

## Tutorial Set 3: Spatial data analysis

### Exercise Site20\_3-3 Developing a lime prescription map

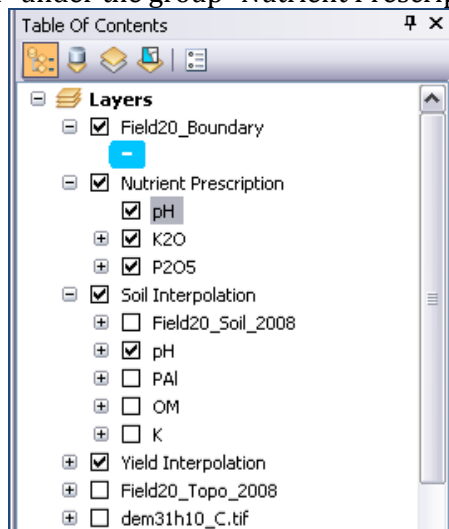
**Learning objective:** Developing a lime prescription map by joining an external tabular file containing soil pH management information

**Techniques:** Geostatistical Analyst – Ordinary Kriging  
Attribute Table – Join

**Data Source:** Dataset3

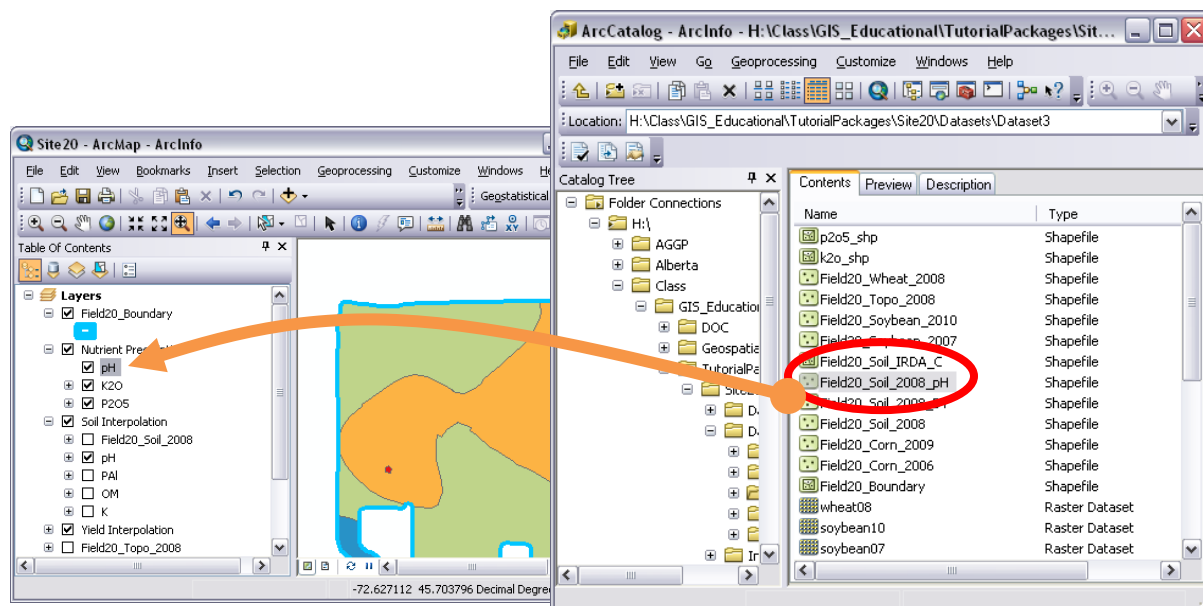
#### Part 1: Layer management

1. Open previously save project.
2. Add a subgroup named “pH” under the group “Nutrient Prescription”.

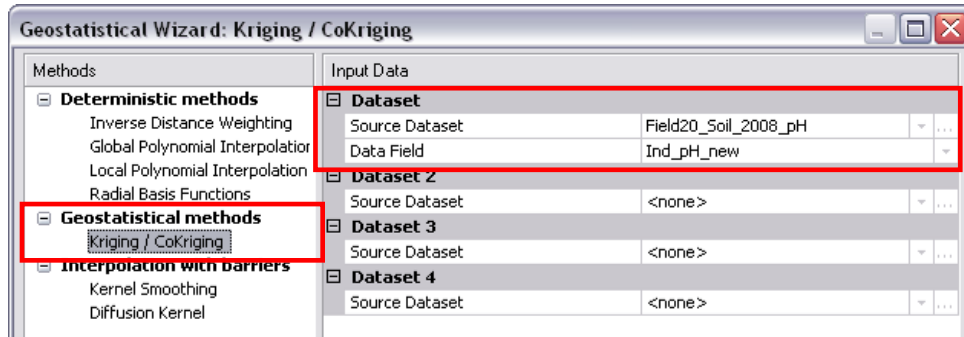
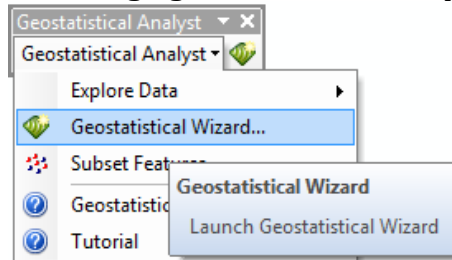


#### Part 2: Interpolating a soil pH map

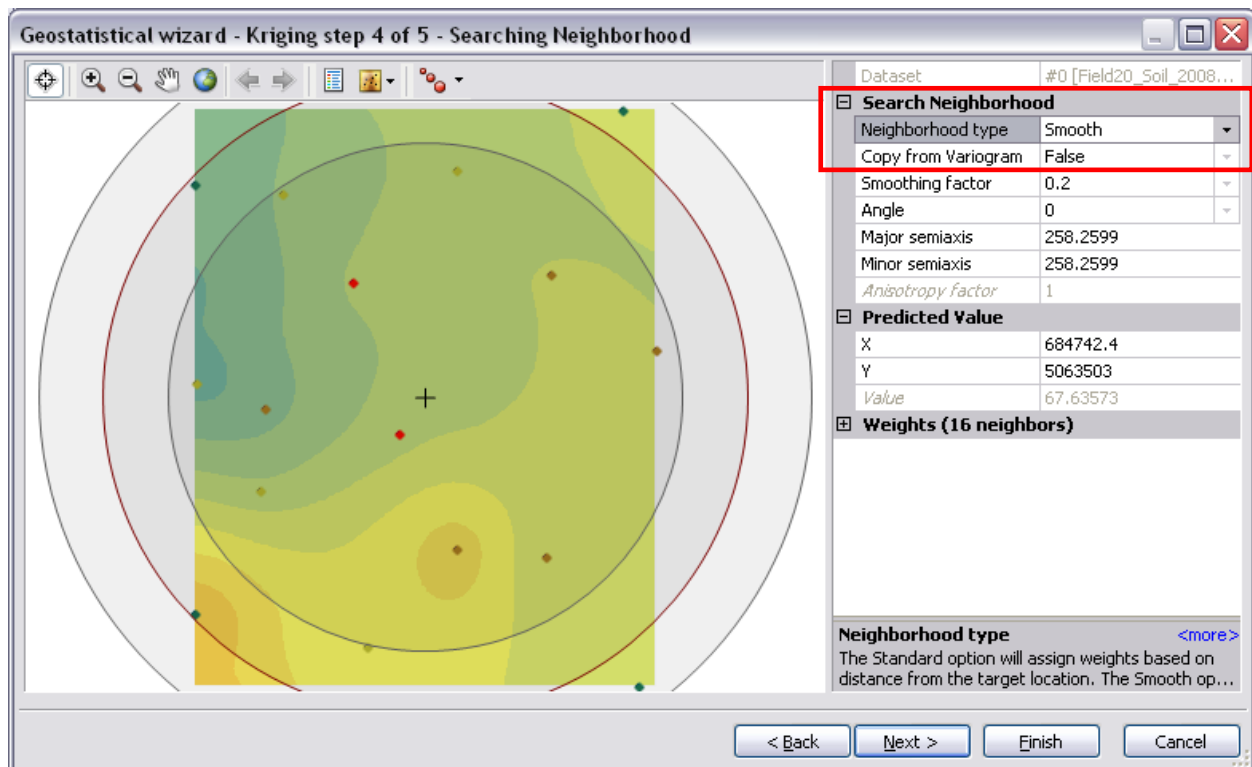
1. Drag and drop the layer *Field20\_Soil\_2008\_pH* from ArcCatalog to ArcMap.



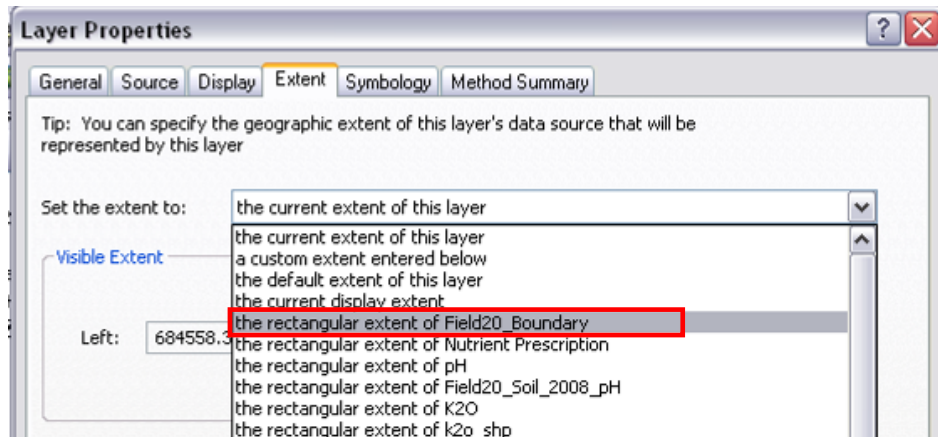
2. Launch **Geostatistical Wizard** from **Geostatistical Analyst** tool bar to interpolate a modified soil pH map. Choose **Kriging** method, and set the parameters as follows.



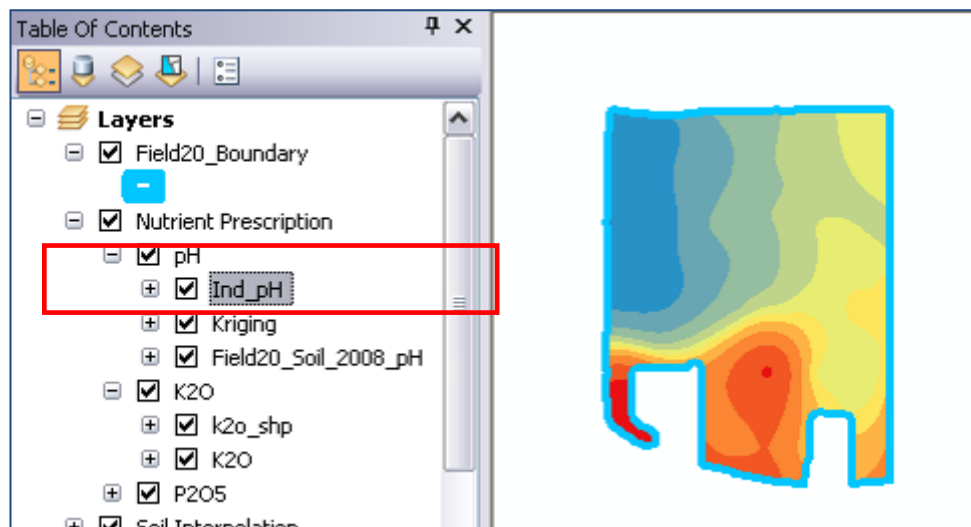
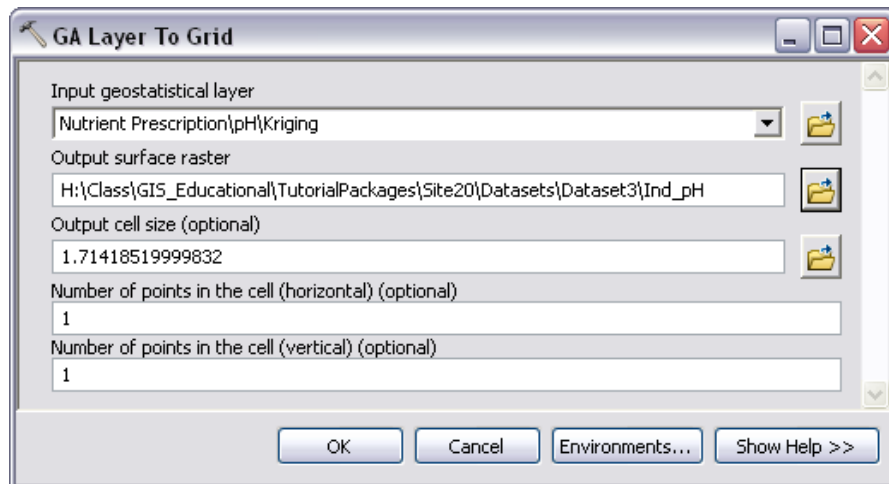
3. In **Step 2**, **Kriging Type = Ordinary** and click **Next**.
4. In **Step 3**, **Model#1 = Spherical** and click **Next**.
5. In **Step 4**, **Neighborhood type = Smooth**, and click **Finish**.



- A temporal interpolated Kriging pH raster is added to **Table of Contents**. Right click on this layer and go to **Layer Properties > Extent**. Set the extent to “the rectangular extent of *Field20\_Boundary*”.

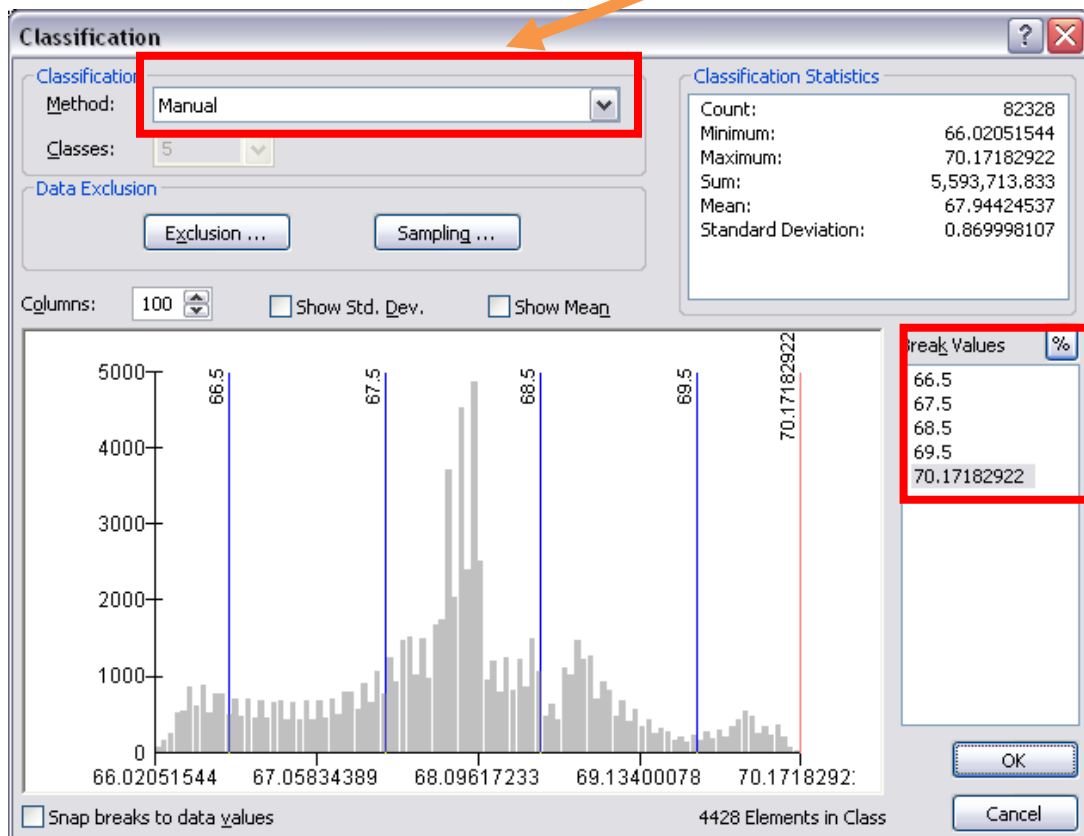
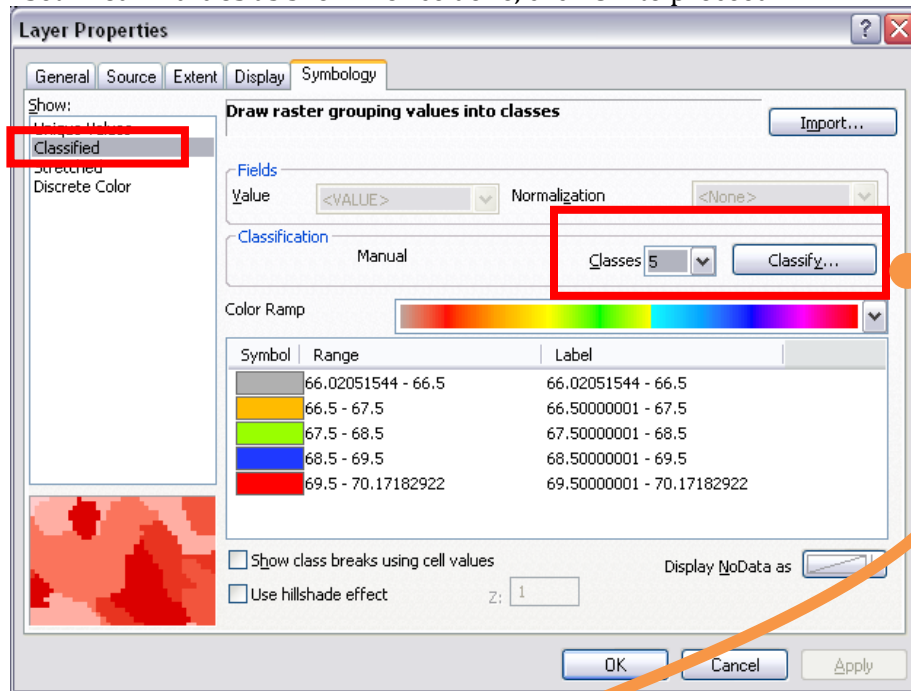


- Permanently store this kriging map to a raster by right clicking on **kriging layer > Data > Export to Raster**. Save this layer as “*Ind\_pH*” in the folder Dataset3. Once finish, remove this Kriging layer from **Table of Contents**.

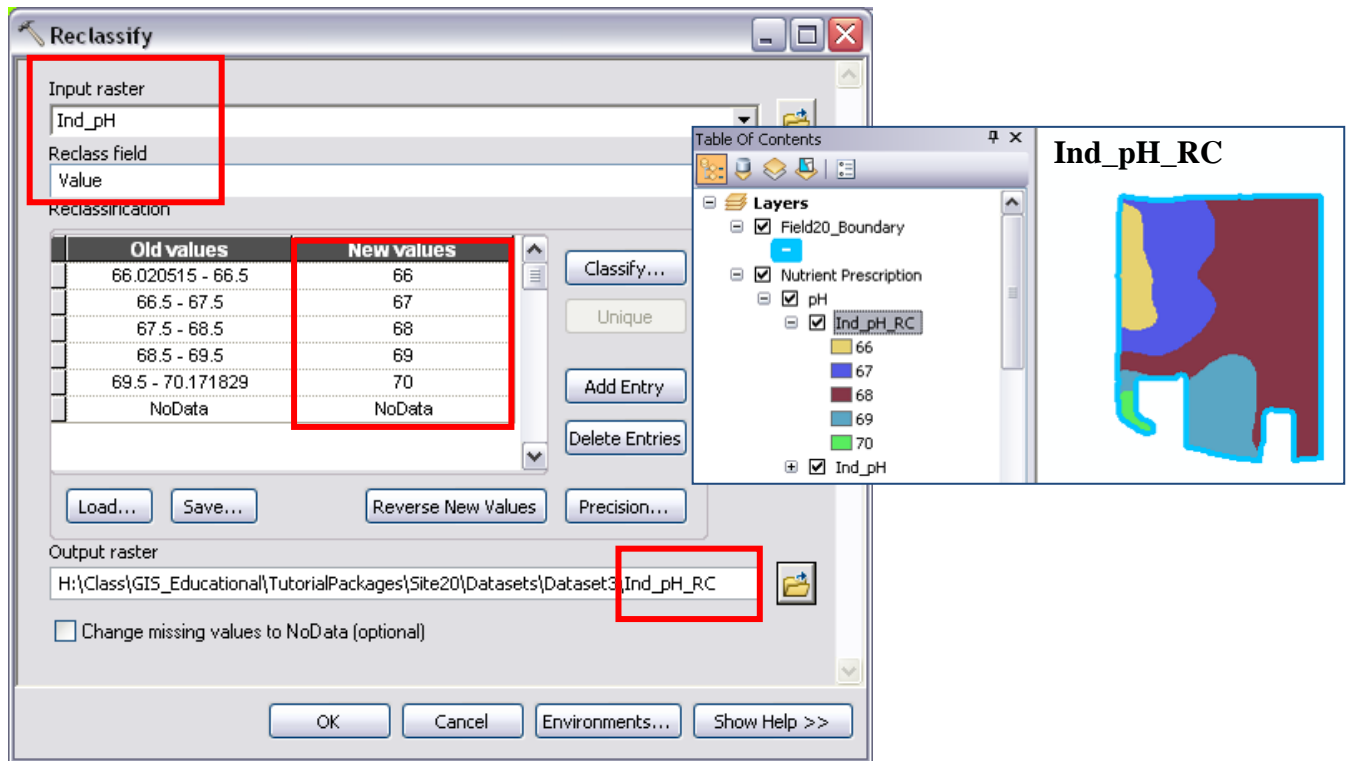


**Part 3: Changing pixel values of a raster from “floating” to “integer”**

1. In **Table of Contents**, right click on **Ind\_pH**. Go to **Layer Properties > Symbology**. Choose method = **Classified**; **Classes** = 5. Click **Classify** and choose classification method as **Manual**. Set **Break Values** as shown. Once done, click **OK** to proceed.

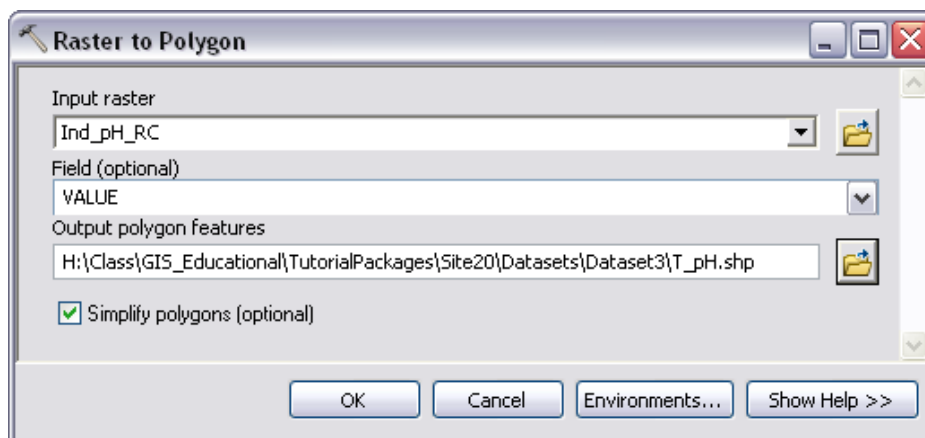


- Go to **ArcToolbox > Spatial Analyst Tools > Reclass > Reclassify**. Drag and drop the layer **Ind\_pH** from Table of Content to Reclassify dialog window as input raster (this way the Old values column keeps the same classification made in previous step). Enter the new values as shown. Save the output raster as **Ind\_pH\_RC**. Click OK to proceed.

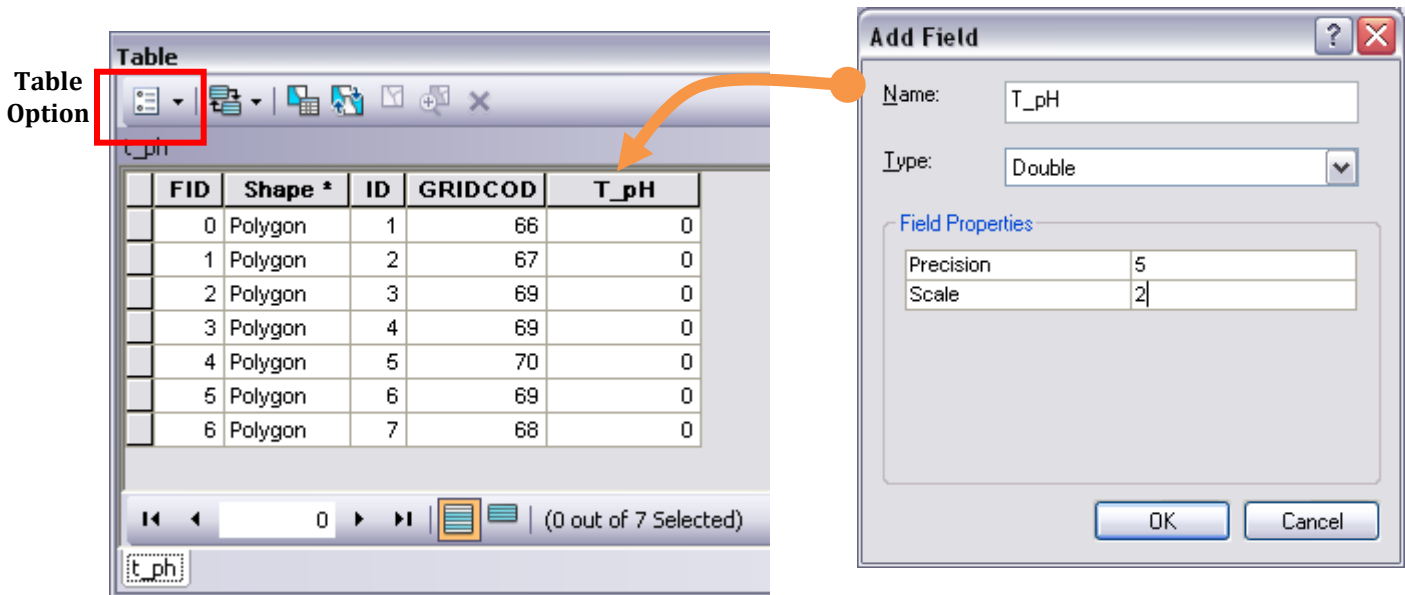


#### Part 4: Converting integer raster to polygon shapefile

- Go to **ArcToolbox > Conversion Tools > From Raster > Raster to Polygon**. Save the output polygon shapefile as **T\_pH** (e.q. Target pH). Click OK to proceed.

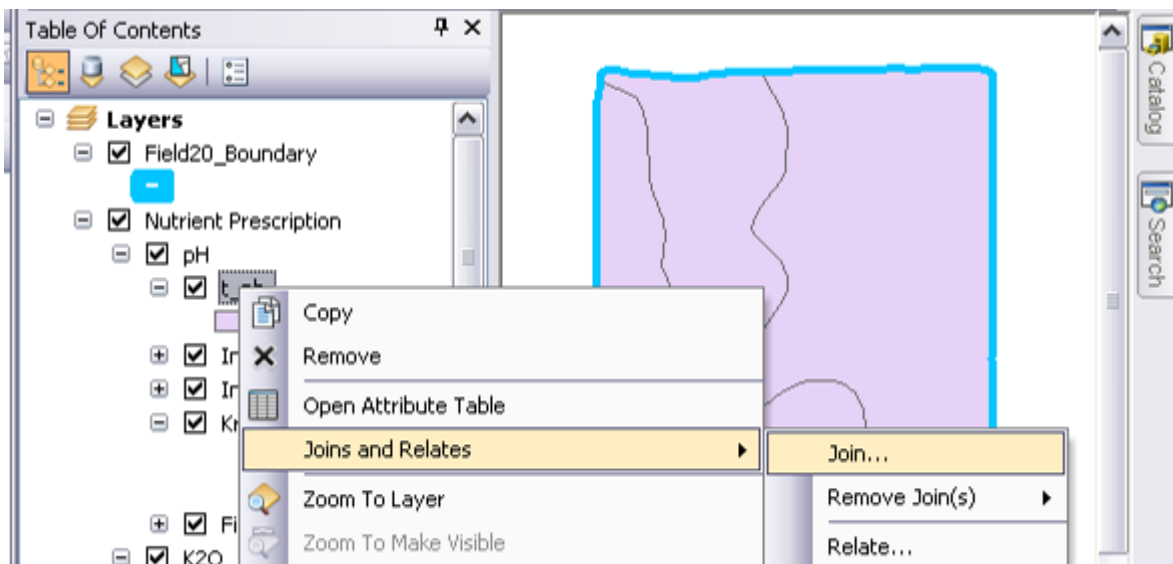


- In **Table of Contents**, right click on the new layer **T\_pH** and select **Open Attribute Table**. From the attribute table, click **Table Option** and select **Add Field**. In **Add Field** dialog window, set parameters as shown. Click OK to proceed and a new field T\_pH is added. Close the table.

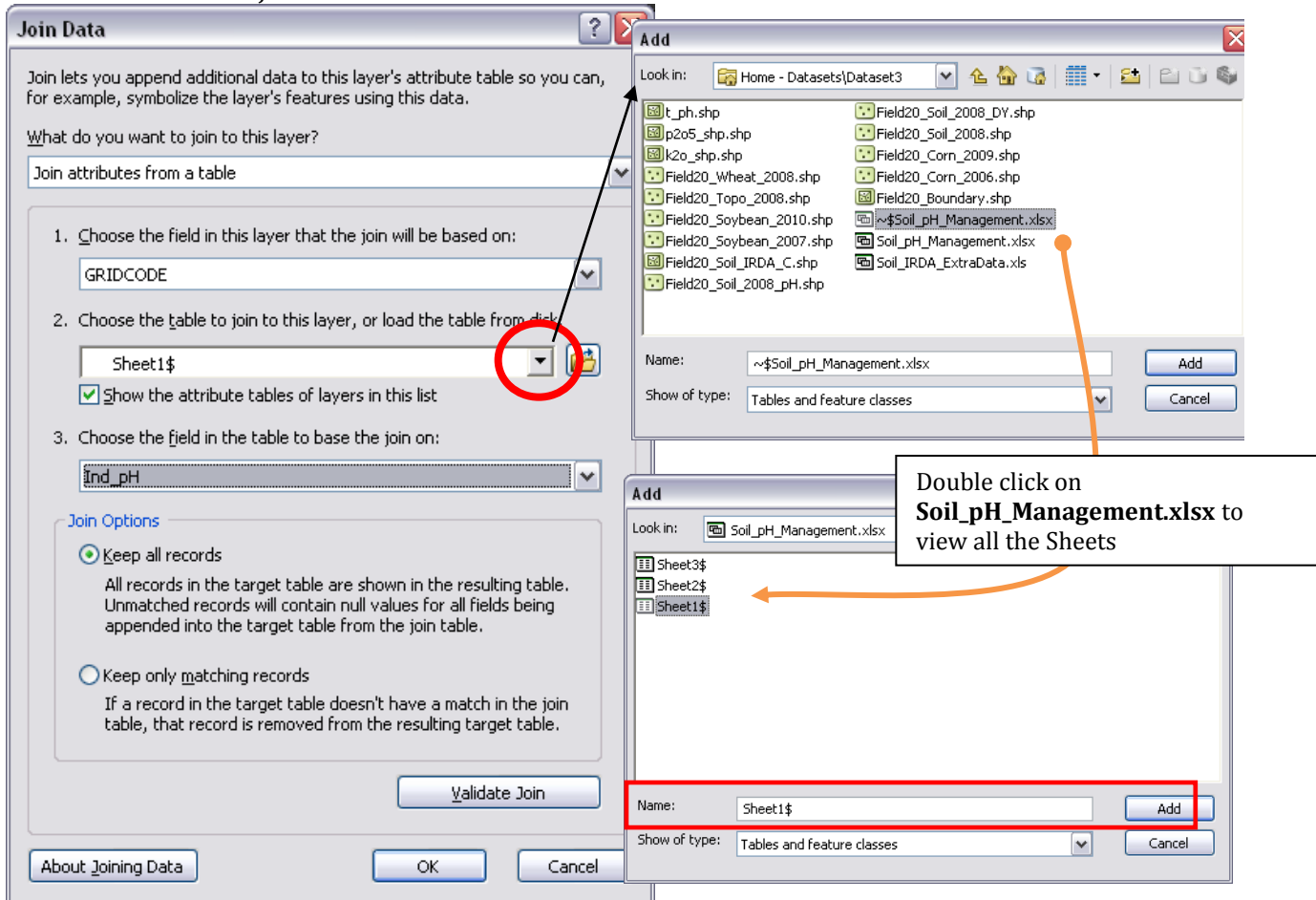


### Part 5: Joining an external tabular file to shapefile

- In **Table of Contents**, right click on **T\_pH** and select **Joins and Relates > Join**



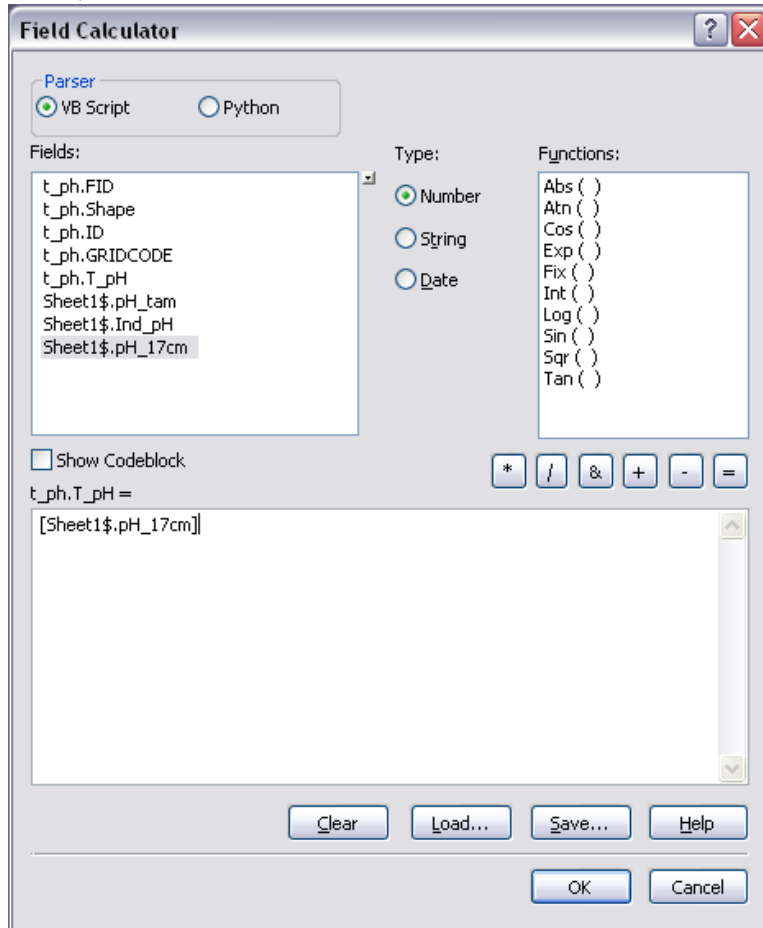
- In **Join Data** dialog window, set the first parameter to be **"GRIDCODE"**.  
Set the second parameter by clicking **Add** button. Locate the file **Soil\_pH\_Management.xlsx** in Dataset3 folder. Double click on the file to locate **Sheet1\$**. Choose this sheet and click Add.  
Set the third parameter to be **"Ind\_pH"**  
Click **OK** to close Join Data window.



- Once the external table is joined, the attribute table of **T\_pH** layer appears as following.

FID	Shape *	ID	GRIDCOD	T_pH	pH_tam	Ind_pH	pH_17cm
0	Polygon	1	66	0	6.6	66	3.1
1	Polygon	2	67	0	6.7	67	2.2
2	Polygon	3	69	0	<Null>	<Null>	<Null>
3	Polygon	4	69	0	<Null>	<Null>	<Null>
4	Polygon	5	70	0	<Null>	<Null>	<Null>
5	Polygon	6	69	0	<Null>	<Null>	<Null>
6	Polygon	7	68	0	<Null>	<Null>	<Null>

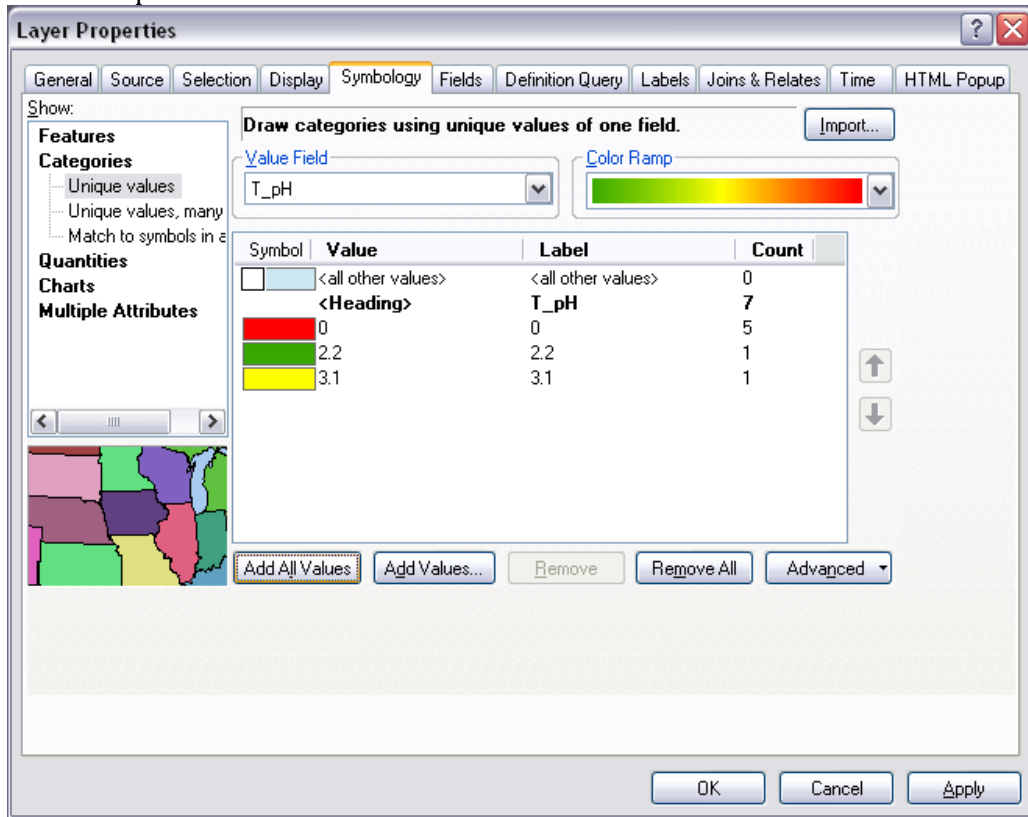
- Now, copy the values of column **pH\_17cm** to the column **T\_pH** field. Right clicking on the field **T\_pH** and select **Field Calculator**. In Field Calculator window, double click on "Sheet1\$.pH\_17cm" and click **OK**. The field T\_pH is updated. Once done, close this attribute table. Remove the joined table by right clicking on the layer **T\_pH** > **Joins and Relates** > **Remove Join(s)** > **Sheet1\$**.



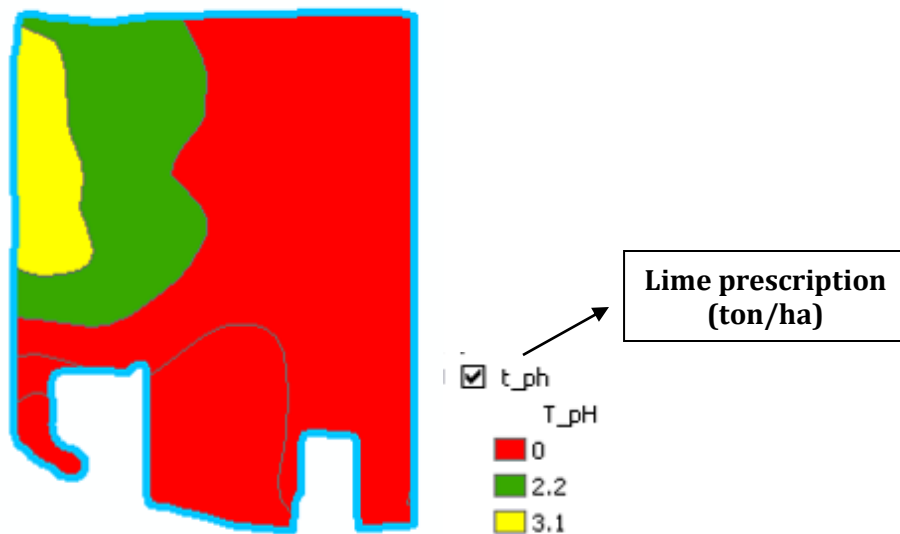
FID	Shape *	ID	GRIDCOD	T_pH	pH_tam	Ind_pH	pH_17cm
0	Polygon	1	66	3.1	6.6	66	3.1
1	Polygon	2	67	2.2	6.7	67	2.2
2	Polygon	3	69	0	<Null>	<Null>	<Null>
3	Polygon	4	69	0	<Null>	<Null>	<Null>
4	Polygon	5	70	0	<Null>	<Null>	<Null>
5	Polygon	6	69	0	<Null>	<Null>	<Null>
6	Polygon	7	68	0	<Null>	<Null>	<Null>



- Open Layer Properties of the layer **T\_pH** and go to **Symbology**. Choose Categories = Unique values and Value Field = T\_pH. Click OK to proceed.



As a result, the following polygonal lime requirement map is presented. The red area requires little or no lime.



- Save the project.