

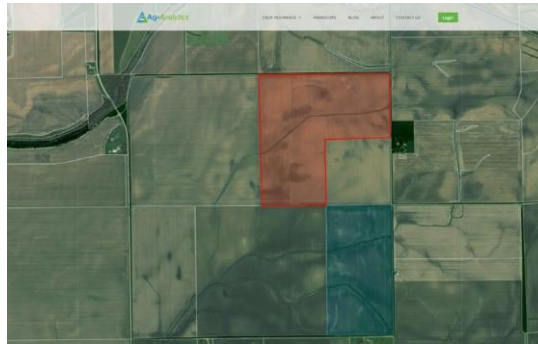
Ag-Analytics

Common Land Unit Boundary API Documentation 2019

Overview

Common Land Unit (CLU) boundaries are farm/field boundaries used by United States Department of Agriculture (USDA) in the delivery of certain farm programs. It is not uncommon for more than one crop to be grown on a CLU. These CLU boundaries are derived from the last publicly available distribution from 2008. A single CLU is approximately interpreted as a “field”. A Common Land Unit (CLU) is the smallest unit of land that has a permanent, contiguous boundary, a common land cover and land management, a common owner and a common producer in agricultural land associated with USDA farm programs.

The Ag-Analytics collection of the 2008 USDA Farm Service Agency (FSA) CLUs Boundaries provides a service which a user can pass an extent (bounding box) and retrieve field boundaries in geojson or json format. To our knowledge, this is the only CLU field boundary data service in the market. It is a frequently requested dataset and useful for researchers who seek pre-made field boundaries in order to conduct representative analyses, as well as other apps that wish to serve ‘starter’ field boundaries.



Common Land Unit (CLU) Boundaries Example

API Specifications

API URL: <https://ag-analytics.portal.azure-api.net/docs/services/common-land-unit-boundary/operations/getrequest-common-land-unit-boundary/console>

Header Parameters

Execute Type: GET

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.

Request Parameters

Geometry: The structure of the geometry is the same as the structure of the json geometry objects returned by the ArcGIS REST API.

- **JSON syntax:**

```
{  
  "xmin" : <xmin>, "ymin" : <ymin>,  
  "xmax" : <xmax>, "ymax" : <ymax>,  
  "zmin" : <zmin>, "zmax" : <zmax>,  
  "mmin" : <mmin>, "mmax" : <mmax>,  
  "spatialReference" : {<spatialReference>}}
```

- **JSON Example:**

A 2D envelope:

```
{"xmin" : -109.55, "ymin" : 25.76, "xmax" : -86.39, "ymax" :  
49.94, "spatialReference" : {"wkid" : 4326}}
```

f (format): json or geojson

Response Parameters

objectIdFieldName:

- OBJECTID **geometryType:**
- esriGeometryPolygon **spatialReference.wkid** (number):
 - The well-known ID of a spatial reference. It is a numerical reference to the spatial reference, which can be searched at <http://www.spatialreference.org>. Common values include **wkid 4326**, which stands for WGS84 and is typically used for latitude and longitude. **fields:**
- Contains an array of information about the requested fields. For example: name, alias and type.

Feature:

- An array of features from the database. Each feature will have “attributes” corresponding to the requested fields and a “geometry” with the coordinates.

features.attributes.OBJECTID(esriFieldTypeOID):

- A unique and not null integer field used to uniquely identify rows in tables in a geodatabase

features.attributes.CALCAREC(esriFieldTypeDouble):

- CLU calculated acreage **features.geometry.rings:**
- An array of rings, clockwise rings are filled and counterclockwise ring are considered holes. Each ring is an array of [x, y] coordinate pairs.

Example Request/Response

Request

```
{"xmin":-89.6484375,"ymin":40.245991504199026,"xmax":-89.62646484375,"ymax":4  
0.26276066437183,"spatialReference":{"wkid":4326}}&f=geojson
```

Response

```
{
  "type": "FeatureCollection",
  "crs": {
    "type": "name",
    "properties": {
      "name": "EPSG:4326"
    }
  },
  "features": [
    {
      "type": "Feature",
      "id": "5110587",
      "geometry": {
        "type": "Polygon",
        "coordinates": [
          [
            [-89.630022, 40.251632], [-89.630048, 40.253073], [-89.633106, 40.253003], [-89.633066, 40.251986], [-89.63384, 40.251545], [-89.636431, 40.250971], [-89.636412, 40.24913], [-89.633756, 40.249167], [-89.633527, 40.249447], [-89.632925, 40.249701], [-89.632203, 40.249946], [-89.63153, 40.250305], [-89.630995, 40.25074], [-89.630389, 40.251303], [-89.630022, 40.251632], [
              [-89.631259, 40.252931], [-89.63093, 40.252915], [-89.630702, 40.252818], [-89.630547, 40.252679], [-89.630367, 40.252449], [-89.630265, 40.252148], [-89.630254, 40.251867], [-89.630388, 40.251646], [-89.630647, 40.251412], [-89.631051, 40.251036], [-89.63137, 40.2508], [-89.631736, 40.250415], [-89.631968, 40.250238], [-89.632676, 40.250004], [-89.633197, 40.249775], [-89.63376, 40.249671], [-89.634263, 40.249545], [-89.63478, 40.249419], [-89.635286, 40.249373], [-89.635883, 40.249348], [-89.636127, 40.249491], [-89.636198, 40.249787], [-89.636149, 40.250051], [-89.635916, 40.250216], [-89.635566, 40.25043], [-89.635398, 40.25057], [-89.635193, 40.250604], [-89.635121, 40.250658], [-89.635117, 40.250732], [-89.635021, 40.25082], [-89.634905, 40.250895], [-89.634619, 40.251035], [-89.634277, 40.251193], [-89.633843, 40.251411], [89.633511, 40.25153], [-89.633281, 40.251584], [-89.633116, 40.251653], [-89.632846, 40.251862], [-89.632608, 40.252099], [-89.632321, 40.252415], [-89.632085, 40.252672], [-89.6317, 40.252804], [-89.631259, 40.252931]]],
            "properties": {
              "OBJECTID": "5110587",
              "CALCACRES": "12.260000229999999",
              "CALCACRES2": null
            }
          },
          {
            "type": "Feature",
            "id": "5110578",
            "geometry": {
              "type": "Polygon",
              "coordinates": [
                [
                  [-89.63965, 40.263914], [-89.639654, 40.264121], [-89.63966, 40.264216], [-89.642838, 40.261496], [-89.648704, 40.256335], [-89.648811, 40.256242], [-89.648818, 40.255944], [-89.648819, 40.255653], [-89.63965, 40.263914]]],
                "properties": {
                  "OBJECTID": "5110578",
                  "CALCACRES": "10.06999969",
                  "CALCACRES2": null
                }
              },
              {
                "type": "Feature",
                "id": "5110613",
                "geometry": {
                  "type": "Polygon",
                  "coordinates": [
                    [
                      [-89.63015, 40.259185], [-89.630188, 40.261669], [-89.634558, 40.261569], [-89.633509, 40.261462], [-89.632922, 40.261361], [-89.632349, 40.261214], [-89.631909, 40.261041], [-89.631468, 40.260811], [-89.631035, 40.260443], [-89.630709, 40.260119], [-89.630362, 40.259646], [-89.63015, 40.259185]]],
                    "properties": {
                      "OBJECTID": "5110613",
                      "CALCACRES": "6.6100001300000004",
                      "CALCACRES2": null
                    }
                  }
                ]
              }
            ]
          }
        ]
      }
    }
  ]
}
```

Walkthrough Instruction

Step 1: Launch the API URL.

The screenshot shows the Agalytics website's 'Get Request' page. At the top, there is a navigation bar with 'HOME', 'ISSUES', 'HELP', and 'AG-ANALYTICS'. Below this is a green header with the Agalytics logo and a message: 'In this portal you will find all available APIs from Ag-Analytics. If you are interested in a custom API, please contact us.' The main content area is titled 'Get Request' and features a 'BUY TRIAL' button with a downward arrow. A note states: 'Please note, you need to purchase a subscription key to call the API. Please use the trial version to try now for a limited amount of uses before purchase.' Below this, there is a paragraph explaining that CLU boundaries are derived from 2008 data and are used for various agricultural purposes. A sidebar on the left contains a 'GET Get Request' button, a 'POST POST Request' button, a 'Browse APIs' section with a list of services (2008 CLU Boundaries, Cropland Data Layers, eMODIS, Insurance Quoter, Polaris Soils, SSURGO Soils, PRISM GDD, PRISM Precipitation), a 'Purchase APIs' section, and an 'Access APIs' section. At the bottom of the main content area, there is a small satellite image of a field.

Step 2: Scroll down to input your subscription key, then hit send.

The screenshot shows the API request configuration interface. It is divided into several sections: 'Query parameters', 'Headers', 'Authorization', 'Request URL', and 'HTTP request'. The 'Query parameters' section has a 'geometry' field with a value of 'xmin:-89.6484375' and an 'f' field with a value of 'Value'. The 'Headers' section has an 'Ocp-Apim-Trace' field set to 'true' and an 'Ocp-Apim-Subscription-Key' field which is circled in green. The 'Authorization' section has a 'Subscription key' field with a dropdown menu showing 'Primary-8001...'. The 'Request URL' section shows a long URL with various parameters. The 'HTTP request' section shows a GET request with headers including 'Host: ag-analytics.azure-api.net', 'Ocp-Apim-Trace: true', and 'Ocp-Apim-Subscription-Key:'. A green circle highlights the 'Send' button at the bottom left of the interface.

Citation

Users who use these CLU 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

"2008 Public FSA Common Land Units 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.

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State	State FIPS	Total Acres	Count Boundaries
Arizona	4	528,832	33,917
Arkansas	5	6,080,673	254,254
California	6	13,396,334	212,539
Colorado	8	19,579,683	211,719
Connecticut	9	531,976	59,321
Delaware	10	533,347	39,968
Georgia	13	8,705,326	751,898
Hawaii	15	1,611,910	10,512
Idaho	16	10,732,363	383,671
Illinois	17	25,372,970	1,482,605
Indiana	18	14,093,068	753,056
Iowa	19	26,580,471	1,380,415
Kansas	20	43,326,372	1,142,617
Kentucky	21	10,264,908	957,171
Louisiana	22	7,248,373	222,710
Maine	23	2,373,594	127,727
Maryland	24	2,849,453	203,967
Massachusetts	25	547,786	45,412
Michigan	26	4,006,083	195,718
Minnesota	27	22,442,920	875,986

Mississippi	28	1,649,422	95,411
Missouri	29	29,821,742	1,899,246
Montana	30	50,721,906	658,292
Nebraska	31	36,676,731	645,104
Nevada	32	1,672,609	23,266
New Hampshire	33	894,481	33,972
New Jersey	34	952,435	77,706
New York	36	9,490,409	549,223
North Carolina	37	13,146,229	1,194,191
North Dakota	38	32,140,089	872,467
Ohio	39	14,995,390	983,316
Oklahoma	40	29,320,352	733,846
Oregon	41	13,212,207	199,824
Pennsylvania	42	7,445,215	470,518
Rhode Island	44	72,680	7,486
South Carolina	45	2,897,836	182,273
South Dakota	46	36,605,108	624,934
Tennessee	47	14,462,059	1,165,303
Texas	48	123,069,000	1,326,269
Utah	49	4,941,516	87,729
Vermont	50	1,544,910	131,722
Virginia	51	14,283,368	821,230
Washington	53	6,000,411	183,964
West Virginia	54	2,843,839	171,781
Wisconsin	55	15,227,478	959,647
Wyoming	56	18,996,788	82,021
Total		703,890,650	23,525,924