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VEGETATIVE WATER USE IN CALIFORNIA, 1974

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On the Cover

EARLY SPRING IRRIGATION IN SOUTHERN SAN JOAQUIN VALLEY

(Upper left)

Pre-irrigation by hand-move sprinklers before a spring crop is planted

(Upper right)

Water flowing from an underground pipeline riser into a shallow wide bottom furrow irrigates a vineyard

(Lower left)

Drip irrigation of young pistachio trees

(Lower right)

Hand-move sprinkler lines placed between rows of peach trees

Photos by Department of Water Resources

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VEGETATIVE WATER USE IN CALIFORNIA, 1974

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GOVERNOR
STATE OF CALIFORNIA

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SECRETARY FOR RESOURCES
THE RESOURCES AGENCY

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Almond orchard irrigated by small under-tree sprinklers, a method well suited to rolling terrain.

(Photos by Department of Water Resources)



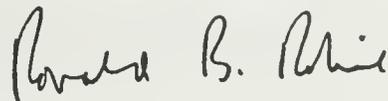
An under-tree sprinkler.

FOREWORD

As a leading agricultural producer, California consumes more water for irrigating crops than for any other purpose -- virtually 85 percent of its total water use, in fact. This high level of use emphasizes the importance of being able to predict what total quantity of water is needed, as well as when and where it is needed. Bulletin No. 113-3 is the third in a series of Department of Water Resources' publications on the rate of water use by crops.

Based on field studies conducted from 1954 to 1972, the report expands the previously published body of basic vegetative water use data for California. It summarizes growing season evapotranspiration and evapotranspiration of applied water for principal crops grown in major agricultural regions of the State, tabulates evaporation and other climatic indexes and provides the data required to calculate irrigation efficiencies. For the first time in this series of reports, data on applied water are included.

The usefulness of the evapotranspiration measurements for a large number of irrigated crops was broadened by correlating measured values to local evaporation rates and then projecting the ratios derived to other areas of the State where only evaporation data were available.



Ronald B. Robie, Director
Department of Water Resources
The Resources Agency
State of California

OTHER BULLETINS IN THIS SERIES

Bulletin No. 113, "Vegetative Water Use Studies, 1954-1960" (1963)

Describes field procedures and presents Detailed tabulations of data collected.

Bulletin No. 113-2, "Vegetative Water Use" (1967)

Covers factors affecting evapotranspiration, sets forth criteria for selecting and operating field plots, and summarizes data collected.

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California.

CHAPTER I. INTRODUCTION

Irrigated agriculture is the largest single user of water in California and it is expected to remain so, even with the anticipated growth in urban and industrial water demand. Present estimates place agricultural water use at about 85 percent of the developed water in the State.

Reliable agricultural water use values are necessary for water project planning, for water management, and for many other water-related activities as well. This report summarizes results of vegetative water use field studies conducted by the Department of Water Resources and cooperating agencies on various aspects of agricultural water use during the period 1954 to 1972.

Based upon data included in this report, three components of agricultural water use -- crop growing season evapotranspiration, evapotranspiration of applied water, and applied water requirements -- were estimated for the principal irrigated crops grown in nine zones of particular agricultural importance in the State.

Summary of Investigation

1. Evaporative demand zones are areas in which annual total and monthly patterns of evaporation are essentially the same. Evaporative demand data provide a basis for transferring related crop evapotranspiration measured in one area to another where ET measurements are unavailable.

On the basis of data collected in this investigation, California was divided into 11 evaporative demand zones whose boundaries are defined by evaporation rates and other agroclimatic data.

Eight of these zones lie in Northern and Central California. They are:

- North Coast, Coastal Valleys and Plains
- North Coast, Interior Valleys
- Northeastern Mountain Valleys
- Sacramento Valley Floor
- San Joaquin Valley Floor
- Central Coast, Coastal Valleys and Plains
- Central Coast, Interior Valleys
- Sierra

In Southern California, where very limited agroclimatic data are available, three zones have been delineated from empirical estimates of evaporation and from general knowledge of the areas. These zones are:

South Coast, Coastal Valleys and Plains
South Coast, Interior Valleys
Southern California Desert

2. Averages of four climatic parameters -- pan evaporation¹, net atmometer evaporation, incoming solar radiation, and potential evapotranspiration -- are tabulated by month for each evaporative demand zone. These values are believed to be sufficiently reliable to provide reasonable averages for each zone.

Because evaporation data for the Sierra and Southern California Desert Zones are generally unavailable, tabulations for these regions have been omitted.

3. Ocean influence on evaporative demand in coastal valleys was observed to be limited to a relatively narrow coastal strip that varied from 15 to 25 miles wide, depending on the size, topography, and geographic orientation of the valleys in which evaporation rates were measured.

The steep coastal zone gradients observed suggest the importance of selecting evaporation data measured, or adjusted, to characterize the location for which crop evapotranspiration is being estimated -- at the same distance inland and with the same prevailing winds.

4. Observed monthly evapotranspiration of grass (potential evapotranspiration) is compared to measured pan evaporation, net atmometer evaporation, solar radiation, and the Blaney-Criddle "f" factor² at eight differing climatic/geographic locations. The evapotranspiration of grass was found to correlate closely to each climatic parameter at individual locations; however, pan evaporation was found to have the most consistent relationship for all locations -- within ± 10 percent on a seasonal basis.

5. Field measurements of monthly evapotranspiration for several irrigated crops made by the Department of Water Resources and cooperating agencies are summarized in this report. These data were obtained under conditions that characterized the upper levels of prevalent grower management practices.

6. Growing season evapotranspiration is summarized for principal crops grown in several evaporative demand zones of the State.

¹ Pan evaporation data, wherever discussed or illustrated in this report, was measured in an irrigated pasture environment or the equivalent, unless otherwise stated.

² In the Blaney-Criddle formula ($u = kf$) for determining evapotranspiration, f = the product of mean monthly temperature and monthly percent of annual day-time hours $\div 100$; this is sometimes called the consumptive use factor.

7. Recommended ratios of evapotranspiration/evaporation, summarized in this report for many crops, can be used with evaporation data reported here to estimate crop evapotranspiration for areas where ET measurements are unavailable.

8. The contribution of precipitation toward meeting evapotranspiration demand was calculated, and the evapotranspiration of applied water is summarized by rainfall zones for the principal crops in several areas of the State.

9. Average values of applied water for principal crops or crop categories in 10 evaporative demand zones were subjectively selected after review of considerable applied water data. In addition, high and low values given represent the range most commonly found in the area.



MASTER AGROCLIMATIC STATION, Arvin 2.5 NW. Because crop evapotranspiration observed in nearby field plots was correlated to data from this station, more elaborate instrumentation was used here than in the typical agroclimatic stations.



TYPICAL AGROCLIMATIC STATION, Bakersfield 10 S. Located in a large irrigated pasture. Evaporation from a Class "A" pan and Livingston atmometers was observed weekly. Grass within the fenced enclosure was maintained at 4-inch to 5-inch heights by periodic mowing.

CHAPTER II. EVAPORATIVE DEMAND

Analysis of agroclimatic data that has been collected over a number of years makes possible delineation of zones of similar evaporative demand within the State. The agroclimatic field studies, analysis of data collected, and the results of that analysis are described below.

Agroclimatic Field Studies

The objective of the Department's agroclimatic studies is to determine the monthly magnitudes and geographic variations of evaporative demand within the major agricultural areas of the State. Evaporative demand data is important because it provides a basis for estimating crop evapotranspiration (ET) -- a climatically-controlled process -- and thus serves as a means of transferring ET values from areas for which measurements are available to areas for which such information is unknown or measurements are unavailable.

Eighty-four agroclimatic stations were operated for various lengths of time and in various locations in the major agricultural areas of Northern and Central California by 11 observers, including the Department of Water Resources. Station locations are shown on Plate 1 and described in Appendix C. The names of the 10 cooperating agencies are also listed in Appendix C.

The primary instruments at these stations were either U. S. Weather Bureau Class "A" evaporation pans or Livingston black and white spherical atmometers (5)¹ or both. All stations were equipped with precipitation gages, and several had instruments for measuring incoming solar radiation. Certain stations located near the ET plots and used to provide the data to which measured ET was correlated (master stations) were generally more elaborately equipped. In addition to the instruments listed above, these master stations were instrumented to make observations of wind movement, air temperatures, and relative humidity. Locations of the master stations are shown on Plate 1 and in Appendix C. Views of a master agroclimatic station and a typical agroclimatic station appear on page 4. While the typical agroclimatic stations were serviced only at weekly intervals, the master stations were serviced more frequently.

In 1960 the marked effects of pan surroundings upon measured evaporation rates were demonstrated by W. O. Pruitt and associates at the University of California, Davis (15). Subsequent analysis of evaporation data collected by the Department

¹ Numerals in parentheses in this and subsequent chapters refer to bibliography (Appendix A).

of Water Resources indicated that differences attributable to station environment were great enough to mask differences attributable to geographic location.

The significant differences in evaporation rates resulting from differing station environments are illustrated in the following data collected at sites within a few miles of one another in southwestern San Joaquin Valley.

Monthly Evaporation in 1965 and 1966
In inches

| Station Environment | Jan | Feb | Mar | Apr | May | Jun | July | Aug | Sept | Oct | Nov | Dec | Totals | |
|--------------------------------|-----|-----|-----|------|------|------|------|------|------|-----|-----|-----|------------------|------------------|
| | | | | | | | | | | | | | M-O ¹ | J-D ² |
| Irrigated Pasture ³ | 2.0 | 2.4 | 4.6 | 7.4 | 9.5 | 9.9 | 9.9 | 7.8 | 6.1 | 4.6 | 1.8 | 1.0 | 59.8 | 67.0 |
| Dry Land ⁴ | 2.3 | 2.5 | 5.8 | 10.8 | 14.6 | 14.3 | 17.3 | 15.5 | 11.1 | 8.7 | 3.4 | 0.9 | 98.1 | 107.2 |

In 1960, large, well-managed irrigated pastures were selected as the prescribed standard environment for all agro-climatic stations. With the elimination (or minimization) of evaporation variations resulting from environmental differences, the variations attributable to geographic location could be determined. Except for a few stations that were operated for specific reasons in other surroundings, since 1960 all agro-climatic stations have been situated in irrigated pastures or comparable settings.

Because depth of water in evaporation pans also affects evaporation rates (14), measures were taken to maintain the water in the pans at a near-constant level.

It was found that, unlike pan evaporation, net atmometer evaporation (the difference in evaporation between the black and white Livingston atmometers (5)) was not significantly affected by differences in station environment. Since net atmometer evaporation is insensitive to the immediate environment,

¹ March through October

² January through December

³ Buttonwillow 1S (station is located one mile south of the town of Buttonwillow), 4 miles east of the western edge of irrigated lands.

⁴ Station D-40-080 (Reference 8, Appendix A) 21 miles west of pasture site (9 miles west of western edge of irrigated land). Dry land surrounds station for many miles in all directions.

atmometers can be operated in unirrigated areas, for example. Disadvantages to the use of atmometers are that they cannot be operated during periods of subfreezing temperatures, and they require more attention than do evaporation pans (9, 20).

As with atmometers, observations of solar radiation are not influenced by the surroundings of the recording instrument. The strict requirements for instrument location used for evaporation pans were therefore not required.

Details of routine station operation and tabulation of data have been described in previous publications (5, 6).

A summary of monthly pan evaporation data for stations meeting the above requirements is presented in Appendix D. Appendix E presents a summary of observed monthly net atmometer evaporation. Department of Water Resources records, combined with generally longer-term solar radiation records collected by other agencies, are presented in Appendix F (4). Locations of the radiation stations are shown in Appendix C and on Plate 1.

Evaporative Demand Zones

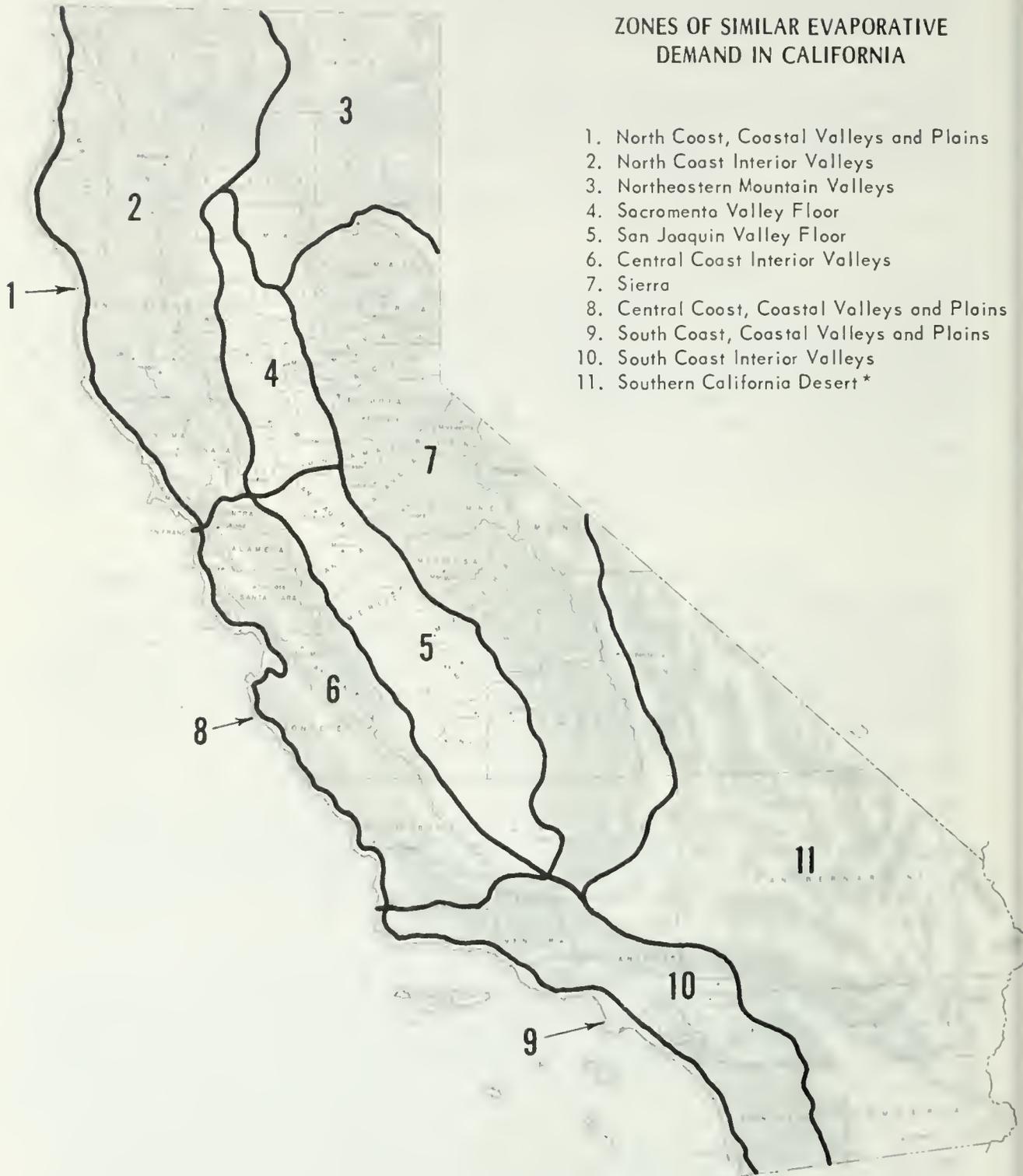
Evaporation pan data were screened for conformance to both environmental and operational standards. Only stations located in irrigated pasture, or in a comparable environment, and stations where pan water depths remained constant were used. Under these standardized conditions of station operation, differences in observed evaporation were attributed to the geographic locations of the stations.

Analysis of Data

Boundaries of zones of similar evaporative demand were defined primarily by observed rates of evaporation from the select group of Class "A" pans. Solar radiation and net atmometer evaporation data were used to supplement the pan evaporation data in defining those zones.

Monthly evaporation rates for the individual stations were tabulated and stations were grouped on the basis of similar monthly patterns of evaporation. These zones are shown in Figure 1. Average monthly pan evaporation, net atmometer evaporation, and solar radiation for the zones are shown in Tables 1, 2, and 3. Little or no evaporation data from pasture sites were available in Southern California; therefore, boundaries of the three evaporative demand zones in this region were based upon empirical estimates that were modified by experienced judgment. Studies are currently being conducted by other agencies in the Southern California Desert zone -- a major agricultural area of Southern California. The evaporative demand zones in Southern California shown in Figure 1 will probably be modified as information becomes available.

ZONES OF SIMILAR EVAPORATIVE DEMAND IN CALIFORNIA



- 1. North Coast, Coastal Valleys and Plains
- 2. North Coast Interior Valleys
- 3. Northeastern Mountain Valleys
- 4. Sacramento Valley Floor
- 5. San Joaquin Valley Floor
- 6. Central Coast Interior Valleys
- 7. Sierra
- 8. Central Coast, Coastal Valleys and Plains
- 9. South Coast, Coastal Valleys and Plains
- 10. South Coast Interior Valleys
- 11. Southern California Desert *

* Reliable Data on evaporative demand is generally unavailable in the Southern California Desert. Studies by other agencies are in progress in Imperial Valley and Palo Verde Valley (Zone 11)

Table 1. SUMMARY OF AVERAGE PAN EVAPORATION IN CALIFORNIA^{1/}
In inches

| MONTH | Northeastern - Mountain Valleys | North Coast - Coastal Valleys and Plains | North Coast - Interior Valleys | Sacramento Valley | San Joaquin Valley | Central Coast - Coastal Valleys and Plains | Central Coast Interior Valleys | South Coast - Coastal Valleys and Plains | South Coast - Interior Valleys |
|---------------------|------------------------------------|--|-----------------------------------|----------------------|-----------------------|--|-----------------------------------|--|-----------------------------------|
| Jan | 0.8 | 0.7 | 1.2 | 1.5 | 1.3 | 2.5 | 2.3 | 2.5 | 2.4 |
| Feb | 1.3 | 1.3 | 1.6 | 2.4 | 2.3 | 2.9 | 2.9 | 3.3 | 3.2 |
| Mar | 2.8 | 2.6 | 3.1 | 3.9 | 4.2 | 4.1 | 4.3 | 4.1 | 4.4 |
| Apr | 4.8 | 3.2 | 4.4 | 5.7 | 5.9 | 5.1 | 5.6 | 4.9 | 5.5 |
| May | 6.4 | 4.2 | 6.4 | 7.5 | 8.3 | 6.0 | 7.3 | 5.8 | 6.5 |
| Jun | 7.5 | 4.6 | 7.6 | 9.3 | 9.6 | 6.3 | 7.9 | 6.6 | 7.7 |
| Jul | 10.1 | 4.5 | 9.1 | 10.1 | 10.0 | 6.8 | 8.6 | 7.0 | 8.8 |
| Aug | 9.0 | 4.3 | 8.0 | 8.6 | 8.5 | 6.1 | 7.7 | 7.0 | 8.6 |
| Sep | 6.3 | 3.6 | 6.0 | 6.8 | 6.3 | 5.0 | 6.2 | 5.8 | 6.8 |
| Oct | 3.8 | 2.3 | 3.6 | 4.6 | 4.4 | 4.3 | 5.0 | 4.6 | 5.1 |
| Nov | 1.3 | 1.5 | 1.6 | 2.2 | 2.1 | 3.0 | 3.1 | 3.6 | 3.2 |
| Dec | 0.7 | 1.0 | 1.0 | 1.4 | 1.0 | 2.1 | 2.1 | 3.1 | 2.6 |
| M - O ^{3/} | 50.7 | 29.3 | 48.2 | 56.5 | 57.2 | 43.7 | 52.6 | 45.8 | 53.4 |
| J - D ^{4/} | 54.8 | 33.8 | 53.6 | 64.0 | 63.9 | 54.2 | 63.0 | 58.3 | 64.8 |

^{1/} Evaporation from USWB - Class "A" pans located in irrigated pasture (or comparable) environment.

^{2/} No evaporation data (irrigated pasture environment) available. Monthly evaporation rates listed are subjective estimates based upon dry land pan evaporation and other climatological data.

^{3/} March through October (principal growing season)

^{4/} January through December

Table 2. SUMMARY OF OBSERVED NET ATMOMETER
EVAPORATION IN CALIFORNIA
In milliliters

| | Northeastern - Mountain Valleys | North Coast - Coastal Valleys and Plains | North Coast - Interior Valleys | Sacramento Valley | San Joaquin Valley | Central Coast - Coastal Valleys and Plains | Central Coast - Interior Valleys | South Coast - Coastal Valleys and Plains | South Coast - Interior Valleys | Southern California Desert |
|---------------------|------------------------------------|--|-----------------------------------|----------------------|-----------------------|--|-------------------------------------|--|-----------------------------------|-------------------------------|
| Jan | - | - | - | - | - | 235 | 200 | | | |
| Feb | - | - | - | - | - | 265 | 225 | | | |
| Mar | - | - | 325 | 330 | 355 | 345 | 355 | | | |
| Apr | - | -- | 335 | 410 | 430 | 390 | 410 | | | |
| May | 445 | No Data Available | 445 | 500 | 510 | 425 | 480 | No Data Available | -- | -- |
| Jun | 535 | | 525 | 570 | 540 | 425 | 480 | | | |
| Jul | 580 | | 560 | 615 | 570 | 450 | 500 | | | |
| Aug | 540 | | 515 | 540 | 535 | 420 | 455 | No Data Available | -- | -- |
| Sep | 430 | | 400 | 440 | 445 | 365 | 380 | | | |
| Oct | - | No Data Available | 290 | 345 | 355 | 310 | 320 | No Data Available | -- | -- |
| Nov | - | -- | 210 | 170 | - | 230 | 220 | -- | -- | -- |
| Dec | - | | - | - | - | 230 | 200 | | | |
| M - O ^{1/} | - | | 3395 | 3750 | 3740 | 3130 | 3380 | | | |
| J - D ^{2/} | - | | - | - | - | 4090 | 4225 | | | |

1/ March through October (principal growing season)

2/ January through December

Table 3. SUMMARY OF SOLAR RADIATION IN CALIFORNIA
In equivalent inches of evaporation^{1/}

| MONTH | Northeastern - Mountain Valleys | North Coast - Coastal Valleys and Plains | North Coast - Interior Valleys | Sacramento Valley | San Joaquin Valley | Central Coast - Coastal Valleys and Plains | Central Coast - Interior Valleys | South Coast - Interior Valleys | Southern California Desert |
|---------------------|------------------------------------|---|-----------------------------------|----------------------|-----------------------|--|-------------------------------------|-----------------------------------|-------------------------------|
| Jan | 3.3 | | 4.7 | 3.8 | 4.0 | 5.5 | 3.9 | 5.5 | 5.7 |
| Feb | 5.0 | | 5.1 | 5.4 | 5.5 | 6.6 | 5.6 | 6.4 | 6.6 |
| Mar | 7.8 | | 8.3 | 8.6 | 8.8 | 9.8 | 8.3 | 9.2 | 9.6 |
| Apr | 9.5 | - | 11.1 | 10.9 | 10.8 | 11.7 | 10.1 | 10.5 | 12.4 |
| May | 12.4 | | 13.3 | 13.7 | 13.0 | 12.9 | 11.6 | 12.3 | 12.8 |
| Jun | 13.3 | No data available | 13.8 | 14.0 | 13.4 | 12.7 | 12.1 | 12.7 | 13.0 |
| Jul | 15.0 | | 14.9 | 14.8 | 13.8 | 13.3 | 12.5 | 13.2 | 12.2 |
| Aug | 12.5 | | 12.9 | 13.0 | 12.4 | 12.2 | 11.0 | 12.1 | 11.3 |
| Sep | 9.6 | | 9.6 | 10.2 | 10.0 | 9.7 | 8.9 | 10.0 | 9.7 |
| Oct | 6.5 | No data available | 7.7 | 7.7 | 7.7 | 8.0 | 6.8 | 8.0 | 8.4 |
| Nov | 3.2 | | 4.3 | 4.4 | 4.7 | 5.7 | 4.4 | 6.1 | 5.9 |
| Dec | 2.7 | - | 3.3 | 3.4 | 3.2 | 5.0 | 3.8 | 5.1 | 5.2 |
| M - O ^{2/} | 86.6 | | 91.6 | 92.9 | 89.9 | 90.3 | 81.3 | 88.0 | 89.4 |
| J - D ^{3/} | 100.8 | | 109.0 | 109.9 | 107.3 | 113.1 | 99.0 | 111.1 | 112.8 |

^{1/} Solar Radiation expressed as equivalent inches of evaporation.
1486 Langleys equals 1 inch of evaporation.

^{2/} March through October (principal growing season).

^{3/} January through December.

The averages shown in Tables 1, 2, and 3 are reasonable values for use within those zones. Little variation was indicated throughout each of the inland zones. In the coastal valleys and plains, the reported values are reasonable averages for entire zones. However, evaporation was observed to vary with distance from the coast.

Qualification of Data

A valid comparison of evaporation rates at different locations requires the use of data for the same time periods. Agroclimatic stations, however, were operated for various periods of time at different places. The data thus reflect the effects of both geographic locations and year-to-year variations in evaporative demand.

To determine the influence of seasonal variations on average evaporation for an area, two methods for determining the area average were compared. Observed evaporation for 12 stations which were operated during different periods of time in the San Joaquin Valley was extrapolated to the same time period on the basis of the long-term record for one continuously operated station. The monthly and seasonal extrapolated values for the 12 stations were then averaged to obtain average evaporation for the area. The value thus obtained was compared to an area mean that was determined by averaging the monthly observed evaporation rate for each of the 12 stations. Results of this comparison indicate that, for this area, differences in average areal evaporation determined by the two methods were not significant. Average evaporation rates for the area as determined by the two methods are compared as follows:

Average Evaporative Demand, San Joaquin Valley; 1959-1967
In inches

| Average Determined From | Jan | Feb | Mar | Apr | May | Jun | July | Aug | Sept | Oct | Nov | Dec | Totals | |
|-------------------------|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|-----|------------------|------------------|
| | | | | | | | | | | | | | M-O ¹ | J-D ² |
| Extrapolated Data | 1.3 | 2.2 | 4.1 | 5.8 | 8.4 | 9.5 | 10.0 | 8.6 | 6.3 | 4.6 | 2.1 | 1.0 | 57.3 | 63.9 |
| Observed Data | 1.3 | 2.3 | 4.2 | 5.9 | 8.3 | 9.5 | 9.9 | 8.4 | 6.2 | 4.5 | 2.0 | 1.0 | 56.9 | 63.5 |

¹ March through October

² January through December

A long-term station record needed to correlate and extrapolate individual station records was not available in all areas of the State; therefore, because the straight averaging method appears to provide an adequate appraisal of average evaporation for an area, that method was used to determine average evaporation rates for the evaporative demand zones.

Evaporation Gradients Near the Coast

Previous studies have shown evaporation rates observed at single locations within the coastal fogbelt to be significantly lower than those measured at interior valley locations (6, 13). For this study, several stations situated within the central coast fogbelt were analyzed. Results show that the coastal influence is limited to a relatively narrow coastal strip.

Evaporation gradients based upon data from eight stations in irrigated pasture environments in four central coastal valleys appear in Figure 2.

The gradient for the Salinas Valley, more gradual than that for the other valleys, indicates that the coastal influence there extends some 25 miles inland. Coastal influence for the other valleys was observed to extend only 15 miles inland. The differences between the gradients are believed to be real, resulting from the shape, topography, and orientation of the valleys.

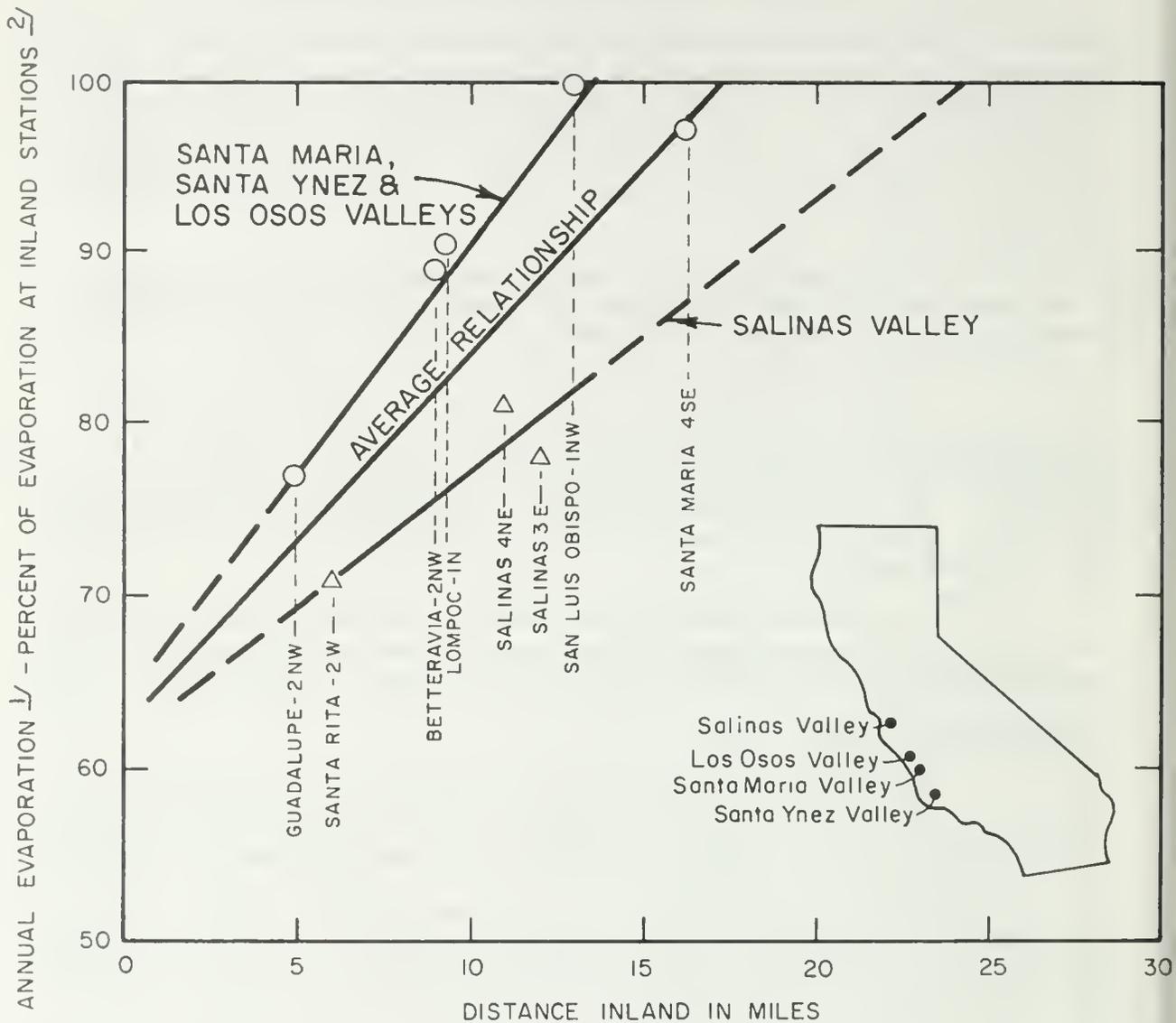
Because of the steep coastal evaporation gradients, care should be exercised in selecting evaporation data used to estimate ET of crops for specific locations within these zones.

Evaporative Demand Map

Plate 1, a fold-out map bound at the back of this report, shows our best present estimate of evaporative demand within the State. Lines of equal evaporative demand were based upon observed evaporation from Class "A" pans located in irrigated pasture (or equivalent) environments where such data were available. These lines are shown as solid black lines on the plate. "Pasture pan" data were available only for the major agricultural areas of Northern and Central California.

For the balance of the State, lines of equal evaporative demand were estimated from evaporation records collected in mostly unirrigated environments (7). Evaporation data from those dry land sites were subjectively adjusted to approximate evaporation from irrigated pasture environment. The adjustment of individual station records was based upon descriptions of the immediate pan environment and knowledge of the general area in which the pan was located. To indicate a lesser degree of confidence, these lines of estimated evaporative demand are shown on Plate 1 as dashed lines.

The use of annual evaporative demand data, such as that shown on Plate 1, to compare the evaporation of different geographic areas must be tempered by knowledge of the monthly distribution of evaporation. While annual evaporative totals for two areas may be similar, monthly patterns of evaporation



1/ Annual Evaporation From Class 'A' Pans in Irrigated Pasture Environments

2/ Annual Evaporation For Inland Stations Based on Average Evaporation at Soledad C.T.F. 35 miles Inland (65.3 inches/year) And San Lucas 63 miles Inland (64.2 inches/year).

Figure 2. RELATIONSHIP BETWEEN ANNUAL EVAPORATION 1/ AND DISTANCE FROM OCEAN FOR EIGHT CENTRAL COAST LOCATIONS

may differ significantly. For example, average annual evaporation for the Central Coast, Interior Valleys Zone is similar to that for the Sacramento Valley and San Joaquin Valley Zones. In winter, when the two inland valleys are shrouded in fog much of the time, evaporation rates are lower there than in the Central Coast, Interior Valleys Zone, where clear skies are more common. In summer, this condition reverses, with hot, clear days and greater evaporation in the inland valleys, and cool days and lower evaporation rates in the Central Coast, Interior Valleys Zone (Table 1).



CHAPTER III. EVAPOTRANSPIRATION

Evapotranspiration is the process whereby water is transpired by plants and evaporated from the earth's surface (see page 57, "Definition of Terms"). Because it can no longer be reclaimed, the water that is evapotranspired is "lost". Knowledge of evapotranspiration rates is necessary to properly plan, design, and operate water development projects, to manage water, and to perform other water-related functions.

This chapter includes summaries of observed evapotranspiration rates for a number of agricultural crops. It also describes methods for transferring measured ET values developed in one area to other areas where direct ET measurements are unavailable. Using evaporative demand data to transfer evapotranspiration values, estimated growing season evapotranspiration has been calculated for the principal crops in several agricultural areas of the State. The contribution of precipitation toward meeting crop ET demand has been estimated, and the ET of applied water calculated. Summaries of three components of agricultural water use -- crop growing season ET, ET of applied water, and applied water requirements -- are presented for a number of crops in the various evaporative demand zones.

Measured Evapotranspiration

Evapotranspiration field studies began as part of the Department's Vegetative Water Use Program in 1954. During the program's early years, data were collected by the gravimetric technique (soil tube sampling) and with evapotranspirometers (lysimeters) of various designs. In 1959 neutron probes replaced the gravimetric technique as the principal method for determining evapotranspiration.

The importance of the movement of unsaturated moisture from the crop root zone was not fully recognized until the late 1950s. With the advent of neutron probes in 1959, field plots were selected and managed to eliminate deep percolation. Because field plot surroundings, too, can affect the observed evapotranspiration rate, the plots were located within large, well-managed fields. (Details of field plot criteria and measurement techniques are described in previously published reports (5, 6).)

All ET data were screened and those data not meeting the field plot criteria were excluded. Monthly observed evapotranspiration data for measured crops are summarized in Table 4. This table also shows the location and year and method of measurement. These values represent the actual evapotranspiration rates for fields managed at the higher levels of agricultural practice.

Until the late 1960s, the Department assisted financially in support of evapotranspiration studies conducted by the Agricultural Research Service (ARS) of the U. S. Department of Agriculture and the University of California at Davis. The ARS data was collected by gravimetric, neutron probe, and lysimetric methods in grower-operated fields (3, 11, 12, 13). The University used neutron probes, two 20-foot-diameter lysimeters, and one 6-foot-by-8-foot lysimeter to determine the ET of various crops in large experimental plots (15, 16, 17, and 18) and Bowen Ratio energy balance apparatus (10) to determine the ET of rice for a large grower-managed field.

The high quality ET data collected by these cooperating agencies are also summarized in Table 4.

Correlating Measured Evapotranspiration to Evaporation

Observed monthly ET rates were correlated to rates of evaporation from Class "A" pans located in irrigated pasture, or comparable settings, near the ET field plots. Ratios of ET to evaporation were calculated for all plots where the necessary evaporation data were available. Evaporation data collected in irrigated pasture environments were not available for some of the early ET plots in the Central Coastal zones. The calculated ratios of ET/E_p are shown in Appendix I. Smoothed curves were fitted to the observed ET-to-evaporation ratios for each crop. Monthly ratios determined from the smoothed curves are shown in Table 5.

Transfer of Evapotranspiration Data

While it is essential to water planning and management studies, measurement of crop evapotranspiration is a costly and time-consuming procedure. Practical considerations limit actual measurement of crop ET to a few well-chosen locations.

Since the 1930s methods have been developed for transferring observed ET of crops from the area of measurement to other areas. These range from simple heat budget methods to complex quasi-theoretical methods. Because ET is a climatically-related process, almost all are based upon climatic data.

While many of the recently developed theoretical equations for estimating evapotranspiration are quite acceptable, the lack of readily available data and the complexity of calculations make the use of these methods impractical. These formulas do, however, increase our understanding of the ET process and the factors influencing ET rates. In practical application, a reliable, simple method to estimate crop ET is needed.

Table 4. MEASURED MONTHLY EVAPOTRANSPIRATION FOR SEVERAL PRINCIPAL CROPS IN CALIFORNIA^{1/}
In inches

| Crop | Location | Method of Measurement | Inch | Year | Growth Season | Evapotranspiration (inches) | | | | | | | | | | | | Total Annual | | | | |
|--------------------|---------------------------|-----------------------|------|-----------------------------------|-----------------------------------|-----------------------------|---------------|------|---------|----------|------|------|-----|-----|------|-----|------|--------------|------|------|------|------|
| | | | | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | | | | | |
| Alfalfa (Hay) | Arvin 2.1NW | Neutron probe | DWR | 1959 | Perennial (Active Growth Mar-Oct) | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | | | | |
| | | | | | | 1960 | 4.0 | 2.1 | 3.7 | 3.0 | 3.1 | 3.0 | 3.0 | 3.0 | 4.0 | 3.1 | 1.4 | 0.6 | 44.1 | 49.2 | | |
| | | | | | | Average | 4.0 | 2.1 | 3.7 | 3.4 | 3.4 | 3.0 | 3.0 | 3.0 | 3.6 | 4.0 | 3.1 | 2.1 | 1.4 | 41.1 | 44.9 | |
| Brawley 2SW | Weighted ET Tank | ARS | 1959 | Perennial (Active Growth Feb-Nov) | 4.2 | 7.1 | 9.3 | 10.9 | 12.2 | 8.8 | 3.2 | 1.1 | 3.1 | 1.9 | - | - | - | - | | | | |
| | | | | | 1962 | 2.6 | 3.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| | | | | | Average | 2.6 | 3.0 | 6.2 | 7.0 | 9.3 | 10.9 | 12.2 | 8.8 | 3.2 | 1.1 | 3.1 | 1.9 | - | - | - | | |
| Lompoc 4.4NW | Neutron probe | ARS | 1961 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | 4.6 | 4.6 | 3.4 | 4.1 | 1.1 | 1.1 | 1.4 | - | | | | | |
| | | | | | 1961 | 3.4 | 3.4 | 3.6 | 3.6 | 5.3 | 3.6 | 3.6 | 3.7 | 4.1 | - | - | - | - | - | | | |
| | | | | | Average | 3.4 | 3.4 | 3.6 | 3.6 | 5.3 | 3.6 | 3.6 | 4.2 | 3.6 | 4.0 | 1.1 | 1.1 | 1.1 | 29.1 | 32.6 | | |
| Lompoc 3.1W | Neutron probe | ARS | 1959 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | 4.1 | 5.0 | 3.1 | 4.6 | - | - | - | - | | | | | |
| | | | | | 1961 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | |
| | | | | | Average | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Lompoc 2.1NW | Neutron probe | ARS | 1961 | Perennial (Active Growth Mar-Oct) | - | - | - | 4.4 | 4.1 | 3.1 | 4.2 | 4.1 | 3.8 | - | - | - | - | | | | | |
| | | | | | 1961 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | |
| | | | | | Average | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Lompoc 2.6NE | Neutron probe | ARS | 1959 | Perennial (Active Growth Mar-Oct) | - | - | - | - | 4.1 | 4.9 | 3.1 | 3.5 | 2.3 | 2.1 | - | - | | | | | | |
| | | | | | 1961 | 2.2 | 1.8 | 2.1 | 4.2 | 3.1 | - | - | - | - | - | - | - | - | - | | | |
| | | | | | Average | 2.2 | 1.8 | 2.1 | 4.2 | 3.1 | 4.9 | 3.6 | 3.5 | 3.0 | 2.3 | 2.1 | - | - | 31.1 | 44.8 | | |
| McArthur 4ESE | Neutron probe | DWR | 1959 | Perennial (Active Growth Apr-Sep) | - | - | - | - | 6.8 | 6.9 | 9.0 | 6.2 | 6.9 | - | - | - | - | | | | | |
| | | | | | 1960 | - | - | - | 2.8 | 6.4 | 5.6 | 8.4 | 6.9 | 3.1 | 3.8 | - | - | 17.2 | - | | | |
| | | | | | 1961 | - | - | 4.8 | 4.4 | 5.4 | 6.5 | - | 6.6 | 5.1 | 2.1 | 0.1 | 0.1 | - | - | | | |
| | | | | | 1962 | - | - | - | 4.6 | 6.0 | 6.7 | 6.4 | 5.5 | 7.0 | - | - | - | - | 36.2 | - | | |
| | | | | | 1963 | - | - | - | - | 6.5 | 7.0 | 3.4 | 6.8 | 4.4 | 2.9 | 1.4 | - | - | - | - | | |
| | | | | | 1964 | - | - | - | - | 3.6 | 7.8 | 3.6 | 6.8 | 7.5 | 4.2 | 4.4 | - | - | 33.5 | - | | |
| | | | | | 1965 | - | - | 1.5 | 2.4 | 1.6 | 6.9 | 6.2 | 7.0 | 6.5 | 6.1 | - | - | - | 33.7 | - | | |
| | | | | | Average | - | 1.5 | 1.6 | 3.4 | 6.4 | 6.1 | 7.8 | 6.9 | 5.1 | 3.3 | 1.1 | 0.1 | 0.1 | 36.1 | - | | |
| Solvang 1.1WNW | Neutron probe | ARS | 1959 | Perennial (Active Growth Mar-Oct) | - | - | - | - | 7.1 | 3.1 | 6.4 | 3.1 | 3.2 | 2.8 | 2.2 | - | | | | | | |
| | | | | | 1961 | 2.5 | 2.7 | 2.6 | 2.1 | 3.6 | 7.1 | 3.4 | 3.1 | 3.2 | - | - | - | - | - | | | |
| | | | | | Average | 2.5 | 2.7 | 2.6 | 2.1 | 3.6 | 7.1 | 3.4 | 3.1 | 3.2 | - | - | - | - | 44.1 | 44.2 | | |
| Barley (Irrigated) | Davis 2W (Grain crop) | Floating ET Tank | U.C. | 1960-70 | 11-1-5/31 | 1.0 | 2.1 | 4.7 | 4.4 | 2.8 | - | - | - | - | 16.1 | 1.6 | 16.1 | | | | | |
| | | | | | | Wasco 2W | Neutron probe | DWR | 1972 | 1-12-6/6 | - | 1.9 | 6.2 | 6.1 | 1.1 | 0.9 | - | - | - | 1.3 | - | |
| | | | | | | Arvin 2.8NW (Winter cover) | Neutron probe | DWR | 1966-67 | 1/23-1/5 | 0.1 | - | - | - | - | - | - | - | - | 0.1 | 1.1 | 0.9 |
| Beans (Dry) | Davis 2W | Floating ET Tank | U.C. | 1966 | 6-21-9/24 | - | - | - | - | 0.5 | 4.1 | 7.6 | 3.1 | - | - | - | 17.9 | | | | | |
| | | | | | | Lompoc 4.5WNW | Neutron probe | ARS | 1957 | 6/1-9/15 | - | - | - | - | 2.2 | 2.1 | 3.0 | - | - | - | 7.9 | - |
| | | | | | | 1958 | 3/20-1/26 | - | - | - | - | 0.4 | 1.4 | 3.9 | 1.1 | 1.1 | - | - | - | 8.2 | - | |
| Cantaloupes | Arvin 2.5S | Neutron probe | DWR | 1960 | 3/2-7/8 | - | - | - | - | 0.2 | 1.6 | 3.3 | 2.2 | 1.1 | - | - | 8.0 | | | | | |
| | | | | | | 1958 | 5-1-9/4 | - | - | - | - | 1.3 | 2.4 | 1.7 | 3.1 | 3.2 | - | - | 14.1 | - | | |
| | | | | | | 1958 | 5-30-8/31 | - | - | - | - | 2.4 | 7.4 | 3.1 | - | - | - | - | 16.8 | - | | |
| Carrots | Lompoc 4.6NW | Neutron probe | ARS | 1961 | Jul-Oct | - | - | - | - | - | - | 2.4 | 3.8 | 3.1 | 3.4 | - | 3.4 | | | | | |
| | | | | | | 1961 | 3-25-2/1 | 0.1 | 1.6 | 1.1 | 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 4.1 | 2.6 | 1.1 | 0.1 | 33.1 | 36.1 | |
| | | | | | | Average | 1-1-1 | - | - | - | - | 0.1 | 4.1 | 1.1 | 1.6 | 2.1 | - | - | - | 2.4 | - | |
| Corn (Field) | Davis 2W | Floating ET Tank | U.C. | Average 1951-61 | 1-1-1 | - | - | - | - | 0.1 | 4.1 | 1.1 | 1.6 | 2.1 | - | - | 2.4 | | | | | |
| | | | | | | 1961 | 4-7-1/10 | - | - | 1.1 | 1.1 | 0.3 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | |
| | | | | | | 1951 | 4/5-10/31 | 0.4 | 1.4 | 1.1 | 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| Cotton | Arvin 2.5NW (Solid plant) | Neutron probe | DWR | 1959 | 4-1-10-11 (Active Growth May-Oct) | - | - | - | - | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | | | | |
| | | | | | | 1960 | 4-7-1/10 | - | - | 1.1 | 1.1 | 0.3 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | |
| | | | | | | Average | Apr-Oct | 0.4 | 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 32.1 |

Table 4. MEASURED MONTHLY EVAPOTRANSPIRATION FOR SEVERAL PRINCIPAL CROPS IN CALIFORNIA (Cont.)

In inches

| County | Station | Method of Measurement | Observer | Year | Growing Season | Monthly Evapotranspiration - Inches | | | | | | | | | | | | Annual | Growing Season | | | | | | |
|----------|---------------------------|-----------------------------|--------------------|---------|---|-------------------------------------|-----|---------|--------------------------------------|------------------|-----|------|-----|------|-----|-----|------|--------|----------------|------|------|------|------|------|------|
| | | | | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | | | | | | | | |
| Imperial | Brown's 65W (S. J. plant) | Hydraulic ET Tank | ARS ²⁾ | 1967 | 4/1-10/31 | - | - | - | 4.1 | 2.7 | 4.6 | 9.1 | 9.1 | 6.8 | 2.9 | - | - | 34.3 | - | | | | | | |
| | | | | 1968 | 4/25-11/21 | - | - | - | 1.3 | 1.1 | 1.7 | 8.1 | 1.2 | 3.0 | - | - | - | - | 4.2 | - | | | | | |
| | | | | 1969 | 4/1-11/25 | - | - | - | 3.8 | 4.1 | 6.4 | - | 2.2 | 6.7 | 2.2 | 1.9 | - | - | - | 42.0 | - | | | | |
| | | | | Average | Apr-Nov | - | - | - | 3.0 | 4.9 | 6.0 | 1.0 | 6.1 | 1.4 | 2.9 | 1.3 | - | - | - | 40.9 | - | | | | |
| | | | | Kern | Mutt Mill 2. SE (Sx p 2 x 2) (Fine textured soil) | Neutron probe | DWR | 1965 | 4/8-10/30 (Active Growth May-Oct) | - | - | - | - | 1.4 | 1.4 | 1.8 | 1.9 | 3.8 | 1.2 | 1.2 | 1.2 | 3.1 | - | | |
| | | | | | | | | 1962 | 3/31-11/26 | 0.6 | 0.6 | 1.0 | 1.1 | 1.1 | 3.7 | 1.1 | 1.0 | 1.0 | 1.1 | - | - | - | 29.3 | - | |
| | | | | | | | | 1963 | 4/8-11/31 | 0.1 | 0.8 | 1.2 | 1.5 | 1.6 | 4.7 | 6.0 | 6.3 | 4.8 | 2.6 | 1.4 | 1.2 | - | - | 31.8 | 10.0 |
| | | | | | | | | Average | - | - | - | - | - | 1.4 | 1.4 | 1.8 | 1.9 | 3.8 | 1.2 | 1.2 | 1.2 | - | - | 31.1 | - |
| | | | | | | | | 1964 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | Kern | Arvin 6 NNW (1198) | Neutron probe | DWR | 1959 | Perennial (Active Growth 3/27-10/31) | - | - | - | 3.6 | 6.1 | 6.4 | 7.1 | 6.1 | 2.1 | 1.0 | 0.1 | - | - | - | | |
| 1960 | - | - | - | | | | | - | - | 8.2 | 4.1 | 4.4 | 4.1 | 1.4 | 1.4 | - | - | - | - | | | | | | |
| 1962 | - | - | - | | | | | 0.6 | 1.3 | 1.1 | 2.1 | 1.1 | 6.1 | 1.7 | 4.1 | 4.1 | 1.4 | 2.1 | 0.6 | 11.1 | 16.4 | | | | |
| 1963 | - | - | - | | | | | 3.4 | 1.1 | 1.1 | 4.1 | 3.4 | 7.9 | 1.1 | 1.1 | 2.8 | 1.1 | 1.1 | 4.1 | 45.1 | - | | | | |
| 1964 | - | - | - | | | | | 1.8 | 1.1 | - | - | - | 1.8 | 1.1 | 1.1 | 3.8 | 1.1 | - | - | - | - | | | | |
| Average | - | - | - | | | | | 0.7 | 1.4 | 2.0 | 3.7 | 5.5 | 6.1 | 7.6 | 6.2 | 4.4 | 2.5 | 1.9 | 1.1 | 1.1 | 36.4 | 42.0 | | | |
| Kern | Wilton 1.7W (Walnuts) | Neutron probe | ARS | | | | | 1960 | Perennial (Active Growth Mar-Oct) | - | - | - | - | 1.4 | 5.1 | 4.2 | 3.3 | 1.1 | 1.1 | 1.1 | - | - | | | |
| | | | | | | | | 1961 | - | - | - | 1.8 | 2.1 | 2.1 | 2.4 | 1.1 | 2.1 | 2.1 | 1.1 | - | - | - | - | | |
| | | | | | | | | Average | - | - | - | 1.8 | 2.1 | 2.1 | 2.4 | 1.1 | 1.8 | 4.0 | 3.4 | 1.1 | 1.1 | 1.1 | 1.1 | 3.1 | 3.1 |
| Kern | Arvin 2.4NE (Walnuts) | Neutron probe ⁵⁾ | ARS ¹⁾ | | | | | 1960 | Perennial (Active Growth Mar-Oct) | - | - | - | - | 4.1 | 4.1 | 4.1 | 2.4 | 1.1 | 1.1 | - | - | - | | | |
| | | | | 1961 | - | - | - | 1.3 | 2.4 | 2.6 | 2.4 | 1.6 | 5.5 | 1.2 | 1.2 | 1.1 | - | - | - | | | | | | |
| | | | | Average | - | - | - | 1.3 | 2.4 | 2.6 | 2.4 | 4.6 | 4.1 | 4.1 | 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 3.1 | 16.6 | | | | |
| | | | | 1962 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | |
| Kern | Arvin 1.7W (Milk) | Neutron probe | DWR | 1971 | 6/29-11/8 | - | - | - | - | - | - | - | 8.1 | 1.1 | 1.1 | 1.4 | 1.4 | 1.1 | | | | | | | |
| | | | | 1963 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | - | - | - | - | 1.3 | 4.1 | - | - | - | | | | | | |
| | | | | 1964 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | |
| | | | | 1965 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | |
| | | | | Average | - | - | - | 0.7 | 1.8 | 3.7 | 4.6 | 6.7 | 1.2 | 6.1 | 3.3 | 1.3 | 3.8 | 1.1 | 1.1 | 46.4 | 1.1 | | | | |
| | | | | Kern | Arvin 2.5NW | Neutron probe | DWR | 1963 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | - | - | 1.3 | 4.1 | - | - | - | - | | | |
| | | | | | | | | 1964 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| | | | | | | | | 1965 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | | | | | Average | - | - | - | 0.7 | 1.8 | 3.7 | 4.6 | 6.7 | 1.2 | 6.1 | 3.3 | 1.3 | 3.8 | 1.1 | 1.1 | 46.4 | 1.1 |
| | | | | | | | | Kern | Arvin 2.5NW | Floating ET Tank | DWR | 1961 | - | - | - | 3.6 | - | 7.1 | - | 6.8 | 1.1 | 4.1 | 1.6 | 1.6 | - |
| 1962 | - | - | - | | | | | | | | | 2.1 | 4.1 | 1.1 | 1.1 | 7.0 | 1.1 | 1.4 | 1.4 | 4.1 | 1.1 | 1.1 | 4.1 | 2.8 | |
| 1963 | - | - | - | | | | | | | | | 1.8 | 1.1 | 3.1 | 1.1 | 6.1 | 1.1 | 1.4 | 1.1 | 2.1 | 1.1 | 1.1 | 1.1 | 1.1 | |
| 1964 | - | - | - | | | | | | | | | 1.2 | 1.1 | 1.1 | 1.1 | 6.1 | 6.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | |
| 1965 | - | - | - | | | | | | | | | 1.0 | 2.0 | 1.5 | 1.1 | 1.8 | 1.4 | 6.2 | 1.1 | 1.1 | - | - | - | - | |
| Average | - | - | - | | | | | | | | | 0.7 | 1.8 | 3.7 | 4.6 | 6.7 | 1.2 | 6.1 | 3.3 | 1.3 | 3.8 | 1.1 | 1.1 | 46.4 | 1.1 |
| Kern | Arvin 1.7W (Orchard) | Floating ET Tank | U.C. ⁴⁾ | 1959 | Perennial (Active Growth Mar-Oct) | - | - | | | | | - | - | - | - | 8.8 | 1.1 | 1.8 | 4.1 | 2.1 | 1.1 | - | | | |
| | | | | 1960 | - | - | - | | | | | 1.1 | 2.2 | 3.2 | 4.6 | 6.4 | 8.1 | 8.4 | 1.4 | 1.2 | 3.8 | 1.4 | 1.1 | 41.7 | 3.3 |
| | | | | 1961 | - | - | - | | | | | 1.6 | 2.7 | 3.1 | 4.1 | 6.4 | 1.2 | 8.6 | 1.1 | 1.1 | 3.6 | 1.1 | 1.1 | 41.1 | 1.8 |
| | | | | 1962 | - | - | - | | | | | 2.2 | 1.1 | 2.1 | 4.1 | 6.3 | 6.2 | 8.2 | 1.1 | 1.1 | 2.6 | 1.1 | 1.1 | 41.1 | 10.3 |
| | | | | 1963 | - | - | - | 0.9 | 1.1 | 2.3 | 3.3 | 1.1 | 6.1 | 1.1 | 1.1 | 4.1 | - | - | - | - | | | | | |
| | | | | 1964 | - | - | - | - | - | - | - | - | 6.1 | 6.3 | 1.1 | 6.4 | 3.1 | 1.1 | 1.1 | - | | | | | |
| | | | | 1965 | - | - | - | 1.0 | 2.6 | 3.1 | 4.1 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 | 1.4 | 1.1 | 1.1 | 4.1 | 1.2 | | | | |
| | | | | 1966 | - | - | - | 1.3 | 0.6 | 1.4 | 1.1 | 1.8 | 6.1 | 1.1 | 1.1 | 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 4.1 | 3.1 | | | |
| | | | | 1967 | - | - | - | 1.3 | 1.1 | 2.1 | 2.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 12.3 | 40.8 | | | |
| | | | | 1968 | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 4.1 | 16.6 | | | |
| 1969 | - | - | - | 1.2 | 1.1 | 1.1 | 1.1 | 1.4 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 4.1 | 2.8 | | | | | | | |
| 1970 | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 17.1 | 2.1 | | | | | | | |
| 1971 | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 4.1 | 2.9 | | | | | | | |
| Average | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 46.4 | 16.8 | | | | | | | |
| Kern | Arvin 1.7W (Orchard) | Hydraulic ET Tank | DWR | 1960 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | |
| | | | | 1961 | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | | | | | | |
| | | | | Average | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | | | | | |
| | | | | 1962 | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | | | | | |
| Kern | Arvin 1.7W (Orchard) | Hydraulic ET Tank | DWR | 1960 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | - | - | - | - | - | - | - | - | | | | | | | |
| | | | | 1961 | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | | | | | | |
| | | | | Average | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | | | | | |
| | | | | 1962 | - | - | - | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | | | | | |

Table 4. MEASURED MONTHLY EVAPOTRANSPIRATION FOR SEVERAL PRINCIPAL CROPS IN CALIFORNIA^{1/}
In inches

| Crop | Location | Method of Measurement | Observer | Year | Growing Season | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Totals | | | |
|--|-------------------------------------|------------------------|--------------|---------|-----------------------------------|-------------------------------------|-----|-----|-----|-----|-----|------|-----|------|------|-----|------|----------------|--------|------|------|
| | | | | | | Monthly Evapotranspiration - Inches | | | | | | | | | | | | Growing Season | Annual | | |
| Pasture (Improved) and Grass (continued) | Guadalupe 2NW (Improved pasture) | Floating ET Tank | SLOPCD & DWR | 2/ | 1963 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | 4.3 | 4.8 | 4.2 | 3.1 | 2.5 | 2.2 | - | - | | |
| | | | | | 1964 | - | 1.9 | 2.6 | 2.7 | 3.5 | 3.3 | 3.4 | 4.6 | 4.2 | 3.1 | 2.1 | 1.6 | 1.3 | 26.6 | 36.2 | |
| | | | | | 1965 | - | 2.1 | 2.7 | 3.4 | 3.1 | 4.8 | 5.0 | 5.4 | 5.7 | 4.1 | 4.1 | 1.9 | 1.5 | 35.6 | 43.4 | |
| | | | | | 1966 | - | 2.1 | 2.2 | 3.7 | 4.5 | 4.2 | 5.5 | 5.6 | 4.4 | 3.7 | 3.3 | 1.9 | 1.1 | 34.9 | 42.2 | |
| | | | | | 1967 | - | 2.0 | 2.5 | 2.7 | 3.3 | 4.3 | 2.5 | 3.6 | 3.8 | 3.2 | 3.8 | - | - | - | - | 27.2 |
| | | | | | Average | - | 2.0 | 2.5 | 3.1 | 3.6 | 4.2 | 4.2 | 4.7 | 4.6 | 3.8 | 3.4 | 2.1 | 1.1 | 31.6 | 39.6 | |
| | | | | | 1958 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | 7.1 | 4.9 | 4.7 | 4.5 | 3.7 | 2.2 | 1.1 | - | - | - |
| | | | | | 1959 | - | - | - | - | 4.6 | 5.4 | 3.7 | 5.7 | 3.1 | 2.6 | 2.4 | 2.8 | 1.5 | - | - | - |
| | | | | | 1960 | - | 1.8 | 2.7 | 2.4 | 4.5 | 3.3 | - | - | - | - | - | - | - | - | - | - |
| | | | | | Average | - | 1.8 | 2.7 | 2.4 | 4.6 | 4.4 | 5.3 | 5.3 | 3.9 | 3.6 | 3.3 | 2.5 | 1.7 | 32.8 | 41.7 | |
| Lompoc 2.5ESE (Improved pasture) | Neutron probe | ARS | 3/ | 1958 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | 7.1 | 4.9 | 4.7 | 4.5 | 3.7 | 2.2 | 1.1 | - | | | |
| | | | | 1959 | - | - | - | - | 4.6 | 5.4 | 3.7 | 5.7 | 3.1 | 2.6 | 2.4 | 2.8 | 1.5 | - | | | |
| | | | | 1960 | - | 1.8 | 2.7 | 2.4 | 4.5 | 3.3 | - | - | - | - | - | - | - | - | - | | |
| | | | | Average | - | 1.8 | 2.7 | 2.4 | 4.6 | 4.4 | 5.3 | 5.3 | 3.9 | 3.6 | 3.3 | 2.5 | 1.7 | 32.8 | 41.7 | | |
| Lompoc 2.2N (Improved pasture) | Neutron probe | ARS | 3/ | 1959 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | 4.1 | 3.4 | 4.8 | 3.6 | 3.6 | 4.1 | 1.7 | - | | | |
| | | | | 1960 | - | 1.8 | 2.3 | 2.6 | 3.1 | 4.7 | - | - | - | - | - | - | - | - | - | | |
| | | | | Average | - | 1.8 | 2.3 | 2.6 | 3.1 | 4.7 | 4.1 | 3.4 | 4.8 | 3.6 | 3.6 | 4.1 | 1.7 | 29.9 | 39.1 | | |
| | | | | 1966 | Perennial (Active Growth Mar-Oct) | 1.8 | 2.2 | 4.5 | 4.1 | 5.0 | 4.3 | 5.0 | 4.6 | 2.9 | 2.4 | 2.0 | 1.3 | 33.3 | 4.6 | | |
| Lompoc 1.9NW (Grass) | Hydraulic and/or electronic ET Tank | ARS | 3/ | 1969 | - | 1.0 | 1.5 | 2.9 | 4.1 | 4.7 | 4.1 | 4.5 | 4.6 | 3.6 | 3.4 | 2.3 | 1.2 | 32.0 | 36.1 | | |
| | | | | 1970 | - | 1.2 | 2.6 | 4.8 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | | Average | - | 1.3 | 2.1 | 4.1 | 4.1 | 4.8 | 4.2 | 4.8 | 4.7 | 3.2 | 3.2 | 2.2 | 1.2 | 33.0 | 3.1 | | |
| | | | | 1966 | Perennial (Active Growth Mar-Oct) | 1.8 | 2.2 | 4.5 | 4.1 | 5.0 | 4.3 | 5.0 | 4.6 | 2.9 | 2.4 | 2.0 | 1.3 | 33.3 | 4.6 | | |
| San Luis Obispo 1NW (Improved pasture) | Floating ET Tank | CSPC & DWR | 2/ | 1969 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | - | - | - | 4.1 | 3.5 | 1.4 | - | - | | | |
| | | | | 1970 | - | 1.4 | 3.4 | 4.9 | 3.8 | 4.1 | 3.3 | 6.0 | 3.6 | 3.1 | 3.0 | - | 3.1 | - | - | | |
| | | | | 1971 | - | - | 3.1 | 3.5 | 3.4 | 4.6 | 3.7 | 6.6 | 6.2 | 1.9 | 2.6 | 2.8 | 1.6 | 36.7 | - | | |
| | | | | 1972 | - | 2.8 | 2.8 | 3.6 | 4.0 | 3.4 | 4.4 | 4.7 | 3.0 | 3.1 | 3.2 | - | - | 3.1 | - | | |
| | | | | Average | - | 2.4 | 3.1 | 4.0 | 3.7 | 4.2 | 4.1 | 3.8 | 4.3 | 4.6 | 3.2 | 3.1 | 1.6 | 3.1 | 3.3 | 4.1 | |
| | | | | 1963 | Perennial (Active Growth Mar-Oct) | - | - | - | 4.1 | 5.0 | 5.3 | 6.4 | 6.3 | 4.6 | 3.4 | 2.0 | 1.6 | - | - | - | |
| Soledad 3.5NW (Improved pasture) | Weighing ET Tank | CDC & DWR | 8/ | 1963 | Perennial (Active Growth Mar-Oct) | - | - | - | 4.1 | 5.0 | 5.3 | 6.4 | 6.3 | 4.6 | 3.4 | 2.0 | 1.6 | - | | | |
| | | | | 1964 | - | 1.4 | 2.6 | 3.4 | 4.4 | 4.8 | 5.6 | 6.0 | 5.4 | 3.3 | 2.4 | 2.1 | 1.4 | 36.3 | 4.6 | | |
| | | | | 1965 | - | 1.5 | 2.3 | 3.0 | 3.6 | 4.1 | 4.8 | 5.9 | - | - | - | - | - | - | - | - | |
| | | | | 1966 | - | 2.1 | 2.6 | 3.8 | 4.8 | 5.1 | 6.8 | 7.3 | 6.4 | 4.7 | 4.4 | 2.2 | 1.7 | 44.1 | 52.6 | | |
| | | | | 1967 | - | 2.3 | 2.8 | 3.0 | 3.6 | 5.6 | 5.7 | 5.2 | 5.4 | 3.6 | 4.1 | 2.8 | 1.4 | 43.4 | 2.7 | | |
| | | | | 1968 | - | 2.0 | 2.0 | 4.4 | 5.7 | 6.1 | 4.2 | 5.2 | 5.4 | 4.8 | 3.6 | 3.1 | 1.3 | 34.3 | 46.3 | | |
| | | | | 1969 | - | 1.1 | 1.1 | 3.7 | 4.8 | 5.1 | 4.7 | - | 6.9 | - | - | - | - | - | - | - | |
| | | | | 1970 | - | 2.3 | 2.6 | 3.6 | 4.1 | 5.1 | 6.3 | 6.8 | 6.1 | 5.7 | 4.5 | 2.9 | 1.2 | 42.4 | 38.4 | | |
| | | | | Average | - | 1.8 | 2.3 | 3.6 | 4.4 | 5.4 | 5.4 | 6.4 | 6.4 | 4.2 | 3.1 | 2.3 | 1.4 | 4.1 | 4.6 | | |
| | | | | 1963 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | - | - | - | - | 5.2 | 2.2 | 1.2 | 1.4 | - | - | |
| Thornton 2S (Improved pasture) | Floating ET Tank | DWR | | 1963 | Perennial (Active Growth Mar-Oct) | - | - | - | - | - | - | - | - | 5.2 | 2.2 | 1.2 | 1.4 | - | | | |
| | | | | 1964 | - | 1.6 | 1.1 | 2.8 | 6.3 | 6.7 | 7.7 | 6.8 | 6.7 | 4.1 | 3.1 | 1.6 | 1.5 | 17.4 | - | | |
| | | | | 1965 | - | 1.8 | 2.1 | 2.2 | 3.4 | 7.4 | 7.4 | 6.3 | 6.6 | 4.0 | 2.3 | 1.0 | - | 41.6 | 46.2 | | |
| | | | | 1966 | - | 1.3 | 1.6 | 3.0 | 5.8 | 6.2 | 8.2 | 8.0 | 8.2 | 5.3 | 3.2 | 1.0 | 1.2 | 47.9 | 52.6 | | |
| | | | | 1967 | - | 1.5 | 1.4 | 1.6 | 2.1 | 5.7 | 6.4 | 7.6 | 6.4 | 4.6 | 3.1 | 1.1 | 0.6 | 38.4 | 41.9 | | |
| | | | | 1968 | - | 1.1 | 0.7 | 2.2 | 5.8 | 6.1 | 8.5 | 8.1 | 7.4 | 4.4 | 2.1 | 1.1 | 1.1 | 42.7 | 4.1 | | |
| | | | | Average | - | 1.7 | 1.4 | 2.4 | 4.8 | 6.4 | 7.6 | 8.3 | 6.7 | 4.1 | 2.8 | 1.1 | 1.1 | 43.7 | 47.1 | | |
| | | | | 1963 | Perennial (Active Growth Apr-Sep) | - | - | - | 5.2 | 6.1 | 9.1 | 10.4 | 9.0 | 4.9 | 2.8 | - | - | 44.1 | - | | |
| Pasture (Native) (High water table meadow) | Alturas 2SE | Inflow-Outflow ET Tank | DWR | 1960 | - | - | - | 3.1 | 4.8 | 6.6 | 9.6 | 9.3 | 6.1 | 3.6 | 1.1 | 1.8 | 39.3 | - | | | |
| | | | | 1961 | - | 1.2 | 0.7 | 2.1 | 4.1 | 6.6 | 8.3 | 7.2 | 7.3 | 6.6 | 3.1 | - | - | 43.7 | - | | |
| | | | | 1962 | - | - | - | 1.8 | 4.4 | 4.8 | 7.4 | 8.6 | 8.4 | 6.9 | 2.3 | 1.1 | 1.6 | 34.1 | - | | |
| | | | | 1963 | - | 1.5 | 0.4 | 1.3 | 1.6 | 3.0 | 5.7 | 7.3 | 7.0 | 4.7 | 3.0 | - | - | 37.4 | - | | |
| | | | | 1964 | - | - | - | - | 2.4 | 3.9 | 5.0 | 6.1 | 6.5 | 5.1 | 3.1 | - | - | 32.9 | - | | |
| | | | | Average | - | 1.4 | 0.6 | 1.4 | 3.6 | 4.9 | 7.0 | 9.0 | 8.4 | 5.3 | 3.1 | 1.8 | 1.1 | 38.4 | 4.6 | | |
| | | | | 1961 | Perennial (Active Growth Apr-Sep) | 1.2 | 0.3 | 1.0 | 3.8 | 5.1 | 7.8 | 9.0 | 7.4 | 6.1 | 3.0 | - | - | 39.1 | - | | |
| | | | | 1962 | - | 1.3 | 0.5 | 1.0 | 3.6 | 5.5 | 7.1 | 8.5 | 8.0 | 5.8 | 2.3 | 1.1 | 1.1 | 38.7 | 44.3 | | |
| 1963 | - | - | - | 1.4 | - | - | 6.4 | 9.5 | 8.7 | 4.8 | 3.8 | - | - | - | - | - | | | | | |
| Average | - | 1.2 | 1.4 | 1.1 | 3.8 | 5.3 | 7.1 | 9.0 | 8.0 | 5.5 | 3.1 | 1.1 | 1.1 | 38.7 | 44.9 | | | | | | |
| Coleville 2W | Inflow-Outflow ET Tank | DWR | | 1957 | Perennial (Active Growth Apr-Sep) | - | - | - | - | 7.5 | 9.1 | 7.8 | - | - | - | - | - | | | | |
| | | | | Average | - | - | - | - | - | 7.5 | 9.1 | 7.8 | - | - | - | - | - | - | - | | |

Table 4. MEASURED MONTHLY EVAPOTRANSPIRATION FOR SEVERAL PRINCIPAL CROPS IN CALIFORNIA^{1/} (Cont.) In inches

| Irrigation | Crop | Method | Year | Period | Evapotranspiration (inches) | | | | | | | | | | | | | |
|-------------------|-------------------|-------------------|-------------------|-------------------|---|---|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | | |
| Greatly irrigated | Almond 2N (Lemon) | Neutron probe | ARS ^{1/} | 1978 | Perennial (Active Growth Mar-Jul) | 1978 | 1.3 | 2.0 | 3.0 | 2.9 | 2.2 | 4.0 | 4.0 | 3.1 | 2.0 | 2.0 | 2.0 | 1.4 |
| | | | | | | 1979 | 1.3 | 2.1 | 3.0 | 2.9 | 2.2 | 4.0 | 4.0 | 3.1 | 2.0 | 2.0 | 1.4 | |
| | | | | | | 1980 | 1.3 | 2.1 | 3.0 | 2.9 | 2.2 | 4.0 | 4.0 | 3.1 | 2.0 | 2.0 | 1.4 | |
| | | | | | | Average | 1.3 | 2.1 | 3.0 | 2.9 | 2.2 | 4.0 | 4.0 | 3.1 | 2.0 | 2.0 | 1.4 | |
| | Almond 2N (Lemon) | Neutron probe | ARS ^{1/} | 1978 | Perennial (Active Growth Mar-Jul) | 1978 | 1.4 | 2.1 | 2.0 | 2.9 | 2.4 | 3.1 | 3.0 | 2.1 | 2.0 | 2.0 | 1.4 | |
| | | | | | | 1979 | 1.4 | 2.1 | 2.0 | 2.9 | 2.4 | 3.1 | 3.0 | 2.1 | 2.0 | 1.4 | | |
| | | | | | | 1980 | 1.4 | 2.1 | 2.0 | 2.9 | 2.4 | 3.1 | 3.0 | 2.1 | 2.0 | 1.4 | | |
| | | | | | | Average | 1.4 | 2.1 | 2.0 | 2.9 | 2.4 | 3.1 | 3.0 | 2.1 | 2.0 | 1.4 | | |
| | Almond 2N (Lemon) | Neutron probe | ARS ^{1/} | 1978 | Perennial (Active Growth Mar-Jul) | 1978 | 1.3 | 2.3 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.9 | 1.4 | |
| | | | | | | 1979 | 1.3 | 2.3 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1980 | 1.3 | 2.3 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | Average | 1.3 | 2.3 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| Greatly irrigated | Almond 2N (Lemon) | Neutron probe | DWR | 1966 | Perennial (Active Growth Mar 2-Apr 8) | 1966 | 1.3 | 2.2 | 2.3 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1967 | 1.3 | 2.2 | 2.3 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1968 | 1.3 | 2.2 | 2.3 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | Average | 1.3 | 2.2 | 2.3 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| Greatly irrigated | Almond 2N (Lemon) | Neutron probe | ARS ^{3/} | 1977 | Perennial (Active Growth Mar-Jul) | 1977 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1978 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1979 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | Average | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | Greatly irrigated | Almond 2N (Lemon) | Neutron probe | DWR | 1966 | Perennial (Active Growth Mar 21-Jul 24) | 1966 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| | | | | | | | 1967 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| | | | | | | | 1968 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| | | | | | | | Average | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| | Greatly irrigated | Almond 2N (Lemon) | Neutron probe | ARS ^{4/} | 1969 | Perennial (Active Growth Apr 30-Sep 24) | 1969 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| | | | | | | | 1970 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| | | | | | | | 1971 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| | | | | | | | Average | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | |
| Greatly irrigated | Almond 2N (Lemon) | Neutron probe | DWR | 1966 | Perennial (Active Growth May-Jul) | 1966 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1967 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1968 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | Average | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| Greatly irrigated | Almond 2N (Lemon) | Neutron probe | ARS ^{2/} | 1971 | Perennial (Active Growth Dec 22-May 24) | 1971 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1972 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | 1973 | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |
| | | | | | | Average | 1.3 | 2.1 | 2.2 | 2.1 | 3.2 | 3.4 | 4.0 | 3.1 | 1.9 | 1.4 | | |

1. Monthly evapotranspiration rate determined by lysimeter method using water from local sources and reported by DWR.
 2. Data contributed by E. W. LeMert, Agricultural Research Service, Imperial Valley Conservation Experiment Station, Brawley.
 3. Data contributed by R. M. Nelson, Agricultural Experiment Station, April 11 until August 1, 1977. Data for 1977 is based on lysimeter data from the Imperial Valley Experiment Station, Brawley.
 4. Data contributed by E. W. LeMert, Agricultural Research Service, Imperial Valley Conservation Experiment Station, Brawley.
 5. Data contributed by R. M. Nelson, Agricultural Experiment Station, April 11 until August 1, 1977. Data for 1977 is based on lysimeter data from the Imperial Valley Experiment Station, Brawley.
 6. Data contributed by R. M. Nelson, Agricultural Experiment Station, April 11 until August 1, 1977. Data for 1977 is based on lysimeter data from the Imperial Valley Experiment Station, Brawley.
 7. Data collected by California State Polytechnic University.
 8. Data collected by California Department of Corrections, Imperial Valley Training Facility in cooperation with DWR.

Table 5. RECOMMENDED MONTHLY ET/Ep RATIOS FOR PRINCIPAL IRRIGATED CROPS^{1/}

| Crop | Month | | | | | | | | | | | |
|--|-------|------|------|--------------------|--------------------|------|--------------------|------|------|------|------|------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Potential ET | 0.71 | 0.74 | 0.76 | 0.77 | 0.78 | 0.78 | 0.78 | 0.78 | 0.77 | 0.75 | 0.73 | 0.70 |
| Field Crops | | | | | | | | | | | | |
| Alfalfa (Hay) | 0.71 | 0.74 | 0.70 | 0.70 | 0.71 | 0.73 | 0.76 | 0.80 | 0.80 | 0.77 | 0.73 | 0.70 |
| Barley (Fall) | 0.67 | 0.95 | 0.82 | 0.50 | 0.20 | - | - | - | - | - | 0.10 | 0.30 |
| Barley (Winter) | 0.30 | 0.67 | 0.95 | 0.82 | 0.50 | 0.20 | - | - | - | - | - | - |
| Beans (Dry) | - | - | - | - | - | - | 0.42 | 0.85 | 0.43 | - | - | - |
| Cantaloupes | - | - | - | 0.15 | 0.32 | 0.86 | 0.13 | - | - | - | - | - |
| Castor Beans ^{2/} | - | - | - | 0.06 | 0.14 | 0.67 | 1.01 | 0.95 | 0.78 | 0.69 | 0.39 | - |
| Corn (Field) | - | - | - | - | 0.12 | 0.48 | 0.94 | 0.84 | 0.50 | - | - | - |
| Cotton (Solid) | - | - | - | - | 0.10 | 0.54 | 1.02 | 1.01 | 0.87 | 0.49 | - | - |
| (2 x 1) | - | - | - | - | 0.10 | 0.49 | 0.91 | 1.06 | 0.87 | 0.76 | - | - |
| (2 x 2) | - | - | - | - | 0.10 | 0.37 | 0.88 | 0.92 | 0.83 | 0.41 | - | - |
| (2 x 2) ^{3/} | - | - | - | - | 0.10 | 0.15 | 0.68 | 0.88 | 0.62 | 0.26 | - | - |
| Grain Sorghum | - | - | - | - | 0.10 | 0.25 | 0.90 | 0.82 | 0.40 | - | - | - |
| Pasture (Improved) | 0.71 | 0.74 | 0.76 | 0.77 | 0.78 | 0.78 | 0.78 | 0.78 | 0.77 | 0.75 | 0.73 | 0.70 |
| Rice | - | - | - | 0.80 ^{4/} | 0.90 | 1.00 | 1.00 | 1.00 | 0.90 | 0.30 | - | - |
| Tomatoes (Machine-harvested) | - | - | - | 0.22 | 0.60 | 0.88 | 0.83 | 0.62 | - | - | - | - |
| Trees and Vines | | | | | | | | | | | | |
| Deciduous Orchard ^{5/} | - | - | 0.45 | 0.55 | 0.65 | 0.70 | 0.75 | 0.75 | 0.70 | 0.60 | - | - |
| Almonds ^{6/} | - | - | 0.33 | 0.40 | 0.50 | 0.52 | 0.55 | 0.55 | 0.35 | 0.30 | - | - |
| Subtropical Orchard ^{7/} | - | - | 0.45 | 0.45 | 0.50 | 0.50 | 0.50 | 0.50 | 0.45 | 0.45 | - | - |
| Vineyard (Table grapes) | - | - | - | 0.12 | 0.45 | 0.60 | 0.66 | 0.65 | 0.55 | 0.30 | - | - |
| Vineyard (Wine grapes) ^{8/} | - | - | - | 0.12 | 0.45 | 0.55 | 0.50 | 0.35 | 0.20 | 0.05 | - | - |
| Truck Crops | | | | | | | | | | | | |
| Carrots | - | - | - | - | - | - | 0.35 ^{4/} | 0.62 | 0.76 | 0.79 | - | - |
| Cauliflower (Early crop) ^{9/} | - | - | - | - | - | - | 0.78 ^{4/} | 0.78 | 0.77 | 0.75 | - | - |
| Cauliflower (Late crop) ^{9/} | - | - | - | - | - | - | - | 0.78 | 0.77 | 0.75 | 0.73 | 0.70 |
| Lettuce (Spring crop) ^{9/} | - | 0.74 | 0.76 | 0.77 | 0.78 ^{4/} | - | - | - | - | - | - | - |
| Lettuce (Summer crop) ^{9/} | - | - | - | 0.78 | 0.78 | 0.78 | - | - | - | - | - | - |
| Lettuce (Fall crop) ^{9/} | - | - | - | - | - | - | 0.78 ^{4/} | 0.78 | 0.77 | - | - | - |
| Potatoes (Spring crop) | - | - | 0.50 | 0.83 | 0.94 | 0.50 | - | - | - | - | - | - |
| Tomatoes (Handpicked) | - | - | 0.22 | 0.60 | 0.88 | 0.88 | 0.75 | 0.50 | 0.30 | - | - | - |

1/ Developed from smoothed curves of monthly observed ET/Ep ratios, except as noted. Monthly ratios shown are for principal growing seasons in State. They must be modified for use in areas of different growing seasons.
2/ An example of a very rough surface field crop.
3/ For extremely fine-textured (clay) soils.
4/ Planted or harvested at mid-month. Evaporation for partial month should be used with ratios shown.
5/ Deciduous trees except almonds.
6/ No ET data available. Ratios estimated from deciduous orchard modified to reflect differences in irrigation and cultural practices.
7/ Citrus, avocados and olives. No observed ratios available. Ratios estimated from potential ET modified to reflect prevalent irrigation and cultural practices.
8/ No ET data available. Ratios estimated from data for table grapes modified to reflect differences in irrigation and cultural practices.
9/ No ET data available. Ratios estimated from potential ET data modified to reflect prevalent irrigation and cultural practices.

In the mid-1950s, after consulting with Professor F. J. Veihmeyer and his associates at the University of California at Davis, the Department of Water Resources adopted the use of evaporation data as the best means to transfer crop ET data from the area of measurement to other areas. This empirical method has been suggested by the close correlation of ET and evaporation observed by many investigators. However, other investigators have found the relationship between ET and evaporation to show differing relationships between various areas. These anomalies are possibly due to environmental differences surrounding the evaporimeters.

Evaluation of Evapotranspiration/Evaporation Correlation Technique for Transferring ET Data

To test the reliability of the ET/evaporation correlation technique in estimating ET rates, evapotranspiration data for a single crop, grass, was evaluated for eight locations. These locations range from sites near the ocean to sites in the Central Valley and the northeastern mountains. Six stations were operated either directly by the Department or in cooperation with local agencies. The Agricultural Research Service and the University of California at Davis each operated one ET tank.

At each location, the evapotranspiration of grass (or pasture) was measured with evapotranspirometers of various designs. Vegetative cover was either grass or mixed improved pasture species, which was adequately irrigated and periodically clipped to maintain a low, smooth, complete crop surface in and around the ET tanks.

The ET data observed at the various locations are believed to be comparable in all respects, except for climatic differences. Measured monthly evapotranspiration of grass was compared to four climatic parameters observed near each ET tank: pan evaporation, net atmometer evaporation, solar radiation, and the Blaney-Criddle "f" factor (1) (Appendix G).

While each of the four climatic parameters correlated well to evapotranspiration at individual stations, the calculated relationships for net atmometer evaporation, solar radiation, and the Blaney-Criddle "f" factor varied between locations. The best correlation was found between ET and pan evaporation. The seasonal relationship was found to be within ± 10 percent for all locations. For these reasons, pan evaporation was used to transfer crop ET from the area of measurement to other areas. The calculated relationships between ET of grass and the four climatic indexes for each of the eight locations are shown in Appendix H.

The observed monthly average ET/Ep ratio for each of the eight locations was plotted in a single smoothed fitted curve.

Monthly ET/Ep ratios taken from the smoothed curve are shown (as potential ET) in Table 5. Potential ET (ET of grass) calculated for each of nine evaporative demand zones using the monthly ratios and average pan evaporation for each zone (Table 1) is shown in Table 6.

Estimating Crop Growing Season Evapotranspiration

The formula for estimating crop ET by the ET/evaporation method is:

$$ET' = (ET/Ep) (Ep')$$

where

ET' = estimated ET for area

(ET/Ep) = the monthly ratio of crop ET to pan evaporation determined at field plot locations

(Ep') = pan evaporation for the area for which ET is being estimated

(All evaporation measured in irrigated pasture or comparable environment.)

In transferring evapotranspiration data, monthly ET/Ep ratios must be selected to reflect the stage of crop development. When the proper selection has been made, differences that may exist in growing seasons or crop development between the area of measurement and the area to which the ET value is to be transferred may be easily adjusted.

The crop growing seasons used to estimate ET for evaporative demand zones were determined from interviews with growers, farm advisors, and other persons having knowledge of agricultural practices. The information obtained was assembled on the basis of the prevalent practice for each crop within each area. For those areas in which farming techniques vary from prevailing agricultural practices, the ET can be calculated by adjusting ET/Ep ratios. (Growing seasons used to estimate crop ET appear in Appendix J.) Growing season ET was then calculated for principal crops in nine evaporative demand zones (even-numbered tables from Table 8 through Table 24). Insufficient evaporation data were available to make adequate estimates of crop ET in Zone 7 (Sierra) and Zone 11 (Southern California Desert).

Estimating Evapotranspiration of Applied Water

In most agricultural areas of the State, part of the crop ET demand can be met by precipitation. The part of the

Table 6. SUMMARY OF ESTIMATED POTENTIAL EVAPOTRANSPIRATION
IN CALIFORNIA ^{1/} ^{2/}
In inches

| | Northeastern Mountain Valleys | North Coast - Coastal Valleys and Plains | North Coast - Interior Valleys | Sacramento Valley | San Joaquin Valley | Central Coast - Coastal Valleys and Plains | Central Coast - Interior Valleys | South Coast - Coastal Valleys and Plains | South Coast - Interior Valleys | Southern California Desert |
|---------------------|----------------------------------|--|-----------------------------------|----------------------|-----------------------|--|-------------------------------------|--|-----------------------------------|-------------------------------|
| Jan | 0.6 | 0.5 | 0.8 | 1.1 | 0.9 | 1.8 | 1.6 | 1.8 | 1.7 | 2.7 |
| Feb | 1.0 | 1.0 | 1.2 | 1.8 | 1.7 | 2.1 | 2.1 | 2.4 | 2.4 | 3.6 |
| Mar | 2.1 | 2.0 | 2.4 | 3.0 | 3.2 | 3.1 | 3.3 | 3.1 | 3.3 | 5.9 |
| Apr | 3.7 | 2.5 | 3.4 | 4.4 | 4.5 | 3.9 | 4.3 | 3.8 | 4.2 | 7.6 |
| May | 5.0 | 3.3 | 5.0 | 5.8 | 6.5 | 4.7 | 5.7 | 4.5 | 5.1 | 10.1 |
| Jun | 5.8 | 3.6 | 5.9 | 7.3 | 7.5 | 4.9 | 6.2 | 5.1 | 6.0 | 11.4 |
| Jul | 7.9 | 3.5 | 7.1 | 7.9 | 7.8 | 5.3 | 6.7 | 5.5 | 6.9 | 11.6 |
| Aug | 7.0 | 3.4 | 6.2 | 6.7 | 6.6 | 4.8 | 6.0 | 5.5 | 6.7 | 9.6 |
| Sep | 4.9 | 2.8 | 4.6 | 5.2 | 4.8 | 3.8 | 4.8 | 4.5 | 5.2 | 8.5 |
| Oct | 2.8 | 1.7 | 2.7 | 3.4 | 3.3 | 3.2 | 3.8 | 3.4 | 3.8 | 6.3 |
| Nov | 0.9 | 1.1 | 1.2 | 1.6 | 1.5 | 2.2 | 2.3 | 2.6 | 2.3 | 3.5 |
| Dec | 0.5 | 0.7 | 0.7 | 1.0 | 0.7 | 1.5 | 1.5 | 2.2 | 1.8 | 2.0 |
| M - O ^{5/} | 39.2 | 22.8 | 37.3 | 43.7 | 44.3 | 33.7 | 40.8 | 35.4 | 41.2 | 71.0 |
| J - D ^{6/} | 42.2 | 26.1 | 41.2 | 49.2 | 49.0 | 41.3 | 48.3 | 44.4 | 49.4 | 82.8 |

^{1/} Potential ET = ET of grass.

^{2/} Calculated from statewide average ET/Ep coefficient and area average Ep, except as noted.

^{3/} No evaporation data (irrigated pasture environment) available. PET estimates based upon estimated evaporation.

^{4/} An estimate of ET - grass for Imperial Valley. Calculated by W. O. Pruitt, U.C. Davis, from ET by alfalfa (excluding 2 weeks following cutting) as observed by Robert D. LeMert, USDA-ARS, Brawley. (A 10-15% lower ET by grass than by alfalfa was assumed.)

^{5/} March through October (principal growing season).

^{6/} January through December.

total which is used by the crop is termed "effective precipitation". Most of the precipitation that falls during the growing season is effective. The portion that falls during the nongrowing season which is stored in the soil profile and is available for crop use in the next growing season is also effective (21). In California's agricultural areas about two-thirds of the annual precipitation occurs during winter, normally the nongrowing season for most crops (see Table 7).

Estimates of effective precipitation were developed for this study from the following assumptions.

- 1) ■ All precipitation occurring during the crop growing season is assumed to be effective precipitation. (The validity of such an assumption is modified by the fact that part of the precipitation falling early in the season before crop vegetative cover has fully developed evaporates from the soil surface and does not contribute substantially to the crop's water needs for the season.)
 - 2) ■ To calculate amounts of nongrowing season precipitation that are effective, it is assumed that only that amount of monthly precipitation exceeding potential ET can be stored each month.
 - 3) ■ In these computations, 1½ inches of soil moisture storage are assumed to be available per foot of root zone depth. (Assumed rooting depths are shown in Appendix J).
 - 4) ■ Furthermore, the intensity of individual storms is assumed to be so moderate that no surface runoff will occur from the generally flat agricultural terrain.
- 5) ■ Evapotranspiration and precipitation are evenly distributed throughout the month.

Other assumptions are: (1) evaporation from soil surfaces between the end of the winter rainy season and the start of the crop growing season decreases the amount of stored moisture; however, a maximum of 0.75 inches per month of moisture can be so evaporated; (2) evaporation of rainfall plus evaporation of soil moisture will not exceed potential evapotranspiration; (3) as land is tilled for planting, the drier surface soil is turned under and replaced with moist soil from the plowing depth. As a result of this practice, the maximum amount of soil moisture evaporated from the soil surface is 2.25 inches (0.75 inch per month for three months).

Table 7. MONTHLY PERCENTAGE DISTRIBUTION^{1/} OF MEAN ANNUAL PRECIPITATION IN CALIFORNIA^{2/}

| Month | North Coast - Coastal and Interior Valleys | Sacramento Valley | San Joaquin Valley | Central Coast - Coastal and Interior Valleys | South Coast - Coastal and Interior Valleys | Average of Five Areas |
|---------------------------|--|-------------------|--------------------|--|--|-----------------------|
| | Number of Stations | | | | | |
| | 8 | 9 | 9 | 9 | 7 | 42 |
| Jan | 20.3 | 19.5 | 18.8 | 21.2 | 20.1 | 20.0 |
| Feb | 16.4 | 17.7 | 18.3 | 19.8 | 21.4 | 18.7 |
| Mar | 12.8 | 13.4 | 16.3 | 14.8 | 14.9 | 14.4 |
| Apr | 6.9 | 8.3 | 10.7 | 8.4 | 8.2 | 8.5 |
| May | 4.0 | 3.9 | 3.5 | 2.3 | 1.4 | 3.0 |
| Jun | 1.5 | 1.3 | 0.7 | 0.6 | 0.4 | 0.9 |
| Jul | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Aug | 0.2 | 0.2 | 0.0 | 0.2 | 0.6 | 0.2 |
| Sep | 1.1 | 1.3 | 1.1 | 0.9 | 1.0 | 1.1 |
| Oct | 6.4 | 5.3 | 4.4 | 3.5 | 3.7 | 4.7 |
| Nov | 11.0 | 9.2 | 8.2 | 8.0 | 8.4 | 9.0 |
| Dec | <u>19.2</u> | <u>19.8</u> | <u>17.9</u> | <u>20.2</u> | <u>19.8</u> | <u>19.4</u> |
| M - O Total ^{3/} | 33.1 | 33.8 | 36.8 | 30.8 | 30.3 | 32.9 |
| N - F Total ^{4/} | 66.9 | 66.2 | 63.2 | 69.2 | 69.7 | 67.1 |

^{1/} That portion of California west of the crest of the Cascade-Sierra Nevada mountain ranges.

^{2/} Monthly percentages calculated from long-term mean annual precipitation as reported in National Weather Service, "Climatological Data".

^{3/} March - October.

^{4/} November - February.

Long-term annual precipitation for the State is shown on an isohyetal map compiled by the U. S. Geological Survey (19) (Plate 2).

The following method was used to determine the mean monthly precipitation within the agricultural regions for which growing season ET was calculated. An analysis of monthly percentage distribution of mean annual precipitation made for a large number of locations throughout the State indicated that while the total annual rainfall amounts varied greatly, the monthly percent of precipitation was nearly uniform for the portion of the State west of the Sierra Nevada-Cascade mountain ranges. These monthly percentages are shown in Table 7. Using the monthly percentage distribution, long-term mean precipitation was calculated for the various rainfall zones within each of the evaporative demand zones.

This method could not be used for the Northeastern Mountain Valleys evaporative demand zone because of the uneven distribution resulting from summertime local convectional storms within that zone. Long-term mean precipitation for several stations located in the agricultural valleys of this area were used to characterize monthly precipitation.

To determine the amount of effective precipitation for each evaporative demand zone, monthly soil moisture budgets were calculated for each of the principal crops. The ET of applied water was then determined for each crop (odd-numbered tables from Table 9 through Table 25).

Table 8. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - NORTHEAST MOUNTAIN VALLEYS^{1/}
In inches

| Month | Potential ET ^{2/} | Alfalfa (Hay) | Barley | Corn (Field) | Pasture | | Potatoes |
|-------|-------------------------------|---------------|--------|--------------|----------|----------------------|----------|
| | | | | | Improved | Meadow ^{3/} | |
| Jan | 0.6 | - | - | - | - | - | - |
| Feb | 1.0 | - | - | - | - | - | - |
| Mar | 2.1 | - | - | - | - | - | - |
| Apr | 3.7 | 3.4 | 3.2 | - | 3.7 | 3.7 | - |
| May | 5.0 | 4.5 | 6.1 | - | 5.0 | 5.0 | - |
| Jun | 5.8 | 5.5 | 6.2 | 3.6 | 5.8 | 5.8 | 6.2 |
| Jul | 7.9 | 7.7 | 5.0 | 9.5 | 7.9 | 5.0 | 9.5 |
| Aug | 7.0 | 7.2 | - | 7.6 | 7.0 | 2.9 | 4.4 |
| Sep | 4.9 | 5.0 | - | 3.2 | 4.9 | - | - |
| Oct | 2.8 | - | - | - | - | - | - |
| Nov | 0.9 | - | - | - | - | - | - |
| Dec | 0.5 | - | - | - | - | - | - |
| Total | 42.2 | 33.3 | 20.5 | 23.9 | 34.3 | 22.4 | 20.1 |

- ^{1/} Calculated from average evaporation (irrigated pasture environment) for area and observed ET/Ep ratios.
^{2/} ET of large plot of well-watered, clipped grass.
^{3/} For prevalent practice of deficit irrigation - evapotranspiration limited by soil moisture available.

Table 9. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - NORTHEAST MOUNTAIN VALLEYS

| Crop | Estimated Growing Season ET, AF/A | Rainfall Zone, Average Annual Precipitation - Inches | | |
|--------------------|-----------------------------------|--|-------------------|-------------------|
| | | 10-12 | 12-14 | 14-16 |
| Alfalfa (Hay) | 2.8 | 2.3 | 2.2 | 2.0 |
| Barley | 1.7 | 1.3 | 1.2 | 1.0 |
| Corn (Field) | 2.0 | 1.8 | 1.7 | 1.6 |
| Pasture (Improved) | 2.9 | 2.4 | 2.3 | 2.2 |
| Pasture (Meadow) | 1.9 | 1.5 ^{1/} | 1.5 ^{1/} | 1.5 ^{1/} |
| Potatoes | 1.7 | 1.6 | 1.5 | 1.4 |

^{1/} Evapotranspiration limited by soil moisture available.

Table 10. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - NORTH COAST, COASTAL VALLEYS AND PLAINS^{1/}
In inches

| Month | Potential ET ^{2/} | Pasture (Improved) |
|-------|-------------------------------|-----------------------|
| Jan | 0.5 | - |
| Feb | 1.0 | - |
| Mar | 2.0 | 2.0 |
| Apr | 2.5 | 2.5 |
| May | 3.3 | 3.3 |
| Jun | 3.6 | 3.6 |
| Jul | 3.5 | 3.5 |
| Aug | 3.4 | 3.4 |
| Sep | 2.8 | 2.8 |
| Oct | 1.7 | 1.7 |
| Nov | 1.1 | - |
| Dec | 0.7 | - |
| Total | 26.1 | 22.8 |

^{1/} Calculated from average evaporation (irrigated pasture environment) for area, and ET/Ep ratio.

^{2/} ET of large plot of well-watered, clipped grass.

Table 11. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - NORTH COAST, COASTAL VALLEYS AND PLAINS
In acre-feet/acre

| Crop | Estimated Growing Season ET, AF/A | Rainfall Zone, Average Annual Precipitation - Inches | | | | | | | | | | | |
|-----------------------|--|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 24-26 | 26-28 | 28-30 | 30-32 | 32-38 | 38-44 | 44-50 | 50-56 | 56-62 | 62-68 | 68-74 | 74-80 |
| Pasture (improved) | 1.9 | 1.1 | 1.0 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.8 | 0.7 | 0.7 |

Table 12. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - NORTH COAST, INTERIOR VALLEYS^{1/}
In inches

| Month | Potential ET ^{2/} | Alfalfa (Hay) | Barley | Corn (Field) | Deciduous Orchard | Pasture (Improved) | Vineyard (Wine grapes) |
|-------|----------------------------|---------------|--------|--------------|-------------------|--------------------|------------------------|
| Jan | 0.8 | - | 0.4 | - | - | - | - |
| Feb | 1.2 | - | 1.1 | - | - | - | - |
| Mar | 2.4 | 2.2 | 2.9 | - | 1.4 | 2.4 | - |
| Apr | 3.4 | 3.1 | 3.6 | - | 2.4 | 3.4 | - |
| May | 5.0 | 4.5 | 3.2 | - | 4.2 | 5.0 | 2.9 |
| Jun | 5.9 | 5.5 | 1.5 | 3.6 | 5.3 | 5.9 | 4.3 |
| Jul | 7.1 | 5.4 | - | 8.6 | 6.8 | 7.1 | 4.6 |
| Aug | 6.2 | 6.4 | - | 6.7 | 6.0 | 6.2 | 2.9 |
| Sep | 4.6 | 4.8 | - | 3.0 | 4.2 | 4.6 | 1.2 |
| Oct | 2.7 | 2.8 | - | - | 2.2 | 2.7 | 0.2 |
| Nov | 1.2 | - | - | - | - | - | - |
| Dec | 0.7 | - | - | - | - | - | - |
| Total | 41.2 | 34.7 | 12.7 | 21.9 | 32.5 | 37.3 | 16.1 |

^{1/} Calculated from average evaporation (irrigated pasture environment) for area, and ET/Ep ratios.
^{2/} ET of large plot of well-watered, clipped grass.

Table 13. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - NORTH COAST, INTERIOR VALLEYS

| Crop | : Estimated : : Growing : : Season : | Rainfall Zone, Average Annual Precipitation - Inches | | | | | | | | | |
|------------------------|--|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | : 16-18 : | : 18-20 : | : 20-22 : | : 22-24 : | : 24-26 : | : 26-28 : | : 28-30 : | : 30-32 : | : 32-38 : | : 38-44 : |
| | : ET, AF/A : | ET of Applied Water, AF/A | | | | | | | | | |
| Alfalfa (Hay) | 2.9 | 1.8 | 1.8 | 1.8 | 1.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.5 | 1.4 |
| Barley | 1.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Corn (Field) | 1.8 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.4 |
| Deciduous Orchard | 2.7 | 1.7 | 1.6 | 1.6 | 1.6 | 1.6 | 1.5 | 1.5 | 1.4 | 1.4 | 1.3 |
| Pasture (Improved) | 3.1 | 2.4 | 2.3 | 2.3 | 2.3 | 2.2 | 2.2 | 2.2 | 2.1 | 2.1 | 2.0 |
| Vineyard ^{1/} | 1.3 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 |

^{1/} Estimated ET and ET applied water based on ET of table grapes, precipitation and applied water data.

Table 14. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - CENTRAL COAST, COASTAL VALLEYS AND PLAINS^{1/}
In inches

| Month | Alfalfa (Hay) | | Barley (Dry) | | Beans (Summer Crop) | | Carrots | | Cauliflower | | Corn | | Deciduous Orchard | | Lettuce | | Pasture (Improved) | Potatoes | Sugar Beets | Tomatoes (Canning) | |
|-------|---------------|------|--------------|------------------|---------------------|------|------------------|------|-------------|------|------|------------------|-------------------|------------------|---------|------|--------------------|----------|-------------|--------------------|---|
| | ET | AF/A | ET | AF/A | ET | AF/A | ET | AF/A | ET | AF/A | ET | AF/A | ET | AF/A | ET | AF/A | ET | AF/A | ET | AF/A | |
| Jan | 1.8 | | 1.1 | | - | | - | | - | | - | | - | | - | | - | | - | | - |
| Feb | 2.1 | | 2.8 | | - | | - | | - | | - | | 2.1 | | - | | - | | - | | - |
| Mar | 3.1 | 2.1 | 3.4 | | - | | - | | - | | - | | 1.8 | 3.1 | - | | 2.1 | | 0.4 | | |
| Apr | 3.1 | 3.6 | 2.6 | | - | | - | | - | | - | | 2.8 | 3.9 | - | | 2.1 | | 1.0 | | |
| May | 4.1 | 4.3 | 3.4 | | - | | - | | - | | - | | 3.9 | 2.4 ^b | 4.7 | | 4.1 | | 1.0 | | |
| Jun | 4.1 | 4.1 | 2.6 | | - | | - | | - | | 3.1 | 3.4 | 4.1 | 4.1 | - | 4.1 | 4.1 | 1.4 | 1.0 | 1.1 | |
| Jul | 4.1 | 4.2 | 1.8 | 2.4 ^b | 2.6 ^b | | 2.6 ^b | | 6.4 | 5.1 | 2.3 | 2.7 ^b | 4.1 | 4.1 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | |
| Aug | 4.1 | 4.1 | 2.6 | 3.8 | 4.8 | | 4.8 | | 4.8 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | |
| Sep | 4.1 | 4.1 | 2.6 | 3.8 | 4.8 | | 4.8 | | 4.8 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | |
| Oct | 4.1 | 4.1 | 2.6 | 3.8 | 4.8 | | 4.8 | | 4.8 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | |
| Nov | 4.1 | 4.1 | 2.6 | 3.8 | 4.8 | | 4.8 | | 4.8 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | |
| Dec | 4.1 | 4.1 | 2.6 | 3.8 | 4.8 | | 4.8 | | 4.8 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | |
| Total | 11.1 | 34.1 | 11.1 | 13.4 | 14.4 | | 15.5 | | 17.0 | 28.7 | 11.5 | 14.9 | 11.2 | 11.7 | 16.1 | 27.2 | 19.1 | | | | |

^{1/} based on average evaporation (irrigated pasture environment) for area. ET/Ep ratios observed in Central Valley.
^{2/} for alfalfa well-watered, clipped grass.
^{3/} ET estimated from ET data at 100 ft within area and average evaporation for area.
^{4/} No ET data available. ET estimated from potential ET modified by crop cultural practices.
^{5/} All mechanically harvested varieties.
^{6/} ET estimate for 1 1/2 months.

Table 15. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - CENTRAL COAST, COASTAL VALLEYS AND PLAINS

| Crop ^{1/} | Estimated Growing Season ET, AF/A | Rainfall Zone, Average Annual Precipitation - Inches | | | | | | | | |
|--|-----------------------------------|--|-------|-------|-------|-------|-------|-------|-------|---------------------------|
| | | 14-16 | 16-18 | 18-20 | 20-22 | 22-24 | 24-26 | 26-28 | 28-30 | ET of Applied Water, AF/A |
| Alfalfa (Hay) | 2.7 | 2.0 | 1.9 | 1.7 | 1.6 | 1.6 | 1.5 | 1.5 | 1.5 | |
| Barley | 1.3 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Beans (Dry) | 0.9 | 0.8 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | |
| Carrots (Summer Crop) ^{2/} | 1.1 | 1.1 | 1.1 | 1.0 | - | - | - | - | - | |
| Cauliflower (Early Crop) ^{2/3/} | 1.2 | 1.2 | 1.1 | 1.1 | - | - | - | - | - | |
| Cauliflower (Late Crop) ^{2/3/} | 1.3 | 1.0 | 1.0 | 1.0 | - | - | - | - | - | |
| Corn (Field) | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | |
| Deciduous Orchard | 2.4 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.3 | 1.2 | |
| Lettuce (Spring Crop) ^{3/} | 1.0 | 0.4 | 0.3 | 0.3 | - | - | - | - | - | |
| Lettuce (Summer Crop) ^{2/3/} | 1.2 | 1.2 | 1.2 | 1.2 | - | - | - | - | - | |
| Lettuce (Fall Crop) ^{2/3/} | 0.9 | 0.9 | 0.9 | 0.9 | - | - | - | - | - | |
| Pasture (Improved) ^{2/} | 2.8 | 2.2 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | |
| Potatoes | 1.4 | 1.4 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | |
| Sugar Beets | 2.3 | 1.8 | 1.7 | 1.5 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | |
| Tomatoes ^{4/} | 1.6 | 1.4 | 1.2 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | |

^{1/} Crops for which ET was measured by University of California or Department of Water Resources in Central Valley locations. Growing season ET for coastal area estimated from evaporation and observed ET/Ep ratios.
^{2/} Assumed to follow a summer harvested truck crop - precipitation stored as soil moisture and carried to growing season = 0.0.
^{3/} No ET data available. ET estimated from potential ET data.
^{4/} Mechanically harvested canning tomatoes.

Table 16. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - CENTRAL COAST, INTERIOR VALLEYS^{1/}
In inches

| Month | Potential ET ^{2/} | Alfalfa (Hay) | Barley | Beans (Dry) | Corn (Field) | Deciduous Orchard | Pasture (Improved) | Sugar Beets | Tomatoes (Canning) ^{3/} | Vineyard (Wine Grapes) ^{4/} |
|-------|----------------------------|---------------|--------|-------------|--------------|-------------------|--------------------|-------------|----------------------------------|--------------------------------------|
| Jan | 1.6 | - | 1.5 | - | - | - | - | - | - | - |
| Feb | 2.1 | - | 2.2 | - | - | - | - | - | - | - |
| Mar | 3.3 | 3.0 | 3.5 | - | - | 1.9 | 3.3 | 0.4 | - | - |
| Apr | 4.3 | 3.9 | 2.8 | - | - | 3.1 | 4.3 | 1.1 | - | - |
| May | 5.7 | 5.2 | 1.5 | - | 0.9 | 4.7 | 5.7 | 4.5 | 1.6 | 3.4 |
| Jun | 6.2 | 5.8 | - | 3.3 | 3.8 | 5.5 | 6.2 | 7.5 | 4.7 | 4.4 |
| Jul | 6.7 | 6.5 | - | 7.3 | 8.1 | 6.4 | 6.7 | 8.0 | 7.6 | 4.3 |
| Aug | 6.0 | 6.2 | - | 3.3 | 6.5 | 5.8 | 6.0 | 6.2 | 6.4 | 2.8 |
| Sep | 4.8 | 5.0 | - | - | 3.1 | 4.3 | 4.8 | 3.7 | 3.8 | 1.2 |
| Oct | 3.8 | 3.8 | - | - | - | 3.0 | 3.8 | 2.2 | - | 0.3 |
| Nov | 2.3 | - | 0.3 | - | - | - | - | - | - | - |
| Dec | 1.5 | - | 0.6 | - | - | - | - | - | - | - |
| Total | 48.3 | 39.4 | 12.4 | 13.9 | 22.4 | 34.7 | 40.8 | 33.6 | 24.1 | 16.1 |

1/ Calculated from average evaporation (irrigated pasture environment) for area and observed ET/Ep ratios.

2/ ET of large plot of well-watered, clipped grass.

3/ Machine-harvested varieties.

4/ No ET measurements available. ET estimated from ET of table grapes, adjusted for difference in prevalent irrigation practice.

Table 17. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - CENTRAL COAST, INTERIOR VALLEYS

| Crop | Estimated Growing Season ET, AF/A | Rainfall Zone, Average Annual Precipitation - Inches | | | | | |
|------------------------|-----------------------------------|--|-------|-------|-------|-------|-------|
| | | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | 22-24 |
| Alfalfa (Hay) | 3.3 | 2.7 | 2.6 | 2.4 | 2.3 | 2.1 | 2.1 |
| Barley | 1.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Beans (Dry) | 1.2 | 1.1 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 |
| Corn (Field) | 1.9 | 1.7 | 1.6 | 1.6 | 1.5 | 1.5 | 1.5 |
| Deciduous Orchard | 2.9 | 2.3 | 2.2 | 2.1 | 2.0 | 1.8 | 1.8 |
| Pasture (Improved) | 3.4 | 2.8 | 2.8 | 2.7 | 2.7 | 2.6 | 2.6 |
| Sugar Beets | 2.8 | 2.4 | 2.3 | 2.1 | 2.0 | 1.9 | 1.9 |
| Tomatoes ^{1/} | 2.0 | 1.9 | 1.8 | 1.6 | 1.5 | 1.4 | 1.4 |
| Vineyard ^{2/} | 1.3 | 1.2 | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 |

1/ Machine-harvested canning tomatoes.

2/ Wine grapes.

Table 18. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - SOUTH COAST, INTERIOR VALLEYS^{1/}
In inches

| Month | Potential ET ^{2/} | Alfalfa (Hay) | Barley | Deciduous Orchard | Pasture (Improved) | Potatoes | Subtropical Orchard ^{3/} | Sugar Beets | Vineyard | |
|-------|----------------------------|---------------|--------|-------------------|--------------------|----------|-----------------------------------|-------------|--------------|-------------|
| | | | | | | | | | Table Grapes | Wine Grapes |
| Jan | 1.7 | - | 1.6 | - | - | - | 1.7 | - | - | - |
| Feb | 2.4 | - | 3.0 | - | - | - | 2.4 | - | - | - |
| Mar | 3.3 | 3.1 | 3.6 | 2.0 | 3.3 | - | 2.0 | 0.4 | - | - |
| Apr | 4.2 | 3.8 | 2.8 | 3.0 | 4.2 | - | 1.7 | 1.1 | - | - |
| May | 5.1 | 4.6 | 1.3 | 4.2 | 5.1 | - | 2.4 | 4.0 | 3.0 | 3.0 |
| Jun | 6.0 | 5.6 | - | 5.4 | 6.0 | 6.4 | 2.8 | 7.3 | 4.7 | 4.3 |
| Jul | 6.9 | 6.7 | - | 6.6 | 6.9 | 8.3 | 3.2 | 8.2 | 5.9 | 4.4 |
| Aug | 6.7 | 6.9 | - | 6.4 | 6.7 | 4.2 | 3.1 | 6.9 | 5.6 | 3.1 |
| Sep | 5.2 | 5.4 | - | 4.8 | 5.2 | - | 2.4 | 4.1 | 3.7 | 1.4 |
| Oct | 3.8 | 3.9 | - | 3.1 | 3.8 | - | 1.7 | 2.3 | 1.6 | 0.3 |
| Nov | 2.3 | - | - | - | - | - | 2.3 | - | - | - |
| Dec | 1.8 | - | 0.8 | - | - | - | 1.8 | - | - | - |
| Total | 40.4 | 40.0 | 13.1 | 35.5 | 41.2 | 18.9 | 27.7 | 34.3 | 24.5 | 16.5 |

^{1/} No evaporation data (irrigated pasture environment) available. ET estimates based upon ratios of ET/Ep observed in other areas and evaporation estimated from dry land pan data and other climatological data.
^{2/} ET of large plot of well-watered, clipped grass.
^{3/} No ET measurements available. ET estimates based upon crop development and prevalent cultural and irrigation practices.

Table 19. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - SOUTH COAST, INTERIOR VALLEYS^{1/}

| Crop | : Estimated Growing Season ^{1/} ET, AF/A | : Rainfall Zone, Average Annual Precipitation - Inches ^{2/} | | | | | | | | |
|------------------------|---|--|---------|---------|---------|---------|---------|---------|---------|-----------------------------|
| | | : 10-12 | : 12-14 | : 14-16 | : 16-18 | : 18-20 | : 20-22 | : 22-24 | : 24-26 | : ET of Applied Water, AF/A |
| Alfalfa (Hay) | 3.3 | 3.0 | 2.8 | 2.7 | 2.5 | 2.4 | 2.2 | 2.2 | 2.1 | |
| Barley | 1.1 | 0.4 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Deciduous Orchard | 3.0 | 2.6 | 2.4 | 2.3 | 2.2 | 2.1 | 1.9 | 1.9 | 1.8 | |
| Pasture (Improved) | 3.4 | 3.1 | 2.9 | 2.8 | 2.8 | 2.7 | 2.7 | 2.6 | 2.6 | |
| Potatoes ^{3/} | 1.6 | 1.6 | 1.6 | 1.5 | 1.5 | 1.5 | 1.4 | 1.4 | 1.4 | |
| Potatoes ^{4/} | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | |
| Subtropical Orchard | 2.3 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | |
| Sugar Beets | 2.9 | 2.6 | 2.5 | 2.4 | 2.3 | 2.1 | 2.0 | 2.0 | 2.0 | |
| Vineyard ^{5/} | 2.0 | 2.0 | 1.9 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.3 | |
| Vineyard ^{6/} | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0.9 | 0.8 | 0.7 | 0.7 | |

^{1/} No evaporation data (pasture environment) available. ET estimates based upon estimated monthly Ep (pasture environment).
^{2/} Long term average monthly precipitation.
^{3/} Single crop.
^{4/} Potatoes following barley or other crop which leaves soil profile dry at harvest. No carry-over stored soil moisture.
^{5/} Table grapes - no moisture stress.
^{6/} Wine grapes - sparsely irrigated - vines stressed. Estimated from table grapes data.

Table 20. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - SOUTH COAST, COASTAL VALLEYS AND PLAINS^{1/}
In inches

| Month | Potential ET ^{2/} | Alfalfa (Hay) | Deciduous Orchard | Pasture (Improved) | Strawberries ^{3/} | Subtropical Orchard ^{3/} | Tomatoes (Market) |
|-------|----------------------------|---------------|-------------------|--------------------|----------------------------|-----------------------------------|-------------------|
| Jan | 1.8 | - | - | - | 1.8 | 1.8 | - |
| Feb | 2.4 | - | - | - | 2.4 | 2.4 | - |
| Mar | 3.1 | 2.9 | 1.8 | 3.1 | 3.1 | 1.8 | 0.9 |
| Apr | 3.8 | 3.4 | 2.7 | 3.8 | 3.1 | 2.3 | 2.7 |
| May | 4.5 | 4.1 | 3.8 | 4.5 | 1.4 ^{4/} | 2.7 | 5.1 |
| Jun | 5.1 | 4.8 | 4.6 | 5.1 | - | 3.1 | 5.8 |
| Jul | 5.5 | 5.3 | 5.2 | 5.5 | - | 3.3 | 5.2 |
| Aug | 5.5 | 5.6 | 5.2 | 5.5 | 1.1 ^{4/} | 3.3 | 3.5 |
| Sep | 4.5 | 4.6 | 4.1 | 4.5 | 3.6 | 2.7 | 1.7 |
| Oct | 3.4 | 3.5 | 1.3 | 3.4 | 3.4 | 2.1 | - |
| Nov | 2.6 | - | - | - | 2.6 | 2.6 | - |
| Dec | 2.2 | - | - | - | 2.2 | 2.2 | - |
| Total | 44.4 | 34.2 | 28.7 | 35.4 | 24.7 | 30.3 | 25.1 |

1/ No evaporation data (irrigated pasture environment) available. ET estimates based upon ratios of ET/Ep observed in other areas, and evaporation estimated from dry land pan data and other climatological data.

2/ ET of large plot of well-watered, clipped grass.

3/ No ET measurements available. ET estimates based upon crop development and prevalent cultural and irrigation practices.

4/ Crop planted or harvested at mid-month.

Table 21. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - SOUTH COAST, COASTAL VALLEYS AND PLAINS^{1/}

| Crop | Estimated Growing Season ^{1/} ET, AF/A ^{2/} | Rainfall Zone, Average Annual Precipitation - Inches | | | |
|-----------------------------------|---|--|-------|-------|-------|
| | | 12-14 | 14-16 | 16-18 | 18-20 |
| Alfalfa (Hay) | 2.8 | 2.4 | 2.2 | 2.1 | 1.9 |
| Deciduous Orchard | 2.4 | 2.0 | 1.9 | 1.8 | 1.6 |
| Pasture (Improved) ^{3/} | 3.0 | 2.5 | 2.3 | 2.2 | 2.0 |
| Strawberries ^{3/} | 2.1 | 1.1 | 1.0 | 1.0 | 0.9 |
| Subtropical Orchard ^{4/} | 2.0 | 1.1 | 1.5 | 1.4 | 1.3 |
| Tomatoes (Market) ^{3/} | 2.1 | 1.8 | 1.7 | 1.6 | 1.4 |

1/ No evaporation data (irrigated pasture environment) available. Evaporation estimated from dry land evapotranspiration and other climatological data. This estimated evaporative demand used as basis for estimating crop ET.

2/ Rainfall zone - average annual precipitation in inches.

3/ No ET data available. Growing season ET estimated from crop development, prevalent cultural and irrigation practice data.

4/ 12 month growing season, large clipped market tomato.

Table 22. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - SACRAMENTO VALLEY^{1/}
In inches

| Month | Potential ET ^{2/} | Alfalfa (Hay) | Barley | Beans (Dry) | Corn (Field) | Deciduous Orchard Except Almonds ^{3/} | Almonds ^{3/} | Grain Sorghum (Improved) | Pasture (Improved) | Potatoes | Rice | Subtropical Orchard ^{3/} | Sugar Beets ^{3/} | Tomatoes (Canning) ^{3/} | Vineyard (Table Grapes) |
|-------|----------------------------|---------------|-------------------|-------------|--------------|--|-----------------------|--------------------------|--------------------|----------|-------------------|-----------------------------------|---------------------------|----------------------------------|-------------------------|
| Jan | 1.1 | - | 1.0 | - | - | - | - | - | - | - | - | 1.1 | - | - | - |
| Feb | 1.8 | - | 2.3 | - | - | - | - | - | - | - | - | 1.8 | - | - | - |
| Mar | 3.0 | 2.7 | 3.2 | - | - | 1.8 | 1.4 ^{5/} | - | 3.0 | - | - | 1.8 | - | - | - |
| Apr | 4.4 | 4.0 | 2.8 | - | - | 3.1 | 2.3 | - | 4.4 | - | 2.2 ^{5/} | 2.6 | - | - | - |
| May | 5.6 | 5.3 | 1.5 | - | - | 4.9 | 3.7 | - | 5.8 | 6.2 | 6.8 | 3.5 | 0.8 ^{5/} | 1.6 | 3.4 |
| Jun | 7.3 | 6.8 | - | 3.9 | 4.5 | 6.5 | 4.9 | 2.4 | 7.3 | 8.7 | 9.2 | 4.4 | 1.4 | 1.4 | 5.1 |
| Jul | 7.9 | 7.7 | - | 8.6 | 9.5 | 7.6 | 5.7 | 9.2 | 7.9 | 4.9 | 9.1 | 4.7 | 4.3 | 8.9 | 6.8 |
| Aug | 6.7 | 6.4 | - | 3.7 | 7.2 | 6.4 | 4.8 | 7.0 | 6.7 | - | 7.8 | 4.1 | 8.2 | 1.1 | 1.6 |
| Sep | 5.2 | 5.4 | - | - | 3.4 | 4.8 | 3.6 | 2.7 | 5.2 | - | 5.6 | 2.6 | 1.3 | 4.2 | 3.7 |
| Oct | 3.4 | 3.5 | - | - | - | 2.8 | 2.1 ^{5/} | - | 3.4 | - | 1.3 ^{5/} | 2.1 | 1.7 | - | 1.5 |
| Nov | 1.6 | - | 0.2 ^{5/} | - | - | - | - | - | - | - | - | 1.6 | 1.6 | - | - |
| Dec | 1.0 | - | 0.4 | - | - | - | - | - | - | - | - | 1.0 | 1.0 ^{5/} | - | - |
| Total | 49.2 | 42.3 | 11.4 | 18.2 | 24.6 | 37.9 | 28.5 | 21.3 | 43.7 | 19.8 | 42.0 | 31.2 | 29.8 | 27.4 | 26.7 |

- 1/ Calculated from average evaporation (irrigated pasture environment) for Valley and observed ET/Ep ratios.
- 2/ ET of large plot of well-watered, clipped grass.
- 3/ No ET measurements available. ET estimates based upon crop development and prevalent cultural and irrigation practice data.
- 4/ Machine-harvested varieties.
- 5/ Assume mid-month planting or harvest. ET for 1/2 month.

Table 23. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - SACRAMENTO VALLEY^{1/}

| Crop | Estimated Growing Season ET, AF/A | | Rainfall Zone, Average Annual Precipitation - Inches | | | | | | | |
|-----------------------------------|-----------------------------------|------|--|-------|-------|-------|-------|-------|-------|-------|
| | ET | AF/A | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | 22-24 | 24-28 | 28-32 |
| Alfalfa | 3.5 | 2.8 | 2.7 | 2.6 | 2.4 | 2.3 | - | - | - | - |
| Barley | 1.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | - | - |
| Beans (Dry) | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | - | - |
| Corn (Field) | 2.0 | 1.9 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.7 | - | - |
| Deciduous Orchard ^{2/} | 3.2 | 2.5 | 2.4 | 2.2 | 2.0 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 |
| Almonds ^{3/} | 2.4 | - | 1.7 | 1.6 | 1.4 | 1.3 | - | - | - | - |
| Grain Sorghum (Milo) | 1.8 | 1.6 | 1.5 | 1.4 | 1.4 | 1.4 | 1.3 | - | - | - |
| Pasture (Improved) | 3.6 | 3.0 | 3.0 | 2.9 | 2.9 | 2.8 | 2.8 | 2.8 | 2.7 | 2.6 |
| Potatoes | 1.6 | 1.5 | 1.4 | - | - | - | - | - | - | - |
| Rice | 3.5 | 3.3 | 3.3 | 3.3 | 3.3 | - | - | - | - | - |
| Subtropical Orchard ^{4/} | 2.6 | - | - | 1.6 | 1.6 | - | - | - | - | - |
| Sugar Beets ^{5/} | 2.5 | 2.0 | 1.9 | 1.7 | 1.6 | 1.5 | 1.5 | - | - | - |
| Tomatoes ^{5/} | 2.3 | 2.0 | 1.9 | 1.7 | - | - | - | - | - | - |
| Vineyard ^{6/} | 2.2 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.4 | 1.4 | 1.4 |

- 1/ Averages for entire Valley floor - differences in crop cultural practices may result in small variations from reported amounts.
- 2/ Deciduous orchard, except almonds.
- 3/ Not based upon crop ET measurements. Almond ET estimated as .75 x ET deciduous orchard.
- 4/ ET citrus estimated from: ET citrus = 0.60 x PET for active growing season, ET maximum = PET winter 12-month growing season.
- 5/ Machine-harvested canning tomatoes.
- 6/ Table grapes - use as maximum for vineyard, wine grapes may be lower.

Table 24. ESTIMATED GROWING SEASON EVAPOTRANSPIRATION FOR PRINCIPAL CROPS - SAN JOAQUIN VALLEY
In inches

| Crop | Rainfall Zone, Average Annual Precipitation - Inches | | | | | | | | | | |
|-------------------------------------|--|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | 22-24 | 24-26 |
| Alfalfa (Hay) | 3.5 | 3.3 | 3.2 | 3.1 | 2.9 | 2.8 | 2.6 | 2.5 | 2.4 | 2.3 | 2.2 |
| Barley | 1.4 | 1.2 | 1.0 | 0.9 | 0.7 | 0.6 | 0.4 | 0.3 | 0.2 | 0.1 | 0.1 |
| Beans (Dry) | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.0 | 0.9 | 0.8 | 0.7 |
| Cantaloupes | 1.1 | 1.0 | 1.0 | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 |
| Corn (Field) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 |
| Cotton ^{1/} | 2.6 | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.2 | 2.1 | 2.0 | 1.9 | 1.8 |
| Deciduous Orchard ^{2/} | 3.2 | 3.0 | 2.9 | 2.8 | 2.6 | 2.5 | 2.3 | 2.2 | 2.1 | 2.0 | 1.9 |
| Almonds ^{3/} | 2.2 | 2.1 | 2.0 | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 |
| Grain Sorghum (Milo) | 1.8 | 1.8 | 1.8 | 1.7 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 |
| Pasture (Improved) | 3.7 | 3.5 | 3.4 | 3.3 | 3.1 | 3.0 | 2.8 | 2.7 | 2.6 | 2.5 | 2.4 |
| Potatoes | 1.6 | 1.5 | 1.4 | 1.2 | 1.1 | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 |
| Rice | 3.8 | 3.7 | 3.6 | 3.5 | 3.4 | 3.4 | 3.1 | 3.0 | 2.9 | 2.8 | 2.7 |
| Subtropical Orchard ^{3/4/} | 2.6 | - | - | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 |
| Sugar Beets ^{5/} | 2.9 | 2.7 | 2.6 | 2.5 | 2.4 | 2.3 | 2.2 | 2.1 | 2.0 | 1.9 | 1.8 |
| Tomatoes ^{6/} | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 2.0 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 |
| Vineyard | 2.3 | 2.2 | 2.2 | 2.1 | 2.0 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 |

1/ ET based on well-watered, irrigated pasture environment for Valley and estimated ET Ep (mm) = 0.00015 (P - 10) + 0.0000002 (P - 10)^2
 2/ Large fruit, well-watered, irrigated, raised bed
 3/ 1/3 solid plant, 1/3 skip row 2 x 1, 1/3 skip row 2 x 2.
 4/ ET measurements available. ET estimates based upon crop development and prevalent cultural and irrigation practices.
 5/ Machine-harvested.
 6/ Machine-harvested. ET for 11 months.

Table 25. ESTIMATED EVAPOTRANSPIRATION OF APPLIED WATER FOR PRINCIPAL CROPS - SAN JOAQUIN VALLEY

| Crop | Estimated Growing Season ET, AF/A | Rainfall Zone, Average Annual Precipitation - Inches | | | | | |
|-------------------------------------|-----------------------------------|--|-----|------|-------|-------|-------|
| | | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 |
| Alfalfa (Hay) | 3.5 | 3.3 | 3.2 | 3.1 | 2.9 | 2.8 | 2.6 |
| Barley | 1.4 | 1.2 | 1.0 | 0.9 | 0.7 | 0.6 | 0.4 |
| Beans (Dry) | 1.4 | 1.4 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 |
| Cantaloupes | 1.1 | 1.0 | 1.0 | 1.0 | 0.9 | 0.8 | 0.7 |
| Corn (Field) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.8 |
| Cotton ^{1/} | 2.6 | 2.5 | 2.5 | 2.5 | 2.4 | 2.3 | 2.2 |
| Deciduous Orchard ^{2/} | 3.2 | 3.0 | 2.9 | 2.8 | 2.6 | 2.5 | 2.3 |
| Almonds ^{3/} | 2.2 | 2.1 | 2.0 | 1.9 | 1.7 | 1.6 | 1.5 |
| Grain Sorghum (Milo) | 1.8 | 1.8 | 1.8 | 1.7 | 1.7 | 1.6 | 1.5 |
| Pasture (Improved) | 3.7 | 3.5 | 3.4 | 3.3 | 3.1 | 3.0 | 2.8 |
| Potatoes | 1.6 | 1.5 | 1.4 | 1.2 | 1.1 | 1.0 | 0.9 |
| Rice | 3.8 | 3.7 | 3.6 | 3.5 | 3.4 | 3.4 | 3.1 |
| Subtropical Orchard ^{3/4/} | 2.6 | - | - | 1.9 | 1.8 | 1.7 | 1.6 |
| Sugar Beets ^{5/} | 2.9 | 2.7 | 2.6 | 2.5 | 2.4 | 2.3 | 2.2 |
| Tomatoes ^{6/} | 2.3 | 2.3 | 2.3 | 2.2 | 2.1 | 2.0 | 1.9 |
| Vineyard | 2.3 | 2.2 | 2.2 | 2.1 | 2.0 | 1.9 | 1.8 |

1/ Assumed 1/3 solid plant, 1/3 skip row 2 x 1, 1/3 skip row 2 x 2.

2/ Except almonds.

3/ No observed ET data available. Growing season ET estimated from ground cover, irrigation practices, applied water and other available data. Active growing season ET estimated as 60% of PET. Assume 12-month growing season. For rainy season (November to February) maximum ET = PET.

4/ Citrus and avocados.

5/ Machine-harvested canning tomatoes.

6/ Table grapes.

CHAPTER IV. APPLIED WATER

Amounts of applied water are usually greater than amounts of moisture lost through evapotranspiration because part of the applied water percolates through the soil profile to depths below the crop root zone and/or leaves the field as surface runoff.

Except in areas adjacent to the ocean, or areas where the ground water or surface water is unacceptable for reuse, irrigation water applied to fields in excess of crop ET requirements is available to downstream users or to growers pumping from the ground water reservoir.

The amount of water applied varies widely, depending upon such factors as soil texture, land slope, cost of water, water table depths, leaching requirements, irrigation methods, and management practices (22, 23, 24). Usually some water in excess of ET and leaching requirements is applied, even with the most carefully managed irrigation systems.

Average applied water amounts for the principal crops for major subareas of each of the evaporative demand zones are shown in Tables 26 through 35. Areas for which the applied water is tabulated are shown in Figure 3. Typical high and low values found within each area are also shown. The average values are reasonable estimates for an entire zone. The high and low values reflect the influence of variations in soil texture, cost of water, management practices, and method of irrigation within the area. Amounts of irrigation water applied by individual growers vary even more widely than those shown by the high and low values.

Comparison of applied water values with estimated ET of applied water presented in Chapter III indicates apparent anomalies in a few cases. Average applied water values for certain crops in some areas are lower than would be expected when compared to ET of applied water for those same crops. These anomalies are attributable in part to crop ET estimates for those cultural practices which result in optimum production, while applied water data reflect the current deficit irrigation practices prevalent in some areas.

Different methods of irrigation in use today are shown in the photographs on pages 46 through 50.

The Department continues to gather data on applied water (headgate delivery); however, the amount of information is not yet adequate to define practices in all locations.

FIGURE 3

AREAS AND MAJOR SUBAREAS OF ESTIMATED APPLIED WATER

Data are shown in Tables 26 through 35

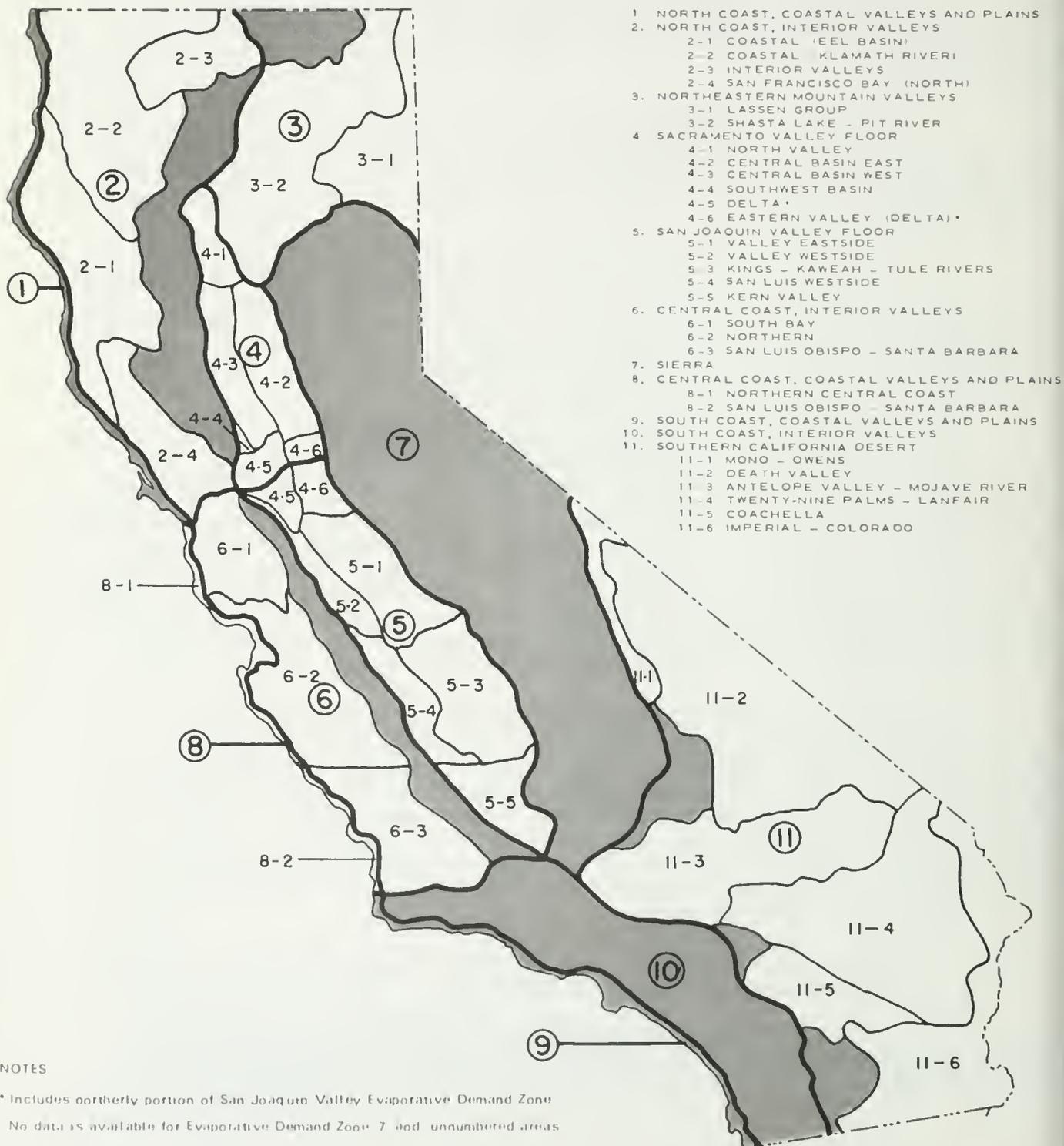


Table 26. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS - NORTH COAST, COASTAL VALLEYS AND PLAINS
In acre-feet/acre

| Crop | Major Subarea | | |
|--------------------|-----------------------|------|-----|
| | North Coast (Coastal) | | |
| | Average | High | Low |
| Pasture (Improved) | 2.1 | 2.7 | 1.7 |

Table 27. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS - NORTH COAST, INTERIOR VALLEYS
In acre-feet/acre

| Crop | Major Subarea | | | | | | | | | | | |
|-------------------------------------|--------------------------------------|------|-----|--|------|-----|-------------------|------|-----|---------------------------|------|-----|
| | Coastal ^{1/} (Eel Basin) | | | Coastal ^{1/} (Klamath River) | | | Interior Valleys | | | San Francisco Ba. (North) | | |
| | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low |
| Alfalfa (Hay) | 1.8 | 1.8 | 1.5 | 3.4 | 3.6 | 2.5 | 3.8 | 4.2 | 3.6 | 3.1 | - | - |
| Barley ^{2/} | - | - | - | 1.0 | - | 0.9 | 2.0 | - | - | - | - | - |
| Corn (Field) | 1.4 | 1.4 | 1.0 | - | - | - | - | - | - | - | - | - |
| Deciduous Orchard ^{3/} | 2.0 | 2.0 | 1.5 | 2.0 | - | 1.4 | - | - | - | 2.0 | - | - |
| Field (Miscellaneous) ^{4/} | - | - | - | - | - | - | 2.5 | - | - | 1.7 | - | - |
| Pasture (Improved) | 2.1 | 2.1 | 1.7 | 3.2 | 3.9 | 2.7 | 4.2 | 4.7 | 3.9 | 3.4 | - | - |
| Pasture (Meadow) | - | - | - | - | - | - | 1.9 | 3.0 | 1. | - | - | - |
| Potatoes | - | - | - | - | - | - | 3.2 | 3.3 | 2.8 | - | - | - |
| Truck (Miscellaneous) | 1.0 ^{5/} | - | - | 1.0 ^{6/} | 2.0 | 1.0 | 3.2 ^{7/} | - | 3.0 | 1.7 | - | - |
| Vineyard (Wine grapes) | - | - | - | - | - | - | - | - | - | 1.5 | - | - |

^{1/} Interior portion of coastal hydrographic study area

^{2/} Barley and small grains

^{3/} Apples

^{4/} Field corn, grain sorghum and dry beans

^{5/} Cole crops, potatoes and carrots

^{6/} Nursery and bulbs

^{7/} Onions and strawberries

Table 28. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS -
NORTHEAST MOUNTAIN VALLEYS
In acre-feet/acre

| Crop | Major Subarea | | | | | |
|---------------------------------|-------------------|------|-----|-------------------------|------|-----|
| | Lassen Group | | | Shasta Lake - Pit River | | |
| | Average | High | Low | Average | High | Low |
| Alfalfa (Hay) | 4.2 | - | - | 3.7 | - | - |
| Barley ^{1/} | 2.1 | - | - | 1.6 | - | - |
| Deciduous Orchard ^{2/} | - | - | - | 2.0 | - | - |
| Field (Miscellaneous) | 2.5 ^{3/} | - | - | 2.0 ^{4/} | - | - |
| Pasture (Improved) | 3.0 | - | - | 4.2 | - | - |
| Pasture (Meadow) | 1.5 ^{5/} | - | - | 1.5 ^{5/} | - | - |
| Truck (Miscellaneous) | 3.3 ^{6/} | - | - | 2.8 ^{7/} | - | - |

- 1/ Barley and other small grains.
2/ Apples only.
3/ Field corn only
4/ Field corn and grain sorghum.
5/ Deficit irrigation, the prevailing practice for meadow pasture.
6/ Onions and potatoes.
7/ Onions, potatoes and seed strawberries.

Table 29. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS - CENTRAL
COAST, COASTAL VALLEYS AND PLAINS
In acre-feet/acre

| Crop | Major Subarea | | | | | |
|------------------------|------------------------|------|-----|---------------------------------|------|-----|
| | Northern Central Coast | | | San Luis Obispo & Santa Barbara | | |
| | Average | High | Low | Average | High | Low |
| Alfalfa (Hay) | 3.5 | - | - | 3.4 | - | - |
| Barley ^{1/} | - | - | - | 1.0 | - | - |
| Beans (Dry) | 2.1 | 2.5 | 1.5 | - | - | - |
| Broccoli | 2.5 | 3.0 | 1.5 | - | - | - |
| Cabbage | 2.2 | 2.8 | 1.4 | - | - | - |
| Carrots | 3.7 | 4.0 | 1.9 | - | - | - |
| Cauliflower | 1.5 | 2.1 | 0.9 | - | - | - |
| Celery | 3.1 | 4.0 | 2.7 | - | - | - |
| Lettuce | 1.4 | 1.7 | 1.1 | - | - | - |
| Pear | 1.0 | - | - | - | - | - |
| Potatoes | 2.0 | 2.6 | 1.5 | - | - | - |
| Truck (Miscellaneous) | - | - | - | 3.2 | - | - |
| Deciduous Orchard | - | - | - | 1.0 | - | - |
| Field (Miscellaneous) | - | - | - | 2.4 | - | - |
| Pasture (Improved) | 3.2 | 3.9 | 2.6 | 3.0 | - | - |
| Subtropical Orchard | - | - | - | 1.0 | - | - |
| Sugar beets | 3.3 | 3.7 | 1.6 | - | - | - |
| Vineyard (Wine grapes) | - | - | - | 0.9 | - | - |

- 1/ Barley and small grains

Table 30. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS - CENTRAL COAST, INTERIOR VALLEYS
In acre-feet/acre

| Crop | Major Subarea | | | | | | | | |
|------------------------|---------------|------|-----|----------|------|-----|---------------------------------|------|-----|
| | South Bay | | | Northern | | | San Luis Obispo & Santa Barbara | | |
| | Average | High | Low | Average | High | Low | Average | High | Low |
| Alfalfa (Hay) | 3.4 | - | - | 3.5 | - | - | - | 6.4 | 3.4 |
| Barley ^{1/} | - | - | - | - | - | - | - | 1.0 | 0.8 |
| Deciduous Orchard | 2.8 | - | - | 2.5 | - | - | - | 3.0 | 2.1 |
| Field (Misc.) | 2.7 | - | - | 2.8 | - | - | - | 2.6 | 1.4 |
| Pasture (Improved) | 3.4 | - | - | 3.2 | 3.9 | 2.6 | - | 6.4 | 3.4 |
| Subtropical Orchard | - | - | - | - | - | - | - | 2.3 | 2.1 |
| Sugar Beets | - | - | - | 3.3 | 3.7 | - | - | - | - |
| Tomatoes (Canning) | - | - | - | 2.2 | 2.8 | 1.7 | - | - | - |
| Truck (Misc.) | 2.3 | - | - | 1.8 | 2.2 | 1.1 | - | 2.5 | 1.8 |
| Vineyard (Wine grapes) | 0.8 | - | - | 1.1 | 1.3 | 0.5 | - | 1.4 | 1.0 |

^{1/} Barley and small grains

Table 31. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS - SOUTH COAST, COASTAL VALLEYS AND PLAINS
In acre-feet/acre

| Crop | Major Subarea | | |
|-----------------------|-----------------------|------|-----|
| | South Coastal (Coast) | | |
| | Average | High | Low |
| Alfalfa (Hay) | 3.4 | - | - |
| Barley ^{1/} | 1.0 | 1.0 | 0.7 |
| Deciduous Orchard | 2.3 | 2.4 | 1.9 |
| Field (Miscellaneous) | 2.4 | 2.4 | 2.0 |
| Pasture (Improved) | 3.4 | 3.4 | 3.3 |
| Subtropical Orchard | 1.6 | 5.4 | 1.0 |
| Tomatoes (Market) | 1.8 | 2.0 | 1.5 |
| Truck (Miscellaneous) | 3.2 | - | 1.9 |
| Strawberries | 5.3 | - | - |

^{1/} Barley and other small grains

Table 32. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS - SOUTH COAST, INTERIOR VALLEYS
In acre-feet/acre

| Crop | Major Subarea | | | |
|------------------------|--------------------------|------|-----|--|
| | South Coastal (Interior) | | | |
| | Average | High | Low | |
| Alfalfa (Hay) | 3.6 | 3.7 | 3.3 | |
| Barley ^{1/} | 1.0 | - | 0.6 | |
| Deciduous Orchard | 2.3 | 2.6 | 2.1 | |
| Field (Miscellaneous) | 1.7 | 3.3 | 1.1 | |
| Pasture (Improved) | 3.5 | 3.7 | 3.4 | |
| Subtropical Orchard | 1.9 | 2.1 | 1.8 | |
| Truck (Miscellaneous) | 2.0 | 3.2 | 1.6 | |
| Vineyard (Wine grapes) | 1.5 | 2.1 | 0.9 | |

^{1/} Barley and small grains

Table 33. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS - SACRAMENTO VALLEY
In acre-feet/acre

| Crop | Major Subarea | | | | | | | | | | | | | | | | | | |
|------------------------|---------------|------|-----|--------------------|------|-----|--------------------|------|-----|-----------------|------|-----|---------|------|-----|----------------|------|-----|-----|
| | North Valley | | | Central Basin East | | | Central Basin West | | | Southwest Basin | | | Delta | | | East of Valley | | | |
| | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low | |
| Alfalfa (Hay) | 3.6 | | | 3.4 | 3.7 | 3.2 | 3.8 | 4.1 | 3.7 | 3.1 | - | 3.5 | 3.1 | | | | | | 1.4 |
| Barley | 1.0 | | | | | | 1.0 | | | | | | | | | | | | |
| Deciduous Orchard | 2.1 | | | 1.0 | | 2.0 | 3.0 | 3.1 | 2.0 | 2.1 | 2.0 | | 2.0 | | | | | | |
| Field (Miscellaneous) | 2.1 | 2.2 | | 1.0 | 2.0 | 1.1 | 1.0 | 2.2 | 1.1 | 1.0 | - | | 2.4 | | | | | | |
| Pasture (Improved) | 4.1 | 4.8 | 4.0 | 3.1 | 4.3 | 3.4 | 4.1 | 5.7 | 4.3 | 4.0 | | | 4.3 | | | | | | 3.1 |
| Subtropical Orchard | 0.0 | 0.3 | | 0.4 | 0.3 | 0.1 | 0.0 | 0.4 | 0.7 | | | | 0.1 | | | | | | |
| Truck (Miscellaneous) | 2.0 | | | | | | | | | | | | | | | | | | |
| Vineyard (Wine grapes) | 1.1 | | | 1.0 | 0.1 | | 1.1 | 1.1 | 1.1 | 0.7 | | | 2.3 | | | | | | 1.1 |
| Other (Miscellaneous) | 2.4 | | | 2.1 | 3.0 | 2.0 | 2.4 | | | | | | 1.1 | | | | | | 1.1 |
| Truck (Miscellaneous) | 1.1 | | | 0.7 | 2.0 | 1.0 | 1.0 | 1.0 | | 2.1 | 2.0 | 1.1 | 1.1 | | | | | | 1.0 |
| Vineyard (Wine grapes) | 1.0 | | | | | | 1.0 | | | 2.1 | | | 2.5 | | | | | | 1.1 |

1. Alfalfa, hay, wheat, corn, sorghum, and other crops.
 2. Deciduous field crops: fruit, forage, and millfeed crops.
 3. All other crops and field crops.
 4. Navel oranges and citrus.
 5. Melons and watermelons for seed.
 6. Miscellaneous crops for seed.
 7. Truck crops: truck, melon.
 8. Vineyard (Wine grapes).
 9. Other (Miscellaneous).
 10. Truck (Miscellaneous).
 11. Subtropical Orchard.
 12. Deciduous Orchard.
 13. Field (Miscellaneous).
 14. Pasture (Improved).
 15. Barley and small grains.

Table 34. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS -
SAN JOAQUIN VALLEY
In acre-feet/acre

| Crop | Major Subarea | | | | | | | | | | | | | | |
|-------------------------|-----------------|------|-----|-----------------|------|-----|--------------------------|------|-----|-------------------|------|-----|-------------|------|-----|
| | Valley Eastside | | | Valley Westside | | | Kings-Kaweah-Tule Rivers | | | San Luis Westside | | | Kern Valley | | |
| | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low |
| Alfalfa (Hay) | 4.8 | 5.6 | 4.0 | 4.7 | 5.6 | 4.1 | 5.0 | 5.3 | 4.5 | 4.6 | - | - | 6.4 | 8.0 | 4.0 |
| Barley ^{1/} | 1.4 | 1.4 | 1.3 | 1.4 | 1.5 | 0.9 | 1.5 | 2.0 | 0.5 | 1.5 | 1.5 | 1.4 | 1.8 | 3.0 | 1.0 |
| Beans (Dry) | 2.4 | 2.6 | 2.2 | 2.6 | 2.6 | 2.5 | 2.0 | 2.5 | 2.2 | 2.0 | - | - | 3.0 | 3.5 | 2.0 |
| Cantaloupes | - | - | - | 3.1 | 3.7 | 3.0 | 3.5 | 4.0 | 3.4 | 3.1 | - | - | 3.0 | - | - |
| Corn (Field) | 3.2 | 3.6 | 3.0 | 3.2 | 3.6 | 2.9 | 3.4 | 3.6 | 3.1 | 2.9 | - | - | 3.5 | 6.0 | 3.0 |
| Cotton | 3.9 | 4.2 | 3.6 | 3.7 | 4.5 | 3.0 | 3.9 | 4.0 | 3.5 | 3.6 | - | - | 4.0 | 5.0 | 3.0 |
| Deciduous Orchard | 3.3 | 4.4 | 3.1 | 3.5 | 4.6 | 3.3 | 3.7 | 4.3 | 3.5 | 3.6 | - | - | 3.7 | 6.0 | 3.0 |
| Almonds | 3.3 | 3.7 | 3.0 | - | - | - | - | - | - | - | - | - | 3.5 | - | - |
| Grain Sorghum | 2.7 | 3.0 | 2.5 | 2.5 | 3.0 | 2.3 | 2.8 | 3.1 | 2.5 | 2.4 | - | - | 3.0 | - | - |
| Pasture (Improved) | 5.7 | 6.0 | 4.4 | 6.0 | 6.2 | 4.6 | 6.5 | 6.8 | 6.2 | 4.9 | - | - | 6.9 | 7.0 | 5.0 |
| Potatoes | - | - | - | - | - | - | 3.7 | 4.0 | 3.3 | - | - | - | 3.7 | 5.0 | 3.0 |
| Rice | 6.7 | - | - | 6.7 | - | - | 6.7 | - | - | 6.7 | - | - | 6.7 | - | - |
| Subtropical Orchard | 2.7 | - | - | - | - | - | 2.7 | 2.8 | 2.0 | 2.9 | - | - | 3.0 | - | - |
| Sugar Beets | 3.8 | 4.0 | 3.4 | 3.9 | 5.0 | 3.6 | 4.0 | 4.5 | 3.2 | 3.6 | - | - | 4.2 | 4.7 | 3.9 |
| Tomatoes (Canning) | - | - | - | 3.1 | 3.5 | 1.9 | - | - | - | 3.3 | - | - | 3.3 | - | - |
| Tomatoes (Market) | 3.0 | 3.2 | 2.4 | - | - | - | 3.0 | 3.3 | 2.2 | - | - | - | 3.3 | 3.5 | 2.5 |
| Vineyard (Table grapes) | 3.4 | 4.3 | 2.2 | 3.4 | 3.5 | 2.0 | 3.8 | 4.3 | 3.1 | 3.7 | - | - | 3.9 | 5.0 | 3.0 |

^{1/} Barley and small grains

Table 35. ESTIMATED APPLIED WATER FOR PRINCIPAL CROPS -
SOUTHERN CALIFORNIA DESERT
In acre-feet/acre

| Crop | Major Subarea | | | | | | | | | | | | | | | | | |
|-------------------------|---------------|------|-----|--------------|------|-----|----------------------------------|------|-----|-------------------------------|------|-----|-----------|------|-----|---------------------|------|-----|
| | Mono-Owens | | | Death Valley | | | Antelope Valley- Mojave River | | | Twenty-nine Palms- Lanfair | | | Coachella | | | Imperial - Colorado | | |
| | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low | Average | High | Low |
| Alfalfa (Hay) | 4.0 | - | - | 4.3 | - | - | 4.2 | 4.3 | 4.0 | 4.1 | - | - | 6.1 | - | - | 6.3 | 13.2 | 3.3 |
| Barley ^{1/} | - | - | - | 1.6 | - | - | 1.2 | 1.3 | 1.1 | 1.4 | - | - | 3.0 | - | - | 2.9 | 4.1 | 1.2 |
| Cotton | - | - | - | - | - | - | - | - | - | - | - | - | 5.0 | - | - | 5.4 | 7.8 | 2.7 |
| Deciduous Orchard | 3.0 | - | - | - | - | - | 3.0 | 3.1 | 3.0 | 3.1 | - | - | 3.8 | - | - | 3.8 | - | - |
| Field (Miscellaneous) | 2.4 | - | - | 2.3 | - | - | 2.1 | - | - | - | - | - | 4.0 | - | - | 4.0 | 6.6 | 1.3 |
| Pasture (Improved) | 3.6 | - | - | 4.0 | - | - | 4.0 | 4.0 | 3.9 | 3.8 | - | - | 8.3 | - | - | 8.3 | - | - |
| Subtropical Orchard | - | - | - | - | - | - | 4.0 | - | - | - | - | - | 6.7 | 9.0 | 6.0 | 6.7 | - | - |
| Sugar Beets | - | - | - | - | - | - | - | - | - | - | - | - | 4.5 | - | - | - | - | - |
| Truck (Miscellaneous) | 2.8 | - | - | 2.3 | - | - | 2.0 | 2.1 | 2.0 | 2.1 | - | - | 5.0 | - | - | 5.0 | - | - |
| Vineyard (Table grapes) | - | - | - | - | - | - | 3.4 | - | - | - | - | - | 6.0 | 7.0 | 5.5 | 6.0 | - | - |

^{1/} Barley and small grains



BASIN IRRIGATION (upper left and right). A common method of irrigating deep-rooted tree crops.

UNDER-TREE SPRINKLER (left). Low-volume sprinklers permit irrigation of sloping land.

PORTABLE SPRINKLER SYSTEM (below). Hand-move sprinkler systems are being used increasingly for irrigating crops on sloping land and problem soils.

(DWR photos)





SUBIRRIGATION. Plants obtain water from the capillary fringe above the regulated free water surface. This is a common method of irrigating crops in the organic soils of the Sacramento-San Joaquin Delta. (DWR photo)



WILD FLOODING. An inefficient practice being replaced in some areas by improved systems, wild flooding of irrigated pasture requires minimal effort to regulate the amount of water applied. Here water is being allowed to spill from overlying ditches onto the fields beyond. (DWR photos)



DRIP (TRICKLE) IRRIGATION

A 64-inch wetted pattern (top right). The method promotes greater efficiency by irrigating only the root zone to controlled depths. (Photo by WESPAC, South El Monte, Calif.)

An elaborate filtering system (top left) is required to remove sediment before water is distributed to the lateral lines. (DWR photo)

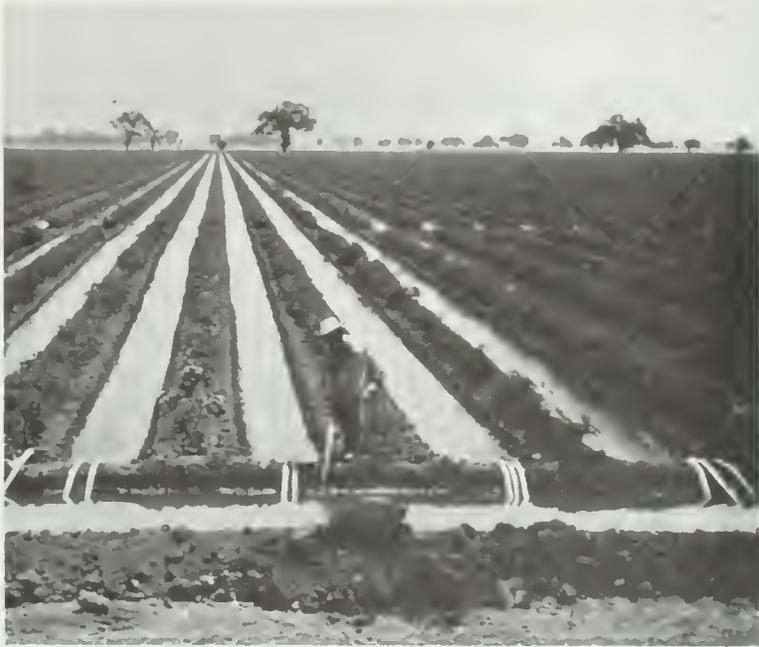
Terraced planting (center) is an example of the type of terrain suited to this method. Irrigation of a corn field (left) showing a smaller wetted pattern. (Photos by University of California Agricultural Extension Service)



RICE CULTURE. Large contour basins are used to control the water to irrigate rice crops. (DWR photos)



SPRINKLERS. These are as adaptable to nonfarming uses as to agricultural irrigation. Examples shown here are irrigation of turf (left) and landscaped areas along highways. (DWR photos)



FURROW IRRIGATION. Currently the most common method of irrigating field and truck crops. Water is delivered to the furrows by siphoning over the bank of the head ditch. (DWR photos)



BORDER STRIP IRRIGATION. Narrow border strips receiving water from underground concrete pipe allow good water management, even with a steep side fall of the land surface.

SUMP AND RETURN SYSTEM. Surface runoff from adjacent irrigated pasture is collected in a sump and pumped to the irrigation distribution system for reuse. Frequently used in border strip irrigation, this method is an example of effective on-farm water conservation.

(Photos by U. S. Soil Conservation Service)

APPENDIX A
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APPENDIX A
BIBLIOGRAPHY

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APPENDIX B
DEFINITION OF TERMS

APPENDIX B

DEFINITION OF TERMS

Agroclimatic - Climatic conditions within an agricultural or vegetated area that influence, and are influenced by, the agriculture of the area.

Agroclimatic Station - A small site, normally irrigated and grass covered, having a prescribed exposure in which instruments are placed to measure selected climatic variables under conditions representative of an irrigated agricultural environment.

Applied Water Requirement (Irrigation Requirement) - The depth of water per unit area required to be delivered to a field headgate for a specific crop. It does not include direct precipitation.

Atmometer - See "Evaporimeter". In this report, atmometer refers to Livingston black and white porous porcelain spheres.

Atmometer Evaporation - Evaporation of water from Livingston black or white atmometers, measured in milliliters.

Available Moisture - The amount of water held in the soil that can be extracted by a crop. Often expressed in inches per foot of soil depth.

Consumptive Use - See "Evapotranspiration".

Effective Precipitation - That portion of precipitation evapotranspired during the crop growing season which reduces the applied water requirement. It includes the ET of precipitation which occurs during the growing season, as well as that which occurs before the growing season and is carried over into the following season as stored soil moisture.

ET - See "Evapotranspiration".

ET Tanks - See "Evapotranspirometer".

ET/E Ratio - The numerical ratio of the depth of water in inches lost from a crop through evapotranspiration (ET) divided by an evaporation value (E), in inches or milliliters. The evaporation value, considered an index of evaporative demand, is measured in the vicinity of the crop under carefully standardized conditions during the same time period.

Evaporation Pan - See "Evaporimeter". In this report, "evaporation pan" refers to a U. S. Weather Bureau Class "A" evaporation pan. See "U. S. Weather Bureau Pan".

Evaporative Demand - The collective influence of all climatic factors on the rate of evaporation of water.

Evaporimeter - Any instrument for measuring or estimating evaporative demand.

Evapotranspiration (ET) - The quantity of water transpired by plants, retained in plant tissue, and evaporated from adjacent soil surfaces in a specified time period. Usually expressed in depth of water per unit area. As used here, evapotranspiration is synonymous with consumptive use.

Evapotranspirometer (Lysimeter, ET Tanks) - A device confining a soil mass of known dimensions in such a manner that measurements of evapotranspiration from the specific soil mass may be made. Provision is made in the system for the periodic or continuous determination of the amount of water removed.

Ground Cover Percentage - The percentage of a specified area covered or shaded by transpiring vegetation, when viewed from directly overhead.

Growing Season - The period during which crops experience their greatest growth and water use, normally considered to be planting-to-harvest for annual crops and leaf-out to leaf-drop for perennials.

Irrigation Efficiency - The percentage of the total amount of water applied that is directly evaporated from soil and plant surfaces or retained within the root zone to be transpired at a later time.

Irrigation Requirement - See "Applied Water Requirement".

Lysimeter - See "Evapotranspirometer".

Net Atmometer Evaporation (E_{b-w}) - The difference between black atmometer evaporation and white atmometer evaporation, usually expressed in milliliters.

Net Water Use - Evapotranspiration of applied water plus irrecoverable losses.

Neutron Probe - An instrument, based upon the principle of neutron moderation, for determination of soil moisture content.

Percent Ground Cover - See "Ground Cover Percentage".

Potential Evapotranspiration (PET) - The amount of water transpired by a low-growing green crop of about the same color as grass, which completely covers the ground and has an unlimited supply of water and an extensive fetch.

Root Zone - The portion of the soil profile through which plant roots readily penetrate to obtain water and plant nutrients, expressed in inches or feet of depth.

Soil Moisture - The water in soils. Usually expressed as a percentage of the dry weight of the soil. Can also be expressed on a wet weight or a volume basis.

Solar Radiation - Essentially short-wave energy originating from the sun. Solar radiation is the earth's principal source of energy.

Transpiration - The process by which water vapor is transferred to the atmosphere through living plants.

U. S. Weather Bureau Pan (Class "A") - An open-topped metal container, 4 feet in diameter and 10 inches deep, used to measure evaporation rates of water.

Water Demand - This term has been used in several ways; however, as most commonly used, it refers to the quantity of water required to support a given type of land development.

APPENDIX C
AGROCLIMATIC STATIONS IN CALIFORNIA

Appendix C

AGROCLIMATIC STATIONS IN CALIFORNIA

| Station | Elevation | County | Location | | Elevation (feet M.S.L.) | Environment | Instrumentation | | | Remarks |
|--|-----------|------------|------------------------------------|--------------------|-------------------------------|-----------------------|-----------------|------------|--------------------|----------|
| | | | Township, Range, Section, Tract | Base & Meridian | | | Wet pan | Atmosphere | Solar Radiation | |
| SOUTHWEST MOUNTAIN VALLEYS | | | | | | | | | | |
| 1000000000 | 2000 | Madoc | T42N/R11E, Sec 19E | MD | 4360 | Irrig. native pasture | X | | | ET tank |
| 1000000000 | 2900 | Madoc | T42N/R9E, Sec 35R | MD | 4310 | Dry land alfalfa | X | | | |
| 1000000000 | 5100 | Madoc | T42N/R22E, Sec 3K | MD | 5120 | Irrig. native pasture | X | X | | ET tank |
| 1000000000 | 4500 | Madoc | T42N/R16E, Sec 1J | MD | 4500 | Irrig. native pasture | X | | | |
| 1000000000 | 4720 | Madoc | T45N/R3E, Sec 13H | MD | 4720 | Irrig. native pasture | X | | | |
| 1000000000 | 3320 | Shasta | T33N/R9E, Sec 30Q | MD | 3320 | Dry land | X | | | |
| 1000000000 | 3320 | Shasta | T33N/R4E, Sec 25M | MD | 3320 | Dry land | X | | | |
| 1000000000 | 3310 | Shasta | T33N/R4E, Sec 19J | MD | 3310 | Irrig. pasture | X | X | | ET tank |
| 1000000000 | 3660 | Shasta | T33N/R4E, Sec 1K | MD | 3660 | Irrig. alfalfa | X | | | |
| 1000000000 | 4400 | Madoc | T46N/R13E, Sec 31F | MD | 4400 | Irrig. pasture | X | | | |
| 1000000000 | 4132 | Lassen | T43N/R2E, Sec 35P | MD | 4132 | Irrig. native pasture | X | X | | ET tank |
| 1000000000 | 3320 | Shasta | T33N/R9E, Sec 24A | MD | 3320 | Irrig. alfalfa | X | | | |
| 1000000000 | 3300 | Shasta | T33N/R9E, Sec 13P | MD | 3300 | Irrig. alfalfa | X | | | ET field |
| 1000000000 | 4100 | Lassen | T42N/R13E, Sec 11N | MD | 4100 | Irrig. pasture | X | | | |
| NORTHWEST COASTAL CALIFORNIA PLAINS | | | | | | | | | | |
| 1000000000 | 275 | Mendocino | T14N/R16W, Sec 13D | MD | 275 | Non-irrig. pasture | X | | | ET tank |
| 1000000000 | 10 | Colusa | T3N/R2W, Sec 14M | MD | 10 | Native grasses | X | | | |
| NORTHWEST INTERIOR VALLEYS | | | | | | | | | | |
| 1000000000 | 1365 | Mendocino | T22N/R12W, Sec 6K | MD | 1365 | Irrig. pasture | X | | | |
| 1000000000 | 1410 | Mendocino | T22N/R13W, Sec 1C | MD | 1410 | Dry land | X | | | |
| 1000000000 | 2720 | Siskiyou | T43N/R9W, Sec 2C | MD | 2720 | Dry land | X | | | |
| 1000000000 | 2720 | Siskiyou | T43N/R6W, Sec 3E | MD | 2720 | Irrig. pasture | X | | | |
| 1000000000 | 200 | Sonoma | T18N/R9W, Sec 18J | MD | 200 | Irrig. pasture | X | | | |
| 1000000000 | 2340 | Trinity | T31N/R12W, Sec 12E | MD | 2340 | Dry land | X | | | |
| 1000000000 | 2600 | Siskiyou | T42N/R6W, Sec 13B | MD | 2600 | Irrig. pasture | X | | | |
| 1000000000 | 0 | Colusa | T6N/R9W, Sec 16R | MD | 0 | Irrig. pasture | X | | | |
| 1000000000 | 600 | Mendocino | T43N/R9E, Sec 23J | MD | 600 | Irrig. pasture | X | | | |
| 1000000000 | 1330 | Lake | T15N/R9W, Sec 7B | MD | 1330 | Irrig. pasture | X | | | |
| 1000000000 | 124 | Napa | T7N/R5W, Sec 24P | MD | 124 | Irrig. pasture | X | | | |
| SAN FRANCISCO VALLEY | | | | | | | | | | |
| 1000000000 | 398 | Shasta | T30N/R3W, Sec 17F | MD | 398 | Irrig. pasture | X | X | | |
| 1000000000 | 960 | Shasta | T13N/R2W, Sec 11E | MD | 960 | Dry land | X | | | |
| 1000000000 | 960 | Shasta | T31N/R3W, Sec 22L | MD | 960 | Dry land | X | | | |
| 1000000000 | 24 | Tehama | T24N/R3W, Sec 12L | MD | 24 | Irrig. pasture | X | | | |
| 1000000000 | 30 | Tehama | T24N/R3W, Sec 29D | MD | 30 | Irrig. alfalfa | X | | | |
| 1000000000 | 60 | Yuba | T4N/R2E, Sec 17K | MD | 60 | Irrig. grass | X | | | ET tank |
| 1000000000 | 23 | Sacramento | T7N/R9E, Sec 28E | MD | 23 | Irrig. pasture | X | | | |
| 1000000000 | 170 | Yuba | T22N/R2W, Sec 28F | MD | 170 | Dry land | X | | | |
| 1000000000 | 100 | Placer | T12N/R7E, Sec 12D | ME | 100 | Irrig. pasture | X | | | |
| 1000000000 | 0 | Yuba | T22N/R6W, Sec 2E | ME | 0 | Dry land | X | | | |
| 1000000000 | 100 | Butte | T18N/R4E, Sec 3G | MD | 100 | Irrig. pasture | X | | | |
| 1000000000 | 1300 | Novato | T10N/R7E, Sec 28H | MD | 1300 | Irrig. pasture | X | | | |
| 1000000000 | 200 | Tehama | T23N/R2W, Sec 3D | MD | 200 | Irrig. pasture | X | | | |
| 1000000000 | 10 | Shasta | T31N/R4W, Sec 10C | ME | 10 | Irrig. pasture | X | | | |
| 1000000000 | 100 | Butte | T13N/R2E, Sec 10B | ME | 100 | Dry land | X | | | |
| 1000000000 | 0 | Sacramento | T4N/R9E, Sec 10A | ME | 0 | Irrig. pasture | X | | | |
| 1000000000 | 0 | Placer | T4N/R2W, Sec 21 | ME | 0 | Irrig. alfalfa | X | | | |
| 1000000000 | 0 | Yuba | T10N/R1W, Sec 9F | ME | 0 | Dry land | X | | | |
| 1000000000 | 40 | Butte | T13N/R2E, Sec 21R | MD | 40 | Irrig. pasture | X | | | |
| SAN FRANCISCO VALLEY | | | | | | | | | | |
| 1000000000 | 40 | Kern | T11N/R2W, Sec 16J | ME | 40 | Irrig. pasture | X | | | ET tank |
| 1000000000 | 120 | Kern | T11N/R2W, Sec 9C | MD | 120 | Irrig. pasture | X | X | | |
| 1000000000 | 200 | Merced | T10N/R1E, Sec 8P | MD | 200 | Irrig. pasture | X | | | |
| 1000000000 | 200 | Kern | T43N/R2W, Sec 24M | ME | 200 | Irrig. pasture | X | | | ET tank |

Appendix C (Continued)

AGROCLIMATIC STATIONS IN CALIFORNIA

| Station ¹ | Observer | County | Location | | Elevation Feet M.S.L. | Environment | Instrumentation ³ | | | Remarks |
|---|-----------------|-----------------|------------------------------------|---------------------------------|-----------------------------|----------------|------------------------------|-----------|---------------------|--|
| | | | Township, Range, Section, Tract | Base & Meridian ² | | | Evapo- pan | Atmometer | Scalar Radiation | |
| SAN JOAQUIN VALLEY (Continued) | | | | | | | | | | |
| Ceres 3E | DWR | Stanislaus | T4S-R10E, Sec 7K | MD | 104 | Irrig. alfalfa | | X | | |
| Fresno A.P. | NWS | Fresno | T13S/R21E, Sec 30J | MD | 331 | Dry land | | | | X Station located approx. 4 miles east of Fresno |
| Fresno State College | DWR | Fresno | T13S/R20E, Sec 12C | MD | 340 | Irrig. pasture | X | X | | X Station located approx. 4 miles NE of Fresno |
| Georgetown 2LSE | DWR | Fresno | T14S/R16E, Sec 17H | MD | 22 | Irrig. pasture | X | X | | X |
| Georgetown 1S | DWR | Kings | T17S/R22E, Sec 16H | MD | 277 | Irrig. pasture | X | X | | |
| Georgetown 3, SW | USBR | Merced | T10S/R10E, Sec 32K | MD | 161 | Dry land | | | | X |
| Georgetown 2S | DWR | Stanislaus | T4S/R7E, Sec 5J | MD | 35 | Irrig. pasture | X | X | | X |
| Georgetown 6SW | DWR | Fresno | T15S/R14E, Sec 4N | MD | 273 | Irrig. alfalfa | | X | | |
| Georgetown SE #1 | DWR | Merced | T6S/R15E, Sec 6M | MD | 148 | Irrig. pasture | | X | | |
| Georgetown SE #2 | DWR | Merced | T6S/R15E, Sec 7D | MD | 195 | Irrig. pasture | X | X | | |
| Georgetown 1E | DWR | Merced | T7S/R9E, Sec 29B | MD | 78 | Irrig. pasture | X | X | | |
| Georgetown 1E | DWR | Kern | T31S/R27E, Sec 20D | MD | 315 | Irrig. pasture | X | X | | |
| Georgetown 3W | DWR | Kern | T30S/R26E, Sec 35A | MD | 334 | Irrig. alfalfa | | X | | |
| Georgetown 1N | DWR | Kern | T25S/R25E, Sec 19E | MD | 268 | Irrig. pasture | X | X | | |
| Georgetown 1S | DWR | San Joaquin | T1S/R7E, Sec 19I | MD | 27 | Irrig. pasture | X | X | | X |
| Georgetown 4S | DWR | Tulare | T17S/R24E, Sec 14B | MD | 265 | Irrig. pasture | X | X | | |
| CENTRAL VALLEY - COASTAL VALLEYS AND PLAINS | | | | | | | | | | |
| Georgetown 2NW | DWR | Santa Barbara | T10N/R34W, Sec 18L | SB | 150 | Irrig. pasture | | | | |
| Georgetown 2NW | SLOCFC & DWR | San Luis Obispo | T11N/R35W, Sec 35E | SB | 76 | Irrig. pasture | X | X | | X ET tank location |
| Georgetown 2N | ARE | Santa Barbara | T11N/R34W, Sec 28R | SB | 95 | Dry land | | X | | |
| Georgetown 1N | ARE | Santa Barbara | T11N/R34W, Sec 21J | SB | 70 | Irrig. grass | X | | | X ET tank and field plot location |
| Georgetown 1E | MCFPC & DWR | Monterey | T14S/R3E, Sec 35K | MD | 87 | Irrig. pasture | X | X | | |
| Georgetown 4NE | MCFPC & DWR | Monterey | T14S/R3E, Sec 13P | MD | 125 | Irrig. pasture | X | X | | |
| Georgetown 1SW | CRPC & DWR | San Luis Obispo | T3 S/R12E, Sec 23C | MD | 324 | Irrig. pasture | X | | | X ET tank location |
| Santa Maria A.P. | NWS | Santa Barbara | T10N/R34W, Sec 34L | SB | 238 | Dry land | | | | X Station located approx. 4 miles SSW of Santa Maria |
| Santa Maria 4EE | DWR | Santa Barbara | T10N/R33W, Sec 20Q | SB | 310 | Irrig. pasture | X | | | |
| Santa Rita 2W | DWR | Monterey | T14S/R2E, Sec 12H | MD | 80 | Irrig. pasture | X | X | | |
| CENTRAL COAST - INTERIOR VALLEYS | | | | | | | | | | |
| Georgetown 6NNW | DWR | San Benito | T11S/R5E, Sec 32P | MD | 150 | Irrig. alfalfa | X | X | | |
| Georgetown 13S | DWR | Monterey | T21S/R9E, Sec 8B | MD | 387 | Irrig. alfalfa | X | X | | |
| Georgetown 3, NW | CDC & DWR | Monterey | T17S/R5E, Sec 12B | MD | 23 | Irrig. pasture | X | X | | X ET tank location |
| CENTRAL COAST - INTERIOR VALLEYS | | | | | | | | | | |
| Georgetown 1, C. | U.C. | Riverside | T2S/R4W, Sec 30K | ME | 107 | Dry land | | | | X |
| CENTRAL CALIFORNIA DESERT | | | | | | | | | | |
| Georgetown 1, E | UCR | Riverside | T6S/R23E, Sec 32 | SB | 267 | Dry land | | | | X ET tank location |
| Georgetown 1, SW | FRS | Imperial | T14S/R14E, Sec 7A | SP | -1 | Dry land | | | | X ET tank location |
| Georgetown 11, 1S | USBR | Riverside | T6S/R8E, Sec 5- | SB | -8 | Dry land | | | | X |
| Georgetown 1, NW | USBR | Imperial | T1S/R13E, Sec 30A | SB | -4 | Dry land | | | | X |

¹ Station name indicates distance (in feet) and direction from nearest town, i.e., Alturas 2SE is located 2 miles east of Alturas, east of Coalinga.

² Base & Meridian: MD = Mount Diablo, H = Humboldt, S = San Bernardino.

³ All stations equipped with evaporation pans, and most stations equipped with atmometers and precipitation gages. Many of the stations also were equipped for observation of dry bulb air temperature, wet bulb air temperature, and wind movement. Data collected are available in DWR District files.

1. National Weather Service
 2. San Joaquin Valley Reclamation
 3. San Luis Obispo County Flood Control District in cooperation with Department of Water Resources.
 4. SEA - Agricultural Research Service
 5. Monterey County Flood Control District in cooperation with Department of Water Resources.
 6. California State Polytechnic College in cooperation with Department of Water Resources.
 7. California Department of Corrections - Soledad Correctional Training Facility, in cooperation with Department of Water Resources.
 8. University of California - Agricultural Extension Service
 9. Vandenberg Air Force Base - Aerospace Recovery Facility

APPENDIX D

SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A"
PANS LOCATED IN IRRIGATED PASTURE ENVIRONMENTS

Appendix D

SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED
IN IRRIGATED PASTURE ENVIRONMENTS¹
In inches

| Station No. | Year of record | Months | | | | | | | | | | | | |
|---|-------------------|--------|------|------|------|-------|-------|-------|------|------|------|------|-------|---------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct |
| W. TREATY TRAIL MOUNTAIN VALLEYS | | | | | | | | | | | | | | |
| Cedarville #ESE | | | | | | | | | | | | | | |
| 1962 | 1.2 | 1.00 | 3.10 | 6.36 | 6.59 | 8.59 | 10.96 | 10.73 | 8.35 | 3.36 | 2.11 | 0.94 | 58.06 | 43.37 |
| 1963 | 1.1 ² | 1.72 | 2.83 | 3.28 | 7.10 | 8.56 | 9.96 | 9.06 | 4.44 | 4.00 | 1.22 | 0.76 | 50.23 | 56.94 |
| 1964 | 0.4 ² | 1.55 | 2.70 | 6.45 | 6.84 | 10.39 | 9.77 | 7.36 | 5.01 | 5.01 | 1.20 | 0.60 | 55.24 | 67.24 |
| 1965 | 0.5 ² | 1.87 | 3.79 | 4.96 | 6.79 | - | - | - | - | - | - | - | - | - |
| Average | 0.84 | 1.58 | 3.96 | 5.27 | 6.85 | 8.00 | 10.44 | 9.85 | 7.05 | 4.12 | 1.53 | 0.77 | 54.64 | 59.36 |
| Lewis Creek 2837² | | | | | | | | | | | | | | |
| 1962 | 1.03 | 0.87 | 2.30 | 6.07 | 5.89 | 9.08 | 11.24 | 11.02 | 8.34 | 3.35 | 1.92 | 1.79 | 57.29 | 62.20 |
| 1963 | 1.04 | 1.11 | 2.42 | 2.80 | 6.29 | 6.51 | 10.04 | 6.81 | 6.81 | 3.50 | 1.19 | 0.73 | 47.28 | 51.3 |
| 1964 | 0.50 | 1.80 | 2.50 | 5.17 | 6.51 | 5.72 | 8.36 | 10.18 | 6.98 | 4.24 | 1.09 | 0.41 | 49.76 | 53.56 |
| 1965 | 0.80 | 0.99 | 3.79 | 4.50 | 6.78 | 1.58 | - | - | - | - | - | - | - | - |
| Average | 0.84 | 1.19 | 2.75 | 4.64 | 6.39 | 6.75 | 9.88 | 10.00 | 7.38 | 3.70 | 1.40 | 0.74 | 51.49 | 55.66 |
| Glenburn .35E | | | | | | | | | | | | | | |
| 1960 | - | - | - | - | - | 6.69 | 10.40 | 9.20 | 5.85 | 3.97 | 1.74 | 0.58 | - | - |
| 1961 | 0.68 | 0.95 | 2.78 | 5.33 | 6.21 | 9.99 | 9.99 | 7.71 | 5.96 | 4.11 | 1.50 | 0.79 | 50.44 | 54.24 |
| 1962 | 1.07 | 0.79 | 2.76 | 6.19 | 6.50 | 9.34 | 10.43 | 9.03 | 6.59 | 3.19 | 1.18 | 0.64 | 53.94 | 57.77 |
| 1963 | 1.20 | 1.32 | 2.60 | 3.07 | 6.64 | 7.92 | 10.39 | 8.70 | 5.78 | 3.64 | 0.85 | 0.70 | 46.94 | 53.01 |
| 1964 | 0.55 | 1.94 | 2.70 | 5.39 | 6.12 | 7.00 | 9.99 | 8.80 | 5.82 | 3.71 | 0.68 | 0.42 | 49.53 | 53.97 |
| 1965 | 0.66 | 1.75 | 3.43 | 3.97 | 7.08 | 7.23 | 8.70 | 5.09 | 5.09 | 3.82 | 1.13 | 0.79 | 46.09 | 51.42 |
| 1966 | 0.60 | 1.35 | 3.12 | 5.69 | 7.53 | 7.81 | 9.72 | 8.85 | 6.31 | 4.19 | 1.13 | 0.70 | 53.22 | 57.00 |
| Average | 0.79 | 1.35 | 2.93 | 4.94 | 6.68 | 8.05 | 9.94 | 8.44 | 5.91 | 3.80 | 1.20 | 0.66 | 50.69 | 54.69 |
| L. Mt 3E | | | | | | | | | | | | | | |
| 1959 | - | - | - | 5.63 | 6.02 | 7.71 | 10.07 | - | 6.11 | 4.10 | 2.17 | 0.74 | 50.20 | 53.81 |
| 1960 | 0.97 | 1.06 | 3.22 | 4.37 | 6.76 | 9.67 | 9.67 | 9.15 | 6.00 | 3.71 | 1.50 | 0.74 | 50.20 | 53.81 |
| 1961 | 0.97 | 0.95 | 2.36 | 5.62 | 6.22 | 7.83 | 10.68 | 7.58 | 6.42 | 3.92 | 1.64 | 0.59 | 50.63 | 54.78 |
| 1962 | 0.97 | 1.24 | 1.82 | 5.51 | 5.83 | 8.46 | 9.84 | 7.77 | 6.77 | 3.27 | 1.59 | 0.87 | 51.24 | 55.91 |
| 1963 | 0.99 | 1.20 | 2.73 | 2.72 | 5.74 | 6.75 | 10.47 | 8.83 | 4.79 | 3.32 | 0.86 | 0.77 | 44.95 | 48.64 |
| 1964 | 0.83 | 1.46 | 2.18 | 4.75 | 5.95 | 5.54 | 9.87 | 8.64 | 5.72 | 3.40 | 1.02 | 0.47 | 46.05 | 49.83 |
| 1965 | 0.50 | 1.66 | 3.51 | 3.74 | 6.49 | 6.03 | - | - | - | - | - | - | - | - |
| Average | 0.87 | 1.24 | 2.57 | 4.62 | 5.94 | 7.30 | 10.10 | 8.79 | 5.97 | 3.62 | 1.35 | 0.69 | 46.91 | 53.06 |
| Area Average | 0.64 | 1.33 | 2.81 | 4.84 | 6.41 | 7.54 | 10.06 | 9.03 | 6.34 | 3.78 | 1.33 | 0.70 | 50.81 | 55.01 |
| W. RT. CREST - EAST VALLEYS AND PLAINS | | | | | | | | | | | | | | |
| Elv 455E | | | | | | | | | | | | | | |
| 1966 | - | - | 2.81 | - | - | - | - | 3.99 | 3.55 | 3.32 | 3.72 | 2.76 | - | - |
| 1967 | - | 1.70 | - | 4.93 | 5.08 | 4.45 | 4.45 | 5.36 | 3.97 | 3.46 | 3.03 | 1.61 | - | - |
| 1968 | - | 2.72 | 5.32 | 4.12 | 6.72 | 6.67 | 5.33 | 4.91 | - | - | 2.17 | - | - | - |
| Average | - | 1.68 | 4.06 | 4.12 | 5.82 | 5.88 | 4.89 | 4.75 | 3.76 | 3.39 | 2.97 | 2.22 | 36.6 | - |
| Fernale 2³ | | | | | | | | | | | | | | |
| 1963 | 0.78 | 1.34 | 2.50 | 3.06 | 3.40 | 5.22 | 5.31 | 3.79 | 3.65 | 1.91 | 1.45 | 0.80 | 28.84 | 33.18 |
| 1964 | 0.78 | 1.80 | 2.32 | 3.42 | 3.91 | 4.15 | 4.42 | 4.79 | 3.77 | 2.45 | 1.08 | 0.85 | 29.23 | 33.66 |
| 1965 | 0.80 | 1.55 | 2.36 | 2.84 | 4.32 | 4.23 | 3.98 | 4.23 | 3.77 | 2.03 | 1.16 | 1.02 | 27.03 | 31.98 |
| 1966 | 0.83 | 1.29 | 1.87 | 3.30 | 4.06 | 4.16 | 4.41 | 4.00 | 3.74 | 1.94 | 0.96 | 0.74 | 26.50 | 32.38 |
| 1967 | 0.83 | 1.25 | 2.17 | 2.49 | 4.15 | 3.55 | 4.38 | 3.85 | 3.55 | 2.31 | 1.19 | 1.00 | 26.4 | 30.72 |
| 1968 | 1.2 | 1.13 | 2.56 | 4.06 | 3.77 | 3.59 | 4.27 | 3.69 | 3.11 | 1.93 | 1.79 | 0.79 | 28.24 | 31.93 |
| 1969 | 0.49 | 0.83 | 2.70 | 3.15 | 3.11 | 3.19 | 4.66 | 4.60 | 3.60 | 2.32 | 1.03 | 0.99 | 28.33 | 31.97 |
| 1970 | 0.51 | 1.50 | 2.53 | 3.46 | 4.43 | 4.74 | 4.17 | 3.17 | 4.17 | 1.98 | 0.91 | 0.66 | 29.1 | 33.17 |
| 1971 | 0.50 | 0.83 | 1.90 | 2.47 | 3.00 | 4.22 | 4.34 | 4.28 | 3.55 | 1.88 | 1.11 | 0.66 | 25.45 | 29.87 |
| 1972 | 0.62 | 1.39 | 1.93 | 3.66 | 3.56 | 4.16 | 4.16 | 4.10 | 3.60 | 1.73 | 0.71 | 0.43 | 27.12 | 29.99 |
| Average | 0.72 | 1.23 | 2.29 | 3.14 | 3.42 | 4.31 | 4.47 | 4.14 | 3.69 | 2.07 | 1.04 | 0.74 | 27.02 | 31.6 |
| Area Average | 0.72 | 1.34 | 2.59 | 3.23 | 4.24 | 4.57 | 4.54 | 4.24 | 3.62 | 2.28 | 1.40 | 0.99 | 29.31 | 33.61 |

Appendix D (Continued)

SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED
IN IRRIGATED PASTURE ENVIRONMENTS
In inches

| Station name | Year of record | Months | | | | | | | | | | | | | |
|--------------------------------|----------------|--------|------|------|------|------|------|-------|-------|------|------|------|-------|----------|----------|
| | | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. | Mar-Oct. | Jan-Dec. |
| NORTH COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | |
| Covelo 1E | 1964 | - | - | - | - | 6.41 | 6.87 | 7.80 | 9.74 | 6.52 | 4.25 | - | - | - | - |
| | 1965 | - | - | - | - | 6.41 | 6.87 | 7.80 | 9.74 | 6.52 | 4.25 | - | - | - | - |
| | 1966 | 1.00 | 1.47 | 2.91 | 4.85 | 6.69 | 8.00 | 8.67 | 10.22 | 6.27 | 4.07 | 1.20 | 0.50 | 51.68 | - |
| | 1967 | 1.80 | 1.49 | 2.40 | 2.79 | 5.99 | 6.90 | 9.72 | 8.31 | 6.16 | 3.93 | 1.32 | 1.00 | 51.81 | 55.85 |
| | 1968 | 0.90 | 1.34 | 2.76 | 5.14 | 6.32 | 8.56 | 8.89 | 8.66 | 6.29 | 2.88 | 1.20 | 0.40 | 50.50 | 54.44 |
| | 1969 | 0.57 | 0.59 | 3.18 | 4.21 | 6.72 | 6.91 | 10.16 | 9.80 | 6.95 | 3.17 | 1.54 | 1.00 | 51.80 | 54.80 |
| | 1970 | 1.00 | 1.12 | 3.80 | 4.89 | 6.70 | 8.33 | 10.53 | 9.54 | 7.18 | 3.52 | 0.70 | 0.50 | 54.99 | 57.81 |
| | Average | 1.05 | 1.20 | 3.01 | 4.38 | 6.47 | 7.60 | 9.46 | 9.08 | 6.42 | 3.55 | 1.19 | 0.68 | 49.97 | 54.09 |
| Geyserville 1E | 1965 | - | - | - | - | 5.91 | 6.10 | 7.34 | 7.40 | 4.47 | 3.59 | 1.67 | 0.74 | - | - |
| | 1966 | - | 0.67 | 3.07 | 4.32 | 7.15 | 9.10 | 7.34 | 7.64 | 4.79 | 3.97 | 1.37 | 0.75 | 47.18 | - |
| | 1967 | - | 1.98 | 2.87 | 3.00 | 6.45 | 7.02 | 7.99 | 6.04 | 4.66 | 5.09 | 2.79 | 1.64 | 43.12 | - |
| | 1968 | 1.08 | 1.37 | 2.81 | 4.94 | 6.95 | 8.59 | 6.80 | 5.64 | 5.50 | 2.12 | 1.36 | - | 43.35 | - |
| | Average | 1.08 | 1.34 | 2.92 | 4.09 | 6.62 | 7.70 | 7.32 | 6.68 | 4.86 | 3.69 | 1.80 | 1.04 | 43.88 | 49.14 |
| Montague 3NE | 1959 | - | - | - | 5.34 | 8.09 | 8.74 | 12.50 | 8.56 | 6.30 | - | - | - | - | - |
| | 1960 | - | - | - | 3.82 | 5.81 | 8.79 | 9.62 | 8.33 | 6.07 | - | - | - | - | - |
| | 1961 | - | - | - | - | 5.76 | 9.10 | 10.83 | 10.18 | 5.85 | 3.15 | 1.95 | 0.93 | - | - |
| | 1962 | 1.02 | 1.59 | 2.81 | 5.78 | 5.40 | 9.89 | 11.10 | 9.15 | 7.08 | 1.48 | 2.15 | 1.02 | 52.69 | 58.47 |
| | 1963 | 1.08 | 1.27 | 2.95 | 3.40 | 6.58 | 7.68 | 9.60 | 8.22 | 5.90 | 3.14 | 0.90 | 0.54 | 47.47 | 51.26 |
| | 1964 | 0.53 | 1.70 | 2.78 | 5.28 | 7.01 | 7.60 | 9.79 | 9.47 | 6.13 | 3.82 | 0.98 | 0.35 | 51.88 | 55.44 |
| | 1965 | 0.67 | 1.88 | 4.15 | 4.05 | 7.35 | 8.35 | - | - | - | - | - | - | - | - |
| | Average | 0.82 | 1.61 | 3.17 | 4.61 | 6.57 | 8.59 | 10.57 | 8.98 | 6.22 | 2.90 | 1.50 | 0.71 | 51.61 | 56.25 |
| Santa Rosa 6SSW | 1962 | - | - | - | - | - | - | 7.08 | 7.03 | 4.88 | 2.73 | 1.77 | 0.78 | - | - |
| | 1963 | 1.06 | 1.65 | 2.77 | 2.97 | 4.86 | 5.50 | 6.90 | 4.79 | 3.74 | 2.85 | 1.60 | 0.98 | 34.38 | 39.67 |
| | 1964 | 0.87 | 2.89 | 2.58 | 5.02 | 6.05 | 7.19 | 9.17 | 9.73 | 7.95 | 5.04 | 2.29 | 0.92 | 52.73 | 59.70 |
| | Average | 0.96 | 2.27 | 2.68 | 4.00 | 5.46 | 6.34 | 7.72 | 7.18 | 5.52 | 3.54 | 1.89 | 0.89 | 42.44 | 48.45 |
| Talimage | 1972 | - | 0.92 | 3.75 | 5.28 | 7.18 | 9.33 | 10.55 | 8.65 | 5.94 | - | - | - | - | - |
| Yountville 2N | 1962 | - | - | - | - | - | - | 8.33 | 7.75 | 5.53 | 3.35 | 2.72 | 0.97 | - | - |
| | 1963 | 1.32 | 1.41 | 2.72 | 2.87 | 4.92 | 7.43 | 8.43 | 5.72 | 4.29 | 3.28 | 1.04 | 0.89 | 39.66 | 44.32 |
| | 1964 | 1.18 | 3.44 | 3.51 | 3.60 | 6.31 | 7.35 | 8.55 | 8.32 | 7.52 | 3.66 | 1.53 | 1.09 | 50.62 | 57.86 |
| | 1965 | 1.15 | 1.86 | 2.28 | 3.45 | 7.25 | 6.67 | 9.12 | 6.42 | 5.96 | 4.02 | 1.72 | 1.19 | 45.17 | 51.09 |
| | 1966 | 2.21 | - | 3.94 | 4.34 | 5.13 | 5.34 | 8.58 | 7.58 | 6.93 | 4.91 | 2.08 | 1.73 | 46.75 | - |
| | 1967 | 1.70 | 1.74 | 2.51 | 2.95 | 5.44 | 4.87 | 9.15 | 7.23 | 7.84 | 4.36 | 2.55 | 2.92 | 44.35 | 53.26 |
| | 1968 | 1.70 | 1.60 | 5.26 | 5.74 | 6.28 | 7.51 | 10.18 | 7.00 | 6.94 | 3.36 | 1.63 | - | 52.27 | - |
| | Average | 1.54 | 2.01 | 3.37 | 4.19 | 5.89 | 6.53 | 8.91 | 7.15 | 6.37 | 3.85 | 1.90 | 1.40 | 46.26 | 53.11 |
| Area Average | 1.16 | 1.60 | 3.12 | 4.36 | 6.35 | 7.60 | 9.09 | 8.02 | 6.03 | 3.55 | 1.65 | 0.97 | 48.12 | 53.50 | |

Appendix D (Continued)
 SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED
 IN IRRIGATED PASTURE ENVIRONMENTS
 In inches

| Year of Record | Months | | | | | | | | | | | | | |
|-------------------|--------|------|------|------|-------|-------|-------|-------|------|------|------|------|---------|---------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct | Jan-Dec |
| SACRAMENTO VALLEY | | | | | | | | | | | | | | |
| Anderson 41 | | | | | | | | | | | | | | |
| 1958 | 1.00 | 1.99 | 4.19 | 5.61 | 7.26 | 8.92 | 9.54 | 8.09 | 6.23 | 4.01 | 1.65 | 1.58 | 54.50 | 61.83 |
| 1959 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| 1960 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| 1961 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| 1962 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| 1963 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| 1964 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| 1965 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| 1966 | 1.01 | 2.31 | 3.77 | 4.68 | 6.49 | 9.31 | 9.58 | 7.72 | 6.62 | 4.64 | 2.76 | 1.67 | 54.50 | 61.83 |
| Average | 1.37 | 2.28 | 3.61 | 5.48 | 6.94 | 8.64 | 9.71 | 7.82 | 6.33 | 3.93 | 2.14 | 1.38 | 52.46 | 59.63 |
| Davis 24 1/2 | | | | | | | | | | | | | | |
| 1959 | 1.77 | 3.54 | 4.56 | 7.20 | 9.39 | 11.70 | 11.19 | 9.15 | 8.19 | 7.19 | 3.57 | 3.04 | 67.23 | 76.58 |
| 1960 | 1.77 | 3.54 | 4.56 | 7.20 | 9.39 | 11.70 | 11.19 | 9.15 | 8.19 | 7.19 | 3.57 | 3.04 | 67.23 | 76.58 |
| 1961 | 1.77 | 3.54 | 4.56 | 7.20 | 9.39 | 11.70 | 11.19 | 9.15 | 8.19 | 7.19 | 3.57 | 3.04 | 67.23 | 76.58 |
| 1962 | 1.83 | 1.74 | 3.66 | 6.84 | 8.09 | 9.75 | 10.73 | 9.05 | 6.99 | 5.89 | 4.20 | 1.82 | 61.81 | 70.49 |
| 1963 | 1.05 | 2.30 | 4.19 | 4.38 | 6.82 | 10.29 | 9.91 | 8.65 | 6.09 | 4.06 | 2.07 | 0.81 | 56.66 | 63.11 |
| 1964 | 1.05 | 2.30 | 4.19 | 4.38 | 6.82 | 10.29 | 9.91 | 8.65 | 6.09 | 4.06 | 2.07 | 0.81 | 56.66 | 63.11 |
| 1965 | 1.05 | 2.30 | 4.19 | 4.38 | 6.82 | 10.29 | 9.91 | 8.65 | 6.09 | 4.06 | 2.07 | 0.81 | 56.66 | 63.11 |
| 1966 | 1.05 | 2.30 | 4.19 | 4.38 | 6.82 | 10.29 | 9.91 | 8.65 | 6.09 | 4.06 | 2.07 | 0.81 | 56.66 | 63.11 |
| 1967 | 1.74 | 2.47 | 4.36 | 7.84 | 8.57 | 9.84 | 9.40 | 9.34 | 7.19 | 5.21 | 1.88 | 0.94 | 61.75 | 68.78 |
| 1968 | 1.22 | 1.71 | 4.17 | 8.85 | 7.85 | 11.36 | 10.97 | 8.98 | 8.43 | 4.45 | 1.94 | 1.43 | 54.29 | 62.79 |
| 1969 | 1.38 | 1.98 | 4.48 | 6.59 | 9.32 | 9.10 | 10.50 | 9.42 | 6.98 | 5.82 | 2.33 | 1.29 | 65.06 | 71.36 |
| 1970 | 1.50 | 2.22 | 6.50 | 6.90 | 10.21 | 9.35 | 10.61 | 9.03 | 8.44 | 4.98 | 1.89 | 0.84 | 62.21 | 69.19 |
| 1971 | 1.63 | 2.59 | 4.70 | 6.36 | 7.50 | 9.56 | 10.68 | 10.68 | 8.20 | 5.07 | 3.55 | 1.95 | 66.02 | 72.47 |
| 1972 | 1.37 | 1.97 | 5.28 | 7.43 | 8.60 | 9.36 | 10.52 | 9.39 | 8.20 | 5.07 | 3.55 | 1.95 | 61.45 | 71.17 |
| Average | 1.38 | 2.37 | 4.46 | 6.44 | 8.45 | 9.68 | 10.43 | 9.06 | 7.40 | 5.34 | 2.46 | 1.51 | 61.26 | 68.98 |
| Elk Grove 40% | | | | | | | | | | | | | | |
| 1960 | 1.34 | 2.32 | 2.96 | 4.94 | 6.90 | 9.15 | 9.35 | 7.56 | 5.69 | 4.39 | 1.75 | 0.79 | 50.94 | 57.14 |
| Georgetown 25% | | | | | | | | | | | | | | |
| 1958 | 1.49 | 2.36 | 4.25 | 5.80 | 6.93 | 9.68 | 11.32 | 8.91 | 6.37 | 5.96 | 2.52 | 1.92 | 59.24 | 68.68 |
| 1959 | 1.83 | 2.72 | 3.59 | 5.69 | 6.60 | 9.96 | 10.74 | 8.91 | 6.63 | 5.16 | 2.05 | 1.07 | 57.28 | 64.95 |
| Average | 1.66 | 2.54 | 3.92 | 5.74 | 6.76 | 9.82 | 11.03 | 8.91 | 6.50 | 5.57 | 2.64 | 1.74 | 58.25 | 66.83 |
| Glenbrook | | | | | | | | | | | | | | |
| 1958 | 1.61 | 2.44 | 3.43 | 5.49 | 7.22 | 9.72 | 10.31 | 9.43 | 6.62 | 5.27 | 2.39 | 1.55 | 57.49 | 65.72 |
| Glen Valley | | | | | | | | | | | | | | |
| 1958 | 1.36 | 2.36 | 3.64 | 5.25 | 5.83 | 9.08 | 10.79 | 10.19 | 6.16 | 4.80 | 1.77 | 1.51 | 54.91 | 60.50 |
| 1959 | 1.39 | 2.36 | 2.95 | 4.02 | 5.85 | 7.87 | 9.78 | 8.98 | 6.00 | 4.51 | 1.97 | 1.12 | 49.86 | 56.04 |
| Average | 1.36 | 2.36 | 3.20 | 4.64 | 5.84 | 8.48 | 10.28 | 9.52 | 6.20 | 4.64 | 1.89 | 1.41 | 52.80 | 59.18 |
| Glen Valley 40% | | | | | | | | | | | | | | |
| 1958 | 1.49 | 2.18 | 3.97 | 6.23 | 6.91 | 10.10 | 10.81 | 8.72 | 8.32 | 5.54 | 3.34 | 2.23 | 61.70 | 71.33 |
| 1959 | 1.43 | 2.76 | 3.64 | 4.47 | 6.86 | 9.68 | 11.37 | 8.36 | 7.05 | 5.70 | 2.76 | 1.81 | 58.59 | 66.59 |
| 1960 | 1.21 | 2.34 | 3.41 | 6.15 | 6.52 | 9.48 | 11.24 | 8.36 | 7.50 | 5.48 | 3.45 | 1.95 | 57.38 | 65.98 |
| 1961 | 1.44 | 2.27 | 3.11 | 6.66 | 7.56 | 10.31 | 10.66 | 8.27 | 6.56 | 4.27 | 2.21 | 2.35 | 58.62 | 64.19 |
| 1962 | 1.21 | 1.76 | 3.52 | 5.32 | 6.66 | 9.89 | 10.36 | 8.60 | 5.73 | 3.65 | 1.63 | 0.46 | 53.72 | 59.79 |
| 1963 | 1.08 | 1.16 | 4.13 | 4.19 | 7.52 | 7.44 | 10.43 | 8.94 | 7.98 | 4.16 | 1.97 | 1.76 | 57.14 | 66.78 |
| 1964 | 1.08 | 1.16 | 4.13 | 4.19 | 7.52 | 7.44 | 10.43 | 8.94 | 7.98 | 4.16 | 1.97 | 1.76 | 57.14 | 66.78 |
| 1965 | 1.08 | 1.16 | 4.13 | 4.19 | 7.52 | 7.44 | 10.43 | 8.94 | 7.98 | 4.16 | 1.97 | 1.76 | 57.14 | 66.78 |
| 1966 | 1.08 | 1.16 | 4.13 | 4.19 | 7.52 | 7.44 | 10.43 | 8.94 | 7.98 | 4.16 | 1.97 | 1.76 | 57.14 | 66.78 |
| Average | 1.63 | 2.27 | 4.73 | 7.18 | 8.05 | 11.26 | 9.35 | 9.17 | 6.62 | 5.15 | 2.13 | 0.88 | 60.51 | 67.71 |

**SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED
IN IRRIGATED PASTURE ENVIRONMENTS^{1/}
In inches**

| Station name | Year of record | Months | | | | | | | | | | | | | |
|--------------------------------------|----------------|--------|------|------|------|------|-------|-------|-------|------|------|------|-------|---------|-------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan-Dec | |
| SACRAMENTO VALLEY (Continued) | | | | | | | | | | | | | | | |
| Red Bluff 5E(Continued) | 1967 | 2.16 | 2.40 | 3.18 | 2.98 | 7.31 | 8.13 | 9.70 | 9.22 | 7.02 | 4.58 | 1.98 | 2.64 | 52.12 | 61.50 |
| | 1968 | 1.82 | 1.40 | 3.46 | 6.91 | 7.45 | 9.85 | 9.42 | 7.43 | 7.36 | 3.90 | 1.53 | 0.84 | 55.76 | 61.37 |
| | 1969 | 1.00 | 1.44 | 3.96 | 5.15 | 9.75 | 9.74 | 10.53 | 8.76 | 6.42 | 5.06 | 3.65 | 2.43 | 59.37 | 67.89 |
| | 1970 | 1.43 | 2.03 | 5.47 | 6.27 | 8.82 | 9.29 | 10.02 | 9.07 | 8.45 | 4.74 | 1.45 | 0.90 | 62.13 | 67.94 |
| | 1971 | 1.91 | 2.66 | 3.51 | 5.27 | 6.38 | 9.40 | 12.45 | 9.23 | 8.46 | 5.28 | 2.78 | 1.49 | 59.98 | 68.62 |
| | 1972 | 2.12 | 2.00 | 3.98 | - | - | - | - | - | - | - | - | - | - | - |
| | Average | 1.76 | 2.34 | 3.91 | 5.63 | 7.54 | 9.52 | 10.40 | 8.66 | 7.18 | 4.69 | 2.32 | 1.64 | 57.53 | 65.59 |
| | Thornton 2S | 1963 | - | - | - | - | - | - | 8.10 | 5.58 | 3.58 | 1.34 | 0.47 | - | - |
| | | 1964 | 0.82 | 2.97 | 4.50 | 6.28 | 7.64 | 7.88 | 10.39 | 9.84 | 6.88 | 1.92 | 1.35 | 0.83 | 57.49 |
| | | 1965 | 0.75 | 2.01 | 2.94 | 4.10 | 7.58 | 8.55 | 11.05 | 8.86 | 5.77 | 3.63 | 1.77 | 0.83 | 52.48 |
| 1966 | | 1.37 | 2.03 | 4.00 | 6.26 | 7.61 | 10.23 | 9.55 | 9.10 | 6.55 | 4.33 | 1.43 | 0.34 | 57.65 | |
| 1967 | | 0.59 | 1.94 | 2.29 | 3.34 | 6.97 | 8.19 | 7.98 | 7.98 | 5.76 | 3.89 | 1.38 | 0.79 | 47.69 | |
| 1968 | | 0.90 | 2.21 | 3.04 | 6.92 | 7.50 | 9.38 | 10.75 | 7.01 | 6.90 | 2.49 | 1.79 | 0.91 | 53.99 | |
| Average | | 0.89 | 2.23 | 3.35 | 5.38 | 7.46 | 8.85 | 10.20 | 8.48 | 6.24 | 3.67 | 1.60 | 0.78 | 53.63 | |
| Yuba City | 1960 | 1.50 | 2.88 | 3.44 | 5.20 | 7.06 | 10.08 | 8.84 | 8.31 | 5.91 | 5.60 | 2.45 | 1.59 | 54.44 | |
| | 1961 | - | - | - | - | - | - | 8.95 | 7.71 | 5.59 | 4.05 | 1.96 | 1.88 | - | |
| | 1962 | - | - | - | - | - | - | 9.27 | 8.12 | 5.24 | 3.55 | 1.34 | 0.59 | 50.17 | |
| | 1963 | 1.49 | 1.80 | 3.63 | 4.40 | 6.48 | 9.48 | 9.24 | 7.68 | 8.20 | 3.54 | 1.84 | 1.42 | 57.44 | |
| | 1964 | 1.88 | 4.01 | 4.92 | 7.25 | 7.79 | 8.12 | 9.94 | 9.21 | 6.85 | 4.08 | 2.08 | 1.29 | 51.27 | |
| | 1965 | 1.55 | 2.91 | 3.28 | 3.84 | 8.99 | 9.53 | 9.21 | 6.85 | 5.72 | 4.87 | 2.15 | 0.95 | 55.13 | |
| | 1966 | 1.35 | 2.05 | 3.75 | 7.48 | 7.40 | 8.69 | 8.33 | 7.89 | 6.72 | 4.87 | 2.15 | 0.95 | 55.13 | |
| Average | 1.55 | 2.73 | 3.80 | 5.63 | 7.54 | 9.18 | 9.09 | 7.76 | 6.19 | 4.28 | 1.97 | 1.29 | 53.47 | | |
| Area Average | 1.47 | 2.36 | 3.87 | 5.73 | 7.54 | 9.29 | 10.13 | 8.56 | 6.76 | 4.58 | 2.19 | 1.41 | 56.46 | | |
| SAN JOAQUIN VALLEY | | | | | | | | | | | | | | | |
| Arvin 2. NW | 1959 | 1.87 | 2.54 | 4.60 | 7.11 | 8.58 | 9.31 | 9.78 | 8.61 | 5.92 | 4.45 | 2.60 | 1.65 | 58.36 | |
| | 1960 | 1.96 | 2.24 | 4.30 | 5.82 | 8.72 | 9.98 | 9.39 | 8.09 | 6.13 | 4.08 | 1.89 | 1.08 | 56.51 | |
| | 1961 | 0.86 | 2.63 | 3.91 | 6.58 | 7.61 | 9.91 | 9.64 | 7.82 | 6.22 | 4.41 | 2.44 | 1.17 | 56.10 | |
| | 1962 | 1.55 | 1.91 | 4.31 | 7.65 | 8.57 | 10.54 | 10.42 | 8.56 | 6.04 | 3.91 | 2.24 | 1.75 | 60.00 | |
| | 1963 | 1.75 | 2.38 | 5.35 | 5.25 | 8.06 | 9.55 | 9.69 | 7.85 | 5.30 | 3.35 | 2.05 | 0.77 | 54.70 | |
| | 1964 | 1.47 | 3.32 | 4.46 | 6.06 | 8.18 | 9.79 | 8.24 | 8.06 | 5.98 | 4.29 | 1.90 | 1.54 | 61.55 | |
| | 1965 | 1.24 | 2.40 | 4.55 | 4.98 | 9.01 | 8.98 | 9.91 | 8.98 | 6.34 | - | - | - | 56.06 | |
| Average | 1.54 | 2.49 | 4.50 | 6.21 | 8.39 | 9.72 | 9.72 | 8.28 | 6.02 | 4.08 | 2.19 | 1.33 | 56.92 | | |
| Bakersfield 10S | 1969 | - | - | - | - | 7.93 | 8.24 | 8.91 | 8.22 | 6.36 | 3.67 | 3.35 | 1.32 | - | |
| | 1970 | 2.13 | 1.82 | 3.75 | 5.61 | 9.36 | 9.34 | - | - | - | - | - | - | | |
| | Average | 2.13 | 1.82 | 3.75 | 5.61 | 8.64 | 8.91 | 8.91 | 8.22 | 6.36 | 3.67 | 3.35 | 1.32 | 53.95 | |
| Berenda 2N | 1960 | - | - | - | - | 9.06 | 10.31 | 10.74 | 9.49 | 6.43 | 4.46 | 1.43 | 0.74 | - | |
| | 1961 | 0.86 | 1.97 | 3.83 | 6.26 | 8.09 | 9.56 | 11.87 | 8.05 | 6.45 | 5.18 | 2.41 | 0.80 | 59.29 | |
| | 1962 | 0.83 | 1.31 | 3.59 | 6.71 | 7.84 | 9.56 | 11.09 | 9.77 | 6.65 | 4.15 | 1.95 | 1.10 | 59.36 | |
| | 1963 | 0.98 | 1.61 | 3.44 | 4.12 | 6.68 | 8.47 | 10.56 | 9.17 | 6.04 | 4.00 | 1.71 | 0.45 | 52.98 | |
| Average | 0.89 | 1.70 | 3.62 | 5.86 | 7.92 | 9.48 | 11.06 | 9.12 | 6.39 | 4.45 | 1.68 | 0.77 | 57.90 | | |

Appendix D (Continued)

SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED IN IRRIGATED PASTURE ENVIRONMENTS₁/ In inches

| Station | Year of record | Months | | | | | | | | | | | | |
|-----------------------------|----------------|--------|------|------|------|-------|-------|-------|-------|------|------|------|-------|-------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| Sawtooth Valley (Continued) | 1965 | 1.1 | 2.42 | 4.60 | 7.41 | 9.51 | 9.90 | 9.90 | 7.83 | 6.07 | 4.65 | 1.79 | 0.95 | |
| | 1966 | | | | | | | | | | | | | |
| | Average | 1.97 | 2.42 | 4.60 | 7.41 | 9.51 | 9.90 | 9.90 | 7.83 | 6.07 | 4.65 | 1.79 | 0.95 | 67.00 |
| | 1968 | | | | | | | | | | | | | |
| | Average | 0.99 | 1.93 | 4.36 | 6.40 | 8.07 | 10.54 | 10.74 | 9.00 | 6.65 | 3.85 | 1.82 | 0.97 | 59.61 |
| Perrin Rese | 1960 | | | | | | | | | | | | | |
| | 1961 | 0.81 | 2.45 | 4.50 | 6.86 | 9.15 | 10.05 | 8.81 | 7.43 | 6.02 | 4.28 | 1.63 | 0.80 | |
| | 1962 | 1.02 | 1.66 | 4.10 | 6.61 | 8.43 | 8.39 | 8.04 | 7.36 | 6.44 | 5.36 | 2.38 | 0.84 | 61.86 |
| | 1963 | 1.01 | 1.86 | 4.18 | 6.85 | 7.89 | 10.06 | 9.99 | 9.27 | 6.76 | 4.33 | 2.13 | 1.06 | 65.03 |
| | 1964 | 1.27 | 2.63 | 4.13 | 6.15 | 8.22 | 9.72 | 11.04 | 8.55 | 5.46 | 3.63 | 1.74 | 0.38 | 60.31 |
| Average | 1.03 | 2.15 | 4.23 | 6.12 | 8.35 | 9.59 | 9.51 | 8.44 | 6.24 | 4.43 | 1.97 | 0.87 | 56.91 | 62.93 |
| Kinsman Res | 1959 | | | | | | | | | | | | | |
| | 1960 | 1.63 | 2.15 | 3.97 | 5.37 | 8.39 | 9.93 | 9.26 | 7.57 | 5.74 | 4.31 | 2.16 | 1.38 | |
| | 1961 | 1.01 | 2.37 | 4.25 | 6.46 | 7.93 | 9.67 | 9.37 | 8.36 | 6.20 | 4.04 | 1.62 | 0.86 | 62.77 |
| | | | | | | | | | | | | | | |
| | Average | 1.32 | 2.22 | 4.13 | 5.98 | 8.38 | 9.48 | 9.09 | 7.79 | 6.13 | 4.18 | 1.89 | 1.12 | 55.16 |
| Mazze Br. Res | 1959 | | | | | | | | | | | | | |
| | 1960 | 1.67 | 2.76 | 4.14 | 6.17 | 9.02 | 11.12 | 10.66 | 9.01 | 7.17 | 5.47 | 2.53 | 2.10 | |
| | 1961 | 0.65 | 2.47 | 4.12 | 6.75 | 7.35 | 10.34 | 9.15 | 8.55 | 6.43 | 4.94 | 1.79 | 1.09 | 66.05 |
| | 1962 | 1.46 | 1.72 | 3.94 | 7.48 | 8.46 | 10.12 | 10.72 | 8.36 | 6.20 | 5.20 | 3.67 | 1.19 | 58.82 |
| | 1963 | 1.04 | 1.98 | 3.93 | 4.06 | 7.22 | 10.19 | 10.03 | 7.82 | 6.12 | 4.22 | 2.72 | 1.12 | 66.60 |
| Average | 1.30 | 2.25 | 4.18 | 6.54 | 7.27 | 9.41 | 9.41 | 8.06 | 5.25 | 4.66 | 1.60 | 0.49 | 52.59 | 57.70 |
| Ward Res | 1964 | 1.21 | 2.48 | 4.12 | 5.91 | 8.26 | 9.63 | 9.99 | 8.31 | 6.40 | 4.81 | 2.35 | 1.21 | 64.68 |
| | 1965 | 1.11 | 2.13 | 3.76 | 4.94 | 8.96 | 9.10 | 10.18 | 8.66 | 6.45 | 4.67 | 2.16 | 1.66 | |
| | 1966 | 1.76 | 2.63 | 4.48 | 6.98 | 8.93 | 10.64 | 11.43 | 10.27 | 7.27 | 4.99 | 2.21 | 0.65 | 63.10 |
| | 1967 | 1.33 | 1.53 | 3.85 | 4.16 | 7.43 | 9.15 | 11.21 | 9.28 | 6.02 | 4.60 | 2.24 | 1.24 | 72.24 |
| | 1968 | 1.46 | 1.74 | 4.37 | 6.78 | 10.21 | 11.97 | 11.33 | | | | | | 62.00 |
| Average | 1.44 | 2.01 | 4.12 | 5.64 | 8.88 | 10.22 | 11.04 | 9.33 | 6.55 | 4.72 | 2.12 | 1.18 | 60.55 | 67.31 |
| Ward Res | 1969 | | | | | | | | | | | | | |
| | 1970 | 1.1 | 2.80 | 4.04 | 6.84 | 7.72 | 10.15 | 9.25 | 8.77 | 6.60 | 6.24 | 1.98 | 0.95 | |
| | 1971 | 1.99 | 1.55 | 3.58 | 6.46 | 6.18 | 9.58 | 10.00 | 8.36 | 6.76 | 5.73 | 2.61 | 0.81 | 65.80 |
| | 1972 | 1.11 | 1.84 | 3.76 | 3.62 | 6.76 | 8.91 | 9.85 | 8.91 | 6.10 | 4.10 | 2.40 | 0.85 | 57.14 |
| | 1973 | 1.4 | 3.98 | 5.27 | 6.88 | 7.58 | 8.32 | 11.03 | 9.35 | 7.2 | 4.81 | 1.75 | 1.32 | 52.23 |
| Average | 1.4 | 2.74 | 4.1 | 5.81 | 8.01 | 9.26 | 10.05 | 8.83 | 6.60 | 5.00 | 2.02 | 0.84 | 60.45 | 64.40 |

Appendix D (Continued)

SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED
IN IRRIGATED PASTURE ENVIRONMENTS^{1/}
In inches

| Station name | Year of record | Months | | | | | | | | | | | | | |
|--|----------------|--------|------|------|------|------|-------|-------|------|------|------|------|-------|---------|---------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct | Jan-Dec |
| SAN JOAQUIN VALLEY (Continued) | | | | | | | | | | | | | | | |
| Old River 3S | 1965 | 1.94 | 2.52 | 4.74 | 6.18 | 8.28 | 9.05 | 8.91 | 8.87 | 6.34 | 4.19 | 1.85 | 0.89 | 56.56 | 63.90 |
| | 1966 | 1.57 | 1.97 | 4.18 | 3.79 | 8.29 | 9.26 | 10.28 | 9.40 | 6.65 | 5.01 | 2.43 | 0.97 | 56.86 | 64.20 |
| | Average | 1.76 | 2.24 | 4.46 | 4.98 | 8.28 | 9.16 | 9.60 | 9.14 | 8.14 | 6.50 | 4.60 | 2.06 | 56.72 | 63.86 |
| | 1962 | - | - | - | - | - | 9.06 | 9.99 | 8.17 | 6.29 | 4.00 | 4.00 | 2.08 | 0.96 | - |
| Pond 1N | 1963 | 1.19 | 1.50 | 3.99 | 4.81 | 7.55 | 8.45 | 8.64 | 5.47 | 3.82 | 3.82 | 1.92 | 0.57 | 52.23 | 57.41 |
| | 1964 | 1.15 | 2.86 | 4.40 | 5.89 | 8.60 | 9.40 | 9.58 | 8.73 | 6.22 | 4.56 | 1.85 | 1.14 | 57.38 | 64.38 |
| | 1965 | 1.10 | 2.49 | 4.03 | 5.39 | 9.21 | 9.07 | 9.79 | 7.97 | 6.46 | 4.42 | 1.68 | 0.87 | 56.34 | 62.48 |
| | Average | 1.15 | 2.28 | 4.14 | 5.36 | 8.45 | 9.14 | 9.72 | 8.38 | 6.11 | 4.20 | 1.88 | 0.88 | 55.50 | 61.69 |
| Stockton 9S | 1959 | - | - | - | 6.33 | 9.16 | 11.05 | 10.70 | 8.70 | 6.37 | 4.82 | 2.43 | 1.55 | - | - |
| | 1960 | 1.84 | 2.48 | 4.34 | 6.40 | 8.56 | 10.32 | 10.42 | 8.64 | 6.18 | 5.66 | 2.07 | 1.06 | 60.72 | 68.17 |
| | 1961 | 0.97 | 2.55 | 4.41 | 6.66 | 7.87 | 9.05 | 9.45 | 7.01 | 6.78 | 6.25 | 3.23 | 1.21 | 57.48 | 65.44 |
| | Average | 1.40 | 2.52 | 4.38 | 6.46 | 8.53 | 10.14 | 10.19 | 8.18 | 6.44 | 5.58 | 2.58 | 1.27 | 59.90 | 67.67 |
| Traver 4ESE | 1962 | - | - | 3.64 | 6.12 | 7.79 | 9.08 | 9.88 | 7.94 | 6.21 | 3.63 | 1.44 | 0.89 | 54.29 | - |
| | 1963 | 1.03 | 1.55 | 3.48 | 4.06 | 7.19 | 8.61 | 9.07 | 7.94 | 5.33 | 3.43 | 1.61 | 0.38 | 53.68 | 53.68 |
| | 1964 | 1.03 | 2.30 | 3.67 | 4.91 | 6.98 | 9.77 | 10.76 | 8.38 | 5.52 | 4.14 | 1.78 | 0.92 | 60.16 | 60.16 |
| | 1965 | 0.87 | 1.91 | 3.33 | 4.56 | 8.29 | 8.55 | 8.97 | 7.65 | 6.00 | 3.80 | 1.71 | 0.84 | 51.15 | 56.48 |
| Average | 0.98 | 1.92 | 3.53 | 4.91 | 7.56 | 9.00 | 9.67 | 7.98 | 5.76 | 3.75 | 1.64 | 0.76 | 52.16 | 57.46 | |
| Area Average | 1.26 | 2.26 | 4.15 | 5.89 | 8.29 | 9.57 | 10.01 | 8.52 | 6.30 | 4.44 | 2.06 | 1.03 | 57.17 | 63.78 | |
| CENTRAL COAST - COASTAL VALLEYS AND PLAINS | | | | | | | | | | | | | | | |
| Bettaravia 2NW | 1961 | - | - | 5.10 | 5.88 | 6.97 | 6.49 | 6.84 | 6.41 | 5.00 | 4.64 | 3.53 | 2.28 | 47.33 | - |
| | 1962 | 3.39 | 2.13 | 3.70 | 5.46 | 6.12 | - | - | - | - | - | - | - | - | - |
| | Average | 3.39 | 2.13 | 4.40 | 5.67 | 6.54 | 6.49 | 6.84 | 6.41 | 5.00 | 4.64 | 3.53 | 2.28 | 45.99 | 57.32 |
| Guadalupe 2NW 5/ | 1963 | - | - | - | - | - | 5.91 | 5.38 | 4.67 | 3.84 | 3.84 | 2.69 | 2.20 | - | - |
| | 1964 | 3.14 | 3.75 | 4.52 | 4.71 | 5.19 | 6.43 | 6.23 | 5.46 | 4.46 | 3.44 | 2.61 | 2.37 | 40.44 | 52.31 |
| | 1965 | 2.30 | 3.29 | 4.13 | 3.71 | 5.96 | 5.69 | 5.77 | 4.79 | 4.38 | 4.79 | 2.05 | 1.67 | 40.14 | 49.45 |
| | 1966 | 2.65 | 2.64 | 4.20 | 5.07 | 4.79 | 6.70 | 6.65 | 5.21 | 4.28 | 3.78 | 1.94 | 1.40 | 40.68 | 49.31 |
| 1967 | 2.20 | 2.77 | 3.37 | 4.00 | 5.80 | 5.67 | 6.05 | 5.09 | 3.99 | 4.24 | - | - | 38.21 | - | |
| Average | 2.57 | 3.11 | 4.06 | 4.37 | 5.44 | 6.12 | 6.12 | 5.37 | 4.44 | 3.94 | 2.32 | 1.91 | 39.86 | 49.77 | |
| Lompoc 1N 2/ | 1968 | 3.56 | 2.51 | 4.66 | 5.93 | 6.65 | 8.10 | 6.83 | 7.12 | 7.06 | 4.79 | 3.35 | 2.79 | 51.14 | 63.35 |
| | 1969 | 2.74 | 2.28 | 4.43 | 5.83 | 6.69 | 5.20 | 6.12 | 6.37 | 4.48 | 4.87 | 2.96 | 2.07 | 43.99 | 54.04 |
| | Average | 3.15 | 2.40 | 4.54 | 5.88 | 6.67 | 6.65 | 6.48 | 6.74 | 5.77 | 4.83 | 3.16 | 2.43 | 47.56 | 58.70 |
| Salinas 3E 5/ | 1969 | - | - | - | 3.85 | 6.05 | 6.73 | 6.77 | 6.35 | 4.85 | 4.25 | 3.75 | 2.00 | - | - |
| | 1970 | 1.88 | 2.34 | 4.22 | 5.29 | 6.67 | 5.30 | 8.20 | 4.75 | 3.93 | 3.22 | 2.50 | 2.58 | 41.58 | 50.88 |
| | 1971 | 1.90 | 3.12 | 3.83 | 4.25 | - | - | - | - | - | - | - | - | - | - |
| Average | 1.89 | 2.73 | 4.02 | 4.46 | 6.36 | 5.52 | 7.48 | 5.55 | 4.39 | 3.74 | 3.12 | 2.29 | 41.52 | 51.55 | |

Appendix D (Continued)
 SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED
 IN IRRIGATED PASTURE ENVIRONMENTS
 In inches

| Station name | Year of record | Months | | | | | | | | | | | | | |
|--|----------------|--------|------|------|------|------|------|-------|------|------|------|------|------|---------|---------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct | Jan-Dec |
| CENTRAL COAST - COASTAL VALLEYS AND PLAINS | | | | | | | | | | | | | | | |
| Salinas 4NE B | 1965 | - | - | - | - | 6.98 | 6.47 | 7.91 | 4.77 | 4.61 | 4.19 | 2.56 | 1.95 | - | - |
| | 1966 | 2.07 | 2.43 | 3.35 | 4.40 | 7.06 | 6.64 | 7.37 | 7.29 | 5.28 | 4.38 | 3.18 | 1.42 | 45.77 | 54.87 |
| | 1967 | 2.55 | 2.10 | 3.23 | 4.55 | 3.89 | 4.61 | 6.64 | 6.03 | 5.13 | 4.51 | 2.53 | 2.30 | 38.59 | 48.07 |
| | 1968 | 1.47 | 1.95 | 2.95 | 5.50 | 5.65 | 7.35 | - | - | - | - | - | - | - | - |
| Average | 2.03 | 2.16 | 3.18 | 4.82 | 5.90 | 6.27 | 7.31 | 6.03 | 5.01 | 4.36 | 2.76 | 1.89 | - | 42.88 | 51.72 |
| San Luis Obispo 11W | 1969 | - | - | - | - | - | - | 8.4 | 7.6 | 5.9 | 5.7 | 4.1 | 2.8 | - | - |
| | 1970 | 1.7 | 3.2 | 6.1 | 7.2 | 7.5 | 6.7 | 7.6 | 7.7 | 6.4 | - | 3.6 | - | - | - |
| | 1971 | 4.3 | 4.2 | 4.4 | 5.1 | 5.8 | 7.5 | 7.9 | 8.1 | 6.8 | 5.8 | 3.6 | 1.7 | 51.4 | 65.2 |
| | 1972 | 3.5 | 3.8 | 5.8 | 6.5 | 7.2 | 7.3 | 8.8 | 6.1 | 6.3 | 3.9 | 3.7 | 2.5 | 51.9 | 65.4 |
| Average | 3.2 | 3.7 | 5.4 | 6.3 | 6.8 | 7.2 | 7.2 | 8.2 | 7.4 | 6.4 | 5.1 | 3.8 | 2.3 | 52.8 | 65.8 |
| Santa Maria 4SE | 1961 | 3.40 | 2.98 | 4.93 | 5.96 | 6.78 | 6.74 | 7.23 | 6.62 | 5.46 | 5.28 | 4.18 | 3.48 | 49.00 | 63.04 |
| Santa Pita 2W | 1962 | - | - | - | - | - | - | 4.13 | 5.05 | 3.21 | 3.39 | 2.12 | 1.82 | - | - |
| | 1963 | 2.02 | 2.68 | 3.04 | 3.82 | 4.52 | 5.89 | 6.10 | 5.17 | 4.17 | 3.30 | 2.31 | 1.93 | 36.01 | 44.95 |
| | 1964 | 1.06 | 4.57 | 2.72 | 4.14 | 4.75 | 5.61 | 5.88 | 5.30 | 4.96 | 4.23 | 2.76 | 1.29 | 37.59 | 47.27 |
| | 1965 | 2.12 | 2.41 | 3.52 | - | - | - | - | - | - | - | - | - | - | - |
| Average | 1.73 | 3.22 | 3.09 | 3.98 | 4.64 | 5.75 | 5.37 | 5.17 | 4.11 | 3.64 | 2.40 | 1.68 | - | 35.75 | 44.78 |
| Area Average | 2.52 | 2.90 | 4.11 | 5.06 | 6.05 | 6.32 | 6.83 | 6.08 | 5.03 | 4.31 | 3.00 | 2.13 | - | 43.79 | 54.34 |
| CENTRAL COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | |
| Hollister 4NW 2 | 1962 | - | - | - | 5.78 | 7.19 | 6.65 | 9.04 | 8.14 | 5.12 | 3.57 | 3.15 | 2.26 | - | - |
| | 1963 | 1.73 | 2.47 | 3.34 | 3.01 | 5.14 | 6.58 | 7.50 | 7.04 | 6.02 | 5.20 | 2.27 | 2.16 | 43.83 | 52.46 |
| | 1964 | 2.45 | 3.25 | 4.05 | 5.82 | 5.29 | 7.30 | 8.80 | 7.62 | 7.47 | 5.81 | 4.12 | 1.90 | 52.36 | 64.08 |
| | 1965 | 1.61 | 1.96 | 3.25 | 3.79 | 7.08 | 7.67 | 6.93 | 6.75 | 4.58 | 3.98 | 2.64 | 1.87 | 44.03 | 52.11 |
| Average | 1.93 | 2.56 | 3.55 | 4.60 | 6.18 | 7.05 | 8.07 | 7.44 | 5.80 | 4.64 | 3.04 | 2.05 | - | 47.33 | 56.91 |
| San Lucas 3S 2 | 1962 | - | - | - | 6.38 | 7.61 | 8.69 | 9.01 | 8.32 | 5.82 | 4.56 | 3.48 | 2.67 | - | - |
| | 1963 | 3.18 | 3.67 | 3.78 | 4.33 | 6.76 | 7.27 | 9.72 | 7.58 | 4.50 | 4.19 | 2.09 | 1.79 | 48.15 | 58.88 |
| | 1964 | 1.76 | 3.58 | 4.87 | 7.17 | 7.04 | 8.06 | 10.37 | 7.23 | 6.04 | 4.32 | 3.17 | 1.89 | 55.10 | 65.50 |
| | 1965 | 1.72 | 2.72 | 4.15 | 4.42 | 7.44 | 8.45 | 8.36 | 8.47 | 5.77 | 4.74 | 4.02 | 1.78 | 52.02 | 62.26 |
| Average | 2.22 | 3.32 | 4.27 | 5.58 | 7.22 | 8.12 | 9.37 | 7.90 | 5.58 | 4.45 | 3.19 | 2.03 | - | 52.49 | 63.25 |
| Soledad 3.1NW 2 | 1961 | - | - | 4.51 | 7.26 | 7.99 | 9.40 | 10.41 | 7.76 | 6.94 | 6.72 | 3.71 | 1.86 | 61.01 | - |
| | 1962 | 2.46 | 2.65 | 4.30 | 7.18 | 6.44 | 6.31 | 7.95 | 7.79 | 5.56 | 5.16 | 3.12 | 2.67 | 54.69 | 65.59 |
| | 1963 | 2.63 | 2.85 | 4.17 | 4.79 | 6.40 | 7.35 | 8.96 | 6.26 | 6.99 | 4.49 | 2.69 | 2.69 | 51.81 | 62.46 |
| | 1964 | 2.36 | 3.62 | 5.06 | 6.06 | 7.22 | 6.40 | 8.21 | 7.36 | 7.16 | 5.08 | 2.57 | 2.01 | 54.57 | 65.33 |
| | 1965 | 1.93 | 3.48 | 4.26 | 5.06 | 8.16 | 7.53 | 7.99 | 7.45 | 6.27 | 6.14 | 3.21 | 2.00 | 52.86 | 63.48 |

Appendix D (Continued)

SUMMARY OF OBSERVED EVAPORATION FROM CLASS "A" PANS LOCATED
IN IRRIGATED PASTURE ENVIRONMENTS^{1/}
In inches

| Station name | Year of record | Months | | | | | | | | | | | | | |
|---|----------------|--------|------|------|------|------|------|------|------|------|------|------|------|---------|---------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct | Jan-Dec |
| CENTRAL COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | |
| Soledad 3.5NW ^{2/} (Continued) | 1966 | 2.10 | 2.81 | 4.87 | 6.28 | 7.06 | 8.85 | 8.09 | 7.47 | 6.22 | 5.24 | 3.15 | 1.96 | 54.08 | 64.10 |
| | 1967 | 2.80 | 2.62 | 3.87 | 4.27 | 7.19 | 6.82 | 8.72 | - | 6.18 | 5.82 | 2.93 | 2.32 | - | - |
| | 1968 | 2.54 | 2.39 | 4.42 | 6.21 | 7.97 | 8.84 | 8.04 | 7.74 | 7.14 | 4.74 | 2.88 | 2.50 | 55.10 | 65.41 |
| | 1969 | 2.47 | 2.21 | 4.92 | 6.14 | 7.76 | 7.39 | 7.87 | 7.90 | 5.92 | 5.25 | 4.25 | 2.75 | 53.15 | 64.83 |
| | 1970 | 2.57 | 3.06 | 5.32 | 6.68 | 8.93 | 8.80 | 9.18 | 8.19 | 7.56 | 4.54 | 2.82 | 1.51 | 59.20 | 69.16 |
| | 1971 | 2.23 | 3.11 | 4.71 | 5.84 | 7.50 | - | - | - | - | - | - | - | - | - |
| Average | | 2.41 | 2.90 | 4.58 | 5.98 | 7.69 | 8.21 | 8.54 | 7.77 | 6.60 | 5.32 | 3.11 | 2.23 | 54.69 | 65.34 |
| Area Average | | 2.26 | 2.92 | 4.34 | 5.60 | 7.27 | 7.93 | 8.62 | 7.72 | 6.19 | 4.98 | 3.11 | 2.14 | 52.65 | 63.10 |

^{1/} Stations located in well-managed irrigated pastures except as noted.

^{2/} Flood irrigated native pasture.

^{3/} Non-irrigated pasture, received sufficient precipitation (rain and fog) to keep grasses green all year.

^{4/} Irrigated alfalfa environment.

^{5/} Data contributed by W. O. Pruitt, U. C.-Davis.

^{6/} Station serviced by San Luis Obispo County Flood Control and Water Conservation District.

^{7/} Data contributed by Paul R. Nixon, USDA-ARS.

^{8/} Station serviced by Monterey County Flood Control and Water Conservation District.

^{9/} Station serviced by Department of Corrections, Soledad Correctional Training Facility.

APPENDIX E

SUMMARY OF OBSERVED MONTHLY NET ATMOMETER
EVAPORATION IN CALIFORNIA

Appendix E

SUMMARY OF OBSERVED MONTHLY NET ATMOSPHERIC EVAPORATION IN CALIFORNIA^{1/} In milliliters^{2/}

| Station name | Year of record | Months | | | | | | | | | | | | | |
|---|----------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|---------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct | Jan-Dec |
| NORTHEASTERN MOUNTAIN VALLEYS | | | | | | | | | | | | | | | |
| Alturas 2SE | 1956 | - | - | - | - | 402 | 547 | 661 | 599 | - | - | - | - | - | - |
| | 1957 | - | - | - | - | 380 | 544 | 607 | 538 | 387 | - | - | - | - | - |
| | 1958 | - | - | - | - | 476 | 471 | 535 | 501 | - | - | - | - | - | - |
| | 1959 | - | - | - | - | - | 547 | 643 | 551 | - | - | - | - | - | - |
| | 1960 | - | - | - | - | - | 562 | 560 | 501 | 422 | - | - | - | - | - |
| | 1961 | - | - | - | - | - | 575 | 602 | 491 | 414 | - | - | - | - | - |
| | 1962 | - | - | - | - | 418 | 597 | 586 | 552 | 444 | - | - | - | - | - |
| | 1963 | - | - | - | - | 406 | 478 | 584 | 540 | 401 | - | - | - | - | - |
| 1964 | - | - | - | - | - | 400 | 571 | 488 | 419 | - | - | - | - | - | |
| Average | | - | - | - | - | 416 | 524 | 594 | 529 | 414 | - | - | - | - | - |
| Canby 2SW ^{3/} | 1958 | - | - | - | - | - | 499 | 572 | 546 | - | - | - | - | - | - |
| | 1959 | - | - | - | - | - | 514 | 530 | 463 | 357 | - | - | - | - | - |
| | Average | | - | - | - | - | 506 | 551 | 504 | 357 | - | - | - | - | - |
| Fall River Mills R. S. ^{4/} | 1955 | - | - | - | - | 474 | 534 | 594 | 628 | 479 | 342 | - | - | - | - |
| | 1956 | - | - | - | - | - | 536 | 612 | 563 | 451 | - | - | - | - | - |
| | 1957 | - | - | - | - | 493 | 554 | 508 | 513 | 418 | - | - | - | - | - |
| | Average | | - | - | - | - | 484 | 541 | 571 | 568 | 449 | 342 | - | - | - |
| Fall River Mills 2NW ^{4/} | 1956 | - | - | - | - | - | 512 | 575 | 497 | 512 | - | - | - | - | - |
| | 1957 | - | - | - | - | 408 | 581 | - | - | - | - | - | - | - | - |
| | Average | | - | - | - | - | 408 | 546 | 575 | 497 | 512 | - | - | - | - |
| Glenburn 0.3SE | 1960 | - | - | - | - | - | 588 | 584 | 550 | 452 | - | - | - | - | - |
| | 1961 | - | - | - | - | 470 | 616 | 609 | 481 | 441 | - | - | - | - | - |
| | 1962 | - | - | - | - | 431 | 564 | 658 | 529 | 438 | - | - | - | - | - |
| | 1963 | - | - | - | - | 432 | 528 | 600 | 548 | 395 | - | - | - | - | - |
| | 1964 | - | - | - | - | - | 463 | 526 | 566 | 462 | - | - | - | - | - |
| | 1965 | - | - | - | - | - | 503 | 587 | 538 | 384 | - | - | - | - | - |
| | 1966 | - | - | - | - | 507 | 519 | 579 | 523 | 388 | - | - | - | - | - |
| | Average | | - | - | - | - | 460 | 540 | 592 | 534 | 423 | - | - | - | - |
| Hat Creek 3SE | 1958 | - | - | - | - | - | 374 | 378 | 521 | - | - | - | - | - | - |
| | 1959 | - | - | - | - | - | 549 | 540 | 555 | 438 | - | - | - | - | - |
| | Average | | - | - | - | - | 462 | 459 | 538 | 438 | - | - | - | - | - |
| Likely 2NW | 1958 | - | - | - | - | - | 584 | 663 | 545 | 401 | - | - | - | - | - |
| | 1959 | - | - | - | - | 510 | 505 | 556 | 535 | - | - | - | - | - | - |
| | Average | | - | - | - | - | 510 | 544 | 610 | 540 | 401 | - | - | - | - |
| Lookout 3S ^{5/} | 1959 | - | - | - | - | - | 586 | 650 | 567 | 424 | - | - | - | - | - |
| | 1960 | - | - | - | - | - | - | 584 | 561 | 458 | - | - | - | - | - |
| | 1961 | - | - | - | - | - | - | 564 | 578 | 478 | 404 | - | - | - | - |
| | 1962 | - | - | - | - | 390 | 568 | 568 | 504 | 407 | - | - | - | - | - |
| | 1963 | - | - | - | - | 443 | 509 | 619 | 539 | 406 | - | - | - | - | - |
| Average | | - | - | - | - | 416 | 557 | 600 | 530 | 420 | - | - | - | - | - |
| McArthur 2SE ^{6/} | 1955 | - | - | - | - | - | - | - | 619 | 519 | - | - | - | - | - |
| | 1956 | - | - | - | - | 428 | 563 | 591 | 540 | 448 | - | - | - | - | - |
| | Average | | - | - | - | - | 428 | 563 | 591 | 580 | 484 | - | - | - | - |
| McArthur 4ESE ^{6/} | 1956 | - | - | - | - | - | - | - | 537 | 434 | - | - | - | - | - |
| | 1957 | - | - | - | - | 484 | 620 | 634 | 549 | 457 | - | - | - | - | - |
| | 1958 | - | - | - | - | - | 474 | 579 | 602 | 450 | - | - | - | - | - |
| | 1959 | - | - | - | - | - | 100 | 659 | 646 | 481 | - | - | - | - | - |
| | Average | | - | - | - | - | 484 | 569 | 624 | 584 | 451 | - | - | - | - |

Appendix E (Continued)

SUMMARY OF OBSERVED MONTHLY NET ATMOSPHERIC EVAPORATION
IN CALIFORNIA^{1/}
In milliliters^{2/}

| Station name | Year of record | Months | | | | | | | | | | | | | |
|---|----------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|---|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | | |
| NORTHEASTERN MOUNTAIN VALLEYS (Continued) | | | | | | | | | | | | | | | |
| Standish 4NW | 1959 | - | - | - | - | 460 | 556 | 456 | 418 | 412 | - | - | - | - | |
| | 1960 | - | - | - | - | - | - | 552 | 537 | - | - | - | - | | |
| | Average | - | - | - | - | 460 | 556 | 504 | 478 | 412 | - | - | - | - | |
| Area Average | | - | - | - | - | 445 | 536 | 581 | 537 | 431 | 342 | - | - | - | |
| NORTH COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | |
| Fort Jones R. S. ^{4/} | 1954 | - | - | - | - | - | - | 618 | 427 | 371 | - | - | - | - | |
| | 1955 | - | - | - | - | 320 | 525 | 566 | 578 | - | - | - | - | | |
| | Average | - | - | - | - | 320 | 525 | 592 | 502 | 371 | - | - | - | - | |
| Gazelle 1:NE | 1958 | - | - | - | - | 530 | 486 | 569 | 507 | 438 | - | - | - | - | |
| | 1959 | - | - | - | 388 | 444 | 556 | 599 | 541 | 370 | - | - | - | - | |
| | 1960 | - | - | - | - | 489 | 661 | 758 | 682 | 534 | - | - | - | - | |
| Average | - | - | - | 388 | 488 | 568 | 642 | 577 | 447 | - | - | - | - | | |
| Hayfork 1SE ^{4/} | 1954 | - | - | - | - | - | - | 466 | 350 | - | - | - | - | - | |
| | 1955 | - | - | - | 226 | 462 | 486 | 493 | 473 | - | - | - | - | - | |
| | 1956 | - | - | - | - | 463 | 513 | 575 | 560 | 396 | - | - | - | - | |
| | 1957 | - | - | - | - | 429 | 566 | 582 | 567 | 448 | - | - | - | - | |
| | 1958 | - | - | - | - | 464 | 369 | 416 | 519 | 421 | - | - | - | - | |
| | 1959 | - | - | - | - | 428 | 537 | 607 | 513 | 398 | 332 | - | - | - | |
| | 1960 | - | - | - | 234 | 377 | 598 | 589 | 612 | - | - | - | - | - | |
| Average | - | - | - | 230 | 437 | 512 | 544 | 530 | 403 | 332 | - | - | - | - | |
| Montague 3NE | 1959 | - | - | - | - | 454 | 575 | 624 | 531 | 368 | - | - | - | - | |
| | 1960 | - | - | - | - | 450 | 621 | 634 | 559 | 452 | - | - | - | - | |
| | 1961 | - | - | - | - | - | 536 | 576 | 489 | 389 | - | - | - | - | |
| Average | - | - | - | - | 452 | 577 | 611 | 526 | 403 | - | - | - | - | - | |
| Santa Rosa 6SSW | 1962 | - | - | - | - | - | - | 506 | 478 | 396 | 283 | 237 | - | - | |
| | 1963 | - | - | 319 | 345 | 402 | 462 | 525 | 466 | 361 | 286 | 160 | - | 3166 | |
| | 1964 | - | - | 354 | 438 | 471 | 483 | 553 | 496 | 374 | 227 | - | - | 3396 | |
| Average | - | - | 336 | 392 | 436 | 472 | 528 | 480 | 377 | 265 | 198 | - | 3288 | - | |
| Yountville 2N | 1962 | - | - | - | - | - | - | 547 | 513 | 411 | 298 | 245 | - | - | |
| | 1963 | - | - | 321 | 309 | 419 | 495 | 453 | 479 | 372 | 287 | 181 | - | 3135 | |
| | 1964 | - | 318 | 300 | 405 | 480 | 477 | 505 | 496 | 405 | 333 | 213 | - | 3401 | |
| | 1965 | - | - | - | - | 459 | 465 | 483 | 360 | 286 | - | - | - | - | |
| Average | - | 318 | 310 | 357 | 453 | 479 | 497 | 462 | 368 | 306 | 213 | - | 3232 | - | |
| Area Average | | - | 318 | 324 | 335 | 444 | 523 | 561 | 514 | 397 | 292 | 207 | - | 3390 | - |
| SACRAMENTO VALLEY | | | | | | | | | | | | | | | |
| Anderson 4E | 1958 | - | - | - | - | - | - | 602 | 563 | 483 | 385 | - | - | - | |
| | 1959 | - | - | 377 | 433 | 466 | 548 | 592 | 540 | 412 | 356 | - | - | 3724 | |
| | 1960 | - | - | 284 | 357 | 442 | 572 | 598 | 515 | 421 | 308 | - | - | 3497 | |
| | 1961 | - | - | 211 | 380 | 436 | 551 | 656 | 504 | 442 | 343 | - | - | 3523 | |
| | 1962 | - | - | - | - | 457 | 537 | 546 | 487 | 391 | 273 | - | - | - | |
| | 1963 | - | - | - | 288 | 404 | 508 | 519 | 466 | 360 | 244 | - | - | - | |
| | 1964 | - | - | - | - | 537 | 547 | 611 | 633 | 472 | 320 | - | - | - | |
| Average | - | - | 291 | 364 | 457 | 544 | 589 | 530 | 426 | 318 | - | - | 3519 | - | |
| Arbuckle 1S ^{4/} | 1958 | - | - | - | 432 | 561 | 552 | 601 | 557 | 482 | 452 | - | - | - | |
| | 1959 | - | - | 404 | 450 | 497 | 589 | 609 | 506 | 416 | 357 | - | - | 3730 | |
| | 1960 | - | - | 330 | 392 | 504 | 555 | 559 | 516 | 430 | 334 | - | - | 3624 | |
| | 1961 | - | - | 343 | 454 | 527 | 552 | 664 | 479 | 365 | 334 | - | - | 3718 | |
| Average | - | - | 359 | 432 | 522 | 562 | 608 | 515 | 423 | 369 | - | - | 3700 | - | |
| Bella Vista 4NE ^{4/} | 1959 | - | - | - | 404 | 437 | 494 | 674 | 493 | 393 | 333 | - | - | - | |
| | 1960 | - | - | 272 | 330 | 436 | 535 | - | 353 | 350 | 112 | - | - | - | |
| | 1961 | - | - | - | - | - | 487 | 522 | 436 | 388 | 272 | - | - | - | |
| Average | - | - | 272 | 367 | 436 | 505 | 598 | 494 | 378 | 328 | 112 | - | 3348 | - | |

Appendix E (Continued)

SUMMARY OF OBSERVED MONTHLY NET ATMOMETER EVAPORATION IN CALIFORNIA^{1/} In millimeters^{2/}

| Station name | Year of record | Months | | | | | | | | | | | | | |
|--------------------------------|----------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|---------|---------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct | Jan-Dec |
| SACRAMENTO VALLEY (Continued) | | | | | | | | | | | | | | | |
| Corning 3NE | 1960 | - | - | 326 | 417 | 476 | 568 | 633 | 562 | 462 | 365 | 168 | - | 3127 | - |
| | 1961 | - | - | 294 | 458 | 514 | 579 | 609 | 507 | 456 | 351 | - | - | 3768 | - |
| | 1962 | - | - | - | - | 517 | 567 | 636 | 584 | 431 | 271 | - | - | - | - |
| | 1963 | - | - | - | 335 | 463 | 513 | 581 | 509 | 424 | 296 | - | - | - | - |
| | Average | - | - | 310 | 403 | 492 | 558 | 615 | 540 | 443 | 320 | 168 | - | 3687 | - |
| Corning 3W ^{6/} | 1958 | - | - | - | 430 | 561 | 572 | 644 | 611 | 481 | 454 | - | - | - | - |
| | 1959 | - | - | - | 463 | 524 | 604 | 660 | 573 | 458 | 361 | - | - | - | - |
| | Average | - | - | - | 446 | 542 | 588 | 652 | 592 | 468 | 418 | - | - | - | - |
| Hamilton City 2W ^{b/} | 1954 | - | - | - | - | - | - | - | 459 | 373 | - | - | - | - | - |
| | 1955 | - | - | - | 386 | 514 | 547 | 601 | 570 | 457 | 362 | - | - | - | - |
| | Average | - | - | - | 386 | 514 | 547 | 601 | 570 | 458 | 368 | - | - | - | - |
| Newville 1E ^{4/} | 1959 | - | - | 383 | 437 | 499 | 595 | 632 | 573 | 470 | 409 | - | - | 3998 | - |
| | 1960 | - | - | 314 | 410 | 501 | 681 | 667 | 713 | 614 | 451 | 199 | - | 4351 | - |
| | 1961 | - | - | 288 | 395 | 450 | 543 | 604 | 486 | 436 | 333 | - | - | 3535 | - |
| | Average | - | - | 328 | 414 | 483 | 606 | 634 | 591 | 507 | 398 | 199 | - | 3961 | - |
| Red Bluff 5E | 1959 | - | - | 369 | 460 | 481 | 641 | 680 | 544 | 444 | 376 | - | - | 3991 | - |
| | 1960 | - | - | 301 | 393 | 487 | 600 | 606 | 499 | 412 | 323 | 150 | - | 3621 | - |
| | 1961 | - | - | 263 | 409 | 476 | 566 | 657 | 528 | 442 | 337 | - | - | 3678 | - |
| | 1962 | - | - | - | - | 510 | 579 | 603 | 530 | 415 | 299 | - | - | - | - |
| | 1963 | - | - | - | 310 | 407 | 480 | 513 | 441 | 360 | 280 | - | - | - | - |
| | 1964 | - | - | - | - | 539 | 559 | 634 | 593 | 507 | 361 | - | - | - | - |
| Average | - | - | 311 | 393 | 483 | 571 | 616 | 522 | 430 | 329 | 150 | - | 3655 | - | |
| Redding 5SE | 1955 | - | - | - | 270 | 578 | 613 | 640 | 691 | 490 | 195 | - | - | - | - |
| | 1956 | - | - | - | - | 464 | 564 | 607 | 548 | 430 | - | - | - | - | - |
| | 1957 | - | - | - | 432 | 461 | 622 | 597 | 485 | 379 | 252 | - | - | - | - |
| | 1958 | - | - | - | - | 506 | 510 | 571 | 547 | 500 | 397 | - | - | - | - |
| | 1959 | - | - | 389 | 449 | 491 | 633 | 739 | 602 | 456 | 396 | - | - | - | - |
| | 1960 | - | - | 281 | 373 | 470 | 632 | 677 | 567 | 463 | 316 | - | - | 3779 | - |
| | 1961 | - | - | 224 | 378 | 419 | 563 | 566 | 465 | 386 | 305 | - | - | 3306 | - |
| | Average | - | - | 298 | 380 | 484 | 591 | 628 | 558 | 443 | 310 | - | - | 3692 | - |
| Richvale 2SE ^{4/} | 1957 | - | - | - | - | - | - | - | 668 | 428 | 314 | - | - | - | - |
| | 1958 | - | - | - | 436 | 553 | 585 | 666 | 577 | 448 | 350 | - | - | - | - |
| | 1959 | - | - | 355 | 473 | 533 | 613 | 703 | 573 | 451 | 390 | - | - | 4091 | - |
| | 1960 | - | - | 309 | 425 | 516 | 639 | 636 | 612 | 474 | 370 | 179 | - | 3981 | - |
| | Average | - | - | 332 | 445 | 534 | 612 | 668 | 608 | 450 | 350 | 179 | - | 4008 | - |
| Thornton 2S | 1963 | - | - | - | - | - | - | - | 429 | 398 | 337 | - | - | - | - |
| | 1964 | - | - | - | 421 | 509 | 512 | 574 | 500 | 428 | 344 | - | - | - | - |
| | 1965 | - | - | - | 365 | 511 | 545 | 580 | 505 | 437 | 375 | - | - | - | - |
| | 1966 | - | - | - | 442 | 515 | 518 | 547 | 488 | 400 | 323 | - | - | - | - |
| | 1967 | - | - | - | 400 | 511 | 509 | 541 | 472 | 344 | 316 | - | - | - | - |
| | 1968 | - | - | - | 427 | 542 | 522 | 543 | 487 | 414 | 336 | - | - | - | - |
| Average | - | - | - | 411 | 518 | 521 | 557 | 480 | 411 | 338 | - | - | - | - | |
| Vina 1S ^{4/} | 1958 | - | - | - | 449 | 546 | 615 | 644 | 581 | 445 | 419 | - | - | - | - |
| | 1959 | - | - | 440 | 446 | 507 | 579 | 612 | 552 | 467 | 379 | - | - | - | - |
| | 1960 | - | - | - | 448 | 530 | 615 | 592 | 498 | - | - | - | - | - | - |
| | Average | - | - | 440 | 448 | 528 | 603 | 616 | 544 | 461 | 399 | - | - | 4729 | - |
| Willow 1S ^{4/} | 1955 | - | - | - | - | - | 504 | 641 | 614 | 529 | 421 | - | - | - | - |
| | 1956 | - | - | - | - | 510 | 615 | 690 | 648 | 515 | 371 | - | - | - | - |
| | 1957 | - | - | - | - | 533 | 638 | 681 | 618 | 486 | 330 | - | - | - | - |
| | 1958 | - | - | - | 458 | 538 | 589 | 659 | 773 | 457 | 357 | - | - | - | - |
| | 1959 | - | - | 419 | 489 | 539 | 637 | 662 | 559 | 481 | 400 | - | - | 4191 | - |
| | 1960 | - | - | 353 | 434 | 518 | 623 | 623 | 570 | 464 | 371 | 194 | - | 3950 | - |
| | 1961 | - | - | 304 | 430 | 516 | 523 | 584 | 414 | 422 | 311 | - | - | 3688 | - |
| | 1962 | - | - | - | - | 492 | 567 | 621 | 543 | 455 | 295 | - | - | - | - |
| | 1963 | - | - | - | 355 | 469 | 570 | 618 | 518 | 433 | 361 | - | - | - | - |
| | Average | - | - | 359 | 433 | 514 | 585 | 642 | 609 | 471 | 379 | 194 | - | 3932 | - |

Appendix E (Continued)

SUMMARY OF OBSERVED MONTHLY NET ATMOMETER EVAPORATION
IN CALIFORNIA^{1/}
In milliliters^{2/}

| Station name | Year of record | Months | | | | | | | | | | | | |
|-------------------------------|----------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| SACRAMENTO VALLEY (Continued) | | | | | | | | | | | | | | |
| Yuba City 7W | 1958 | - | - | - | 416 | 535 | 559 | 648 | 576 | 521 | 426 | - | - | - |
| | 1959 | - | - | 417 | 488 | 545 | 619 | 634 | 551 | 451 | 380 | - | - | - |
| | 1960 | - | - | 339 | 429 | 519 | 601 | 591 | 530 | 427 | 337 | 176 | - | - |
| | 1961 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1962 | - | - | - | - | - | - | 540 | 490 | 440 | 295 | - | - | - |
| | 1963 | - | - | - | 356 | 459 | 531 | 562 | 493 | 403 | 330 | - | - | - |
| | 1964 | - | - | - | - | 492 | 499 | 530 | 516 | 411 | 293 | - | - | - |
| Average | - | - | 378 | 422 | 510 | 562 | 584 | 526 | 442 | 345 | 176 | - | - | |
| Area Average | - | - | 330 | 411 | 499 | 569 | 613 | 541 | 442 | 346 | 100 | - | - | |
| SAN JOAQUIN VALLEY | | | | | | | | | | | | | | |
| Arvin 2.5NW | 1959 | - | - | 390 | 473 | 498 | 571 | 582 | 546 | 473 | 413 | - | - | 344 |
| | 1960 | - | - | - | 436 | 570 | 670 | 639 | 582 | 480 | 372 | - | - | - |
| | 1961 | - | - | 364 | 475 | 504 | 610 | 610 | 529 | 485 | 350 | - | - | 3427 |
| | 1962 | - | - | 344 | 444 | 500 | 601 | 622 | 576 | 498 | 355 | - | - | 3440 |
| | 1963 | - | - | 365 | 355 | 437 | 475 | 562 | 551 | 465 | 340 | - | - | 3500 |
| | 1964 | - | - | 360 | 434 | 496 | 528 | 563 | 516 | 466 | 381 | - | - | 3744 |
| | 1965 | - | - | 327 | 370 | 527 | 525 | 551 | 529 | 434 | - | - | - | - |
| Average | - | - | 358 | 427 | 505 | 569 | 590 | 547 | 472 | 368 | - | - | 3630 | |
| Bakersfield 10S | 1969 | - | - | - | - | 486 | 453 | 489 | 479 | 410 | 330 | - | - | - |
| | 1970 | - | - | 356 | 420 | 510 | 495 | - | - | - | - | - | - | - |
| | Average | - | - | 356 | 420 | 498 | 474 | 489 | 479 | 410 | 330 | - | - | 3450 |
| Berenda 2N | 1959 | - | - | - | - | 528 | 598 | 620 | 571 | 471 | 413 | - | - | - |
| | 1960 | - | - | 353 | 441 | 538 | 558 | 511 | 495 | 436 | 347 | - | - | 3679 |
| | 1961 | - | - | 369 | 453 | 495 | 551 | 552 | 476 | 456 | 346 | - | - | 3670 |
| | 1962 | - | - | 350 | 476 | 497 | 529 | 544 | 582 | 488 | 354 | - | - | 3320 |
| | 1963 | - | - | 319 | 338 | 465 | 525 | 578 | 518 | 399 | 347 | - | - | 3380 |
| Average | - | - | 348 | 427 | 505 | 552 | 561 | 528 | 450 | 361 | - | - | 3732 | |
| Buttonwillow 1S | 1965 | - | - | - | - | - | 508 | 555 | 509 | 432 | 382 | - | - | - |
| | 1966 | - | - | 323 | 423 | 421 | - | - | - | - | - | - | - | - |
| | Average | - | - | 323 | 423 | 421 | 508 | 555 | 509 | 432 | 382 | - | - | 3553 |
| Ceres 3E ^{6/} | 1959 | - | - | 400 | 460 | 520 | 573 | 549 | 513 | 379 | 335 | - | - | 3520 |
| | 1960 | - | - | 373 | 445 | 569 | 600 | 577 | 554 | 501 | 402 | - | - | 4021 |
| | 1961 | - | - | 370 | 466 | 481 | 539 | 490 | 441 | 443 | 368 | - | - | 3598 |
| | 1962 | - | - | 366 | 482 | 493 | - | - | - | - | - | - | - | - |
| | Average | - | - | 377 | 463 | 516 | 571 | 539 | 503 | 441 | 368 | - | - | 3778 |
| Fresno State College | 1969 | - | - | 374 | 467 | 524 | 478 | 536 | 553 | 413 | 329 | - | - | 3674 |
| | 1970 | - | - | - | - | 542 | 467 | 468 | 512 | 500 | 366 | - | - | - |
| | 1971 | - | - | - | 375 | 387 | 466 | 490 | 472 | 290 | 228 | - | - | - |
| | 1972 | - | - | 395 | 388 | 494 | 472 | 491 | 424 | 336 | 251 | - | - | 3251 |
| | Average | - | - | 384 | 410 | 487 | 471 | 496 | 490 | 385 | 294 | - | - | 3417 |
| Kerman 2ESE | 1960 | - | - | - | - | 490 | 536 | 540 | 516 | 415 | 343 | - | - | - |
| | 1961 | - | - | 331 | 435 | 472 | 521 | 604 | 479 | 456 | 360 | - | - | 3600 |
| | 1962 | - | - | 372 | 457 | 462 | 460 | 540 | 530 | 447 | 349 | - | - | 3607 |
| | 1963 | - | - | 358 | 373 | 481 | 463 | 494 | 523 | 395 | 325 | - | - | 3412 |
| | 1964 | - | - | 313 | 443 | 464 | 508 | 540 | 516 | 435 | 366 | - | - | 3700 |
| Average | - | - | 344 | 427 | 474 | 498 | 544 | 513 | 430 | 349 | - | - | 3709 | |
| Kingsburg 5S | 1959 | - | - | 421 | 455 | 517 | 544 | 604 | 529 | 431 | 371 | - | - | 3872 |
| | 1960 | - | - | - | 427 | 502 | 511 | 507 | 494 | 395 | 330 | - | - | - |
| | 1961 | - | - | 381 | 466 | 506 | 552 | 529 | 558 | 474 | - | - | - | - |
| | Average | - | - | 401 | 449 | 508 | 536 | 547 | 527 | 433 | 350 | - | - | 3751 |
| Maze Bridge 2S | 1959 | - | - | 427 | 476 | 531 | 590 | 610 | 515 | 419 | 360 | - | - | 3934 |
| | 1960 | - | - | 362 | 438 | 528 | 583 | 591 | 547 | 452 | 350 | - | - | 3850 |
| | 1961 | - | - | 364 | 440 | 482 | 569 | 555 | 488 | 419 | 332 | - | - | 3440 |
| | 1962 | - | - | 344 | 459 | 492 | 523 | 581 | 569 | 491 | 370 | - | - | 3700 |
| | 1963 | - | - | 333 | 330 | 503 | 491 | 600 | 496 | 404 | 280 | - | - | 3444 |
| | 1964 | - | - | 312 | 469 | 540 | 442 | 599 | 549 | 486 | 372 | - | - | 3709 |
| | 1965 | - | - | 316 | 300 | 592 | 552 | - | - | - | - | - | - | - |
| | Average | - | - | 351 | 416 | 524 | 536 | 589 | 527 | 449 | 336 | - | - | 3724 |

Appendix E (Continued)

SUMMARY OF OBSERVED MONTHLY NET ATMOSPHERIC EVAPORATION
IN CALIFORNIA^{1/}
In milliliters^{2/}

| Station name | Year of record | Month | | | | | | | | | | | | | | |
|--|-----------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|---------|---|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar-Oct | Jan-Dec | |
| SAN JOAQUIN VALLEY (Continued) | | | | | | | | | | | | | | | | |
| Mendota (SW) ⁶ | 1959 | - | - | - | 473 | 561 | 595 | 590 | 561 | 456 | 420 | - | - | - | - | |
| | 1960 | - | - | 410 | 452 | - | - | - | 593 | 502 | 371 | - | - | - | - | |
| | 1961 | - | - | 383 | 483 | 544 | 630 | 615 | 528 | 516 | 406 | - | - | 4105 | - | |
| | 1962 | - | - | 364 | 464 | 514 | - | - | - | - | - | - | - | - | - | |
| | Average | - | - | 366 | 468 | 540 | 612 | 602 | 561 | 491 | 399 | - | - | 4059 | - | |
| | Merced (SE #1) | 1959 | - | - | 415 | 475 | 515 | 588 | 576 | 536 | 427 | 388 | - | - | 3420 | - |
| | | 1960 | - | - | 371 | 457 | 526 | 578 | 567 | 541 | 442 | 359 | - | - | 3841 | - |
| 1961 | | - | - | 379 | 477 | 28 | 614 | 730 | 583 | 483 | 407 | - | - | 4181 | - | |
| 1962 | | - | - | 356 | 453 | 513 | 571 | 571 | 535 | 436 | 319 | - | - | 3740 | - | |
| 1963 | | - | - | 316 | 353 | 668 | 525 | 570 | 548 | 442 | 353 | - | - | 3670 | - | |
| 1964 | | - | - | 268 | 448 | 504 | 549 | 581 | 584 | 460 | 345 | - | - | 3739 | - | |
| Average | | - | - | 348 | 444 | 526 | 571 | 599 | 554 | 448 | 369 | - | - | 3840 | - | |
| Merced (SE #2) | 1964 | - | - | - | - | - | - | - | 500 | 435 | 385 | - | - | - | - | |
| | 1965 | - | - | 203 | 420 | 508 | 590 | 646 | 587 | 485 | 442 | - | - | 3881 | - | |
| | 1966 | - | - | - | 508 | 556 | 605 | 607 | 625 | 491 | 401 | - | - | - | - | |
| | 1967 | - | - | 340 | 345 | 480 | 500 | 550 | 610 | 445 | 334 | - | - | 3664 | - | |
| | 1968 | - | - | 347 | 495 | 564 | 647 | 621 | - | - | - | - | - | - | - | |
| | Average | - | - | 297 | 442 | 527 | 586 | 606 | 580 | 464 | 406 | - | - | 3706 | - | |
| Newman (SE) | 1960 | - | - | - | - | - | 543 | 542 | 533 | 426 | 321 | - | - | - | - | |
| | 1961 | - | - | 351 | 449 | 484 | 566 | 556 | 486 | 417 | 348 | - | - | 3657 | - | |
| | 1962 | - | - | 347 | 466 | 493 | 520 | 562 | 570 | 448 | 313 | - | - | 3719 | - | |
| | 1963 | - | - | 348 | 349 | 506 | 564 | 593 | 538 | 447 | 351 | - | - | 3490 | - | |
| | 1964 | - | - | 298 | 435 | 579 | 427 | 562 | 513 | 435 | 372 | - | - | 3621 | - | |
| | 1965 | - | - | 320 | 305 | 478 | 491 | - | - | - | - | - | - | - | - | |
| | Average | - | - | 333 | 401 | 508 | 518 | 563 | 528 | 435 | 341 | - | - | 3625 | - | |
| Old River (S) | 1966 | - | - | 353 | 456 | 479 | 520 | 531 | 529 | 426 | 343 | - | - | 3637 | - | |
| | 1967 | - | - | 315 | 337 | 493 | 546 | 614 | 565 | 443 | 396 | - | - | 3749 | - | |
| | Average | - | - | 334 | 396 | 486 | 533 | 572 | 547 | 434 | 370 | - | - | 3692 | - | |
| | Old River (SW) ^L | 1968 | - | - | - | - | - | 537 | 529 | 462 | 438 | 325 | - | - | - | - |
| 1969 | | - | - | 355 | 432 | 469 | 544 | 585 | 552 | 439 | 315 | - | - | 3820 | - | |
| 1970 | | - | - | 407 | 455 | 583 | 554 | 565 | 569 | 493 | 369 | - | - | 3945 | - | |
| 1971 | | - | - | 364 | 389 | 448 | 512 | 497 | 456 | 368 | 308 | - | - | 3342 | - | |
| 1972 | | - | - | 430 | 474 | 547 | 532 | 542 | 499 | 411 | 313 | 179 | - | 3748 | - | |
| Average | | - | - | 389 | 436 | 537 | 536 | 544 | 508 | 429 | 334 | 159 | - | 3710 | - | |
| Yuba (N) | | 1962 | - | - | - | - | - | 615 | 647 | 602 | 503 | 351 | - | - | - | - |
| | 1963 | - | - | 399 | 356 | 433 | 502 | 558 | 508 | 471 | 325 | - | - | 3552 | - | |
| | 1964 | - | - | 401 | 444 | 554 | 572 | 622 | 598 | 496 | 403 | - | - | 4099 | - | |
| | 1965 | - | - | 329 | 376 | 552 | 547 | - | - | - | - | - | - | - | - | |
| | Average | - | - | 376 | 372 | 513 | 559 | 609 | 569 | 490 | 369 | - | - | 3808 | - | |
| Yuba (S) | 1959 | - | - | - | 481 | 484 | 523 | 577 | 535 | 444 | 378 | - | - | - | - | |
| | 1960 | - | - | 319 | 442 | 612 | 588 | 612 | 618 | 484 | 344 | - | - | 4020 | - | |
| | 1961 | - | - | 337 | 424 | 452 | 536 | 537 | 509 | 464 | 371 | - | - | 3630 | - | |
| | Average | - | - | 324 | 449 | 516 | 549 | 579 | 554 | 464 | 368 | - | - | 3833 | - | |
| Yuba (SESE) | 1962 | - | - | 34 | 489 | 483 | 61 | 608 | 65 | 48 | 318 | - | - | 3820 | - | |
| | 1963 | - | - | 338 | 372 | 477 | 503 | 561 | 542 | 409 | 241 | - | - | 3513 | - | |
| | 1964 | - | - | 386 | 415 | 546 | 462 | 611 | 3 | 442 | 389 | - | - | 3724 | - | |
| | 1965 | - | - | 312 | 393 | 509 | 564 | - | - | - | - | - | - | - | - | |
| | Average | - | - | 347 | 422 | 525 | 522 | 593 | 608 | 494 | 393 | - | - | 3730 | - | |
| Area Average | | - | - | 355 | 430 | 511 | 541 | 569 | 533 | 440 | 344 | 179 | - | 3741 | - | |
| CENTRAL COAST COASTAL VALLEYS AND PLAINS | | | | | | | | | | | | | | | | |
| Bottle Rock (SW) | 1961 | - | - | 300 | 404 | 430 | 388 | 433 | 410 | 33 | 318 | 203 | 201 | 3503 | - | |
| | 1962 | - | - | - | - | 442 | - | - | - | - | - | - | - | - | - | |
| | Average | - | - | 300 | 404 | 436 | 388 | 433 | 410 | 33 | 318 | 203 | 201 | 3503 | - | |
| Santalitas (SW) | 1963 | - | - | - | - | - | 480 | 440 | 46 | 313 | 203 | - | - | - | - | |
| | 1964 | - | - | 39 | 402 | 473 | 484 | 411 | 69 | 309 | 277 | - | - | - | - | |
| | 1965 | - | - | 349 | 409 | 347 | 426 | 442 | 62 | 62 | 212 | - | - | - | - | |
| | Average | - | - | 379 | 404 | 399 | 471 | 479 | 300 | 62 | 278 | - | - | - | - | |

Appendix E (Continued)

SUMMARY OF OBSERVED MONTHLY NET ATMOMETER EVAPORATION
IN CALIFORNIA^{1/}
In milliliters^{2/}

| Station name | Year of record | Months | | | | | | | | | | | | Mar-Oct | Jan-Dec | | |
|--|----------------|--------|-----|-----|-----|--------------------|-----|-----|-----|-----|-----|-----|------|---------|---------|--|--|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | | | | |
| CENTRAL COAST - COASTAL VALLEYS AND PLAINS (Continued) | | | | | | | | | | | | | | | | | |
| Lompoc 0.2N ^{8/} | 1957 | - | - | - | - | 506 | 520 | 545 | 486 | 480 | 301 | 289 | 252 | - | - | | |
| | 1958 | 276 | 257 | 283 | 380 | 484 | 538 | 485 | 467 | 454 | 386 | - | 263 | 3477 | - | | |
| | 1959 | 285 | 272 | 420 | 404 | 509 | 495 | 478 | 420 | 354 | - | - | - | - | - | | |
| | 1960 | - | - | - | - | Data not available | | | | | | | | | | | |
| | 1961 | - | - | - | - | - | 473 | 475 | 425 | 364 | - | - | - | - | - | | |
| | Average | 280 | 264 | 352 | 392 | 500 | 506 | 496 | 450 | 413 | 344 | 289 | 258 | 3453 | 4544 | | |
| Salinas 3E ^{9/} | 1969 | - | - | - | 373 | 406 | 321 | 428 | 449 | 380 | 266 | 225 | - | - | - | | |
| | 1970 | - | - | - | - | 406 | 384 | 325 | 350 | 293 | 262 | 276 | - | - | - | | |
| | 1971 | - | - | - | 377 | 334 | 408 | - | - | - | - | - | - | - | - | | |
| | Average | - | - | - | 375 | 382 | 371 | 376 | 400 | 336 | 264 | 250 | - | - | - | | |
| Salinas 4NE ^{9/} | 1965 | - | - | - | - | 405 | 361 | 387 | 391 | 311 | 273 | 188 | 224 | - | - | | |
| | Average | - | - | - | - | 405 | 361 | 387 | 391 | 311 | 273 | 188 | 224 | - | - | | |
| Santa Maria 4SE | 1961 | - | - | 396 | 440 | 458 | 442 | 484 | 444 | 368 | 355 | 247 | 238 | 3387 | - | | |
| | 1962 | - | - | - | - | 427 | - | - | - | - | - | - | - | - | - | | |
| | Average | - | - | 396 | 440 | 442 | 442 | 484 | 444 | 368 | 355 | 247 | 238 | 3371 | - | | |
| Santa Rita 2N | 1962 | - | - | - | - | - | - | 397 | 422 | 294 | 319 | 241 | 206 | - | - | | |
| | 1963 | - | - | 356 | 380 | 379 | 420 | 514 | 393 | 379 | 288 | 194 | 238 | 3109 | - | | |
| | 1964 | 228 | 297 | 348 | 379 | 408 | 416 | 423 | 377 | 332 | 293 | 145 | 235 | 2976 | 3881 | | |
| | 1965 | 145 | 242 | 239 | - | - | - | - | - | - | - | - | - | - | - | | |
| | Average | 186 | 270 | 314 | 380 | 394 | 418 | 445 | 397 | 335 | 300 | 193 | 226 | 2983 | 3858 | | |
| Area Average | 234 | 267 | 344 | 388 | 427 | 423 | 450 | 421 | 363 | 311 | 231 | 232 | 3127 | 4091 | | | |
| CENTRAL COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | | | |
| Hollister 6NNW ^{6/} | 1962 | - | - | - | 468 | 502 | 534 | 557 | 549 | 421 | 347 | 249 | - | - | - | | |
| | 1963 | - | - | 330 | 343 | 422 | 507 | 533 | 472 | 376 | 283 | 172 | - | 3266 | - | | |
| | 1964 | - | - | - | 432 | 460 | 498 | 515 | 455 | 258 | 161 | - | - | - | - | | |
| | Average | - | - | 330 | 414 | 461 | 513 | 535 | 492 | 352 | 264 | 210 | - | 3361 | - | | |
| San Lucas 0.3S ^{6/} | 1962 | - | - | - | 497 | 542 | 543 | 548 | 538 | 437 | 346 | 251 | - | - | - | | |
| | 1963 | - | - | 386 | 411 | 456 | 521 | 570 | 486 | 387 | 310 | 244 | 248 | 3527 | - | | |
| | 1964 | - | - | - | 421 | 665 | 522 | 581 | 558 | 561 | 432 | - | - | - | - | | |
| | 1965 | - | - | - | - | - | 381 | 485 | 429 | 340 | 333 | 169 | - | - | - | | |
| | Average | - | - | 386 | 443 | 554 | 492 | 546 | 503 | 431 | 355 | 221 | 248 | 3710 | - | | |
| Soledad 3.5NW ^{10/} | 1961 | - | - | 362 | 458 | 470 | 483 | 501 | 414 | 382 | 326 | 196 | 186 | 3396 | - | | |
| | 1962 | 222 | 177 | 349 | 466 | 483 | 490 | 509 | 520 | 417 | 376 | 291 | 246 | 3610 | 4546 | | |
| | 1963 | - | 212 | 343 | 375 | 414 | 480 | 512 | 454 | 422 | 335 | 237 | 239 | 3335 | - | | |
| | 1964 | 221 | 265 | 323 | 372 | 431 | 467 | 454 | 444 | 372 | 252 | 242 | 173 | 3115 | 4016 | | |
| | 1965 | 218 | 286 | 317 | 350 | 508 | 494 | 527 | 534 | 420 | 549 | 277 | - | 3699 | - | | |
| | 1966 | - | - | 606 | 590 | 705 | 763 | 515 | 515 | 432 | 361 | 234 | 161 | 4487 | - | | |
| | 1967 | 238 | 309 | 324 | 314 | 447 | 368 | 419 | 340 | 291 | 302 | 210 | 190 | 2805 | 3752 | | |
| | 1968 | 168 | 165 | 281 | 318 | 342 | 361 | 479 | 352 | 315 | 257 | 195 | 131 | 2705 | 3364 | | |
| | 1969 | 128 | 154 | 258 | 298 | 345 | 318 | 330 | 245 | 229 | 183 | 129 | - | 2206 | - | | |
| | 1970 | - | - | - | - | 485 | 435 | 432 | 405 | 389 | 262 | - | - | - | - | | |
| | Average | 199 | 224 | 351 | 393 | 463 | 466 | 468 | 422 | 367 | 320 | 223 | 189 | 3250 | 4085 | | |
| Area Average | 199 | 224 | 353 | 408 | 480 | 480 | 498 | 454 | 379 | 319 | 221 | 197 | 3371 | 4212 | | | |

1/ Irrigated pasture environments except as noted.
2/ Calculated from observed evaporation from Livingston black and white spherical atmometers. Data reported are the average of three atmometer pairs at each station.
3/ Non-irrigated alfalfa environment.
4/ Dry land environment.
5/ Flood irrigated native pasture.
6/ Irrigated alfalfa.
7/ Station serviced by San Luis Obispo County Flood Control and Water Conservation District.
8/ Data contributed by Paul R. Nixon, USDA-ARS. Average represents the ARS estimate of long-term average monthly net atmometer evaporation.
9/ Station serviced by Monterey County Flood Control and Water Conservation District.
10/ Station serviced by California Dept. of Corrections, Soledad Correctional Training Facility.

APPENDIX F
SUMMARY OF OBSERVED INCOMING SOLAR
RADIATION IN CALIFORNIA

Appendix F

SUMMARY OF OBSERVED INCOMING SOLAR RADIATION IN CALIFORNIA In equivalent inches of evaporation^{1/2}

| Station | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar - Oct | Jan - Dec |
|---------------------------------------|------|------|------|------|-------|-------|-------|-------|-------|-------|------|------|------|-----------|-----------|
| NORTHEASTERN MOUNTAIN VALLEYS | | | | | | | | | | | | | | | |
| Alturas 2SE | 1963 | 3.17 | 5.39 | 7.93 | 8.28 | 11.72 | 12.88 | 15.04 | 12.89 | 8.46 | 6.09 | 3.09 | 2.73 | 82.62 | 96.00 |
| | 1964 | 3.57 | 3.99 | 7.26 | | | | | | | | | | | |
| Average | | 3.37 | 4.69 | 7.60 | 8.28 | 11.72 | 12.88 | 15.04 | 12.89 | 8.46 | 6.09 | 3.09 | 2.73 | 82.96 | 96.84 |
| Glenburn 0.3SE | 1963 | 3.94 | 4.41 | 7.49 | 8.62 | 11.43 | 13.36 | 14.73 | 12.60 | 8.48 | 5.92 | 2.58 | 2.65 | 82.63 | 96.21 |
| | 1964 | 2.75 | 5.65 | 7.80 | 10.62 | 12.09 | 12.23 | 13.97 | 12.26 | 9.33 | 6.27 | | | 84.57 | |
| | 1965 | 2.86 | 4.52 | 7.24 | 7.99 | 12.72 | 12.47 | 14.64 | 12.50 | 10.42 | 7.60 | 3.83 | | 85.38 | |
| | 1966 | - | 5.92 | 8.97 | 12.14 | 13.95 | 15.45 | 16.42 | 12.28 | 11.36 | | | | | |
| Average | | 3.18 | 5.12 | 7.88 | 9.84 | 12.55 | 13.38 | 14.94 | 12.36 | 9.90 | 6.60 | 3.20 | 2.65 | 87.45 | 101.60 |
| Area Average | | 3.26 | 4.98 | 7.78 | 9.53 | 12.38 | 13.28 | 14.96 | 12.47 | 9.61 | 6.47 | 3.17 | 2.69 | 86.48 | 100.58 |
| NORTH COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | |
| Covelo 1NW | 1966 | - | 5.29 | 8.20 | 11.22 | 13.27 | 13.34 | - | 12.48 | 6.58 | 7.43 | 3.76 | 3.07 | | |
| | 1967 | - | 5.33 | 6.57 | 8.58 | 13.73 | - | 14.90 | 13.25 | 10.13 | 7.74 | 4.62 | | | |
| | 1968 | - | 4.69 | 8.24 | 13.02 | 13.27 | - | 14.46 | 11.60 | 10.20 | 6.82 | 3.73 | 3.13 | | |
| | 1969 | - | 3.77 | 9.37 | 10.72 | - | - | - | - | - | - | - | - | | |
| Average | | - | 4.77 | 8.10 | 10.88 | 13.42 | 13.34 | 14.68 | 12.44 | 8.97 | 7.33 | 4.04 | 3.10 | 89.16 | |
| Upper Lake 1SE | 1970 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1971 | 4.76 | 6.99 | 8.49 | 11.53 | 12.39 | 14.23 | 15.40 | 14.10 | 11.29 | 8.72 | 5.17 | 3.17 | 96.15 | 117.08 |
| | 1972 | 4.55 | 4.71 | 9.03 | 11.49 | 13.68 | - | 14.83 | 13.12 | - | - | - | - | - | - |
| Average | | 4.66 | 5.85 | 8.76 | 11.51 | 13.04 | 14.23 | 15.12 | 13.61 | 11.29 | 8.72 | 5.17 | 3.59 | 96.28 | 115.55 |
| Area Average | | 4.66 | 5.13 | 8.32 | 11.09 | 13.27 | 13.78 | 14.90 | 12.91 | 9.55 | 7.68 | 4.32 | 3.34 | 91.50 | 108.95 |
| SACRAMENTO VALLEY | | | | | | | | | | | | | | | |
| Davis 2W ^{2/3} | 1959 | - | - | - | - | - | - | 14.67 | 12.98 | 8.44 | 7.94 | 5.69 | 4.38 | | |
| | 1960 | 4.75 | 6.73 | 9.35 | 12.44 | 14.92 | 15.01 | 14.51 | 13.39 | 10.08 | 7.47 | 5.27 | 3.69 | 97.17 | 117.61 |
| | 1961 | 2.87 | 5.99 | 9.47 | 11.62 | 13.98 | 14.73 | 15.26 | 12.82 | 10.53 | 7.82 | 5.23 | 3.38 | 96.23 | 113.70 |
| | 1962 | 4.78 | 5.79 | 9.32 | 12.04 | 13.98 | 15.37 | 15.54 | 14.13 | 10.83 | 7.10 | 5.39 | 3.56 | 98.31 | 117.83 |
| | 1963 | 4.14 | 5.27 | 8.65 | 9.75 | 12.56 | 15.44 | 15.77 | 13.78 | 9.88 | 7.76 | 3.93 | 2.26 | 93.59 | 109.19 |
| | 1964 | 3.92 | 7.69 | 9.39 | 12.96 | 14.50 | 13.47 | 15.06 | 13.68 | 10.10 | 7.05 | 4.14 | 3.17 | 96.21 | 115.13 |
| | 1965 | 2.88 | 5.64 | 7.06 | 8.34 | 13.22 | 14.16 | 14.27 | 12.40 | 9.80 | 8.08 | 4.11 | 2.86 | 87.33 | 102.82 |
| | 1966 | 4.51 | 5.65 | 9.21 | 12.07 | 13.85 | 14.33 | 14.27 | 12.40 | 10.54 | 8.02 | 4.12 | 2.63 | 96.19 | 113.10 |
| | 1967 | 3.92 | 5.60 | 8.34 | 9.79 | 14.35 | 13.53 | 15.24 | 13.41 | 10.38 | 8.05 | 4.59 | 4.53 | 93.09 | 111.73 |
| | 1968 | 4.02 | 5.08 | 8.95 | 12.34 | 13.88 | 14.71 | 15.27 | 12.72 | 10.96 | 7.36 | 3.87 | 3.56 | 96.19 | 112.72 |
| | 1969 | 3.10 | 4.09 | 9.73 | 11.19 | 14.83 | 13.61 | 15.26 | 13.58 | 10.50 | 7.27 | 5.22 | 3.32 | 95.97 | 111.70 |
| | 1970 | 3.41 | 5.46 | 9.38 | 11.51 | 13.81 | 14.10 | 15.19 | 13.99 | 11.50 | 7.84 | 4.01 | 3.14 | 97.01 | 113.03 |
| | 1971 | 3.98 | 6.23 | 8.91 | 11.99 | 11.80 | 14.22 | 14.73 | 13.73 | 10.85 | 8.35 | 5.28 | 3.79 | 94.58 | 113.86 |
| Average | | 3.86 | 5.77 | 8.98 | 11.34 | 13.81 | 14.39 | 15.05 | 13.37 | 10.31 | 7.70 | 4.68 | 3.41 | 94.95 | 112.67 |

SUMMARY OF OBSERVED INCOMING SOLAR RADIATION IN CALIFORNIA
In equivalent inches of evaporation

| Station | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar - Oct | Jan - Dec | |
|-------------------------------|--------------------|------|------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-----------|-----------|--------|
| SACRAMENTO VALLEY (Continued) | | | | | | | | | | | | | | | | |
| Newville 1E | 1966 | - | 5.92 | 8.03 | 6.86 | - | 13.34 | 14.79 | 13.08 | - | 8.26 | 3.55 | 2.87 | - | - | |
| | 1967 | 3.82 | 4.30 | 8.49 | 12.11 | 13.35 | 14.27 | 14.23 | 11.91 | 10.62 | 7.47 | 4.50 | 4.44 | 88.52 | 107.20 | |
| | 1968 | 4.13 | 3.71 | 8.74 | 11.08 | 14.77 | 14.35 | 15.12 | 13.39 | 9.25 | 6.36 | 3.67 | 3.23 | 92.45 | 107.78 | |
| | 1969 | 3.19 | 4.94 | 9.28 | 11.95 | 13.35 | 13.28 | 15.17 | 13.85 | 11.02 | 7.64 | 4.32 | 2.61 | 93.06 | 106.89 | |
| | 1970 | 2.61 | 4.72 | 8.64 | 10.50 | 13.92 | 13.81 | 14.83 | 13.06 | 10.29 | 7.54 | 3.63 | 2.92 | 95.54 | 109.64 | |
| | Average | 3.44 | 4.45 | 7.76 | 8.36 | 13.71 | 13.53 | 14.21 | 12.54 | 9.87 | 7.13 | 3.94 | - | - | 87.11 | 107.89 |
| | 1967 | 3.80 | 4.45 | 8.51 | 12.34 | 13.89 | - | 14.10 | 10.60 | - | - | 3.53 | - | - | - | - |
| | 1968 | - | 3.50 | 8.74 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1969 | 3.80 | 4.47 | 8.34 | 10.35 | 13.80 | 13.53 | 14.16 | 11.57 | 9.87 | 7.13 | 3.74 | - | - | 88.75 | - |
| | Average | 3.80 | 4.47 | 8.34 | 10.35 | 13.80 | 13.53 | 14.16 | 11.57 | 9.87 | 7.13 | 3.74 | - | - | 88.75 | - |
| Thornton 2S | 1963 | - | 6.10 | 8.18 | 11.43 | 12.83 | 12.07 | 13.81 | 11.01 | 8.84 | 7.11 | 3.49 | 2.25 | - | - | |
| | 1964 | 3.17 | 5.80 | 7.66 | 7.83 | 11.62 | 13.77 | 14.00 | 12.52 | 9.63 | 7.26 | 3.57 | 3.09 | 84.08 | 100.01 | |
| | 1965 | 4.59 | 5.76 | 9.20 | 12.98 | 13.58 | 13.63 | 14.39 | 13.25 | 10.70 | 8.03 | 4.22 | 2.65 | 84.29 | 102.65 | |
| | 1966 | 4.67 | 4.97 | 7.95 | 9.00 | 14.54 | 13.57 | 15.25 | 13.39 | 11.10 | 9.91 | 6.38 | 5.13 | 95.76 | 113.06 | |
| | 1967 | 3.78 | 5.39 | 7.91 | 10.18 | 12.48 | 12.96 | 14.56 | 10.75 | 9.33 | 8.28 | 4.44 | 3.98 | 94.71 | 114.97 | |
| | 1968 | 3.96 | 5.60 | 8.18 | 10.28 | 13.01 | 13.20 | 14.40 | 12.18 | 9.72 | 7.77 | 4.47 | 3.39 | 86.45 | 104.22 | |
| | Average | 4.03 | 5.54 | 7.32 | 11.95 | 14.83 | 14.84 | 15.25 | 13.81 | 11.16 | 8.39 | - | - | 88.74 | 106.23 | |
| | 1958 | - | 5.40 | 8.62 | 10.92 | 13.70 | 14.01 | 14.82 | 12.96 | 10.18 | 7.69 | 4.42 | 3.36 | 97.55 | 109.90 | |
| | Area Average | 3.82 | 5.40 | 8.62 | 10.92 | 13.70 | 14.01 | 14.82 | 12.96 | 10.18 | 7.69 | 4.42 | 3.36 | 92.90 | 109.90 | |
| | SAN JOAQUIN VALLEY | | | | | | | | | | | | | | | |
| Arvin 2.5NW | 1959 | 4.53 | 6.09 | 10.08 | 11.91 | 14.10 | 13.97 | 13.87 | 13.14 | 10.88 | 8.59 | 6.12 | 4.40 | 96.54 | 117.68 | |
| | 1960 | 4.86 | 5.88 | 9.80 | 11.87 | 13.96 | 14.45 | 13.62 | 13.66 | 10.76 | 8.30 | 5.23 | 4.03 | 96.42 | 116.42 | |
| | 1961 | 3.73 | 6.16 | 8.78 | 11.83 | 12.66 | 13.42 | 13.31 | 11.81 | 10.44 | 7.61 | 5.07 | 3.44 | 89.86 | 108.26 | |
| | 1962 | 4.65 | 4.58 | 8.82 | 11.24 | 13.10 | 13.44 | 13.64 | 12.68 | 10.50 | 7.74 | 5.19 | 3.34 | 91.16 | 108.92 | |
| | 1963 | 4.78 | 5.43 | 9.14 | 10.09 | 11.62 | 12.80 | 13.73 | 11.83 | 10.39 | 6.72 | 4.46 | 3.04 | 85.32 | 103.03 | |
| | 1964 | 4.19 | 6.42 | 8.47 | 10.28 | 12.34 | 13.14 | 13.52 | 12.14 | 10.42 | 8.16 | 5.09 | 3.90 | 88.47 | 108.07 | |
| | 1965 | 4.67 | 6.03 | 8.28 | 8.36 | 12.66 | 11.91 | 13.27 | 12.10 | 9.77 | - | - | - | - | - | |
| | Average | 4.49 | 5.80 | 9.05 | 10.80 | 12.92 | 13.30 | 13.57 | 12.48 | 10.31 | 7.85 | 5.19 | 3.69 | 90.28 | 109.45 | |
| | 1969 | - | 5.35 | 7.26 | 9.73 | 11.45 | 10.80 | 11.85 | 10.35 | 8.08 | 6.30 | 4.40 | 3.76 | - | - | - |
| | 1970 | 3.82 | 5.35 | 7.26 | 9.73 | 11.45 | 10.62 | - | - | - | - | - | - | - | - | - |
| Area Average | 3.82 | 5.35 | 7.26 | 9.73 | 11.19 | 10.71 | 11.85 | 10.35 | 8.08 | 6.30 | 4.40 | 3.76 | 75.47 | 92.80 | | |
| Bakersfield 10S | 1962 | - | 5.16 | 9.45 | 10.60 | 12.79 | 13.67 | 14.42 | 13.35 | 10.36 | 7.32 | 4.93 | 3.25 | - | - | |
| | 1963 | 3.76 | 5.16 | 9.45 | 10.60 | 12.79 | 14.09 | 14.83 | 12.27 | 8.84 | 6.91 | 3.53 | 1.13 | 89.78 | 103.36 | |
| | Average | 3.76 | 5.16 | 9.45 | 10.60 | 13.11 | 13.88 | 14.62 | 12.81 | 9.60 | 7.12 | 4.23 | 2.19 | 91.19 | 106.53 | |
| Buttonwillow 1S | 1965 | - | 5.75 | 8.68 | 11.00 | 12.43 | 13.00 | 13.10 | 11.43 | 9.71 | 8.01 | 4.56 | 2.80 | - | - | |
| | 1966 | 4.76 | 5.75 | 8.68 | 11.00 | 12.43 | 13.00 | - | - | - | - | - | - | - | - | |
| | Average | 4.76 | 5.75 | 8.68 | 11.00 | 12.43 | 13.00 | 13.10 | 11.43 | 9.71 | 8.01 | 4.56 | 2.80 | 87.36 | 105.23 | |

Appendix F (Continued)

SUMMARY OF OBSERVED INCOMING SOLAR RADIATION IN CALIFORNIA
In equivalent inches of evaporation^{1/2}

| Station | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar - Oct | Jan - Dec |
|--|---------|------|------|------|-------|-------|-------|-------|-------|-------|-------|------|------|-----------|-----------|
| SAN JOAQUIN VALLEY (Continued) | | | | | | | | | | | | | | | |
| Fresno NWS ^{1/2} | 1959 | 3.48 | 5.26 | 9.22 | 10.82 | 13.12 | 13.22 | 12.64 | 11.47 | 9.51 | 7.55 | 5.15 | 3.92 | 87.55 | 105.36 |
| | 1960 | 4.13 | 4.71 | 8.05 | 10.42 | 12.60 | 12.80 | 11.58 | 11.31 | 8.90 | 7.09 | 4.04 | 3.02 | 82.75 | 98.65 |
| | 1961 | 2.80 | 5.20 | 8.37 | 10.60 | 11.89 | 10.60 | 13.00 | 10.74 | 9.17 | 6.99 | 4.62 | 2.34 | 82.99 | 97.95 |
| | 1962 | 3.36 | 3.66 | 8.28 | 10.84 | 11.93 | 14.60 | 15.77 | 14.33 | 11.57 | 8.34 | 5.27 | - | 95.66 | - |
| | 1963 | - | 4.58 | 9.05 | 10.26 | 13.33 | 14.39 | 15.40 | 13.37 | 9.69 | 7.36 | 3.86 | 1.98 | 92.85 | 113.13 |
| | 1964 | 3.80 | 6.54 | 8.97 | 11.65 | 13.69 | 14.15 | 14.92 | 12.91 | 10.74 | 7.76 | 4.93 | 3.07 | 94.79 | 113.13 |
| | 1965 | 3.36 | 5.92 | 8.55 | 9.65 | 14.27 | 13.91 | 14.00 | 12.56 | 9.97 | 8.26 | 4.16 | 3.05 | 91.17 | 107.66 |
| | 1966 | 4.61 | 5.80 | 9.33 | 11.95 | 13.12 | 13.85 | 14.21 | 12.95 | 9.91 | 7.55 | 4.38 | 2.07 | 92.87 | 109.73 |
| | 1967 | 3.40 | 5.05 | 7.97 | 9.21 | 13.77 | 13.89 | 14.14 | 12.87 | 10.03 | 8.39 | 4.06 | 4.13 | 90.27 | 106.91 |
| | 1968 | 3.84 | 4.26 | 8.53 | 12.13 | 13.87 | - | - | - | - | - | 3.71 | 3.11 | - | - |
| | 1969 | 2.13 | 4.11 | 8.59 | 10.70 | 13.06 | 12.64 | 13.27 | 12.10 | 9.55 | 7.05 | 4.85 | 3.46 | 86.96 | 101.51 |
| | 1970 | 4.01 | 5.69 | 9.64 | 12.03 | 14.71 | 14.07 | 14.50 | 13.60 | 11.18 | 8.03 | 4.85 | 3.46 | 97.76 | 115.77 |
| | 1971 | 4.15 | 5.67 | 9.60 | 11.37 | 12.04 | 15.12 | 14.62 | 12.79 | 10.48 | 8.09 | 5.07 | 3.48 | 94.11 | 112.48 |
| | Average | | 3.59 | 5.11 | 8.78 | 10.89 | 13.18 | 13.74 | 14.00 | 12.58 | 10.06 | 7.70 | 4.53 | 3.09 | 90.93 |
| Kerman ZESE | | | | | | | | | | | | | | | |
| 1964 | | 3.88 | 6.05 | 8.57 | 11.14 | 12.58 | 13.08 | 14.46 | 11.54 | 10.01 | 7.64 | 4.62 | 3.17 | 89.02 | 106.74 |
| Los Banos 3.5SW | | | | | | | | | | | | | | | |
| 1959 | | - | 6.58 | - | 12.23 | 13.73 | 13.26 | 12.50 | 11.54 | 9.45 | 7.66 | 5.49 | 4.13 | - | - |
| 1960 | | 4.44 | 6.58 | 9.14 | 12.23 | 14.31 | 14.90 | 11.83 | 12.27 | 9.39 | 7.26 | 4.68 | 3.59 | 91.33 | 110.62 |
| 1961 | | 3.48 | 6.16 | - | 12.07 | 13.89 | 13.38 | 13.41 | 11.56 | 10.15 | 7.72 | 5.05 | - | - | - |
| 1962 | | 4.42 | 5.09 | 8.93 | - | - | - | - | - | - | - | - | - | - | - |
| Average | | 4.11 | 5.94 | 9.04 | 12.15 | 13.98 | 13.85 | 12.58 | 11.79 | 9.66 | 7.55 | 5.07 | 3.86 | 90.60 | 109.58 |
| Maze Bridge 2S | | | | | | | | | | | | | | | |
| 1962 | | - | 5.58 | 8.80 | 9.53 | 12.62 | 14.11 | 14.25 | 12.87 | 10.36 | 7.13 | 5.43 | 2.82 | - | - |
| 1963 | | 4.09 | 5.58 | 8.80 | 9.53 | 12.62 | 14.11 | 14.37 | 12.16 | 9.25 | 7.20 | 3.63 | 1.86 | 88.04 | 103.20 |
| 1964 | | 3.71 | 6.56 | 8.24 | 10.92 | 12.41 | 12.54 | 14.04 | 12.25 | 10.01 | 7.30 | 5.11 | 3.82 | 87.71 | 106.91 |
| 1965 | | 3.67 | 6.43 | 8.66 | 8.56 | 12.60 | - | - | - | - | - | - | - | - | - |
| Average | | 3.82 | 6.19 | 8.57 | 9.67 | 12.54 | 13.65 | 14.22 | 12.43 | 9.87 | 7.21 | 4.72 | 2.83 | 88.16 | 105.72 |
| Old River 3S | | | | | | | | | | | | | | | |
| 1965 | | - | 6.03 | 8.97 | 10.94 | 12.04 | 13.38 | 13.66 | 13.02 | 10.58 | 8.34 | 4.36 | 3.28 | - | - |
| 1966 | | 4.80 | 5.18 | 8.74 | 8.96 | 12.60 | 12.98 | 13.81 | 12.45 | 9.39 | 8.14 | 4.22 | 3.00 | 90.93 | 109.93 |
| 1967 | | 4.80 | 5.18 | 8.74 | 8.96 | 12.60 | 12.98 | 13.81 | 12.45 | 9.39 | 8.14 | 4.22 | 4.05 | 87.07 | 105.32 |
| Average | | 4.80 | 5.60 | 8.86 | 9.95 | 12.32 | 13.18 | 13.74 | 12.74 | 9.98 | 8.24 | 4.58 | 3.44 | 89.01 | 107.43 |
| Stockton 9S | | | | | | | | | | | | | | | |
| 1960 | | - | 5.95 | 9.03 | 12.13 | 13.91 | 14.80 | 15.00 | 12.75 | 11.20 | 8.12 | 4.46 | 3.61 | - | - |
| 1961 | | 2.67 | 5.95 | 9.03 | 12.13 | 13.91 | 14.80 | 15.00 | 12.75 | 11.20 | 8.18 | 4.62 | - | 97.00 | - |
| Average | | 2.67 | 5.95 | 9.03 | 12.13 | 13.91 | 14.80 | 15.00 | 12.75 | 11.20 | 8.15 | 4.54 | 3.61 | 96.97 | 113.74 |
| Area Average | | 3.96 | 5.54 | 8.81 | 10.78 | 12.96 | 13.44 | 13.77 | 12.37 | 9.99 | 7.66 | 4.70 | 3.23 | 89.78 | 107.21 |
| CENTRAL COAST - COASTAL VALLEYS AND PLAINS | | | | | | | | | | | | | | | |
| Guadalupe 2:SW ^{1/2} | | | | | | | | | | | | | | | |
| 1963 | | - | 7.16 | 9.30 | 11.26 | 12.39 | 12.78 | 12.70 | 11.06 | 8.90 | 7.05 | 5.19 | 5.01 | - | - |
| 1964 | | 5.74 | 7.16 | 9.30 | 11.26 | 12.39 | 12.78 | 12.70 | 11.06 | 8.90 | 7.05 | 5.19 | - | - | - |
| Average | | 5.78 | 7.16 | 9.30 | 11.26 | 12.39 | 12.78 | 12.70 | 11.06 | 8.90 | 7.05 | 5.19 | 5.01 | 85.44 | 108.58 |

Appendix F (Continued)

SUMMARY OF OBSERVED INCOMING SOLAR RADIATION IN CALIFORNIA
In equivalent inches of evaporation $\frac{1}{2}$

| Station | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar - Oct | Jan - Dec |
|--|-----------|------|------|-------|-------|-------|-------|-------|-------|-------|------|------|------|-----------|-----------|
| CENTRAL COAST - COASTAL VALLEYS AND PLAINS (Continued) | | | | | | | | | | | | | | | |
| Lompoc $\frac{5}{1N}$ | 1968 | 5.17 | 5.37 | 8.84 | 11.73 | 13.14 | 13.32 | 13.14 | 12.35 | 10.22 | 8.14 | 6.28 | 5.01 | 90.88 | 112.71 |
| | 1969 | 3.91 | 5.63 | 10.66 | 11.58 | 12.15 | 9.60 | 13.14 | 12.83 | 10.26 | 8.56 | 5.46 | 5.08 | 88.78 | 108.86 |
| Average | | 4.54 | 5.50 | 9.75 | 11.66 | 12.64 | 11.46 | 13.14 | 12.59 | 10.24 | 8.35 | 5.87 | 5.04 | 89.83 | 110.78 |
| San Luis Obispo $\frac{5}{1NW}$ | 1969 | - | - | - | - | - | 10.12 | 12.05 | 11.81 | 9.41 | 8.32 | 5.68 | 5.02 | - | - |
| | 1970 | 4.88 | 6.30 | 9.99 | 11.89 | 13.01 | 11.76 | 12.93 | 11.88 | 10.38 | 7.19 | 5.68 | 4.69 | 89.03 | 110.58 |
| | 1971 | 6.04 | 6.62 | 9.61 | 11.53 | 11.67 | 13.12 | 13.73 | 11.93 | 9.25 | 8.06 | 6.18 | 5.09 | 88.92 | 112.85 |
| | 1972 | 6.28 | 6.88 | 9.94 | 11.99 | 12.95 | 12.66 | 13.09 | 11.91 | 9.62 | 6.74 | 6.32 | 5.54 | 88.90 | 113.92 |
| | Average | 5.73 | 6.60 | 9.85 | 11.80 | 12.54 | 11.92 | 12.95 | 11.88 | 9.66 | 7.58 | 5.96 | 5.08 | 88.18 | 111.55 |
| Santa Maria $\frac{4}{1NWS}$ | 1959 | 6.13 | 9.27 | 12.29 | 14.60 | 14.62 | 15.67 | 13.31 | 12.33 | 10.42 | 8.16 | 5.63 | 4.13 | 101.40 | 126.56 |
| | 1960 | 4.99 | 5.90 | 10.24 | - | 14.81 | 13.38 | 13.71 | 13.02 | 10.24 | 8.85 | 6.00 | 5.82 | - | - |
| | 1961 | 6.15 | 7.42 | 11.01 | 12.92 | 13.83 | 14.39 | 14.52 | 12.56 | 10.28 | 8.47 | 5.96 | 5.36 | 97.98 | 122.87 |
| | 1962 | 6.15 | 5.60 | 9.28 | 13.43 | 14.71 | 13.45 | 14.25 | 13.50 | 10.15 | 8.49 | 6.00 | 5.15 | 97.26 | 120.16 |
| | 1963 | 5.42 | - | 10.01 | 11.71 | 10.22 | - | - | - | - | - | - | - | - | - |
| | 1964 | 6.28 | 7.59 | 9.91 | 11.29 | 12.93 | 13.53 | 14.04 | 11.93 | 9.71 | 9.71 | 7.36 | 5.75 | 90.70 | 114.55 |
| | 1965 | 5.34 | 6.43 | 8.57 | 9.49 | 12.81 | 11.39 | 12.87 | 12.18 | 8.96 | 8.96 | 8.05 | 4.62 | 84.32 | 105.24 |
| | 1966 | 5.55 | 6.18 | 9.10 | 9.99 | 10.56 | 12.82 | 12.83 | 11.47 | 8.82 | 7.13 | 7.13 | 4.42 | 82.72 | 103.31 |
| | 1967 | 4.86 | 7.08 | 8.53 | 10.20 | 13.46 | 11.10 | 13.48 | 11.95 | 8.94 | 8.25 | 5.44 | 5.25 | 86.48 | 109.11 |
| | 1968 | 5.22 | 5.14 | 9.16 | 11.69 | 13.60 | 13.95 | 13.46 | 12.87 | 9.75 | 9.75 | 8.12 | 6.08 | 92.60 | 113.92 |
| Average | 5.61 | 6.73 | 9.81 | 11.70 | 13.16 | 13.30 | 13.61 | 12.42 | 9.70 | 9.70 | 8.16 | 5.52 | 4.98 | 91.86 | 114.70 |
| Area Average | 5.51 | 6.57 | 9.78 | 11.69 | 12.93 | 12.69 | 13.33 | 12.22 | 9.71 | 9.71 | 7.97 | 5.66 | 5.02 | 90.32 | 113.08 |
| CENTRAL COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | |
| Soledad 3.5NW | 1963 | - | - | - | 10.52 | 12.41 | 14.84 | 14.98 | 12.70 | 10.03 | 7.76 | 4.70 | 4.59 | - | - |
| | 1964 | 4.74 | 6.74 | 9.26 | 12.01 | 12.77 | 12.68 | 13.96 | 11.72 | 9.93 | 6.59 | 4.64 | 3.13 | 88.92 | 108.17 |
| | 1965 | 3.98 | 5.94 | 10.20 | 9.53 | 13.43 | 12.70 | 13.25 | 13.45 | 9.49 | 7.26 | 4.46 | 4.05 | 87.42 | 105.85 |
| | 1966 | 3.96 | 7.08 | 8.95 | 10.64 | 11.89 | 13.10 | 12.31 | 11.72 | 9.16 | 7.57 | 4.87 | 4.86 | 85.34 | 106.11 |
| | 1967 | 4.94 | 7.08 | 7.55 | 9.43 | 11.87 | 10.74 | 12.10 | 10.12 | 7.25 | 6.72 | 4.18 | 3.92 | 95.90 | 106.11 |
| | 1968 | 4.30 | 4.07 | 7.61 | 10.15 | 11.20 | 11.57 | 10.79 | 9.58 | 8.26 | 5.67 | 3.84 | 3.23 | 74.83 | 95.90 |
| | 1969 | 2.90 | 3.75 | 8.05 | 9.17 | 10.78 | 10.32 | 11.79 | 11.24 | 8.62 | 6.97 | 4.52 | 4.15 | 76.94 | 92.26 |
| | 1970 | 3.40 | 5.48 | 7.84 | 9.97 | 10.74 | 10.70 | 10.47 | 9.66 | 8.60 | 8.60 | 6.07 | 4.36 | 74.05 | 89.75 |
| | 1971 | 3.23 | 4.80 | 6.82 | 9.17 | 9.49 | - | - | - | - | - | - | - | - | - |
| | Average | 3.93 | 5.62 | 8.28 | 10.07 | 11.62 | 12.08 | 12.46 | 11.04 | 8.92 | 8.92 | 6.83 | 4.45 | 3.80 | 81.30 |
| SOUTH COAST - INTERIOR VALLEYS | | | | | | | | | | | | | | | |
| Riverside U.C. $\frac{3}{1}$ | 1935-1964 | 5.48 | 6.38 | 9.18 | 10.47 | 12.26 | 12.69 | 13.23 | 12.10 | 10.02 | 7.99 | 6.06 | 5.09 | 87.94 | 110.95 |
| | Average | 5.48 | 6.38 | 9.18 | 10.47 | 12.26 | 12.69 | 13.23 | 12.10 | 10.02 | 7.99 | 6.06 | 5.09 | 87.94 | 110.95 |

Appendix F (Continued)

SUMMARY OF OBSERVED INCOMING SOLAR RADIATION IN CALIFORNIA
In equivalent inches of evaporation^{1/} _{2/}

| Station | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mar - Oct | Jan - Dec |
|-----------------------------------|-----------|------|------|-------|-------|-------|-------|-------|-------|-------|------|------|------|-----------|-----------|
| SOUTHERN CALIFORNIA DESERT | | | | | | | | | | | | | | | |
| Blythe U.C.E. ^{2/} g/ | 1966-1971 | 4.67 | 5.62 | 8.34 | 9.89 | 11.18 | 10.82 | 10.51 | 9.39 | 7.83 | 6.51 | 4.93 | 4.30 | 74.47 | 93.99 |
| Brawley 2SW | 1967 | 6.84 | 7.95 | 10.35 | 12.11 | 14.14 | 14.35 | 12.98 | 11.81 | 10.15 | 9.47 | 6.64 | 5.99 | 95.36 | 122.78 |
| | 1968 | 6.76 | 7.30 | 10.39 | 13.14 | 14.60 | 14.52 | 13.43 | 12.85 | 11.26 | 9.55 | 7.30 | 6.32 | 99.74 | 127.42 |
| | 1969 | 6.45 | 7.69 | 11.29 | 13.18 | 14.35 | 14.35 | 12.60 | 12.50 | 10.46 | 9.55 | 6.88 | 6.84 | 98.28 | 126.14 |
| | Average | 6.68 | 7.65 | 10.68 | 12.81 | 14.36 | 14.41 | 13.00 | 12.39 | 10.62 | 9.52 | 6.94 | 6.38 | 97.79 | 125.44 |
| Coachella ISE g/ | 1966 | 5.15 | 6.36 | 11.09 | 17.48 | 12.88 | 12.89 | 12.05 | 10.91 | 9.85 | 7.78 | 5.50 | 4.83 | 94.93 | 116.77 |
| | 1967 | 4.79 | 6.50 | 7.84 | 11.90 | 12.34 | 13.20 | 12.35 | 11.04 | 9.04 | 8.82 | 5.29 | 4.30 | 86.53 | 107.41 |
| | 1968 | 6.23 | 5.67 | 8.29 | 11.85 | 10.19 | 11.20 | 11.42 | 11.10 | 9.91 | 7.79 | 5.72 | 4.63 | 81.75 | 104.00 |
| | 1969 | 4.17 | 5.32 | 8.56 | 10.58 | 11.93 | 12.18 | 11.98 | 11.08 | 9.00 | 7.39 | 4.76 | 4.08 | 82.70 | 101.03 |
| | Average | 5.08 | 5.96 | 8.94 | 12.95 | 11.84 | 12.37 | 11.95 | 11.03 | 9.45 | 7.94 | 5.32 | 4.46 | 86.47 | 107.29 |
| El Centro 7:W g/ | 1971 | 6.17 | 7.24 | 10.39 | 11.93 | 13.35 | 13.38 | 12.81 | 10.76 | 9.73 | 8.26 | 6.30 | 5.30 | 90.61 | 115.62 |
| Area Average | | 5.69 | 6.63 | 9.62 | 12.45 | 12.77 | 12.99 | 12.24 | 11.27 | 9.69 | 8.35 | 5.92 | 5.18 | 89.38 | 112.80 |

^{1/} Solar radiation expressed as equivalent inches of evaporation, 1486 Langley's = 1 inch of evaporation.
^{2/} Except as noted, radiation determined with Instruments Corporation's "pyrheliometer" (more correctly described as Robitzsch type pyranometer or actinograph). These instruments were periodically standardized to Eppley pyranometers at NWS Fresno or U.C.-Davis.
^{3/} Data collected by University of California using Eppley pyranometer.
^{4/} Data collected by National Weather Service using Eppley pyranometer.
^{5/} Instrument standardization to NWS Eppley at Santa Maria A.P., May 1965, used to correct all data collected.
^{6/} Data collected by USDA, Agricultural Research Service, using Eppley pyranometer.
^{7/} Data collected by University of California, Agricultural Research Service, using actinograph. Monthly data reported are the averages for the period 1966-1971.
^{8/} Data collected by U. S. Bureau of Reclamation using sol-a-meter Mk. II, Type MV, 1966-1968, and sol-a-meter Mk. IV, 1969.
^{9/} Data collected by U. S. Navy Aerospace Recovery Facility - El Centro, using Eppley pyranometer.

APPENDIX G

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS,
RELATED CLIMATIC INDEXES, AND RATIOS OF
EVAPOTRANSPIRATION TO CLIMATIC INDEXES

| | |
|-----------|-------------------------|
| Table G-1 | Arvin Station |
| Table G-2 | Davis Station |
| Table G-3 | Glenburn Station |
| Table G-4 | Guadalupe Station |
| Table G-5 | Lompoc Station |
| Table G-6 | San Luis Obispo Station |
| Table G-7 | Soledad Station |
| Table G-8 | Thornton Station |

Table G-1. ARVIN STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

Near Bakersfield in southern San Joaquin Valley
 Latitude 35°03' N, longitude 118°02' W
 Elevation 437 feet, mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | | |
|---|------|------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|-------------------|-------------------|---|
| | | | | | | | | | | | | | M-O ^{1/} | J-D ^{2/} | |
| EVAPOTRANSPIRATION OF GRASS, (ET) - INCHES ^{3/} | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | - | 7.3 | 4.3 | - | - | - | - | - | - |
| 1960 | - | - | 3.6 | - | - | 7.0 | - | 6.8 | 5.0 | 4.5 | 1.6 | 0.8 | - | - | - |
| 1961 | 0.6 | 2.5 | 4.1 | 5.1 | 5.7 | 7.0 | 7.0 | 8.4 | 5.4 | 4.3 | 1.5 | 1.0 | 47.0 | 52.6 | |
| 1962 | 0.8 | 1.0 | 3.9 | 5.5 | 6.1 | 7.0 | 8.6 | 7.4 | 6.3 | 2.6 | 1.5 | 1.0 | 47.4 | 51.7 | |
| 1963 | 0.2 | 1.5 | 3.7 | 3.8 | 7.9 | 8.3 | 7.6 | 6.8 | 5.1 | 2.7 | 2.2 | 0.4 | 45.9 | 50.2 | |
| 1964 | 1.0 | 1.9 | 3.2 | 3.5 | 6.0 | 6.8 | 8.5 | 7.9 | 5.9 | 3.8 | 1.8 | 1.4 | 45.6 | 51.7 | |
| 1965 | 1.0 | 2.0 | 3.5 | 5.1 | 7.6 | 7.4 | 8.2 | 6.2 | 5.1 | - | - | - | - | - | |
| Avg. | 0.7 | 1.8 | 3.7 | 4.6 | 6.7 | 7.2 | 8.0 | 7.3 | 5.3 | 3.6 | 1.7 | 0.9 | 46.4 | 51.5 | |
| EVAPORATION FROM CLASS "A" PAN, (Ep) - INCHES | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | - | 8.6 | 5.9 | - | - | - | - | - | - |
| 1960 | - | - | 4.3 | - | - | 10.0 | - | 8.1 | 6.1 | 4.1 | 1.9 | 1.1 | - | - | - |
| 1961 | 0.9 | 2.6 | 3.9 | 6.6 | 7.6 | 9.9 | 9.6 | 7.8 | 6.2 | 4.4 | 2.4 | 1.2 | 56.0 | 63.1 | |
| 1962 | 1.6 | 1.9 | 4.3 | 7.6 | 8.6 | 10.5 | 10.4 | 8.6 | 6.0 | 3.9 | 2.2 | 1.8 | 59.9 | 67.4 | |
| 1963 | 1.8 | 2.4 | 5.4 | 5.2 | 8.1 | 9.6 | 9.7 | 7.8 | 5.5 | 3.4 | 2.0 | 0.8 | 54.7 | 61.7 | |
| 1964 | 1.5 | 3.3 | 4.5 | 6.1 | 8.2 | 9.8 | 9.2 | 8.1 | 6.0 | 4.3 | 1.9 | 1.5 | 56.2 | 64.4 | |
| 1965 | 1.3 | 2.4 | 4.6 | 5.0 | 9.0 | 9.0 | 9.9 | 9.0 | 6.3 | - | - | - | - | - | |
| Avg. | 1.4 | 2.5 | 4.5 | 6.1 | 8.3 | 9.8 | 9.8 | 8.3 | 6.0 | 4.0 | 2.1 | 1.3 | 56.8 | 64.1 | |
| NET ATMOMETER EVAPORATION, (E _{b-w}) - MILLILITERS | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | - | 548 | 473 | - | - | - | - | - | - |
| 1960 | - | - | - | - | - | 670 | - | 582 | 480 | 372 | - | - | - | - | - |
| 1961 | - | - | 364 | 475 | 504 | 610 | 610 | 529 | 485 | 350 | - | - | 3927 | - | |
| 1962 | - | - | 344 | 444 | 500 | 601 | 622 | 576 | 498 | 355 | - | - | 3940 | - | |
| 1963 | - | - | 365 | 355 | 437 | 475 | 562 | 551 | 465 | 340 | - | - | 3550 | - | |
| 1964 | - | - | 360 | 434 | 496 | 528 | 563 | 516 | 466 | 381 | - | - | 3744 | - | |
| 1965 | - | - | 327 | 370 | 527 | 525 | 551 | 529 | 434 | - | - | - | - | - | |
| Avg. | - | - | 352 | 416 | 493 | 568 | 582 | 547 | 472 | 360 | - | - | 3790 | - | |
| INCOMING SOLAR RADIATION, (Rs) - EQUIVALENT INCHES OF EVAPORATION | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | - | 13.14 | 10.88 | - | - | - | - | - | - |
| 1960 | - | - | 9.80 | - | - | 14.45 | - | 13.66 | 10.76 | 8.30 | 5.23 | 4.03 | - | - | - |
| 1961 | 3.73 | 6.16 | 8.78 | 11.83 | 12.66 | 13.42 | 13.31 | 11.81 | 10.44 | 7.61 | 5.07 | 3.44 | 80.86 | 103.26 | |
| 1962 | 4.65 | 4.58 | 8.82 | 11.24 | 13.10 | 13.44 | 13.64 | 12.68 | 10.50 | 7.74 | 5.19 | 3.34 | 91.16 | 108.92 | |
| 1963 | 4.78 | 5.43 | 9.14 | 10.09 | 11.62 | 12.80 | 13.73 | 11.83 | 9.39 | 6.72 | 4.46 | 3.04 | 95.32 | 103.03 | |
| 1964 | 4.19 | 6.42 | 8.47 | 10.28 | 12.34 | 13.14 | 13.52 | 12.14 | 10.42 | 8.16 | 5.09 | 3.00 | 83.47 | 108.07 | |
| 1965 | 4.67 | 6.03 | 8.28 | 8.36 | 12.66 | 11.91 | 13.27 | 12.10 | 9.77 | - | - | - | - | - | |
| Avg. | 4.40 | 5.72 | 8.88 | 10.36 | 12.48 | 13.19 | 13.49 | 12.48 | 10.31 | 7.71 | 5.01 | 3.55 | 88.00 | 107.58 | |
| BLANEY-CRIDDLE CONSUMPTIVE USE FACTOR, (f) - $\frac{t \times p}{100}$ | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | - | 7.09 | 5.85 | - | - | - | - | - | - |
| 1960 | - | - | 4.74 | - | - | 7.67 | - | 7.17 | 6.09 | 4.74 | 3.46 | 2.81 | - | - | - |
| 1961 | 2.73 | 3.26 | 4.27 | 5.40 | 6.09 | 7.61 | 8.04 | 7.44 | 5.73 | 4.67 | 3.37 | 2.84 | 40.25 | 61.45 | |
| 1962 | 2.67 | 3.18 | 4.12 | 5.16 | 5.70 | 6.71 | 7.26 | 6.71 | 5.53 | 4.48 | 3.30 | 2.79 | 45.67 | 57.50 | |
| 1963 | 2.72 | 4.01 | 4.31 | 4.74 | 6.48 | 6.81 | 7.42 | 6.98 | 6.08 | 4.86 | 3.44 | 2.44 | 47.68 | 60.20 | |
| 1964 | 2.84 | 3.09 | 4.16 | 4.92 | 6.05 | 6.87 | 7.60 | 7.04 | 5.59 | 5.11 | 3.18 | 3.11 | 47.34 | 59.56 | |
| 1965 | 3.03 | 3.10 | 4.41 | 5.00 | 6.05 | 6.58 | 7.59 | 7.22 | 5.51 | - | - | - | - | - | |
| Avg. | 2.80 | 3.33 | 4.34 | 5.04 | 6.07 | 7.04 | 7.58 | 7.09 | 5.77 | 4.77 | 3.35 | 2.80 | 47.70 | 60.08 | |
| AVERAGE RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | | | |
| ET/Ep | 0.50 | 0.72 | 0.82 | 0.75 | 0.81 | 0.74 | 0.82 | 0.88 | 0.83 | 0.90 | 0.81 | 0.69 | 0.62 | 0.62 | |
| ET/E _{b-w} | - | - | 0.0105 | 0.0111 | 0.0136 | 0.0127 | 0.0137 | 0.0133 | 0.0112 | 0.0100 | - | - | 0.12 | - | |
| ET/Rs | 0.16 | 0.31 | 0.42 | 0.44 | 0.54 | 0.55 | 0.59 | 0.58 | 0.51 | 0.47 | 0.24 | 0.20 | 0.10 | 0.10 | |
| ET/f ^{1/} | 0.25 | 0.54 | 0.85 | 0.91 | 1.10 | 1.02 | 1.06 | 1.03 | 0.92 | 0.75 | 0.61 | 0.32 | 0.37 | 0.4 | |

1/ March - October

2/ January - December

3/ Evapotranspiration determined with 6-foot diameter, Wisconsin type, floating evapotranspirometer.

Table G-2. DAVIS STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

In southern Sacramento Valley
 Latitude 38°32' N, longitude 121°46' W
 Elevation 60 ft. mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | | |
|--|------|------|------|-------|----------------------------------|-------|-------|-------|-------|------|------|------|-------------------|-------------------|--|
| | | | | | | | | | | | | | M-U ^{1/} | J-D ^{2/} | |
| EVAPOTRANSPIRATION OF GRASS, (ET) - INCHES ^{3/} | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | 8.8 | 7.3 | 5.8 | 4.5 | 2.2 | 1.4 | - | - | |
| 1960 | 1.0 | 2.2 | 3.2 | 4.6 | 6.4 | 8.7 | 8.4 | 7.4 | 5.2 | 3.8 | 1.4 | 1.0 | 47.7 | 53.3 | |
| 1961 | 0.6 | 2.0 | 3.0 | 4.9 | 6.4 | 8.2 | 8.8 | 6.7 | 5.1 | 3.6 | 1.6 | 0.9 | 46.7 | 51.8 | |
| 1962 | 1.2 | 1.5 | 2.9 | 4.9 | 6.3 | 8.2 | 8.2 | 6.8 | 5.0 | 2.8 | 1.7 | 0.8 | 45.1 | 50.3 | |
| 1963 | 0.9 | 1.5 | 2.3 | 3.3 | 5.1 | 8.0 | 8.1 | 6.6 | 4.5 | - | - | - | - | - | |
| 1964 | - | - | - | - | - | 6.7 | 8.3 | 7.7 | 6.4 | 3.9 | 1.5 | 1.1 | - | - | |
| 1965 | 1.0 | 2.8 | 3.1 | 4.0 | 7.4 | 7.3 | 7.9 | 6.8 | 5.5 | 3.4 | 1.2 | 0.8 | 45.4 | 51.2 | |
| 1966 | 1.3 | 1.8 | 3.4 | 6.0 | 6.8 | 8.1 | 7.6 | 7.0 | 5.4 | 3.8 | 1.6 | 0.9 | 48.1 | 53.7 | |
| 1967 | 1.3 | 1.9 | 2.7 | 2.7 | 6.4 | 6.5 | 7.8 | 7.1 | 5.3 | 3.8 | 1.7 | 1.6 | 42.3 | 48.8 | |
| 1968 | 1.2 | 1.1 | 3.3 | 5.8 | 6.3 | 8.1 | 8.2 | 6.8 | 6.0 | 3.2 | 1.5 | 1.1 | 47.7 | 52.6 | |
| 1969 | 1.2 | 1.7 | 3.6 | 4.8 | 7.4 | 6.8 | 8.1 | 7.4 | 5.3 | 3.6 | 1.7 | 1.2 | 47.0 | 52.8 | |
| 1970 | 1.1 | 1.9 | 3.9 | 4.3 | 7.1 | 7.3 | 8.2 | 7.0 | 5.8 | 3.5 | 1.3 | 0.7 | 47.1 | 52.1 | |
| 1971 | 1.3 | 1.9 | 3.1 | 4.9 | 5.5 | 7.6 | 8.3 | 7.3 | 6.0 | 3.7 | 2.1 | 1.2 | 46.4 | 52.9 | |
| AVG. | 1.1 | 1.8 | 3.1 | 4.6 | 6.5 | 7.6 | 8.2 | 7.1 | 5.5 | 3.6 | 1.6 | 1.1 | 46.2 | 51.8 | |
| EVAPORATION FROM CLASS "A" PAN, (Ep) - INCHES | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | 11.2 | 9.2 | 8.2 | 7.2 | 3.6 | 3.0 | - | - | |
| 1960 | 1.8 | 3.5 | 4.6 | 7.2 | 9.4 | 11.7 | 11.4 | 9.1 | 7.4 | 6.5 | 2.4 | 1.7 | 67.3 | 76.7 | |
| 1961 | 0.5 | 2.9 | 4.6 | 6.5 | 8.1 | 10.0 | 10.7 | 9.0 | 7.0 | 5.9 | 4.2 | 1.1 | 61.8 | 70.5 | |
| 1962 | 1.8 | 1.7 | 3.7 | 6.8 | 8.1 | 9.8 | 9.5 | 8.6 | 6.1 | 4.1 | 2.1 | 0.8 | 56.7 | 63.1 | |
| 1963 | 1.0 | 2.3 | 4.2 | 4.4 | 6.8 | 10.3 | 9.9 | 8.1 | 5.9 | - | - | - | - | - | |
| 1964 | - | - | - | - | - | 8.7 | 10.4 | 9.5 | 7.9 | 4.8 | 1.7 | 1.5 | - | - | |
| 1965 | 0.9 | 3.2 | 3.7 | 4.8 | 9.3 | 9.0 | 10.0 | 8.3 | 7.2 | 4.7 | 1.7 | 0.9 | 57.0 | 63.7 | |
| 1966 | 1.7 | 2.5 | 4.4 | 7.8 | 8.6 | 9.8 | 9.4 | 9.3 | 7.2 | 5.2 | 1.9 | 0.9 | 61.7 | 68.7 | |
| 1967 | 1.7 | 1.9 | 3.3 | 3.6 | 7.7 | 7.9 | 10.1 | 9.2 | 7.2 | 5.4 | 2.3 | 2.6 | - | - | |
| 1968 | 1.2 | 1.7 | 4.2 | 8.8 | 7.8 | 11.4 | 11.0 | 9.0 | 8.4 | 4.4 | 1.9 | 1.4 | 65.0 | 71.2 | |
| 1969 | 1.4 | 2.0 | 4.5 | 6.6 | 9.3 | 9.1 | 10.5 | 9.4 | 7.0 | 5.8 | 2.3 | 1.3 | 62.2 | 69.2 | |
| 1970 | 1.5 | 2.2 | 6.5 | 6.9 | 10.2 | 9.4 | 10.6 | 9.0 | 8.4 | 5.0 | 1.9 | 0.8 | 66.0 | 72.4 | |
| 1971 | 1.6 | 2.6 | 4.7 | 6.4 | 7.5 | 9.4 | 10.7 | 9.6 | 8.2 | 5.1 | 3.6 | 2.0 | 61.6 | 71.4 | |
| AVG. | 1.4 | 2.4 | 4.4 | 6.3 | 8.4 | 9.7 | 10.4 | 9.0 | 7.4 | 5.3 | 2.5 | 1.5 | 60.9 | 68.7 | |
| NET ATMOMETER EVAPORATION, (E _{D-W}) - MILLILITERS | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | 629 | 412 | 562 | 449 | - | - | - | - | |
| 1960 | - | - | - | - | 532 | 608 | 653 | 597 | 514 | 398 | - | - | - | - | |
| 1961 | - | - | - | - | - ATMOMETER DATA NOT AVAILABLE - | | | | | | | | | | |
| 1962 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1963 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1964 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1965 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1966 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1967 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1968 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1969 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1970 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1971 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| 1972 | - | - | - | - | - | - | " | " | " | " | " | " | " | " | |
| AVG. | - | - | - | - | 532 | 608 | 641 | 504 | 538 | 424 | - | - | - | - | |
| INCOMING SOLAR RADIATION, (R _S) - EQUIVALENT INCHES OF EVAPORATION ^{4/} | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | 14.67 | 12.98 | 8.44 | 7.94 | 5.69 | 4.38 | - | - | |
| 1960 | 4.75 | 6.73 | 9.35 | 12.44 | 14.92 | 15.01 | 14.51 | 13.39 | 10.08 | 7.47 | 5.27 | 3.69 | 97.17 | 117.61 | |
| 1961 | 2.87 | 5.99 | 9.47 | 11.62 | 13.98 | 14.73 | 15.26 | 12.82 | 10.53 | 7.82 | 5.23 | 3.38 | 96.23 | 113.70 | |
| 1962 | 4.78 | 5.79 | 9.32 | 12.04 | 13.98 | 15.37 | 15.54 | 14.13 | 10.88 | 7.10 | 5.39 | 3.56 | 98.31 | 117.83 | |
| 1963 | 4.14 | 5.27 | 8.65 | 9.75 | 12.56 | 15.44 | 15.77 | 13.78 | 9.88 | - | - | - | - | - | |
| 1964 | - | - | - | - | - | 13.47 | 15.06 | 13.68 | 10.10 | 7.05 | 4.14 | 3.17 | - | - | |
| 1965 | 2.88 | 5.64 | 7.06 | 8.34 | 13.22 | 14.16 | 14.27 | 12.40 | 9.80 | 8.08 | 4.11 | 2.86 | 87.33 | 102.82 | |
| 1966 | 4.51 | 5.65 | 9.21 | 12.07 | 13.85 | 14.33 | 14.91 | 13.26 | 10.54 | 8.02 | 4.12 | 2.63 | 96.19 | 113.10 | |
| 1967 | 3.92 | 5.60 | 8.34 | 9.79 | 14.35 | 13.53 | 15.24 | 13.41 | 10.38 | 8.05 | 4.59 | 4.53 | 93.09 | 111.73 | |
| 1968 | 4.02 | 5.08 | 8.95 | 12.34 | 13.88 | 14.71 | 15.27 | 12.72 | 10.96 | 7.36 | 3.87 | 3.56 | 96.10 | 112.72 | |
| 1969 | 3.10 | 4.09 | 9.73 | 11.19 | 14.83 | 13.61 | 15.26 | 13.58 | 10.50 | 7.27 | 5.22 | 3.32 | 95.97 | 111.70 | |
| 1970 | 3.41 | 5.46 | 9.38 | 11.51 | 13.81 | 14.10 | 15.19 | 13.99 | 11.19 | 7.84 | 4.01 | 3.14 | 97.01 | 113.03 | |
| 1971 | 3.98 | 6.23 | 8.91 | 11.99 | 11.80 | 14.22 | 14.73 | 13.73 | 10.85 | 8.35 | 5.28 | 3.79 | 94.58 | 113.86 | |
| AVG. | 3.85 | 5.59 | 8.94 | 11.19 | 13.74 | 14.39 | 15.05 | 13.37 | 10.31 | 7.70 | 4.74 | 3.50 | 94.60 | 112.37 | |

Table Q-2. DAVIS STATION (Continued)

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | | |
|--|------|------|------|------|--------|--------|--------|--------|--------|--------|------|------|-------------------|-------------------|--|
| | | | | | | | | | | | | | M-O ^{1/} | J-D ^{2/} | |
| BLANEY-CRIDDLE CONSUMPTIVE USE FACTOR, (f) - $\frac{t \times p^{5/}}{100}$ | | | | | | | | | | | | | | | |
| 1959 | - | - | - | - | - | - | 7.64 | 6.61 | 5.72 | 5.32 | 3.62 | 3.12 | - | - | |
| 1960 | 3.10 | 3.34 | 4.59 | 5.08 | 6.21 | 7.35 | 7.64 | 6.80 | 5.77 | 4.86 | 3.51 | 2.99 | 48.30 | 61.24 | |
| 1961 | 3.01 | 3.50 | 4.40 | 5.22 | 5.99 | 7.32 | 7.65 | 7.09 | 5.66 | 4.83 | 3.48 | 2.90 | 48.16 | 61.05 | |
| 1962 | 2.91 | 3.26 | 4.20 | 5.39 | 6.09 | 6.93 | 7.29 | 6.72 | 5.65 | 4.78 | 3.72 | 3.10 | 47.05 | 60.04 | |
| 1963 | 2.83 | 3.77 | 4.25 | 4.65 | 6.09 | 6.83 | 7.14 | 6.80 | 5.88 | - | - | - | - | - | |
| 1964 | - | - | - | - | - | 6.69 | 7.29 | 6.82 | 5.68 | 5.03 | 3.42 | 3.31 | - | - | |
| 1965 | 3.11 | 3.29 | 4.39 | 5.11 | 6.41 | 6.66 | 7.36 | 7.02 | 5.49 | 5.05 | 3.70 | 2.74 | 47.49 | 60.33 | |
| 1966 | 3.07 | 3.18 | 4.45 | 5.54 | 6.54 | 7.11 | 7.17 | 7.05 | 5.87 | 4.89 | 3.68 | 3.04 | 48.62 | 61.59 | |
| 1967 | 3.11 | 3.29 | 4.22 | 4.30 | 6.36 | 6.82 | 7.73 | 7.37 | 6.16 | 5.02 | 3.81 | 2.97 | 47.98 | 61.16 | |
| 1968 | 2.94 | 3.66 | 4.56 | 5.37 | 6.37 | 7.35 | 7.51 | 6.77 | 5.99 | 4.79 | 3.55 | 2.90 | 48.71 | 61.76 | |
| 1969 | 2.99 | 3.16 | 4.36 | 5.14 | 6.74 | 7.01 | 7.61 | 7.18 | 6.07 | 4.77 | 3.66 | 3.24 | 48.88 | 61.93 | |
| 1970 | 3.43 | 3.54 | 4.56 | 4.93 | 6.63 | 7.07 | 7.63 | 6.77 | 5.88 | 4.76 | 3.74 | 3.06 | 48.23 | 62.00 | |
| 1971 | 3.13 | 3.31 | 4.32 | 4.93 | 6.08 | 6.87 | 7.21 | 6.86 | 5.27 | 3.97 | 2.99 | 2.11 | 45.51 | 57.5 | |
| AVG. | 3.06 | 3.39 | 4.39 | 5.06 | 6.32 | 7.00 | 7.45 | 6.91 | 5.78 | 4.84 | 3.57 | 2.96 | 47.75 | 60.73 | |
| AVERAGE RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | | | |
| ET/Ep | 0.79 | 0.75 | 0.70 | 0.73 | 0.77 | 0.78 | 0.79 | 0.79 | 0.74 | 0.68 | 0.64 | 0.73 | 0.76 | 0.75 | |
| ET/E _{b-w} ^{6/} | - | - | - | - | 0.0120 | 0.0143 | 0.0134 | 0.0147 | 0.0102 | 0.0099 | - | - | - | - | |
| ET/R | 0.29 | 0.32 | 0.35 | 0.41 | 0.47 | 0.53 | 0.54 | 0.53 | 0.53 | 0.47 | 0.34 | 0.31 | 0.49 | 0.46 | |
| ET/f | 0.36 | 0.53 | 0.71 | 0.91 | 1.03 | 1.09 | 1.10 | 1.03 | 0.95 | 0.74 | 0.45 | 0.37 | 0.97 | 0.85 | |

Data contributed by W. O. Pruitt, Irrigation Engineer, Department of Water Science and Engineering, University of California, Davis.

- 1/ March - October
- 2/ January - December
- 3/ Data collected with 20-foot weighing lysimeter
- 4/ Radiation data collected with Eppley pyranometer by H. B. Schultz, Professor, Department Agricultural Engineering, University of California, Davis. This data obtained through the courtesy of W. O. Pruitt.
- 5/ Blaney-Criddle 'f' factor calculated using mean monthly air temperatures from NWS Davis 2WSW station (H. B. SCHULTZ - observer). Temperatures may be slightly higher than at the grassed lysimeter site.
- 6/ Ratio of ET - Grass to net atmometer based upon the 1- to 2-year record available.

Table G-3. OLENBURN STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

Near Fall River Mills in northeastern California
 Latitude 41°03' N, longitude 121°29' W
 Elevation 3,314 ft., mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Apr-Oct |
|---|-----|-----|-----|-------|--------|--------|--------|--------|--------|------|------|-----|---------|
| EVAPOTRANSPIRATION OF GRASS, (ET) - INCHES ^{1/} | | | | | | | | | | | | | |
| 1964 | - | - | - | 2.9 | 4.4 | 5.6 | 6.6 | 8.5 | 5.1 | 2.5 | - | - | 35.6 |
| 1965 | - | - | - | 2.9 | 4.8 | 5.7 | 6.8 | 7.3 | 4.8 | 3.3 | 0.5 | - | 35.6 |
| 1966 | - | - | - | 4.6 | 5.2 | 6.0 | 7.5 | 7.5 | 4.7 | - | - | - | - |
| Avg. | - | - | - | 3.5 | 4.8 | 5.8 | 7.0 | 7.8 | 4.9 | 2.9 | 0.5 | - | 36.7 |
| EVAPORATION FROM CLASS "A" PAN, (Ep) - INCHES | | | | | | | | | | | | | |
| 1964 | - | - | - | 5.4 | 6.1 | 7.0 | 10.0 | 8.8 | 5.8 | 3.7 | - | - | 46.8 |
| 1965 | - | - | - | 4.0 | 7.1 | 7.2 | 8.7 | 6.8 | 5.1 | 3.8 | 1.1 | - | 42.7 |
| 1966 | - | - | - | 5.7 | 7.5 | 7.8 | 9.7 | 8.8 | 6.3 | - | - | - | - |
| Avg. | - | - | - | 5.0 | 6.9 | 7.3 | 9.5 | 8.1 | 5.7 | 3.8 | 1.1 | - | 46.3 |
| NET ATMOMETER EVAPORATION, (E _{b-w}) - MILLILITERS | | | | | | | | | | | | | |
| 1964 | - | - | - | - | - | 463 | 526 | 566 | 462 | - | - | - | - |
| 1965 | - | - | - | - | - | 503 | 587 | 538 | 384 | - | - | - | - |
| 1966 | - | - | - | - | 507 | 519 | 579 | 523 | 388 | - | - | - | - |
| Avg. | - | - | - | - | 507 | 495 | 564 | 542 | 411 | - | - | - | - |
| INCOMING SOLAR RADIATION, (Rs) - EQUIVALENT INCHES OF EVAPORATION | | | | | | | | | | | | | |
| 1964 | - | - | - | 10.62 | 12.09 | 12.23 | 13.97 | 12.26 | 9.33 | 6.27 | - | - | 76.77 |
| 1965 | - | - | - | 7.99 | 12.72 | 12.47 | 14.64 | 12.30 | 10.42 | 7.60 | 3.83 | - | 78.14 |
| 1966 | - | - | - | 12.14 | 13.95 | 15.45 | 16.42 | 12.28 | 11.36 | - | - | - | - |
| Avg. | - | - | - | 10.25 | 12.92 | 13.38 | 15.01 | 12.28 | 10.37 | 6.94 | 3.83 | - | 81.15 |
| BLANEY-CRIDDLE CONSUMPTIVE USE FACTOR, (f) - $\frac{t \times p}{100}$ | | | | | | | | | | | | | |
| 1964 | - | - | - | 4.00 | 5.08 | 5.88 | 6.77 | 6.14 | 4.68 | 4.08 | - | - | 36.63 |
| 1965 | - | - | - | 4.15 | 5.08 | 5.96 | 6.66 | 6.08 | 4.62 | 3.98 | 2.73 | - | 36.53 |
| 1966 | - | - | - | 4.37 | 5.63 | 5.93 | 6.34 | 6.34 | 4.99 | - | - | - | - |
| Avg. | - | - | - | 4.17 | 5.26 | 5.92 | 6.59 | 6.19 | 4.76 | 4.03 | 2.73 | - | 36.92 |
| AVERAGE RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | |
| ET/Ep | - | - | - | 0.70 | 0.70 | 0.79 | 0.74 | 0.96 | 0.86 | 0.76 | 0.45 | - | 0.79 |
| ET/E _{b-w} | - | - | - | - | 0.0103 | 0.0117 | 0.0124 | 0.0144 | 0.0119 | - | - | - | - |
| ET/Rs | - | - | - | 0.34 | 0.37 | 0.43 | 0.47 | 0.64 | 0.47 | 0.42 | 0.13 | - | 0.45 |
| ET/'f' | - | - | - | 0.84 | 0.91 | 0.98 | 1.06 | 1.26 | 1.03 | 0.72 | 0.18 | - | 0.99 |

^{1/} Evapotranspiration determined with 6-foot diameter, Wisconsin type, floating evapotranspirometer.

Table G-4. GUADALUPE STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

Five miles inland in the Santa Maria Valley
 Latitude 35°00' N, longitude 120°33'W
 Elevation 96 ft., mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | |
|--|------|------|------|--------|--------|--------|--------|--------|--------|--------|--------|------|-------------------|-------------------|
| | | | | | | | | | | | | | M-O ^{1/} | J-D ^{2/} |
| EVAPOTRANSPIRATION OF GRASS, (ET) - INCHES ^{3/} | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | 4.3 | 4.8 | 4.2 | 3.0 | 2.5 | 2.2 | - | - |
| 1964 | 1.9 | 2.6 | 2.7 | 3.5 | 3.3 | 3.9 | 4.6 | 4.2 | 3.7 | 2.7 | 1.8 | 1.2 | 28.6 | 36.2 |
| 1965 | 2.1 | 2.7 | 3.4 | 3.1 | 4.8 | 5.0 | 5.4 | 5.7 | 4.1 | 4.1 | 1.9 | 1.6 | 35.6 | 42.8 |
| 1966 | 2.1 | 2.2 | 3.7 | 4.5 | 4.2 | 5.5 | 5.6 | 4.4 | 3.7 | 3.3 | 1.9 | 1.1 | 34.0 | 46.2 |
| 1967 | 2.0 | 3.5 | 2.7 | 3.3 | 4.3 | 2.5 | 3.6 | 3.8 | 3.2 | 3.9 | - | - | 27.0 | - |
| Avg. | 2.0 | 2.5 | 3.1 | 3.6 | 4.2 | 4.2 | 4.7 | 4.6 | 3.8 | 3.4 | 2.0 | 1.5 | 31.6 | 39.6 |
| EVAPORATION FROM CLASS "A" PAN, (Ep) - INCHES | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | 5.9 | 5.4 | 4.7 | 3.8 | 2.7 | 2.2 | - | - |
| 1964 | 3.1 | 3.3 | 4.5 | 4.7 | 5.2 | 6.4 | 6.2 | 5.5 | 4.5 | 3.4 | 2.6 | 2.4 | 40.4 | 52.3 |
| 1965 | 2.3 | 3.3 | 4.1 | 3.7 | 6.0 | 5.7 | 5.3 | 5.7 | 4.8 | 4.4 | 2.0 | 1.7 | 40.2 | 49.5 |
| 1966 | 2.6 | 2.6 | 4.2 | 5.1 | 4.8 | 6.7 | 6.6 | 5.2 | 4.3 | 3.8 | 1.9 | 1.4 | 40.7 | 49.2 |
| 1967 | 2.2 | 2.8 | 3.4 | 4.0 | 5.8 | 5.7 | 6.0 | 5.1 | 4.0 | 4.2 | - | - | 38.2 | - |
| Avg. | 2.6 | 3.1 | 4.0 | 4.4 | 5.4 | 6.1 | 6.1 | 5.4 | 4.5 | 3.9 | 2.3 | 1.9 | 39.8 | 49.7 |
| NET ATMOMETER EVAPORATION, (E _{p-w}) - MILLILITERS | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | 480 | 420 | 367 | 313 | 267 | - | - | - |
| 1964 | - | - | - | 395 | 402 | 413 | 464 | 411 | 369 | 303 | 257 | - | - | - |
| 1965 | - | - | - | 349 | 409 | 342 | 428 | 452 | 362 | 363 | 242 | - | - | - |
| 1966 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1967 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Avg. | - | - | - | 372 | 406 | 378 | 457 | 428 | 366 | 326 | 255 | - | - | - |
| INCOMING SOLAR RADIATION (Rs) - EQUIVALENT INCHES OF EVAPORATION ^{4/} | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | N.R. | N.R. | 8.90 | 7.05 | 5.19 | 5.01 | - | - |
| 1964 | 5.78 | 7.16 | 9.30 | 11.26 | 12.39 | 12.78 | 12.70 | 11.06 | 10.09 | 6.55 | 5.01 | 3.61 | 96.13 | 107.60 |
| 1965 | 4.92 | 5.97 | 8.05 | 9.00 | 12.16 | 10.92 | 12.10 | 11.20 | 8.08 | 7.18 | 4.02 | 3.84 | 79.59 | 97.34 |
| 1966 | 4.11 | 5.75 | 9.55 | 9.49 | 10.03 | 12.17 | 12.06 | 10.55 | 7.93 | 6.34 | 3.86 | 3.78 | 77.12 | 95.62 |
| 1967 | 4.46 | 6.60 | 8.01 | 9.69 | 12.79 | 10.54 | 12.66 | 10.99 | 8.06 | 7.84 | - | - | 80.58 | - |
| Avg. | 5.07 | 6.37 | 8.48 | 9.86 | 11.84 | 11.58 | 12.38 | 10.95 | 8.61 | 7.09 | 4.62 | 4.06 | 91.60 | 100.71 |
| BLANFY-CRIDDLE CONSUMPTIVE USE FACTOR, (f) - $\frac{t \times e^5}{100}$ | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | 5.57 | 5.40 | 5.14 | 4.74 | 3.83 | 3.51 | - | - |
| 1964 | 3.41 | 3.37 | 4.05 | 4.45 | 4.96 | 5.32 | 5.61 | 5.35 | 4.75 | 4.63 | 3.55 | 3.00 | 30.12 | 33.05 |
| 1965 | 3.65 | 3.42 | 4.22 | 4.70 | 5.17 | 5.35 | 5.68 | 5.56 | 4.90 | 4.98 | 3.88 | 3.39 | 40.53 | 44.87 |
| 1966 | 3.23 | 3.20 | 4.32 | 4.94 | 5.40 | 5.58 | 5.69 | 5.47 | 5.01 | 4.63 | 3.88 | 3.47 | 41.05 | 55.03 |
| 1967 | 3.28 | 3.60 | 4.15 | 4.11 | 5.30 | 5.39 | 5.98 | 5.53 | 5.10 | 4.74 | - | - | 40.00 | - |
| Avg. | 3.49 | 3.40 | 4.20 | 4.55 | 5.21 | 5.41 | 5.69 | 5.46 | 4.98 | 4.72 | 3.78 | 3.49 | 40.22 | 54.38 |
| AVERAGE RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | | |
| T/Ep | 0.77 | 0.71 | 0.78 | 0.82 | 0.78 | 0.69 | 0.77 | 0.85 | 0.94 | 0.87 | 0.87 | 0.72 | 0.70 | 0.80 |
| T/Ep-w | - | - | - | 0.0099 | 0.0099 | 0.0116 | 0.0105 | 0.0114 | 0.0109 | 0.0101 | 0.0082 | - | - | - |
| T/Rs | 0.39 | 0.33 | 0.37 | 0.37 | 0.35 | 0.36 | 0.38 | 0.42 | 0.44 | 0.40 | 0.41 | 0.37 | 0.33 | 0.39 |
| T/Avg | 0.57 | 0.74 | 0.74 | 0.79 | 0.81 | 0.78 | 0.83 | 0.84 | 0.76 | 0.72 | 0.63 | 0.53 | 0.72 | 0.73 |

1/ Maren - October

2/ January - December

3/ Evapotranspiration determined with 6-foot diameter, Wisconsin type, floating evapotranspirometer.
 4/ Observed radiation data at ET tank site for period 9/63 - 8/64. Rs estimated from the monthly relationship between Rs at the Guadalupe ET tank site and N.W.S. Santa Maria Station for the period 9/63 - 8/64, and the observed Rs at N. W. S. Santa Maria for the period 9/64 - 10/67.

5/ Based upon average monthly air temperature °F observed at ET tank site for period 1/66 - 12/66. Average air temperatures for all other months estimated for ET tank site from the monthly relationship between air temperatures at that location and at N.W.S. Santa Maria - A. P. station and the Santa Maria temperature record.

6/ Average monthly ratios of evapotranspiration/net atmometer evaporation calculated for months corresponding to atmometer evaporation only.

Table 0-5. LOMPOC STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

Eight miles inland in Santa Ynez Valley
 Latitude 34°41' N, longitude 120°21' W
 Elevation 90 ft., mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|-------------------|
| | | | | | | | | | | | | | M-O ^{1/} | J-D ^{2/} |
| EVAPOTRANSPIRATION OF GRASS, (ET) - INCHES ^{3/} | | | | | | | | | | | | | | |
| 1968 | 1.8 | 2.2 | 4.5 | 4.1 | 5.0 | 4.3 | 5.0 | 4.6 | 2.9 | 2.9 | 2.0 | 1.3 | 33.3 | 40.6 |
| 1969 | 1.0 | 1.5 | 2.9 | 4.0 | 4.7 | 4.1 | 4.5 | 4.8 | 3.6 | 3.4 | 2.3 | 1.2 | 32.0 | 38.0 |
| 1970 | 1.2 | 2.6 | 4.8 | - | - | - | - | - | - | - | - | - | - | - |
| AVG. ^{4/} | 1.5 | 2.2 | 3.7 | 4.3 | 4.8 | 4.8 | 4.9 | 4.6 | 3.8 | 3.0 | 2.0 | 1.4 | 33.9 | 41.0 |
| EVAPORATION FROM CLASS "A" PAN, (Ep) - INCHES | | | | | | | | | | | | | | |
| 1968 | 3.6 | 2.5 | 4.7 | 5.9 | 6.6 | 8.1 | 6.8 | 7.1 | 7.1 | 4.8 | 3.4 | 2.8 | 51.1 | 63.4 |
| 1969 | 2.7 | 2.3 | 4.4 | 5.8 | 6.7 | 5.2 | 6.1 | 6.4 | 4.5 | 4.9 | 3.0 | 2.1 | 44.0 | 54.1 |
| 1970 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AVG. | 3.2 | 2.4 | 4.6 | 5.8 | 6.6 | 6.6 | 6.4 | 6.8 | 5.8 | 4.8 | 3.2 | 2.4 | 47.4 | 58.6 |
| NET ATMOMETER EVAPORATION, (E _{b-w}) - MILLILITERS | | | | | | | | | | | | | | |
| 1968 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1969 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1970 ^{5/} | 275 | 270 | 352 | 399 | 500 | 497 | 496 | 460 | 400 | 379 | 299 | 249 | 3,483 | 4,576 |
| INCOMING SOLAR RADIATION, (Rs) - EQUIVALENT INCHES OF EVAPORATION | | | | | | | | | | | | | | |
| 1968 | 5.17 | 5.37 | 8.84 | 11.73 | 13.14 | 13.32 | 13.14 | 12.35 | 10.22 | 8.14 | 6.28 | 5.01 | 90.88 | 112.71 |
| 1969 | 3.91 | 5.63 | 10.66 | 11.58 | 12.15 | 9.60 | 13.14 | 12.83 | 10.26 | 8.56 | 5.46 | 5.08 | 88.78 | 108.86 |
| 1970 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AVG. | 4.54 | 5.50 | 9.75 | 11.66 | 12.64 | 11.46 | 13.14 | 12.59 | 10.24 | 8.35 | 5.87 | 5.04 | 89.83 | 110.78 |
| BLANEY-CRIDDLE CONSUMPTIVE USE FACTOR, (f) - $\frac{t \times P}{100}$ ^{6/} | | | | | | | | | | | | | | |
| 1968 | 3.67 | 4.03 | 4.67 | 4.97 | 5.70 | 5.93 | 6.18 | 5.93 | 5.30 | 4.89 | 4.06 | 3.44 | 43.57 | 58.77 |
| 1969 | 3.76 | 3.57 | 4.44 | 4.89 | 5.60 | 5.98 | 6.13 | 5.77 | 5.20 | 4.83 | 4.13 | 3.68 | 42.84 | 57.98 |
| 1970 | 3.84 | 3.84 | 4.64 | - | - | - | - | - | - | - | - | - | - | - |
| AVG. | 3.76 | 3.81 | 4.58 | 4.93 | 5.65 | 5.96 | 6.16 | 5.85 | 5.25 | 4.86 | 4.10 | 3.56 | 43.24 | 58.47 |
| AVERAGE RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | | |
| ET/Ep ^{7/} | 0.44 | 0.75 | 0.80 | 0.69 | 0.73 | 0.64 | 0.75 | 0.69 | 0.55 | 0.67 | 0.69 | 0.50 | 0.69 | 0.67 |
| ET/E _{b-w} ^{8/} | 0.0055 | 0.0081 | 0.0105 | 0.0108 | 0.0096 | 0.0097 | 0.0099 | 0.0100 | 0.0095 | 0.0079 | 0.0067 | 0.0056 | 0.0097 | 0.0090 |
| ET/Rs | 0.31 | 0.33 | 0.38 | 0.34 | 0.38 | 0.37 | 0.37 | 0.37 | 0.31 | 0.38 | 0.37 | 0.24 | 0.36 | 0.35 |
| ET/'f' ^{9/} | 0.35 | 0.55 | 0.90 | 0.81 | 0.85 | 0.70 | 0.78 | 0.80 | 0.61 | 0.66 | 0.54 | 0.34 | 0.78 | 0.70 |

Data contributed by Paul R. Nixon, formerly Project Leader, USDA, Agricultural Research Service, Lompoc, California.

- 1/ March - October
- 2/ January - December
- 3/ ET data observed with 1-meter square hydraulic pillow lysimeter and/or 4-foot diameter electronic weighing lysimeter.
- 4/ Average of all available ET-grass data 1965, 1968-1970.
- 5/ Average net atmometer evaporation during 1957-1961. Atmometers operated at 35" above ground at a site 9 miles inland.
- 6/ Calculated from mean monthly air temperature observed at Lompoc Sewer plant as published in N.W.S. "Climatological Data - Annual Summaries", 1968-1970.
- 7/ Monthly ratios calculated from 1968 and 1969 data.
- 8/ Monthly ratios calculated from average ET, 1965, 1968-1970 and average net atmometer evaporation, 1957-1961.
- 9/ Ratios calculated from average monthly ET and 'f' data for the period 1/1968 - 3/1970.

Table G-6. SAN LUIS OBISPO STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

13 miles inland in the Los Oaos Valley
 Latitude 35°18' N, longitude 120°40' W
 Elevation 300 ft., mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | |
|---|-----------------------|------|------|-------|-------|-------|-------|-------|-------|------|------|------|-------------------|-------------------|
| | | | | | | | | | | | | | M-O ^{1/} | J-D ^{2/} |
| EVAPOTRANSPIRATION OF GRASS - INCHES ^{3/} | | | | | | | | | | | | | | |
| 1969 | - | - | - | - | - | - | - | - | - | 4.0 | 3.5 | 1.9 | - | - |
| 1970 | 1.9 | 3.4 | 4.9 | 3.8 | 6.0 | 5.3 | 6.0 | 3.8 | 5.0 | 3.0 | 3.0 | - | 27.8 | - |
| 1971 | - | 3.1 | 3.5 | 3.4 | 4.6 | 3.7 | 6.8 | 6.2 | 5.9 | 2.6 | 2.8 | 1.8 | 36.7 | - |
| 1972 | 2.8 | 2.8 | 3.6 | 4.0 | 5.0 | 4.4 | 4.7 | 3.0 | 3.0 | 3.2 | - | - | 30.9 | - |
| AVG. | 2.4 | 3.1 | 4.0 | 3.7 | 5.2 | 4.5 | 5.8 | 4.3 | 4.6 | 3.2 | 3.1 | 1.8 | 35.3 | 45.7 |
| EVAPORATION FROM CLASS "A" PAN - INCHES | | | | | | | | | | | | | | |
| 1969 | - | - | - | - | - | - | - | - | - | 5.7 | 4.1 | 2.8 | - | - |
| 1970 | 1.7 | 3.2 | 6.1 | 7.2 | 7.5 | 6.7 | 7.6 | 7.7 | 6.4 | 5.1 | 3.6 | - | 54.3 | - |
| 1971 | - | 4.2 | 4.4 | 5.1 | 5.8 | 7.5 | 7.9 | 8.1 | 6.8 | 5.8 | 3.6 | 1.7 | 51.4 | - |
| 1972 | 3.5 | 3.8 | 5.8 | 6.5 | 7.2 | 7.3 | 8.8 | 6.1 | 6.3 | 3.9 | - | - | 51.9 | - |
| AVG. | 2.6 | 3.7 | 5.4 | 6.3 | 6.8 | 7.2 | 8.1 | 7.3 | 6.5 | 5.1 | 3.8 | 2.2 | 52.7 | 65.0 |
| NET ATMOMETER EVAPORATION - MILLILITERS | | | | | | | | | | | | | | |
| 1969 | - NO DATA AVAILABLE - | | | | | | | | | | | | | |
| 1970 | - NO DATA AVAILABLE - | | | | | | | | | | | | | |
| 1971 | - NO DATA AVAILABLE - | | | | | | | | | | | | | |
| 1972 | - NO DATA AVAILABLE - | | | | | | | | | | | | | |
| AVG. | - NO DATA AVAILABLE - | | | | | | | | | | | | | |
| INCOMING SOLAR RADIATION - EQUIVALENT INCHES OF EVAPORATION | | | | | | | | | | | | | | |
| 1969 | - | - | - | - | - | - | - | - | - | 8.32 | 5.68 | 5.02 | - | - |
| 1970 | 4.88 | 6.30 | 9.99 | 11.89 | 13.01 | 11.76 | 12.93 | 11.88 | 10.38 | 7.19 | 5.68 | - | 89.03 | - |
| 1971 | - | 6.62 | 9.61 | 11.53 | 11.67 | 13.12 | 13.73 | 11.93 | 9.25 | 8.08 | 6.18 | 5.09 | 88.92 | - |
| 1972 | 6.28 | 6.88 | 9.94 | 11.99 | 12.95 | 12.66 | 13.09 | 11.91 | 9.62 | 6.74 | - | - | 88.90 | - |
| AVG. | 5.58 | 6.60 | 9.85 | 11.80 | 12.54 | 12.51 | 13.25 | 11.91 | 9.75 | 7.58 | 5.85 | 5.06 | 89.10 | 112.28 |
| BLANEY-CRIDDLE 'f' FACTOR $\frac{t \times p^4}{100}$ | | | | | | | | | | | | | | |
| 1969 | - | - | - | - | - | - | - | - | - | 4.93 | 4.26 | 3.79 | - | - |
| 1970 | 3.79 | 3.80 | 4.57 | 4.69 | 5.91 | 5.90 | 6.61 | 5.95 | 5.42 | 4.73 | 3.96 | - | 43.78 | - |
| 1971 | - | 3.58 | 4.46 | 4.82 | 5.47 | 5.97 | 6.31 | 6.36 | 5.63 | 4.65 | 3.76 | 3.16 | 43.67 | - |
| 1972 | 3.42 | 3.78 | 4.87 | 5.04 | 5.81 | 6.11 | 6.48 | 6.17 | 5.43 | 4.86 | - | - | 44.77 | - |
| AVG. | 3.60 | 3.72 | 4.63 | 4.85 | 5.73 | 5.99 | 6.47 | 6.16 | 5.49 | 4.79 | 3.99 | 3.48 | 44.11 | 58.90 |
| RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | | |
| ET/Ep | 0.92 | 0.84 | 0.74 | 0.59 | 0.76 | 0.62 | 0.72 | 0.59 | 0.71 | 0.63 | 0.82 | 0.82 | 0.67 | 0.70 |
| ET/E _{b-w} | - NO DATA AVAILABLE - | | | | | | | | | | | | | |
| ET/Rs | 0.43 | 0.47 | 0.41 | 0.31 | 0.41 | 0.36 | 0.44 | 0.36 | 0.47 | 0.42 | 0.53 | 0.36 | 0.40 | 0.41 |
| ET/'f' | 0.67 | 0.83 | 0.86 | 0.76 | 0.91 | 0.75 | 0.90 | 0.70 | 0.84 | 0.67 | 0.78 | 0.52 | 0.80 | 0.78 |

Data collected by California Polytechnic College in cooperation with Department of Water Resources - Southern District

1/ March - October

2/ January - December

3/ Evapotranspiration determined with 6-foot diameter, Wisconsin type, floating evapotranspirometer.

4/ Calculated from temperature record at San Luis Obispo - Poly N.W.S. station.

Table G-7. SOLEDAD STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

35 miles inland in the Salinas Valley
 Latitude 36°28' N, longitude 121°23' W
 Elevation 230 ft., mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|-------------------|
| | | | | | | | | | | | | | M-O ^{1/} | J-D ^{2/} |
| EVAPOTRANSPIRATION OF GRASS, (ET) - INCHES ^{3/} | | | | | | | | | | | | | | |
| 1963 | - | - | - | 4.0 | 5.0 | 5.3 | 6.4 | 6.3 | 4.8 | 3.4 | 2.0 | 1.6 | - | - |
| 1964 | 1.4 | 2.6 | 3.4 | 4.4 | 5.8 | 5.6 | 6.0 | 5.4 | 5.3 | 2.4 | 2.1 | 1.4 | 38.3 | 45.8 |
| 1965 | 1.5 | 2.3 | 3.0 | 3.8 | 4.8 | 4.8 | 5.9 | - | - | - | - | - | - | - |
| 1966 | 2.1 | 2.6 | 3.8 | 4.8 | 5.5 | 6.8 | 7.3 | 6.9 | 4.5 | 4.4 | 2.2 | 1.7 | 44.0 | 52.6 |
| 1967 | 2.3 | 2.8 | 3.0 | 3.6 | 5.6 | 5.9 | 7.2 | 7.4 | 5.8 | 4.9 | 2.8 | 1.4 | 43.4 | 52.7 |
| 1968 | 2.0 | 2.0 | 4.4 | 5.7 | 6.0 | 4.2 | 5.2 | 5.4 | 4.8 | 3.6 | 1.7 | 1.3 | 39.3 | 46.3 |
| 1969 | 1.1 | 1.0 | 3.7 | 4.8 | 5.1 | 4.7 | - | 6.9 | - | - | - | - | - | - |
| 1970 | 2.3 | 2.6 | 3.6 | 4.1 | 5.1 | 6.0 | 6.8 | 6.6 | 5.7 | 4.5 | 2.9 | 1.2 | 42.4 | 51.4 |
| Avg. | 1.8 | 2.3 | 3.6 | 4.4 | 5.4 | 5.4 | 6.4 | 6.4 | 5.2 | 3.9 | 2.3 | 1.4 | 40.7 | 48.5 |
| EVAPORATION FROM CLASS "A" PAN, (Ep) - INCHES | | | | | | | | | | | | | | |
| 1963 | - | - | - | 4.8 | 6.4 | 7.8 | 9.0 | 8.3 | 7.0 | 4.5 | 2.5 | 2.7 | - | - |
| 1964 | 2.4 | 3.8 | 5.1 | 6.1 | 7.2 | 8.4 | 8.2 | 7.4 | 7.2 | 5.1 | 2.6 | 2.0 | 54.7 | 65.5 |
| 1965 | 1.9 | 3.5 | 4.3 | 5.1 | 8.2 | 7.5 | 8.0 | - | - | - | - | - | - | - |
| 1966 | 2.1 | 2.8 | 4.9 | 6.3 | 7.1 | 8.8 | 8.1 | 7.5 | 6.2 | 5.2 | 3.2 | 2.0 | 54.1 | 64.2 |
| 1967 | 2.8 | 2.6 | 3.9 | 4.3 | 7.2 | 6.8 | 8.7 | 7.8 | 6.2 | 5.8 | 2.9 | 2.3 | 50.7 | 61.3 |
| 1968 | 2.5 | 2.4 | 4.4 | 6.2 | 8.0 | 8.8 | 8.0 | 7.7 | 7.1 | 4.7 | 2.9 | 2.5 | 54.9 | 65.2 |
| 1969 | 2.5 | 2.2 | 4.9 | 6.1 | 7.8 | 7.4 | - | 7.9 | - | - | - | - | - | - |
| 1970 | 2.6 | 3.1 | 5.3 | 6.7 | 8.9 | 8.8 | 9.2 | 8.2 | 7.6 | 4.5 | 2.8 | 1.5 | 59.2 | 69.2 |
| Avg. | 2.4 | 2.9 | 4.7 | 5.7 | 7.6 | 8.0 | 8.5 | 7.8 | 6.9 | 5.0 | 2.8 | 2.2 | 54.2 | 64.5 |
| NET ATMOMETER EVAPORATION, (E _{b-w}) - MILLILITERS | | | | | | | | | | | | | | |
| 1963 | - | - | - | 375 | 414 | 480 | 512 | 454 | 422 | 335 | 237 | 239 | - | - |
| 1964 | 221 | 265 | 323 | 372 | 431 | 467 | 454 | 444 | 372 | 252 | 242 | 173 | 3115 | 4016 |
| 1965 | 218 | 286 | 317 | 350 | 508 | 494 | 527 | - | - | - | - | - | - | - |
| 1966 | 199 | 224 | 320 | 369 | 436 | 433 | 515 | 515 | 432 | 361 | 234 | 161 | 3381 | 4199 |
| 1967 | 238 | 309 | 324 | 314 | 447 | 368 | 419 | 340 | 291 | 302 | 210 | 190 | 2805 | 3752 |
| 1968 | 168 | 165 | 281 | 318 | 342 | 361 | 479 | 352 | 315 | 257 | 195 | 131 | 2705 | 3364 |
| 1969 | 128 | 154 | 258 | 298 | 345 | 318 | - | 245 | - | - | - | - | - | - |
| 1970 | 199 | 224 | 320 | 369 | 485 | 435 | 432 | 405 | 389 | 262 | 223 | 189 | 3097 | 3932 |
| Avg. | 196 | 232 | 306 | 346 | 426 | 420 | 477 | 394 | 370 | 295 | 224 | 180 | 3034 | 3866 |
| INCOMING SOLAR RADIATION, (Rs) - EQUIVALENT INCHES OF EVAPORATION | | | | | | | | | | | | | | |
| 1963 | - | - | - | 10.52 | 12.41 | 14.84 | 14.98 | 12.70 | 10.03 | 7.76 | 4.70 | 4.59 | - | - |
| 1964 | 4.74 | 6.74 | 9.26 | 12.01 | 12.77 | 12.68 | 13.96 | 11.72 | 9.93 | 6.59 | 4.64 | 3.13 | 88.92 | 108.17 |
| 1965 | 3.98 | 5.94 | 10.20 | 9.53 | 13.43 | 12.70 | 13.25 | - | - | - | - | - | - | - |
| 1966 | 3.96 | 7.08 | 8.95 | 10.64 | 11.89 | 13.10 | 12.31 | 11.72 | 9.16 | 7.57 | 4.87 | 4.86 | 85.34 | 106.11 |
| 1967 | 4.94 | 7.03 | 7.55 | 9.43 | 11.87 | 10.74 | 12.10 | 10.12 | 7.25 | 6.72 | 4.18 | 3.92 | 75.78 | 88.82 |
| 1968 | 4.30 | 4.07 | 7.61 | 10.15 | 11.20 | 11.57 | 10.79 | 9.58 | 8.26 | 5.67 | 3.84 | 3.23 | 74.83 | 90.27 |
| 1969 | 2.90 | 3.75 | 8.05 | 9.17 | 10.78 | 10.32 | - | 11.24 | - | - | - | - | - | - |
| 1970 | 3.40 | 5.48 | 7.84 | 9.97 | 10.74 | 10.70 | 10.47 | 9.66 | 8.60 | 6.07 | 4.36 | 2.46 | 74.05 | 89.75 |
| Avg. | 4.03 | 5.73 | 8.49 | 10.18 | 11.89 | 12.08 | 12.55 | 10.96 | 8.87 | 6.73 | 4.43 | 3.70 | 81.75 | 99.64 |
| BLANEY-CRIDDLE CONSUMPTIVE USE FACTOR, (f) - $\frac{t \times p}{100}$ | | | | | | | | | | | | | | |
| 1963 | - | - | - | 4.67 | 5.67 | 5.95 | 6.22 | 5.84 | 5.52 | 4.79 | 3.73 | 3.41 | - | - |
| 1964 | 3.34 | 3.40 | 3.95 | 4.71 | 5.36 | 5.95 | 6.27 | 6.00 | 5.54 | 5.10 | 3.56 | 3.54 | 42.88 | 56.72 |
| 1965 | 3.45 | 3.46 | 4.33 | 4.85 | 5.37 | 5.59 | 5.95 | - | - | - | - | - | - | - |
| 1966 | 3.30 | 3.31 | 4.46 | 5.22 | 5.53 | 6.06 | 6.74 | 5.02 | 5.30 | 4.82 | 3.90 | 3.37 | 44.15 | 58.03 |
| 1967 | 3.33 | 3.57 | 4.34 | 4.34 | 5.79 | 5.86 | 7.04 | 6.00 | 5.56 | 4.90 | 4.00 | 3.15 | 43.83 | 57.89 |
| 1968 | 3.41 | 3.85 | 4.57 | 4.88 | 5.68 | 6.11 | 6.33 | 5.98 | 5.30 | 4.71 | 3.78 | 3.09 | 43.56 | 57.69 |
| 1969 | 3.41 | 3.31 | 4.36 | 4.51 | 5.77 | 6.09 | - | 5.62 | - | - | - | - | - | - |
| 1970 | 3.61 | 3.68 | 4.47 | 4.66 | 5.75 | 6.15 | 6.20 | 5.81 | 5.32 | 4.61 | 3.84 | 3.25 | 42.97 | 57.35 |
| Avg. | 3.41 | 3.51 | 4.35 | 4.73 | 5.62 | 5.97 | 6.39 | 5.90 | 5.42 | 4.82 | 3.80 | 3.30 | 43.20 | 57.22 |
| AVERAGE RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | | |
| ET/Ep | 0.75 | 0.79 | 0.77 | 0.77 | 0.71 | 0.68 | 0.75 | 0.82 | 0.75 | 0.78 | 0.82 | 0.64 | 0.75 | 0.75 |
| ET/E _{b-w} | 0.0092 | 0.0099 | 0.0118 | 0.0127 | 0.0127 | 0.0129 | 0.0134 | 0.0162 | 0.0141 | 0.0132 | 0.0103 | 0.0078 | 0.0134 | 0.0125 |
| ET/Rs | 0.45 | 0.40 | 0.42 | 0.43 | 0.45 | 0.45 | 0.51 | 0.58 | 0.59 | 0.58 | 0.52 | 0.38 | 0.50 | 0.49 |
| ET/'f' | 0.53 | 0.66 | 0.83 | 0.93 | 0.96 | 0.90 | 1.00 | 1.08 | 0.96 | 0.81 | 0.61 | 0.42 | 0.94 | 0.85 |

Data collected by California Department of Corrections - Soledad Correctional Training Facility, in cooperation with Department of Water Resources.

1/ March - October

2/ January - December

3/ Evapotranspiration determined with three 32-inch-diameter weighing evapotranspirometers; reported ET is the average of the three tanks.

Table G-8. THORNTON STATION

SUMMARY OF MONTHLY EVAPOTRANSPIRATION OF GRASS, RELATED CLIMATIC INDEXES, AND RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES

In southern Sacramento Valley near the eastern edge of the Sacramento-San Joaquin Delta
 Latitude 38°12' N, longitude 121°25' W
 Elevation 7 ft., mean sea level

| Year | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Totals | |
|--|------|------|------|--------|--------|--------|--------|--------|--------|--------|------|------|--------------------|-------------------|
| | | | | | | | | | | | | | M-01 ^{1/} | J-D ^{2/} |
| EVAPOTRANSPIRATION OF GRASS, (ET) - INCHES ^{3/} | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | - | - | 5.2 | 2.2 | 0.2 | 0.4 | - | - |
| 1964 | 0.6 | 1.1 | 2.8 | 6.3 | 6.5 | 7.7 | 9.8 | 6.7 | 4.5 | 3.1 | 0.9 | 0.5 | 47.4 | 50.5 |
| 1965 | 0.7 | 2.1 | 2.2 | 3.4 | 7.4 | 7.4 | 8.3 | 6.6 | 4.0 | 2.3 | 1.0 | 0.7 | 41.6 | 46.2 |
| 1966 | 1.3 | 1.6 | 3.0 | 5.8 | 6.2 | 8.2 | 8.0 | 8.2 | 5.3 | 3.2 | 1.6 | 0.2 | 47.9 | 52.6 |
| 1967 | 0.5 | 1.4 | 1.8 | 2.8 | 5.7 | 6.4 | 7.6 | 6.4 | 4.6 | 3.1 | 1.0 | 0.6 | 38.4 | 41.9 |
| 1968 | 0.5 | 0.7 | 2.2 | 5.8 | 6.1 | 8.5 | 8.0 | 5.7 | 4.4 | 2.0 | 1.1 | 0.5 | 42.7 | 45.5 |
| Avg. | 0.7 | 1.4 | 2.4 | 4.8 | 6.4 | 7.6 | 8.3 | 6.7 | 4.7 | 2.6 | 1.0 | 0.5 | 43.5 | 47.1 |
| EVAPORATION FROM CLASS "A" PAN, (E _p) - INCHES | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | - | - | 5.6 | 3.6 | 1.2 | 0.5 | - | - |
| 1964 | 0.8 | 3.0 | 4.5 | 6.3 | 7.6 | 7.9 | 10.4 | 9.8 | 6.9 | 4.1 | 1.9 | 1.4 | 57.5 | 64.6 |
| 1965 | 0.8 | 2.0 | 2.9 | 4.1 | 7.6 | 8.6 | 11.0 | 8.9 | 5.8 | 3.6 | 1.8 | 0.8 | 52.5 | 57.9 |
| 1966 | 1.4 | 2.0 | 4.0 | 6.3 | 7.6 | 10.2 | 9.6 | 9.1 | 6.6 | 4.3 | 1.4 | 0.3 | 57.7 | 62.8 |
| 1967 | 0.6 | 1.9 | 2.3 | 3.3 | 7.0 | 8.2 | 9.3 | 8.0 | 5.8 | 3.9 | 1.4 | 0.8 | 47.8 | 52.5 |
| 1968 | 0.9 | 2.2 | 3.0 | 6.9 | 7.5 | 9.4 | 10.8 | 7.0 | 6.9 | 2.5 | 1.6 | 0.9 | 54.0 | 59.8 |
| Avg. | 0.9 | 2.2 | 3.3 | 5.4 | 7.5 | 8.9 | 10.2 | 8.6 | 6.3 | 3.7 | 1.6 | 0.8 | 53.9 | 59.4 |
| NET ATMOMETER EVAPORATION, (E _{b-w}) - MILLILITERS | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | - | - | 398 | 337 | - | - | - | - |
| 1964 | - | - | - | 421 | 509 | 512 | 574 | 500 | 428 | 344 | - | - | - | - |
| 1965 | - | - | - | 365 | 511 | 545 | 580 | 505 | 437 | 375 | - | - | - | - |
| 1966 | - | - | - | 442 | 515 | 518 | 547 | 488 | 400 | 323 | - | - | - | - |
| 1967 | - | - | - | 440 | 511 | 509 | 541 | 472 | 394 | 316 | - | - | - | - |
| 1968 | - | - | - | 427 | 542 | 522 | 543 | 487 | 414 | 336 | - | - | - | - |
| Avg. | - | - | - | 419 | 518 | 521 | 557 | 490 | 412 | 338 | - | - | - | - |
| INCOMING SOLAR RADIATION, (R _s) - EQUIVALENT INCHES OF EVAPORATION | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | - | - | 8.84 | 7.11 | 3.49 | 2.25 | - | - |
| 1964 | 3.17 | 5.10 | 8.18 | 11.43 | 12.83 | 12.07 | 13.81 | 11.01 | 8.72 | 6.03 | 3.57 | 3.09 | 84.08 | 100.01 |
| 1965 | 4.59 | 5.80 | 7.66 | 7.83 | 11.62 | 13.77 | 14.00 | 12.52 | 9.63 | 7.26 | 4.72 | 3.25 | 84.29 | 102.65 |
| 1966 | 4.67 | 5.76 | 9.20 | 12.98 | 13.58 | 13.63 | 14.39 | 13.25 | 10.70 | 8.03 | 4.22 | 2.65 | 95.76 | 113.06 |
| 1967 | 3.78 | 4.97 | 7.95 | 9.00 | 14.54 | 13.57 | 15.25 | 13.39 | 11.10 | 9.91 | 6.38 | 5.13 | 94.71 | 114.97 |
| 1968 | 3.96 | 5.39 | 7.91 | 10.18 | 12.48 | 12.96 | 14.56 | 10.75 | 9.33 | 8.28 | 4.44 | 3.98 | 86.45 | 104.22 |
| Avg. | 4.03 | 5.60 | 8.18 | 10.28 | 13.01 | 13.20 | 14.40 | 12.18 | 9.72 | 7.77 | 4.47 | 3.39 | 88.74 | 106.23 |
| BLANEY-CRIDDLE CONSUMPTIVE USE FACTOR, (f) - $\frac{t \times p}{100}$ | | | | | | | | | | | | | | |
| 1963 | - | - | - | - | - | - | - | - | 5.58 | 4.56 | 3.23 | 2.73 | - | - |
| 1964 | 2.97 | 3.09 | 3.96 | 4.76 | 5.60 | 6.27 | 6.92 | 6.44 | 5.56 | 4.88 | 3.30 | 3.32 | 44.39 | 57.07 |
| 1965 | 2.97 | 3.16 | 4.21 | 4.92 | 5.87 | 6.14 | 6.92 | 6.65 | 5.18 | 4.64 | 3.61 | 2.60 | 44.73 | 57.07 |
| 1966 | 2.31 | 3.00 | 4.24 | 5.20 | 6.07 | 6.65 | 6.79 | 6.68 | 5.63 | 4.71 | 3.55 | 2.91 | 45.97 | 58.40 |
| 1967 | 3.10 | 3.20 | 4.56 | 4.21 | 6.06 | 6.17 | 7.38 | 6.36 | 5.88 | 5.10 | 3.08 | 2.88 | 45.72 | 57.98 |
| 1968 | 2.85 | 3.13 | 4.34 | 4.77 | 6.10 | 6.96 | 7.42 | 6.72 | 5.99 | 4.76 | 3.43 | 2.84 | 47.06 | 59.31 |
| Avg. | 2.96 | 3.13 | 4.26 | 4.77 | 5.94 | 6.44 | 7.09 | 6.57 | 5.64 | 4.81 | 3.37 | 2.88 | 45.52 | 57.86 |
| AVERAGE RATIOS OF EVAPOTRANSPIRATION TO CLIMATIC INDEXES | | | | | | | | | | | | | | |
| ET/E _p | 0.78 | 0.64 | 0.73 | 0.89 | 0.85 | 0.85 | 0.81 | 0.78 | 0.75 | 0.70 | 0.62 | 0.62 | 0.81 | 0.79 |
| ET/E _{b-w} | - | - | - | 0.0115 | 0.0124 | 0.0146 | 0.0149 | 0.0137 | 0.0114 | 0.0077 | - | - | - | - |
| ET/R _s | 0.17 | 0.25 | 0.29 | 0.47 | 0.49 | 0.58 | 0.58 | 0.55 | 0.48 | 0.33 | 0.22 | 0.15 | 0.49 | 0.44 |
| ET/f ^{3/} | 0.24 | 0.45 | 0.56 | 1.01 | 1.08 | 1.18 | 1.17 | 1.02 | 0.83 | 0.54 | 0.30 | 0.17 | 0.96 | 0.81 |

1/ March - October

2/ January - December

3/ Evapotranspiration determined with 6-foot-diameter floating evapotranspirometer.

APPENDIX H

LINEAR RELATIONSHIPS BETWEEN OBSERVED
MONTHLY EVAPOTRANSPIRATION OF GRASS
AND FOUR CLIMATIC INDEXES

Appendix H

LINEAR RELATIONSHIPS BETWEEN OBSERVED MONTHLY EVAPOTRANSPIRATION OF GRASS AND FOUR CLIMATIC INDEXES^{1/}

Derived from data shown in Appendix C

| Stations | Relationship between observed monthly evapotranspiration and - | | | | | | | | | | | |
|--|--|--|----------------------------|---------------------------------|--|--------------|-------------------------------|--|--------------|-------------------------------|--|--------------|
| | Pan evaporation | Corre- lation coeffi- cient "r" | Sy \bar{x} ^{3/} | Net atmometer evaporation | Corre- lation coeffi- cient "r" | Sy \bar{x} | Solar Radiation ^{2/} | Corre- lation coeffi- cient "r" | Sy \bar{x} | Blanley-Criddle 'f' factor | Corre- lation coeffi- cient "r" | Sy \bar{x} |
| Arvin | 0.00 + 0.807 Ep | 0.06 | 0.74 | -1.64 + 0.0157 E _{B-W} | 0.82 | 1.00 | -1.97 + 0.699 R _S | 0.95 | 0.82 | -3.07 + 1.468 f | 0.96 | 0.76 |
| Davis | -0.14 + 0.777 Fp | 0.09 | 0.41 | -1.35 + 0.0149 E _{B-W} | 0.76 | 1.22 | -1.28 + 0.600 R _S | 0.97 | 0.66 | -3.76 + 1.595 f | 0.98 | 0.53 |
| Thornton | -0.25 + 0.846 Ep | 0.08 | 0.59 | -5.19 + 0.0238 E _{B-W} | 0.89 | 0.96 | -2.17 + 0.689 R _S | 0.94 | 0.93 | -4.89 + 1.804 f | 0.94 | 0.95 |
| Glenburn | -0.16 + 0.811 Ep | 0.91 | 0.82 | -1.50 + 0.0154 E _{B-W} | 0.82 | 0.71 | -0.79 + 0.515 R _S | 0.81 | 1.18 | -3.63 + 1.676 f | 0.93 | 0.75 |
| Soledad | 0.22 + 0.707 Ep | 0.93 | 0.67 | -0.46 + 0.0139 E _{B-W} | 0.82 | 1.03 | -0.20 + 0.458 R _S | 0.86 | 0.93 | -3.34 + 1.548 f | 0.93 | 0.68 |
| Guadalupe | 0.24 + 0.747 Ep | 0.89 | 0.54 | -1.01 + 0.0130 E _{B-W} | 0.81 | 0.64 | -0.52 + 0.334 R _S | 0.83 | 0.66 | -2.26 + 1.228 f | 0.86 | 0.61 |
| Lompoc | 0.10 + 0.649 Ep | 0.87 | 0.68 | -1.83 + 0.0138 E _{B-W} | 0.96 | 0.40 | -0.26 + 0.382 R _S | 0.93 | 0.50 | -3.12 + 1.328 f | 0.88 | 0.66 |
| San Luis Obispo | 0.86 + 0.547 Ep | 0.79 | 0.79 | No atmometer data | | | -0.78 + 0.327 R _S | 0.74 | 0.88 | -1.01 + 0.984 f | 0.76 | 0.85 |
| Central Valley | -0.12 + 0.796 E | 0.08 | 0.57 | -2.58 + 0.0178 E _{B-W} | 0.83 | 1.05 | -1.61 + 0.639 R _S | 0.95 | 0.79 | -3.81 + 1.604 f | 0.96 | 0.72 |
| Arvin Davis Thornton | | | | | | | | | | | | |
| Central Coast | 0.37 + 0.670 Ep | 0.89 | 0.69 | -0.36 + 0.0128 E _{B-W} | 0.78 | 1.04 | 0.32 + 0.392 R _S | 0.80 | 0.92 | -2.77 + 1.364 f | 0.87 | 0.77 |
| Soledad Guadalupe Lompoc San Luis Obispo | | | | | | | | | | | | |
| All eight locations | -0.05 + 0.772 Ep | 0.04 | 0.65 | -0.06 + 0.0144 E _{B-W} | 0.85 | 1.05 | -1.01 + 0.561 R _S | 0.91 | 0.96 | -3.63 + 1.564 f | 0.94 | 0.76 |

1/ Calculated by least squares method
 2/ Solar radiation = Equivalent inches evaporation
 3/ Sy \bar{x} = Standard error of estimate

APPENDIX I

SUMMARY OF OBSERVED MONTHLY ET/E_p RATIOS
FOR PRINCIPAL IRRIGATED CROPS

Appendix I
SUMMARY OF OBSERVED MONTHLY ET/Ep RATIOS FOR PRINCIPAL
IRRIGATED CROPS^{1/}

| Crop | Location | Observer | Year | Active Growing Season | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Growing Season Average | | |
|----------------------|--------------------------|----------|---------|-----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------|------|------|
| <u>Alfalfa (Hay)</u> | Arvin 2.5NW | DWR | 1959 | Mar-Oct | - | - | - | 0.64 | 0.52 | 0.64 | 0.63 | 0.70 | 0.90 | 0.71 | 1.04 | 1.12 | - | | |
| | | | 1960 | " | - | - | - | - | - | - | 0.77 | 0.64 | 0.81 | 0.67 | 0.63 | - | - | - | |
| | | | 1963 | " | 1.00 | 0.88 | 0.72 | 0.73 | 0.78 | 0.73 | 0.86 | 0.90 | 0.85 | 0.91 | 0.81 | 0.70 | 1.00 | 0.81 | |
| | | | Average | | 1.00 | 0.88 | 0.72 | 0.69 | 0.64 | 0.71 | 0.71 | 0.80 | 0.81 | 0.81 | 0.75 | 0.88 | 1.17 | 0.73 | |
| | | | 1960 | Apr-Sep | - | - | - | - | - | 0.64 | 0.81 | 0.97 | 0.86 | 0.95 | - | - | - | - | - |
| <u>Barley</u> | Davis 2W (Grain Crop) | U.C. | 1969-70 | Nov-May | 0.70 | 0.95 | 0.72 | 0.64 | 0.25 | - | - | - | - | - | 0.27 | 0.50 | 0.52 | | |
| | | | 1972 | Feb-May | - | 0.48 | 1.22 | 0.83 | 0.18 | - | - | - | - | - | - | - | - | 0.62 | |
| | | | 1966-67 | Oct-Dec | - | - | - | - | - | - | - | - | - | - | - | 0.12 | 0.90 | 0.46 | |
| | | | 1968 | Jul-Sep | - | - | - | - | - | - | - | - | 0.42 | 0.85 | 0.43 | - | - | - | 0.56 |
| | | | Average | | - | 0.70 | 0.69 | 0.41 | 0.85 | 0.90 | 0.80 | 0.96 | 1.19 | - | - | - | - | - | 0.87 |
| <u>Beans (Dry)</u> | Arvin 2.5S | DWR | 1970 | Mar 25- Jul 10 | - | - | - | 0.15 | 0.32 | 0.86 | 0.38 | - | - | - | - | - | 0.48 | | |
| | | | 1970 | May-Oct | 0.49 | 0.28 | 0.32 | 0.06 | 0.14 | 0.67 | 1.01 | 0.95 | 0.78 | 0.69 | 0.39 | 0.44 | 0.71 | | |
| | | | Average | Jun-Sep | - | - | - | - | 0.12 | 0.48 | 0.89 | 0.84 | 0.50 | - | - | - | 0.62 | | |
| | | | 1970-71 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | | 1970 | May-Oct | 0.49 | 0.28 | 0.32 | 0.06 | 0.14 | 0.67 | 1.01 | 0.95 | 0.78 | 0.69 | 0.39 | 0.44 | 0.71 | | |
| <u>Corn (Field)</u> | Davis 2W | U.C. | Average | Jun-Sep | - | - | - | - | 0.12 | 0.48 | 0.89 | 0.84 | 0.50 | - | - | - | 0.62 | | |
| | | | 1970-71 | | - | - | - | - | - | - | - | - | - | - | - | - | - | | |

^{1/} Ratios of observed evapotranspiration to evaporation from Class "A" pans in irrigated pasture, or comparable environments data collected by Department of Water Resources and/or cooperative agencies.
^{2/} Growing season ratios calculated from seasonal totals of ET and evaporation.

SUMMARY OF OBSERVED MONTHLY ET/Ep RATIOS FOR PRINCIPAL IRRIGATED CROPS/

| Crop | Location | Descriptor | Year | Activity | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Average | | |
|----------------------|---------------------------|----------------------------|-------------------|-----------------|---------|---------|------|------|------|------|------|------|------|------|------|------|---------|------|------|
| Cotton | Arvin 2.5NW (Solid Plant) | DWR | 1959 | May-Oct | - | - | - | - | 0.19 | 0.81 | 1.09 | 0.91 | 0.86 | 0.68 | 0.08 | - | 0.77 | | |
| | | DWR | 1960 | " | - | - | 0.26 | 0.14 | 0.03 | 0.53 | 1.07 | 1.10 | 0.82 | 0.24 | 0.53 | 0.36 | - | 0.66 | |
| | | DWR | 1961 | " | 0.44 | 0.54 | 0.28 | 0.06 | 0.14 | 0.55 | 0.90 | 1.05 | 0.92 | 0.54 | 0.29 | 0.33 | - | 0.69 | |
| | | DWR | Average | " | 0.44 | 0.54 | 0.27 | 0.10 | 0.13 | 0.63 | 1.02 | 1.01 | 0.87 | 0.49 | 0.26 | 0.33 | - | 0.70 | |
| | | DWR | 1962 | May-Oct | 0.38 | 0.32 | 0.23 | 0.14 | 0.08 | 0.37 | 0.88 | 0.92 | 0.83 | 0.41 | 0.14 | - | - | 0.59 | |
| | | DWR | 1963 | May-Oct | 0.06 | 0.33 | 0.22 | 0.28 | 0.20 | 0.49 | 0.91 | 1.06 | 0.87 | 0.76 | 0.20 | 0.25 | - | 0.70 | |
| | | DWR | 1965 | May-Oct | - | - | - | - | 0.07 | 0.15 | 0.68 | 0.88 | 0.62 | 0.26 | 0.14 | 0.26 | - | 0.46 | |
| | | Deciduous Orchard | Arvin 3NW (Plums) | DWR | 1959 | Apr-Oct | - | - | - | 0.51 | 0.70 | 0.69 | 0.83 | 0.76 | 0.42 | 0.23 | 0.04 | - | 0.59 |
| | | | | DWR | 1960 | " | - | - | - | - | - | 0.82 | 0.92 | 0.79 | 0.77 | 0.34 | 0.21 | - | - |
| | | | | DWR | 1962 | " | 0.38 | 0.68 | 0.26 | 0.36 | 0.59 | 0.62 | 0.66 | 0.48 | 0.68 | 0.87 | 0.91 | 0.33 | - |
| DWR | 1963 | | | " | 0.39 | 0.71 | 0.56 | 0.92 | 0.67 | 0.61 | 0.69 | 0.90 | 0.94 | 0.82 | 0.84 | 0.38 | - | 0.79 | |
| DWR | 1964 | | | " | 0.53 | 0.33 | - | - | - | 0.57 | 0.83 | 0.86 | 0.95 | 0.88 | 0.32 | 0.60 | - | - | |
| DWR | Average | | | " | 0.44 | 0.56 | 0.42 | 0.56 | 0.65 | 0.66 | 0.78 | 0.76 | 0.74 | 0.62 | 0.43 | 0.43 | - | 0.69 | |
| Grain Sorghum (Milo) | Bakersfield 9W | DWR | 1971 | Jul-Oct | - | - | - | - | - | - | 0.26 | 0.91 | 0.82 | 0.40 | - | - | 0.58 | | |
| | | Pasture (Improved) & Grass | DWR | 1959-65 Average | Mar-Oct | 0.50 | 0.72 | 0.82 | 0.75 | 0.81 | 0.74 | 0.82 | 0.88 | 0.88 | 0.90 | 0.81 | 0.69 | 0.82 | |
| | | | U.C. | 1959-71 Average | " | 0.79 | 0.75 | 0.70 | 0.73 | 0.77 | 0.78 | 0.79 | 0.79 | 0.74 | 0.68 | 0.64 | 0.73 | 0.76 | |
| | | Pasture (Improved) & Grass | DWR | 1959-60 Average | " | 0.50 | 0.51 | 0.67 | 0.74 | 0.76 | 0.50 | 0.78 | 0.76 | 0.73 | 0.64 | 0.53 | 0.40 | 0.69 | |
| | | | DWR | 1964-66 Average | Apr-Sep | - | - | - | 0.70 | 0.70 | 0.79 | 0.74 | 0.96 | 0.86 | 0.76 | 0.45 | - | 0.79 | |
| | | Pasture (Improved) & Grass | SLOFC & DWR | 1963-67 Average | Mar-Oct | 0.77 | 0.81 | 0.78 | 0.82 | 0.78 | 0.69 | 0.77 | 0.85 | 0.84 | 0.87 | 0.87 | 0.79 | 0.79 | |
| | | | ARS | 1968-70 | " | 0.44 | 0.75 | 0.80 | 0.69 | 0.73 | 0.64 | 0.75 | 0.69 | 0.55 | 0.67 | 0.69 | 0.50 | 0.69 | |
| | | | CSPC & DWR | 1969-72 Average | " | 0.92 | 0.84 | 0.74 | 0.59 | 0.76 | 0.62 | 0.72 | 0.59 | 0.71 | 0.63 | 0.82 | 0.82 | 0.67 | |
| | | | CDC & DWR | 1963-70 | " | 0.75 | 0.79 | 0.77 | 0.77 | 0.71 | 0.68 | 0.75 | 0.82 | 0.75 | 0.78 | 0.82 | 0.64 | 0.75 | |
| | | Pasture (Improved) & Grass | DWR | 1963-68 | " | 0.78 | 0.64 | 0.73 | 0.89 | 0.85 | 0.85 | 0.81 | 0.78 | 0.75 | 0.70 | 0.62 | 0.62 | 0.81 | |

Appendix I (Continued)
 SUMMARY OF OBSERVED MONTHLY ET/EP RATIOS FOR PRINCIPAL
 IRRIGATED CROPS I/

| Crop | Location | Observer | Year | Active : Growing : Season : | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Growing : Season : Average : | |
|---|-------------|----------|---------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------------------|------|
| Pasture (Native) (High Water Table Meadow) | Alturas 2SE | DWR | 1959 | Apr-Sep | - | - | - | 0.94 | 0.98 | 1.14 | 1.06 | 1.05 | 0.96 | 0.78 | - | - | 1.03 | |
| | | | 1960 | " | - | - | - | 0.67 | 0.81 | 0.82 | 1.09 | 1.12 | 1.02 | 0.97 | - | 1.33 | 0.95 | |
| | | | 1961 | " | 0.17 | 0.47 | 0.74 | 0.78 | 1.00 | 1.00 | 1.19 | 0.96 | 1.12 | 1.00 | - | - | - | 1.02 |
| | | | 1962 | " | - | - | 0.35 | 0.72 | 0.76 | 0.86 | 0.96 | 0.98 | 0.95 | 0.77 | 0.69 | 0.60 | 0.88 | |
| | | | 1963 | " | 0.42 | 0.36 | 0.48 | 0.59 | 0.61 | 0.98 | 0.81 | 0.89 | 0.89 | 0.83 | - | - | 0.82 | |
| | | | 1964 | " | - | - | - | 0.56 | 0.66 | 0.86 | 0.93 | 0.99 | 0.89 | 0.86 | - | - | 0.85 | |
| Average | " | 0.44 | 0.40 | 0.56 | 0.75 | 0.80 | 0.94 | 1.00 | 1.00 | 0.96 | 0.85 | 0.69 | 0.88 | 0.93 | | | | |
| Pasture (Native) (Continued) | Lookout 3S | DWR | 1961 | Apr-Sep | 0.20 | 0.30 | 0.42 | 0.68 | 0.82 | 1.00 | 0.84 | 0.97 | 0.94 | 0.77 | - | - | 0.88 | |
| | | | 1962 | " | - | - | - | 0.69 | 0.95 | 0.84 | 0.87 | 0.82 | 0.85 | 0.70 | 0.62 | 0.56 | 0.84 | |
| | | | 1963 | " | - | - | 0.61 | - | - | 0.94 | 1.06 | 0.99 | 1.00 | 1.15 | - | - | - | |
| | | | Average | " | 0.20 | 0.30 | 0.50 | 0.68 | 0.88 | 0.92 | 0.92 | 0.92 | 0.92 | 0.86 | - | - | 0.88 | |
| Potatoes | Arvin 2.8NW | DWR | 1966 | Apr-Jun | - | - | - | 0.91 | 1.01 | 0.49 | - | - | - | - | - | - | 0.87 | |
| | | | 1967 | " | - | - | 0.50 | 0.66 | 0.90 | 0.51 | 0.38 | - | - | - | - | - | 0.66 | |
| | | | Average | " | - | - | 0.50 | 0.83 | 0.94 | 0.49 | 0.38 | - | - | - | - | - | 0.76 | |
| Sugar Beets | Arvin 2.5S | DWR | 1966 | Apr-Jul | - | - | - | 0.68 | 1.01 | 1.02 | 0.68 | - | - | - | - | - | 0.86 | |
| | | | 1965 | Jul-Oct | - | - | - | - | - | - | 0.41 | 0.92 | 0.88 | 0.88 | 0.57 | - | 0.66 | |
| | | | 1966 | Apr-Sep | - | - | - | 0.17 | 0.36 | 0.86 | 0.93 | 0.83 | 0.91 | - | - | - | 0.64 | |
| | | | 1968 | Apr-Jul | - | - | - | 0.14 | 0.72 | 0.70 | 0.50 | - | - | - | - | - | 0.53 | |
| Tomatoes | Arvin 2.5NW | DWR | 1969 | " | - | - | - | 0.35 | 0.86 | 0.98 | 0.82 | - | - | - | - | - | 0.78 | |
| | | | Average | " | - | - | - | 0.25 | 0.80 | 0.84 | 0.76 | - | - | - | - | - | 0.64 | |
| | | | 1969 | " | - | - | - | - | 0.22 | 0.39 | 0.87 | 0.90 | 0.62 | - | - | - | 0.59 | |
| Vineyard | Davis 2W | U.C. | 1966 | May-Oct | - | - | - | - | 0.41 | 0.57 | 0.79 | 0.45 | 0.30 | - | - | - | - | |
| | | | 1967 | " | - | - | - | - | - | 0.51 | 0.66 | 0.79 | 0.64 | 0.32 | 0.04 | 0.50 | - | |
| | | | 1968 | " | 0.50 | 0.31 | 0.16 | 0.13 | 0.62 | 0.68 | 0.58 | 0.51 | 0.65 | 0.24 | 0.11 | 0.42 | 0.58 | |
| | | | 1969 | " | 0.87 | 0.20 | 0.11 | 0.11 | 0.35 | 0.68 | 0.72 | 0.65 | 0.64 | 0.38 | 0.12 | 0.15 | 0.60 | |
| Average | " | 0.62 | 0.27 | 0.15 | 0.12 | 0.46 | 0.61 | 0.67 | 0.62 | 0.55 | 0.32 | 0.08 | 0.35 | 0.56 | | | | |

APPENDIX J

GROWING SEASONS AND ROOTING DEPTHS USED
IN ESTIMATING CROP EVAPOTRANSPIRATION

Appendix J

GROWING SEASONS AND ROOTING DEPTHS USED IN ESTIMATING CROP EVAPOTRANSPIRATION

| Crop | Root Zone Depth, Feet | Evaporative Demand Zones | | | | | | | | |
|-----------------------------------|-----------------------|-------------------------------|---|-------------------------------|-------------------------|-------------------------|---|---------------------------------|---|-------------------------------|
| | | Northeastern Mountain Valleys | North Coast, Coastal Valleys and Plains | North Coast, Interior Valleys | Sacramento Valley | San Joaquin Valley | Central Coast, Coastal Valleys and Plains | Central Coast, Interior Valleys | South Coast, Coastal Valleys and Plains | South Coast, Interior Valleys |
| Alfalfa (Hay) | 5.0 | 4/1-9/30 | - | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 |
| Barley ^{1/} | 3.0 | 4/1-7/31 | - | 1/1-6/30 | 11/15-5/31 | 1/1-6/15 | 11/15-5/31 | 11/1-5/31 | - | 12/1-5/31 |
| Beans (Dry) | 2.0 | - | - | - | 6/1-8/31 | 6/1-8/31 | 6/1-8/31 | 6/1-8/31 | - | - |
| Cantaloupes | 3.0 | - | - | - | - | 4/1-7/31 | - | - | - | - |
| Carrots | 4.0 | - | - | - | - | - | 7/15-10/31 | - | - | - |
| Corn (Field) | 3.0 | 6/1-9/30 | - | 6/1-9/30 | 6/1-9/30 | 6/1-9/30 | 6/1-9/30 | 5/1-9/30 | - | - |
| Cotton | 5.0 | - | - | - | - | 5/1-10/31 | - | - | - | - |
| Cauliflower (Early) ^{2/} | 1.0 | - | - | - | - | - | 7/15-10/31 | - | - | - |
| Cauliflower (Late) ^{2/} | 1.0 | - | - | - | - | - | 8/1-12/31 | - | - | - |
| Deciduous Orchard ^{3/} | 6.0 ^{4/} | - | - | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 |
| Almonds | 2.0 | - | - | - | 3/15-10/15 | 3/1-10/15 | - | - | - | - |
| Grain Sorghum | 4.0 | - | - | - | 6/1-9/30 | 6/1-9/30 | - | - | - | - |
| Lettuce (Spring) ^{5/} | 1.0 | - | - | - | - | - | 2/1-5/15 | - | - | - |
| Lettuce (Summer) ^{5/} | 1.0 | - | - | - | - | - | 5/1-7/31 | - | - | - |
| Lettuce (Fall) ^{5/} | 1.0 | - | - | - | - | - | 7/15-9/30 | - | - | - |
| Pasture (Improved) | 2.0 | 4/1-9/30 | 3/1-10/31 | 3/1-10/31 | - | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 | 3/1-10/31 |
| Pasture (Meadow) | 0.0 | 4/1-8/31 | - | - | - | - | - | - | - | - |
| Potatoes | 2.0 | 6/1-8/31 | - | - | 5/1-7/31 | 3/1-6/30 | 6/15-10/15 | - | - | 6/1-8/31 |
| Rice | 1.0 | - | - | - | 4/15-10/15 | 4/15-10/31 | - | - | - | - |
| Strawberries | 1.0 | - | - | - | - | - | - | - | 8/15-3/15 | - |
| Subtropical Orchard ^{6/} | 3.0 | - | - | - | 1/1-12/31 ^{6/} | 1/1-12/31 ^{6/} | - | - | 1/1-12/31 ^{6/} | 1/1-12/31 ^{6/} |
| Sugar Beets | 5.0 | - | - | - | 3/15-12/15 | 2/15-8/31 | 3/1-10/31 | 3/1-10/31 | - | 3/1-10/31 |
| Tomatoes (Canning) ^{7/} | 1.0 | - | - | - | 5/1-9/30 | 5/1-9/30 | 5/1-9/30 | 5/1-9/30 | - | - |
| Tomatoes (Market) ^{8/} | 5.0 | - | - | - | - | - | - | - | 3/1-9/30 | - |
| Vineyard (Table) | 4.0 | - | - | - | 5/1-10/31 | 4/15-10/31 | - | - | - | - |
| Vineyard (Wine) | 1.0 | - | - | 5/15-10/31 | - | - | - | 5/1-10/31 | - | 5/1-10/31 |

- ^{1/} Barley and small grains.
^{2/} Crop has wide range of planting and harvest date. Growing season shown was selected to be representative of typical practice in area.
^{3/} Except almonds.
^{4/} Root zone depth for all areas except Sacramento and San Joaquin Valley where 6.0' was used.
^{5/} Citrus, avocados and olives.
^{6/} Evergreen - active growing season 3/1-10/31.
^{7/} Machine-harvested varieties.
^{8/} Hand-picked.

ANNUAL EVAPORATIVE DEMAND & CLIMATE STATION LOCATIONS

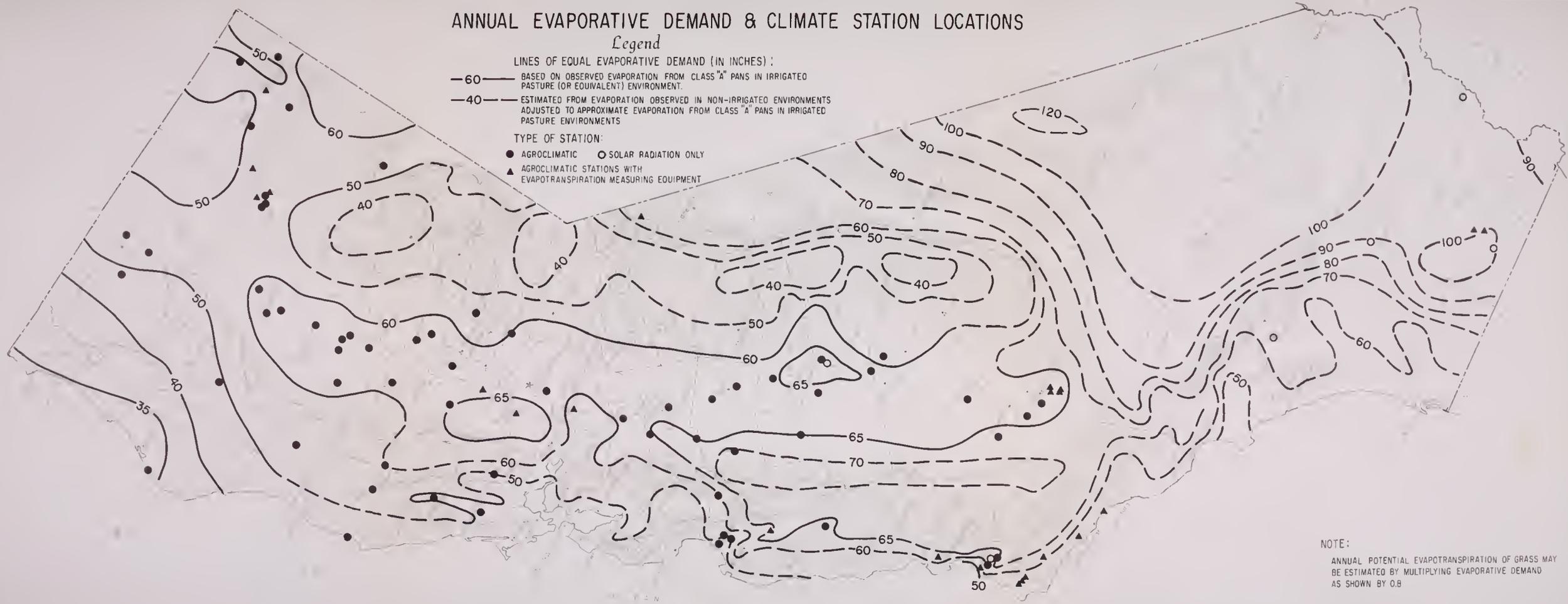
Legend

LINES OF EQUAL EVAPORATIVE DEMAND (IN INCHES):

- 60- BASED ON OBSERVED EVAPORATION FROM CLASS "A" PANS IN IRRIGATED PASTURE (OR EQUIVALENT) ENVIRONMENT.
- 40- ESTIMATED FROM EVAPORATION OBSERVED IN NON-IRRIGATED ENVIRONMENTS ADJUSTED TO APPROXIMATE EVAPORATION FROM CLASS "A" PANS IN IRRIGATED PASTURE ENVIRONMENTS

TYPE OF STATION:

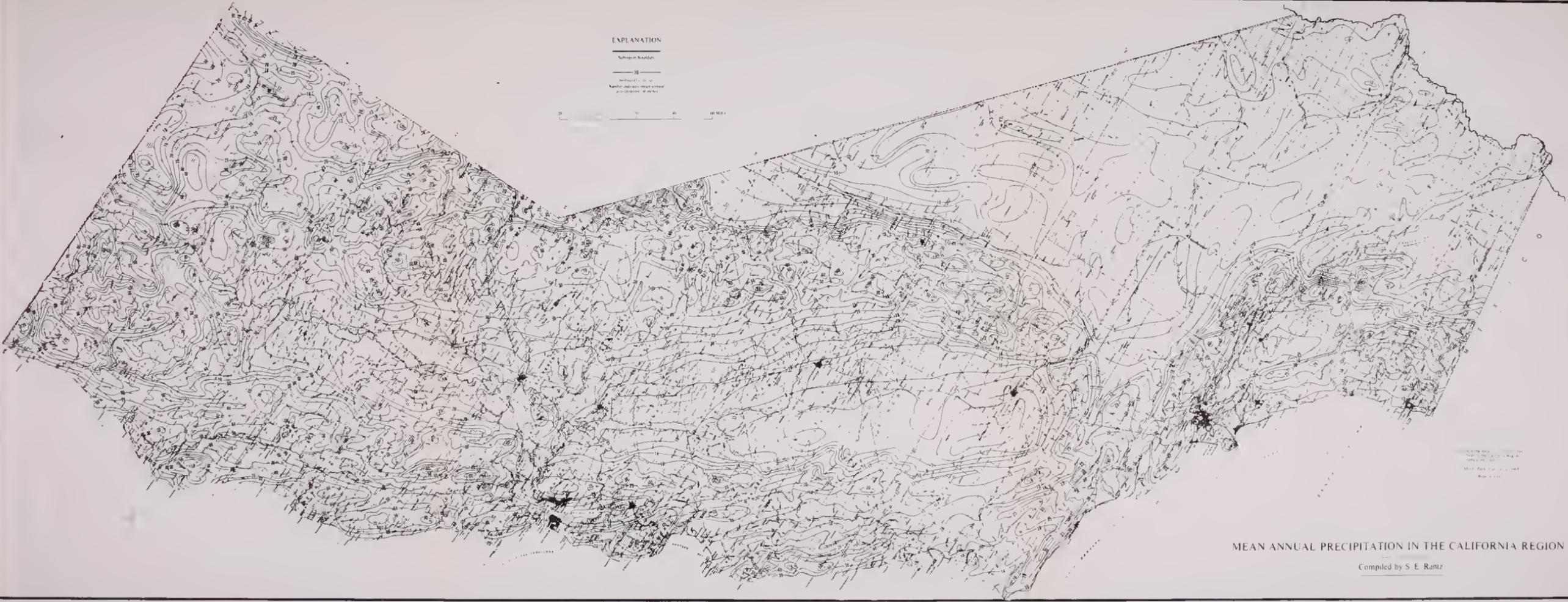
- AGROCLIMATIC ○ SOLAR RADIATION ONLY
- ▲ AGROCLIMATIC STATIONS WITH EVAPOTRANSPIRATION MEASURING EQUIPMENT



NOTE:
 ANNUAL POTENTIAL EVAPOTRANSPIRATION OF GRASS MAY BE ESTIMATED BY MULTIPLYING EVAPORATIVE DEMAND AS SHOWN BY 0.8

EXPLANATION

Subsequent to 1949
10
Number indicates mean annual precipitation in inches



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WATER RESOURCES DIVISION
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RESTON, VIRGINIA

MEAN ANNUAL PRECIPITATION IN THE CALIFORNIA REGION

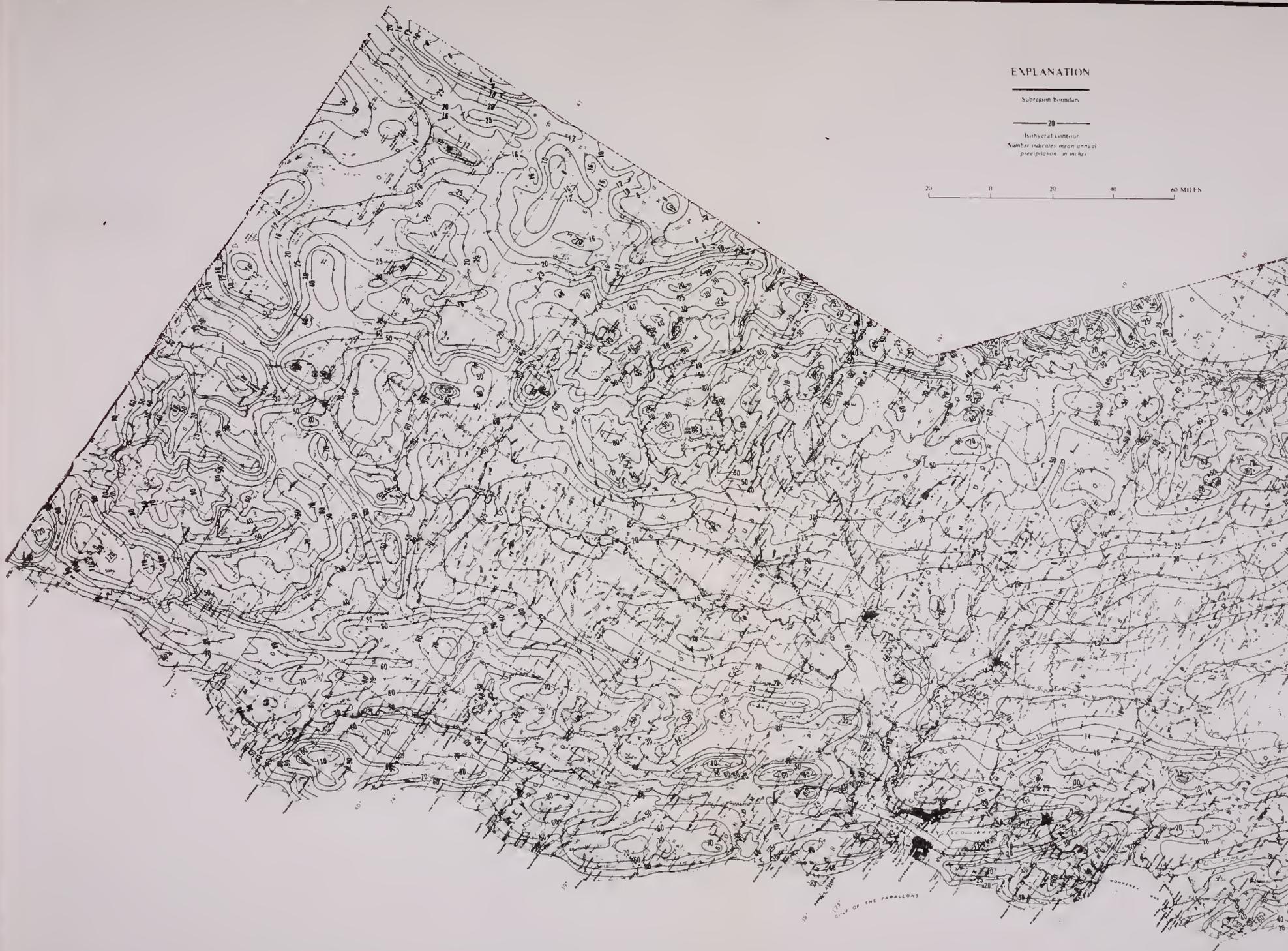
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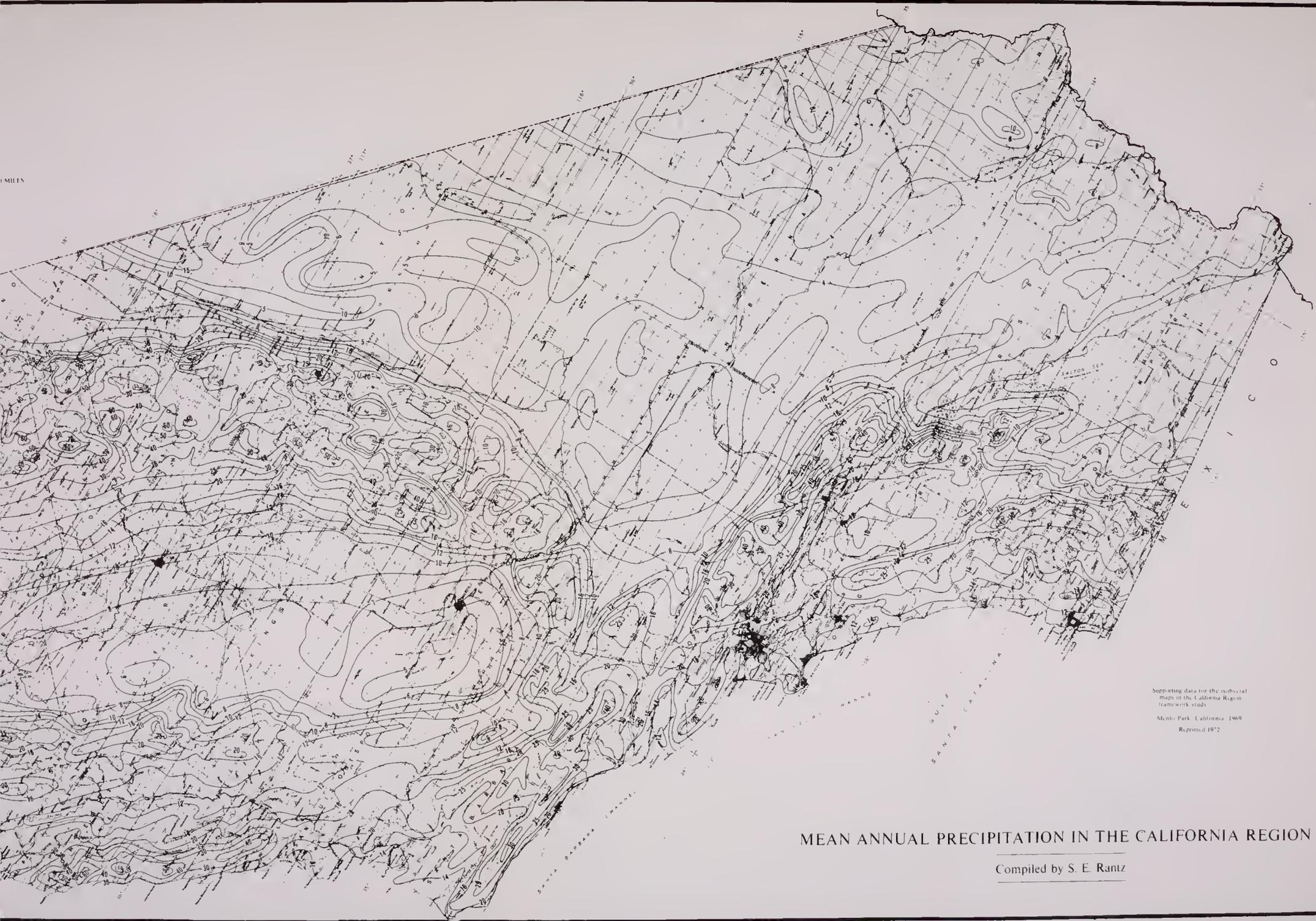
EXPLANATION

Subregion boundaries

20

Isobetal contour
Number indicates mean annual
precipitation in inches





Supporting data for the isohyral
 maps in the California Region
 framework study
 Menlo Park, California 1969
 Reprinted 1972

MEAN ANNUAL PRECIPITATION IN THE CALIFORNIA REGION

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