Lesson 3.1: Developing a P fertilizer prescription map

Data Source: dataset3.zip

Part 1: Data Management

- 1. Unzip *Dataset3.zip*, bring in data layers (*Field20_Boundary, Field20_Soil_2008, k, om, pal*) into ArcGIS Pro.
- Right-click on Layers in the Table of Contents to add New Group Layer, name it "Soil Interpolation" and arrange them as shown below. k, om and pal layers are interpolated soil properties from Lesson 2 Exercise 1.
- Right-click on Layers in Table of Contents to add another New Group Layer, name it "Nutrient Prescription". Then add a subgroup named "P2O5" under the group "Nutrient Prescription". In the following steps you can pull the files you create into the appropriate group-layers to make it easier to navigate and avoid clutter.

Part 2: Creating a P_2O_5 prescription map using the **Raster Calculator.**

1. Understand the formula used to estimate the P2O5 prescription.

$$\left\{ egin{array}{l} if rac{P}{Al} > 20 \
ightarrow P_2O_5 \ rate = 0 \ {}^{kg}\!/_{ha} \ if rac{P}{Al} \le 20 \
ightarrow \ P_2O_5 \ rate = \left(20 - {}^{P}\!/_{Al}
ight) imes 4 \ {}^{kg}\!/_{ha} \end{array}
ight.$$

- 2. Search Raster Calculator.
- 3. Generate a P2O5 prescription map by **entering the following map algebra expression** (without any space) in the **Raster Calculator dialog window**.

Int(Con("Soil Interpolation\pal">20,0,(20-"Soil Interpolation\pal")*4))

Meaning of the operators: **Con:** an operator for IF statement **Int:** an operator to convert the values to integer type

4. Change the Output raster file location and name it P2O5_1. A new raster P2O5_1 is added to the Table of Contents.



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Parameters Environments		(?)
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Soil Interpolation\pal	Operators	^
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Int(Con("Soil Interpolation	\pal">20,0,(20-"Soil	ہ ج
<pre>Interpolation\pal")*4))</pre>		~
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		S
Output raster		
P2O5_1		

Part 3: Converting P2O5 prescription map (raster) into a classified polygon layer.

- 1. In **Table of Contents**, right-click on *P2O5_1* layer and then click **Symbology**. Under **Primary Symbology** select **Classify**.
- Change Classes to 12. Make sure to do this before changing the method. Change Method to Manual Interval. This process only changes the classification for visualization. Next, we will create a raster with classes.

Primary symbology		
Classify		
Field	Value	•
Normalization	<none></none>	•
Method	Manual Interval	•
Classes	12	•
Color scheme		

- 3. Search Reclassify (Spatial Analyst Tool).
- In the Reclassify window, change the following inputs and then hit Run: Input Raster : P2O5_1

Reclass Field: Value

New: Change the values in **New** to match the values in **End.** (except for the last which will be 12)

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8	10	10	_	
10	12	12	_	
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Classify Unique			•	
Reclass_P2O51				

5. Search Raster to Polygon.

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6. In the window fill out the following parameters, then hit **Run**:

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arameters Enviror	ments	G
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Reclass_P2O51		× 📔
Field		
Value		~ 资
Output polygon feat	ures	
P2O5_poly		
Simplify polygon	5	
Create multipart f	eatures	
Maximum vertices pe	r polygon feature	

- 7. Right click on the new polygon layer and select **Symbology.**
- 8. Fill out the window as follows:

Graduated Cold	Drs	
Field	gridcode	• 🔀
Normalization	<none></none>	•
Method	Natural Breaks (Jenks)	•
Classes	11	•
Color scheme		

9. Search Clip (Analysis Tool)

10. Fill out the window as follows:

Geoprocessing		~ † ×
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Output Features or Dataset		~



Save your Project. Done!