

# SSURGO SOILS

## API Documentation 2020

### Service Overview

The SSURGO 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 SSURGO 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



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## 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.

## Request Parameters For GET API

**inputShape:** The shape information for the field. Starts with esriGeometryPolygon format as “geometryType”.

### Example

```
{ "geometryType": "esriGeometryPolygon", "features": [ { "geometry": { "rings": [ [ [ -95.973782, 40.304692 ], [ -95.973732, 40.300839 ], [ -95.973706, 40.297503 ], [ -95.974429, 40.297515 ], [ -95.975498, 40.297522 ], [ -95.975591, 40.297522 ], [ -95.976765, 40.29753 ], [ -95.980238, 40.297552 ], [ -95.980489, 40.297553 ], [ -95.983115, 40.29755 ], [ -95.983121, 40.297943 ], [ -95.983154, 40.300268 ], [ -95.983155, 40.300372 ], [ -95.983157, 40.300529 ], [ -95.983167, 40.301191 ], [ -95.98318, 40.301863 ], [ -95.98318, 40.302066 ], [ -95.981465, 40.302046 ], [ -95.980183, 40.301462 ], [ -95.97983, 40.301208 ], [ -95.979615, 40.301431 ], [ -95.97936, 40.301735 ], [ -95.979486, 40.302235 ], [ -95.979573, 40.302839 ], [ -95.979583, 40.303079 ], [ -95.97956, 40.303274 ], [ -95.979307, 40.303292 ], [ -95.978928, 40.303165 ], [ -95.978387, 40.303099 ], [ -95.977985, 40.303097 ], [ -95.977768, 40.303263 ], [ -95.977775, 40.303423 ], [ -95.977843, 40.303639 ], [ -95.977884, 40.304221 ], [ -95.977697, 40.304706 ], [ -95.973782, 40.304692 ] ] ] ], "spatialReference": { "wkid": 4326 } } ] }
```

**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



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## Request Body For POST API

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

### Request Body

#### Example

```
inputShape=%7B%22geometryType%22%3A%22esriGeometryPolygon%22%2C%22features%22%3A%5B%7B%22geometry%22%3A%7B%22rings%22%3A%5B%5B%5B-95.973782%2C40.304692%5D%2C%5B-95.973732%2C40.300839%5D%2C%5B-95.973706%2C40.297503%5D%2C%5B-95.974429%2C40.297515%5D%2C%5B-95.975498%2C40.297522%5D%2C%5B-95.975591%2C40.297522%5D%2C%5B-95.976765%2C40.29753%5D%2C%5B-95.980238%2C40.297552%5D%2C%5B-95.980489%2C40.297553%5D%2C%5B-95.983115%2C40.29755%5D%2C%5B-95.983121%2C40.297943%5D%2C%5B-95.983154%2C40.300268%5D%2C%5B-95.983155%2C40.300372%5D%2C%5B-95.983157%2C40.300529%5D%2C%5B-95.983167%2C40.301191%5D%2C%5B-95.98318%2C40.301863%5D%2C%5B-95.98318%2C40.302066%5D%2C%5B-95.981465%2C40.302046%5D%2C%5B-95.980183%2C40.301462%5D%2C%5B-95.97983%2C40.301208%5D%2C%5B-95.979615%2C40.301431%5D%2C%5B-95.97936%2C40.301735%5D%2C%5B-95.979486%2C40.302235%5D%2C%5B-95.979573%2C40.302839%5D%2C%5B-95.979583%2C40.303079%5D%2C%5B-95.97956%2C40.303274%5D%2C%5B-95.979307%2C40.303292%5D%2C%5B-95.978928%2C40.303165%5D%2C%5B-95.978387%2C40.303099%5D%2C%5B-95.977985%2C40.303097%5D%2C%5B-95.977768%2C40.303263%5D%2C%5B-95.97775%2C40.303423%5D%2C%5B-95.977843%2C40.303639%5D%2C%5B-95.977884%2C40.304221%5D%2C%5B-95.977697%2C40.304706%5D%2C%5B-95.973782%2C40.304692%5D%5D%2C%22spatialReference%22%3A%7B%22wkid%22%3A4326%7D%7D%5D%7D&env%3AoutSR=4326&inputFields=nccpi2all&f=json
```

## Example - GET and POST

#### 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_nccpi2all","type":"esriFieldTypeDouble","alias":"SUM_wa_nccpi2all"}],"features":[{"attributes":{"FID":1,"intersect_FID_inputShapeProjected":0,"FREQUENCY":6,"SUM_wa_nccpi2all":0.90582095475000701}},"exceededTransferLimit":false}],"paramName":"output2","dataType":"GPFeatureRecordSetLayer","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":"SPATIALVER","type":"....."}
```

# Appendix

## Resources

<https://sdmdataaccess.sc.egov.usda.gov/documents/TableColumnDescriptionsReport.pdf>

Options for metadata choices to request out of the SSURGO Soils dataset. Use this report as a reference in adding additional attributes to your GET SSURGO SOILS request.

[https://www.nrcs.usda.gov/wps/PA\\_NRCSConsumption/download?cid=stelprdb1241114&ext=pdf](https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=stelprdb1241114&ext=pdf)

Expanded, detailed report on the Tables and Columns names available in the SSURGO Soils metadata.

## 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 (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.

Format: vector polygon - Arc shapefiles

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

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