

ACTUAL EVAPOTRANSPIRATION ANALYSIS

August 2022

Prepared for
East Kaweah Groundwater Sustainability Agency

Prepared by
 **LAND IQ**
2020 L Street, Ste 210
Sacramento, CA
Contact: Joel Kimmelshue
916.265.6330

OCTOBER 04, 2022

SUMMARY

TABLE 1. SUMMARY OF GSA ET AND PRECIPITATION (117,346 AC)

	ET (ac-ft)	Precipitation (in)
Past 12 months (SEP 1, 2021 - AUG 31, 2022)	256,141	8.6
Prior water year (OCT 1, 2021 – AUG 31, 2022)	233,067	8.6
Prior calendar year (JAN 1, 2022 – AUG 31, 2022)	204,000	2.1

TABLE 2. SENSORS USED IN DAILY AND MONTHLY ET_A ANALYSIS BY CROP CATEGORY

	Number of Active Stations	Number of Used Stations in model
Alfalfa	6	5
Almonds	11	5
Annuals	1	1
Citrus	12	11
Fallow/Native	7	7
Grapes	3	2
Olives	0	0
Pistachios	8	5
Pomegranates	0	0
Walnuts	2	1

TABLE 3. PRECIPITATION MEASURED BY FIELD STATIONS

Station ID	Source	August Precipitation (in)
CIMIS #205: Coalinga	CIMIS	0
CIMIS #5: Shafter	CIMIS	0
CIMIS #15: Stratford	CIMIS	0
CIMIS #2: FivePoints	CIMIS	0
CIMIS #146: Belridge	CIMIS	0
CIMIS #39: Parlier	CIMIS	0.1
CIMIS #105: Westlands	CIMIS	0
CIMIS #80: Fresno State	CIMIS	0.14
CIMIS #182: Delano	CIMIS	0
CIMIS #169: Porterville	CIMIS	0
CIMIS #258: Lemon Cove	CIMIS	0
CIMIS #125: Arvin_Edison	CIMIS	0
LandIQ_EK_Full_Sumos	Land IQ	0.07
LandIQ_GK_Full_Murcotts	Land IQ	0.1

CIMIS - California Irrigation Management Information System; CNRFC - California Nevada River Forecast Center; GHCN - Global Historical Climate Network.

REMOTE SENSING RESULTS

TABLE 4. IMAGE DATES AND SOURCES

Date	Image Source
August 14, 2022	Sentinel 2
August 24, 2022	Sentinel 2
August 25, 2022	Landsat 9
August 29, 2022	Sentinel 2

TABLE 5. MONTHLY GSA ET_A

Unit	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
(mm)	23.8	34.0	60.5	68.2	80.3	78.7	102.9	83.0
(inch)	0.9	1.3	2.4	2.7	3.2	3.1	4.1	3.3
(AF)	9,148	13,080	23,288	26,248	30,928	30,298	39,625	31,964

TABLE 6. MONTHLY FIELD ET_A

ET _A (in) Including Fallow									
	Field Size (ac)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Maximum	230.1	1.5	2.2	3.8	5.3	7.2	7.9	9.1	7.1
Minimum	0.1	0.4	0.3	0.4	0.4	0.1	0.0	0.0	0.0
Average	10	1.0	1.4	2.4	2.6	3.4	3.3	4.4	3.6
ET _A (in) Excluding Fallow									
	Field Size (ac)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Maximum	230.1	1.5	2.2	3.8	5.3	7.2	7.9	9.1	7.1
Minimum	0.1	0.4	0.4	0.5	0.5	0.1	0.0	0.1	0.0
Average	10.3	1.0	1.4	2.4	2.6	3.7	3.5	4.7	3.9

TABLE 7. MONTHLY GSA PRECIPITATION

Precipitation Unit	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
(mm)	0.9	11.5	28.7	8.6	0.0	1.0	0.1	1.4
(inch)	0.0	0.5	1.1	0.3	0.0	0.0	0.0	0.1
(AF)	353	4,417	11,049	3,314	0	378	44	544

ACCURACY OF REMOTE SENSING RESULTS

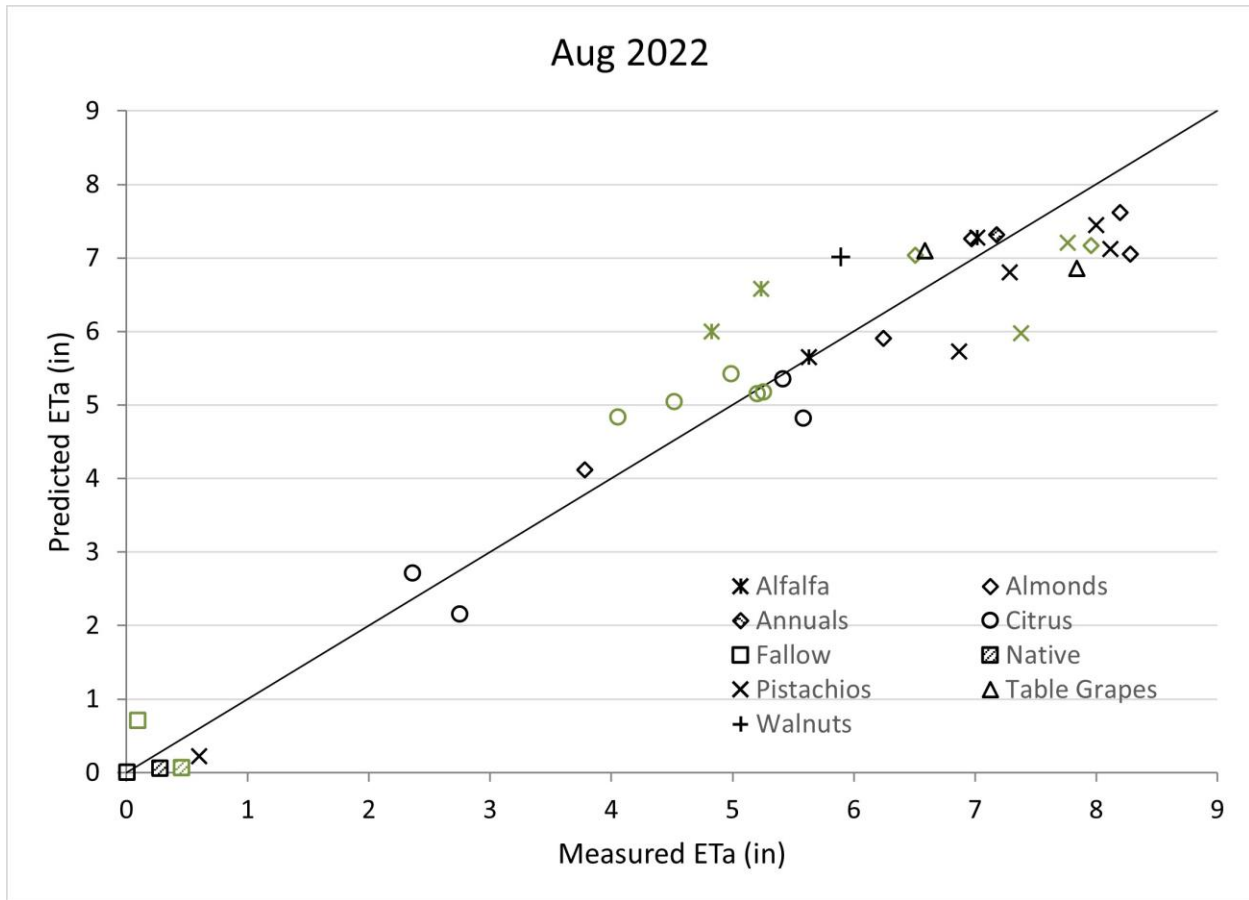


FIGURE 1. MEASURED VERSUS PREDICTED ET_A FOR THE MONTH. SYMBOL COLORS REPRESENT THE STATION TYPES (BLACK = FULL, GREEN = WATER IQ (WIQ))

TABLE 8. MEASURED VS. PREDICTED MONTHLY ET_A

R ²	RMSE (IN)
0.9	0.67

Note: The R² value is the relative measure of fit of the observed data to the predicted result, where a value of 1 indicates a perfect fit. RMSE can be interpreted as the standard deviation, where a value of 0 indicates a perfect fit to the observed data.