Land Use Program Frequently Asked Questions (FAQs)

Last Updated June 2025

1. **What is the goal of the DWR Land Use Program?**
   Land Use is a program unit within DWR's Division of Regional Assistance (DRA), under the Water Use Efficiency Branch (WUE) in the CIMIS, Land Use, and Water Use Section. Our long-term goal is to survey land use more frequently and efficiently, applying remote sensing and Geographic Information Systems (GIS) in conjunction with field observations to analyze data from local sources, satellite imagery, and high-elevation digital imagery. The main emphasis of our current land use surveys is mapping agricultural land statewide. We also collect urban and native classes (i.e., undeveloped land) information to a lesser extent. Our surveys include more than 70 different crop types within 10 crop categories (classes). Information on irrigation methods and water sources was also collected for some surveys.

2. **How does the DWR Land Use Program operate?**
   The development and analysis of land use data to support the California Water Plan Update and for various other uses is a collaborative effort that involves staff in the Department's headquarters, regional offices, and consultants. We apply GIS and remote sensing technologies that include satellite imagery and aerial photography in conjunction with ground surveys and modelling to map land use data every year. Ground reference (ground truth) data is collected in "real-time" while crops are in situ each growing season. About 80% of collected ground reference data is used for training the crop classification model, and the other 20% to validate the classification results through accuracy assessment. We currently use ArcGIS Field Maps, an application from the Environmental Systems Research Institute (Esri) that employs data-driven maps and mobile forms to help capture and edit ground reference data.

3. **Who uses DWR land use survey data?**
   End users of our high-quality and peer-reviewed land use data cover a wide spectrum that includes several DWR groups and modelling teams, the academic community, NGOs, private consultants, and the general public in and outside California. Please see this Web App for more details on our data users. Our data is critical for fulfilling the landmark 2018 Water Conservation Legislation (AB 1668 and SB 606, 2018), the implementation of Sustainable Ground Water Management (SGMA), and other DWR programs that require land use survey data as an input. The California Water Plan, the State's strategic plan for managing and developing water resources, is mandated by California Water Code Sections 10004–10013 to investigate the State's water resources and assess present and future water needs across all hydrologic regions.

4. **What is the historical background to DWR's land use surveys?**
   In 1947, the State Legislature requested an investigation be conducted of the water resources focusing on present and future water needs in California. DWR and its predecessor agencies began collecting urban and agricultural land use and water use data that serves as the basis for calculating current and projected water needs. Since the early 1950s, DWR has conducted more than 250 land-use surveys of all or parts of California's 58 counties. Early land-use surveys were recorded on United States Geological Survey (USGS) 7.5-feet quadrangle paper maps. The development of georeferenced digital maps of land-use survey data commenced in 1986. Historically, DWR has been surveying counties once every five years or longer, and filling temporal data gaps using County Agricultural Commissioner's data that depended on surveying growers rather than actual field surveys. DWR started working with a consultant, Land IQ LLC, in 2014 to implement statewide land use surveys every two years initially, and transitioned to annual statewide land use surveys from 2018 onwards.

5. **How frequently is statewide land use survey data published?**
   Statewide land use data is released annually, with a one year lag to accommodate DWR's data quality assurance processes. The most recent finalized data available at the time of writing this document is the Statewide Crop Mapping Water Year 2022 dataset, while the Water Year 2023 Statewide dataset is available in provisional

format. Please keep checking the California Natural Resources Agency (CNRA) Open Data Portal for newly posted land use surveys, or contact us to inquire.

6. **What is the spatial resolution of the published land use survey data?**
   Our land use survey datasets are provided in vector format, and all crops are mapped at field level Statewide. So unlike raster data, there is no "pixel size" to determine the spatial resolution. However, an end-user can convert any land use survey in vector format to a raster and specify a spatial resolution of their choice, depending on the objective of their project.

7. **What is the difference between County, Regional, and Statewide land use surveys?**
   Crops are mapped within the boundaries of specific counties for County land use surveys. Hand-drawn techniques were used to produce the earliest versions of County land use surveys in the 1950s. As more digital mapping tools became available in the mid-1980s, historic County surveys were produced through intensive field-by-field visits by DWR staff. Regional surveys cover two or more counties, and some are special cases that cover certain geographical locations for a specific purpose. These include the 2015 and 2017 California Legal Delta Regional surveys. The former was produced through intensive field-by-field visits, but the latter was generated using remote sensing methods. Statewide land use surveys are produced annually using technologies that include remote sensing, GIS and ground surveys.

8. **Where can I view and download current or historical County, Regional, and Statewide land use survey data?**
   Land use surveys are available for direct download from the California Natural Resources Agency (CNRA) Open Data Portal. The CNRA Portal can also be accessed indirectly through the CADWR Land Use Viewer, found in the DWR Land Use Gallery of web applications. You can also contact the Land Use Unit for additional information.

9. **Are published historical land use surveys georeferenced?**
   Most published historical County and Regional land use surveys are roughly georeferenced to indicate their approximate locations on the ground. We are continually processing and publishing georeferenced historical land use surveys, so keep checking our download locations. End users can further refine the georeferencing depending on how they would like to use the land use survey data. We also have digitized but ungeoreferenced historical land use data for various locations throughout the state, please contact us to check if we have land use surveys covering your area of interest.

10. **What imagery is used in land use classification?**
    We use publicly available imagery resources, including aerial photography from the National Agriculture Imagery Program (NAIP) when it is available, and satellite imagery from Landsat and Sentinel systems.

11. **What is the difference between "Provisional" and "Final" land use survey data?**
    Our published land use surveys are designated as either 'Final', or 'Provisional', depending on their status in the peer review process. A provisional release is intended to get land use information delivered by our consultant out to users quickly, and the data has not been reviewed or edited and has only minimum metadata. Final land use survey data, on the other hand, has gone through our full quality review process and is accompanied by full and comprehensive metadata upon release.In most cases, differences between provisional and final land use data are not significant.

12. **When is statewide land use mapping conducted in California?**
    We conduct statewide crop mapping by Water Year (October 1 to September 30), and ground reference data is collected by crop growing season.

13. **How are crop growing seasons defined in California?**
    Fall: October 1 - December 31
    Winter: January 1 - March 31

Spring: April 1 - June 30
Summer: July 1 - September 30

14. **How can I access detailed metadata or data dictionary for your published land use datasets?**
    Metadata for our published land use datasets can be accessed through Catalog using ArcGIS software. Please reach out to your GIS technical person for assistance if you are not familiar with this process, or contact us.

15. **Where can I find the Land Use Legend document?**
    Please contact the DWR Land Use Unit (landuse@water.ca.gov) for our latest version (December 2022). We also have historical land use legend documents for 2016, 2009, 2007, 2005, 1998, 1993, 1993, 1982, 1981, 1976, 1976, 1976, 1970, 1963, 1962, 1958, 1957, 1957, and 1956.

16. **Where can I find information on irrigated non-irrigated acreages?**
    This information is found in the spatial land use database associated with each published land use survey. Every water year, we classify over 9.4 million acres of irrigated agriculture on a field scale, and additional areas of urban extent. All fields in our land use database are presumed irrigated unless an 'n' for non-irrigated has been applied in the attribute table.

17. **How do you define idle and fallow land?**
    Various fallow and idle classes in the DWR statewide land use dataset are defined below:
    I – IDLE Classes
    - I1 - Land not cropped the current or previous crop season, but cropped within the past three years
    - I2 - New lands being prepared for crop production
    - I4 - Long term idle, land that has been fallow or idle for four or more years

    X -UNCLASSIFIED FALLOW
    - X - Unclassified fallow (not cropped, or unclassified at the time of remote sensing analysis) and not falling into any of the Idle classes above.

18. **What is the release schedule for DWR statewide land use datasets?**
    DWR's Land Use Program conducts statewide land use classifications annually using remotely sensed satellite data with a possible lag of one year to process the collected data. Historically, DWR surveyed counties once every five years and filled temporal and spatial data gaps using County Agricultural Commissioner's data.