Ag-Analytics

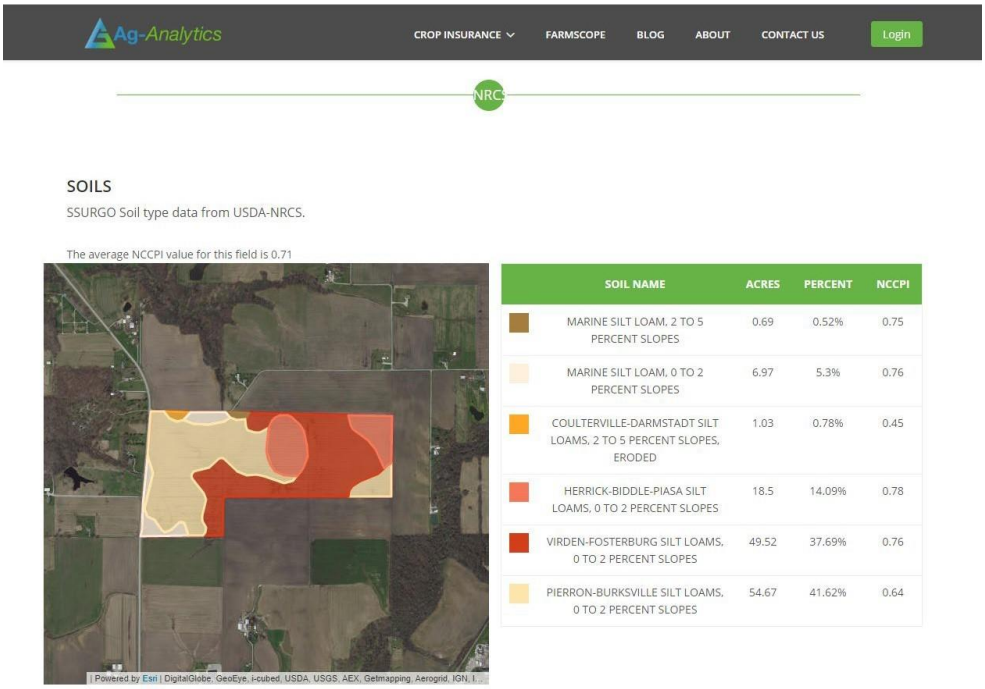
SURGGO Soils API Documentation

2019

Overview

The SURGGO Soils API provides soil type and average of the soil type attribute (e.g., NCCPI) by field for a shape entered. This API uses GET request with a subscription key, but we can also provide POST request endpoint. Soil Type data is derived from NRCS USDA; average soil type attribute data are available for processing for the continental USA. It uses data provided by the USDA, which can be downloaded from http://sdmdataaccess.nrcs.usda.gov. Those soil type attributes contain both numerical data type and categorical (ordinal) data type, which can be found from the links in the reference.

This API is utilized to drive the Ag-Analytics SURGGO soil panel below, for illustration. Area calculations from the API are provided in square meters and can be easily converted to acres on the front-end. The API Response contains shapes/features in ESRI JSON format, as well as the calculated metric (e.g., National Commodity Crop Productivity Index) and areas of each shape, the soil type name, the area for the sums of each soil type across all features for display in the table, metadata related to projection and other information. This API can be easily called and mapped using any standard front-end JavaScript mapping library (e.g., Leaflet).



SSURGO Soil Type Example

References

https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1241114&ext=pdf
https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1241115&ext=pdf
https://prod.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052165.pdf
https://sdmdataaccess.sc.egov.usda.gov/documents/TableColumnDescriptionsReport.pdf

API Specifications

Header Parameters

Ocp-Apim-Subscription-Key: Given upon purchase.
This key is necessary to access the API and should be passed as a Header.

IP Address Throttling: The single client IP address is restricted to 5 calls every minute, with a total of 500 calls and 10,000 kilobytes of bandwidth per month.

Execute Type: GET

API URL:
https://ag-analytics.portal.azure-api.net/docs/services/ssurgosoil/operations/get-request- ssurgo-soils

Request URL:
https://ag-analytics.azure-api.net/ssurgosoil/get[?inputShape][&inputFields]

Execute Type: POST

API URL:
https://ag-analytics.portal.azure-api.net/docs/services/ssurgosoil/operations/post-request-ssurgo-soils?

Request URL:
https://ag-analytics.azure-api.net/ssurgosoil/post

Request Parameters For GET API

inputShape *(ESRI Polygon shape):* The inputShape should have the **Albers ("wkid": 5070)** spatial reference. The shape information for field is **esriGeometryPolygon** format. Standard open source JavaScript front-end libraries (e.g., Leaflet) can be used to structure the shape. See example request below, in which "spatialReference": {"wkid": 5070} is required.

- Example: { "geometryType": "esriGeometryPolygon", "spatialReference": {"wkid": 5070}, **<- Must be Albers**
  "features":[{"geometry":{"rings":[[[-89.311086,40.265971],[89.311026,40.263477],[-89.310869,40.263278],[89.310224,40.263128],[-89.309801,40.262867],[-89.311416,40.259366],[-89.313941,40.259364],[-89.314186,40.259196],[-89.314285,40.265951],[-89.311204,40.265976],[-89.311086,40.265971]]],"spatialReference":{"wkid":4326}}}] **<- Can be any projection**

inputFields *(string):* The metrics to return with the format **"TableName_SoilTypeName". *f***

(string): Response format, default is **JSON**.

env:outSR *(Output Spatial Reference)*: **4326**. The well-known ID of the spatial reference of the output geometries. If the env:outSR is not specified, the output geometries are in the spatial reference of the input geometries. If env:processSR is specified and env:outSR is not specified, the output geometries are in the spatial reference of the process spatial reference.

env:processSR *(Optional)*: The well-known ID of the spatial reference that the model will use to perform geometry operations. If env:processSR is specified and env:outSR is not specified, the output geometries are in the spatial reference of the process spatial reference. **ReturnZ:** Default is False

ReturnM: Default is False

Request Body For POST API

***In an HTTP POST request, the parameters are sent in the request body, in the format that the content type specifies:

Content-type: application/x-www-form-urlencoded.

Request Body: the same format as the query string: parameter=value&also=another

- Example: inputShape={"geometryType":"esriGeometryPolygon", "spatialReference": {"wkid": 5070}, "features":[{"geometry":{"rings":[[[-89.311086,40.265971],[-89.311026,40.263477],[-89.310869,40.263278],[-89.310224,40.263128],[-89.309801,40.262867],[-89.311416,40.259366],[-89.313941,40.259364],[-89.314186,40.259196],[-89.314285,40.265951],[-89.311204,40.265976],[-89.311086,40.265971]]],"spatialReference":{"wkid":4326}}}]}&inputFields=valu1_nccpi2all&env:outSR=4326&env:processSR=&returnZ=false&returnM=false&f=pjson

Example

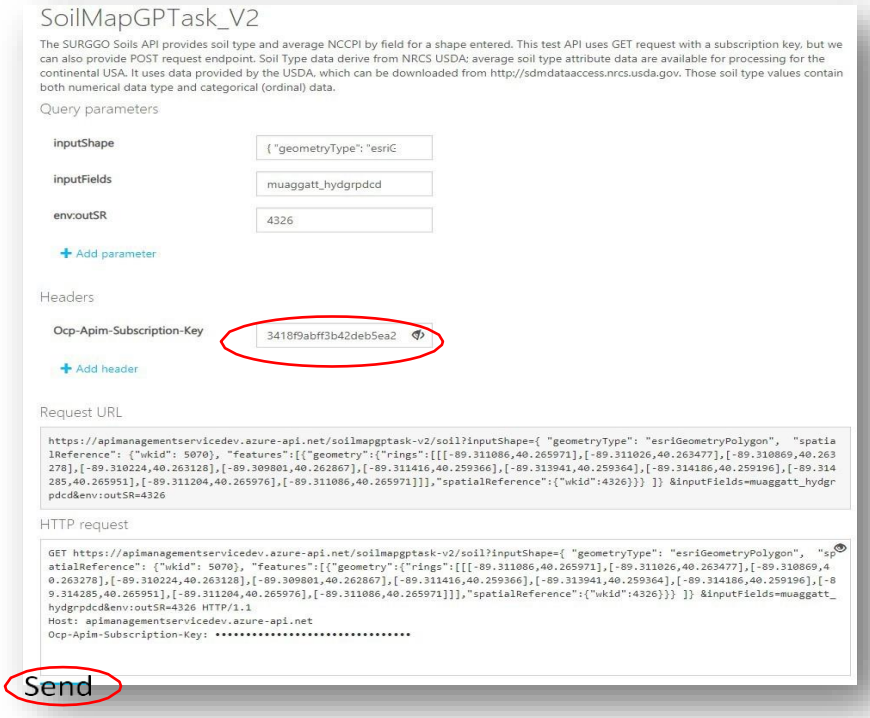
Response

{"results":[{"paramName":"output1","dataType":"GPRecordSet","value":{"displayFieldName":""
,"fields":[{"name":"FID","type":"esriFieldTypeOID","alias":"FID"},{"name":"intersect_FID_i
nputShapeProjected","type":"esriFieldTypeInteger","alias":"intersect.FID_inputShapeProject
ed"},{"name":"FREQUENCY","type":"esriFieldTypeInteger","alias":"FREQUENCY"},{"name":"SUM_w
a_nccpi2all","type":"esriFieldTypeDouble","alias":"SUM_wa_nccpi2all"}],"features":[{"attri
butes":{"FID":1,"intersect_FID_inputShapeProjected":0,"FREQUENCY":6,"SUM_wa_nccpi2all":0.9
0582095475000701}}],"exceededTransferLimit":false}},{"paramName":"output2","dataType":"GPF
eatureRecordSetLayer","value":{"displayFieldName":"","geometryType":"esriGeometryPolygon",
"spatialReference":{"wkid":5070,"latestWkid":5070},"fields":[{"name":"FID","type":"esriFie
ldTypeOID","alias":"FID"},{"name":"FID_inputShapeProjected","type":"esriFieldTypeInteger",
"alias":"FID_inputShapeProjected"},{"name":"OBJECTID","type":"esriFieldTypeInteger","alias
":"OBJECTID"},{"name":"Shape_Leng","type":"esriFieldTypeDouble","alias":"Shape_Leng"},{"na
me":"FID_soilmu_a_il107","type":"esriFieldTypeInteger","alias":"FID_soilmu_a_il107"},{"nam
e":"AREASYMBOL","type":"esriFieldTypeString","alias":"AREASYMBOL","length":20},{"name":"SP
ATIALVER","type":…….

Walkthrough Instruction

Step 1: Launch the API **URL** in browser and then click **Try it.**

Step 2 : Paste the **Ocp-Apim-Subscription-Key** and then click **Send**



Step 3: An interface with metadata and examples of live calls will be returned. Each returned feature contains several fields.

Appendix I - Input Fields Available SSURGO Soil Type

inputFields	Column Description	Data Type	Units/Categories Scoring
muaggatt_slopegraddcp	The difference is elevation between two points, expressed as a percentage of the distance between those points. This column displays the slope gradient of the dominant component of the map unit based on composition percentage.	Numerical	percent
muaggatt_slopegradwta	The difference is elevation between two points, expressed as a percentage of the distance between those points. This column displays the weighted average slope gradient of all components in the map unit.	Numerical	percent
muaggatt_brockdepmin	The distance from the soil surface to the top of a paralithic or lithic bedrock layer, expressed as a shallowest depth of components whose composition in the map unit is equal to or exceeds 15%.	Numerical	cm
muaggatt_wtdepannmin	The shallowest depth to a wet soil layer (water table) at any time during the year expressed as centimeters from the soil surface, for components whose composition in the map unit is equal to or exceeds 15%.	Numerical	cm
muaggatt_wtdepaprjunmin	The shallowest depth to a wet soil layer (water table) during the months of April through June expressed in centimeters from the soil surface for components whose composition in the map unit is equal to or exceeds 15%.	Numerical	cm
muaggatt_flodfreqdcd	The annual probability of a flood event expressed as a class. This column displays the dominant flood frequency class for the map unit, based on composition percentage of map unit components whose composition in the map unit is equal to or exceeds 15%.	Categorical	{'None': 0, 'Very rare': 1, 'Rare': 2, 'Occasional': 3, 'Frequent': 4, 'Very frequent': 5}
muaggatt_flodfreqmax	The annual probability of a flood event expressed as a class. This column displays the highest probability class assigned to an individual component of the map unit whose composition in the map unit is equal to or exceeds 15%.	Categorical	{'None': 0, 'Very rare': 1, 'Rare': 2, 'Occasional': 3, 'Frequent': 4, 'Very frequent': 5}
muaggatt_pondfreqprs	The percentage of the map unit that is subject to water being ponded on the soil surface, expressed as one of four classes; 0-14%, 15-49%, 5074% or 75-100%.	Categorical	NULL
muaggatt_aws025wta	Available water storage (AWS). The volume of water that the soil, to a depth of 25 centimeters, can store that is available to plants. It is reported as the weighted average of all components in the map unit, and is expressed as centimeters of water. AWS is calculated from AWC (available water capacity) which is commonly estimated as the difference between the water contents at 1/10 or 1/3 bar (field capacity) and 15 bars (permanent wilting point) tension, and adjusted for salinity and fragments.	Numerical	cm

muaggatt_aws050wta	Available water storage (AWS). The volume of water that the soil, to a depth of 50 centimeters, can store that is available to plants. It is reported as the weighted average of all components in the map unit, and is expressed as centimeters of water. AWS is calculated from AWC (available water capacity) which is commonly estimated as the difference between the water contents at 1/10 or 1/3 bar (field capacity) and 15 bars (permanent wilting point) tension, and adjusted for salinity and fragments.	Numerical	cm
muaggatt_aws0100wta	Available water storage (AWS). The volume of water that the soil, to a depth of 100 centimeters, can store that is available to plants. It is reported as the weighted average of all components in the map unit, and is expressed as centimeters of water. AWS is calculated from AWC (available water capacity) which is commonly estimated as the difference between the water contents at 1/10 or 1/3 bar (field capacity) and 15 bars (permanent wilting point) tension, and adjusted for salinity and fragments.	Numerical	cm
muaggatt_aws0150wta	Available water storage (AWS). The volume of water that the soil, to a depth of 150 centimeters, can store that is available to plants. It is reported as the weighted average of all components in the map unit, and is expressed as centimeters of water. AWS is calculated from AWC (available water capacity) which is commonly estimated as the difference between the water contents at 1/10 or 1/3 bar (field capacity) and 15 bars (permanent wilting point) tension, and adjusted for salinity and fragments.	Numerical	cm
muaggatt_drclassdcd	The natural drainage condition of the soil refers to the frequency and duration of wet periods. This column displays the dominant drainage class for the map unit, based on composition percentage of each map unit component.	Categorical	{'Well drained': 7, 'Moderately well drained': 6, 'Poorly drained': 5,'Somewhat poorly drained': 4, 'Very poorly drained': 3, 'Somewhat excessively drained': 2, 'Excessively drained': 1}
muaggatt_drclasswettest	The natural drainage condition of the soil refers to the frequency and duration of wet periods. This column displays the wettest drainage class assigned to an individual component of the map unit whose composition in the map unit is equal to or exceeds 15%.	Categorical	
muaggatt_hydgrpdcd	Hydrologic Group is a grouping of soils that have similar runoff potential under similar storm and cover conditions. This column displays the dominant hydrologic group for the map unit, based on composition percentage of each map unit component.	Categorical	{'A': 8, 'B': 6, 'A/D': 5, 'C': 4, 'B/D': 4, 'C/D':3, 'D':2}
muaggatt_iccdcd	The broadest category in the land capability classification system for soils. This column displays the dominant capability class, under irrigated conditions, for the map unit based on composition percentage of all components in the map unit.	Categorical	NULL
muaggatt_iccdcdpct	The percent composition of the map unit that has the capability class displayed in the Irrigated Capability Class	Numerical	percent

muaggatt_niccdcd	The broadest category in the land capability classification system for soils. This column displays the dominant capability class, under nonirrigated conditions, for the map unit based on composition percentage of all components in the map unit.	Categorical	NULL
muaggatt_niccdcdpct	The percent composition of the map unit that has the capability class displayed in the Non-Irrigated Capability Class - Dominant Condition column.	Numerical	percent
muaggatt_engdwobdcd	The rating of the map unit as a site for dwellings without basements, expressed as the dominant rating class for the map unit, based on composition percentage of each map unit component.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engdwbdcd	The rating of the map unit as a site for dwellings with basements, expressed as the dominant rating class for the map unit, based on composition percentage of each map unit component.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engdwbll	The rating of the map unit as a site for dwellings with basements, expressed as the least limiting rating class for the map unit, based on the evaluation of each component in the map unit.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engdwbml	The rating of the map unit as a site for dwellings with basements, expressed as the most limiting rating class for the map unit, based on the evaluation of each component in the map unit.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engstafdcd	The rating of the map unit as a site for septic tank absorption fields, expressed as the dominant rating class for the map unit, based on composition percentage of each map unit component.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engstafll	The rating of the map unit as a site for septic tank absorption fields, expressed as the least limiting rating class for the map unit, based on the evaluation of each component in the map unit.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}

muaggatt_engstafml	The rating of the map unit as a site for septic tank absorption fields, expressed as the most limiting rating class for the map unit, based on the evaluation of each component in the map unit.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engsldcd	The rating of the map unit as a site for sewage lagoons, expressed as the dominant rating class for the map unit, based on composition percentage of each map unit component.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engsldcp	The rating of the map unit as a site for sewage lagoons, expressed as the rating class for the dominant component in the map unit, based on composition percentage of each map unit component.	Categorical	{'Very limited': 2, 'Not limited': 0,

			'Somewhat limited': 1, 'Not rated': -1}
muaggatt_englrsdcd	The rating of the map unit as a site for local roads and streets, expressed as the dominant rating class for the map unit, based on composition percentage of each map unit component.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_engcmssdcd	The rating of the map unit as a source of sand, expressed as the dominant class for the map unit, based on composition percentage of each map unit component	Categorical	{'Not rated': -1, 'Poor': 1, 'Fair': 2, 'Good': 3}
muaggatt_engcmssmp	The rating of the map unit as a source of sand, expressed as the most probable class for the map unit, based on the evaluation of each component whose composition in the map unit is equal to or exceeds 15%.	Categorical	{'Not rated': -1, 'Poor': 1, 'Fair': 2, 'Good': 3}
muaggatt_urbrecptdcd	The rating of the map unit as a site for paths and trails, expressed as the dominant rating class for the map unit, based on composition percentage of each map unit component.	Categorical	{'Very limited': 2, 'Not limited': 0, 'Somewhat limited': 1, 'Not rated': -1}
muaggatt_urbrecptwta	The relative rating of the map unit for use as paths and trails, expressed as a weighted average of numerical ratings for individual soil components in the map unit. The ratings are on a scale of 0.0 to 1.0, with the higher values indicating more limitations.	Numerical	NULL
muaggatt_forpehrtdcp	The relative potential erosion hazard for the map unit when used as a site for forest roads and trails, expressed as the rating class for the dominant component in the map unit, based on composition percentage of each map unit component.	Categorical	{'Not rated': -1, 'Severe': 1, 'Slight': 2, 'Moderate': 3}

muaggatt_hydclprs	An indication of the proportion of the map unit, expressed as a percent, that is "hydric", based on the hydric classification of individual map unit components.	Categorical	NULL
muaggatt_awmmfpwwta	The relative rating of the map unit for use as a disposal site of Manure and Food Processing Wastes, expressed as a weighted average of numerical ratings for individual components in the map unit. The ratings are on a scale of 0.0 to 1.0, with the higher values indicating increasing limitations.	Numerical	NULL
valu1_aws0_5	Available water storage estimate (AWS) in standard layer 1 or standard zone 1 (0-5 cm depth), expressed in mm. The volume of plant available water that the soil can store in this layer based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws5_20	Available water storage estimate (AWS) in standard layer 2 (5-20 cm depth), expressed in mm. The volume of plant available water that the soil can store in this layer based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws20_50	Available water storage estimate (AWS) in standard layer 3 (20-50 cm depth), expressed in mm. The volume of plant available water that the soil can store in this layer based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws50_100	Available water storage estimate (AWS) in standard layer 4 (50-100 cm depth), expressed in mm. The volume of plant available water that the soil can store in this layer based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws100_150	Available water storage estimate (AWS) in standard layer 5 (100-150 cm depth), expressed in mm. The volume of plant available water that the soil can store in this layer based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws150_999	Available water storage estimate (AWS) in standard layer 6 (150 cm to the reported depth of the soil profile), expressed in mm. The volume of plant available water that the soil can store in this layer based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws0_20	Available water storage estimate (AWS) in standard zone 2 (0-20 cm depth), expressed in mm. The volume of plant available water that the soil can store in this zone based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws0_30	Available water storage estimate (AWS) in standard zone 3 (0-30 cm depth), expressed in mm. The volume of plant available water that the soil can store in this zone based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws0_100	Available water storage estimate (AWS) in standard zone 4 (0-100 cm depth), expressed in mm. The volume of plant available water that the soil can store in this zone based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_aws0_150	Available water storage estimate (AWS) in standard zone 5 (0-150 cm depth), expressed in mm. The volume of plant available water that the soil can store in this zone based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm

valu1_aws0_999	Available water storage estimate (AWS) in total soil profile (0 cm to the reported depth of the soil profile), expressed in mm. The volume of plant available water that the soil can store in this layer based on all map unit components (weighted average). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_tk0_5a	Thickness of soil components used in standard layer 1 or standard zone 1 (0-5 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk5_20a	Thickness of soil components used in standard layer 2 (5-20 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk20_50a	Thickness of soil components used in standard layer 3 (20-50 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk50_100a	Thickness of soil components used in standard layer 4 (50-100 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk100_150 a	Thickness of soil components used in standard layer 5 (100-150 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm

valu1_tk150_999 a	Thickness of soil components used in standard layer 6 (150 cm to the reported depth of the soil profile) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk0_20a	Thickness of soil components used in standard zone 2 (0-20 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk0_30a	Thickness of soil components used in standard zone 3 (0-30 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk0_100a	Thickness of soil components used in standard zone 4 (0-100 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk0_150a	Thickness of soil components used in standard zone 5 (0-150 cm) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk0_999a	Thickness of soil components used in total soil profile (0 cm to the reported depth of the soil profile) expressed in cm (weighted average) for the available water storage calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_musumcpcta	The sum of the comppct_r (SSURGO component table) values used in the available water storage calculation for the map unit. Useful metadata information. NULL values are presented where data are incomplete or not available.	Numerical	NULL
valu1_soc0_5	Soil organic carbon stock estimate (SOC) in standard layer 1 or standard zone 1 (0-5 cm depth). The concentration of organic carbon present in the soil	Numerical	grams/m^2

	expressed in grams C per square meter to a depth of 5 cm. NULL values are presented where data are incomplete or not available.		
valu1_soc5_20	Soil organic carbon stock estimate (SOC) in standard layer 2 (5-20 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter for the 5-20 cm layer. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc20_50	Soil organic carbon stock estimate (SOC) in standard layer 3 (20-50 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter for the 20-50 cm layer. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc50_100	Soil organic carbon stock estimate (SOC) in standard layer 4 (50-100 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter for the 50-100 cm layer. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc100_150	Soil organic carbon stock estimate (SOC) in standard layer 5 (100-150 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter for the 100-150 cm layer. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc150_999	Soil organic carbon stock estimate (SOC) in standard layer 6 (150 cm to the reported depth of the soil profile). The concentration of organic carbon present in the soil expressed in grams C per square meter for the 150 cm and greater depth layer. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc0_20	Soil organic carbon stock estimate (SOC) in standard zone 2 (0-20 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter to a depth of 20 cm. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc0_30	Soil organic carbon stock estimate (SOC) in standard zone 3 (0-30 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter to a depth of 30 cm. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc0_100	Soil organic carbon stock estimate (SOC) in standard zone 4 (0-100 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter to a depth of 100 cm. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc0_150	Soil organic carbon stock estimate (SOC) in standard zone 5 (0-150 cm depth). The concentration of organic carbon present in the soil expressed in grams C per square meter to a depth of 150 cm. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_soc0_999	Soil organic carbon stock estimate (SOC) in total soil profile (0 cm to the reported depth of the soil profile). The concentration of organic carbon present in the soil expressed in grams C per square meter for the total reported soil profile depth. NULL values are presented where data are incomplete or not available.	Numerical	grams/m^2
valu1_tk0_5s	Thickness of soil components used in standard layer or standard zone (0-5 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk5_20s	Thickness of soil components used in standard layer 3 (5-20 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm

valu1_tk20_50s	Thickness of soil components used in standard layer 3 (20-50 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk50_100s	Thickness of soil components used in standard layer 4 (50-100 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk100_150s	Thickness of soil components used in standard layer 5 (100-150 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk150_999s	Thickness of soil components used in standard layer 6 (150 cm to the reported depth of the soil profile) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available	Numerical	cm
valu1_tk0_20s	Thickness of soil components used in standard zone 2 (0-20 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available	Numerical	cm
valu1_tk0_30s	Thickness of soil components used in standard zone 3 (0-30 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk0_100s	Thickness of soil components used in standard zone 4 (0-100 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_tk0_150s	Thickness of soil components used in standard zone 5 (0-150 cm) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm

valu1_tk0_999s	Thickness of soil components used in total soil profile (0 cm to the reported depth of the soil profile) expressed in cm (weighted average) for the Soil Organic Carbon calculation. NULL values are presented where data are incomplete or not available.	Numerical	cm
valu1_musumcpcts	The sum of the comppct_r (SSURGO component table) values used in the soil organic carbon calculation for the map unit. Useful metadata information. NULL values are presented where data are incomplete or not available.	Numerical	NULL
valu1_nccpi2cs	National Commodity Crop Productivity Index for Corn and Soybeans (weighted average) for major earthy components. Values range from .01 (low productivity) to .99 (high productivity). Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes' (SSURGO component table). NULL values are presented where data are incomplete or not available.	Numerical	NULL
valu1_nccpi2sg	National Commodity Crop Productivity Index for Small Grains (weighted average) for major earthy components. Values range from .01 (low productivity) to .99 (high productivity). Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes' (SSURGO component table). NULL values are presented where data are incomplete or not available.	Numerical	NULL

valu1_nccpi2co	National Commodity Crop Productivity Index for Cotton (weighted average) for major earthy components. Values range from .01 (low productivity) to .99 (high productivity). Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes' (SSURGO component table). NULL values are presented where data are incomplete or not available.	Numerical	NULL
valu1_nccpi2all	National Commodity Crop Productivity Index that has the highest value among Corn and Soybeans, Small Grains, or Cotton (weighted average) for major earthy components. Values range from .01 (low productivity) to .99 (high productivity). Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes' (SSURGO component table). NULL values are presented where data are incomplete or not available.	Numerical	NULL
valu1_pctearthm c	The National Commodity Crop Productivity Index map unit percent earthy is the map unit summed comppct_r for major earthy components. Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes' (SSURGO component table). Useful metadata information. NULL values are presented where data are incomplete or not available.	Numerical	NULL
valu1_rootznemc	Root zone depth is the depth within the soil profile that commodity crop (cc) roots can effectively extract water and nutrients for growth. Root zone depth influences soil productivity significantly. Soil component horizon criteria for root-limiting depth include: presence of hard bedrock, soft bedrock, a fragipan, a duripan, sulfuric material, a dense layer, a layer having a pH of less than 3.5, or a layer having an electrical conductivity of more than 12 within the component soil profile. If no root-restricting zone is identified, a depth of 150 cm is used to approximate the root zone depth (Dobos et al., 2012). Root zone depth is computed for all map unit major earthy components (weighted average). Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes' (SSURGO component table). NULL values are presented where data are incomplete or not available.	Numerical	NULL

valu1_rootznaws	Root zone (commodity crop) available water storage estimate (RZAWS) , expressed in mm, is the volume of plant available water that the soil can store within the root zone based on all map unit earthy major components (weighted average). Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes' (SSURGO component table). NULL values are presented where data are incomplete or not available.	Numerical	mm
valu1_droughty	Drought vulnerable soil landscapes comprise those map units that have available water storage within the root zone for commodity crops that is less than or equal to 6 inches (152 mm) expressed as "1" for a drought vulnerable soil landscape map unit or "0" for a non- droughty soil landscape map unit or NULL for miscellaneous areas (includes water bodies). It is computed as a weighted average for major earthy components. Earthy components are those soil series or higher level taxa components that can support crop growth (Dobos et al., 2012). Major components are those soil components where the majorcompflag = 'Yes'	Numerical	NULL

	(SSURGO component table). NULL values are presented where data are incomplete or not available.		
valu1_pwsl1pom u	"Potential Wetland Soil Landscapes" (PWSL) is expressed as the percentage of the map unit that meets the PWSL criteria. The hydric rating (soil component variable “hydricrating”) is an indicator of wet soils. For version 1 (pwsl1), those soil components that meet the following criteria are tagged as PWSL and their comppct_r values are summed for each map unit. Soil components with hydricrating = 'YES' are considered PWSL. Soil components with hydricrating = “NO” are not PWSL. Soil components with hydricrating = 'UNRANKED' are tested using other attributes, and will be considered PWSL if any of the following conditions are met: drainagecl = 'Poorly drained' or 'Very poorly drained' or the localphase or the otherph data fields contain any of the phrases "drained" or "undrained" or "channeled" or "protected" or "ponded" or "flooded". If these criteria do not determine the PWSL for a component and hydricrating = 'UNRANKED', then the map unit will be classified as PWSL if the map unit name contains any of the phrases "drained" or "undrained" or "channeled" or "protected" or "ponded" or "flooded". For version 1 (pwsl1), waterbodies are identified as "999" when map unit names match a list of terms that identify water or intermittent water or map units have a sum of the comppct_r for "Water" that is 80% or greater. NULL values are presented where data are incomplete or not available.	Numerical	NULL
valu1_musumcpct	The sum of the comppct_r (SSURGO component table) values for all listed components in the map unit. Useful metadata information. NULL values are presented where data are incomplete or not available.	Numerical	NULL

Citation

Users who use these data in their Applications must use the button provided below.

Users who use in publications or data analysis must cite us in your publications as

"SSURGO Soil Types obtained via Ag-Analytics.Org (Woodard,2016a; Woodard, 2016b)" or similar with the following references:

1.) Woodard, J.D., “Big data and Ag-Analytics: an open source, open data platform for agricultural & environmental finance, insurance, and risk,” Agricultural Finance Review, (2016) 76(1):15-26.

2.) Woodard, J.D., “Data Science and Management for Large Scale Empirical Applications in Agricultural and Applied Economics Research,” Applied Economic Perspectives and Policy, (2016) 38(3): 373-388.

Each county zip file contains a shapefile, with format clu_public_a_SSFFF where SS is the State abbreviation and FFF is the 3 digit county fips code (e.g., clu_public_a_il001 is Adams County, IL)

Format: vector polygon - Arc shapefiles

Spatial Reference Information: Universal Transverse Mercator (UTM) Dominant Zone, North American Datum 1983

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with any comments or questions.