i15_Crop_Mapping_2020

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: Joel Kimmelshue, Land IQ, LLC, Owner (Originator)

Publication Date: 03/10/2023

Title:

i15_Crop_Mapping_2020

Edition: 20230310

Geospatial Data Presentation Form: vector digital data

Series Information:

Series Name: Planning

Issue Identification: i15

Other Citation Details:

CDWR Land Use Viewer: https://gis.water.ca.gov/app/CADWRLandUseViewer/. Statewide Crop Mapping on California Natural Resources Agency (CRNA) Open Data Portal: https://data.cnra.ca.gov/dataset/statewide-crop-mapping. SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#waterbudget

Description:

Abstract:

Land use data is critically important to the work of the Department of Water Resources (DWR) and other California agencies. Understanding the impacts of land use, crop location, acreage, and management

practices on environmental attributes and resource management is an integral step in the ability of Groundwater Sustainability Agencies (GSAs) to produce Groundwater Sustainability Plans (GSPs) and implement projects to attain sustainability. Land IQ was contracted by DWR to develop a comprehensive and accurate spatial land use database for the 2020 water year (WY 2020), covering over 9.4 million acres of irrigated agriculture on a field scale and additional areas of urban extent.

The primary objective of this effort was to produce a spatial land use database with accuracies exceeding 95% using remote sensing, statistical, and temporal analysis methods. This project is an extension of the 2014, 2016, 2018 and 2019 land use mapping, which classified over 14 million acres of land into irrigated agriculture and urban area. Unlike the 2014 and 2016 datasets, the WY 2018, 2019 and 2020 datasets include multi-cropping and incorporate ground-truth data from Siskiyou, Modoc, Lassen and Shasta counties.

Land IQ integrated crop production knowledge with detailed ground truth information and multiple satellite and aerial image resources to conduct remote sensing land use analysis at the field scale. Individual fields (boundaries of homogeneous crop types representing true irrigated area, rather than legal parcel boundaries) were classified using a crop category legend and a more specific crop type legend. A supervised classification process using a random forest approach was used to classify delineated fields and was carried out county by county where training samples were available. Random forest approaches are currently some of the highest performing methods for data classification and regression. To determine frequency and seasonality of multiple-cropped fields, peak growth dates were determined for annual crops. Fields were attributed with DWR crop categories and included citrus/subtropical, deciduous fruits and nuts, field crops, grain and hay, idle, pasture, rice, truck crops, urban, vineyards, and young perennials. These categories represent aggregated groups of specific crop types in the Land IQ dataset.

Accuracy was calculated for the crop mapping using both DWR and Land IQ crop legends. The overall accuracy result for the crop mapping statewide was 97.8% using the Land IQ legend (Land IQ Subclass) and 99.0% using the DWR legend (DWR Class). Accuracy and error results varied among crop types. Some less extensive crops that have very few validation samples may have a skewed accuracy result depending on the number and nature of validation sample points.

DWR revised crops and conditions from the Land IQ classification were encoded using standard DWR land use codes added to feature attributes, and each modified classification is indicated by the value 'r' in the ‘DWR_REVISE' data field. Polygons drawn by DWR, not included in Land IQ dataset receive the 'n' code for new. Boundary change (i.e. DWR changed the boundary that LIQ delivered, could be split boundary) indicated by 'b'. Each polygon classification is consistent with DWR attribute standards, however some of DWR's traditional attribute definitions are modified and extended to accommodate unavoidable constraints within remote-sensing classifications, or to make data more specific for DWR's water balance computation needs. The original Land IQ classifications reported for each polygon are preserved for comparison, and are also expressed as DWR standard attributes. Comments, problems, improvements, updates, or suggestions about local conditions or revisions in the final data set should be forwarded to the appropriate Regional Office Senior Land Use Supervisor.

Revisions were made if:

- DWR corrected the original crop classification based on local knowledge and analysis,

-PARTIALLY IRRIGATED CROPS Crops, irrigated for only part of their normal irrigation season were given the special condition of ‘X’,

-In certain areas, DWR changed the irrigation status to non-irrigated. Among those areas the special condition may have been changed to 'Partially Irrigated' based on image analysis and local knowledge,

- young versus mature stages of perennial orchards and vineyards were identified (DWR added ‘Young’ to Special Condition attributes),

- DWR determined that a field originally classified ‘Idle’ or 'Unclassified' were actually cropped one or more times during the year,

- the percent of cropped area was changed from the original acres reported by Land IQ (values indicated in DWR ‘Percent’ column),

- DWR determined that the field boundary should have been changed to better reflect the cropped area of the polygon and is identified by a 'b' in the DWR_REVISED column,

- DWR determined that the field boundary should have been split to better reflect separate crops within the same polygon and identified by a 'b' in the DWR_REVISED column,

- The ‘Mixed’ was added to the MULTIUSE column refers to no boundary change, but percent of field is changed where more than one crop is found,

- DWR identified a distinct early or late crop on the field before the main season crop (‘Double’ was added to the MULTIUSE column); if the 1st and 2nd sequential crops occupied different portions of the total field acreage, the area percentages were indicated for each crop).

This dataset includes multicropped fields. If the field was determined to have more than one crop during the course of the WY, the order of the crops is sequential, beginning with Class 1. All single cropped fields will be placed in Class 2, so every polygon will have a crop in the Class 2 and CropType2 columns. In the case that a permanent crop was removed during the WY, the Class 2 crop will be the permanent crop followed by ‘X’ – Unclassified fallow in the Class 3 column. In the case of Intercropping, the main crop will be placed in the Class 2 column with the partial crop in the Class 3 column.

A new column for the 2019 and 2020 datasets is called ‘MAIN_CROP’. This column indicates which field Land IQ identified as the main season crop for the WY representing the crop grown during the dominant growing season for each county. The column ‘MAIN_CROP_DATE’, another addition to the 2019 and 2020 datasets, indicates the Normalized Difference Vegetation Index (NDVI) peak date for this main season crop. The column 'EMRG_CROP' for 2019 and 2020 indicates an emerging crop at the end of the WY. Crops listed indicate that at the end of the WY, September 2020, crop activity was detected from a crop that reached peak NDVI in the following WY (2021 WY). This attribute is included to account for water use of crops that span multiple WYs and are not exclusive to a single WY. It is indicative of early crop growth and initial water use in the current WY, but a majority of crop development and water use

in the following WY. Crops listed in the 'EMRG_CROP' attribute will also be captured as the first crop (not necessarily Crop 1) in the following WY (2021 WY). These crops are not included in the 2020 UCF_ATT code as their peak date occurred in the following WY.

For the 2020 dataset new columns added are: 'YR_PLANTED' which represent the year orchard / grove was planted. 'SEN_CROP' indicates a senescing crop at the beginning of the WY. Crops listed indicate that at the beginning of the WY, October 2019, crop activity was detected from a crop that reached peak NDVI in the previous WY (2019 WY), thus was a senescing crop. This is included to account for water use of crop growth periods that span multiple WYs and are not exclusive to a WY. Crops listed in the 'SEN_CROP' attribute are also captured in the CROPTYP 1 through 4 sequence of the previous WY (2019 WY). These crops are not included in the 2020 UCF_ATT code as their peak NDVI occurred in the previous WY.

Purpose:

Understanding the impacts of land use, crop location, acreage, and management practices on environmental attributes and resource management will be an integral step in the ability of GSAs to produce GSPs and implement projects to attain sustainability. For these purposes, as well as many others, a spatial mapping base layer is essential for effective decision-making and other applications.

In response to this need for information, Land IQ was contracted by DWR to develop a comprehensive and accurate spatial land use database first for the 2014, 2016, 2018, and 2019 WYs and now for the 2020 WY, covering over 9.4 million acres of irrigated agriculture on a field scale and additional areas of urban extent. The primary objective of this effort was to produce a comprehensive and accurate spatial land use database with overall accuracies exceeding 95% using remote sensing, statistical, and temporal analysis methods.

DWR reviewed and revised the data in some cases. Detailed reviews and revisions of individual fields were determined by DWR Land Use staff in Regional Offices, therefore it is important to contact individual Senior Land Use Supervisors within Regional Offices for local details. For Northern Regional Office you may contact Tito Cervantes at Tito.Cervantes@water.ca.gov; North Central Regional Office, Jeff Smith at Jeff.A.Smith@water.ca.gov; South Central Regional Office, Steve Ewert at Steve.Ewert@water.ca.gov; and Southern Regional Office, Robert Fastenau at Robert.Fastenau@water.ca.gov. The associated data are considered DWR enterprise GIS data, which meet all appropriate requirements of the DWR Spatial Data Standards, specifically the DWR Spatial Data Standard version 3.3, dated April 13, 2022. This data set was not produced by DWR. Data were originally developed and supplied by Land IQ, LLC, under contract to California Department of Water Resources. DWR makes no warranties or guarantees - either expressed or implied - as to the completeness, accuracy, or correctness of the data. DWR neither accepts nor assumes liability arising from or for any incorrect, incomplete, or misleading subject data. The official DWR GIS steward for the statewide compilation of this data are Land Use Unit staff. Comments, problems, improvements, updates, or suggestions should be forwarded to the official GIS steward as available and appropriate. Detailed

compilation and reviews of Statewide Crop Mapping and metadata development were performed by DWR Land Use Unit staff, therefore you may forward your questions to Landuse@water.ca.gov.

Supplemental Information:

Land Use Data Quality Control

This dataset is the final copy of Crop_Mapping_2020. Digital surveys published on this site are designated as either ‘Final’, or ‘Provisional’, depending upon its status in a peer review process. Each survey has been zipped into a downloadable folder which contains the survey shapefile, feature class, and other documentation that further explains how that specific survey was processed, and how the information is interpreted.

'Final' surveys are peer reviewed with extensive quality control methods to confirm that field polygon attributes reflect the most detailed and specific land-use classification available, using the standard DWR Land Use Legend specific to the survey year. Data sets are considered ‘final’ following the reconciliation of peer review comments and confirmation by the originating Regional Office. During final review, individual polygons are evaluated using a combination of aerial photointerpretation, satellite image multi-spectral data and time series analysis, comparison with other sources of land use data, and general knowledge of land use patterns at the local level.

'Provisional' data sets have been reviewed for conformance with DWR’s published data record format, and for general agreement with other sources of land use trends. Comments based on peer review findings may not be reconciled, and no significant edits or changes are made to the original survey data.

Time Period of Content:

Time Period Information:

Range of Dates/Times:

Beginning Date: 10/01/2019

Ending Date: 09/30/2020

Currentness Reference:

publication date

Status:

Progress:

Complete

Maintenance and Update Frequency: Irregular

Spatial Domain:

Description of Geographic Extent:

GEOGRAPHIC EXTENT, BOUNDING RECTANGLE, EXTENT TYPE: Extent used for searching

Bounding Coordinates:

West Bounding Coordinate: -124.4692

East Bounding Coordinate: -113.4995

North Bounding Coordinate: 42.0709

South Bounding Coordinate: 32.4317

Keywords:

Theme:

Theme Keyword Thesaurus: None

Theme Keyword: Imagery

Theme Keyword: Urban

Theme Keyword: Planning

Theme Keyword: Satellite imagery

Theme Keyword: Ground truth

Theme Keyword: Crop

Theme Keyword: Raster

Theme Keyword: Landsat

Theme Keyword: Land cover

Theme Keyword: Irrigated land

Theme Keyword: 2020

Theme Keyword: Multispectral analysis

Theme Keyword: Vector

Theme Keyword: Digital imagery

Theme Keyword: Image classification

Theme Keyword: Aerial photography

Theme Keyword: Land use

Theme Keyword: Survey

Theme Keyword: Boundaries

Theme Keyword: Agriculture

Theme Keyword: DWR GIS Atlas

Place:

Place Keyword Thesaurus: None

Place Keyword: State of California

Access Constraints: None

Use Constraints:

None

Point of Contact:

Contact Information:

Contact Organization Primary:

Contact Organization: California Department of Water Resources

Contact Person: Land Use Supervisor

Contact Position: Senior Environmental Scientist

Contact Address:

Address Type: mailing

Address: PO Box 942836

City: Sacramento

State or Province: CA

Postal Code: 94236-0001

Country: USA

Contact Voice Telephone:

Contact Electronic Mail Address: Landuse@water.ca.gov

Data Set Credit:

Land IQ, www.LandIQ.com, California Department of Water Resources, Division of Regional Assistance Regional Offices: Northern, North Central, South Central and Southern Regional Offices, and Water Use Efficiency Branch (Sacramento Headquarters).

Native Data Set Environment:

Version 6.2 (Build 9200); Esri ArcGIS 10.8.1

Back to Top

Data Quality Information:

Attribute Accuracy:

Attribute Accuracy Report:

The overall accuracy for WY 2020 crop mapping statewide was 99% at the DWR Crop Class legend level and 97.8% at the Subclass legend level. Only crop classes represented by at least 10 fields in the validation data for a hydrologic region were included in the assessment. Accuracy statistics were calculated independently for each region (statewide and hydrologic) as well as each level of legend (DWR Class and Subclass).

ACCURACY BY CROP CLASS: Accuracy was calculated for each crop (percentage of reference fields correctly classified in each crop category) for both DWR Class and Subclass legends statewide. In addition to the statewide assessment, accuracy was also determined at the hydrologic region level. Some land cover types (e.g., apples, kiwis, subtropical fruits) and hydrologic regions are not included in the accuracy assessment due to insufficient data. In these cases, there were either no or less than ten samples available for accuracy assessment. A weighted accuracy assessment was conducted for each crop class by hydrologic region. Count based accuracies were first calculated for each crop class as the percent of reference fields correctly classified. Weights for each crop were independently calculated as the percent of total cropped area represented by the respective crop. The count-based accuracies were then multiplied by their respective weight by crop category and region. These weighted accuracies were then summed across all crops in the region to yield the overall weighted accuracy for the respective region.

In total, the multi-crop resolution of mapping data in WY 2020 captures the vast majority of the cropping year-round in the state, allowing data users to characterize crop production and water use more accurately. Some crop rotations may occasionally be missed; this is because satellite data are intermittent and cropping is rotational and, in some cases, very short term. For this reason, available data will occasionally miss a rotational crop timing. However, any missed crops are short season in nature and therefore have a smaller impact on total water use analysis. It should also be noted that young perennials, while a smaller class, are challenging to detect with remote sensing approaches and can be confused with fallow until features are detectable. This is particularly true in years when higher resolution (e.g., NAIP) image resources are not available. NAIP imagery was available in WY 2020; many young perennial features undetectable in 2019 were detected in 2020 with higher resolution data availability.

PRECISION BY CROP: Two-tailed confidence intervals (95%) were calculated using the method in Olofsson et al. (2014) for the commission error of each crop class. As noted above, precision is related to the random error, which can be quantified by a confidence interval. A confidence interval gives a range that encompasses the true value of an unknown fixed quantity with a specified probability. A precise estimate would thus have a small confidence interval. For example, cherries were mapped at 98% accuracy with a confidence interval of plus or minus 1%. This means that 98% of the time, we are confident that the cherry classification was between 97 and 99% correct. As the number of ground truth

points increases, precision (confidence) generally also increases, and the confidence interval becomes smaller. Some crops are mapped with high accuracy with few ground truth points because they are very distinct and relatively easy to distinguish from other crops. Other crops have a lower accuracy but relatively high precision (miscellaneous grasses) because the number of ground truth points was relatively high. Some crops were mapped with high accuracy but lower precision because of very few ground truth points.

Logical Consistency Report:

Data are considered logically consistent.

Completeness Report:

Data are complete as of final delivery 2022/12/08

Positional Accuracy:

Horizontal Positional Accuracy:

Horizontal Positional Accuracy Report:

Locational quality for this mapping dataset was determined to be no better than +/- 8.0 meters.

Lineage:

Source Information:

Source Citation:

Citation Information:

Originator: Joel Kimmelshue, Land IQ, LLC, Owner (Originator)

Publication Date: 03/10/2023

Title:

Land IQ California 2020

Edition: 20230310

Geospatial Data Presentation Form: vector digital data

Type of Source Media: None

Source Time Period of Content:

Time Period Information:

Range of Dates/Times:

Beginning Date: 10/01/2019

Ending Date: 09/30/2020

Source Currentness Reference:

publication date

Source Citation Abbreviation:

DWR

Source Contribution:

California Department of Water Resources, Division of Regional Assistance, Regional Offices: Northern, North Central, South Central and Southern Regional Offices, and Water Use Efficiency Branch (Sacramento Headquarters).

Process Step:

Process Description:

METHODS

Land IQ integrated crop production knowledge with detailed ground truth information and multiple satellite and aerial image resources to conduct remote sensing land use analysis at the field scale. The mapping approach employed advanced spatial statistical analysis approaches to determine prediction probabilities and inform Quality Assurance/Quality Control (QA/QC) efforts. A rigorous QA/QC and analysis refinement process was used to improve predictions on all lower

confidence fields.

Individual fields (boundaries of homogeneous crop types representing true irrigated area, rather than legal parcel boundaries) were defined so that each independent field could be analyzed independently and assigned to a crop class. The result represents the true irrigated area and not legal or other less detailed boundaries that may be available elsewhere.

The classification legend was developed in coordination with DWR with consideration of the known crop variation, existing DWR legends used in current models, and Land IQ mapping classes. Two legend levels were selected to retain the detail in base mapping, while providing a more general legend which groups some crops into categories.

Process Date: 06/01/2020

Process Step:

Process Description:

GROUND TRUTH DATA COLLECTION

To generate and validate a land use map using remotely sensed imagery, a representative sample of reference points in the imagery with known class values (or known land use types) is needed for two reasons. Some of the data are used to calibrate or train the remote sensing model that generates land use results on all analyzed fields. Another set of reference data is needed to independently validate the accuracy of the remote sensing model. Currently, Land IQ collects reference data for model training and validation from cropped areas in California by conducting “on-the-ground” survey. For this reason, Land

IQ calls reference data collection “ground truthing.” Land IQ ground truth data collection seeks to gather information representing crop types with a target of 10 to 20% of mapped land. These data are split for purposes of training and validation as described in later sections.

Ground truth data collection areas are selected to best represent the cropping systems in mapped areas across the state. In WY 2020, ground truth efforts included Siskiyou, Modoc, Lassen, and Shasta counties, the central coast, southern coast, the low desert, the Sacramento-San Joaquin Delta, and the San Joaquin and Sacramento Valleys. Information from ground truth areas are compiled and applied regionally across the state. In this way the image classification approaches used in all areas are informed by training data from representative crops. Ground truth data collection approaches are continually refined as cropping and crop timing details are determined through mapping efforts.

Process Date: 12/02/2019

Process Step:

Process Description:

IMAGERY ACQUISITION

Both aerial and satellite data resources were used for the crop classification. Aerial imagery provided by the United States Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) was collected throughout the summer of 2020 by the USDA and used for field delineation, classification, and QA/QC of the final product. Multiple Landsat 8 images were used for the initial crop classification. Imagery from the Landsat 8 satellite is free of charge, available every 16 days, and allowed temporal analysis throughout the growing season. Satellite-based imagery provided by Sentinel was also utilized during the QA/QC process. While lower resolution than NAIP imagery, the overpass frequency of Sentinel is multiple times per month, which is valuable for a visual analysis of the temporal characteristics (i.e., growing season) for each crop.

Process Date: 06/01/2020

Process Step:

Process Description:

CROP FREQUENCY AND PEAK DATES

Prior to WY 2018, only summer crops were classified. The WY 2020 dataset includes multiple crop attributes for some fields depending on the time of year. These fields are referred to as multi-cropped fields. Mapping frequency was determined in coordination with DWR personnel to represent areas understood to have higher frequency crop production. These areas were delineated from existing DWR Detailed Analysis Unit (DAU) maps and incorporated all or portions of DAUs expected to have multiple cropping. Three levels of multiple cropping were defined (double, triple, and triple+) using knowledge about regional production practices. All fields within a given multi-cropping area were mapped at the cropping frequency designated for that region.

The timing of multi cropping varies among crops and regions. Rather than defining set seasons such as spring, summer, fall and winter, an assessment of peak crop production date was conducted. Peak dates were determined for each crop by assessing field Normalized Difference Vegetative Index (NDVI), which

represents crop vigor, and evaluating index patterns and maximum points. The average of the dates of these maximum points was determined to be the peak date for a particular crop season and a peak date was determined for each annual crop. A maximum of four crops per field were mapped depending on the targeted mapping frequency. Fields were attributed with more than one crop when more than one peak date was found. When a permanent crop such as alfalfa or almonds was removed, the mid-point between the removal date and the end date of the WY (September 30, 2020) was recorded as the peak date, which can be used to calculate the crop's timeframe for crop water use.

Process Date: 03/17/2021

Process Step:

Process Description:

PERCENT COVER (PERCENT CROPPED)

A percent cover attribute was also newly added in WY 2018 and is included in the 2020 dataset for each field. This attribute represents the percentage of a field that is cropped. Staggered or strip planting, where a field is not planted uniformly but rather in stages during a season, is a common practice in crops such as lettuce/leafy greens, cole crops, carrots, and miscellaneous truck crops. To provide more accurate acreages for these crops, the percent cover attribute represents approximately what proportion of a field was in production for that mapped season. This is used to calculate more specific acreage for these crops while allowing outer field boundaries to remain relatively consistent over multiple years.

Process Date: 03/17/2021

Process Step:

Process Description:

ANALYSIS

The Land IQ mapping scale is focused on all cropped fields greater than 2 acres across the state. In some cases, fields smaller than two acres were included if they were adjacent, the same crop and clearly associated as a part of a broader group of fields cultivated together. More than 423,000 delineated fields were classified in WY 2020 utilizing ground training examples and multiple image sources and dates. Multiple selected image sources and timeframes served as input data for the remote sensing classification process, along with comprehensive ground truth training samples. In some more sparsely cropped counties, photo interpretation methods are used for initial crop mapping.

Process Date: 10/22/2020

Process Step:

Process Description:

GROUND TRUTH TRAINING DATA

Field data from 18% of all cropped land in California were collected, which represented 57,204 data points and 42,992 fields. This represents a small (3%) decline in ground truthed area from the previous

year as winter and spring surveys were limited by a global pandemic. The ground truthing data were stratified based on Land IQ's classification schema, with approximately 75% of the data selected for model building and calibration, and the remaining approximately 25% dedicated to independent validation and accuracy assessment. These independent data were set aside from the modeling process and used in the final accuracy assessment discussed later. The two datasets were reviewed and evaluated statistically to identify any repeated points within a single field or samples considered unrepresentative (crops that were very stressed, intercropped or abandoned, for example). These data points were flagged and removed from the training and validation samples.

Process Date: 11/17/2020

Process Step:

Process Description:

MODEL INPUT FEATURES

The input features were produced using ground truth training samples and satellite imagery from Landsat 8 OLI/TIRS sensors and NAIP, collected during the growing season.

Process Date: 10/22/2020

Process Step:

Process Description:

CROP CLASSIFICATION MODEL

Multiple geoprocessing tools and methods were employed to assess the model dataset, including ArcGIS, and other open-source statistical tools. These tools were used to generate spectral characteristics, textural characteristics, and temporal representations that are related to the specific attributes of each crop or land use.

Supervised classification was used to classify delineated fields. Selected ground truth data and feature data were used for model building and calibration. A portion of these data were used for model calibration and the remainder was used to train the models. Multiple remote sensing models are assessed and compared to determine the highest performing for classification. The preferred model was then applied to all delineated fields to predict land cover type, as well as prediction confidence, which was is used to inform QA/QC efforts.

Process Date: 10/22/2020

Process Step:

Process Description:

QUALITY REVIEW

Photo interpretation methods were used to review imagery of classified fields with a low confidence level. Results were also cross validated with ancillary data sources such as the coinciding USDA Crop Data Layer (CDL) and county agricultural surveys and county crop reports, to assess and evaluate

significant differences. Differences do not always indicate incorrect classification but are used both to evaluate the classification result and explain deviation from other data sources if any exists.

Process Date: 06/07/2021

Process Step:

Process Description:

CROP MAP PRODUCT

The geospatial database was attributed with field size (acres), relevant county, and the appropriate crop classification categories per both the Land IQ and DWR legends.

Process Date: 02/21/2023

Back to Top

Spatial Data Organization Information:

Direct Spatial Reference Method:

Vector

Point and Vector Object Information:

SDTS Terms Description:

SDTS Point and Vector Object Type: G-polygon

Point and Vector Object Count: 422942

Back to Top

Spatial Reference Information:

Horizontal Coordinate System Definition:

Planar:

Map Projection:

Map Projection Name: Unprojected

Albers Conical Equal Area:

Standard Parallel: 34.0

Standard Parallel: 40.5

Longitude of Central Meridian: -120.0

Latitude of Projection Origin: 0.0

False Easting: 0.0

False Northing: -4000000.0

Planar Coordinate Information:

Planar Coordinate Encoding Method: coordinate pair

Coordinate Representation:

Abscissa Resolution: 0.6096

Ordinate Resolution: 0.6096

Planar Distance Units: meters

Geodetic Model:

Horizontal Datum Name: NAD_1983_2011

Ellipsoid Name: GRS_1980

Semi-major Axis: 6378137.0

Denominator of Flattening Ratio: 298.257222101

Back to Top

Entity and Attribute Information:

Detailed Description:

Entity Type:

Entity Type Label: i15_Crop_Mapping_2020

Entity Type Definition:

Table containing attribute information associated with the data set.

Entity Type Definition Source:

Producer defined

Attribute:

Attribute Label: OBJECTID

Attribute Definition:

Internal feature number.

Attribute Definition Source:

Esri

Attribute Domain Values:

Unrepresentable Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute Label: Shape

Attribute Definition:

Feature geometry.

Attribute Definition Source:

Esri

Attribute Domain Values:

Unrepresentable Domain:

Coordinates defining the features.

Attribute:

Attribute Label: UniqueID

Attribute Definition:

Unique Identifier for each polygon

Attribute Definition Source:

Land IQ

Attribute Domain Values:

Unrepresentable Domain:

Attribute:

Attribute Label: DWR_REVISE

Attribute Definition:

Indicator that the original polygon classification was revised or modified by DWR Regional Land Use staff. Revised polygons are indicated by the letter 'r'.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Revised polygons are indicated by the code 'r'. Revisions include attribute revisions only. Polygons drawn by DWR, not included in the Land IQ dataset receive the 'n' code for new. Polygons which have had their boundary changed (ie. DWR changed the boundary that Land IQ delivered) is indicated by 'b'

and may also include attribute revision. A changed boundary could include a split boundary or a redrawn polygon to better reflect the cropped area of the polygon.

Attribute:

Attribute Label: SYMB_CLASS

Attribute Definition:

CLASS2 used as class code symbology, stripped of all spaces and asterisks (**).

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See CLASS2 for detail

Attribute:

Attribute Label: MULTIUSE

Attribute Definition:

This field indicates whether sequential or concurrent land uses are mapped within the area represented by a polygon.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Polygons where a sequence of one to four crops were planted in succession are coded as:

S - a single land use or crop

D - double cropped: two crops grown in sequence

T – triple cropped: three crops grown in sequence.

Q – quadruple cropped: four crops grown in sequence.

Polygons where crops or land uses are spatially mixed within the polygon at the same time are coded as:

I- intercropped: orchards or vineyards with an annual crop planted between the rows,

M – mixed use: A single polygon area that represents a mixture of two or three land uses.

The percentages representing each multiuse type are coded in the PCNT1, PCNT2, PCNT3, and PCNT4 fields.

Attribute:

Attribute Label: CLASS1

Attribute Definition:

Class for the first land use group on the field, and the first level of detail for land use identification. All class codes are letters, not numerals. In the statewide data set: (1) all Main Season summer crop data begins in column CLASS2; only multicropped fields (MULTIUSE = 'D', ‘T’, or ‘Q’, or Mixed Use fields (MULTIUSE = 'M') will have a code in CLASS1. All agricultural class codes except for 'YP' are right justified with a leading space. All non-agricultural codes are left justified, and may have a trailing space. (2) all Single cropped data has a crop in CLASS2. Therefore, all Single cropped fields will have no attribute in CLASS1, but all Double, Triple, and Quadruple crops will begin their sequence in CLASS1, with sequential crops in CLASS2, CLASS3 and CLASS 4 (for double, triple, and quadruple crops).

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Class codes are:

G - Grain and hay crops (' G'),

R - Rice (' R'),

F - Field crops (' F'),

P - Pasture (' P'),

T - Truck, nursery, and berry crops (' T'),

D - Deciduous fruits and nuts (' D'),

C - Citrus and subtropical (' C'),

V - Vineyards (' V'),

I - Idle (' I'),

S - Semi-agricultural and incidental to agriculture ('S '),

U - Urban - residential, commercial, and industrial, unsegregated ('U '),

UR - Urban residential - single and multi-family units, includes trailer parks ('UR'),

UC - Urban commercial ('UC'),

UI - Urban industrial ('UI'),

UV - Urban vacant ('UV'),

NC - Native classes, unsegregated ('NC'),

NV - Native vegetation ('NV'),

NR - Native riparian vegetation ('NR'),

NW - Water surface ('NW'),

NB - Barren and wasteland ('NB'),

NS - Not surveyed ('NS'),

E - Entry denied - area within the study area that was not mapped because entry into the area was denied ('E ') and

Z - Outside of the study area ('Z ').

Following CLASS codes were used to align Land IQ values with the DWR Standard Land Use Legend:

' X' - Unclassified fallow “X” reflect the following circumstances: (1) A field was fallow for a whole season (in this case, ‘X’ will be in the Crop2 ‘main crop’ segment and no other crops have been assigned for this field in this instance). (2) Fallow condition followed removal of a permanent crop, the permanent crop has been assigned in the Crop2 'main crop' segment and the "X" will be in the crop 3 segment indicating the permanent crop was removed. (3) Unclassified Fallow is also used when indicating the planting of Alfalfa & Alfalfa Mixtures or Miscellaneous Grasses. In these scenarios Unclassified fallow would be Crop1, and Alfalfa & Alfalfa Mixtures or Miscellaneous Grasses would be Crop2.

'YP' - Young Perennial

Attribute:

Attribute Label: SUBCLASS1

Attribute Definition:

This is the subclass associated with the CLASS1, in combination, CLASS and SUBCLASS provide the most specific level of detail for land use identification in the DWR Standard Land Use Legend. It is not mandatory to have a subclass code after a CLASS code. All subclasses are text numerals, and associated with each class. A specific subclass value represents different crops or other land uses depending upon the class associated with it. The subclass list was extended to accommodate Land IQ classifications for remote-sensing purposes.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Subclasses used in this 2019 statewide data set are:

CLASS G - Grain and hay crops: 1 - Barley, 2 - Wheat, 3 - Oats, 6 - Miscellaneous grain and hay, 7 - Mixed grain and hay. (' 1', ' 2', ' 3', ' 6', ' 7', '**')

CLASS R - Rice: 1 - Rice, 2 - Wild Rice. (' 1', ' 2', '**')

CLASS F - Field crops: 1 - Cotton, 2 - Safflower, 3 - Flax, 4 - Hops, 5 - Sugar beets, 6 - Corn (field & sweet), 7 - Grain sorghum, 8 - Sudan, 9 - Castor beans, 10 - Beans (dry), 11 - Miscellaneous field, 12 - Sunflowers, 13 - Hybrid sorghum/sudan, 14 - Millet, 15, Sugar cane, 16 - Corn,Sorghum or Sudan grouped for remote sensing only. (' 1', ' 2', ' 3', ' 4', ' 5', ' 6', ' 7', ' 8', ' 9', '10', '11', '12', '13', '14', '15', '16', '**')

CLASS P - Pasture: 1 - Alfalfa & alfalfa mixtures, 2 - Clover, 3 - Mixed pasture, 4 - Native pasture, 5 - Induced high water table native pasture, 6 - Miscellaneous grasses, 7 - Turf farms, 8 - Bermuda grass, 9 - Rye grass, 10 - Klein grass. (' 1', ' 2', ' 3', ' 4', ' 5', ' 6', ' 7', ' 8', ' 9', '10', '**')

CLASS T - Truck, nursery & berry crops: 1 - Artichokes, 2 - Asparagus, 3 - Beans (green), 4 - Cole crops (mixture of 22-25), 6 - Carrots, 7 - Celery, 8 - Lettuce (all types), 9 - Melons, squash, and cucumbers (all types), 10 - Onions & garlic, 11 - Peas, 12 - Potatoes, 13 - Sweet potatoes, 14 - Spinach, 15 - Tomatoes (processing), 16 - Flowers, nursery & Christmas tree farms, 17 - Mixed (four or more), 18 - Miscellaneous truck, 19 - Bush berries, 20 - Strawberries, 21 - Peppers (chili, bell, etc.), 22 - Broccoli, 23 - Cabbage, 24 - Cauliflower, 25 - Brussels sprouts, 26 - Tomatoes (market), 27 - Greenhouse, 28 - Blueberries, 29 - Asian leafy vegetables, 30 - Lettuce or Leafy Greens grouped for remote sensing only, 31 - Potato or Sweet potato grouped for remote sensing only. (' 1', ' 2', ' 3', ' 4', ' 5', ' 6', ' 7', ' 8', ' 9', '10', '11', '12', '13', '14', '15', '16', '17', '18', '19', '20', '21', '22', '23', '24', '25', '26', '27', '28', '29', '30', '31', '**')

CLASS D - Deciduous fruits and nuts: 1 - Apples, 2 - Apricots, 3 - Cherries, 5 - Peaches and nectarines, 6 - Pears, 7 - Plums, 8 - Prunes, 9 - Figs, 10 - Miscellaneous deciduous, 11 - Mixed deciduous, 12 - Almonds, 13 - Walnuts, 14 - Pistachios, 15 - Pomegranates, 16 - Plums, Prunes or Apricots grouped for remote sensing only. (' 1', ' 2', ' 3', ' 5', ' 6', ' 7', ' 8', ' 9', '10', '11', '12', '13', '14', '15', '16', '**')

CLASS C - Citrus and subtropical: 1 - Grapefruit, 2 - Lemons, 3 - Oranges, 4 - Dates, 5 - Avocados, 6 - Olives, 7 - Miscellaneous subtropical fruit, 8 - Kiwis, 9 - Jojoba, 10 - Eucalyptus, 11 - Mixed subtropical fruits. (' 1', ' 2', ' 3', ' 4', ' 5', ' 6', ' 7', ' 8', ' 9', '10', '11', '**')

CLASS V - Vineyards: 1 - Table grapes, 2 - Wine grapes, 3 - Raisin grapes. (' 1', ' 2', ' 3', '**')

CLASS YP - no subclass ('**')

CLASS I - Idle: 1 - Land not cropped the current or previous crop season, but cropped within the past three years, 2 - new lands being prepared for crop production, 4 - long term, land consistently idle for four or more years. (' 1', ' 2', ' 4', '**')

CLASS X - Not cropped or unclassified, no subclass ('**')

CLASS S – Semi-agricultural & incidental to agriculture: 1 - Farmsteads (includes a farm residence), 2 - Livestock feed lot operations, 3 - Dairies, 4 - Poultry farms, 5 - Farmsteads (without a farm residence), 6 - Miscellaneous semi-agricultural (small roads, ditches, non-planted areas of cropped fields). (' 1', ' 2', ' 3', ' 4', ' 5', '6', '**')

CLASS U - Urban - generic nomenclature with no subclass. ('**')

CLASS UR - Urban residential: 1 - Single family dwellings with lot sizes greater than 1 acre up to 5 acres (ranchettes, etc.), 2 - Single family dwellings with a density of 1 unit/acre up to 8+ units per acre, 3 - Multiple family (apartments, condominiums, townhouses, barracks, bungalows, duplexes, etc.), 4 - Trailer courts. WATER USE FACTOR (% of total area irrigated - will be the second digit of the UR subclass when water factor is used): 1 - 0% to 25% area irrigated, 2 - 26% to 50% area irrigated, 3 - 51% to 75% area irrigated, 4 - 76% to 100% area irrigated. (' 1', '11', '12', '13', '14', ' 2', '21', '22', '23', '24', ' 3', '31', '32', '33', '34', ' 4', '41', '42', '43', '44', '**')

CLASS UC - Commercial: 1. Offices, retailers, etc. 2. Hotels, 3. Motels, 4. Recreation vehicle parking, camp sites, 5. Institutions (hospitals, prisons, reformatories, asylums, etc., having a reasonably constant 24-hour resident population), 6. Schools (yards to be mapped separately if large enough), 7. Municipal auditoriums, theaters, churches, buildings and stands associated with race tracks, football stadiums, baseball parks, rodeo arenas, amusement parks, etc., 8. Miscellaneous highwater use (to be used to indicate a high water use condition not covered by the above categories.). (' 1', ' 2', ' 3', ' 4', ' 5', ' 6', ' 7', ' 8', '**')

CLASS UI - Industrial: 1. Manufacturing, assembling, and general processing, 2. Extractive industries (oil fields, rock quarries, gravel pits, rock and gravel processing plants, etc.), 3. Storage and distribution (warehouses, substations, railroad marshalling yards, tank farms, etc.), 6. Saw mills, 7. Oil refineries, 8. Paper mills, 9. Meat packing plants, 10. Steel and aluminum mills, 11. Fruit and vegetable canneries and general food processing, 12. Miscellaneous highwater use (to be used to indicate a high water use condition not covered by other categories.), 13. Sewage treatment plant including ponds, 14. Waste accumulation sites (public dumps, sewage sludge sites, landfill and hazardous waste sites, etc.), or 15. Wind farms, solar collector farms, etc. (' 1', ' 2', ' 3', ' 6', ' 7', ' 8', ' 9', '10', '11', '12', '13', '14', '15', '**')

CLASS - UL: 1. Lawn area – irrigated, 2. Golf course – irrigated, 3. Ornamental landscape (excluding lawns) – irrigated, 4. Cemeteries – irrigated, or 5. Cemeteries - not irrigated. (' 1', ' 2', ' 3', ' 4', ' 5', '**')

CLASS UV - Vacant: 1. Unpaved areas (vacant lots, graveled surfaces, play yards, developable open lands within urban areas, etc.), 3. Railroad right of way, 4. Paved areas (parking lots, paved roads, oiled surfaces, flood control channels, tennis court areas, auto sales lots, etc.), 6. Airport runways, or 7. Land in urban area that is not developable. (' 1', ' 3', ' 4', ' 6', ' 7', '**')

CLASS NC - Native class - generic nomenclature with no subclass ('**') CLASS NV - Native vegetation: 1. Grassland, 2. Light brush, 3. Medium brush, 4. Heavy brush, 5. Brush and timber, 6. Forest, or 7. Oak woodland. (' 1', ' 2', ' 3', ' 4', ' 5', ' 6', ' 7', '**')

CLASS NR - Riparian vegetation: 1. Marsh lands, tules and sedges, 2. Natural highwater table meadow, 3. Trees, shrubs or other larger stream side or watercourse vegetation, 4. Seasonal duck marsh, dry or only partially wet during summer, or 5. Permanent duck marsh, flooded during summer. (' 1', ' 2', ' 3', ' 4', ' 5', '**')

CLASS NW - Water Surface: 1. River or stream (natural fresh water channels), 2. Water channel (all sizes - ditches and canals - delivering water for irrigation and urban use - e.g. State Water Project, Central Valley Project, water district canals, etc.), 3. Water channel (all sizes - ditches and canals - for removing on-farm drainage water - surface runoff and subsurface drainage - e.g. Colusa drain, drainage ditches in Imperial), 4. Freshwater lake, reservoir, or pond (all sizes, includes ponds for stock, recreation, groundwater recharge, managed wetlands, on-farm storage, etc.), 5. Brackish and saline water (includes areas in estuaries, inland water bodies, the ocean, etc.), 6. Wastewater pond (dairy, sewage, cannery, winery, etc.), or 7. Paved water conveyance channels within urban areas (mainly for flood control). (' 1', ' 2', ' 3', ' 4', ' 5', ' 6', ' 7', '**')

CLASS NB - Barren and Wasteland: 1. Dry stream channels, 2. Mine tailings, 3. Barren land, 4. Salt flats, or 5. Sand dunes. (' 1', ' 2', ' 3', ' 4', ' 5', '**')

CLASS E - Entry denied - no subclass ('**')

CLASS Z - Outside of study area - no subclass ('**')

Attribute:

Attribute Label: SPECOND1

Attribute Definition:

SPECIAL CONDITIONS (only one can be used per parcel). This is a special condition for the first land use, which is a single character.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

It is not mandatory to have a special condition code after a class code:

A - ABANDONED ORCHARDS AND VINEYARDS Trees or vines must be in such a condition that renewal of cultural practices would restore economic production. Example: D1-A indicates an apple orchard previously in production but now abandoned. ('A')

B - BURNED OVER AREAS Indicated by "B". The type and density of natural cover destroyed by fire may be obtained by examination of aerial photographs or satellite imagery. Example: NV7-B indicates oak grassland recently burned over. ('B')

C – GREEN CHOPPED Grain or field crops harvested early for livestock feed ('C')

D - HIGH DENSITY ORCHARDS Indicates the density of trees is higher than normally expected (used with D and C classes). ('D')

E – ECOSYSTEM RESTORATION Native vegetation or riparian areas that have undergone restoration (used with NV and NR classes). ('E')

F - FALLOW LANDS Land not cropped during the current crop season, but cropped during the previous crop season. (1) If no crop residue is apparent or identifiable then the "F" symbol will follow the agricultural class symbol for the crop most representative of those grown in the area. Example: T-F indicates fallow land within a truck crop area (with facilities for irrigation). (2) If the crop residue is apparent and identifiable but is not from the current crop season covered by the survey then the field is considered fallow and mapped as the class of the crop residue. Example: Surveyor found old sugar beet residue not from current season. Land would be mapped F-F. (3) If the crop residue is identifiable as that of a crop which was grown during the survey period, then the field is mapped as though the crop existed. Example: Surveyor found carrot residue from current growing season. Land would be mapped T6. ('F')

G – COVER CROP Indicates where grain, field, or pasture type crops have been planted for soil stabilization or for cover crops grown between rows of deciduous and subtropical trees and vines. ('G')

H – HARVESTED CROP Indicates the identified crop was harvested at the time of the survey (used with truck, field, and grain crops). ('H')

K - FREEWAYS The area within the freeway right of way. Examples: UV-K indicates urban vacant, unsegregated, with a freeway special condition (all areas within the freeway right of way). UV4-K indicates the urban vacant paved areas with a freeway special condition (the paved portion within the freeway right of way.) UL3-K indicates irrigated urban landscape with a freeway special condition (irrigated landscape portion within the freeway right of way). ('K')

R - RECREATIONAL To be used with urban residential, commercial, and vacant (recreational vehicle parks and camp sites) within primarily a seasonal recreational area. ('R')

S - SEED CROP Indicates any crop grown for seed. Example: P1-S indicates an irrigated alfalfa seed crop. ('S')

T - TILLED LANDS Land prepared for immediate planting, or just newly planted, including the appearance of seed lines or unidentifiable tiny seedlings. Example: T-T indicates tilled land (either prepared for planting or just planted) in a predominately truck crop area. ('T')

U – INTERPRETED LANDUSE Indicates that the land use was determined using other means than visual field verification. ('U')

W - THIRD PARTY DATA SOURCE

X - PARTIALLY IRRIGATED CROPS Crops irrigated for only part of their normal irrigation season. Example: P3-X indicates partially irrigated mixed pasture. ('X')

Y - YOUNG CROPS Indicates the identified crop is at early stages of growth (used with non-bearing orchards and vineyards, and truck, field, and grain crops). Example: C3-Y indicates young non-bearing oranges. All orchards 3 years or younger considered young. Walnuts 4 years and younger, as well as Citrus and Pistachios 5 years and younger given 'Y' special condition. ('Y')

Z - RECLAMATION Land being leached for the removal of harmful salts. This symbol will be used following either the “Idle” symbol or symbols of crops grown as a step in the reclamation process. Example: I2-Z indicates new lands being leached in preparation for crop production. ('Z')

Attribute:

Attribute Label: IRR_TYP1PA

Attribute Definition:

This field is the irrigation status for the first land use (either irrigated or non-irrigated).

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

All fields are presumed irrigated unless an ‘n’ for non-irrigated has been applied. This code refers to the status of the land, so a fallowed field will be mapped as "irrigated" if the field is usually irrigated when a crop has been planted, even if no water has been applied this year.

Attribute:

Attribute Label: IRR_TYP1PB

Attribute Definition:

This field is the type of irrigation system.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Types of irrigation system codes are:

C - Center Pivot Sprinkler

L - Linear Move Sprinkler

R - Side Roll Sprinkler

H - Hand Move Sprinkler

P - Permanent Sprinkler

T - Solid Set Sprinkler

F - Furrow Irrigation

B - Border Strip Irrigation

N - Basin Irrigation

W - Wild Flooding

S - Subirrigation

D - Surface Drip Irrigation

A - Buried Drip Irrigation

M - Micro Sprinkler

E - LEPA (Low Energy Precision Application)

U - Unknown or not mapped.

Attribute:

Attribute Label: PCNT1

Attribute Definition:

This is the percentage of cropped area associated with the first land use, using text numerals.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

The code “50” means 50%, the code “00” means 100%. A single, double, triple, quadruple, and intercropped (“S”, “D”, “T”, “Q”, and “I”) land use will display their true percentage value in this field and not necessarily "00" (100%). A mixed land use (“M”) will always have a code in this field, but it will be less than 100% (for further details, see MULTIUSE definition, above).

Attribute:

Attribute Label: CLASS2

Attribute Definition:

The Main Season (summer) crop classified on the field for Single cropped fields. The second crop in the WY for Double, Triple, and Quadruple cropped fields.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See CLASS1 for detail

Attribute:

Attribute Label: SUBCLASS2

Attribute Definition:

See SUBCLASS1 for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See SUBCLASS1 for detail

Attribute:

Attribute Label: SPECOND2

Attribute Definition:

See SPECOND1 for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See SPECOND1 for detail

Attribute:

Attribute Label: IRR_TYP2PA

Attribute Definition:

See IRR_TYP1PA for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See IRR_TYP1PA for detail

Attribute:

Attribute Label: IRR_TYP2PB

Attribute Definition:

See IRR_TYP1PB for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See IRR_TYP1PB for detail

Attribute:

Attribute Label: PCNT2

Attribute Definition:

Percentage of the area covered by the crop for CLASS2 crop.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Percentage of the area covered by the crop for CLASS2 (ranging from 0 - 100%). See PCNT1 for details.

Attribute:

Attribute Label: CLASS3

Attribute Definition:

This field is the third crop or other land use identified on a field. (See CLASS1 for list details and descriptions)

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See CLASS1 for list detail

Attribute:

Attribute Label: SUBCLASS3

Attribute Definition:

See SUBCLASS1 for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See SUBCLASS1 for detail

Attribute:

Attribute Label: SPECOND3

Attribute Definition:

See SPECOND1 for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See SPECOND1 for detail

Attribute:

Attribute Label: IRR_TYP3PA

Attribute Definition:

See IRR_TYP1PA for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See IRR_TYP1PA for detail

Attribute:

Attribute Label: IRR_TYP3PB

Attribute Definition:

See IRR_TYP1PB for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See IRR_TYP1PB for detail

Attribute:

Attribute Label: PCNT3

Attribute Definition:

Percentage of the area covered by the crop for CLASS3 crop.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Percentage of the area covered by the crop for CLASS3 (ranging from 0 - 100%). See PCNT1 for details.

Attribute:

Attribute Label: CLASS4

Attribute Definition:

The fourth crop or other land use identified on a field. (See CLASS1 for list details and descriptions)

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See CLASS1 for list detail

Attribute:

Attribute Label: SUBCLASS4

Attribute Definition:

See SUBCLASS1 for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See SUBCLASS1 for detail

Attribute:

Attribute Label: SPECOND4

Attribute Definition:

See SPECOND1 for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See SPECOND1 for detail

Attribute:

Attribute Label: IRR_TYP4PA

Attribute Definition:

See IRR_TYP1PA for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See IRR_TYP1PA for detail

Attribute:

Attribute Label: IRR_TYP4PB

Attribute Definition:

See IRR_TYP1PB for details.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See IRR_TYP1PB for detail

Attribute:

Attribute Label: PCNT4

Attribute Definition:

Percentage of the area covered by the crop for CLASS4 crop.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Percentage of the area covered by the crop for CLASS4 (ranging from 0 - 100%). See PCNT1 for details.

Attribute:

Attribute Label: UCF_ATT

Attribute Definition:

This field is 37 characters string concatenation of all field survey attributes starting from the MULTIUSE field to the PCNT4 field. The summary string is used for analysis and review in the QA/QC process and for processing data in some raster formats. Beginning character positions of attribute substrings within the UCF_ATT text are listed below:

1 MULTIUSE

2 CLASS1

4 SUBCLASS1

6 SPECOND1

7 IRR_TYP1PA

8 IRR_TYP1PB

9 PCNT1

11 CLASS2

13 SUBCLASS2

15 SPECOND2

16 IRR_TYP2PA

17 IRR_TYP2PB

18 PCNT2

20 CLASS3

22 SUBCLASS3

24 SPECOND3

25 IRR_TYP3PA

26 IRR_TYP3PB

27 PCNT3

29 CLASS4

31 SUBCLASS4

33 SPECOND4

34 IRR_TYP4PA

35 IRR_TYP4PB

36 PCNT4

Columns CLASS 2 through PCNT2 reflect attributes for single cropped fields, as well as the second crop on the field for multicropped fields.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Concatenation of fields from MULTIUSE through PCNT4.

Attribute:

Attribute Label: YR_PLANTED

Attribute Definition:

This field is a four digit number representing

the year the orchard / grove was planted (with excepion of vineyards).

Attribute Definition Source:

Producer Defined

Attribute Domain Values:

Unrepresentable Domain:

Code indicates four digit year which the field was planted.

Attribute:

Attribute Label: SEN_CROP

Attribute Definition:

This field is a four character string. Indicates a senescing crop at the beginning of the WY. Crops listed indicate that at the beginning of the WY, October 2019, crop activity was detected from a crop that reached peak NDVI in the previous WY (2019 WY), thus was a senescing crop. This is included to account for water use of crop growth periods that span multiple WYs and are not exclusive to a single WY. Crops listed in the 'SEN_CROP' attribute are also captured in the final crop of the CROPTYP sequence of the previous WY (2019 WY). These crops are not included in the 2020 UCF_ATT code as their peak NDVI occurred in the previous WY.

Attribute Definition Source:

Producer Defined

Attribute Domain Values:

Unrepresentable Domain:

Code indicates 'CROPTYP' on the field is peaking in the previous WY (i.e. before October 1, 2019).

Attribute:

Attribute Label: CROPTYP1

Attribute Definition:

This field is a four character string from the concatenation of CLASS1 and SUBCLASS1, stripped of all spaces and asterisks (**).

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Concatenation of CLASS1 and SUBCLASS1, stripped of all spaces and asterisks (**).

Attribute:

Attribute Label: ADOY1

Attribute Definition:

This is a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date corresponding to CROPTYP1. Negative numbers represent year 2019 peak dates, and positive numbers represent year 2020 peak date. For example:

-92 = Crop peak NDVI date of October 1, 2019

-1 = Crop peak NDVI date of December 31, 2019

1 = Crop peak NDVI date of January 1, 2020

273 = Crop peak NDVI date of September 30, 2020

A <NULL> value was used when no peak date was determined by Land IQ.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Codes for this field are as following:

Positive ADOY values correspond to year 2020 Julian date (1 = January 1, 2019 through 273 = September 30, 2020) for peak NDVI. However, negative values correspond to Julian date prior to year (-92 = October 1, 2019 through -1 = December 31, 2019)

A <NULL> value was used when no peak date was determined by Land IQ.

Attribute:

Attribute Label: CROPTYP2

Attribute Definition:

This field is a four character string from the concatenation of CLASS2 and SUBCLASS2, stripped of all spaces and asterisks (**).

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Concatenation of CLASS2 and SUBCLASS2, stripped of all spaces and asterisks (**).

Attribute:

Attribute Label: ADOY2

Attribute Definition:

This is a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date received by Land IQ. The date This is a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date corresponding to CROPTYP2. See ADOY1 for detail.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See ADOY1 for detail.

Attribute:

Attribute Label: CROPTYP3

Attribute Definition:

This field is a four character string from the concatenation of CLASS3 and SUBCLASS3, stripped of all spaces and asterisks (**).

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Concatenation of CLASS3 and SUBCLASS3, stripped of all spaces and asterisks (**).

Attribute:

Attribute Label: ADOY3

Attribute Definition:

This is a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date received by Land IQ. The date This is a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date corresponding to CROPTYP3. See ADOY1 for detail.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See ADOY1 for detail.

Attribute:

Attribute Label: CROPTYP4

Attribute Definition:

This field is a four character string from the concatenation of CLASS4 and SUBCLASS4, stripped of all spaces and asterisks (**).

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Concatenation of CLASS4 and SUBCLASS4, stripped of all spaces and asterisks (**).

Attribute:

Attribute Label: ADOY4

Attribute Definition:

This is a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date received by Land IQ. The date This is a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date corresponding to CROPTYP4. See ADOY1 for detail.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

See ADOY1 for detail.

Attribute:

Attribute Label: EMRG_CROP

Attribute Definition:

This field is a four character string.

Attribute Definition Source:

Producer Defined

Attribute Domain Values:

Unrepresentable Domain:

Indicates an emerging crop at the end of the WY. Crops listed indicate that at the end of the WY, September 2020, crop activity was detected from a crop that reached peak NDVI in the following WY (2021 WY). This attribute is included to account for water use of crops that span multiple WYs and are not exclusive to a single WY. It is indicative of early crop growth and initial water use in the current WY, but a majority of crop development and water use in the following WY. Crops listed in the 'EMRG_CROP' attribute will also be captured as the first crop (not necessarily Crop 1) in the following WY (2021 WY). These crops are not included in the 2020 UCF_ATT code as their peak date occurred in the following WY.

Attribute:

Attribute Label: REGION

Attribute Definition:

DWR Regional Office associated with the polygon.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Attribute:

Attribute Label: Acres

Attribute Definition:

Total land acreage for each individual polygon, given in U.S. acres. Note that land acres are not necessarily equal to the summation of crop acres if multiple crops were planted through the year.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Attribute:

Attribute Label: County

Attribute Definition:

Indicates the county that the centroid of each crop field resides in. Due to the size of the urban areas we did not attribute the county/counties for these features because some extended beyond a single county.

Attribute Definition Source:

Land IQ

Attribute Domain Values:

Unrepresentable Domain:

Attribute:

Attribute Label: HYDRO_RGN

Attribute Definition:

Indicates the DWR hydrological region that the centroid of each crop field resides in.

Attribute Definition Source:

Producer Defined

Attribute Domain Values:

Unrepresentable Domain:

Attribute:

Attribute Label: LIQ_REPORT

Attribute Definition:

This is a 19 character string concatenation of the multicropping classification by Land IQ for WY 2020. Each crop is represented by four characters based on the combination of CLASS and SUBCLASS stripped of all '*' and ' ' (space) characters, with a ' ' (space) between each crop. The code '****' represents no crop reported by Land IQ for that season. Original Land IQ classifications reported for each polygon are preserved for comparison.

Attribute Definition Source:

California Department of Water Resources

Attribute Domain Values:

Unrepresentable Domain:

Attribute:

Attribute Label: MAIN_CROP

Attribute Definition:

Main Season Crop represents the crop grown during the dominant growing season. The dominant growing season was identified for each county based on cropping patterns and prevalence. The county associated with each field was determined as that within which the polygon centroid (inside the polygon) lies.

Attribute Definition Source:

Land IQ

Attribute Domain Values:

Unrepresentable Domain:

In the event of multi-cropping, the crop with the peak date nearest to the dominant growing season date was assigned to this column. In the event of perennial crops, the last crop classified in the series was assigned to this column.

County MAIN_DATE

Alameda 8/15/2020

Amador 8/15/2020

Butte 7/15/2020

Calaveras 8/15/2020

Colusa 7/15/2020

Contra Costa 7/15/2020

Del Norte 7/1/2020

El Dorado 8/15/2020

Fresno 8/15/2020

Glenn 7/15/2020

Humboldt 7/15/2020

Imperial 1/15/2020

Inyo 8/1/2020

Kern 8/15/2020

Kings 8/15/2020

Lake 8/15/2020

Lassen 8/15/2020

Los Angeles 8/15/2020

Madera 8/15/2020

Marin 8/15/2020

Mariposa 8/15/2020

Mendocino 8/15/2020

Merced 8/15/2020

Modoc 8/1/2020

Mono 8/1/2020

Monterey 9/15/2020

Napa 8/15/2020

Nevada 8/15/2020

Orange 7/15/2020

Placer 7/15/2020

Plumas 8/15/2020

Riverside 3/15/2020

Sacramento 8/15/2020

San Benito 8/15/2020

San Bernardino 4/15/2020

San Diego 8/15/2020

San Joaquin 8/15/2020

San Luis Obispo 8/15/2020

San Mateo 8/15/2020

Santa Barbara 8/15/2020

Santa Clara 8/15/2020

Santa Cruz 8/15/2020

Shasta 8/15/2020

Sierra 8/15/2020

Siskiyou 8/1/2020

Solano 7/15/2020

Sonoma 8/15/2020

Stanislaus 8/15/2020

Sutter 7/15/2020

Tehama 7/15/2020

Trinity 8/15/2020

Tulare 8/15/2019

Tuolumne 8/15/2020

Ventura 9/15/2020

Yolo 7/15/2020

Yuba 7/15/2020

Attribute:

Attribute Label: MAIN_CROP_DATE

Attribute Definition:

Main Season Crop Date

Attribute Definition Source:

Land IQ

Attribute Domain Values:

Unrepresentable Domain:

This is equivalent to the Adjusted Day Of Year "ADOY#" affiliated with the crop that was selected as the main season crop.

This value represents the peak date of crop production. It is reflected as a number value representing the Adjusted Day Of Year for peak NDVI (Normalized Difference Vegetation Index) date corresponding to MAIN_CROP

Negative numbers represent year 2019 peak dates, and positive numbers represent year 2020 peak date. For example:

-92 = Crop peak NDVI date of October 1, 2019

-1 = Crop peak NDVI date of December 31, 2019

1 = Crop peak NDVI date of January 1, 2020

273 = Crop peak NDVI date of September 30, 2020

A <NULL> value was used when no peak date was determined by Land IQ.

Attribute:

Attribute Label: Shape_Length

Attribute Definition:

Length of feature in internal units.

Attribute Definition Source:

Esri

Attribute Domain Values:

Unrepresentable Domain:

Positive real numbers that are automatically generated.

Attribute:

Attribute Label: Shape_Area

Attribute Definition:

Area of feature in internal units squared.

Attribute Definition Source:

Esri

Attribute Domain Values:

Unrepresentable Domain:

Positive real numbers that are automatically generated.

Back to Top

Distribution Information:

Distributor:

Contact Information:

Contact Organization Primary:

Contact Organization: California Department of Water Resources

Contact Person: Land Use Supervisor

Contact Position: Senior Environmental Scientist

Contact Address:

Address Type: mailing

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Postal Code: 94236-0001

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Contact Electronic Mail Address: Landuse@water.ca.gov

Distribution Liability:

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Standard Order Process:

Digital Form:

Digital Transfer Information:

Format Name: Digital Data

Digital Transfer Option:

Online Option:

Computer Contact Information:

Network Address:

Network Resource Name:https://data.cnra.ca.gov/dataset/statewide-crop-mapping or https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#waterbudget

Fees: No

Back to Top

Metadata Reference Information:

Metadata Date: 03/10/2023

Metadata Contact:

Contact Information:

Contact Organization Primary:

Contact Organization: California Department of Water Resources

Contact Person: Land Use Supervisor

Contact Position: Senior Environmental Scientist

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Metadata Standard Name: FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

Metadata Standard Version: FGDC-STD-001.1-1999

Back to Top