fixed table
Uncheck replace no data values
Uncheck replace other values
Click Run

	minimum	maximum	new
1	64	66	65
2	66	68	67
3	68	70	69
4	70	72	71



Reclassify values

Parameters Log Run as batch process...

Grid
lime_index [EPSG:32618]

Method
[2] simple table

old value (for single value change)
0.000000

new value (for single value change)
1.000000

operator (for single value change)
[0] =

minimum value (for range)
0.000000

maximum value (for range)
1.000000

new value (for range)
2.000000

operator (for range)
[0] <=

Lookup Table
Fixed table 4x3

operator (for table)

0%

Run Close

4. **Converting raster to polygon.** In the Processing Toolbox, enter "polygon" in Search ... and then click GDAL/OGR > Conversion > Polygonize (raster to vector)
 - a. Input layer = **Reclassified Grid**
 - b. Output field name = lime_index
 Click Run

Polygonize (raster to vector)

Parameters Log Run as batch process...

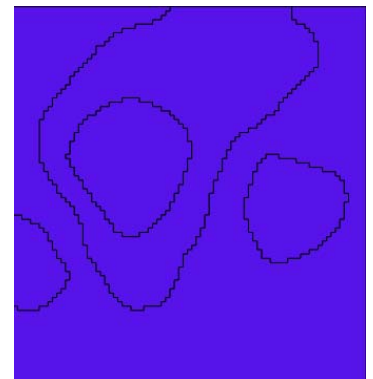
Input layer
Reclassified Grid [EPSG:32618]

Output field name
lime_index

Vectorized
[Save to temporary file]

☒ Open output file after running algorithm

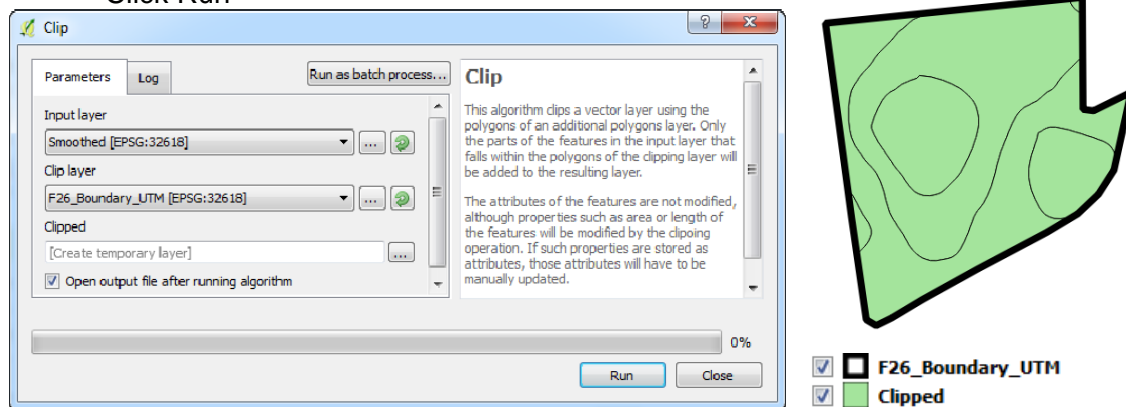
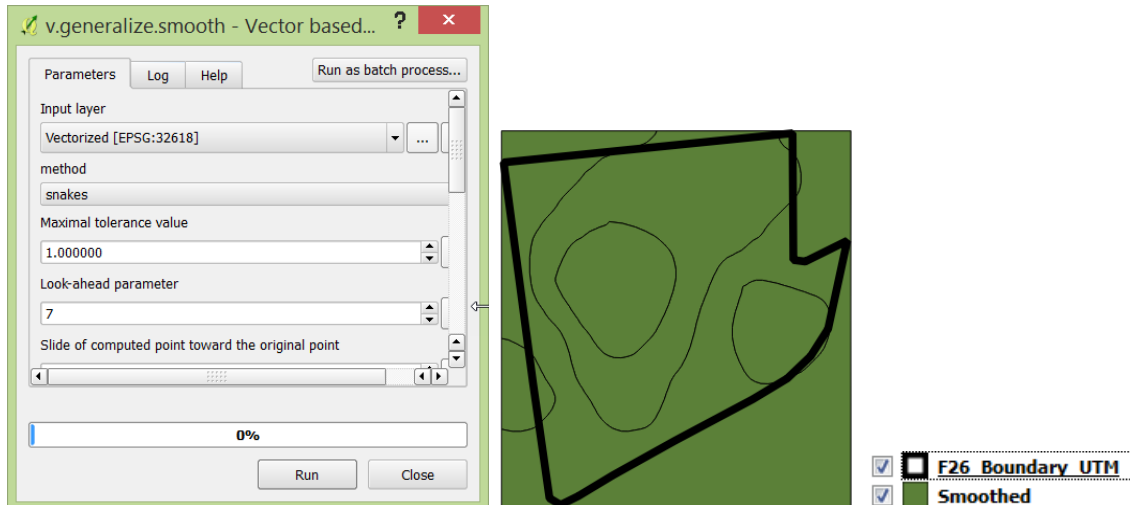
Polygonize (raster to vector)
This algorithm is based on the GDAL cmd.exe module.
For more info, see the [module help](#)



5. **Smoothing polygon outline.** In the Processing Toolbox, enter "smooth" in Search ... and then click > GRASS GIS > Vector > v.generalize.smooth

Use default value, except the following exceptions

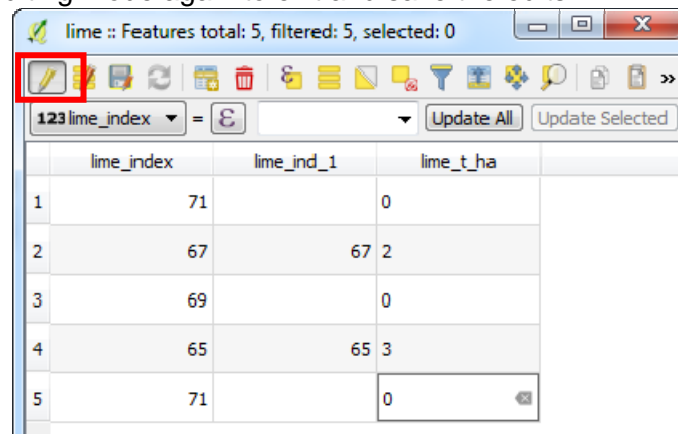
 - a. Input layer = **Vectorized**
 - b. Method = snake
 Click Run. A Smoothed polygon is added



8. **Storing the temperate file as a shapefile in the system.** In the Layers Panel, right click **Joined layer** and then click Save as ...
 - a. Format = ESRI shapefile
 - b. File name = lime.shp
 - c. CRS = Selected CRS (EPSG:32618, WGS 84 / UTM zone 18 N)Click OK
9. **Remove the unneeded layers.** In Layers Panel, remove **Clipped**, **Smoothed**, **Vectorized**, **Filtered Grid**, **Joined layer**, and **Reclassified Grid**

Part 3: Produce a liming layout map

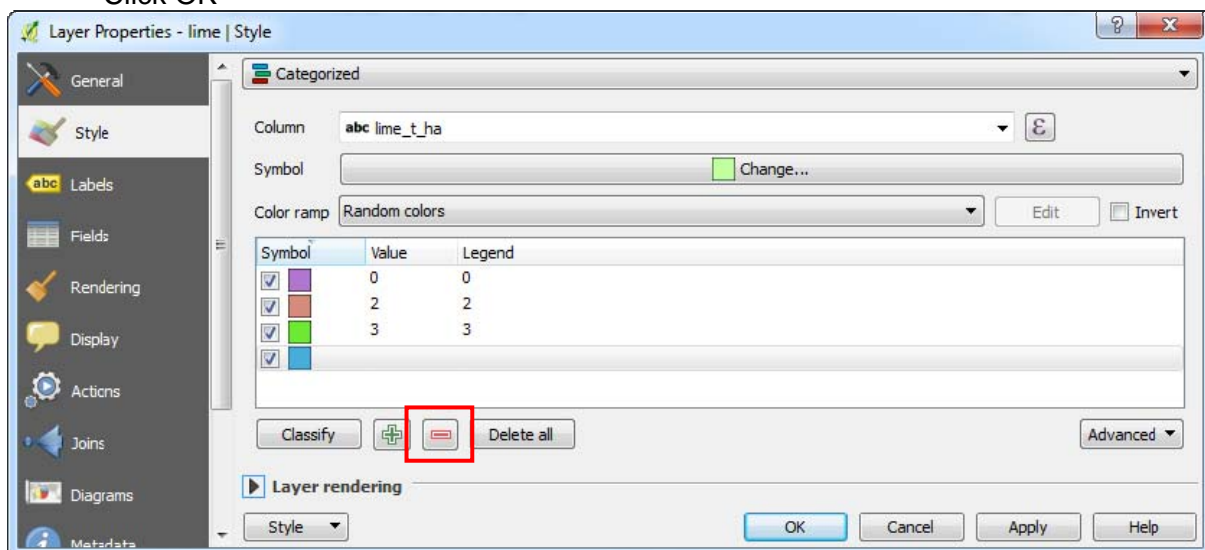
1. In Layers Panel, right click **lime** and click Open Attribute Table. Click Toggle editing mode and manually enter 0 in the column of lime_t_ha for lime_index > 67. Once done, click Toggle editing mode again to exit and save the edits



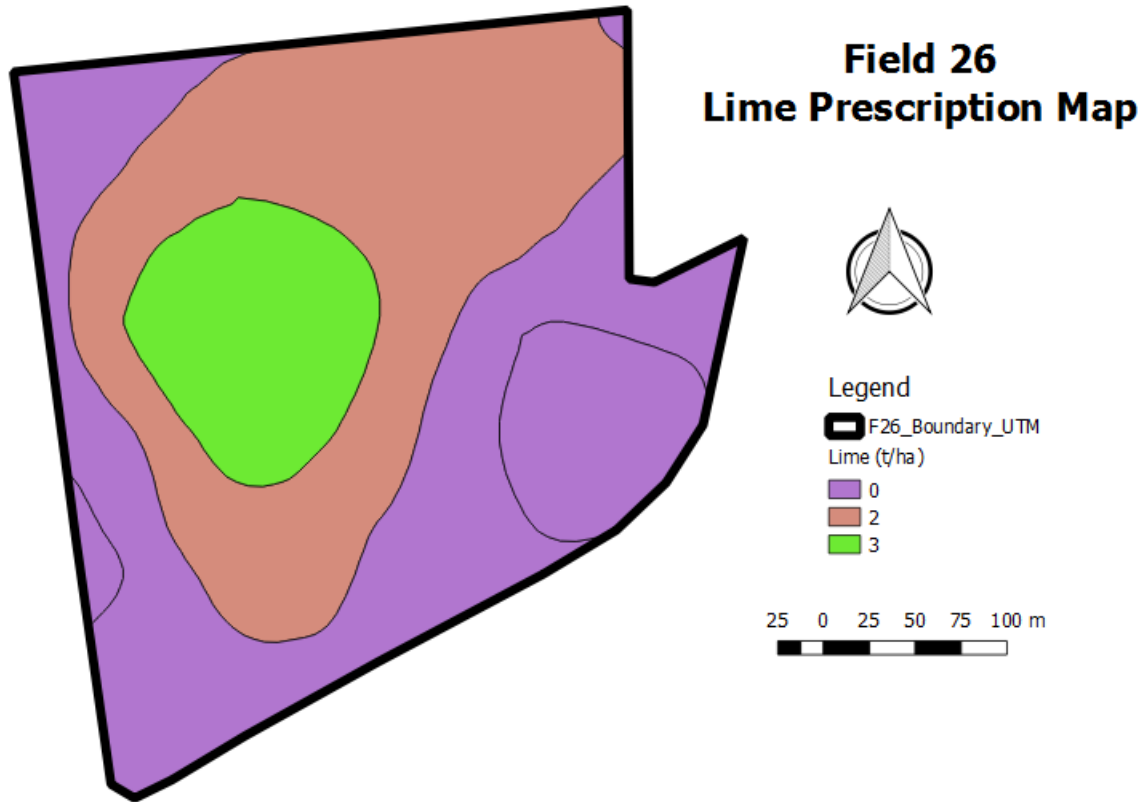
	lime_index	lime_ind_1	lime_t_ha
1	71		0
2	67	67	2
3	69		0
4	65	65	3
5	71		0

2. In the Layers Panel, right click **lime** and then click Properties
 - a. Style = Categorized
 - Column = lime_t_ha
 - Color ramp = Random colors
 - Click Classify
 - Click the unassigned category and then click Delete

Click OK



3. In Layers Panel, right click **lime** and rename this layer as **Lime (t/ha)**
4. Create a lime prescription layout map following the same steps described in previous exercise.



5. Save this project as **set4.qgs**.