

LAND IQ ET

OPEN ET <sup>1</sup>

Spatial Extent	3.3 million acres in California's San Joaquin Valley, expansion as requested into other areas	17 Western US States
Unit of Analysis	Pixel, aggregated to field, parcel, district or region	Pixel, aggregated by field
Analysis Approach	Data driven and ground calibrated remotely sensed modeling from a network of ET climatic stations (a ground up approach)	Varies by model used, usually image attribute interpretation (a top down approach)
Deliverables	ET, precipitation, crop type, permanent crop age	ET
Spatial Resolution	10m x 10m (0.02 acres)	30m x 30m (0.22 acres)
Time Interval of Analysis (Temporal Resolution)	Annual and monthly Daily currently in development	Annual, monthly and daily
Data Delivery	Multiple formats including web-based tools, GIS compatible shape files and written reports.	Application Programming Interface (API)
Model	Data-driven, ground-calibrated model informed by extensive field measurements, multiple image resources, and current land use datasets	Simplified empirical model utilizing multiple models to produce a single, "ensemble" value
Accuracy & Validation	Sets aside monthly results from ground truthing stations to perform independent validation in cropping systems over two years RMSE = 15.6mm, R2=.94	Compares monthly results against ET measurements collected from flux tower sites in cropping systems RMSE=20.2mm, R2=.90
Imagery	Landsat (every 16 days) Sentinel (every 5 days) ECOSTRESS (multiple dates per month)	Depends on model, could include: Landsat (every 16 days), GOES, Sentinel-2 (every 5 days), Suomi NPP, Terra, or Aqua
Crop Type and Field Boundary Dataset	Land IQ 2022, updated continuously	Land IQ 2018 (within CA) and USDA Cropland Data Layer (outside of CA)
Crop Type Accuracy	97%	97% within CA (Land IQ), 70-80% outside of CA (USDA CDL)
Field Boundary Accuracy	+/- 6 feet at 95% confidence level	+/- 6 feet at 95% confidence level within CA, variable accuracies and completeness outside CA

<sup>1</sup> Information derived from Open ET FAQ and Accuracy Assessment at <https://openetdata.org>



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Field-by-Field Precipitation	Field measured at ground truthing stations and spatially interpolated to the field level	Not provided
Ground Truth Data Collection (Field Calibration and Validation Stations)	Approximately 80 stations in croplands over 3.3 million acres within the analysis area.	Approximately 45 stations in croplands across 17 western US states
Expert Independent Review	Independent review of monthly results by University of California Cooperative Extension emeriti	Unknown
Direct User Technical Support	Dedicated agronomic and biometeorological staff	Unknown
Calibration and validation to crop type	Yes	No
Confidentiality	Results are the property of the client and are not shared without permission	Data are publicly accessible
Cost	Current rate is cents/acre/year depending on size, complexity, and analysis duration and includes all four deliverables	Free for viewing and limited volumes of data. Fees are expected for larger volume data requests (cost TBD)

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Land IQ is a specialized Agricultural Science and Remote Sensing firm that pairs scientific knowledge of agronomic, native plant and land systems with advanced remote sensing technologies, custom modeling, and analytical methods to develop powerful and cost-effective client solutions. We focus on large scale land systems and management applications.

Land IQ's dedicated ET team consists of multiple spatial scientists that are 100% dedicated to this project, agronomists with specific crop knowledge and grower relationships, as well as biometeorologists dedicated to station maintenance and data review.

Land IQ understands the need for sound scientific support as well as practical experience. Many of our staff have roots in agriculture and bring first hand and irreplaceable understanding of agricultural production systems to projects.