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BUREAU OF RECLAMATION
Mid-Pacific Regional Office
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Sacramento, California 95825-1898

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To: Interested Parties

From: Robert F. Stackhouse
Regional Resources Manager

Subject: Proposed Water Need Methodologies for Long-term Contract Renewal - Central Valley Project

On October 23, 1998, Reclamation's Mid-Pacific Region announced its intent to undertake a water needs assessment for each contractor as a part of the forthcoming Central Valley Project (CVP) long-term contract renewal process. The announcement advised that workshops would be held to address the development of water demand methodologies for both irrigation and municipal and industrial (M&I) purposes as the first step in the overall water needs assessment. These workshops were held November 2 - 16, 1998.

The purpose of the attached document is to lay out the entire proposed methodology for the water needs assessments. The workshops focused primarily on methodologies to estimate historic irrigation and M&I water demand and provided the public an opportunity to comment on the draft methodologies and seek additional clarification.

This document has been posted on Reclamation's website and distributed to interested parties to provide additional opportunities for workshop participants and others to comment on the proposed water needs assessment methodology. Once this document has been finalized, it will be posted on Reclamation's website to allow interested parties to understand the methodology Reclamation proposes to use in assessing water needs in connection with the long-term contract renewal process. Reclamation's Mid-Pacific Region website can be found at www.mp.usbr.gov.

For additional information or questions regarding the proposed irrigation water demand methodology, please contact Mr. Joel Zander at (916) 978-5270 (TDD 978-5608). Questions related to the M&I water demand methodology may be directed to Ms. Marsha Prillwitz at (916) 978-5213 (TDD 978-5608). Written comments on the draft water needs assessment methodologies may be submitted by COB December 11, 1998, to Ms. Donna Tegelman, Bureau of Reclamation, MP-440, 2800 Cottage Way, Sacramento, CA 95825.

Attachment

**PROPOSED WATER NEED METHODOLOGIES,
LONG-TERM CONTRACT RENEWAL
CENTRAL VALLEY PROJECT**

STEPS IN ASSESSING WATER NEEDS. The proposed water demand methodologies discussed in the workshops will be used to demonstrate historic beneficial use of water from both CVP and non-CVP sources. The second step in the process is the determination of future demand for irrigation and M&I water during the term of the renewal contract, again using the proposed water demand methodologies. The final step in the process will be the determination of need for CVP water based on comparisons of future water demands and non-CVP water supplies for each contractor. **If the need for CVP water exceeds the current maximum contract amount, the contract amount will not necessarily be augmented. Conversely, if the need for CVP water is less than the current maximum contract amount, Reclamation may take steps to reduce the contract amount.**

IRRIGATION WATER DEMAND ANALYSIS. Reclamation proposes to rely upon the following generally accepted data and principles to determine historic and projected demand for irrigation.

- **Historic Crop Database.** Reclamation's existing crop database for individual CVP contractors encompasses a 15-year period from 1979 through 1993. The contractors will be asked to confirm the accuracy of this data and provide crop information from 1994 through 1997 to document recent crop rotational trends.
- **Projected Crops.** The more current data will reflect more recent trends, which could be pertinent to the contractor's future demands. Reclamation will work with the individual contractors to project future cropping patterns. Reclamation will compare these projections with other informational sources, such as Bulletin 160-98, to assess the reasonableness of the projections.
- **Annual Evapotranspiration Requirement (ET).** ET is provided by crop and geographic location in the Department of Water Resources' (DWR) Bulletin 113-3 (Bulletin 113). Actual ET requirements in a particular service area may vary somewhat from that of the geographic locations reported in Bulletin 113 as a result of various local factors (e.g., soil type, crop variety and climate). Location-specific ET published by local agencies, universities, and/or cooperative extensions will be used, if available.
- **Annual Effective Precipitation (EP).** EP is shown in Bulletin 113, Tables 23 and 25, [EP = ET - ET of applied water (ETAW)]. These tables are attached.
- **Crop Irrigation Requirement (CIR).** CIR is also shown in Bulletin 113, Tables 23 and 25. CIR may also be referred to as ETAW, which equals (ET - EP).
- **Cultural Practices Requirement (CP).** CP is reflective of crop needs in specific contractor locations. CP which varies by year type, provides water needed for crop quality, germination irrigation, and weed and climate control. These practices may change over time.
- **Leaching Requirement (LR).** The LR is established to ensure no yield loss due to salinity effects on the root zone of the crop. LR is calculated consistent with Food and Agricultural Organization (FAO) Publication 29, Rev. 1 and ASAE Monograph #3, Design and Operation of Farm Irrigation Systems, 1980, Chapter 5, "Salinity in Irrigated Agriculture."

- **Average On-Farm Irrigation Efficiency (SE)**, SE is assumed for each contractor consistent with farm operating units regarded as characteristic of the contractor's service area and compatible with recent and future water conservation strategies deemed practicable for the service area. As a rule of thumb, 75 percent SE is currently considered to be representative of most areas in California, unless more specific information is available. By the year 2020, Bulletin 160-98 assumes SE to be 80 percent and CALFED assumes it to be 85 percent.

To facilitate data processing, Reclamation proposes to consolidate the total number of crops reported by all contractors from approximately 86 to 22 general crop categories, and, unless otherwise determined to be inappropriate, will exclude those crops grown less than 3 out of the 19 years. Each general category will include crops having similar LR and ET requirements.

The estimated historic and projected water demand for each irrigated crop will then be calculated and used to determine a weighted average historic and projected Farm Delivery Requirement (FDR) for the consolidated crop categories in the contractor's service area. A computer software program entitled the FDR Program, which was first fully automated by Reclamation in 1986, and has been slightly modified by Reclamation, will be used to accomplish these calculations. The program is largely consistent with the irrigation water demand calculations employed by the University of California, California Polytechnic University at San Luis Obispo, and FAO. The program relies upon the following algebraic formula:

- **FDR (AF/acre) = CIR/[(SE/100)(1-LR)] + CP**
 Where, CIR = ET-EP = ETAW (Bulletin 113-3)
 SE = on-farm system efficiency, and
 LR = leaching requirement = $EC_w/[5(EC_e)-EC_w]$
 CP = cultural practices
 EC_w - electrical conductivity of applied water
 EC_e - salinity threshold limit of crop
 AF = acre-foot

Following computation of the average historic and projected FDR, Reclamation will calculate and evaluate the total historic and projected irrigation water demand as follows:

- **Total Irrigation Water Demand = Irrigation Water Demand + Distribution System Losses**

where:

- **Irrigation Water Demand = FDR X Irrigated (Productive) Acres¹**

The above calculation will be influenced by possible changes in the contractor's cropping patterns, crop genetics, urbanization, economic considerations, improvements in on-farm irrigation systems over time, and other factors. Reclamation will work with contractors on an individual basis to include the effect of these factors in determining total historic and projected irrigation water demand.

The second component of this equation, i.e. distribution system losses, has previously been determined for historic conditions by many of CVP contractors and included in the water conservation plans,

¹ Lands which are actually in production and are being served project water.

submitted by the contractors to Reclamation. The calculation of future distribution system losses may reflect improved water management practices and/or increasing system efficiencies over time.

IRRIGATION WATER NEED ANALYSIS. Following computation of the total historic and projected irrigation water demands, Reclamation will estimate the total potential CVP irrigation need for all contractors. This will be accomplished in consultation with the individual contractors. The computation will reflect available non-CVP water supplies, including ground water and non-CVP surface supplies as follows:

- **Total Potential CVP Irrigation Need of the Contractor = Total Projected Irrigation Demand - Non-CVP Water Available**

[Note: There must be a demonstrated need for CVP water, however, if the **Total Potential CVP Irrigation Need of the Contractor** exceeds the Contractor's current maximum CVP water service contract amount, the CVP water service contract amount will not necessarily be augmented.]

M&I WATER DEMAND ANALYSIS. Generally, annual M&I water demand consists of the following components: Residential Demand, Nonresidential Demand, and Distribution System Demand, each of which is discussed below. The following equation is proposed to be used to calculate current and projected M&I water demand. A number of the parameters will likely change for the projected calculations due to water conservation efforts.

- **Total M&I Water Demand = Total Residential Demand + Total Nonresidential Demand + Total Distribution System Demand**

Projected M&I water demand will be influenced over time by many factors, including future land use changes, population shifts, and improvements in residential and distribution system efficiencies over time. These factors are reflected in Residential Demand, Nonresidential Demand, and Distribution System Demand for each contractor, as follows, and will be assessed in consultation with the individual contractors:

Residential Demand. Residential demand equals the number of residents times a per capita factor for indoor demand, plus the acreage of residential landscape times an evapotranspiration (ET) factor for outdoor demand:

- **Total Indoor Demand (AF / Year) = $\frac{\text{Number of residents X gpcd X 365 (days/year)}}{325,851 \text{ (gallons/AF)}}$**
gpcd = gallons per customer per day

Reclamation proposes to use 75 gpcd to estimate current residential demands and 55 gpcd to project future residential demands, consistent with the planning assumptions put forth by CALFED. Such assumptions may not be appropriate for all contractors and locations.

- **Total Landscape Demand (AF / Year) = $\frac{\text{Acreage Irrigated X ETo (inches) X ET Factor}}{12 \text{ (inches/foot)}}$**

Reclamation proposes to use 100 percent for the ET Factor to determine current residential landscape demands and 80 percent for the ET Factor to estimate future demands, consistent with the planning assumptions put forth by CALFED. The attached excerpt from the California Model Water Efficient Landscape Ordinance contains information on ETo. Again, such assumptions, which are intended to reflect increasing water use efficiency over time, may not be appropriate for all contractors and locations.

- **Total Residential Demand = Total Indoor Demand + Total Landscape Demand**

Nonresidential Demand (Commercial, Industrial, Institutional). For current conditions, nonresidential demand is assumed to equal the average amount of water used indoors over the past 5 years plus the acreage of nonresidential landscape times an ET Factor, as shown below. For the purposes of projected demand, current demand will be adjusted to reflect changes (increases or other adjustments) in land use as may be reflected in regional land use or planning studies, DWR publications or other documents. M&I contractors will be asked to identify any major changes to projected nonresidential demands, such as siting of water-intensive industrial facilities, based on their regional land use plans or other information. Assumptions regarding the ET Factor are consistent with that presented for computation of residential demand. Specifically,

- **Total Nonresidential Demand = Total Indoor Demand + Total Landscape Demand, where**
 - **Indoor Demand (AF/Year) = Average February² Water Use (Prior 5 Years) x 12 (months)**
 - **Landscape Demand (AF/Year) = $\frac{\text{Acreage Irrigated} \times \text{ETo (inches)} \times \text{ET Factor}}{12 \text{ (inches/foot)}}$**

Distribution System Demand. Distribution system demand equals water used for unaccounted beneficial uses and distribution system losses as discussed below.

Unaccounted Beneficial Use includes water uses such as firefighting, mainline flushing, stormdrain flushing, sewer and street cleaning, construction site use, water quality, and other testing. Unaccounted Beneficial Uses may be estimated as follows:

- **Unaccounted Beneficial Uses (AF/Year) = Actual number of AF / Yr of Unaccounted Beneficial Uses, or, as an estimate, 1 to 2 percent of Average Total Interior and Exterior Use for previous 5 years**

Distribution System Losses includes water uses such as leaks in storage and distribution systems, evaporation, illegal connections, and water theft. Distribution system losses may be estimated as follows:

- **Distribution System Losses = Actual number of AF / Yr of Distribution System Losses, or, as an estimate, approximately 7 percent of Average Total Interior and Exterior for previous 5 years**

² The month of February was suggested as that month is expected to more accurately demonstrate monthly interior water demands in situations where landscape (exterior) water demands are not typically metered separately.

Therefore, total current and projected distribution system demand is calculated as follows:

- **Total Distribution System Demand = Unaccounted Beneficial Uses + Distribution System Losses**

M&I WATER NEED ANALYSIS. Following computation of the total current and projected M&I water demands, the potential need for CVP M&I water will be calculated as the difference between total M&I water demand and the supply available from non-CVP sources. These determinations will be done in consultation with CVP M&I contractors.

- **Total Potential CVP M&I Water Need = Total M&I Water Demand - Non-CVP Water Supplies**

[**Note:** There must be a demonstrated need for CVP water, however, if the **Total Potential CVP Irrigation Need of the Contractor** exceeds the Contractor's current maximum CVP water service contract amount, the CVP water service contract amount will not necessarily be augmented.]

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	Pasture (Improved)	Potatoes	Rice	Subtropical Orchard ^{3/}	Sugar Beets	Tomatoes (Canning) ^{4/}	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	5.8	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	1.9	5.6	5.7
Jul	7.9	7.7	-	8.6	9.5	7.6	5.7	9.2	7.9	4.9	9.1	4.7	6.3	8.9	6.8
Aug	6.7	6.9	-	3.7	7.2	6.4	4.8	7.0	6.7	-	7.8	4.0	8.2	7.1	5.6
Sep	5.2	5.4	-	-	3.4	4.8	3.6	2.7	5.2	-	5.6	2.6	6.3	4.2	3.7
Oct	3.4	3.5	-	-	-	2.8	2.1 ^{5/}	-	3.4	-	1.3 ^{5/}	2.1	3.7	-	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	16.2	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													
		12-14	14-16	16-18	18-20	20-22	22-24	24-28	28-32	ET of Applied Water, AF/A					
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	0.0	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	1.1	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	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Deciduous Orchard ^{2/}	3.2	2.5	2.4	2.2	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
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	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Pasture (Improved)	3.6	3.0	3.0	2.9	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Potatoes	1.6	1.5	1.4	-	-	-	-	-	-	-	-	-	-	-	-
Rice	3.5	3.3	3.3	3.3	3.3	3.3	-	-	-	-	-	-	-	-	-
Subtropical Orchard ^{4/}	2.6	-	-	1.6	1.6	1.6	-	-	-	-	-	-	-	-	-
Sugar Beets ^{5/}	2.5	2.0	1.9	1.7	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	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	1.4	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

Month	Potential ET	Alfalfa	Barley	Beans	Cantaloupes	Corn	Cotton	Deciduous Orchard		Grain	Pasture	Potatoes	Rice	Subtropical Orchard	Sugar Beets	Tomatoes	Vineyard
		(Hay)	(Div)	(Field)	(Field)	(Field)	(Field)	Almonds	Almonds	(Sorghum)	(Improved)					(Canning)	(Table Grapes)
Jan	0.9	-	0.4	-	-	-	-	-	-	-	-	-	-	0.9	-	-	-
Feb	1.7	-	1.5	-	-	-	-	-	-	-	-	-	-	1.7	-	-	-
Mar	3.2	2.9	4.0	-	-	-	-	1.9	1.4	-	3.2	2.1	-	1.9	0.8 ^{5/}	-	-
Apr	4.5	4.1	4.8	-	0.9	-	-	3.2	2.4	-	4.5	4.9	2.4 ^{6/}	2.7	3.7	-	0.7 ^{5/}
May	6.5	5.9	4.2	-	2.7	-	0.8	5.4	4.0	-	6.5	7.8	7.5	3.9	7.9	1.8	3.8
Jun	7.5	7.0	1.9 ^{5/}	4.0	8.3	4.6	4.5	6.7	5.0	2.5	7.5	4.7	9.6	4.5	8.9	5.8	5.8
Jul	7.8	7.6	-	8.5	1.3	9.4	9.4	7.5	5.6	9.1	7.8	-	10.0	4.7	8.0	8.8	6.7
Aug	6.6	6.8	-	3.7	-	7.1	8.5	6.4	4.8	7.0	6.6	-	8.5	4.0	5.1	7.1	5.5
Sep	4.8	5.0	-	-	-	3.2	5.4	4.4	2.2	2.5	4.8	-	5.7	2.9	-	3.9	1.5
Oct	3.3	2.5	-	-	-	-	2.4	2.6	1.3 ^{5/}	-	3.3	-	1.3	2.0	-	-	1.4
Nov	1.5	-	-	-	-	-	-	-	-	-	-	-	-	1.5	-	-	-
Dec	0.7	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-
Total	49.0	41.8	16.8	16.2	13.2	24.3	31.0	38.1	26.7	21.1	44.2	19.5	45.0	31.4	34.4	27.4	27.4

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/ Assumed 1/3 solid plant, 1/3 skip row 2 x 1, 1/3 skip row 2 x 2.
4/ No ET measurements available. ET estimates based upon crop development and prevalent cultural and irrigation practices.
5/ Machine-harvested.
6/ Assume mid-month planting or harvest. ET for 1/2 month.

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	2.6	2.5	2.5	2.5	2.4	2.3	2.2
Deciduous Orchard	3.2	3.0	2.9	2.8	2.6	2.5	2.3
Almonds	2.2 ^{3/}	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	3.0
Potatoes	1.6	1.5	1.4	1.2	1.1	1.0	1.0
Rice	3.8	3.7	3.6	3.5	3.4	3.4	3.1
Subtropical Orchard	2.6 ^{3/4/}	-	-	1.9	1.8	1.7	1.7
Sugar Beets	2.9	2.7	2.6	2.5	2.4	2.3	2.2
Tomatoes	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	1.7

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.

6/15/92

**MODEL
WATER EFFICIENT
LANDSCAPE
ORDINANCE**

495.

REFERENCE EVAPOTRANSPIRATION

in inches (Historical Data, extrapolated from 12-Month Normal Year ETo Maps and U.C. publication 21426)

County	City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann. Eto
Alameda	Livermore	1.2	1.5	2.9	4.4	5.9	6.6	7.4	6.4	5.3	3.2	1.5	0.9	47.2
	Oakland	1.5	1.5	2.8	3.9	5.1	5.3	6.0	5.5	4.8	3.1	1.4	0.9	41.8
Alpine	Markleeville	0.7	0.9	2.0	3.5	5.0	6.1	7.3	6.4	4.4	2.6	1.2	0.5	40.5
Amador	Jackson	1.2	1.5	2.8	4.4	6.0	7.2	7.9	7.2	5.3	3.2	1.4	0.9	48.9
Butte	Chico	1.2	1.8	2.9	4.7	6.1	7.4	8.5	7.3	5.4	3.7	1.7	1.0	51.7
	Gridley	1.2	1.8	3.0	4.7	6.1	7.7	8.5	7.1	5.4	3.7	1.7	1.0	51.9
	Oroville	1.2	1.7	2.8	4.7	6.1	7.6	8.5	7.3	5.3	3.7	1.7	1.0	51.5
Calaveras	San Andreas	1.2	1.5	2.8	4.4	6.0	7.3	7.9	7.0	5.3	3.2	1.4	0.7	48.8
Colusa	Colusa	1.1	1.7	2.8	4.8	6.6	7.4	8.2	7.0	5.7	3.5	1.7	1.0	51.4
	Williams	1.2	1.7	2.9	4.5	6.1	7.2	8.5	7.3	5.3	3.4	1.6	1.0	50.8
Contra Costa	Benicia	1.3	1.4	2.7	3.8	4.9	5.0	6.4	5.5	4.4	2.9	1.2	0.7	40.3
	Brentwood	1.0	1.5	2.9	4.5	6.1	7.1	7.9	6.7	5.2	3.2	1.4	0.7	48.3
	Courtland	0.9	1.5	2.9	4.4	6.1	6.9	7.9	6.7	5.3	3.2	1.4	0.7	48.0
	Concord	1.1	1.4	2.4	4.0	5.5	5.9	7.0	6.0	4.8	3.2	1.3	0.7	43.4
	Martinez	1.2	1.4	2.4	3.9	5.3	5.6	6.7	5.6	4.7	3.1	1.2	0.7	41.8
	Pittsburg	1.0	1.5	2.8	4.1	5.6	6.4	7.4	6.4	5.0	3.2	1.3	0.7	45.4
Del Norte	Crescent City	0.5	0.9	2.0	3.0	3.7	3.5	4.3	3.7	3.0	2.0	0.9	0.5	27.7
El Dorado	Camino	0.9	1.7	2.5	3.9	5.9	7.2	7.8	6.8	5.1	3.1	1.5	0.9	47.3
Fresno	Clovis	1.0	1.5	3.2	4.8	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.4
	Coalinga	1.2	1.7	3.1	4.6	6.2	7.2	8.5	7.3	5.3	3.4	1.6	0.7	50.9
	Five Points	0.9	1.7	3.3	5.0	6.6	7.7	8.5	7.3	5.4	3.4	1.5	0.9	52.1
	Fresno	0.9	1.7	3.3	4.8	6.7	7.8	8.4	7.1	5.2	3.2	1.4	0.6	51.1
	Friant	1.2	1.5	3.1	4.7	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.3
	Kerman	0.9	1.5	3.2	4.8	6.6	7.7	8.4	7.2	5.3	3.4	1.4	0.7	51.2
	Kingsburg	1.0	1.5	3.4	4.8	6.6	7.7	8.4	7.2	5.3	3.4	1.4	0.7	51.6
	Reedley	1.1	1.5	3.2	4.7	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.3
Glenn	Orland	1.2	1.7	3.1	4.8	6.7	7.4	8.8	7.3	5.8	3.8	1.7	1.1	53.3
	Willows	1.2	1.7	2.9	4.7	6.1	7.2	8.5	7.3	5.3	3.6	1.7	1.0	51.3
Humboldt	Eureka	0.5	1.1	2.0	3.0	3.7	3.7	3.7	3.7	3.0	2.0	0.9	0.5	27.5
	Ferndale	0.5	1.1	2.0	3.0	3.7	3.7	3.7	3.7	3.0	2.0	0.9	0.5	27.5
	Garderville	0.6	1.2	2.2	3.1	4.5	5.0	5.5	4.9	3.8	2.4	1.0	0.7	34.9
	Hoopa	0.5	1.1	2.1	3.0	4.4	5.4	6.1	5.1	3.8	2.4	0.9	0.7	35.6
Imperial	Brawley	2.8	3.8	5.9	8.0	10.4	11.5	11.7	10.0	8.4	6.2	3.5	2.1	84.2
	Calipatria	2.9	3.9	6.1	8.3	10.5	11.8	12.0	10.4	8.6	6.5	3.8	2.3	86.9
	El Centro	2.7	3.5	5.6	7.9	10.1	11.1	11.6	9.5	8.3	6.1	3.3	2.0	81.7
	Holtville	2.8	3.8	5.9	7.9	10.4	11.6	12.0	10.0	8.6	6.2	3.5	2.1	84.7
	Yuma	3.1	4.1	6.6	8.7	11.0	12.4	12.7	11.0	8.9	6.6	4.0	2.6	91.5
Inyo	Bishop	1.7	2.7	4.8	6.7	8.2	10.9	7.4	9.6	7.4	4.8	2.5	1.6	68.3
	Death Valley	2.2	3.3	5.4	7.7	9.8	11.1	11.4	10.1	8.3	5.4	2.9	1.7	79.1
	Independence	1.7	2.7	3.4	6.6	8.5	9.5	9.8	8.5	7.1	3.9	2.0	1.5	65.2
	Lower Haiwee	1.8	2.7	4.4	7.1	8.5	9.5	9.8	8.5	7.1	4.2	2.6	1.5	67.6
	Oasis	2.7	2.8	5.9	8.0	10.4	11.7	11.6	10.0	8.4	6.2	3.4	2.1	83.1
Kern	Arvin	1.2	1.8	3.5	4.7	6.6	7.4	8.1	7.3	5.3	3.4	1.7	1.0	51.9
	Bakersfield	1.0	1.8	3.5	4.7	6.6	7.7	8.5	7.3	5.3	3.5	1.6	0.9	52.4
	Buttonwillow	1.0	1.8	3.2	4.7	6.6	7.7	8.5	7.3	5.4	3.4	1.5	0.9	52.0
	Delano	0.9	1.8	3.4	4.7	6.6	7.7	8.5	7.3	5.4	3.4	1.4	0.7	52.0
	Grapevine	1.3	1.8	3.1	4.4	5.6	6.8	7.6	6.8	5.9	3.4	1.9	1.0	49.5
	China Lake	2.1	3.2	5.3	7.7	9.2	10.0	11.0	9.8	7.3	4.9	2.7	1.7	74.8
	Inyokern	2.0	3.1	4.9	7.3	8.5	9.7	11.0	9.4	7.1	5.1	2.6	1.7	72.4
	Isabella Dam	1.2	1.4	2.8	4.4	5.8	7.3	7.9	7.0	5.0	3.2	1.7	0.9	48.4
	Lost Hills	0.6	1.1	2.6	4.4	7.0	7.7	8.5	7.1	5.0	3.9	0.8	0.4	49.0
	Shafter	1.0	1.7	3.4	5.0	6.6	7.7	8.3	7.3	5.4	3.4	1.5	0.9	52.1
	Taft	1.3	1.8	3.1	4.3	6.2	7.3	8.5	7.3	5.4	3.4	1.7	1.0	51.2
	Tehachapi	1.4	1.8	3.2	5.0	6.1	7.7	7.9	7.3	5.9	3.4	2.1	1.2	52.9

Section 495 Continued

County	City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Kings	Corcoran	0.9	1.5	3.3	5.2	7.2	7.9	8.4	7.3	5.8	3.4	1.4	0.7	53.1
	Hanford	0.9	1.5	3.4	5.0	6.6	7.7	8.3	7.2	5.4	3.4	1.4	0.7	51.5
	Kettleman City	1.0	1.8	3.4	5.3	7.2	7.9	8.4	7.4	5.9	3.7	1.7	1.0	54.6
	Lemoore	0.9	1.5	3.4	5.0	6.6	7.7	8.3	7.3	5.4	3.4	1.4	0.7	51.7
Lake	Lakeport	1.1	1.3	2.6	3.5	5.1	6.0	7.3	6.1	4.7	2.9	1.2	0.9	42.8
	Lower Lake	1.2	1.4	2.7	4.5	5.3	6.3	7.4	6.4	5.0	3.1	1.3	0.9	45.4
Lassen	Ravendale	0.6	1.1	2.3	4.1	5.6	6.7	7.9	7.3	4.7	2.8	1.2	0.5	44.9
	Susanville	0.7	1.0	2.2	4.1	5.6	6.5	7.8	7.0	4.6	2.8	1.2	0.5	44.0
Los Angeles	Burbank	2.1	2.8	3.7	4.7	5.1	6.0	6.6	6.7	5.4	4.0	2.6	2.0	51.7
	Glendora	2.0	2.5	3.6	4.9	5.4	6.1	7.3	6.8	5.7	4.2	2.6	2.0	53.1
	Gorman	1.6	2.2	3.4	4.6	5.5	7.4	7.7	7.1	5.9	3.6	2.4	1.1	52.4
	Lancaster	2.1	3.0	4.6	5.9	8.5	9.7	11.0	9.8	7.3	4.6	2.8	1.7	71.1
	Los Angeles	2.2	2.7	3.7	4.7	5.5	5.8	6.2	5.9	5.0	3.9	2.6	2.0	50.1
	Long Beach	2.2	2.5	3.4	3.8	4.8	5.0	5.3	4.9	4.5	3.4	2.4	2.0	44.0
	Palmdale	2.0	2.7	4.2	5.1	7.6	8.5	9.9	9.8	6.7	4.2	2.6	1.7	64.8
	Pasadena	2.1	2.7	3.7	4.7	5.1	6.0	7.1	6.7	5.6	4.2	2.6	2.0	52.3
	Pearblossom	1.7	2.4	3.7	4.7	7.3	7.7	9.9	7.9	6.4	4.0	2.6	1.6	59.9
	Redondo Beach	2.2	2.4	3.3	3.8	4.5	4.7	5.4	4.8	4.4	2.8	2.4	2.0	42.6
San Fernando	2.0	2.7	3.5	4.6	5.5	5.9	7.3	6.7	5.3	3.9	2.6	2.0	52.0	
Madera	Chowchilla	1.0	1.4	3.2	4.7	6.6	7.8	8.5	7.3	5.3	3.4	1.4	0.7	51.4
	Madera	0.9	1.4	3.2	4.8	6.6	7.8	8.5	7.3	5.3	3.4	1.4	0.7	51.5
	Raymond	1.2	1.5	3.0	4.6	6.1	7.6	8.4	7.3	5.2	3.4	1.4	0.7	50.5
Marin	Novato	1.3	1.5	2.4	3.5	4.4	6.0	5.9	5.4	4.4	2.8	1.4	0.7	39.8
	San Rafael	1.2	1.3	2.4	3.3	4.0	4.8	4.8	4.9	4.3	2.7	1.3	0.7	35.8
Mariposa	Coulterville	1.1	1.5	2.8	4.4	5.9	7.3	8.1	7.0	5.3	3.4	1.4	0.7	48.8
	Mariposa	1.1	1.5	2.8	4.4	5.9	7.4	8.2	7.1	5.0	3.4	1.4	0.7	49.0
	Yosemite Village	0.7	1.0	2.3	3.7	5.1	6.5	7.1	6.1	4.4	2.9	1.1	0.6	41.4
Mendocino	Fort Bragg	0.9	1.3	2.2	3.0	3.7	3.5	3.7	3.7	3.0	2.3	1.2	0.7	29.0
	Point Arena	1.0	1.3	2.3	3.0	3.7	3.9	3.7	3.7	3.0	2.3	1.2	0.7	29.6
	Hopland	1.1	1.3	2.6	3.4	5.0	5.9	6.5	5.7	4.5	2.8	1.3	0.7	40.9
	Ukiah	1.0	1.3	2.6	3.3	5.0	5.8	6.7	5.9	4.5	2.8	1.3	0.7	40.9
Merced	Merced	1.0	1.5	3.2	4.7	6.6	7.9	8.5	7.2	5.3	3.4	1.4	0.7	51.5
	Los Banos	1.0	1.5	3.2	4.7	6.1	7.4	8.2	7.0	5.3	3.4	1.4	0.7	50.0
Mono	Bridgeport	0.7	0.9	2.2	3.8	5.5	6.6	7.4	6.7	4.7	2.7	1.2	0.5	43.0
Monterey	Castroville	1.6	1.8	2.7	3.5	4.4	4.4	4.5	4.2	3.8	2.8	1.8	1.3	36.7
	King City	1.7	2.0	3.4	4.4	4.4	5.6	6.1	6.7	6.5	5.2	2.2	1.3	49.6
	Long Valley	1.5	1.9	3.2	4.1	5.8	6.5	7.3	6.7	5.3	3.6	2.0	1.2	49.1
	Monterey	1.7	1.8	2.7	3.5	4.0	4.1	4.3	4.2	3.5	2.8	1.9	1.5	36.0
	Salinas	1.6	1.9	2.7	3.8	4.8	4.7	5.0	4.5	4.0	2.9	1.9	1.3	39.1
	Soledad	1.7	2.0	3.4	4.4	5.5	5.4	6.5	6.2	5.2	3.7	2.2	1.5	47.7
Napa	St. Helena	1.2	1.5	2.8	3.9	5.1	6.1	7.0	6.2	4.8	3.1	1.4	0.9	44.1
	Yountville	1.3	1.7	2.8	3.9	5.1	6.0	7.1	6.1	4.8	3.1	1.5	0.9	44.3
Nevada	Grass Valley	1.1	1.5	2.6	4.0	5.7	7.1	7.9	7.1	5.3	3.2	1.5	0.9	48.0
	Nevada City	1.1	1.5	2.6	3.9	5.8	6.9	7.9	7.0	5.3	3.2	1.4	0.9	47.4
Orange	Santa Ana	2.2	2.7	3.7	4.5	4.6	5.4	6.2	6.1	4.7	3.7	2.5	2.0	48.2
	Laguna Beach	2.2	2.7	3.4	3.8	4.6	4.6	4.9	4.9	4.4	3.4	2.4	2.0	43.2
Placer	Auburn	1.2	1.7	2.8	4.4	6.1	7.4	8.3	7.3	5.4	3.4	1.6	1.0	50.6
	Blue Canyon	0.7	1.1	2.1	3.4	4.8	6.0	7.2	6.1	4.6	2.9	0.9	0.6	40.5
	Colfax	1.1	1.5	2.6	4.0	5.8	7.1	7.9	7.0	5.3	3.2	1.4	0.9	47.9
	Soda Springs	0.7	0.7	1.8	3.0	4.3	5.3	6.2	5.5	4.1	2.5	0.7	0.7	35.4
	Tahoe City	0.7	0.7	1.7	3.0	4.3	5.4	6.1	5.6	4.1	2.4	0.8	0.6	35.5
	Truckee	0.7	0.7	1.7	3.2	4.4	5.4	6.4	5.7	4.1	2.4	0.8	0.6	36.2

Section 495 Continued

County	City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann. Eto
Plumas	Quincy	0.7	0.9	2.2	3.5	4.9	5.9	7.3	5.9	4.4	2.8	1.2	0.5	40.2
	Portola	0.7	0.9	2.0	3.5	4.9	5.9	7.3	5.9	4.3	2.7	0.9	0.5	39.4
Riverside	Beaumont	2.0	2.3	3.4	4.4	6.1	7.1	7.6	7.9	6.0	3.9	2.6	1.7	55.0
	Blythe	3.2	4.2	6.7	8.9	11.1	12.4	12.8	11.1	9.1	6.7	4.0	2.7	92.9
	Coachella	2.9	4.4	6.2	8.4	10.5	11.9	12.3	10.1	8.9	6.2	3.8	2.4	88.1
	Desert Center	2.9	4.1	6.4	8.5	11.0	12.1	12.2	11.1	9.0	6.4	3.9	2.6	90.0
	Elsinore	2.1	2.8	3.9	4.4	5.9	7.1	7.6	7.0	5.8	3.9	2.6	2.0	55.0
	Indio	2.9	4.0	6.2	8.3	10.5	11.9	12.3	10.0	8.9	6.4	3.8	2.4	87.6
	Palm Desert	2.0	3.5	4.9	7.7	8.5	10.6	9.8	9.2	8.4	6.1	2.7	1.8	75.1
	Palm Springs	2.0	2.9	4.9	7.2	8.3	8.5	11.6	8.3	7.2	5.9	2.7	1.7	71.1
	Riverside	2.1	2.9	4.0	4.1	6.1	7.1	7.9	7.6	6.1	4.2	2.6	2.0	56.6
Sacramento	Roseville	1.1	1.7	3.1	4.7	6.2	7.7	8.5	7.3	5.6	3.7	1.7	1.0	52.2
	Sacramento	1.0	1.8	3.2	4.7	6.4	7.7	8.4	7.2	5.4	3.7	1.7	0.9	51.9
San Benito	Hollister	1.5	1.8	3.1	4.3	5.5	5.7	6.4	5.9	5.0	3.5	1.7	1.1	45.1
San Bernardino	Baker	2.7	3.9	6.1	8.3	10.4	11.8	12.2	11.0	8.9	6.1	3.3	2.1	86.6
	Barstow	2.6	3.6	5.7	7.9	10.1	11.6	12.0	10.4	8.6	5.7	3.3	2.1	83.6
	Chino	2.1	2.9	3.9	4.5	5.7	6.5	7.3	7.1	5.9	4.2	2.6	2.0	54.6
	Crestline	1.5	1.9	3.3	4.4	5.5	6.6	7.8	7.1	5.4	3.5	2.2	1.6	50.8
	Needles	3.2	4.2	6.6	8.9	11.0	12.4	12.8	11.0	8.9	6.6	4.0	2.7	92.1
	Lucerne Valley	2.2	2.9	5.1	6.5	9.2	11.0	11.4	9.9	7.4	5.0	3.0	1.8	75.3
	San Bernardino	2.0	2.7	3.8	4.6	5.7	6.9	7.9	7.4	5.9	4.2	2.6	2.0	55.6
	Twentynine Palms	2.6	3.6	5.9	7.9	10.1	11.2	11.2	10.3	8.6	5.9	3.4	2.2	82.9
	Victorville	2.3	3.1	4.9	6.7	9.3	10.0	11.2	9.8	7.4	5.1	2.8	1.8	74.6
San Diego	Chula Vista	2.2	2.7	3.4	3.8	4.9	4.7	5.5	4.9	4.5	3.4	2.4	2.0	44.2
	Escondido	2.1	2.8	3.8	4.7	5.6	6.7	6.8	6.5	5.4	3.8	2.5	2.0	52.6
	Oceanside	2.2	2.7	3.4	3.7	4.9	4.6	4.6	5.1	4.1	3.3	2.4	2.0	42.9
	Pine Valley	1.5	2.4	3.8	5.1	6.0	7.0	7.8	7.3	6.0	4.0	2.2	1.7	54.8
	Ramona	2.1	2.5	4.0	4.7	5.6	6.5	7.3	7.0	5.6	3.9	2.5	1.7	53.4
	San Diego	2.2	2.5	3.3	3.4	4.4	4.0	4.6	4.6	3.9	3.3	2.2	2.0	40.6
	Santee	2.1	2.7	3.7	4.5	5.5	6.1	6.6	6.2	5.4	3.8	2.6	2.0	51.1
	Warner Springs	1.6	2.7	3.7	4.7	5.7	7.6	8.3	7.7	6.3	4.0	2.5	1.3	56.0
San Francisco	San Francisco	1.5	1.3	2.4	3.0	3.7	4.6	4.9	4.8	4.1	2.8	1.3	0.7	35.1
San Joaquin	Farmington	1.5	1.5	2.9	4.7	6.2	7.6	8.1	6.8	5.3	3.3	1.4	0.7	50.0
	Lodi	0.9	1.5	2.9	5.1	6.5	7.0	7.7	7.7	5.2	3.1	1.3	0.7	49.5
	Manteca	1.5	1.5	3.0	4.7	6.4	7.6	8.1	6.8	5.3	3.3	1.4	0.6	50.1
	Stockton	0.8	1.5	2.9	4.7	6.2	7.4	8.1	6.8	5.3	3.2	1.4	0.6	49.1
	Tracy	1.0	1.5	2.9	4.5	6.1	7.3	7.9	6.7	5.3	3.2	1.3	0.7	48.5
San Luis Obispo	Arroyo Grande	2.0	2.2	3.2	3.8	4.3	4.7	4.3	4.6	3.8	3.2	2.4	1.7	40.0
	Atascadero	1.2	1.5	2.8	3.9	4.5	6.0	6.7	6.2	5.0	3.2	1.7	1.0	43.7
	Morro Bay	2.0	2.2	3.1	3.5	4.3	4.5	4.6	4.6	3.8	3.5	2.1	1.7	39.9
	Paso Robles	1.6	2.0	3.2	4.3	5.5	6.3	7.3	6.7	5.1	3.7	2.1	1.4	49.0
	San Luis Obispo	2.0	2.2	3.2	4.1	4.9	5.3	4.6	5.5	4.4	3.5	2.4	1.7	43.8
	San Miguel	1.6	2.0	3.2	4.3	5.0	6.4	7.4	6.8	5.1	3.7	2.1	1.4	49.0
	San Simeon	2.0	2.0	2.9	3.5	4.2	4.4	4.6	4.3	3.5	3.1	2.0	1.7	38.1
San Mateo	Half Moon Bay	1.5	1.7	2.4	3.0	3.9	4.3	4.3	4.2	3.5	2.8	1.3	1.0	33.7
	Redwood City	1.5	1.8	2.9	3.8	5.2	5.3	6.2	5.6	4.8	3.1	1.7	1.0	42.8
Santa Barbara	Carpenteria	2.0	2.4	3.2	3.9	4.8	5.2	5.5	5.7	4.5	3.4	2.4	2.0	44.9
	Guadalupe	2.0	2.2	3.2	3.7	4.9	4.6	4.5	4.6	4.1	3.3	2.4	1.7	41.1
	Los Alamos	1.8	2.0	3.2	4.1	4.9	5.3	5.7	5.5	4.4	3.7	2.4	1.6	44.6
	Lompoc	2.0	2.2	3.2	3.7	4.8	4.6	4.9	4.8	3.9	3.2	2.4	1.7	41.1
	Santa Barbara	2.0	2.5	3.2	3.8	4.6	5.1	5.5	4.5	3.4	2.4	1.8	1.8	40.6
	Santa Maria	1.8	2.2	3.2	4.0	5.0	5.1	5.1	5.1	4.5	3.5	2.4	1.7	43.7
	Solvang	2.0	2.0	3.3	4.3	5.0	5.6	6.1	5.6	4.4	3.7	2.2	1.6	45.6

Section 495 Continued

County	City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann. Eto
Santa Clara	Gilroy	1.3	1.8	3.1	4.1	5.3	5.6	6.1	5.5	4.7	3.4	1.7	1.1	43.6
	Los Gatos	1.5	1.8	2.8	3.9	5.0	5.6	6.2	5.5	4.7	3.2	1.7	1.1	42.9
	Palo Alto	1.5	1.8	2.8	3.8	5.2	5.3	6.2	5.6	5.0	3.2	1.7	1.0	43.0
	San Jose	1.5	1.8	3.1	4.1	5.5	5.8	6.5	5.9	5.2	3.3	1.8	1.0	45.3
Santa Cruz	Santa Cruz	1.5	1.8	2.6	3.5	4.3	4.4	4.8	4.4	3.8	2.8	1.7	1.2	36.6
	Watsonville	1.5	1.8	2.7	3.7	4.6	4.5	4.9	4.2	4.0	2.9	1.8	1.2	37.7
Shasta	Burney	0.7	1.0	2.1	3.5	4.9	5.9	7.4	6.4	4.4	2.9	0.9	0.6	40.9
	Fall River Mills	0.6	1.0	2.1	3.7	5.0	6.1	7.8	6.7	4.6	2.8	0.9	0.5	41.8
	Glenburn	0.6	1.0	2.1	3.7	5.0	6.3	7.8	6.7	4.7	2.8	0.9	0.6	42.1
	Redding	1.2	1.4	2.6	4.1	5.6	7.1	8.5	7.3	5.3	3.2	1.4	0.9	48.8
Sierra	Downieville	0.7	1.0	2.3	3.5	5.0	6.0	7.4	6.2	4.7	2.8	0.9	0.6	41.3
	Sierraville	0.7	1.1	2.2	3.2	4.5	5.9	7.3	6.4	4.3	2.6	0.9	0.5	39.6
Siskiyou	Happy Camp	0.5	0.9	2.0	3.0	4.3	5.2	6.1	5.3	4.1	2.4	0.9	0.5	35.1
	Mt. Shasta	0.5	0.9	2.0	3.0	4.5	5.3	6.7	5.7	4.0	2.2	0.7	0.5	36.0
	Tulelake	0.5	0.9	2.1	3.4	5.3	5.9	7.9	6.7	4.4	2.7	0.9	0.5	41.2
	Weed	0.5	0.9	2.0	2.5	4.5	5.3	6.7	5.5	3.7	2.0	0.9	0.5	34.9
	Yreka	0.6	0.9	2.1	3.0	4.9	5.8	7.3	6.5	4.3	2.5	0.9	0.5	39.2
Solano	Fairfield	1.1	1.7	2.8	4.0	5.5	6.1	7.8	6.0	4.8	3.1	1.4	0.9	45.2
	Rio Vista	0.9	1.7	2.8	4.4	5.9	6.7	7.9	6.5	5.1	3.2	1.3	0.7	47.0
Sonoma	Cloverdale	1.1	1.4	2.6	3.4	5.0	5.9	6.2	5.6	4.5	2.8	1.4	0.7	40.7
	Fort Ross	1.2	1.4	2.2	3.0	3.7	4.5	4.2	4.3	3.4	2.4	1.2	0.5	31.9
	Hearldsburg	1.2	1.5	2.4	3.5	5.0	5.9	6.1	5.6	4.5	2.8	1.4	0.7	40.8
	Lincoln	1.2	1.7	2.8	4.7	6.1	7.4	8.4	7.3	5.4	3.7	1.9	1.2	51.9
	Petaluma	1.2	1.5	2.8	3.7	4.6	5.6	4.6	5.7	4.5	2.9	1.4	0.9	39.6
	Santa Rosa	1.2	1.7	2.8	3.7	5.0	6.0	6.1	5.9	4.5	2.9	1.5	0.7	42.0
Stanislaus	La Grange	1.2	1.5	3.1	4.7	6.2	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.2
	Modesto	0.9	1.4	3.2	4.7	6.4	7.7	8.1	6.8	5.0	3.4	1.4	0.7	49.7
	Newman	1.0	1.5	3.2	4.6	6.2	7.4	8.1	6.7	5.0	3.4	1.4	0.7	49.3
	Oakdale	1.2	1.5	3.2	4.7	6.2	7.7	8.1	7.1	5.1	3.4	1.4	0.7	50.3
	Turlock	0.9	1.5	3.2	4.7	6.5	7.7	8.2	7.0	5.1	3.4	1.4	0.7	50.2
Sutter	Yuba City	1.3	2.1	2.8	4.4	5.7	7.2	7.1	6.1	4.7	3.2	1.2	0.9	46.7
Tehama	Red Bluff	1.2	1.8	2.9	4.4	5.9	7.4	8.5	7.3	5.4	3.5	1.7	1.0	51.1
	Corning	1.2	1.8	2.9	4.5	6.1	7.3	8.1	7.2	5.3	3.7	1.7	1.1	50.7
Trinity	Hay Fork	0.5	1.1	2.3	3.5	4.9	5.9	7.0	6.0	4.5	2.8	0.9	0.7	40.1
	Weaverville	0.6	1.1	2.2	3.3	4.9	5.9	7.3	6.0	4.4	2.7	0.9	0.7	40.0
Toulomme	Groveland	1.1	1.5	2.8	4.1	5.7	7.2	7.9	6.6	5.1	3.3	1.4	0.7	47.5
	Sonora	1.1	1.5	2.8	4.1	5.8	7.2	7.9	6.7	5.1	3.2	1.4	0.7	47.6
Tulare	Alpaugh	0.9	1.7	3.4	4.8	6.6	7.7	8.2	7.3	5.4	3.4	1.4	0.7	51.6
	Badger	1.0	1.3	2.7	4.1	6.0	7.3	7.7	7.0	4.8	3.3	1.4	0.7	47.3
	Dinuba	1.1	1.5	3.2	4.7	6.2	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.2
	Porterville	1.2	1.8	3.4	4.7	6.6	7.7	8.5	7.3	5.3	3.4	1.4	0.7	52.1
	Visalia	1.0	1.8	3.4	5.4	7.0	8.2	8.4	7.2	5.7	3.8	1.7	0.9	54.3
Ventura	Oxnard	2.2	2.5	3.2	3.7	4.4	4.6	5.4	4.8	4.0	3.3	2.4	2.0	42.3
	Thousand Oaks	2.2	2.7	3.4	4.5	5.4	5.9	6.7	6.4	5.4	3.9	2.6	2.0	51.0
	Ventura	2.2	2.7	3.2	3.8	4.6	4.7	5.5	4.9	4.1	3.4	2.5	2.0	43.5
Yolo	Davis	1.0	1.9	3.3	5.0	6.4	7.6	8.2	7.1	5.4	4.0	1.8	1.0	52.5
	Winters	1.7	1.7	2.9	4.4	5.8	7.1	7.9	6.7	5.3	3.3	1.6	1.0	49.4
	Woodland	1.0	1.8	3.2	4.7	6.1	7.7	8.2	7.2	5.4	3.7	1.7	1.0	51.6
Yuba	Brownsville	1.1	1.4	2.6	4.0	5.7	6.8	7.9	6.8	5.3	3.4	1.5	0.9	47.4
	Average	1.4	1.9	3.2	4.6	6.0	6.9	7.6	6.8	5.3	3.6	1.8	1.1	50.2
	Max	3.2	4.4	6.7	8.9	11.1	12.4	12.8	11.1	9.1	6.7	4.0	2.7	92.9
	Min	0.5	0.7	1.7	2.5	3.7	3.5	3.7	3.7	3.0	2.0	0.7	0.4	27.5