2023 Cultivated Layer

Metadata:

- Identification_Information
- Data_Quality_Information
- Spatial_Data_Organization_Information
- Spatial_Reference_Information
- Entity_and_Attribute_Information
- Distribution_Information
- Metadata_Reference_Information

Identification_Information:

Citation:

Citation_Information:

Originator:

United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS)

Publication_Date: 20240131 Title: 2023 Cultivated Layer Edition: 2023 Edition Geospatial_Data_Presentation_Form: raster digital data Publication_Information: Publication_Place: USDA NASS Marketing and Information Services Office, Washington, D.C.

Publisher: USDA NASS

Other_Citation_Details:

The data can be viewed at CroplandCROS https://croplandcros.scinet.usda.gov/ and free for download at https://www.nass.usda.gov/Research_and_Science/Cropland/Release/. NASS maintains a Frequently Asked Questions (FAQ's) at https://www.nass.usda.gov/Research_and_Science/Cropland/Sarsfaqs2.php.

Online_Linkage:

<https://www.nass.usda.gov/Research_and_Science/Cropland/Release/>

Larger_Work_Citation:

Citation_Information:

Originator:

United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS)

Publication_Date: 20240131 Title: 2023 Cropland Data Layer Edition: 2023 Edition Geospatial_Data_Presentation_Form: remote-sensing image Publication_Information: Publication_Place: Washington, District of Columbia 20250-9410 USA Publisher: USDA NASS

Other_Citation_Details:

For more technical details, FAQs, metadata and download links please visit https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php. The

parent dataset, the Cropland Data Layer, is available free for download through CroplandCROS https://croplandcros.scinet.usda.gov/

Online_Linkage: https://croplandcros.scinet.usda.gov/

Description:

Abstract:

The 2023 Cultivated Layer identifies cultivated and non-cultivated land cover for the Continental United States and is based on land cover information derived from the 2019 through 2023 USDA NASS Cropland Data Layers (CDL). The Cultivated Layer is a raster, geo-referenced data layer that has a ground resolution of 30 meters. See the 'Process_Description' Section for details on how this data layer was created. For a more detailed description of the Cultivated Layer please reference the following journal article: Boryan, Claire, Yang, Z., and Di, L., 2012. Deriving 2011 Cultivated Land Cover Data Sets Using USDA National Agricultural Statistics Service Historic Cropland Data Layers. Proc. of IEEE International Geoscience and Remote Sensing Symposium, July 22-27, 2012, Munich, Germany.

Purpose:

The purpose of the Cultivated Layer is to improve NASS Area Frame stratification used for agricultural surveys.

Time_Period_of_Content:

Time_Period_Information: Range_of_Dates/Times: Beginning_Date: 20221001 Ending_Date: 20231230

Currentness_Reference: 2023 growing season

Status:

Progress: Complete *Maintenance_and_Update_Frequency:* annual updates

Spatial_Domain:

Bounding_Coordinates: West_Bounding_Coordinate: -127.8873 East_Bounding_Coordinate: -74.1585 North_Bounding_Coordinate: 47.9580 South_Bounding_Coordinate: 23.1496

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Category Theme_Keyword: farming, 001 Theme_Keyword: environment, 007 Theme Keyword: imageryBaseMapsEarthCover, 010

Theme:

Theme_Keyword_Thesaurus: Global Change Master Directory (GCMD) Science Keywords *Theme_Keyword:*

Earth Science > Biosphere > Terrestrial Ecosystems > Agricultural Lands

Theme_Keyword: Earth Science > Land Surface > Land Use/Land Cover > Land Cover

Theme:

Theme_Keyword_Thesaurus: None Theme_Keyword: crop cover Theme_Keyword: cropland Theme_Keyword: agriculture Theme_Keyword: farming Theme_Keyword: land cover Theme_Keyword: crop estimates Theme_Keyword: ESA SENTINEL-2 Theme_Keyword: Landsat Theme Keyword: CroplandCROS

Place:

Place_Keyword_Thesaurus: Global Change Master Directory (GCMD) Location Keywords *Place_Keyword:* Continent > North America > United States of America

Place:

Place_Keyword_Thesaurus: None Place_Keyword: United States Place_Keyword: USA Place Keyword: CONUS

Temporal:

Temporal_Keyword_Thesaurus: None *Temporal_Keyword:* 2023

Access_Constraints: none

Use_Constraints:

The Cultivated Layer is provided to the public as is and is considered public domain and free to redistribute. The USDA NASS does not warrant any conclusions drawn from these data.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: USDA NASS, Spatial Analysis Research Section *Contact_Person:* USDA NASS, Spatial Analysis Research Section staff

Contact_Address:

Address_Type: mailing and physical address Address: 1400 Independence Avenue, SW, Room 5029 South Building City: Washington State_or_Province: District of Columbia Postal_Code: 20250-2001 Country: USA

Contact_Voice_Telephone: 800-727-9540 Contact_Facsimile_Telephone: 855-493-0447 Contact_Electronic_Mail_Address: SM.NASS.RDD.GIB@usda.gov

Data Set Credit: USDA National Agricultural Statistics Service

Security_Information:

Security_Classification_System: None Security_Classification: Unclassified Security Handling Description: None

Data_Quality_Information:

Attribute Accuracy:

Attribute Accuracy Report:

USDA, National Agricultural Statistics Service, 2023 Cultivated Layer NATIONAL ACCURACY REPORT

	Producer	Omission		User	Commission	Conditional
	Accuracy	Error	Карра	Accuracy	Error	Карра
Non-Cultivated	96.82%	3.18%	0.931	96.13%	3.87%	0.917
Cultivated	95.52%	4.48%	0.917	96.31%	3.69%	0.931

The accuracy of the non-agricultural land cover classes within the Cropland Data Layer and the Cultivated Layer is entirely dependent upon the USGS, National Land Cover Database (NLCD). Thus, the USDA NASS recommends that users consider the NLCD for studies involving non-agricultural land cover. For more information on the accuracy of the NLCD please reference ">https://www.mrlc.gov/>.

Quantitative_Attribute_Accuracy_Assessment:

Attribute Accuracy Value:

Classification accuracy is generally 85% to 95% correct for the major crop-specific land cover categories in the Cropland Data Layer, which the Cultivated Layer is based upon. See the 'Attribute Accuracy Report' section of this metadata file for the detailed accuracy report.

Attribute_Accuracy_Explanation:

The accuracy assessment of the Cultivated Layer uses independent validation derived from the FSA CLU (agricultural categories) that was to accuracy assess the Cropland Data Layer (CDL). See the 'Attribute Accuracy Report' section of this metadata file for the full accuracy report.

These definitions of accuracy statistics were derived from the following book: Congalton, Russell G. and Kass Green. Assessing the Accuracy of Remotely Sensed Data: Principles and Practices. Boca Raton, Florida: CRC Press, Inc. 1999. The 'Producer's Accuracy' is calculated for each cover type in the ground truth and indicates the probability that a ground truth pixel will be correctly mapped (across all cover types) and measures 'errors of omission'. An 'Omission Error' occurs when a pixel is excluded from the category to which it belongs in the validation dataset. The 'User's Accuracy' indicates the probability that a pixel from the CDL classification actually matches the ground truth data and measures 'errors of commission'. The 'Commission Error' represent when a pixel is included in an incorrect category according to the validation data. It is important to take into consideration errors of omission and commission. For example, if you classify every pixel in a scene to 'wheat', then you have 100% Producer's Accuracy for the wheat category and 0% Omission Error. However, you would also have a very high error of commission as all other crop types would be included in the incorrect category. The 'Kappa' is a measure of agreement based on the difference between the actual agreement in the error matrix (i.e., the agreement between the remotely sensed classification and the reference data as indicated by the major diagonal) and the chance agreement which is indicated by the row and column totals. The 'Conditional Kappa Coefficient' is the agreement for an individual category within the entire error matrix.

Logical_Consistency_Report:

The 2023 Cultivated Layer is based on the 2019-2023 Cropland Data Layers (CDLs). The CDL data are produced using training and independent validation data from the Farm Service Agency (FSA) Common Land Unit (CLU) Program (agricultural data) and the most recent version of the United States Geological Survey (USGS) National Land Cover Database (NLCD). More information about the FSA CLU Program can be found at https://www.fsa.usda.gov/. More information about the NLCD can be found at https://www.mrlc.gov/.

Completeness_Report: The data encompasses the Continental United States.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The Cropland Data Layer and Cultivated Layer retain the spatial attributes of the input imagery. The Landsat 8 and 9 OLI/TIRS imagery is obtained via download from the USGS Global Visualization Viewer using the Collection 2 Level-1">https://glovis.usgs.gov/> using the Collection 2 Level-1 specifications. Please reference the metadata on the Glovis website for the positional accuracy of each Landsat scene. The Sentinel 2A and 2B imagery is obtained via download from the Copernicus Open Access Hub using the S2MSI1C">https://scihub.copernicus.eu/> using the S2MSI1C product type which is orthorectified Top-of-Atmosphere reflectance. Please reference the metadata on the Copernicus website for positional accuracy details.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator:

United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS)

Publication Date: 20240131

Title: 2023 Cropland Data Layer

Edition: 2023 Edition

Geospatial Data Presentation Form: remote-sensing image

Publication Information:

Publication_Place: Washington, District of Columbia 20250-9410 USA *Publisher:* USDA NASS

Other_Citation_Details:

Visit CroplandCROS https://croplandCROS https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php for more information.

The USDA NASS Cropland Data Layer (CDL) is a raster, geo-referenced, cropspecific land cover data layer. The CDL is produced using moderate spatial resolution satellite imagery which in the past has included the following: Landsat 5 TM, Landsat 7 ETM+, Landsat 8 and 9 OLI/TIRS, the Indian Remote Sensing RESOURCESAT-1 (IRS-P6) Advanced Wide Field Sensor (AWiFS), the Disaster Monitoring Constellation (DMC) DEIMOS-1 and UK2 sensors, ISRO ResourceSat-2 LISS-3, and ESA SENTINEL-2A and -2B sensors. Some CDL states used additional satellite imagery and ancillary inputs to supplement and improve the classification. These additional sources can include the United States Geological Survey (USGS) National Elevation Dataset (NED), the imperviousness and canopy data layers from the most current version of the USGS National Land Cover Database (NLCD), and the National Aeronautics and Space Administration (NASA) Moderate Resolution Imaging Spectroradiometer (MODIS) 250 meter 16 day Normalized Difference Vegetation Index (NDVI) composites.

Agricultural training and validation data are derived from the Farm Service Agency (FSA) Common Land Unit (CLU) Program. The NLCD is used as non-agricultural training and validation data.

The strength and emphasis of the CDL is agricultural land cover. Please note that no farmer reported data are derivable from the Cropland Data Layer.

Source_Scale_Denominator: 30 meter Type_of_Source_Media: online download Source_Time_Period_of_Content: Time_Period_Information: Range_of_Dates/Times: Beginning_Date: 1997 Ending_Date: 2023

Source_Currentness_Reference: ground condition

Source_Citation_Abbreviation: CDL *Source_Contribution:* Land cover information used to identify planting history

Process_Step:

Process_Description:

OVERVIEW: The Cultivated Layer is based on the most recent five years of CDL data (2019-2023). An Erdas Imagine Spatial Model is used to create the Cultivated Layer. The processing logic is as follows. If a pixel is identified as cultivated in at least two out of the five years of CDL data then it is assigned to the 'Cultivated' category. The exception is that all pixels identified as cultivated in the most recent year are assigned to the 'Cultivated' category regardless of whether or not they were cultivated in the previous four years of CDL data. For a more detailed description of the Cultivated Layer please reference the following journal article: Boryan, Claire, Yang, Z., and Di, L., 2012. Deriving 2011 Cultivated Land Cover Data Sets Using USDA National Agricultural Statistics Service Historic Cropland Data Layers. Proc. of IEEE International Geoscience and Remote Sensing Symposium, July 22-27, 2012, Munich, Germany.

Below is a list of the CDL categories that are considered cultivated and non-cultivated for the Cultivated Layer.

USDA,	NASS Cropland Data Layer categories considered cultivated:
CODE	CLASS NAME
1	Cortia
2	
3	Rice
4	Sorghum
5	Soydeans
6 10	Suntiower
10	Pednuts
11	
12	Sweet Corn
13	Pop or Urn Corn
14	Mint
21	Barley
22	Durum wheat
23	Spring wheat
24	Winter wheat
25	Other Small Grains
20	DDI Crop winwhi/soybeans
27	Rye
28	
29	Millet
30 21	Speitz
31 22	
3Z 22	FlaxSeeu
55 24	Sattiower
54 25	Rape Seeu
35	
20 20	Alldlid
20	
39 //1	Sugaphoate
41	Day Pope
42	Dity Dealis
45	Athen Crons
44 15	Sugarcane
45	Sweet Potatoes
40	Mise Vegs & Enuits
47	Watermelons
40	Onions
50	Cucumbers
51	Chick Peas
52	lentils
53	Peas
54	Tomatoes
55	Caneberries
56	Hops
57	Herbs
58	Clover/Wildflowers

61	Fallow/Idle Cropland
66	Cherries
67	Peaches
68	Apples
69	Grapes
70	Christmas Trees
71	Other Tree Crops
72	Citrus
74	Pecans
75	Almonds
76	Walnuts
77	Pears
204	Pistachios
205	Triticale
206	Carrots
207	Asparagus
208	Garlic
209	Cantaloupes
210	Prunes
211	Olives
212	Oranges
213	Honeydew Melons
214	Broccoli
215	Avocado
216	Peppers
217	Pomegranates
218	Nectarines
219	Greens
220	Plums
221	Strawberries
222	Squash
223	Apricots
224	Vetch
225	Dbl Crop WinWht/Corn
226	Dbl Crop Oats/Corn
227	Lettuce
228	Dbl Crop Triticale/Corn
229	Pumpkins
230	Dbl Crop Lettuce/Durum Wht
231	Dbl Crop Lettuce/Cantaloupe
232	Dbl Crop Lettuce/Cotton
233	Dbl Crop Lettuce/Barley
234	Dbl Crop Durum Wht/Sorghum
235	Dbl Crop Barley/Sorghum
236	Dbl Crop WinWht/Sorghum
237	Dbl Crop Barley/Corn
238	Dbl Crop WinWht/Cotton
239	Dbl Crop Soybeans/Cotton
240	Dbl Crop Soybeans/Oats
241	Dbl Crop Corn/Soybeans
242	Blueberries
243	Cabbage
244	Cauliflower
245	Celery
246	Radishes
247	Turnips
248	Eggplants
249	Gourds
250	Cranberries
254	Dbl Crop Barley/Soybeans
USDA, CODE	NASS Cropland Data Layer categories considered non-cultivated: CLASS NAME
37	Other Hay/Non Alfalfa
59	Sod/Grass Seed
60	Switchgrass

63	Forest
64	Shrubland
65	Barren
81	Clouds/No Data
82	Developed
83	Water
87	Wetlands
88	Nonag/Undefined
92	Aquaculture
111	Open Water
112	Perennial Ice/Snow
121	Developed/Open Space
122	Developed/Low Intensity
123	Developed/Med Intensity
124	Developed/High Intensity
131	Barren
141	Deciduous Forest
142	Evergreen Forest
143	Mixed Forest
152	Shrubland
176	Grass/Pasture
190	Woody Wetlands
195	Herbaceous Wetlands

ACCURACY: The accuracy assessment of the 2023 Cultivated Layer uses the same independent validation derived from the FSA CLU (agricultural categories) that was used to accuracy assess the 2023 Cropland Data Layer (CDL). See the 'Attribute Accuracy Report' section of this metadata file for the full accuracy report.

PUBLIC RELEASE: The Cultivated Layer is considered public domain and free to redistribute. The data can be viewed at CroplandCROS https://croplandcros.scinet.usda.gov/ and downloaded at

<https://www.nass.usda.gov/Research_and_Science/Cropland/Release/index.php>. Please note that in no case are farmer reported data revealed or derivable from the public use Cultivated Layer or Cropland Data Layer.

Process_Date: 2023

Process_Contact:

Contact_Information:

Contact Organization Primary:

Contact_Organization: USDA NASS, Spatial Analysis Research Section *Contact_Person:* USDA NASS, Spatial Analysis Research Section staff

Contact_Address:

Address_Type: mailing and physical address Address: 1400 Independence Avenue, SW, Room 5029 South Building City: Washington State_or_Province: District of Columbia Postal_Code: 20250-2001 Country: USA

Contact_Voice_Telephone: 800-727-9540 Contact_Facsimile_Telephone: 855-493-0447 Contact_Electronic_Mail_Address: SM.NASS.RDD.GIB@usda.gov

Spatial_Data_Organization_Information: Indirect_Spatial_Reference: United States of America Direct_Spatial_Reference_Method: Raster Raster_Object_Information: Raster_Object_Type: Pixel Row_Count: 96523 Column Count: 153811 Spatial Reference Information:

Horizontal Coordinate System Definition:

Planar:

Map_Projection: Map_Projection_Name: Albers Conical Equal Area Albers_Conical_Equal_Area: Standard_Parallel: 29.500000 Standard_Parallel: 45.500000 Longitude_of_Central_Meridian: -96.000000 Latitude_of_Projection_Origin: 23.000000 False_Easting: 0.000000 False_Northing: 0.000000

Planar_Coordinate_Information: Planar_Coordinate_Encoding_Method: row and column Coordinate_Representation: Abscissa_Resolution: 30.000000 Ordinate_Resolution: 30.000000

Planar_Distance_Units: meters

Geodetic_Model:

Horizontal_Datum_Name: North American Datum of 1983 *Ellipsoid_Name:* Geodetic Reference System 80 *Semi-major_Axis:* 6378137.000000 *Denominator_of_Flattening_Ratio:* 298.257222

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

The Cultivated Layer is created using historical land cover products from the Cropland Data Layer (CDL). The CDL is produced using agricultural training data from the Farm Service Agency (FSA) Common Land Unit (CLU) Program and non-agricultural training data from the most current version of the United States Geological Survey (USGS) National Land Cover Database (NLCD). The strength and emphasis of the CDL is crop-specific land cover categories. The accuracy of the CDL non-agricultural land cover classes are entirely dependent upon the NLCD. Thus, the USDA NASS recommends that users consider the NLCD for studies involving non-agricultural land cover.

Entity_and_Attribute_Detail_Citation:

Data Dictionary: USDA, National Agricultural Statistics Service, Cultivated Layer Source: USDA, National Agricultural Statistics Service Raster Attribute Domain Values and Definitions: NO DATA, BACKGROUND 0 Raster Attribute Domain Values and Definitions: CULTIVATION Categorization Code Land Cover "1" Non-Cultivated "2" Cultivated

Distribution_Information: Distributor: Contact_Information: Contact_Organization_Primary: Contact_Organization: USDA NASS Customer Service Contact Person: USDA NASS Customer Service Staff

Contact_Address:

Address_Type: mailing and physical address Address: 1400 Independence Avenue, SW, Room 5038-S City: Washington State_or_Province: District of Columbia Postal_Code: 20250-9410 Country: USA

Contact_Voice_Telephone: 800-727-9540 Contact_Facsimile_Telephone: 855-493-0447 Contact_Electronic_Mail_Address: SM.NASS.RDD.GIB@usda.gov Contact_Instructions: Please visit the official website

https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php for distribution details.

Resource_Description: 2023 Cultivated Layer

Distribution_Liability:

Disclaimer: Users of this data are solely responsible for interpretations made from these products. The data is provided 'as is' and the USDA NASS does not warrant results you may obtain using the data. Contact our staff at (SM.NASS.RDD.GIB@usda.gov) if technical questions arise. NASS does maintain a Frequently Asked Questions (FAQ's) section on the CDL website at https://www.nass.usda.gov/Research and Science/Cropland/SARS1a.php>.

Standard Order Process:

Digital_Form:

Digital_Transfer_Information: Format_Name: GEOTIFF Format_Version_Date: 2023 Format_Information_Content: GEOTIFF

Digital_Transfer_Option: Online_Option: Computer_Contact_Information:

Network_Address:

Network_Resource_Name:

<https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php>

Access_Instructions:

The Cultivated Layer is available free for download at the official website https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php. The CDL is available online and free for download at CroplandCROS https://croplandcros.scinet.usda.gov/ and the Geospatial Data Gateway https://croplandcros.scinet.usda.gov/ and the Geospatial Data Gateway https://chatagateway.nrcs.usda.gov/.

Fees:

The Cultivated Layer is available free for download at the official website https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php. The CDL is available online and free for download at CroplandCROS https://croplandcros.scinet.usda.gov/, the Geospatial Data Gateway https://croplandcros.scinet.usda.gov/, the Geospatial Data Gateway https://croplandcros.usda.gov/, and the NASS CDL website https://www.nass.usda.gov/. Distribution questions can be directed to the NASS Customer Service Hotline at 1-800-727-9540.

Ordering_Instructions:

The Cultivated Layer is available free for download at the official website https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php. The CDL is available

online and free for download at CroplandCROS https://croplandcros.scinet.usda.gov/, the Geospatial Data Gateway https://datagateway.nrcs.usda.gov/, and the NASS CDL website https://www.nass.usda.gov/. Distribution questions can be directed to the NASS Customer Service Hotline at 1-800-727-9540.

Technical Prerequisites:

If the user does not have software capable of viewing GEOTIF (.tif) or ERDAS Imagine (.img) file formats then we suggest using CroplandCROS https://croplandcros.scinet.usda.gov/.

Metadata_Reference_Information:

Metadata_Date: 20240131 *Metadata_Contact:*

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: USDA NASS, Spatial Analysis Research Section *Contact_Person:* USDA NASS, Spatial Analysis Research Section Staff

Contact_Address:

Address_Type: mailing and physical address Address: 1400 Independence Avenue, SW, Room 5029 South Building City: Washington State_or_Province: District of Columbia Postal_Code: 20250-2001 Country: USA

Contact_Voice_Telephone: 800-727-9540 Contact_Facsimile_Telephone: 855-493-0447 Contact_Electronic_Mail_Address: SM.NASS.RDD.GIB@usda.gov

Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata Metadata_Standard_Version: FGDC-STD-001-1998 Metadata_Access_Constraints: No restrictions on the distribution or use of the metadata file

Metadata Use Constraints: No restrictions on the distribution or use of the metadata file

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