Review and pull soil data for test locations of corn - HWSD-global set

Notebook:	Computomics		
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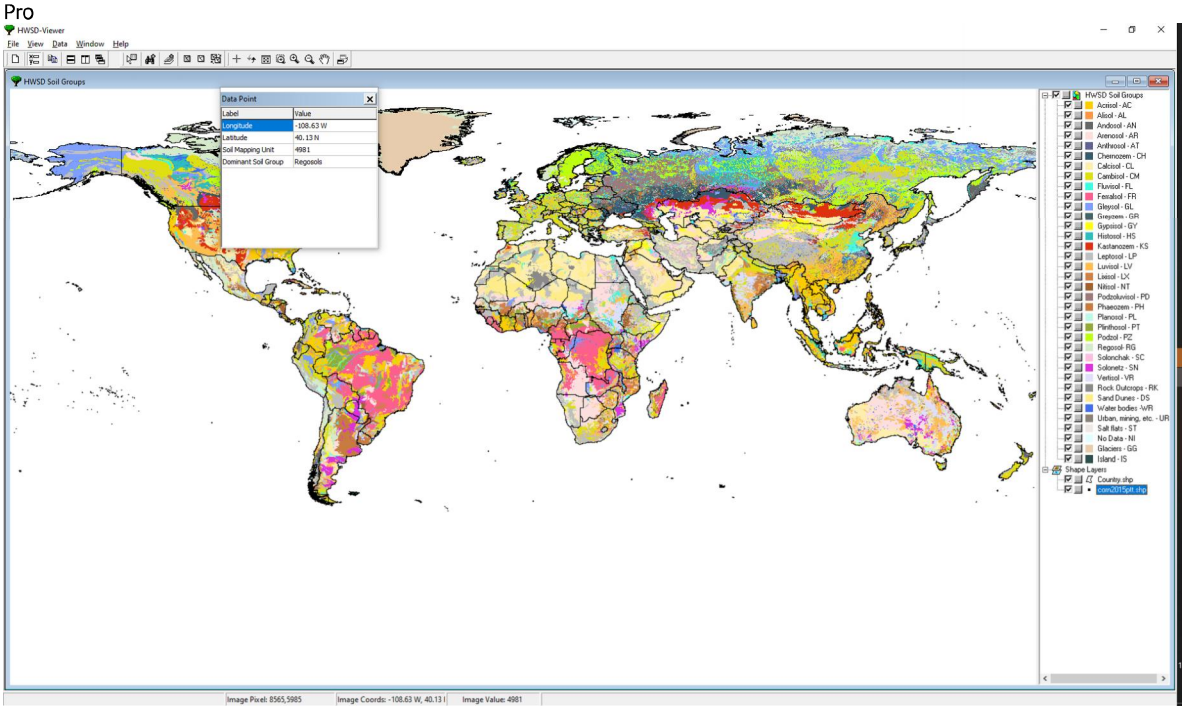
- HWSD-Viewer

Workflow:

☑ Downloaded and extracted Soil Viewer and the datasets ~2 Gb

☑ Installed viewer to quickly explore data (note the coverage and list of soil types) - the data can be pulled as a table of soil properties under Lat/Lon - note: format of geographical coordinates is different than in given data set of 28 corn trial data.

☑ Extracted one .bil (raster grid format for the map) and 2 MS Access dbase files to link with trial data and explore in ArcGIS Pro



How HWSD works

The HWSD is composed of a raster image file and a linked attribute database. The raster database consists of 21600 rows and 43200 columns, of which 221 million grid cells cover the globe's land territory.

Each grid cell in the database is linked to commonly used soil parameters, namely, organic carbon, pH, water storage capacity, soil depth, cation exchange capacity of the soil and the clay fraction, total exchangeable nutrients, lime and gypsum contents, sodium exchange percentage, salinity, textural class, and granulometry. HWSD allows soil compositions to be displayed or queried in terms of user-selected soil parameters.

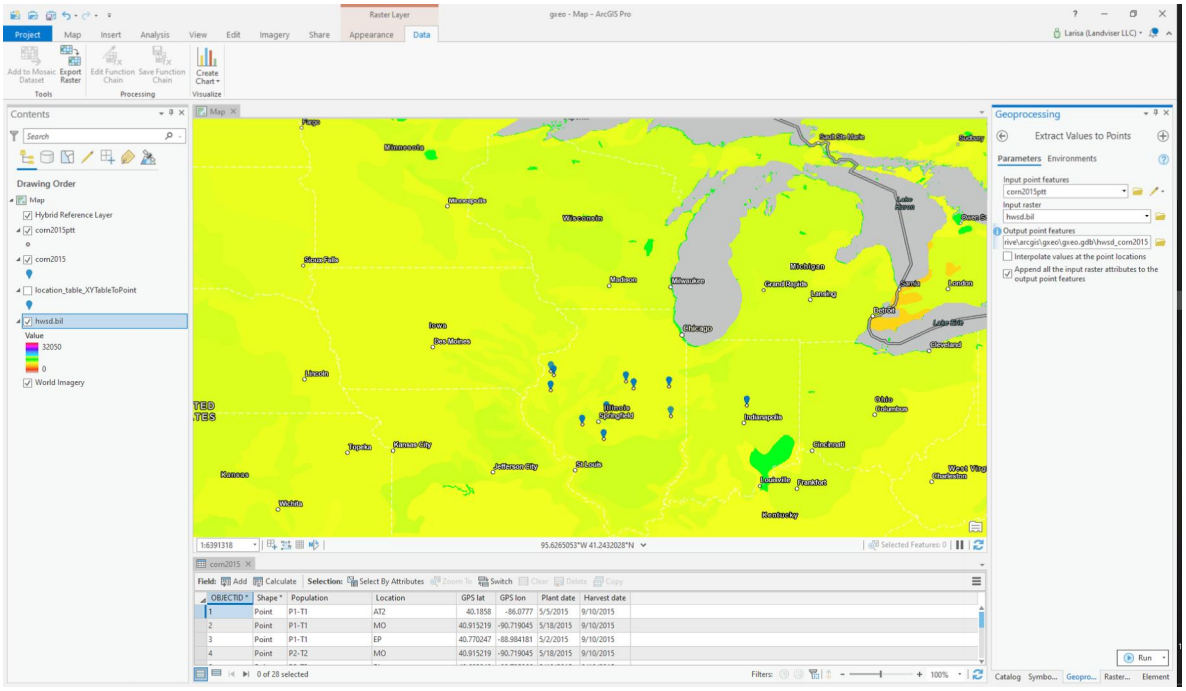
The HWSD Viewer allows soil association compositions to be displayed or queried in terms of user-selected soil parameters, and it provides a geographical tool to query and visualize the database. For modeling, the HWSD and its geographical layer can directly be read or imported by common GIS and Remote Sensing software.

The HWSD allows the soil components and attributes to be seen at a high level of spatial resolution at the global scale.

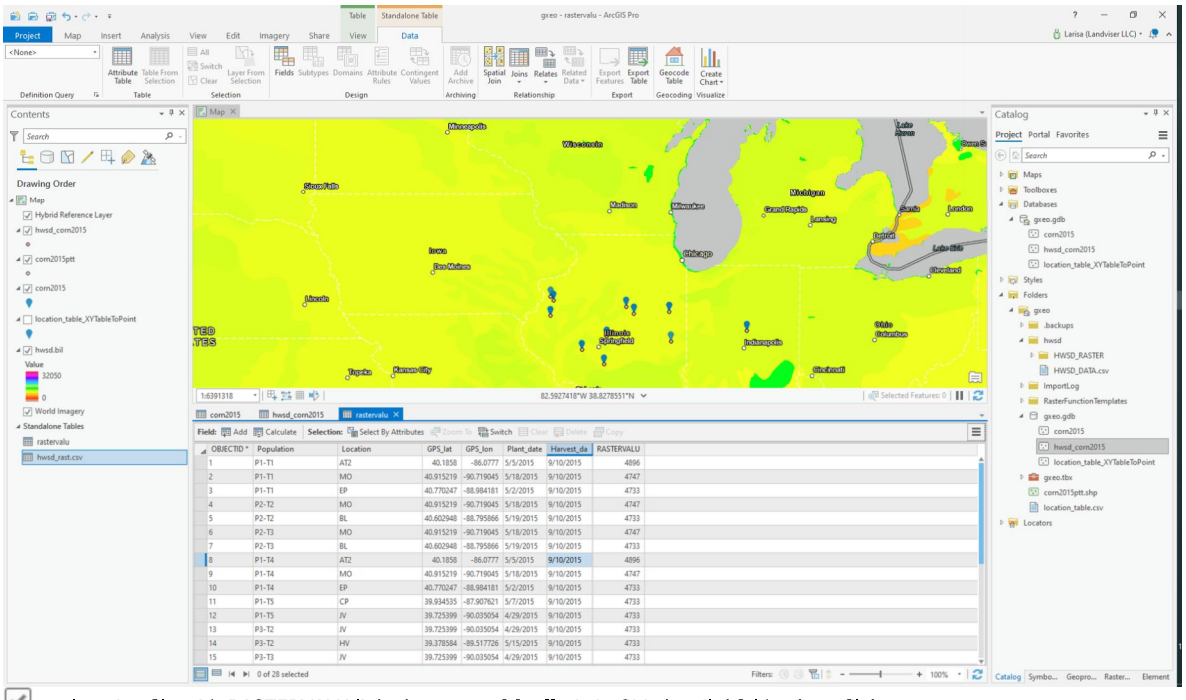
gxeo - Map - ArcGIS Pro

☑ see below soil grid data and mapped locations of corn trial supplied (there are 28 entries, but only 10 unique locations - there 2015-2016 data, which is relevant to weather data, but not for soil

bigger and more diverse spatial dataset is desired to really capture the EO effect, the workflow can accept as many geo-located data as available in one table and link with soil .bil file (manual, but API can be developed)



☑ HWSD .bil file has arbitrary numbers - ids of global soil mapping units to link with Access dbase of soil properties
☑ spatial joint performed in GIS software - only 3 different soil IDs present for 10 location in test

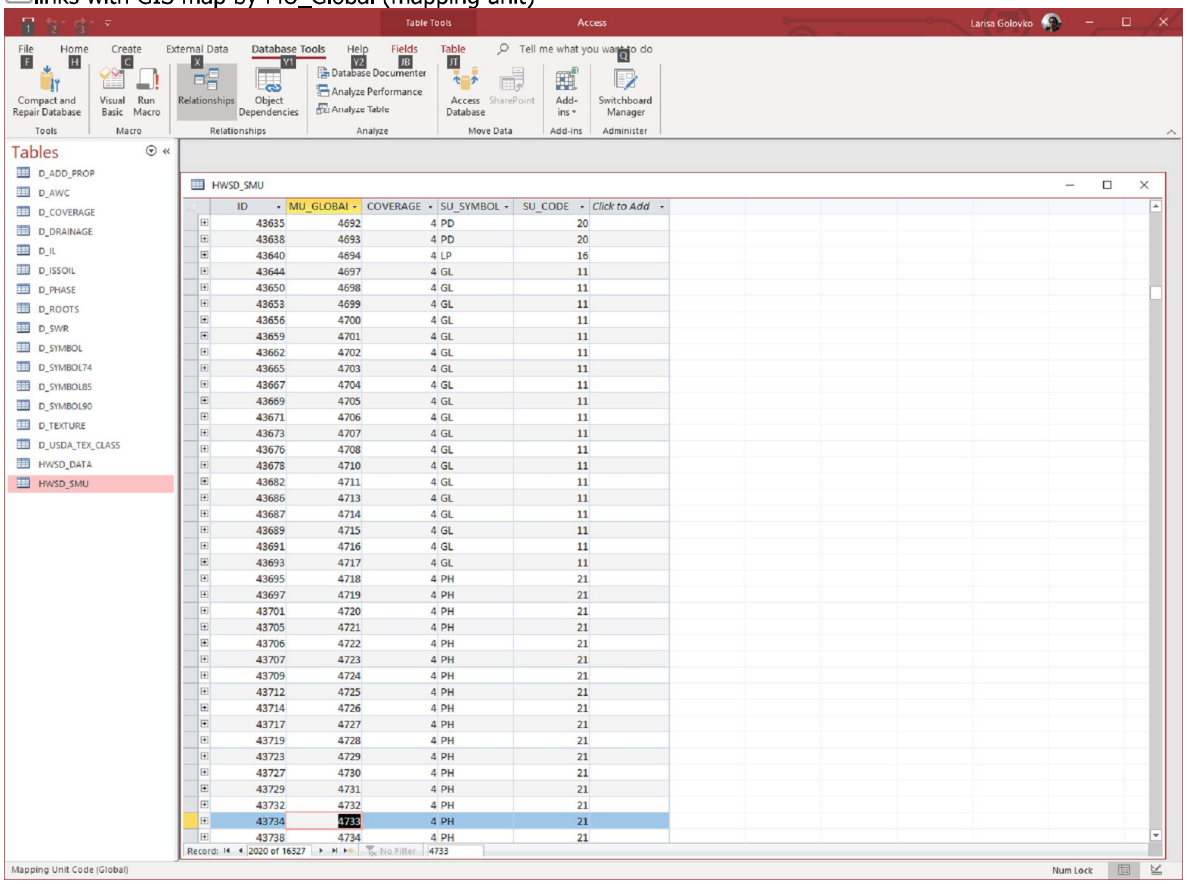


☑ test location file with RASTERVALU linked **geographically** is in GitLab soils/ folder (.csv file)

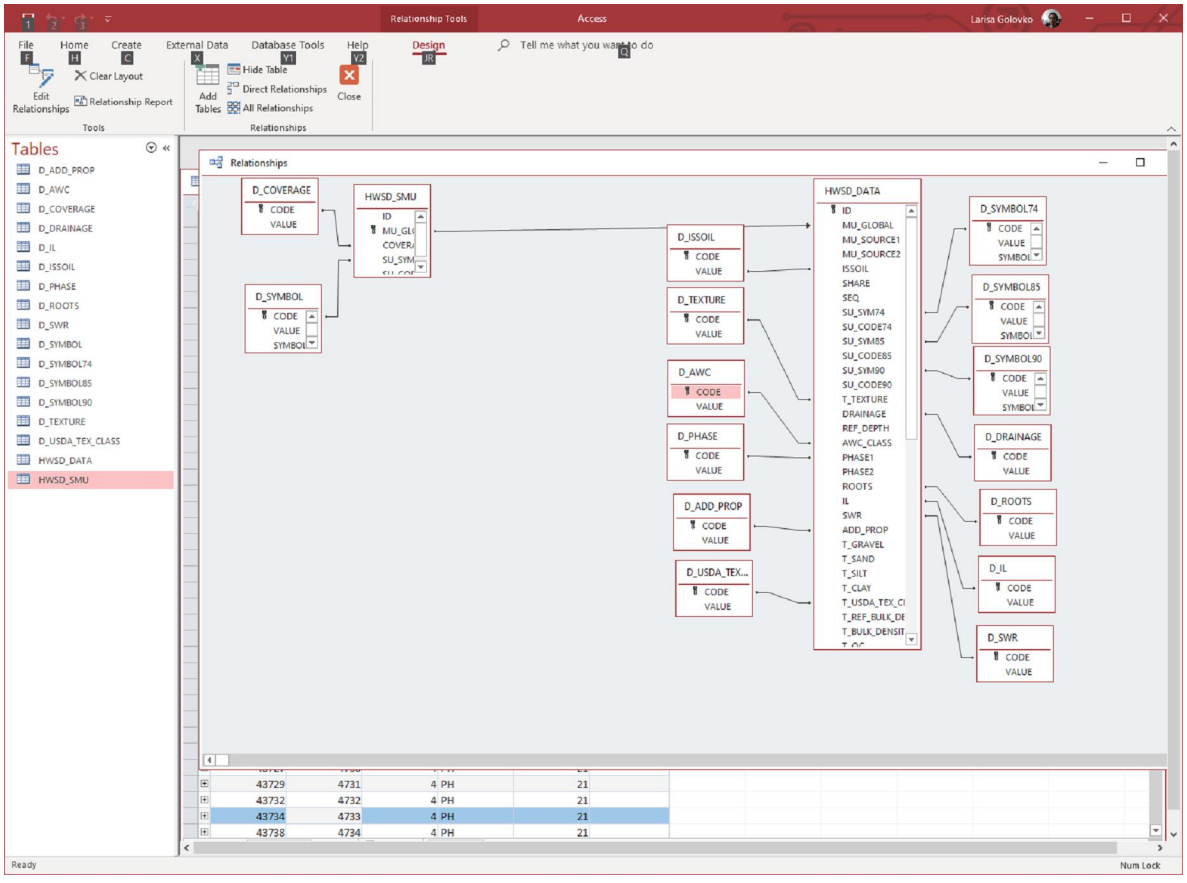
MS Access - HWSD : Database- C:\Users\laris\OneDrive\arcgis\gxeo\hwsd\HWSD.mdb (Access 2000 file format)

Overview of MS Access soil dbase:

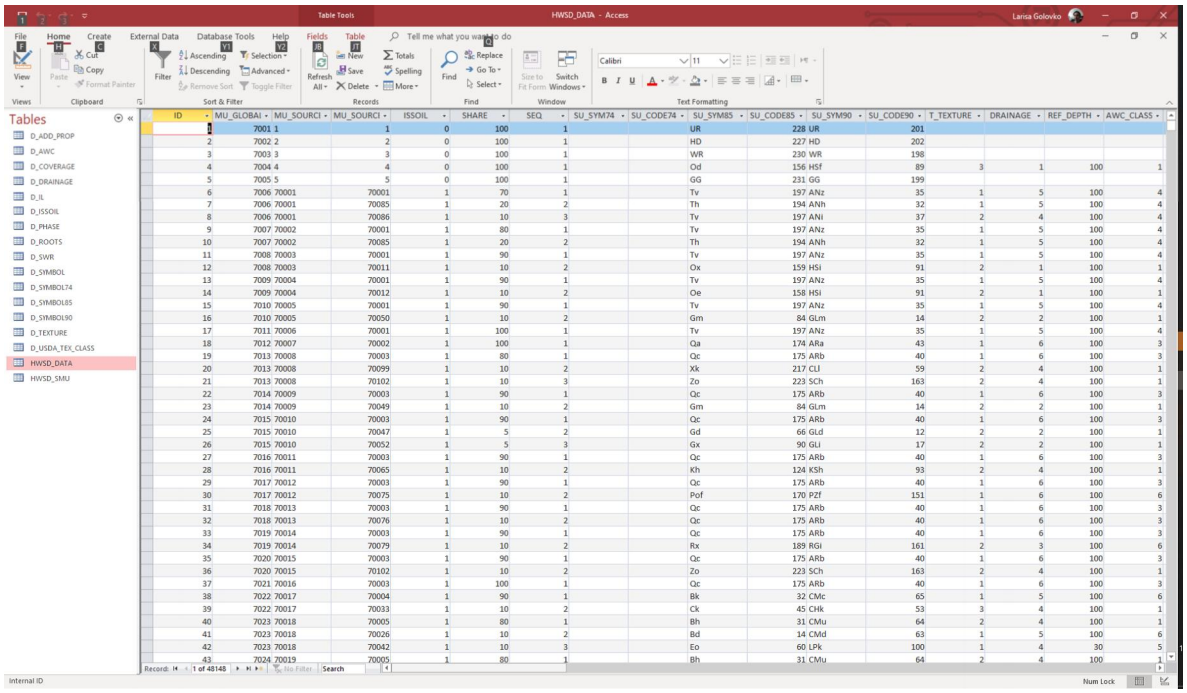
☑ links with GIS map by MU_Global (mapping unit)



☑ review graphical relationships between tables in dbase

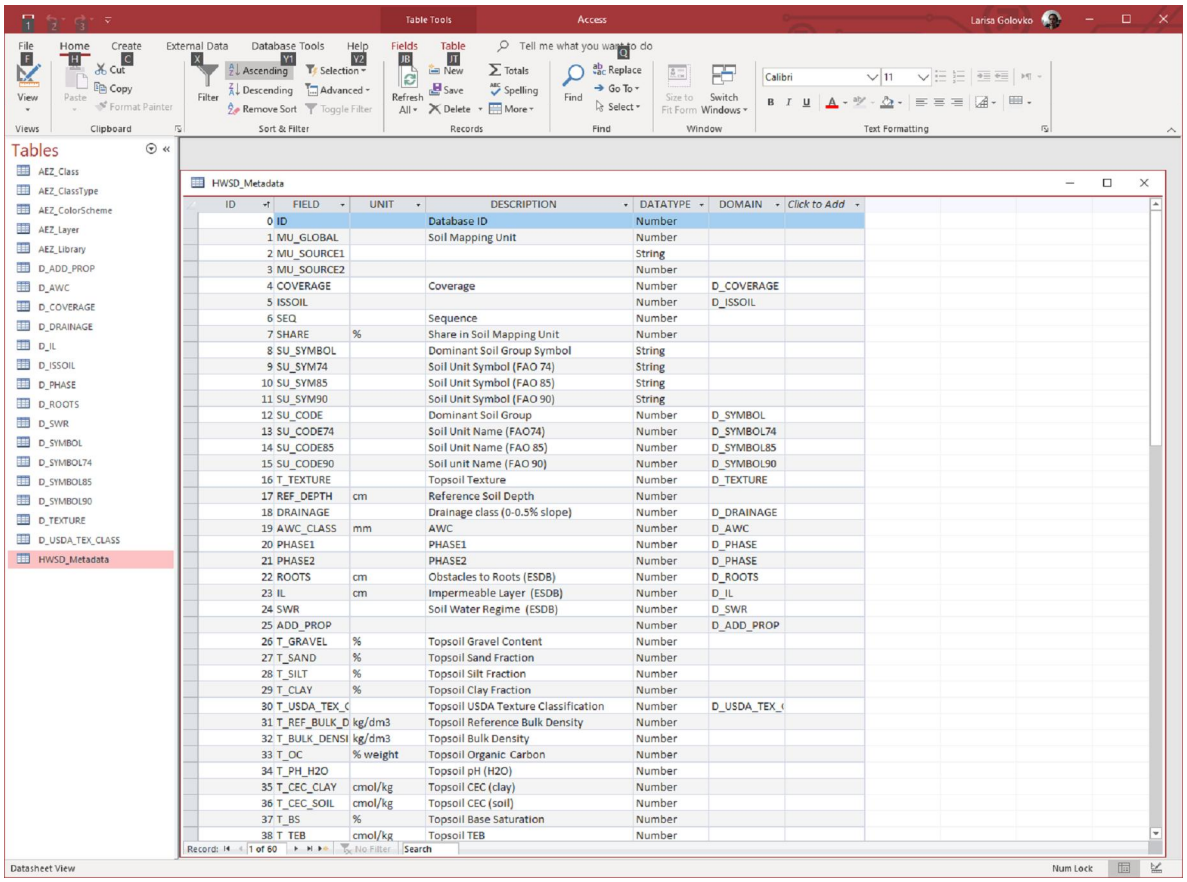


☑ key table with all soil properties -> extracted as standalone Excel and posted on GitLab in /soils folder



Access - HWSD_META : Database- C:\Users\laris\OneDrive\arcgis\gxeo\hwsd\HWSD_META.mdb (Access 2000 file format)

☑ whole another MS Access dbase is given for explaining METADATA about soils
☑ exported as Excel file and posted in Gitlab in **soils/**



Next steps:

- [ ] I can link those files together in Pandas, or you can grab those yourself, but we would only have 3 different soils (and properties) for this test set -
- [ ] looking for different sets/crops, approaching my contacts for:
  - [x] Columbia: oil palms, rice
  - [ ] USA: cranberries, blueberries
  - [ ] Russia: rice?
- [ ] Do you have bigger sets?
- [ ] review HWSD data set in more details - which properties would be of importance to different crops/scenarios, literature review
- [ ] explore SSURGO data for more detail soils info (only applicable to US)
- [ ] develop API for soil data spatial pull aside from ESRI software (although landviser now is a partner and actually the use /incorporation of their modules could be beneficials for exposure and marketing our solution to other companies)