

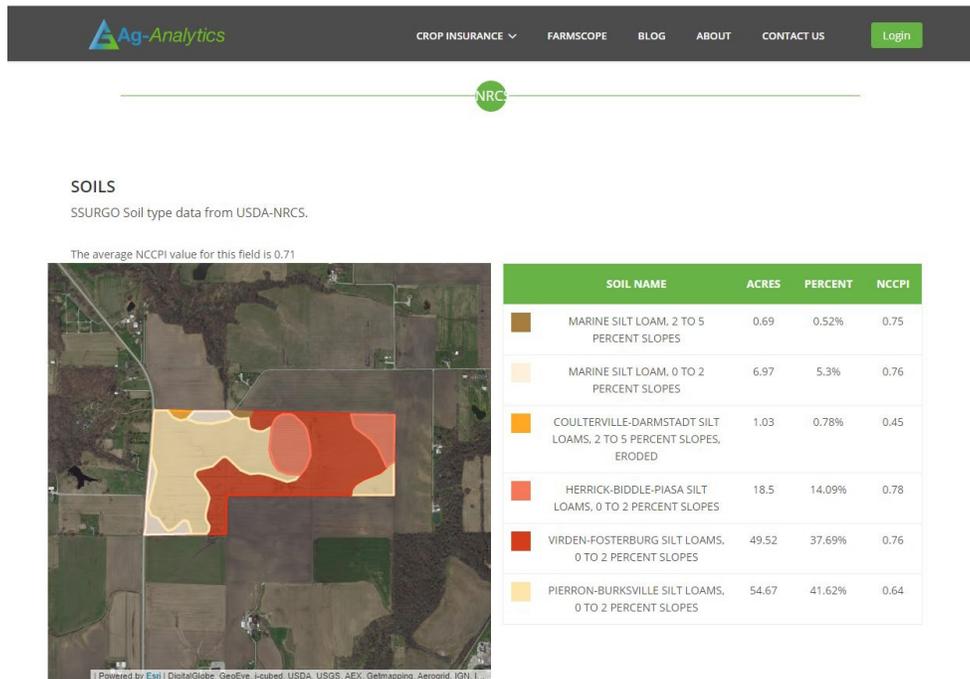
Ag-Analytics

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-Api-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/ssurgo-soil/operations/get-request-ssurgo-soils>

Request URL:

[https://ag-analytics.azure-api.net/ssurgosoil/get\[?inputShape\]\[&inputFields\]](https://ag-analytics.azure-api.net/ssurgosoil/get[?inputShape][&inputFields])

Execute Type: POST

API URL:

<https://ag-analytics.portal.azure-api.net/docs/services/ssurgo-soil/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_nccpi2a ll&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_inputShapeProjected","type":"esriFieldTypeInteger","alias":"intersect.FID_inputShapeProjected"}, {"name":"FREQUENCY","type":"esriFieldTypeInteger","alias":"FREQUENCY"}, {"name":"SUM_wa_nccpi2a ll","type":"esriFieldTypeDouble","alias":"SUM_wa_nccpi2a ll"}],"features":[{"attributes":{"FID":1,"intersect_FID_inputShapeProjected":0,"FREQUENCY":6,"SUM_wa_nccpi2a ll":0.90582095475000701}}],"exceededTransferLimit":false}],"paramName":"output2","dataType":"GPF eatureRecordSetLayer","value":{"displayFieldName":"","geometryType":"esriGeometryPolygon","spatialReference":{"wkid":5070,"latestWkid":5070},"fields":[{"name":"FID","type":"esriFieldTypeOID","alias":"FID"}, {"name":"FID_inputShapeProjected","type":"esriFieldTypeInteger","alias":"FID_inputShapeProjected"}, {"name":"OBJECTID","type":"esriFieldTypeInteger","alias":"OBJECTID"}, {"name":"Shape_Leng","type":"esriFieldTypeDouble","alias":"Shape_Leng"}, {"name":"FID_soilmu_a_il107","type":"esriFieldTypeInteger","alias":"FID_soilmu_a_il107"}, {"name":"AREASYMBOL","type":"esriFieldTypeString","alias":"AREASYMBOL","length":20}, {"name":"SP ATIALVER","type":"....."}
```


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

Please contact Joshua Woodard, josh@ag-analytics.org or woodardjoshua@gmail.com, with any comments or questions.