

Tutorial Set 2: Data interpolation

Exercise Site20_2-1 Interpolating soil sampling data

Learning objective: Generating soil properties variability maps: Potassium (K), Organic matter (OM), pH, phosphorus to Aluminum ratio (P/Al)

Techniques: Geostatistical Analyst – Ordinary Kriging

Data Source: Dataset2

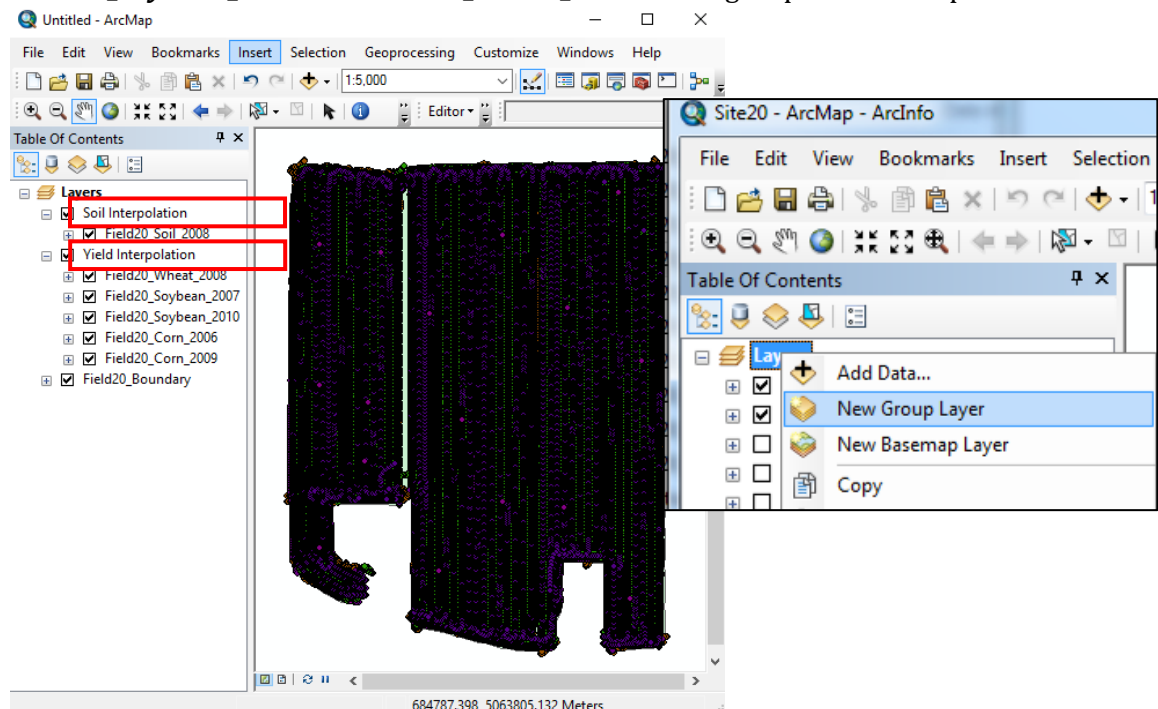
Part 1: Layer management

1. Bring following required layers into ArcMap:

- *Field20_Boundary.shp*
- *Field20_Corn_2006.shp*
- *Field20_Corn_2009.shp*
- *Field20_Soybean_2007.shp*
- *Field20_Soybean_2010.shp*
- *Field20_Wheat_2008.shp*
- *Field20_Soil_2008.shp*

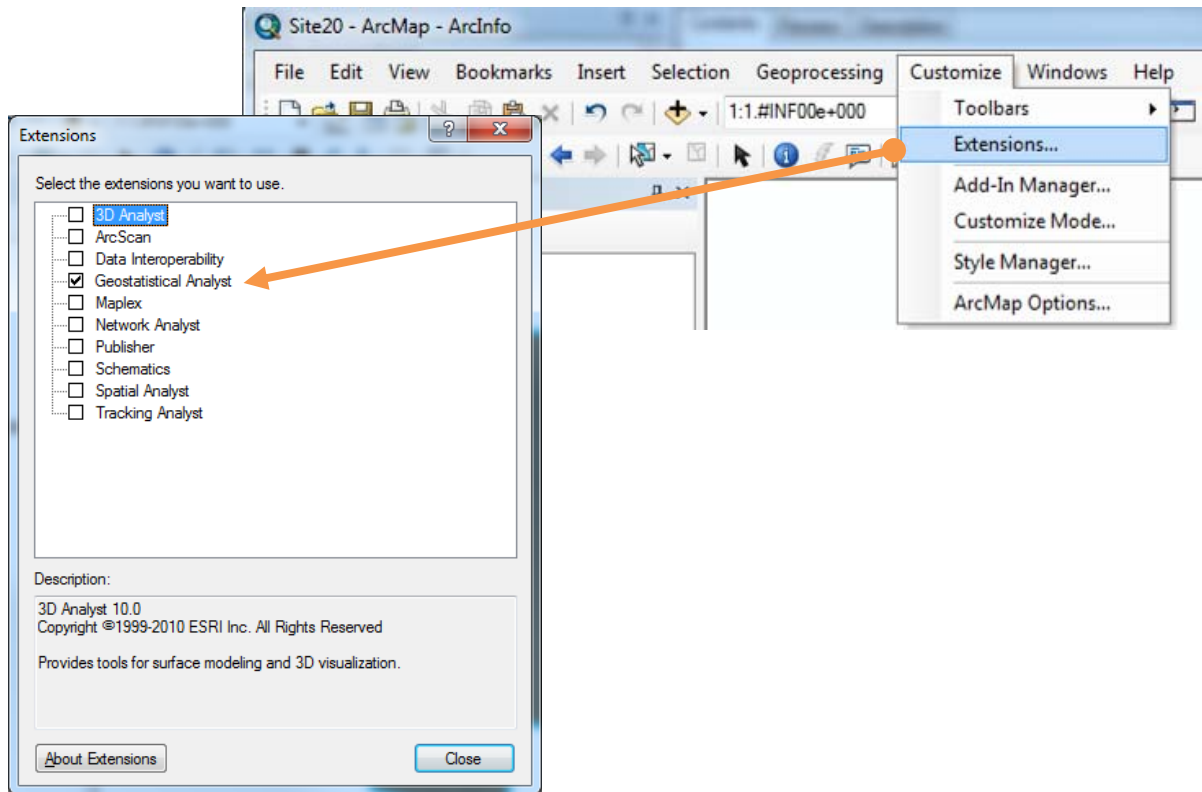
2. In **Table of Contents:**

- Right click on **Layer** to add **New Group Layer**, name it as “Soil Interpolation”.
- Add another group layer and name it as “Yield Interpolation”.
- Move/drag *Field20_Soil2008* to the “Soil Interpolation” group.
- Move/drag *Field20_Corn_2006*, *Field20_Corn_2009*, *Field20_Soybean_2007*, *Field20_Soybean_2010* and *Field20_Wheat_2008* to the group “Yield Interpolation”.

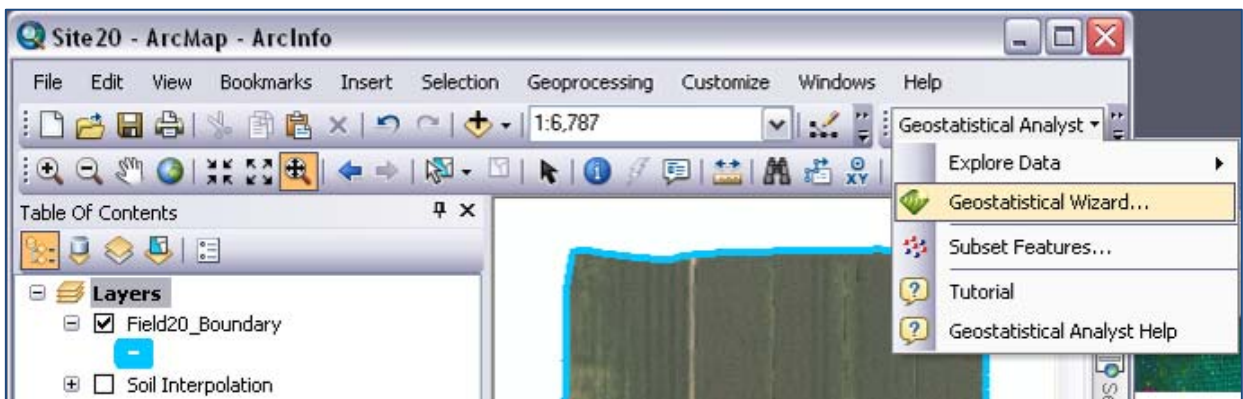


Part 2: Activating the Geostatistical Analyst

1. Go to **Customize > Extensions** to launch **Extension** dialog window and select **Geostatistical Analyst**, then **Close**.
(By default, Geostatistical Analyst is not activated in ArcGIS. You only need to activate once.)

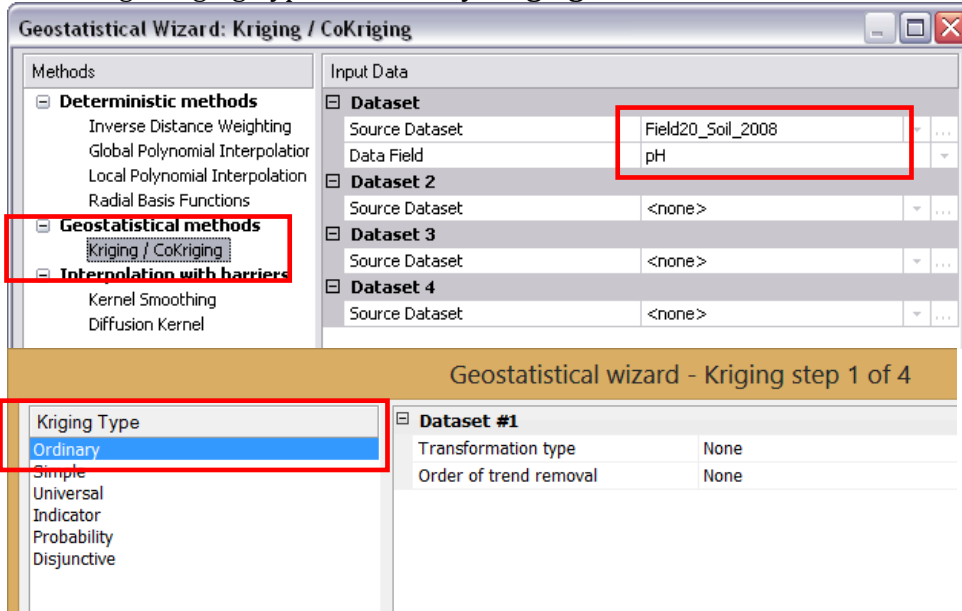


2. Right click on Menu bar to add **Geostatistical Analyst** to the Toolbar.
Then launch **Geostatistical Wizard**.

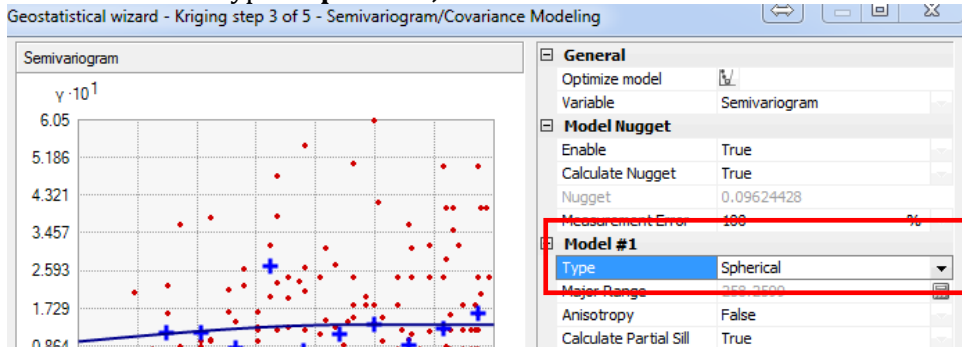


Part 3: Creating interpolated soil property map using Kriging method

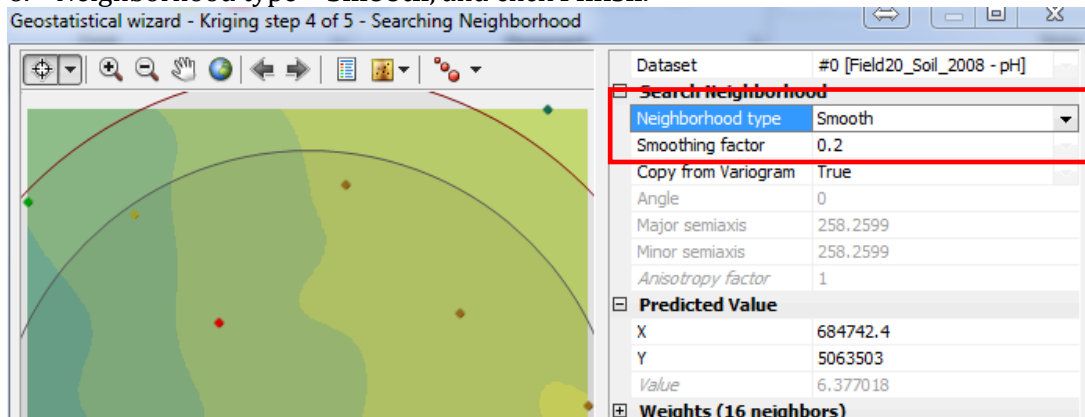
1. In Geostatistical Wizard, choose **Kriging/CoKriging** method.
2. Source Dataset: **Field20_Soil_2008**.
3. Data Field: **pH**
4. Click **NEXT**
Change Kriging Type to **Ordinary Kriging**, and click **Next**.



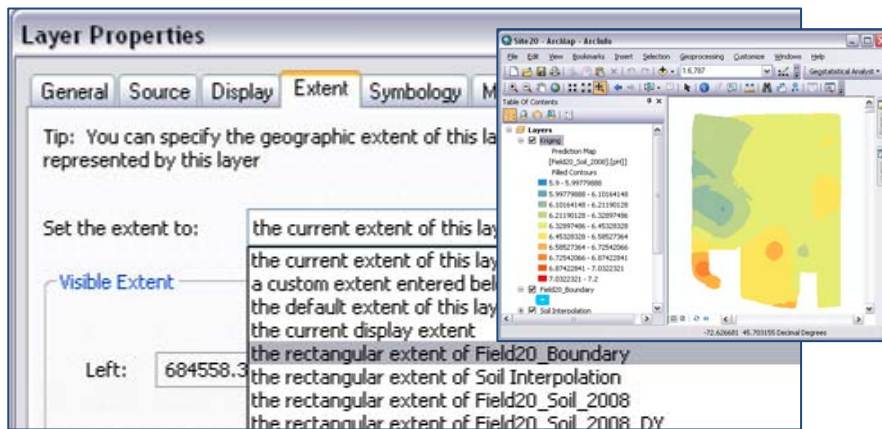
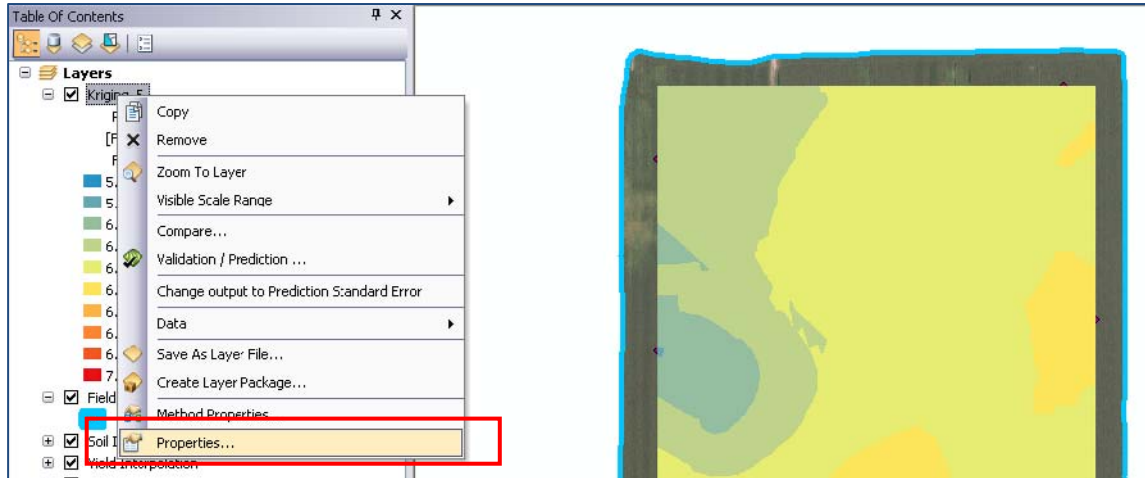
5. Model #1 -> Type = **Spherical**, and click **Next**.



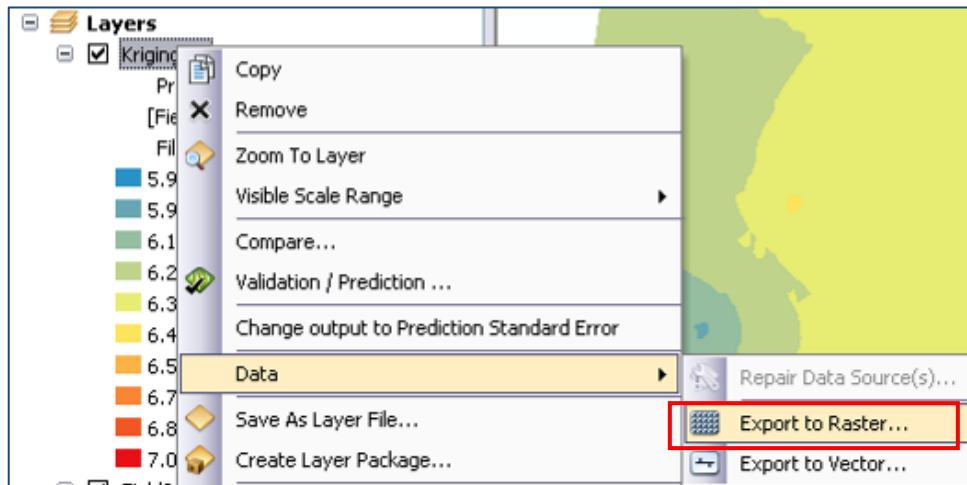
6. Neighborhood type = **Smooth**, and click **Finish**.



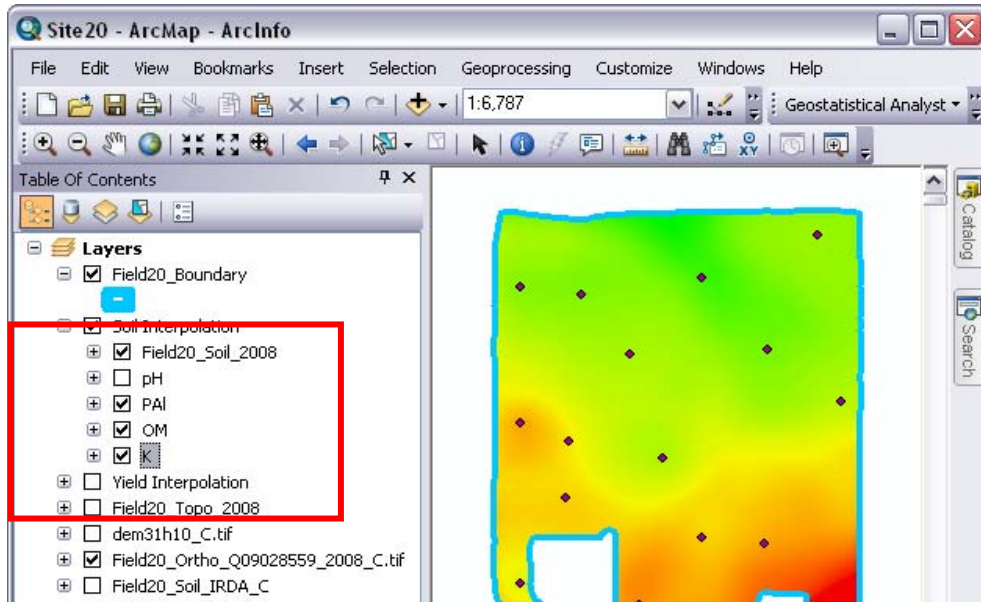
- A temporal interpolated Soil pH raster is added to the map. Right click on the layer **Kriging**, then go to **Properties>Extent** and specify shape to the rectangular extent of to **Field20_Boundary**.



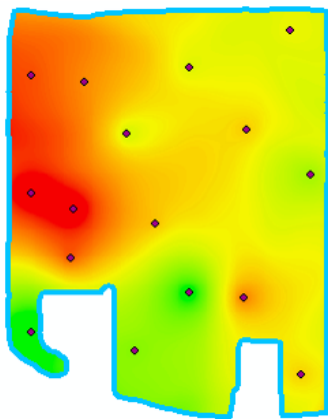
- Go **Layers>Properties>Data Frame>Clip Options>Clip to Shape** and specify shape to **Field20_Boundary**. E.g., Soil PH raster then has the same boundary as **Field20_Boundary**.
- Permanently save the interpolated soil pH map by right clicking on the **kriging** layer > **Data > Export to Raster**.
- Store this map as "**pH**" in the folder Dataset2.
- Right click on the Kriging layer and then remove it from **Table of Content**.



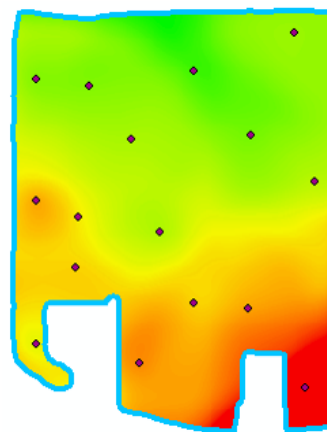
12. Repeat Part 3: Step 1 to Step 10 to generate maps for **OM** (Organic Matter), **PAI** (Ratio of Phosphorus to Aluminum), and **K** (Potassium) by using *Field20_Soil_2008* as source layer and entering the **Data Field** values as “om”, “p_al_ratio”, and “k_ppm”, respectively.
13. Browse through *Dataset2* folder in **ArcCatalog**; there should be four new created rasters: **pH**, **K**, **OM**, and **PAI**. Drag and drop them to **Table of Contents** in ArcMap under the group “Soil Interpolation”.



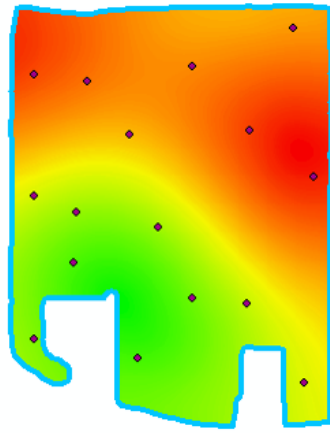
14. Results of the four soil property maps.



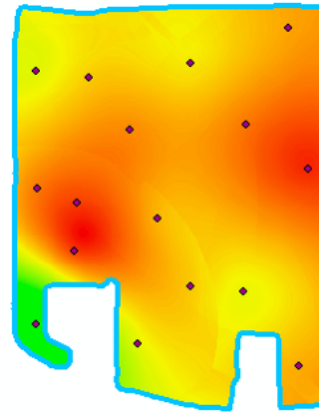
pH



P/Al



OM (%)



K (ppm)

15. Save this project for further exercises.