# Applying digital SSURGO soils to county-wide tax assessment of agricultural land



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## Soils are complicated





SSURGO soils database contains many "one to many" relationships

- Most map units contain more than one component
- Most components have multiple horizons
- Many horizons contain many different kinds and sizes of fragments

Ultimately, need to create one value for each map unit for display and analyses- requires decisions on how to accumulate soils data, often through weighted averaging

## What is the % clay for this soil map unit in upper 50cm?



Calculate a weighted average of the 2 soil components, each w/ 3 horizons above 50cm:

 $((15/50)^*.15) + ((15/50)^*.1) + ((20/50)^*.05)^*.35 + ((20/50)^*.25) + ((15/50)^*.1) + ((15/50)^*.15))^*.65 = 0.147$ 



Soil survey contains many soil properties, interpretations and classifications

## Possible to assess agricultural land using Non-Irrigated Capability Class which shows the suitability of soils for producing crops

#### Capability Legend

Increased Limitations and Hazards

Decreased Adaptability and Freedom of Choice Users

	Land, Capability								
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Poor soils	'Wild Life'			•		•	•		•
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Best ag soils	Very Intense								
	Caralan Cublication								

#### Capability class I





### Capability class III or IV

These soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.





## Capability class IV or V Soils are subject to little or no erosion but have other limitations that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat

#### **Capability class VI**

Soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat





## Soil maps are easily created in GIS software using digital soils data (SSURGO) and the USDA-NRCS tool <u>Soil Data Viewer</u>



**Soil Data Viewer** tool that runs as an extension within ArcMap (not currently available for ArcGIS Pro) <u>https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2\_053614</u>



## SDV- few things to note....

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## SDV- few things to note....

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## SDV- final note ....

Left side shows available soil interpretations, features, physical and chemical properties

Here is the Land Capability Class

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## County digital soils data available for download from USDA-NRCS Web Soil Survey https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Natural Resources Conservation Service										
Contact Us   Subscribe 🔊   Archived Soil Surveys   Soil Survey Status   Glossary   Preferences   Link   Logout   Help										
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Extracted SSURGO contains spatial and tabular folders and Access database which will link the two

#### **Open Access file**

Import dialog box copy/paste path How of Understand and Use this Database of SSURGO tabular data folder Report - Interp Rating - Interp 1 Report - Interp Rating - Interp 2



#### Albemarle County SSURGO data: Non-irrigated Capability Class



#### Boar's Head Resort area- overly county parcel layer



#### Now, use GIS tool to calculate area within each Capability class for each parcel



#### Resulting table shows area and percent of each soil capability class per parcel



#### Summary:

- SSURGO soils data and the Soil Data Viewer tool make creating interpretive soil layers by county <u>simple</u> and <u>straightforward</u>
- Non-irrigated capability class layer shows the suitability of soils for most kinds of field crops without significant interventions or modifications
  Numbers 1 through 8; progressively greater limitations
- GIS tools allow for overlay of parcel boundaries and calculation of area and percent in each capability class per parcel
  - Implications for reasonable and fair tax assessment based on soil potential productivity

# **Questions?**





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