

ACTUAL EVAPOTRANSPIRATION ANALYSIS

September 2022

Prepared for
East Kaweah Groundwater Sustainability Agency

Prepared by
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SUMMARY

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

	ET (ac-ft)	Precipitation (in)
Prior 12 months (OCT 1, 2021 - SEP 30, 2022)	257,436	8.6
Prior water year (OCT 1, 2020 - SEP 30, 2021)	256,352	4.7
Current water year to date (OCT 1, 2021 - SEP 30, 2022)	257,436	8.6
Prior water year to date (OCT 1, 2020 - SEP 30, 2022)	513,788	13.3

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	6
Almonds	13	10
Annuals	4	4
Citrus	16	16
Fallow/Native	7	7
Grapes	7	7
Olives	0	0
Pistachios	11	10
Pomegranates	0	0
Walnuts	2	1

TABLE 3. PRECIPITATION MEASURED BY FIELD STATIONS

Station ID	Source	September Precipitation (in)
CIMIS #205: Coalinga	CIMIS	0.14
CIMIS #5: Shafter	CIMIS	0
CIMIS #15: Stratford	CIMIS	0.03
CIMIS #2: FivePoints	CIMIS	0.65
CIMIS #39: Parlier	CIMIS	0.12
CIMIS #105: Westlands	CIMIS	0.11
CIMIS #80: Fresno State	CIMIS	0.22
CIMIS #182: Delano	CIMIS	0.01
CIMIS #169: Porterville	CIMIS	0.07
CIMIS #125: Arvin_Edison	CIMIS	0.08
LandIQ_EK_Full_Sumos	Land IQ	0.01
LandIQ_GK_Full_Murcotts	Land IQ	0

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
September 2, 2022	Landsat-8
September 3, 2022	Sentinel-2
September 23, 2022	Sentinel-2
September 26, 2022	Landsat-9
September 28, 2022	Sentinel-2

TABLE 5. MONTHLY GSA ET_A

Unit	OCT, 2021	NOV, 2021	DEC, 2021	JAN, 2022	FEB, 2022	MAR, 2022	APR, 2022	MAY, 2022	JUN, 2022	JUL, 2022	AUG, 2022	SEP, 2022
(mm)	41.1	21.6	13.1	23.8	34.0	60.5	68.2	80.3	78.7	102.9	83.0	63.6
(inch)	1.6	0.9	0.5	0.9	1.3	2.4	2.7	3.2	3.1	4.1	3.3	2.5
(AF)	15,829	8,298	5,024	9,148	13,080	23,288	26,248	30,928	30,298	39,625	31,964	24,487

TABLE 6. MONTHLY FIELD ET_A

ET _a (in) Including Fallow													
	Field Size (ac)	OCT, 2021	NOV, 2021	DEC, 2021	JAN, 2022	FEB, 2022	MAR, 2022	APR, 2022	MAY, 2022	JUN, 2022	JUL, 2022	AUG, 2022	SEP, 2022
Maximum	230.1	2.8	1.5	0.7	1.5	2.2	3.8	5.3	7.2	7.9	9.1	7.1	5.1
Minimum	0.1	0.1	0.1	0.2	0.4	0.3	0.4	0.4	0.1	0.0	0.0	0.0	0.0
Average	10	1.8	1.0	0.5	1.0	1.4	2.4	2.6	3.4	3.3	4.4	3.6	2.8
ET _a (in) Excluding Fallow													
	Field Size (ac)	OCT, 2021	NOV, 2021	DEC, 2021	JAN, 2022	FEB, 2022	MAR, 2022	APR, 2022	MAY, 2022	JUN, 2022	JUL, 2022	AUG, 2022	SEP, 2022
Maximum	230.1	2.8	1.5	0.7	1.5	2.2	3.8	5.3	7.2	7.9	9.1	7.1	5.1
Minimum	0.1	0.2	0.1	0.2	0.4	0.4	0.5	0.5	0.1	0.0	0.1	0.0	0.0
Average	10.3	1.9	1.1	0.6	1.0	1.4	2.4	2.6	3.7	3.5	4.7	3.9	3.0

TABLE 7. MONTHLY GSA PRECIPITATION

Precipitation Unit	OCT, 2021	NOV, 2021	DEC, 2021	JAN, 2022	FEB, 2022	MAR, 2022	APR, 2022	MAY, 2022	JUN, 2022	JUL, 2022	AUG, 2022	SEP, 2022
(mm)	41.5	3.7	121.2	0.9	11.5	28.7	8.6	0.0	1.0	0.1	1.4	1.0
(inch)	1.6	0.1	4.8	0.0	0.5	1.1	0.3	0.0	0.0	0.0	0.1	0.0
(AF)	15,964	1,435	46,656	353	4,417	11,049	3,314	0	378	44	544	382

ACCURACY OF REMOTE SENSING RESULTS

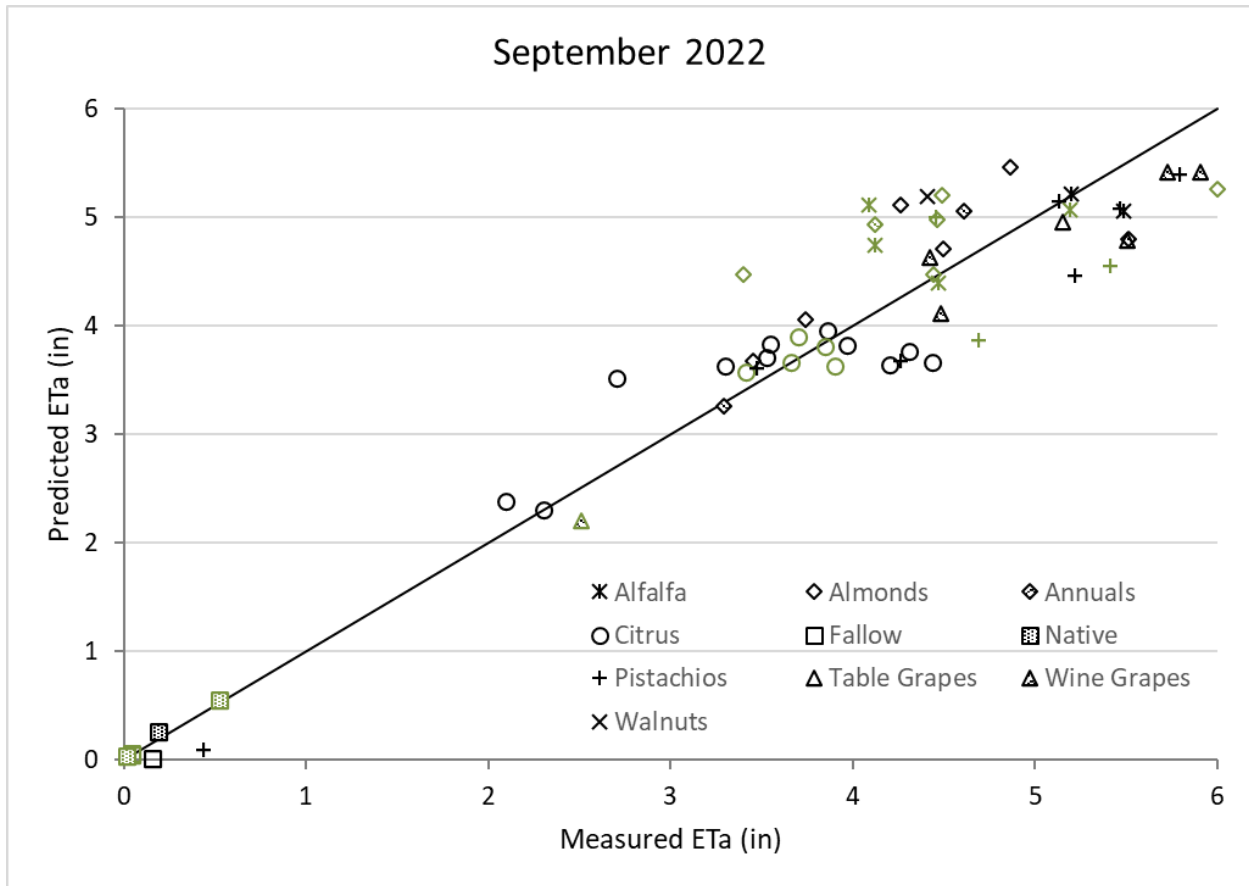


FIGURE 1. MEASURED VERSUS PREDICTED ET_A FOR THE MONTH. SYMBOL COLORS REPRESENT THE STATION TYPES (BLACK = FULL, GREEN = WATER IQ (WIQ))

TABLE 8. MEASURED VS. PREDICTED MONTHLY ET_A

R ²	RMSE (IN)
0.9	0.48

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.