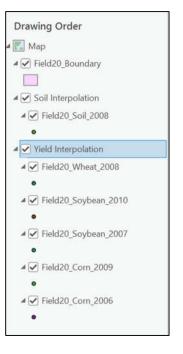
## Lesson 2.1: Interpolating Soil Sampling Data

## Data Source: dataset2.zip

Part 1: Layer management.

- 1. Importing Files
  - a. **Connec**t *Dataset2.zip* to the catalog.
  - b. **Drag** layers into the map: *Field20\_Boundary.shp*
  - c. Right click on **Map** to add **New Group Layer**, name it as **"Soil Interpolation"**.
  - d. Add another group layer and name it as "**Yield** Interpolation".
  - e. Drag *Field20\_Soil2008* to the "**Soil Interpolation**" group.
  - f. Drag Field20\_Corn\_2006, Field20\_Corn\_2009, Field20\_Soybean\_2007, Field20\_Soybean\_2010 and Field20\_Wheat\_2008 to the group "**Yield** Interpolation".



## 2. Labeling the Soil by pH

- a. Right click on Field20\_Soil2008 > Labeling Properties.
- b. In the Label Class tab delete \$feature.Longitude and select pH from the Fields drop down menu. In the Expression box it should now read \$feature.pH. Select Apply.
- c. In the **Position** tab select **Top of point** from the drop-down menu.

Label Class - Field20_Soil_2008 ~ 4 Class 1 Class ~ Symbol Position	Label Class - Field20_Soil_2008 < ∓ ×         Class 1         Class < Symbol         Position	
Title Custom Fields T Functions T ID Abs() PH Acos()	Placement     Top of point     May shift label upon fixed position	6.4 6.2 6.3 6.5 6.6 6.3
Insert Values  Expression Sfeature.pH	Preferred offset 1.0 Maximum offset 100.0 Measure offset from Simplified symbol Orientation Rotation	5.9 5.9 6.3 6.1 7.2 6.6 6.6 6.3 6.5 6.6 6.3

- d. Right click on *Field20\_Soil2008 > Label*.
- e. You should now have a non-interpolated map that looks like the one above.

**Part 2:** Creating interpolated soil property map using Kriging method.

1. In the Analysis tab select Geostatistical Wizard.

Analys	is View	Edit	Imagery	Share He	lp	
Tools	Analysis Gallery ~	Feature Analysis ~	Raster	Data Engineering Suitability Model	er 🍰 Simulation 🛩	<ul> <li>         Neighborhood Explorer     </li> <li>         Geostatistical Wizard     </li> <li>         Business Analysis ×     </li> </ul>
5	Tools	Por	tal		World	dlows

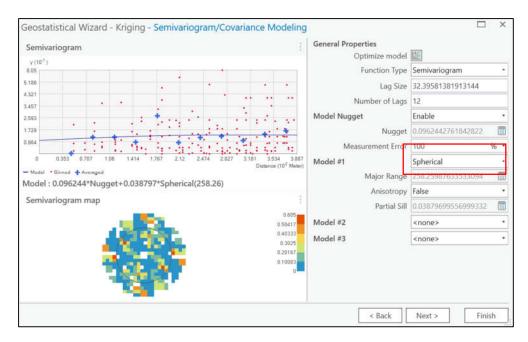
 In Geostatistical Wizard: Choose Kriging/CoKriging method under Geostatistical methods. Source Dataset: *Field20\_Soil\_2008*. Data Field: pH. Click NEXT

Geostatistical Wizard - Kriging / CoKriging		
Geostatistical methods	_ Input Dataset 1	
O Empirical Bayesian Kriging	Source Dataset Field20_Soil_2008	•
EBK Regression Prediction	Data Field pH	*
Kriging / CoKriging	Input Dataset 2	
Areal Interpolation	Source Dataset	•
3D Interpolation	Data Field	•
O Empirical Bayesian Kriging 3D		
Interpolation with barriers		
Kernel Interpolation		

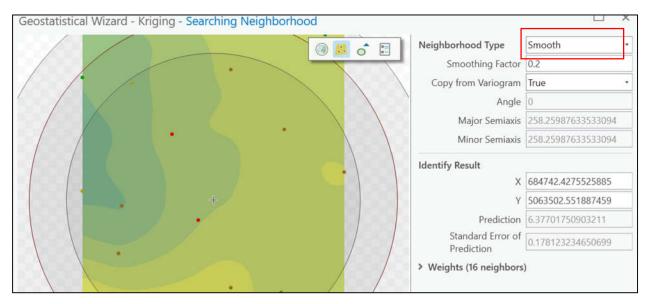
## 3. Change Kriging Type to **Ordinary Kriging ( > Prediction)**, and click **Next**.

Geos	tatistical Wizard - Kriging		
Ordin	ary Kriging	Dataset #1	
• • • • •	Prediction Quantile Probability Prediction Standard Error	Transformation type Order of Trend Removal	
Simple O O O	e Kriging Prediction Quantile Probability Prediction Standard Error		

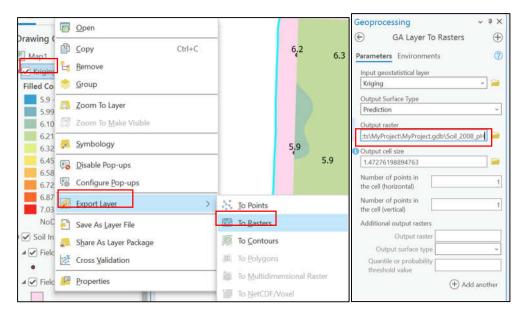
4. Model #1 -> Type = **Spherical**, and click **Next**.



5. Neighborhood type = Smooth, and click Finish. Then press Ok for the method report.



- 6. A temporal interpolated Soil pH raster is added to the map.
- 7. Right click on Kriging in Contents and select Export Layer and To Raster.



8. In the **GA Layer to Rasters** tab, make sure you have the correct input layer and **rename your output raster** to something meaningful. For example, Soil\_2008\_pH\_Kriging\_Interpolated.

Geopro	cessing	~ å ×
Ð	GA Layer To Rasters	$\oplus$
Paramet	ers Environments	?
∽ Outpu	t Coordinates	-
Output	Coordinate System	• •
Geogra	phic Transformations	<b>~</b> 4
Proces	sing Extent	
	2 🗾 🛥 🙃 🖥 👘	- の
Exte	ent of data in all layers	
G	ALayerToRas2	
G	ALayerToRas2	
E G.	ALayerToRas1	
• Ki	iging	
Se	oil Interpolation\Field20_Soil_20	800
Y Pa So	oil Interpolation\Field20_Bound	ary

9. In the Environments tab, in Processing Extent select Field20\_Boundary. Hit Run.

- 10. The layer should appear in your Contents tab. If not, go to Catalog > Databases
   > MyProject.gdb and you should find your layer there. You can then drag it to your contents page.
- 11. Next, search **Clip Raster** in the search bar at the top. A window at the side should open like the one below.
- 12. Input Raster: Soil\_2008\_pH\_Kriging\_Interpolated

Output Extent: Field20\_Boundary

Output Raster Dataset: Soil\_2008\_pH\_Kriging\_In\_Clip

Check Use Input Features for Clipping Geometry.

Hit Run.

13. The resultant raster should be clipped to the Field 20 Boundaries.

Note - Repeat Part 2: Step 1 to 13 to generate maps for OM (Organic Matter), PAI (Ratio of Phosphorus to Aluminum), and K (Potassium) by using Field20\_Soil\_2008 as source layer and

entering the Data Field values as "om", "p\_al\_ratio", and "k\_ppm", respectively.

The results of the four soil maps are shown below (exact symbology may be different but trends should be these).

