2) ***RISK*** - Risk is considered the potential for wildfires to start and threaten communities. Inherent to that is a display of where those communities are, including a buffer around them defined as "Wildland Urban Interface". Additional information is displayed as to population density, key infrastructures, fire department capabilities, and communities with evacuation plans and assembly areas.

a) PC FSC Communities at Risk Map - In the Federal Register / Vol. 66, No. 160 / Friday, August 17, 2001 / Notices is a listing of urban wildland interface communities within the vicinity of federal lands that are at high risk from wildfire. The Plumas County Fire Safe Council, in collaboration with local, state, and federal fire agencies, proposed amending Plumas County's listing of urban wildland interface communities within the vicinity of federal lands that are at high risk from wildfire, also referred to as "at-risk communities" or "Communities at Risk". Due to the number of small communities spread through the county and the fact that naming all of them could be difficult, the council chose to define them geographically and also attach a general name, one that in many cases was already listed in the federal register. The map and listing of names was presented to the Board of Supervisors who approved the amended list and map on April 10, 2004.

Insert

PC FSC Communities at Risk Map

b) PC FSC Map of Adjacent Wildland Urban Interface (WUI *)* - The wildland-urban interface (WUI) is commonly described as the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels.

In order to focus Hazardous Fuel Reduction (HFR) activities to the benefit of most communities, this plan establishes a priority for treatment in the WUI as the first 1/2 mile around a community's boundary. For planning purposes this will be considered the "adjacent" WUI, and first priority for WUI fuel treatment.

Insert

PC FSC Map of Adjacent Wildland Urban Interface (WUI)

c) **PC FSC Map of Extended Wildland Urban Interface (WUI *)* -** Discussions with the US Forest Service have precipitated an extension of Plumas County's WUI's to better facilitate project planning and incorporation of their efforts under the Herger Feinstein Quincy Library Group Forest Recovery Act (HFQLG). For planning purposes this will be considered the "extended" WUI, and second priority for WUI fuel treatment.

Insert

PC FSC Map of Extended Wildland Urban Interface (WUI)

d) **Table of Associated Acreages for Communities at Risk and WUI's by ownership.-** This table displays by community, acres of private and public lands within the 1.5 mile WUI buffer, and for the Community WUI.

Insert

Table of Associated Acreages for Communities at Risk and WUI's by ownership.-

e) **PNF/LNF & CDF Ignitions Occurrence *Maps* -** Fire occurrence both natural and person-caused are frequent and spaced fairly uniform across the county, with concentration of person-caused fires closer to population centers, recreational areas, and travel corridors. Lightning accounts for approximately 60% of all fires in Plumas County.

For the risk of fire occurrence in Plumas County refer to the following ignition maps:

- **Lightning Ignition Occurrence by point source - 1970 -1996**
- **Person Caused Ignition Occurrence by point source - 1970 -1996**
- **Lightning Ignition Occurrence by frequency per section - 1970 -1996**
- **Person Caused Ignition Occurrence by frequency per section - 1970 -1996**

Insert

Map of Lightning Ignition Occurrence by point source - 1970 -1996

Insert

Map of Person Caused Ignition Occurrence by point source - 1970 -1996

Insert

Map of Lightning Ignition Occurrence by frequency per section - 1970 -1996

Insert

Map of Person Caused Ignition Occurrence by frequency per section - 1970 - 1996

f) PNF/LNF & CDF Large Fire Occurrence Map - Large fire history data for Plumas County shows that almost half of the county's acreage has been burned in large wildfires between 1900 and 2000; some of that acreage and large fire areas have been burned over more than once by subsequent fires. This historic data shows that Plumas County has had a history of large fires and ignitions that probably have played a major role in the development of the present stand structure and vegetation found in Plumas County. It also gives the fire and fuels planner an idea of how much a role fire plays in the determination of a strategic fuels planning process.

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Insert

PNF/LNF & CDF Large Fire Occurrence Map

INSERT

g) ***Census Data Density Map -***

Insert

h) ***Plumas County Housing Density Map -***

i) **Plumas County Fire Department Boundaries and Staffing Level Map -** In assessing risk the identification of VFD District Boundaries and fire station location is important. It is also important to understand what type of response levels can be expected in each district. Fire stations are coded as to whether they are staffed with full-time personnel available to respond at a pre-determined level 24/7; volunteer, where volunteers will respond from their homes to the station to get the equipment; or seasonal, such as state and federal wildland fire agencies with staffing during fire season.

Insert

Plumas County Fire Department Boundaries and Staffing Level Map

j) **Hydrant Systems -** Critical to rapid and efficient fire suppression is easily available water for suppression resources to replenish their supplies in their trucks. Fire hydrants provide the best source for this on both wild and structural fires.

Insert

Hydrant Systems Map

k) **Plumas County Road Access -** Critical to rapid and efficient fire suppression is easily accessible homes and communities.

Insert

Plumas County Road Access Map

l) **Communities With Evacuation Plans -** Often critical to public safety is the ability of communities to rapidly evacuate and report to "Wildfire Evacuation Assembly Areas". The Plumas County Fire Safe Council has worked with 13 communities to date that have completed evacuation maps, and many also identified assembly areas where information could be provided to residents.

Insert

Communities With Evacuation Plans Map

3) ***Fire Behavior Factors*** are considered to be the factors which contribute to how fast and intensely a fire burns. They are: *Topography*, (slope, aspect, elevation, and features); *Fuel* (type, volume, species, space between layers, surface, ladder & crown fuels, and compactness of the fuelbed); and *Weather* (temperature, humidity, wind, and precipitation). These three factors result in expected fire behavior following an ignition. Fire Behavior models are used to predict how fast a fire will burn, how intensively it will burn, and its potential for crowning and spotting.

A key fire behavior output is flame length. Flame length correlations are used in planning for suppression resource capability and can be related to firebrand production, spotting, and resource damage. The Plumas County Fire Safe Council has set a target flame length of 1-4 feet in stands where hazardous fuels are treated. While 4 feet is the upper limit, every effort should be made to reduce it to 2 feet, especially closer into structures and communities.

In identifying the hazard it is important to show what fuels treatment work has been accomplished, and what is already planned. This will create "gaps" which can then help focus future treatment activities in the mitigation section.

a) **Topography of Plumas County -** Topography is the shape of the land and the most static, obvious, and predictable, though not easily changed. Topographic features that affect wildland fire are slope, aspect, elevation, and terrain features such as canyons, drainages, and ridges. Topography has an affect on the amount and type of vegetation, fuel moistures, wind speeds and direction.

Insert

Topography of Plumas County Map

b) **Vegetation Types of Plumas County -** Vegetation types play a key role in how intense a fire can become. Grass, brush, and timber are the three common types. Each has its own burning characteristics based on several inherent factors. Where grass is a light fuel which will burn fast and produce flame lengths which could be fatal, the duration is short and spotting limited. Timber, on the other end of the spectrum, can spread as a low intense surface fire when it has been treated, or burn in multiple layers as a catastrophic stand-replacing fire, generating the most intensity, spotting, and damage.

Insert

Vegetation Types of Plumas Map

c) **Surface Fuel Models of Plumas County -** A fuel model as used in fire behavior modeling refers to a set of surface fuel bed characteristics (load and surface-area-to volume-ratio by size class, heat content, and depth) organized for input into a fire model. Standard fuel models (Anderson 1982) have been stylized to represent specific fuel conditions. There are 13 commonly used or standard fuel models used in four types (Grass, Brush, Timber, & Slash).

Insert

Surface Fuel Models of Plumas County Map

d) **Crown to Base Height -** Crown to base height is an estimation of how many feet of separation exist between the surface fuels and the base of the live tree crown. In forested stands, it is desirable to have a crown to base height of at least 15 to 20 feet (where the size of the tree allows) depending on the type and amount of surface fuels. Torching, crowning, and spotting occurrences are more pronounced when the crown to base height is less than 8 to 12 feet.

Insert

Crown to Base Height map

e) **Crown Fire Potential -** Fires which go from the surface to crown fires create catastrophic stand-replacing events where forests are lost, watersheds are severely damaged, and threats to homes increase due to an increase in embers and radiated heat. Potential for crown fires is determined by projected flame lengths from surface fuel in combination with forested stand conditions with low crown to base height and densely stocked trees.

Insert

Crown Fire Potential Map

f) **Current & Planned Fuel Treatment Projects in Plumas County -**

i) **Map of Completed, Active & Proposed PC FSC HFR Projects. -** Refer to: Plumas County's FSC HFR Projects map.

ii) Map of Completed, Active & Proposed QLG Program of Work. - Refer to: Plumas and Lassen National Forest's Active & Proposed QLG Program of Work map.

iii) Map of Completed, Active & Proposed Large Landowner HFR Projects. - Refer to: Plumas County's Large Landowner HFR Projects map.

iv) Map of Untreated Areas (Gaps) Refer to Map and Table for Plumas County's Hazardous Fuel Reduction Needs.

Insert

Map of Completed, Active & Proposed PC FSC HFR Projects.

Insert

Map of Completed, Active & Proposed QLG Program of Work. -

Insert

Map of Completed, Active & Proposed Large Landowner HFR Projects.

Insert

Map of Untreated Areas (Gaps) Refer to Map

g) **Condition Class Map –** Fire is a natural component of the ecosystem. Historically fires burned at an interval that helped balance the ecosystem. With the suppression of fires, there has been a deviation of the natural frequency. There are three Condition Classes. Condition Class 3 ecosystems (the worst) have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Condition Class 1 ecosystems are the closest to being in balance with fire. This map was developed by the Plumas NF and PC FSC using a crosswalk of existing vegetation, aspect and historical large fires. Field validation and updates will occur when the Plumas NF conducts watershed analyses for future projects.

Insert

Condition Class Map

h) **Climate of Plumas County -** An overview of the climate, average monthly temperatures, and precipitation from four weather stations, and an average annual precipitation map for Plumas County is provided.

CLIMATE OF PLUMAS COUNTY

TOPOGRAPHIC FEATURES – The Cascades end in the northern part of the County where they merge into the Sierra Nevada. The Cascades range generally from 5,000 to 10,000 feet in height, with spectacular Mt. Lassen rising to 10,457 feet. The Sierra Nevada's rise from 1600 feet in the North fork of the Feather River to over 8,000 feet at Mt. Ingalls and Dixie Mountain. Plumas County sits mostly in the Sierra Nevada Range and lies between the Central Valley and Great Basin. There are about 30 mountain peaks over 7,000 feet in elevation. Most of the population centers are over 3,400 feet.

Almost all streams drain into the Feather Rivers, then into the Sacramento River and into San Francisco Bay. Streams are of varying size with a host of lesser creeks that drain small watersheds. Most of the major streams are fed by melting snow from the high slopes of the Sierra Nevada. Stream flow continues well into or throughout the arid summer months. Many of the streams have been dammed to hold the water supply in reservoirs for power generation, irrigation, and domestic uses throughout the dry part of the year, and to provide flood control during the winter and spring. As a result, less and less water from these streams flows directly to the ocean. Most of it is being used at least once before being drained to the sea or percolated into underground storage.

EFFECTS OF TOPOGRAPHY ON CLIMATE – These wide ranges of elevation (1,600-8,000+ feet) are responsible in part for the variety of climates and vegetation found in the County. Another significant factor is the continuous interaction of maritime air masses with those of continental origin. The combination of these influences results in pronounced climatic changes within short distances.

Precipitation from fall and winter Pacific storms is heavy on western side of the Sierra Nevada and lighter on the eastern slopes. Precipitation is also slightly reduced at the highest elevations of the Sierra Nevada because the range extends above the level of maximum transport of the moisture laden winds from the Pacific.

EFFECT OF GENERAL CIRCULATION ON CLIMATE – A dominating factor in the weather of California is the semi-permanent high pressure area of the North Pacific Ocean. This pressure center moves northward in summer, holding storm tracks well to the north, and as a result California receives little or no precipitation from this source during that period. In winter, the Pacific high retreats southward permitting storm centers to swing into and across California. These storms bring widespread, moderate precipitation to the State. When changes in the circulation pattern permit storm centers to approach the California coast from a southwesterly direction, copious amounts of moisture are carried by the northeastward streaming air. This results in heavy rains and often produces widespread flooding during the winter months.

WEATHER & DROUGHT CYCLES
Weather and drought cycles greatly influence fire patters and severity in the area. Researchers concluded that recent drought years during which many large, severe fires burned appear to be relatively common viewed on a time scale of centuries.

PRECIPITATION – Annual precipitation ranges from 82 inches, in Strawberry on the westside, to 22 inches in Portola, on the eastside. Summer is a dry period over most of the area. With the northward migration of the semi-permanent Pacific high during summer, most storm tracks are deflected far to the north. California seldom receives precipitation from Pacific storms during this time of year. Occasionally, however, moist monsoon air drifts northward during the warm months from the Gulf of Mexico or the Gulf of California. At such times, scattered, locally heavy thunder showers, usually with lightning, occur.

THUNDERSTORMS – Over the interior mountain areas storms are more intense, and they may become unusually severe on occasion at intermediate and high elevations of the Sierra Nevada. In these mountain areas, thunderstorms, observed by radar at one point of another, average 50 to 60 days per year. They usually occur when cool, moist air moves in to break a prolonged hot spell.

SNOWFALL – In the Sierra Nevada, snow in moderate amounts is reported nearly every winter at elevations as low as 2,000 feet. Amounts and intensities increase with elevation to around 7,000 or 8,000 feet. Above 4,000 feet elevation snow remains on the ground for appreciable lengths of time each winter. Highways are closed for periods of a few hours to two or three days at a time by blowing and drifting snow. Cloud seeding in some areas of the County occurs to increase snow pack, for increased water quantity and runoffs, during the peak snow season.

TEMPERATURE – A large number of people come to Plumas County in order to enjoy the benefits of the four season climate. Temperatures range from an average low in January of 18 degrees in Portola to an average high of 91 in Quincy in July.

WINDS – California lies within the zone of prevailing westerlies and on the east side of the semi-permanent high pressure area of the northeast Pacific Ocean. The basic flow in the free air above the State, therefore, is from the west or northwest during most of the year. The major canyons within the County, however, are responsible for deflecting these winds and, surface wind direction is likely to be as much of a product of local terrain as it is of prevailing circulation.

During thunderstorm activity, winds are erratic an unpredictable as the cool air falls from the upper levels of the atmosphere.

Since 1970, most of the acres burned have been under southwest and north wind conditions. Critical fire weather patters vary within the County, but mostly a southwest flow, which occurs across Plumas County due to the general wind flow associated with air moving from sea to land and California lying in the “Belt of the Westerlies” global circulation pattern. In addition to the general southwesterly flow, topography and local up canyon flow from diurnal heating of the

Sacramento Valley compliment this air movement, usually increasing speeds. The strongest southwest winds are associated with frontal system or low pressure trough. These winds tend to cause most of the large fires in the county to burn from the southwest to the north east.

On the western slopes of the County, before the crest of the Sierras, most large fires are driven from east to west by north and east winds, when a high pressure forms over the Great Basin and reversing normal air flows from land to sea. These conditions are magnified at night and in the early morning hours when down canyon winds are accelerated by the local diurnal process, the general flow and channeled topographically. These north and east wind events usually occur in the spring and fall, and have the largest impacts in the Feather River Canyons. In theses events, relative humidity is also lower as the air mass originates on land versus sea, and as the air moves downslope it compresses, creating additional lowering. This is similar to what occurs in Southern California during Santa Ana conditions. Meteorologists with the US Forest Service conducted a study of these wind events. They found that while these patterns only occurred about 25% of the time in fire season, that 90% of large fires, on the western slopes, burned during those events.

RELATIVE HUMIDITY – Inland humidities are high during the winter and low during the summer. Since the ocean is the source of the cool, humid, maritime air of summer, it follows that with increasing distance from the ocean, relative humidity tends to decrease. Where mountain barriers prevent the free flow of marine air inland, humidity's decrease rapidly.

Many thunderstorms produce little or isolated precipitation and forest fires often result from the lightning strikes, although pockets of heavy precipitation occasionally result. Some flash flooding has been reported as a result of thunderstorms. Hail up to one-half inch in diameter is sometimes reported, but serious hail damage is infrequent.

Plumas County Temperature and Rainfall Summary

Average weather from four weather stations in Plumas County is displayed in the following Tables. Weather station data is from 1948 until 3/31/2004.

CHESTER, CALIFORNIA (041700)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	41.8	45.8	51.3	58.5	67.8	76.6	85.0	84.2	78.1	66.8	50.2	42.2	62.4
Average Min. Temperature (F)	19.5	22.2	25.1	28.2	34.1	40.4	44.2	42.7	37.6	31.1	25.6	20.5	30.9
Average Total Precipitation (in.)	6.24	5.53	4.35	2.09	1.50	0.86	0.30	0.36	0.74	1.93	4.08	5.35	33.32
Average Total SnowFall (in.)	36.6	28.5	20.9	7.6	1.3	0.1	0.0	0.0	0.0	0.7	11.9	27.9	135.5
Average Snow Depth (in)	15	19	11	2	0	0	0	0	0	0	1	7	5

PORTOLA, CALIFORNIA (047085)

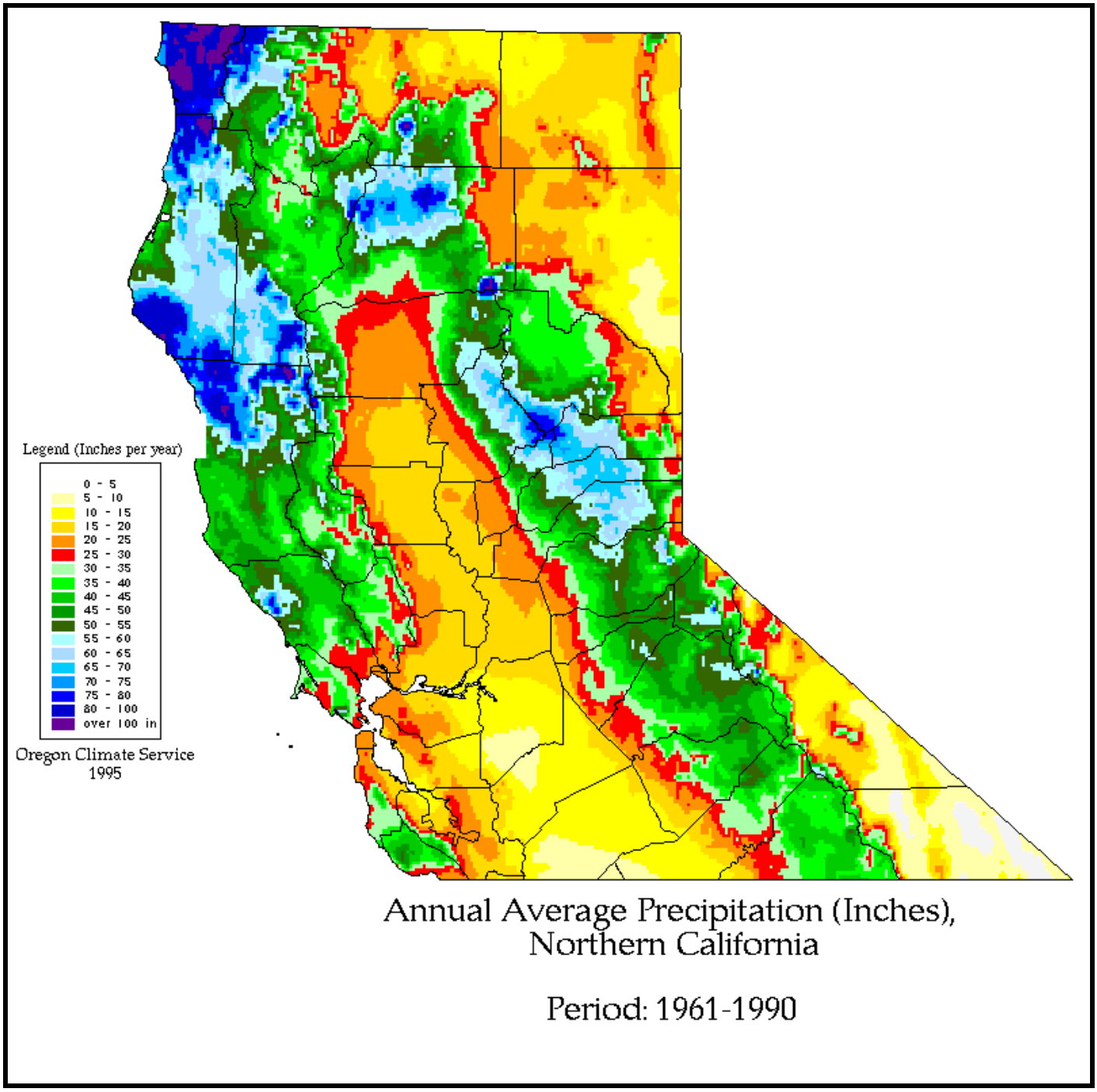
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	41.9	46.1	51.3	58.5	67.5	76.8	85.8	84.4	78.3	67.7	52.5	43.6	62.9
Average Min. Temperature (F)	17.9	20.6	24.4	27.7	33.1	38.1	41.4	39.8	35.3	29.3	23.9	19.5	29.3
Average Total Precipitation (in.)	4.13	3.34	3.03	1.36	1.10	0.59	0.37	0.36	0.54	1.15	2.36	3.73	22.05
Average Total SnowFall (in.)	13.6	9.8	7.0	2.4	0.7	0.0	0.0	0.0	0.1	0.2	3.7	11.5	48.9
Average Snow Depth (in.)	5	4	2	0	0	0	0	0	0	0	0	2	1

QUINCY, CALIFORNIA (047195)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	45.6	52.3	58.0	64.3	74.5	83.5	91.1	89.8	84.3	73.5	56.2	45.9	68.2
Average Min. Temperature (F)	23.9	26.4	29.0	31.3	37.0	42.0	43.5	41.2	37.0	31.3	28.4	25.5	33.0
Average Total Precipitation (in.)	7.37	6.23	5.13	2.66	1.57	0.72	0.19	0.32	0.73	2.56	5.01	7.29	39.77
Average Total SnowFall (in.)	12.8	8.2	6.5	3.0	0.4	0.0	0.0	0.0	0.0	0.0	1.4	7.3	39.6
Average Snow Depth (in.)	3	2	1	0	0	0	0	0	0	0	0	1	1

STRAWBERRY VALLEY, CALIFORNIA (048606)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	48.6	50.4	53.1	59.3	67.8	76.2	84.4	83.7	79.1	69.0	55.7	49.6	64.7
Average Min. Temperature (F)	29.4	30.4	31.6	34.7	40.7	47.5	52.2	51.1	48.0	41.4	34.3	30.4	39.3
Average Total Precipitation (in.)	16.18	13.22	11.46	6.00	3.05	0.91	0.16	0.33	1.24	4.37	10.50	14.67	82.09
Average Total SnowFall (in.)	26.1	22.3	23.4	11.4	1.0	0.0	0.0	0.0	0.0	0.2	5.9	19.4	109.6
Average Snow Depth (in.)	8	7	6	2	0	0	0	0	0	0	1	4	2



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