

ACTUAL EVAPOTRANSPIRATION ANALYSIS

January 2024

Prepared for
East Kaweah Groundwater Sustainability Agency



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SUMMARY

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

	ET (ac-ft)	Precipitation (ac-ft)
2024 Allocation Year to date (OCT 1, 2023 - JAN 31, 2024)	38,234	31,338
2023 Allocation Year to date (OCT 1, 2022 - Jan 31, 2023)	35,810	89,026
2022 Allocation Year to date (OCT 1, 2021 - Jan 31, 2022)	38,204	64,419
Allocation Year 2023 (OCT 1, 2022 - SEP 30, 2023)	261,015	193,051
Allocation Year 2022 (OCT 1, 2021 - SEP 30, 2022)	257,412	84,548

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

	Number of Active Stations	Number of Used Stations in model
Alfalfa	8	7
Almonds	17	12
Annual	3	2
Citrus	15	10
Fallow/Native	11	6
Grapes	9	4
Olives	1	1
Pistachios	13	11
Pomegranates	1	0
Walnuts	2	2

TABLE 3. PRECIPITATION MEASURED BY FIELD STATIONS

Station ID	Source	January Precipitation (in)	Year to Date (Oct 1, 2023 - Jan 31, 2024)
CIMIS #205: Coalinga	CIMIS	1.23	2.86
CIMIS #5: Shafter	CIMIS	1.19	2.18
CIMIS #15: Stratford	CIMIS	1.02	2.2
CIMIS #2: FivePoints	CIMIS	1.26	3
CIMIS #146: Belridge	CIMIS	2.41	4.42
CIMIS #182: Delano	CIMIS	1.51	1.96
CIMIS #125: Arvin_Edison	CIMIS	1.64	2.12
CIMIS #7: Firebaugh	CIMIS	1.39	3.47
CIMIS #148: Merced	CIMIS	3.49	5.93
CIMIS #206: Denair II	CIMIS	3.99	6.66
USC00044957	GHCN	1.3	1.22
LandIQ_GK_Full_Murcotts	Land IQ	1.57	3.2
LandIQ_EK_Full_Sumos_2023	Land IQ	1.93	3.02
LandIQ_EK_Full_Olives_2023	Land IQ	1.61	2.84

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
1/11/2024	Sentinel 2A

TABLE 5. MONTHLY GSA ET_A

Unit	OCT, 2023	NOV, 2023	DEC, 2023	JAN, 2024	FEB, 2024	MAR, 2024	APR, 2024	MAY, 2024	JUN, 2024	JUL, 2024	AUG, 2024	SEP, 2024	Total
(mm)	46.2	20.3	13.2	19.9									99.6
(inch)	1.8	0.8	0.5	0.8									3.9
(AF)	17,795	7,801	5,094	7,642									38,332

TABLE 6. MONTHLY FIELD ET_A

ET _a (in) Including Fallow														
	Field Size (ac)	OCT, 2023	NOV, 2023	DEC, 2023	JAN, 2024	FEB, 2024	MAR, 2024	APR, 2024	MAY, 2024	JUN, 2024	JUL, 2024	AUG, 2024	SEP, 2024	Ave
Maximum	230	3.6	1.9	1.1	1.2									2.0
Minimum	0.04	0.0	0.0	0.0	0.1									0.0
Average	10.1	1.9	0.9	0.6	0.8									1.0
ET _a (in) Excluding Fallow														
	Field Size (ac)	OCT, 2023	NOV, 2023	DEC, 2023	JAN, 2024	FEB, 2024	MAR, 2024	APR, 2024	MAY, 2024	JUN, 2024	JUL, 2024	AUG, 2024	SEP, 2024	Ave
Maximum	230	3.3	1.8	1.1	1.2									1.9
Minimum	0.04	0.0	0.0	0.0	0.1									0.0
Average	10.4	2.1	1.0	0.6	0.8									1.1

TABLE 7. MONTHLY GSA PRECIPITATION

Precipitation Unit	OCT, 2023	NOV, 2023	DEC, 2023	JAN, 2024	FEB, 2024	MAR, 2024	APR, 2024	MAY, 2024	JUN, 2024	JUL, 2024	AUG, 2024	SEP, 2024	Total
(mm)	2.8	6.4	27.7	44.4									81.3
(inch)	0.1	0.3	1.1	1.7									3.2
(AF)	1,076	2,474	10,657	17,111									31,318

ACCURACY OF REMOTE SENSING RESULTS

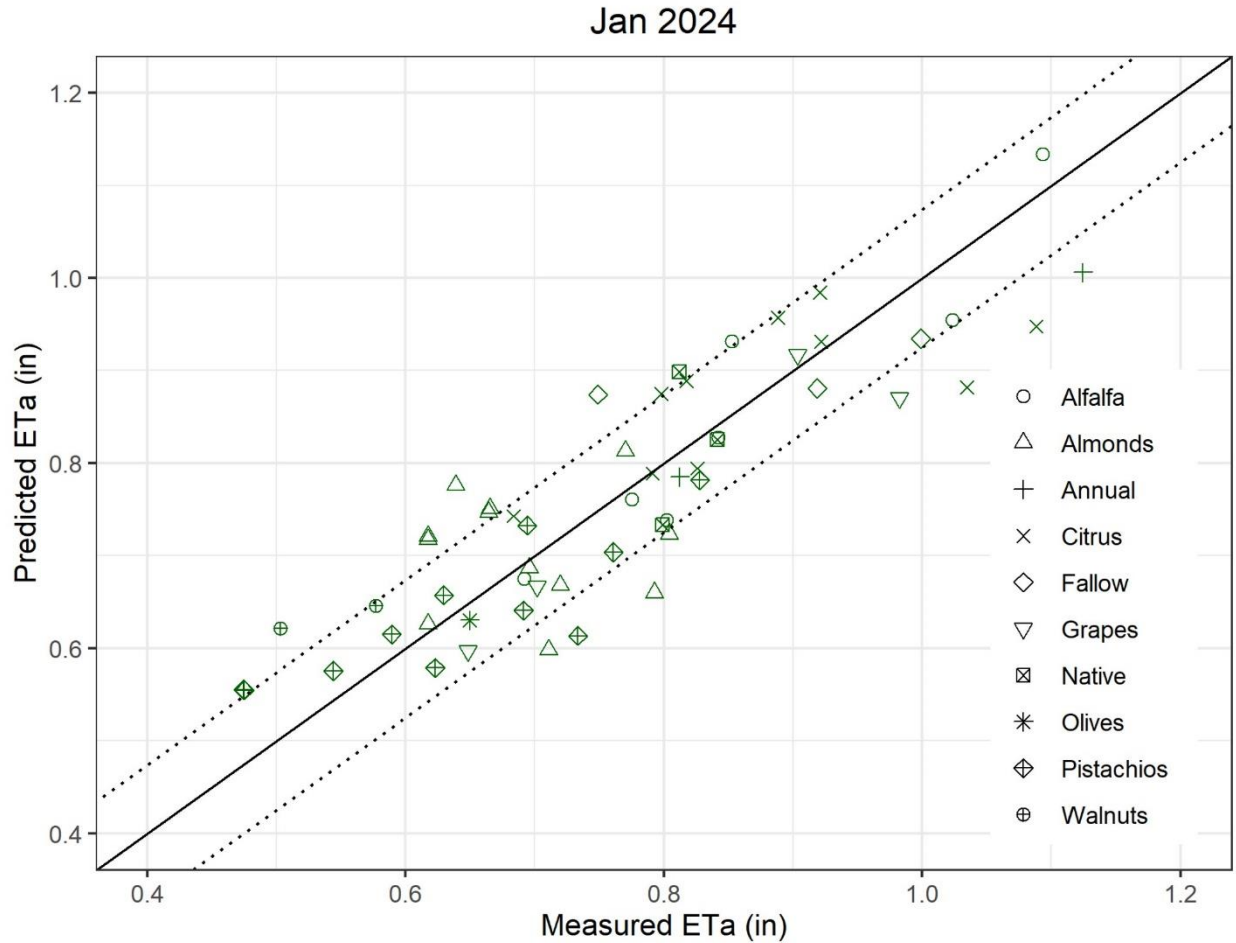


FIGURE 1. MEASURED VERSUS PREDICTED ET_A FOR THE MONTH. SYMBOL COLORS REPRESENT THE STATION TYPES (BLACK = FULL, GREEN = WATER IQ (WIQ)). THE SOLID LINE REPRESENTS 1:1 LINE, WHILE THE DOTTED LINE ARE THE 1:1 LINE PLUS AND MINUS THE RMSE (ROOT MEAN SQUARE ERROR).

TABLE 8. MEASURED VS. PREDICTED MONTHLY ET_A

R ²	RMSE (IN)
0.76	0.07

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.