

ACTUAL EVAPOTRANSPIRATION ANALYSIS

December 2021

Prepared for
East Kaweah Groundwater Sustainability Agency

Prepared by
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SUMMARY

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

| | ET (ac-ft) | Precipitation (in) |
|-----------------------------------------|------------|--------------------|
| Past 12 months | 254,055 | 10.3 |
| Prior water year (OCT 1 – SEP 30) | 257,182 | 4.7 |
| Prior calendar year (JAN 1 – DEC 31) | 254,055 | 10.3 |

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 | 9 | 5 |
| Almonds | 22 | 6 |
| Annuals | 6 | 4 |
| Citrus | 16 | 10 |
| Fallow/Native | 7 | 5 |
| Grapes | 11 | 6 |
| Olives | 2 | 0 |
| Pistachios | 14 | 9 |
| Pomegranates | 1 | 0 |
| Walnuts | 1 | 1 |

TABLE 3. PRECIPITATION MEASURED BY FIELD STATIONS

| Station ID | Source | December Precipitation (in) |
|--------------------------------|---------|-----------------------------|
| LandIQ_EK_Full_Sumos | Land IQ | 5.01 |
| CIMIS #205: Coalinga | CIMIS | 1.79 |
| CIMIS #5: Shafter | CIMIS | 2.19 |
| CIMIS #2: FivePoints | CIMIS | 2.25 |
| CIMIS #146: Belridge | CIMIS | 1.54 |
| CIMIS #39: Parlier | CIMIS | 3.66 |
| CIMIS #105: Westlands | CIMIS | 1.54 |
| CIMIS #182: Delano | CIMIS | 3.16 |
| CIMIS #169: Porterville | CIMIS | 4.44 |
| KTLC1 | CNRFC | 2.41 |
| PNOC1 | CNRFC | 2.12 |
| SCSC1 | CNRFC | 5.05 |
| USW00053119 | GHCN | 3.37 |
| USC00044890 | GHCN | 5.41 |
| USW00023110 | GHCN | 2.24 |
| USC00049367 | GHCN | 3.85 |

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 |
|-------------------|--------------|
| December 12, 2021 | Sentinel 2 |
| November 27, 2021 | Sentinel 2 |

TABLE 5. MONTHLY DISTRICT ET_A

| Unit | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| (mm) | 22.3 | 26.9 | 43.4 | 70.5 | 82.0 | 99.8 | 98.8 | 80.2 | 60.2 | 41.1 | 21.6 | 13.1 |
| (inch) | 0.9 | 1.1 | 1.7 | 2.8 | 3.2 | 3.9 | 3.9 | 3.2 | 2.4 | 1.6 | 0.9 | 0.5 |
| (AF) | 8,593 | 10,375 | 16,704 | 27,148 | 31,560 | 38,425 | 38,038 | 30,875 | 23,175 | 15,829 | 8,298 | 5,024 |

TABLE 6. MONTHLY FIELD ET_A

| ET _A (in) Including Fallow | | | | | | | | | | | | | |
|---------------------------------------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Field Size (ac) | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| Maximum | 230.1 | 1.6 | 2.0 | 3.5 | 5.5 | 7.4 | 8.6 | 7.4 | 7.0 | 5.0 | 2.8 | 1.5 | 0.7 |
| Minimum | 0.02 | 0.1 | 0.0 | 0.5 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 |
| Average | 9.8 | 1.0 | 1.2 | 1.7 | 2.8 | 3.4 | 4.1 | 4.0 | 3.3 | 2.6 | 1.8 | 1.0 | 0.5 |
| ET _A (in) Excluding Fallow | | | | | | | | | | | | | |
| | Field Size (ac) | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| Maximum | 230.1 | 1.6 | 2.0 | 3.5 | 5.5 | 7.4 | 8.6 | 7.4 | 7.0 | 5.0 | 2.8 | 1.5 | 0.7 |
| Minimum | 0.02 | 0.1 | 0.0 | 0.5 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.2 |
| Average | 10 | 1.0 | 1.3 | 1.8 | 2.9 | 3.5 | 4.3 | 4.3 | 3.5 | 2.8 | 1.9 | 1.1 | 0.6 |

TABLE 7. MONTHLY DISTRICT PRECIPITATION

| Precipitation Unit | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|--------------------|--------|-------|--------|-------|-----|-----|-----|-----|-----|--------|-------|--------|
| (mm) | 50.1 | 12.1 | 28.2 | 4.8 | 0.0 | 0.1 | 0.1 | 0.0 | 0.2 | 41.5 | 3.7 | 121.2 |
| (inch) | 2.0 | 0.5 | 1.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 | 0.1 | 4.8 |
| (AF) | 19,302 | 4,661 | 10,850 | 1,857 | 12 | 29 | 26 | 0 | 84 | 15,964 | 1,435 | 46,656 |

ACCURACY OF REMOTE SENSING RESULTS

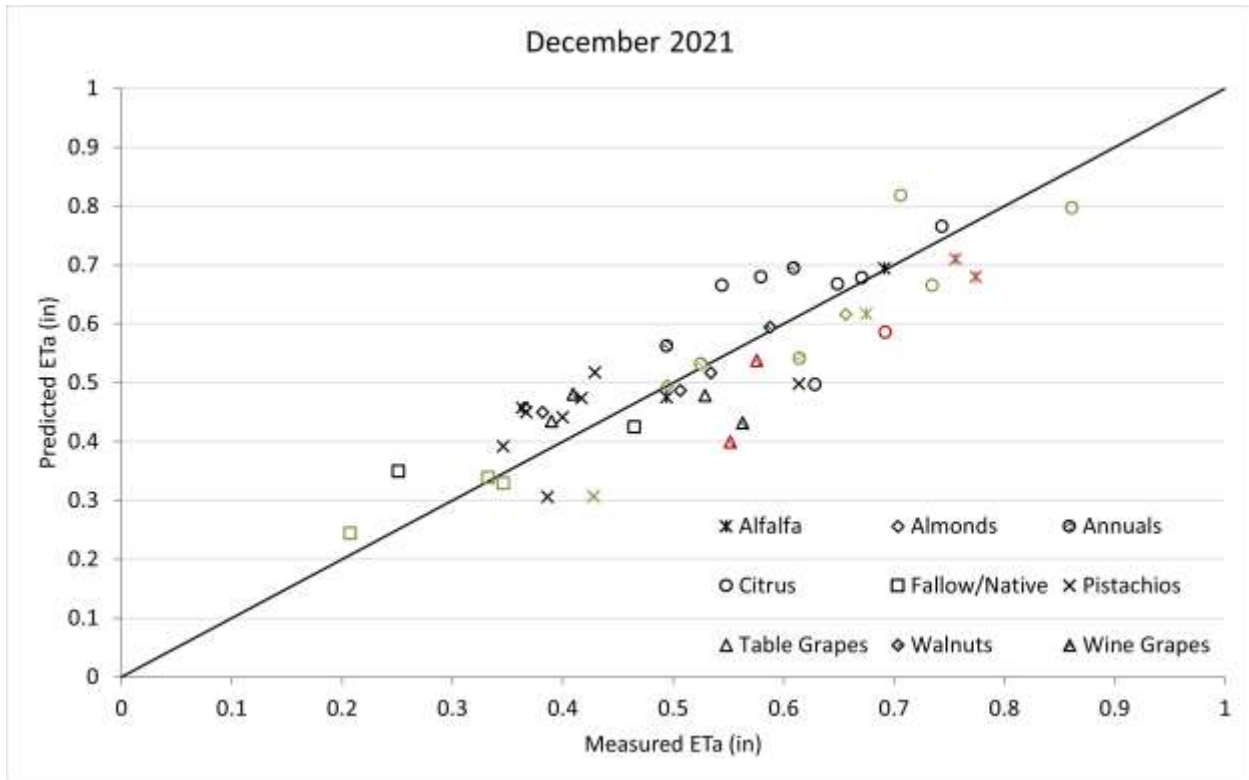


FIGURE 1. MEASURED VERSUS PREDICTED ET_A FOR THE MONTH. SYMBOL COLORS REPRESENT THE STATION TYPES (BLACK = FULL, GREEN = WATER IQ (WIQ), RED = TULE TECH)

TABLE 8. MEASURED VS. PREDICTED MONTHLY ET_A

| R ² | RMSE (IN) |
|----------------|-----------|
| 0.8 | 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 perfect fit to the observed data.