

Tutorial Set 3: Spatial data analysis

Exercise Site20_3-2 Developing a K fertilizer prescription map

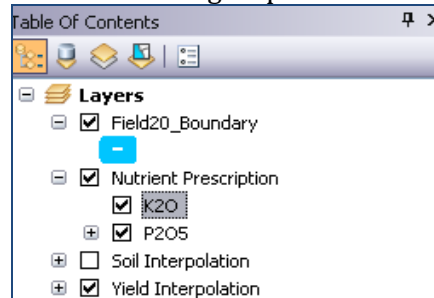
Learning objective: Generating a potassium (K_2O) prescription variability map (raster) and converting it to a classified polygon layer

Techniques: ArcToolbox – Spatial Analyst – Reclass – Reclassify
ArcToolbox – Conversion Tools – From Raster – Raster to Polygon

Data Source: Dataset3

Part 1: Layer management

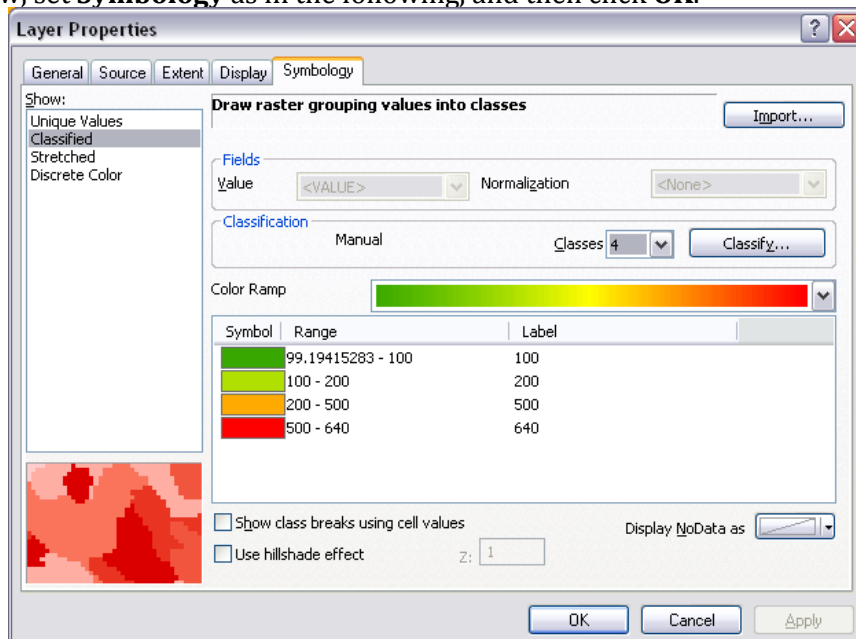
1. Open previously saved project.
2. Add a subgroup named “**K2O**” under the group “**Nutrient Prescription**”.



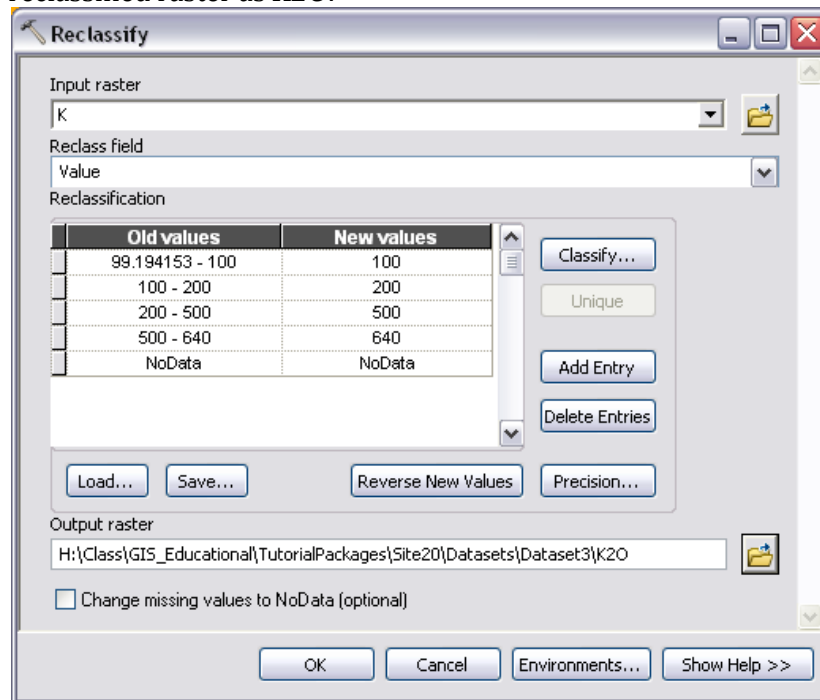
Part 2: Creating a K_2O prescription map using the **Reclassify** tool in the **ArcToolbox**

1. Understand the formulas used to estimate K_2O prescription

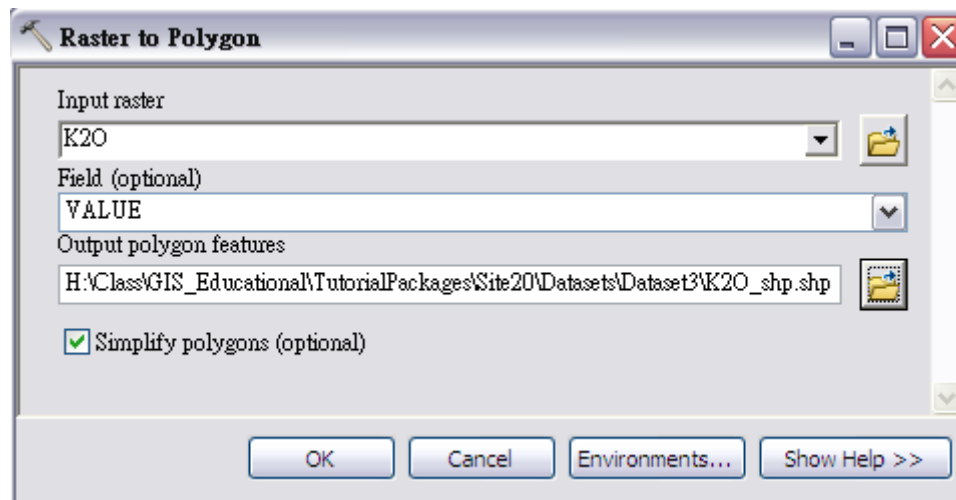
| | |
|-----------------------------|------------------------|
| If $k < 100$ (ppm) | K_2O rate = 80 kg/ha |
| If $100 \leq k < 200$ (ppm) | K_2O rate = 60 kg/ha |
| If $200 \leq k < 500$ (ppm) | K_2O rate = 40 kg/ha |
| If $k > 500$ (ppm) | K_2O rate = 0 kg/ha |
2. Right click on the **K** layer (under the group “Soil Interpolation”). In **Layer Properties** dialog window, set **Symbology** as in the following, and then click **OK**.



3. Create a K_2O prescription raster from a previously classified K Layer. Go to **ArcToolbox > Spatial Analyst Tools > Reclass > Reclassify**. In **Reclassify** dialog window, drag the layer K in the field of Input raster. Save this reclassified raster as K_2O .



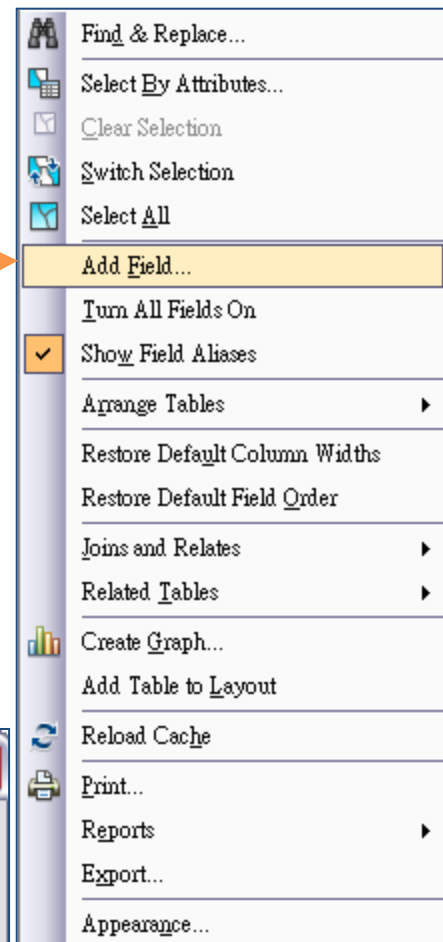
4. Convert the raster layer K_2O to a shapefile using **ArcToolbox**. Go to **ArcToolbox > Conversion Tools > From Raster > Raster to Polygon**. Save the new shapefile as K_2O_shp .



Part 3: Editing the attribute table of a K2O prescription map (e.g., *K2O_shp*)

1. Right click on the layer *K2O_shp* and select **Open Attribute Table**.
2. Click the first button and select **Add Field**.

| FID | Shape * | ID | GRIDCOD |
|-----|---------|----|---------|
| 0 | Polygon | 1 | 100 |
| 1 | Polygon | 2 | 200 |
| 2 | Polygon | 3 | 200 |
| 3 | Polygon | 4 | 640 |
| 4 | Polygon | 5 | 200 |
| 5 | Polygon | 6 | 500 |



3. Set the parameters as shown

Add Field

Name:

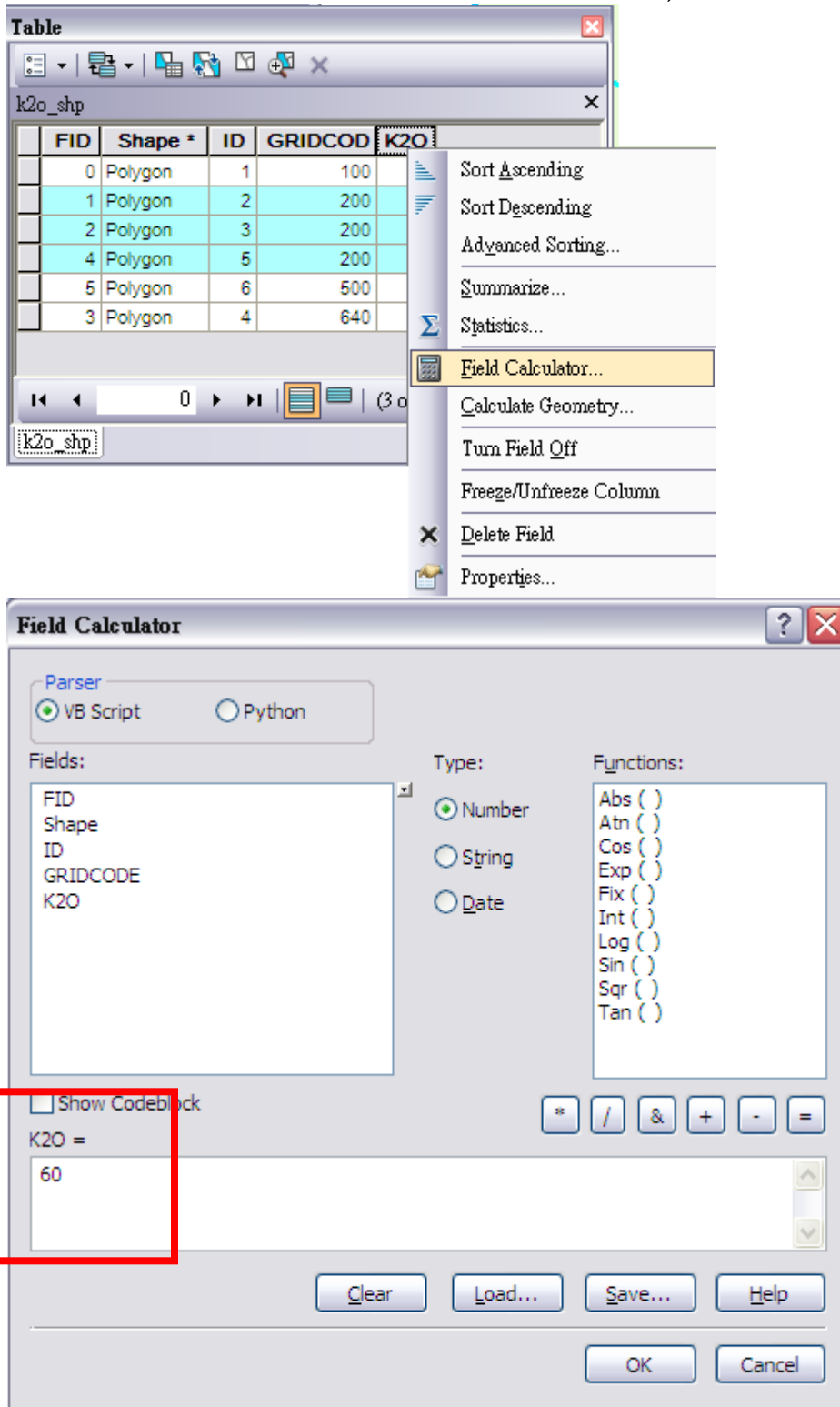
Type:

Field Properties

Precision:

OK Cancel

- Select the three rows containing GRIDCOD = 200 (e.g. $100 \leq k < 200$), then right click on the field name **K20** to launch **Field Calculator**. Give K20 = 60, and then click **OK**.



- Repeat step 4 to set:
 GRIDCOD = 100 (e.q. $k < 100$); $K_2O = 80$
 GRIDCOD = 500 (e.q. $100 \leq k < 500$); $K_2O = 40$
 GRIDCOD = 640 (e.q. $k > 500$); $K_2O = 0$

The screenshot shows a 'Table' window titled 'k2o_shp'. The table contains the following data:

| FID | Shape * | ID | GRIDCOD | K2O |
|-----|---------|----|---------|-----|
| 0 | Polygon | 1 | 100 | 80 |
| 1 | Polygon | 2 | 200 | 60 |
| 2 | Polygon | 3 | 200 | 60 |
| 4 | Polygon | 5 | 200 | 60 |
| 5 | Polygon | 6 | 500 | 40 |
| 3 | Polygon | 4 | 640 | 0 |

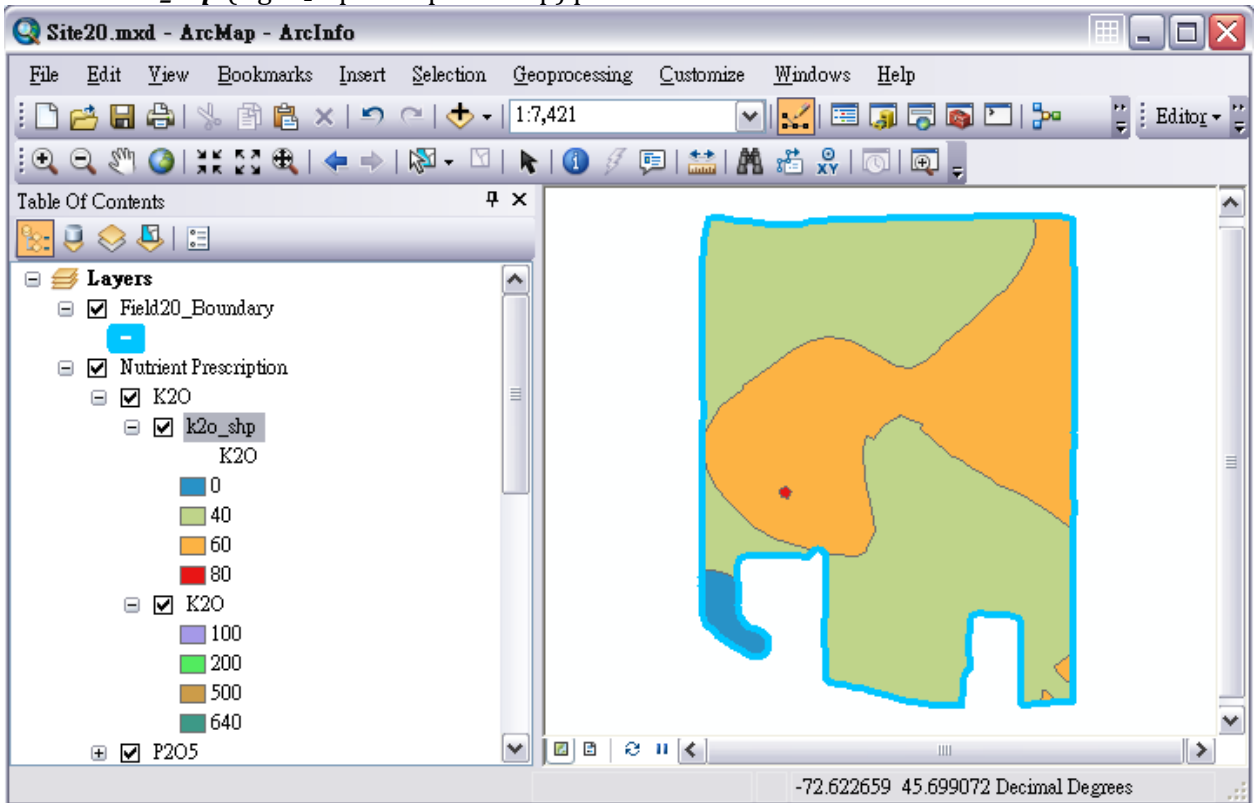
The table has a navigation bar at the bottom showing '4' out of 6 records selected.

- Change **Symbology** of the layer *K2O_shp* as follows.

The screenshot shows the 'Layer Properties' dialog box for the 'K2O' layer. The 'Symbology' tab is active, showing 'Draw categories using unique values of one field.' The 'Value Field' is set to 'K2O' and the 'Color Ramp' is set to a sequential color ramp. The table below shows the symbology categories:

| Symbol | Value | Label | Count |
|----------|--------------------|--------------------|-------|
| [White] | <all other values> | <all other values> | |
| [Blue] | 0 | 0 | ? |
| [Green] | 40 | 40 | ? |
| [Orange] | 60 | 60 | ? |
| [Red] | 80 | 80 | ? |

7. The *K2O_shp* (e.g. K₂O prescription map) presents as:



8. Save the project.