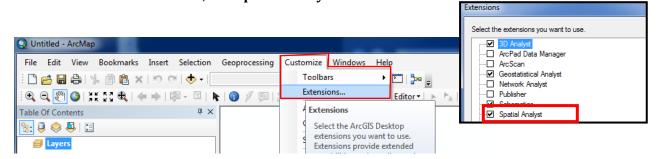
Tutorial Set 2: Data interpolation

Exercise Site20_2-4 Extracting values based on points

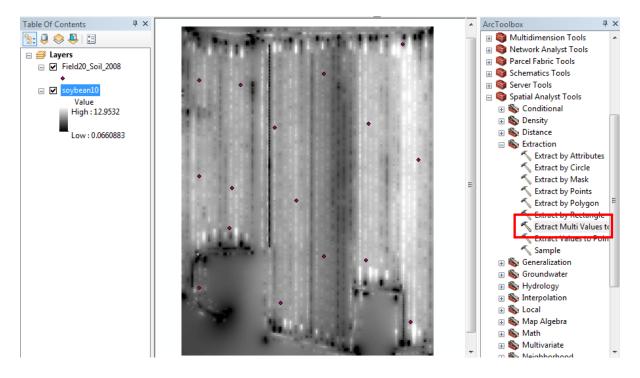
| Learning objective: | Obtaining sensor measured yield at soil sampling locations |
|---------------------|---|
| Techniques : | ArcToolbox - Spatial Analyst Tools - Extraction - Extract Multi |
| | Values to Points |
| Data Source: | Dataset2 |

Part 1: Extracting yield value from interpolated yield map

 Open previously save project (in exercise Site20_2-2) in ArcMap Make sure the layers *Field20_Soil_2008.shp* (vector data) and *soybean10* (raster data) are listed in Table of Content; and Spatial Analyst is activated.



Launch ArcToolbox.
 Go to Spatial Analyst tools > Extraction > Extract Multi Values to Points.



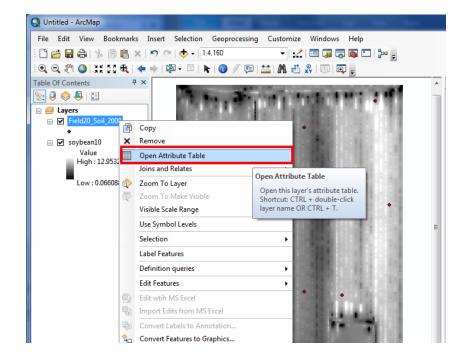
3. In Extract Multi Values to Points dialog windows, set parameters as following:

| K Extract Multi Values to Points | |
|--|-------------------------------------|
| Input point features Field20_Soil_2008 Input rasters | ▼ ≥ |
| Raster | Output field name |
| soybean 10 | soybean 10 |
| | |
| | • |
| | 4 |
| Bilinear interpolation of values at poir | t locations (optional) |
| | |
| | OK Cancel Environments Show Help >> |

Input point features: *Field20_Soil_2008* Input rasters: *soybean10*

Click **OK** to proceed.

4. Once done, right click on the layer *Field20_Soil_2008* and choose **Open Attribute Table**.



5. In the opened attribute table, a new column *soybean10*, containing soybean yield of 2010, is added.

| T | ID | Shape | Longitude | Latitude | ID | pН | Ind_pH | OM | P_ppm | Al_ppm | K_ppm | Ca ppm | Mg_ppm | Sat_K | Sat_Ca | Sat_Mg | CEC | P AI ratio | soybean10 |
|---|----|-------|------------|-----------|----|-----|--------|-----|-------|--------|-------|--------|--------|-------|--------|--------|------|------------|-----------|
| | 0 | Point | -72.624796 | 45.698294 | 1 | 6.3 | 70 | 3.1 | 367 | 626 | 207 | 3290 | 222 | 1.9 | 57.7 | 6.5 | 12.7 | 26.2 | 7.3059 |
| F | 1 | Point | -72.624525 | 45.700735 | 2 | 6.6 | 70 | 2.4 | 247 | 564 | 111 | 3100 | 189 | 1.1 | 58.2 | 5.9 | 11.9 | 19.5 | 8.0452 |
| 1 | 2 | Point | -72.624792 | 45.702488 | 3 | 6.4 | 70 | 3 | 216 | 554 | 201 | 3030 | 347 | 1.8 | 54.1 | 10.3 | 12.5 | 17.4 | 6.9359 |
| 1 | 3 | Point | -72.625583 | 45.701304 | 4 | 6.3 | 70 | 2.4 | 170 | 570 | 164 | 3140 | 342 | 1.5 | 55.2 | 10 | 12.7 | 13.3 | 7.6006 |
| 1 | 4 | Point | -72.625721 | 45.699246 | 5 | 6.1 | 69 | 3.2 | 296 | 698 | 273 | 3200 | 255 | 2.3 | 53.1 | 7.1 | 13.4 | 19 | 7.6244 |
| 1 | 5 | Point | -72.626631 | 45.699325 | 6 | 7 | 74 | 3.5 | 247 | 631 | 229 | 4180 | 197 | 2.2 | 79.9 | 6.3 | 11.7 | 17.5 | 5.9063 |
| 1 | 6 | Point | -72.626513 | 45.702077 | 7 | 6.5 | 70 | 3 | 179 | 570 | 254 | 3880 | 318 | 2 | 60.3 | 8.2 | 14.4 | 14 | 5.8402 |
| 1 | 7 | Point | -72.627608 | 45.701286 | 8 | 6.6 | 70 | 2.7 | 227 | 595 | 181 | 3710 | 350 | 1.4 | 57.6 | 9.1 | 14.4 | 17 | 7.4632 |
| | 8 | Point | -72.627178 | 45.700182 | 9 | 6.3 | 69 | 3.3 | 204 | 747 | 212 | 2960 | 258 | 1.9 | 51.5 | 7.5 | 12.9 | 12.2 | 7.3709 |
| | 9 | Point | -72.627584 | 45.698638 | 10 | 6.6 | 70 | 3.6 | 470 | 915 | 281 | 3480 | 222 | 2.3 | 56 | 5.9 | 13.9 | 22.9 | 6.7074 |
| | 10 | Point | -72.629332 | 45.698906 | 11 | 7.2 | 75 | 3.2 | 258 | 955 | 612 | 3970 | 788 | 5.6 | 70.9 | 23.5 | 12.5 | 12.1 | 5.4735 |
| | 11 | Point | -72.628634 | 45.699794 | 12 | 6.1 | 69 | 3.6 | 388 | 896 | 124 | 2810 | 145 | 1.1 | 49 | 4.2 | 12.8 | 19.4 | 6.4063 |
| | 12 | Point | -72.628555 | 45.700393 | 13 | 5.9 | 68 | 3.7 | 327 | 832 | 123 | 2580 | 177 | 1.1 | 43.3 | 5 | 13.3 | 17.6 | 7.0722 |
| | 13 | Point | -72.629253 | 45.700592 | 14 | 5.9 | 66 | 3 | 523 | 818 | 167 | 2660 | 209 | 1.3 | 39.1 | 5.1 | 15.2 | 28.5 | 6.9154 |
| | 14 | Point | -72.629198 | 45.702035 | 15 | 6.2 | 68 | 2.3 | 245 | 1030 | 282 | 4550 | 874 | 1.6 | 50.5 | 16.2 | 20.1 | 10.6 | 6.2779 |
| | 15 | Point | -72.628302 | 45.701943 | 16 | 6.3 | 69 | 3 | 245 | 679 | 233 | 3250 | 363 | 1.9 | 52.1 | 9.7 | 13.9 | 16.1 | 6.8609 |

Part 2: Exporting attribute table to EXCEL file

- 1. Export this table to EXCEL by clicking on **Table Option > Export ...**
- 2. Save as *Yield_Soil.txt* (Text File).

| Tabl | | | | | | | | | | | | | |
|------|-------------------------------|------------|-------|------------|----------|------------|---------------|----------------------|---------------------------------------|------|------|----|---|
| := | 🖶 + 🖫 🏡 🖄 🐠 🗙 | | | | | | | | | | | | |
| 8 | Find and Replace | | | | | | | | | | | | |
| Í ⊾ | Select By Attributes | de | ID | pН | Ind_pH | OM | P_ppm Al_ppm | | | | | | |
| | Clear Selection | 294 | 1 | 6.3 | 70 | | Saving Data | | | | | | |
| 5 | Switch Selection | 735 488 | 2 | 6.6 6.4 | 70 70 | 2.4 | | | | | | | |
| | Select All | 304 | 4 | 6.3 | 70 | 2.4 | Look in: 🔁 | Dataset2 | - | 🔁 🟠 | - | 84 | E |
| | Select All | 246 | 5 | 6.1 | 69 | 3.2 | | | · · · · · · · · · · · · · · · · · · · | , | | | |
| | Add Field | 325 | 6 | 7 | 74 | 3.5 | | | | | | | |
| | Turn All Fields On | 077 | 7 | 6.5 | 70 | 3 | | | | | | | |
| ~ | Show Field Aliases | 286 | 8 | 6.6 | 70 | 2.7 | | | | | | | |
| | | 182 | 9 | 6.3 | 69 | 3.3 3.6 | | | | | | | |
| | Arrange Tables | 638 906 | 10 | 6.6 7.2 | 70 75 | 3.6 | | | | | | | |
| | Restore Default Column Widths | 794 | 12 | 6.1 | 69 | 3.6 | | | | | | | |
| | Restore Default Field Order | 393 | 13 | 5.9 | 68 | 3.7 | | | | | | | |
| | | 592 | 14 | 5.9 | 66 | 3 | | | | | | | |
| | Joins and Relates | 035 | 15 | 6.2 | 68 | 2.3 | | | | | | | |
| | Related Tables | ▶ 943 | 16 | 6.3 | 69 | 3 | | | | | | | |
| dh | Create Graph | | | | | | | | | | | | |
| | Add Table to Layout | it of | 16 Se | lected | D) | | Ĺ. | | | | | | _ |
| З | Reload Cache | | | | | | Name: | Yield_Soil | | | | l | _ |
| a | Print | | - | 10/ | • | | Save as type: | File and Personal G | eodatabase tal | bles | - | | |
| | Reports | • | | 12 | 1.1.1 | | | File and Personal Ge | eodatabase tab | oles | | | |
| | Export | | 24 | | 1000 | 1 | | dBASE Table | | | | | _ |
| | | | | | 100 | | | Info tables | | | | | |
| | Appearanc Export | | | and is | | 1 | | Text File | anies. | | | | |
| | | | | | | | | SDE tables | abica | | | | |
| | Exports the table to | a new tab | le. | | | | | | | | | 3 | |

3. Launch EXCEL. Open the *Yield_Soil.txt* file.

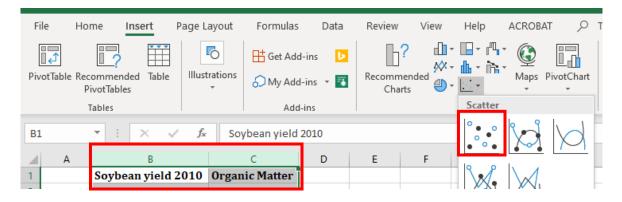
| Open | See. | 4427 | S. A. 10 | 6-1- | | ? × |
|------------------------|--------------------|---------------|----------|-----------|-----------|----------------|
| Look in: | 퉬 Dataset2 | | - 🚱 | 🗖 🔇 🗙 🛛 | 🍟 🏢 🔻 Too | ļs 🔻 |
| | Name | Date modified | Туре | Size | | |
| My Recent Documents | info Yield_Soil | | | | | |
| Desktop | | | | | | |
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| My Computer | | | | | | |
| My Network | File <u>n</u> ame: | | | | • | <u>O</u> pen • |
| Places | Files of type: | Text Files | | | • | Cancel |

4. Import the text file as **Delimited** and delimiters as **Comma**.

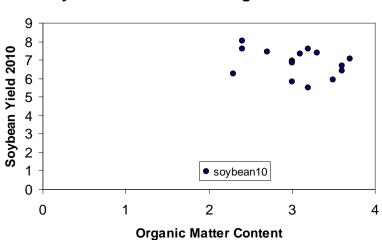
| Text Import Wizard - Step 1 of 3 | |
|--|--|
| | data type that best describes your data. ur data: commas or tabs separate each field. |
| | columns with spaces between each field. |
| Start import at <u>r</u> ow: <u>1</u> | File <u>o</u> rigin: 437 : OEM United States |
| Preview of file E:\Adamchuk_drive_2014082 | 21\PROJECT\Class\Projects\\Yield_Soil.txt. |
| 2 0,-72.62479600000003,45.698 3 1,-72.62452500000006,45.700 | <pre>X, Ind_pH, OM, P_ppm, Al_ppm, K_ppm, Ca_ppr 293999999997, 1.00000000000000, 6.30 73500000002, 2.000000000000, 6.60 488000000002, 3.0000000000000, 6.40</pre> |
| | ext Import Wizard - Step 2 of 3 |
| | This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below. |
| | Delimiters Image: Tab Image: Space Image: Space <t< td=""></t<> |
| | Data <u>p</u> review |
| | FID Longitude Latitude ID pH 0 -72.62479600000003 45.69829399999997 1.00000000000000000 6.31 1 -72.62452500000006 45.700735000000002 2.00000000000000000 6.4 2 -72.625583000000006 45.70130400000000 3.000000000000000000000000000000000000 |
| | Cancel < <u>B</u> ack <u>N</u> ext > <u>F</u> inish |

Part 3: Plotting correlation between yield and soil property

1. Select the two targeted columns in the excel and insert a Scatter plot



2. Produce a XY (Scatter) chart to observe the relationship between sensor-based measurement (e.g., Soybean yield 2010) and soil properties (e.g., Organic Matter).



Soybean Yield 2010 v.s. Organic Matter