

CLIMATE

The most recent published synthesis of climate data located during the preparation of this assessment was presented in the Colusa County Soil Survey (USDA/NRCS 1998). This summary was intended to cover the Colusa County area, including the Coast Range Mountains lying to the east of the watershed. It was based on 1961-1990 precipitation data from the Colusa and East Park Reservoir stations, among other data, and is thought to be the most recent and essentially representative climate summary available for the Colusa Basin Watershed area as a whole. USDA/NRCS has since published 1971-2000 climate data summaries. (USDA/NRCS 1998):

The climate of Colusa County is characterized by warm, dry summer. Winters are cool and moist in the Sacramento Valley and cold and wet on the Coast Range. The climate varies widely because of variations in the topography of the county.

Table 1 gives data on temperatures and precipitation for the survey area as recorded at Colusa and East Park Reservoir in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

The Coast Range receives abundant precipitation. The higher elevations receive more than 50 inches per year. The Coast Range shields the Sacramento Valley from excessive precipitation. Pacific storms generally enter the county from the west, and precipitation diminishes as elevations drop from the crest of the Coast Range to the Sacramento Valley in the rain-shadow effect. Pacific storms are generally mild. Occasionally, a strong, warm, persistent storm generated to the southwest in the north-central Pacific drops a large amount of rainfall that causes widespread flooding along streams and in the Colusa Basin and in Butte Sink.

Most precipitation falls during a pronounced rainy season from November through March. Colusa receives more than 81 percent of its average annual precipitation during this season. Little, if any, precipitation usually falls in the period June through August. On the average, less than 1 inch of precipitation falls at Colusa from May through September. Thunderstorms occur on only 5 days of the year, on average, at Colusa and are not severe. They are more frequent on the Coast Range.

Temperatures vary with elevation across the county. The Sacramento Valley is the warmest part of the county. It has summer afternoon temperatures in the upper 90s. The Coast Range, above an elevation of 5,000 feet, has summer afternoon temperatures in the 70s. At Colusa, average winter temperatures are 49.8 degrees F and average summer temperatures are 74.6 degrees F. Cool south winds, of coastal marine origin, flow through the Carquinez Straits and cool the Sacramento Valley in the summer months. Occasional heat waves with temperatures over 100 degrees F occur when an air-pressure pattern with resultant north winds cuts off the flow of cool marine air into the Sacramento Valley from the San Francisco Bay area. Winter temperatures are moderated by the relative proximity of the county to the Pacific Ocean and to the Sierra Nevada Mountains to the east, which deflect cold continental air. Temperatures below freezing generally occur from November to March and become more frequent with increasing elevation.

Snowfall is very rare in the Sacramento Valley and increases in amount with elevation through the foothills and into the Coast Range. The greatest snow depth recorded at Colusa was 8 inches on January 8, 1973. Snowfall occurs occasionally in the foothills below 2,000 feet and may

accumulate to depths of a few inches. On the Coast Range snow can accumulate to depths of 5 or 6 feet at elevations above 5,000 feet. Snow is usually evident on Snow Mountain from November to May.

Prevailing winds are from the southwest and are generally light throughout the survey area, except for exposed ridgetops on the Coast Range and open areas of the Sacramento Valley. Strong winds are rare. Thunderstorms are uncommon and are not severe, and tornadoes are almost unknown.

Cloud cover is considerable in the winter months and averages 52 percent at Colusa. Radiational cooling fog, forming in late night and early morning hours, is common in December and January. Under stagnant weather conditions, this fog can persist for many days. Clear skies are typical in late spring, summer, and early fall. At Colusa the sun shines an average of 96 percent of the time possible during the summer months.

Relative humidity is very low on summer afternoons, making the summer heat more tolerable. Humidity is high throughout the rainy season (November through March).

Note that Tables 1-3 are reproduced in this assessment as **Tables 1-Climate** through **3-Climate**.

The climate summary reproduced above does not distinguish between the county lands and the Colusa Basin Watershed lands. The data and observations it provides for the Coast Range area are representative of the higher Coast Range Mountains lying to the east of the watershed's lower foothills. Data and observations it provides for the Colusa vicinity are probably representative of the valley flat and low plains areas on the eastern half of the watershed. A map of long term mean annual precipitation data would be useful for determining the maximum precipitation in the upper watersheds of the foothill streams. It is generally understood that the annual precipitation within the Colusa Basin Watershed ranges from 27 inches along its western edge to about 17 inches on the valley flat (DWR 2006). These data are probably for 1900-1960 as they are most likely taken from Rantz (1971).

**Table 1. Climate. Temperature and Precipitation Recorded in the Period 1961-1990 at Colusa and East Park Reservoir;
Adapted from Reed 2006.**

Month	Temperature						Precipitation				
	Average Daily Maximum	Average Daily Minimum	Average	2 Years in 10 Will Have		Average Number of Growing Degree Days*	Average	2 Years in 10 Will Have		Average Number of Days with 0.10 in or More	Average Snowfall
				Maximum Temperature Higher than	Minimum Temperature Higher than			Less than	More than		
	°F	°F	°F	°F	°F	Days	In	in	in	in	in
Station: Colusa 2 SSW											
January	53.8	36.4	45.1	70	23	172	3.15	0.92	4.95	5	0.0
February	61.0	39.9	50.5	75	28	297	2.54	0.72	4.16	5	0.0
March	65.9	41.9	53.9	82	28	430	2.18	0.98	3.21	5	0.0
April	73.4	44.5	59.0	91	32	570	0.88	0.16	1.44	2	0.0
May	82.4	51.4	66.9	99	38	834	0.32	0.08	0.8	0	0.0
June	90.4	56.4	73.4	106	45	1,001	0.22	0.07	0.59	0	0.0
July	95.5	58.6	77.1	108	48	1,149	0.04	0.01	0.27	0	0.0
August	94.1	57.3	75.7	107	47	1,105	0.07	0.05	0.43	0	0.0
September	88.8	53.7	71.2	103	42	937	0.34	0.07	0.83	0	0.0
October	78.6	47.6	63.1	96	35	715	1.04	0.28	1.92	2	0.0
November	63.2	41.1	52.2	80	27	365	2.51	0.68	3.68	5	0.0
December	53.8	36.6	45.2	69	22	178	2.47	1.27	3.98	5	0.1
Yearly											
Average	75.1	47.1	61.1								
Extreme	113	15		109	21						
Total						7,752	15.76	10.65	20.04	29	0.1
Station: East Park Reservoir											
January	54.5	31.5	43.0	71	18	130	4.50	1.77	6.8	7	0.0
February	58.6	35.0	46.8	74	22	198	3.48	0.87	5.89	5	0.0
March	61.2	37.2	49.2	79	24	290	2.44	0.73	3.95	5	0.0
April	68.1	40.5	54.3	87	28	429	1.13	0.37	1.92	3	0.0

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 °F)

Month	Temperature						Precipitation				
	Average Daily Maximum	Average Daily Minimum	Average	2 Years in 10 Will Have		Average Number of Growing Degree Days*	Average	2 Years in 10 Will Have		Average Number of Days with 0.10 in or More	Average Snowfall
				Maximum Temperature Higher than	Minimum Temperature Higher than			Less than	More than		
	°F	°F	°F	°F	°F	Days	In	in	in	in	in
May	77.7	47.0	62.4	97	32	693	0.39	0.11	0.78	1	0.0
June	86.7	54.3	70.5	105	40	893	0.27	0.10	0.73	0	0.0
July	93.7	58.8	76.2	107	47	1,117	0.04	0.06	0.32	0	0.0
August	92.1	57.0	74.5	106	46	1,070	0.15	0.07	0.51	0	0.0
September	87.2	52.2	69.7	104	40	890	0.26	0.09	0.63	0	0.0
October	76.9	45.2	61.0	96	31	665	1.10	0.28	2.12	2	0.0
November	64.0	37.3	50.6	83	23	320	2.62	0.58	4.34	4	0.0
December	56.1	32.4	44.3	72	19	115	3.79	1.28	6.03	6	0.0
Yearly											
Average	73.1	44.0	58.6								
Extreme	113	10		109	16						
Total						6,851	20.18	10.62	26.93	33	0.0

In addition, a data set for average annual precipitation based on the more recent 30-year period 1971 – 2000 has been developed through PRISM. [<http://www.wcc.nrcs.usda.gov/climate/prism.html>] **Tables 4-Climate** through **5-Climate** contain 1971-2000 data for comparison to **Tables 1-Climate** through **3-Climate**. An update of frost data at Colusa (**Table 2-Climate**) was not published at the time of this assessment. The complete available data for this period can be downloaded from USDA Geospatial Data Gateway. [<http://datagateway.nrcs.usda.gov/>] The USDA/NRCS database contains 30-year summary data for the following stations:

Colusa County

- Colusa
- Williams (frost data only)
- Williams Airport (frost data only)
- East Park Reservoir (outside watershed)
- Stonyford Ranger Station (outside watershed)

Glenn County

- Orland (outside watershed)
- Stony Gorge Reservoir (outside watershed)
- Willows

Yolo County

- Brooks Farnham Ranch (frost data only) (outside watershed)
- Davis (outside watershed)

Table 2. Climate. Freeze Dates in Spring and Fall Recorded for the Period 1961-1990; Adapted from Reed 2006.

Probability	Temperature		
	24 °F or Lower	28 °F or Lower	32 °F or Lower
Last Freezing Temperature in Spring			
1 Year in 10 Later than	January 22	March 16	April 16
2 Year in 10 Later than	January 12	February 28	April 1
5 Year in 10 Later than	December 12	January 27	March 2
First Freezing Temperature in Fall			
1 Year in 10 Earlier than	December 1	November 16	November 1
2 Year in 10 Earlier than	December 14	November 24	November 9
5 Year in 10 Earlier than	January 18	December 9	November 24

Table 3. Climate. Growing Season Recorded for the Period 1961-1990; Adapted from Reed 2006.

Probability	Daily Minimum Temperature during Growing Season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 Years in 10	338	358	208
8 Years in 10	>365	276	228
5 Years in 10	>365	312	266
2 Years in 10	>365	>365	304
1 Years in 10	>365	>365	324

Table 4. Climate. Temperature and Precipitation Recorded in the Period 1971-2000 at Colusa.

Month	Temperature						Precipitation				
	Average Daily Maximum	Average Daily Minimum	Average	2 Years in 10 Will Have		Average Number of Growing Degree Days*	Average	2 Years in 10 Will Have		Average Number of Days with 0.10 in or More	Average Snowfall
				Maximum Temperature Higher than	Minimum Temperature Higher than			Less than	More than		
	°F	°F	°F	°F	°F	Days	In	in	in	in	in
Station: Colusa 2 SSW											
January	58.2	37.6	45.9	69	25	191	3.58	0.92	6.17	6	0.0
February	60.6	40.9	50.7	75	29	304	3.09	0.66	5.42	6	0.0
March	65.9	43.4	54.7	81	29	454	2.66	1.05	3.96	5	0.0
April	73.9	45.6	59.7	91	33	590	0.76	0.20	1.26	2	0.0
May	81.7	52.7	67.2	100	39	840	0.67	0.00	1.18	1	0.0
June	89.5	57.3	73.4	105	45	1,001	0.20	0.00	0.42	0	0.0
July	94.1	59.2	76.6	108	48	1,136	0.04	0.00	0.00	0	0.0
August	93.0	57.3	75.2	107	48	1,088	0.04	0.00	0.00	0	0.0
September	89.1	54.1	71.6	104	43	947	0.34	0.00	0.59	0	0.0
October	79.5	47.9	63.7	97	36	734	0.94	0.14	1.68	2	0.0
November	63.3	40.9	52.1	80	27	361	2.22	0.58	3.51	4	0.0
December	54.6	36.6	45.6	69	23	187	2.34	0.80	3.87	5	0.1
Yearly											
Average	74.9	47.8	61.4								
Extreme	113	15		109	22						
Total						7,832	16.89	10.66	22.08	31	0.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 °F)

Table 5. Climate. Growing Season Recorded at Colusa for the Period 1971-2000.

Probability	Daily Minimum Temperature during Growing Season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 Years in 10	>365	270	210
8 Years in 10	>365	292	231
5 Years in 10	>365	343	272
2 Years in 10	>365	>365	312
1 Years in 10	>365	>365	334