

LAND IQ ET

OPEN ET <sup>1</sup>

|                                                 |                                                                                                                                                                    |                                                                                                                                                                                            |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spatial Extent                                  | California's Southern San Joaquin Valley                                                                                                                           | 17 Western US States                                                                                                                                                                       |
| Unit of Analysis                                | Pixel, which can be aggregated to field, parcel, district or region                                                                                                | Pixel, averaged by field at each timestep                                                                                                                                                  |
| Analysis Approach                               | From the bottom up – starting at the field level                                                                                                                   | From the top down – starting at the sky                                                                                                                                                    |
| Spatial Resolution                              | 10m x 10m (0.02 acres)                                                                                                                                             | 30m x 30m (0.22 acres)                                                                                                                                                                     |
| Time Interval of Analysis (Temporal Resolution) | Monthly and yearly                                                                                                                                                 | Daily, monthly, and yearly                                                                                                                                                                 |
| Time Interval of Deliverables                   | Monthly, delivered within 25 days of the end of the month                                                                                                          | Monthly, delivered within six weeks or less of the end of the month<br>Daily data, delivered within two days of satellite overpass                                                         |
| Data Delivery                                   | Multiple formats including web-based tools, GIS compatible shape files and written reports.                                                                        | Application Programming Interface (API) and custom reporting tools                                                                                                                         |
| Model                                           | Data-driven model informed by multiple image resources, current land use datasets and extensive field measurements                                                 | Simplified empirical model utilizing multiple models to produce a single, “ensemble” value                                                                                                 |
| Imagery                                         | Landsat (every 16 days)<br>Sentinel (every 5 days)<br>ECOSTRESS (multiple dates per month)                                                                         | Landsat (every 16 days)<br>GOES<br>Sentinel-2 (every 5 days)<br>Suomi NPP<br>Terra<br>Aqua                                                                                                 |
| Land Use and Field Boundary Dataset             | Land IQ 2021                                                                                                                                                       | Land IQ 2018 and USDA Cropland Data Layer                                                                                                                                                  |
| Precipitation                                   | Spatial map of precipitation at the field-level included in deliverables                                                                                           | Unknown                                                                                                                                                                                    |
| Ground Truth Data Collection (Field Stations)   | Over 90 Residual Energy Balance (eddy covariance), Water IQ (modified surface renewal) and Tule Tech (surface renewal) stations in the Southern San Joaquin Valley | 120 flux tower sites across the 17 western US states, including Ameriflux and other collaborators such as USDA, USGS and partner Universities, in addition to CIMIS stations in California |
| Ground Truth Field Station Density              | 1 for every 13,000 acres                                                                                                                                           | 1 for every 130,000 acres (CIMIS)                                                                                                                                                          |

<sup>1</sup> Information derived from Open ET FAQ at <https://openetdata.org/faq.pdf>



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| QA/QC                                            | Dedicated team reviewing station data, data driven model and model results monthly                                                              | Unknown                                                                                                                                                                      |
| Accuracy & Validation                            | Sets aside data from ground truth stations to perform independent validation and accuracy.<br><br>Accuracy is +/- 8%.                           | Compares results against ET measurements collected from flux tower sites, groundwater pumping records and water balances at the watershed scale.<br><br>Accuracy is +/- 15%. |
| Calibration & Validation to Individual Crop Type | Yes                                                                                                                                             | No                                                                                                                                                                           |
| Expert Independent Review                        | Independent review of monthly results by University of California Cooperative Extension Emeriti                                                 | Unknown                                                                                                                                                                      |
| Longevity                                        | Field-level consumptive use analysis on a small scale (<10,000 acres) beginning in 2014 and on a large scale (>100,000 acres) beginning in 2016 | Downloadable data expected to be released to the public in early 2022                                                                                                        |
| Customers Served                                 | Irrigation Districts and Groundwater Sustainability Agencies accounting for more than 1.9 million acres                                         | Intended for use by farmers, landowners, irrigation district, and GSA managers                                                                                               |
| Urban Landscape ET Analysis                      | Yes                                                                                                                                             | No                                                                                                                                                                           |
| Confidentiality                                  | Data are the property of the client and are not shared without permission                                                                       | Data are publicly accessible                                                                                                                                                 |
| Public/Private Partnerships                      | Yes, with UC Davis Department of Land, Air and Water Scientists                                                                                 | Yes, with NASA, Desert Research Institute, Environmental Defense Fund, and Google Earth Engine                                                                               |
| Cost                                             | Current rate is cents/acre/year depending on size and client duration                                                                           | Limited amount of downloadable data is available at no cost, details on acquiring data for larger organizations will be available when the API launches in early 2022        |

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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.