# Lesson 3.3: Developing a lime prescription map

## Data Source: dataset3.zip

Part 1: Interpolating a soil pH map

- 1. Open the previously saved project.
- 2. Add a subgroup named "**pH**" under the group "Soil Prescription".
- 3. Add *Field20\_Soil\_2008\_pH.shp* to your map.
- 4. In the Analysis Tab select Geostatistical Wizard.

Geostatistical Wizard - Kriging / CoKriging				Х
Geostatistical methods	Input Dataset 1			
<ul> <li>Empirical Bayesian Kriging</li> </ul>	Source Dataset	Field20_Soil_2008_pH	•	÷
O EBK Regression Prediction	Data Field	Ind_pH_new	•	
Kriging / CoKriging	Input Dataset 2			
<ul> <li>Areal Interpolation</li> </ul>	Source Dataset		•	÷
3D Interpolation	Data Field		•	
<ul> <li>Empirical Bayesian Kriging 3D</li> </ul>				

In Step 2, Kriging Type = Ordinary and click Next.

In Step 3, Model#1 = Spherical and click Next.

In Step 4, Neighborhood type = Smooth, and click Finish.

- Right click on the kriging layer, select Export Layer > to Raster. Name the layer Ind\_pH\_raster. In the Environments tab, change the extent to Field20\_boundary.shp. Hit Run.
- 6. Search Clip Raster. Follow the image below, hit Run.

Geoproce	ssing	~ 4 ×	
	Clip Raster	(+)	
Parameters	Environments	?	
Input Raste	er		
Ind_pn_ras	ster	<b>—</b>	
Output Ext	ent		
Field20_Bo	oundary	× 🧎 🖊 •	
Rectangle			
🗾 💼 v			
✓ X and	Y Extent		
Тор	5063768.43567429		
Left	684524.403869727		
Right	684952.950169726		
Bottom	5063208.00577429		
Output Ras	ster Dataset		
Ind_pH		i i i i i i i i i i i i i i i i i i i	
Use Inp	out Features for Clipping Geometry		
NoData Va	lue		
3.4e+38			
🗌 Maintai	in Clipping Extent		

Part 3: Changing pixel values of a raster from "floating" to "integer".

- 1. Right-click on *Ind\_pH* and select **Symbology.**
- 2. Under **Primary Symbology** select **Classify.** Then select **5 Classes.** Then select **Manual Interval.**
- 3. Under the **Label Column** change the values to the ones shown below.

Symbology -	Kriging_rast	er_pH		~ ū ×				
/				≡				
Primary symb	Primary symbology							
Classify				•				
Field	No fields	•						
Normalization	No fields	•						
Method	Manual Interval	•						
Classes	5	-						
Color scheme	Color scheme							
000								
Classes Mask Histogram								
More •			+ 0.0	- 0.0				
Color	Upper value	Label						
	≤ 67.356232	66.07 - 66.5						
	≤ 67.894833	66.5-67.5						
	≤ 68.109577	67.5-68.5						
	≤ 68.637469	68.5-69.5						
	≤ 69.935158	69.5 - 69.935						

### How to determine the number of classes for Lime Index?

The **Label Values** selected here should start at the integer of the dataset's minimum value+0.5 and finish at the dataset's maximum value. In the example above, the minimum value is approx. 66.07 (blue box), in this case, the first break value should be 66.5, while the maximum break value approx. 69.935. Be aware that these break values are dataset-dependent, as each dataset has different minimum and maximum values. They WILL change for other fields!

- 4. Search Reclassify.
- 5. Input the following. Under **Reclassification**, choose the **Classify** button. In the window that pops up select the **histogram tab**. **Adjust the histogram bars** to match the label values that you added above.

Geoprocessing		~ ‡ ×	Classify			$\times$
$\odot$	Reclassify	$\oplus$	Field	VALUE		
Parameters Environments		?	Method	Manual Interval 🔻		
Input raster Kriging_raster_pH		✓	Classes	5 •••		
Reclass field VALUE		读	Classes	Histogram		
Reclassification			_		More	Ŧ
	Rever	rse New Values		66.069		2856
Start	End	New	6	6.506		
66.069252	66.505733	66	Ŭ	0.5001		
66.505733	67.495356	67				
67.495356	68.496168	68	6	7.495		
68.496168	69.500855	69				— x
69.500855	69.935158	70				_
NODATA	NODATA	NODATA	6	8.496		
Classify Unique	1		6	9.501		
A Output raster						
Ind_pH_reclass		i		69.935		
Change missing values to N	loData				OK Ca	ncel

#### 6. Search Raster to Polygon.

Geoprocessing		~ 4 ×					
	Raster to Polygon	$\oplus$					
Parameters Environment	S	?					
Input raster							
Ind_pH_reclass		~ 🦳					
Field	1						
Value		~ 袋					
Output polygon features							
Ind_pH_poly		🖻					
Simplify polygons							
Create multipart features							
Maximum vertices per poly	gon feature						

- 7. Right-click on the new polygon file and select Attribute Table.
- 8. Add a **New Field.** Name the field **T\_pH** and select the type to be **Double. Save** the field.
- 9. **Rename** the polygon layer to **T\_pH** for target pH.

Part 5: Joining an external tabular file to shapefile.

- 1. In the **Table of Contents**, right-click on *T\_pH* and select **Joins and Relates** > **Join**
- 2. In the opened window input the following attributes. Find *Sheet1*\$ in the *dataset3* folder under *Soil\_pH\_Management.xl*.

Add Join	?	$\times$
Input Table		
Т_рН		~
🗈 Input Field		
gridcode	~	錼
Join Table		
Sheet1\$	~	
Join Field		
Ind_pH	~	錼
✓ Keep all input records		
🗌 Index join fields		
Join Operation		
		~

- 3. In the *T\_pH* attribute table, right-click on the **T\_pH** column and select **Calculate Field.**
- **4.** In the **Calculate Field** window, double click on *pH\_17cm* in the **Fields** tab. This should equate **Ind\_pH\_poly.T\_pH = !Sheet1\$.pH\_17cm!.** Hit **OK**.

Calculate Field		?
• This tool modifies th	ne Input Table	
Input Table		
T_pH		~ 🦳
Field Name (Existing or N	New)	
Т_рН		~ <sup></sup>
Expression Type		
Python		~
Expression		
Fields	T Helpers	T
Shape_Length Shape_Area T_pH pH_tam Ind_pH pH_17cm ObjectID Insert Values	<pre>.as_integer_ratio() .capitalize() .center() .conjugate() .count() .decode() .denominator() * / + - =</pre>	•
Ind_pH_poly.T_pH =		
!Sheet1\$.pH_17cm!		

- 5. Right-click on *T-pH* and remove the join.
- 6. Back in the *T\_pH* attribute table select all the rows in column **T\_pH** that are **Null.** To select all the rows, hold down ctrl.
- 7. Once they are all selected, right-click on the **T\_pH** column, and select **Calculate Field.** In the window, set all the rows **equal to zero**.

-	
0	

	OBJECTID *	Shape *	Id	gridcode	Shape_Length	Shape_Area	T_pH
1	1	Polygon	1	66	622.647185	17445.336892	3.1
2	2	Polygon	2	67	1095.548931	42524.236308	2.2
3	3	Polygon	3	69	373.980786	3278.525036	0
4	4	Polygon	4	69	10.285111	5.876862	0
5	5	Polygon	5	69	64.176953	207.590405	0
6	6	Polygon	6	70	264.456376	3846.832582	0
7	7	Polygon	7	69	<mark>66.18</mark> 2	142.51734	0
8	8	Polygon	8	68	2139.085603	116371.914903	0
9	9	Polygon	9	69	674.520009	28590.624805	0

## 8. Your table should now look like this:

Right-click on *T\_pH* in the contents tab and select Symbology.
 In Symbology, change the field to T\_pH.

Symbology	- Т_рН	~ † ×	
🗾 🔊 🗧		≡	
Primary sym	bology		
Graduated Col	ors	•	
Field	Т_рН	• 🗙	
Normalization	<none></none>	•	
Method	Natural Breaks (Jenks)	•	
Classes	3	•	
Color scheme		▼ ☆	

11. Save your project.