NOAA TECHNICAL MEMORANDUM
NWS WR-261

CLIMATE OF LOS ANGELES, CALIFORNIA

David Bruno, Senior Forecaster
Gary Ryan, Data Program Manager
With assistance from
Curt Kaplan, Intern and Jonathan Slemmer, Intern
National Weather Service Forecast Office
Los Angeles, California

January 2000

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service

NOAA TECHNICAL MEMORANDA
National Weather Service, Western Region Subseries

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5 Station Descriptions of Local Effects on Synoptic Weather Patterns. Philip Williams, Jr., April 1966 (Revised November 1967, October 1968). (PB-17800)
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11 Some Electrical Processes in the Atmosphere. J. Latham, June 1966.
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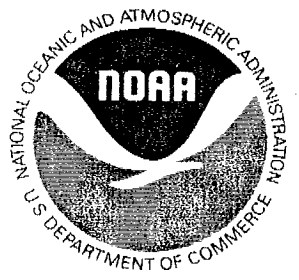

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January 2000

UNITED STATES
DEPARTMENT OF COMMERCE
William M. Daley, Secretary

National Oceanic and
Atmospheric Administration
D. James Baker, Under
Secretary and Administrator

National Weather Service
John J. Kelly, Jr., Assistant
Administrator for Weather Services

This publication has been reviewed and is approved for publication by Scientific Services Division, Western Region

Delain A. Edman, Chief
Scientific Services Division
Salt Lake City, Utah

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE

Forecast Office
520 N. Elevar St.
Oxnard CA 93030

November 1, 1999

Dear Reader:

In the mid 1960s, the United States Weather Bureau's State Climatologist for California, C. Robert Elford, produced a series of papers which catalogued climatological data for several counties in the state—including weather summaries for Los Angeles County. The official Weather Bureau records for 1931-1960 were used in his analyses.

Since the 1960s, sweeping changes have occurred in the monitoring and collection of weather data in the Los Angeles metropolitan area. In addition to thirty-five more years of basic climatological data, these changes—which include vast improvements in meteorological equipment and the proliferation of new environmental study sites—have led to an overwhelming need for a new and broadly-based official survey of Los Angeles climate.

As we approach the beginning of a new century, a number of government and private agencies now maintain weather monitoring equipment in the Los Angeles area. The leading government agencies now involved in weather data collection include the National Weather Service, Federal Aviation Administration, Department of Defense, US Army Corps of Engineers, City of Los Angeles Department of Water and Power, South Coast Air Quality Management District, State of California Department of Water Resources, and Caltrans. In addition, educational institutions, private corporations and citizens also are engaged in weather and climate data collection for a variety of reasons. As a direct result of all these data collection activities, both the climatological database and the knowledge of meteorological processes within the Los Angeles Basin have greatly expanded.

The study offered in this publication was conducted by members of the National Weather Service Forecast Office in Oxnard, California—which serves the Los Angeles area. Our goal was to assemble the latest available climatological data from as many reliable sources as possible for the city of Los Angeles and surrounding communities. Our effort was designed to provide a comprehensive view of Los Angeles climate, in a form and scope never before attempted in a publication of this type. Much of this work is original and is presented here for the first time.

We hope and trust that readers will find the Climate of Los Angeles, California to be both useful and informative, not only as a data source, but as an important document that broadens the understanding of weather and climate systems that affect southern California.

Todd R. Morris,
Meteorologist-in-Charge
National Weather Service Forecast Office
Los Angeles/Oxnard CA

In Memoriam...

The Climate of Los Angeles **is dedicated to the memory of Arnold Court, Professor Emeritus, California State University Northridge, Dr. Court's lifetime of work in the study of climatology was outstanding and exemplary.**

WAR DEPARTMENT,

SIGNAL SERVICE U. S. ARMY.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

Weekly Meteorological Record.

COVER FROM THE FIRST OFFICIAL WEEKLY CLIMATE RECORD AT LOS ANGELES, JULY 1877

First Section

ANALYSIS

1. AN OVERVIEW OF LOS ANGELES CLIMATE

Los Angeles is noted for its moderate weather. Under the modified Köppen classification system, Los Angeles climate is categorized as *Mediterranean.* This climate type is characterized by pronounced seasonal changes in rainfall—a dry summer and a rainy winter—but relatively modest transitions in temperature.

In the dry season, the eastern Pacific high pressure area—a semi-permanent feature of the general hemispheric circulation pattern—dominates the weather over much of southern California. Warm and very dry air descending from this Pacific high caps cool, ocean-modified air under a strong inversion, producing a *marine layer.* This marine layer is the prominent weather feature for the Los Angeles Basin for much of the year—especially from late spring through early fall.

Daily variations in the strength of the Pacific high result in variations in the depth and coverage of the marine layer, which typically thickens and advances inland during the night and early morning hours, before retreating to the sea or "burning off" to hazy sunshine around midday. Surface pollutants trapped under the marine inversion result in smog—the infamous L.A. mixture of smoke and fog.

Due to the dominance of the stable marine layer, significant precipitation is rare between May and October. Any rain that does occur at this time of year is usually the result of isolated thunderstorms associated with subtropical moisture.

During the remainder of the year—from November through April—the eastern Pacific high pressure ridge is displaced and Los Angeles finds itself on the southern margins of the northern hemisphere polar jet stream. With cold air aloft, the marine layer breaks down and is no longer dominant. Pacific storms, sometimes fed with subtropical moisture, often push cold fronts across California from northwest to southeast. These storms and frontal systems account for the vast bulk of the area's annual rainfall. Such rainy season storms are migratory, with wet and dry periods alternating during the winter and early spring with considerable irregularity in timing and duration.

Average annual precipitation for the Los Angeles area is highly variable and terrain-dependent, ranging from twelve inches at the ocean to about twice that in the foothills. At downtown Los Angeles, the average seasonal rainfall is 14.77 inches. The annual average high temperature for the city is 75°F, while the average low is 57°F.

Winds are generally light, with frequent afternoon sea breezes of 10 to 15 miles per hour. While severe weather is uncommon, strong offshore winds, known as *Santa Anas*, can reach hurricane strength below passes and canyons. Also, passing winter storms can bring southeast winds to gale force. However, for the most part, damaging winds tend to be rare, or highly localized.

2.THE CITY OF LOS ANGELES: A BRIEF HISTORY

[We found] a delightful place among the trees on the river. There are all the requisites for a large settlement.

—Fr. Juan Crespi
August 2, 1769

Perhaps no city in modern times has been so universally envied, imitated, ridiculed, and, because of what it may portend, feared.

—Encyclopedia Britannica, 1997

Less than 250 years ago, a primitive aboriginal village near the center of an obscure coastal plain on the west coast of North America was visited for the first time by European colonials. That agreeable Spanish campsite is now called Los Angeles. Today, the city has a population of 3.5 million people in an area of 464 square miles—extending from the south coast port of San Pedro through the sprawling San Fernando Valley to the northwest.

The Los Angeles metropolitan district, the second largest in the United States, is home to almost nine million people. The Los Angeles/Long Beach seaport is by far the largest in the United States, and the third largest in the world. In fiscal year 1997, the value of shipping imports through this busy seaport amounted to $80 billion. Los Angeles International Airport (LAX) moves more air cargo than any airport in the country—ranking third in the world in that category. If the Greater Los Angeles Area were an independent nation, it would have the world's twelfth largest economy.

The modern history of Los Angeles dates from the 1700s. A Native American settlement known as *Yang-na* existed on the banks of what is today the Los Angeles River. In August 1769, a Spanish expedition headed by Gaspar de Portola camped at what was to become downtown Los Angeles. A dozen years later, in 1781, forty-four Spanish settlers established a secular village—the first civil colonial town in California—at the old Spanish campground. The town was called *El Pueblo de Nuestra Señora, La Reina de Los Angeles.* It was referred to by locals as *El Pueblo* [The Town].

In the spring of 1822, word reached *El Pueblo* that Mexico had won its independence from Spain. Between 1839 and 1845, approximately 4,000 square miles of land surrounding *El Pueblo* were divided into 70 *ranchos*, each containing many thousands of acres. This led to a land boom, a developing cattle market, and an increase in the presence of Yankee traders.

In January 1847, after a brief skirmish, American John C. Fremont took possession of the Los Angeles area for the United States. The City of Los Angeles was incorporated into the State of California on April 4th 1850.

The city grew quickly. From a population base of 1,250 in 1835, the number of inhabitants grew to 11,000 at the time of the first official weather observation in 1877; to 50,395 in 1890; and to 320,000 in 1910. A nearby harbor, the railroad,

aerospace and above all, the automobile, contributed to a dizzying growth rate. The world's first freeway, the Pasadena Freeway (I-110) was dedicated on December 30, 1940. There are now twenty major freeways in the Los Angeles area and 10.5 million registered motor vehicles.

Part of the elixir that attracted huge numbers of people to the Los Angeles Basin was the Mediterranean climate regime. An early drawback to the city's expansion was the lack of available water to support a large population. In the early twentieth century, shrewd businessmen and politicians arranged to import large amounts of water from the Owens and Colorado River valleys. That made the increase in population and human activity nearly inevitable, with the pace of growth continuing unabated ever since.

Diversity is Los Angeles' middle name. Its cultural, racial, and political diversity are universally acknowledged. And the diversity of Los Angeles extends to its geography and climate as well.

Los Angeles County has 70 miles of seacoast. The City of Los Angeles sits on a 20 to 40 mile wide coastal plain bounded on the north and east by relatively high mountains; on the south and west lies the Pacific Ocean. Elevations within the city range from sea level at its Pacific beaches to 5080 feet at Mt. Lukens. Some of the mountains in the San Gabriel Range north of the city exceed 10,000 feet in elevation (Figure 5). Transitions between vegetation and climate zones, highly dependent upon elevation and distance from the ocean, can be striking.

The diversity theme extends to Los Angeles' weather, which is normally about as benign as the inside of a shopping mall. However, the area has a lesser-known history of winter storms that can produce amazing rainfall rates and flooding. In fact, the 24-hour record rainfall for the entire state of California, 26.12 inches, occurred in the foothills of the San Gabriel Mountains, just a few miles north of downtown Los Angeles.

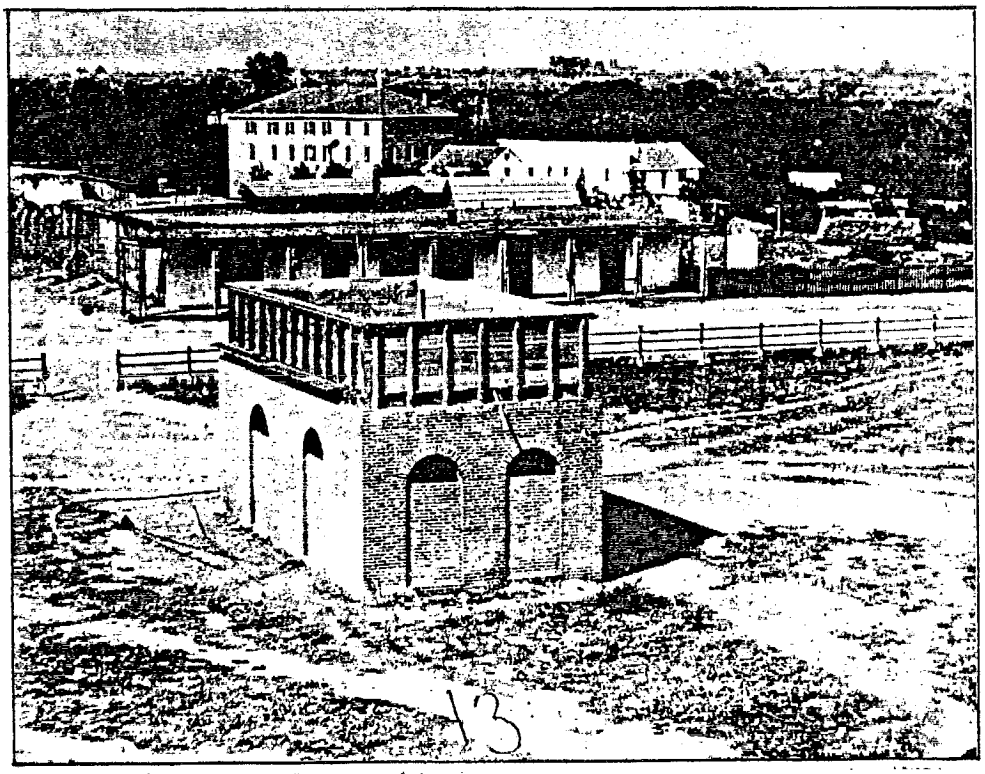


Figure 1. In the late nineteenth century, this water storage reservoir (brick building) was built near the Los Angeles River.

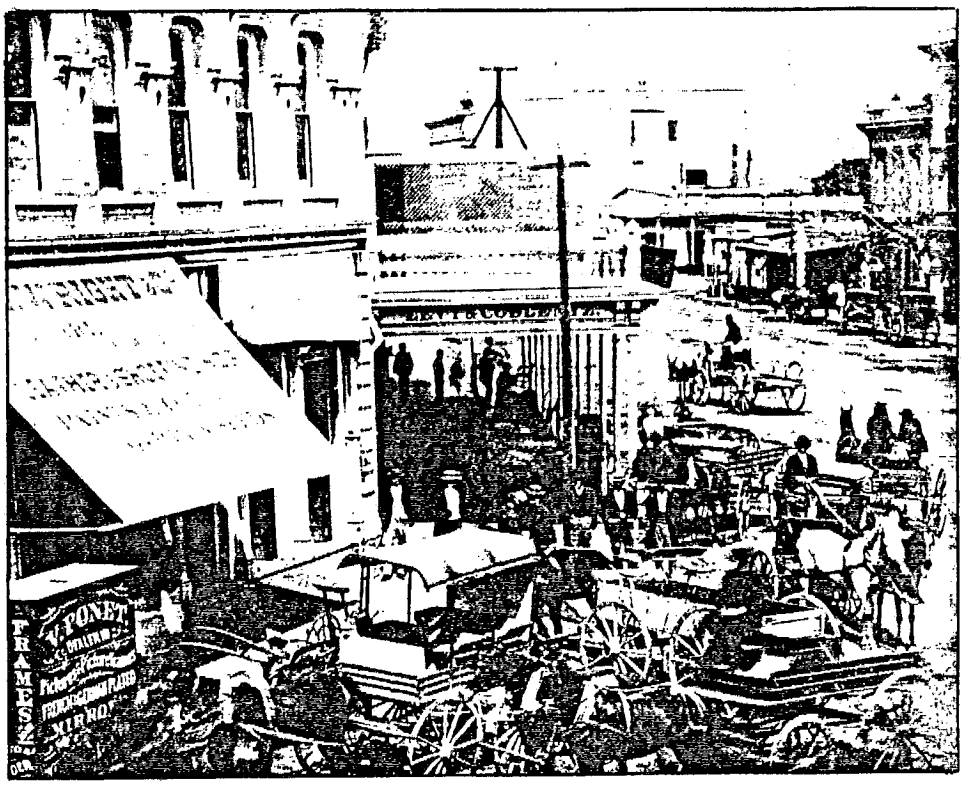


Figure 2. Temperature readings were taken from a bookstore on Spring Street before the US Army established the first official weather station in Los Angeles in 1877.

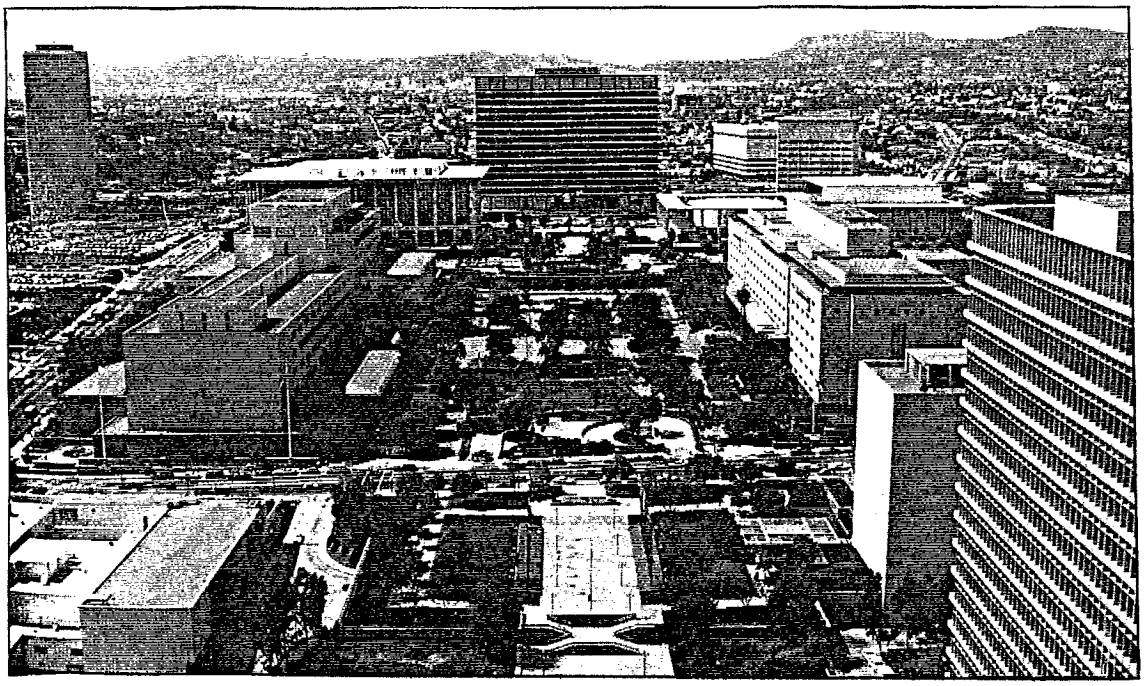


Figure 3. The Civic Center government and arts complex in downtown Los Angeles.

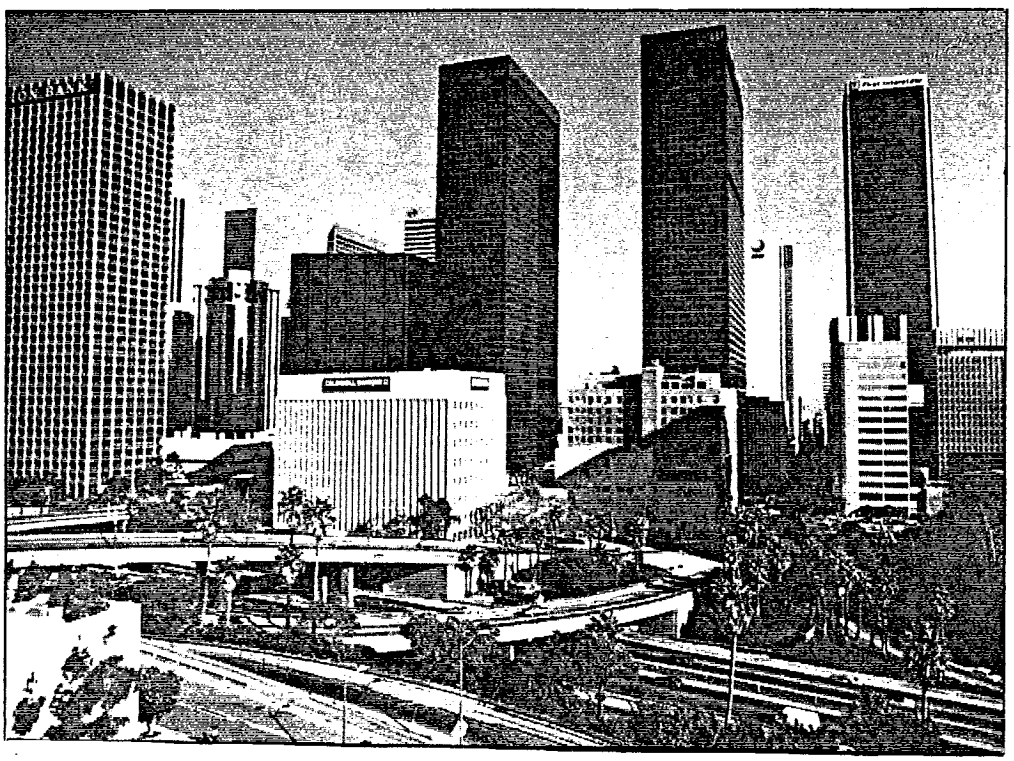


Figure 4. Freeways converge in downtown Los Angeles. There are 10.5 million registered motor vehicles in the Los Angeles Basin.


MOUNT WILSON
BURBANK
PASADENA
CANOGA PARK
LA CIVIC CTR
USC
POMONA
LONG BEACH
LA AIRPORT
SANTA ANA
SAN GABRIEL MTS
SAN FERNANDO VALLEY
HOLLYWOOD
SANTA MONICA BAY
SAN PEDRO BAY
PACIFIC OCEAN
GREATER
LOS ANGELES
AREA CALIFORNIA

Figure 5.

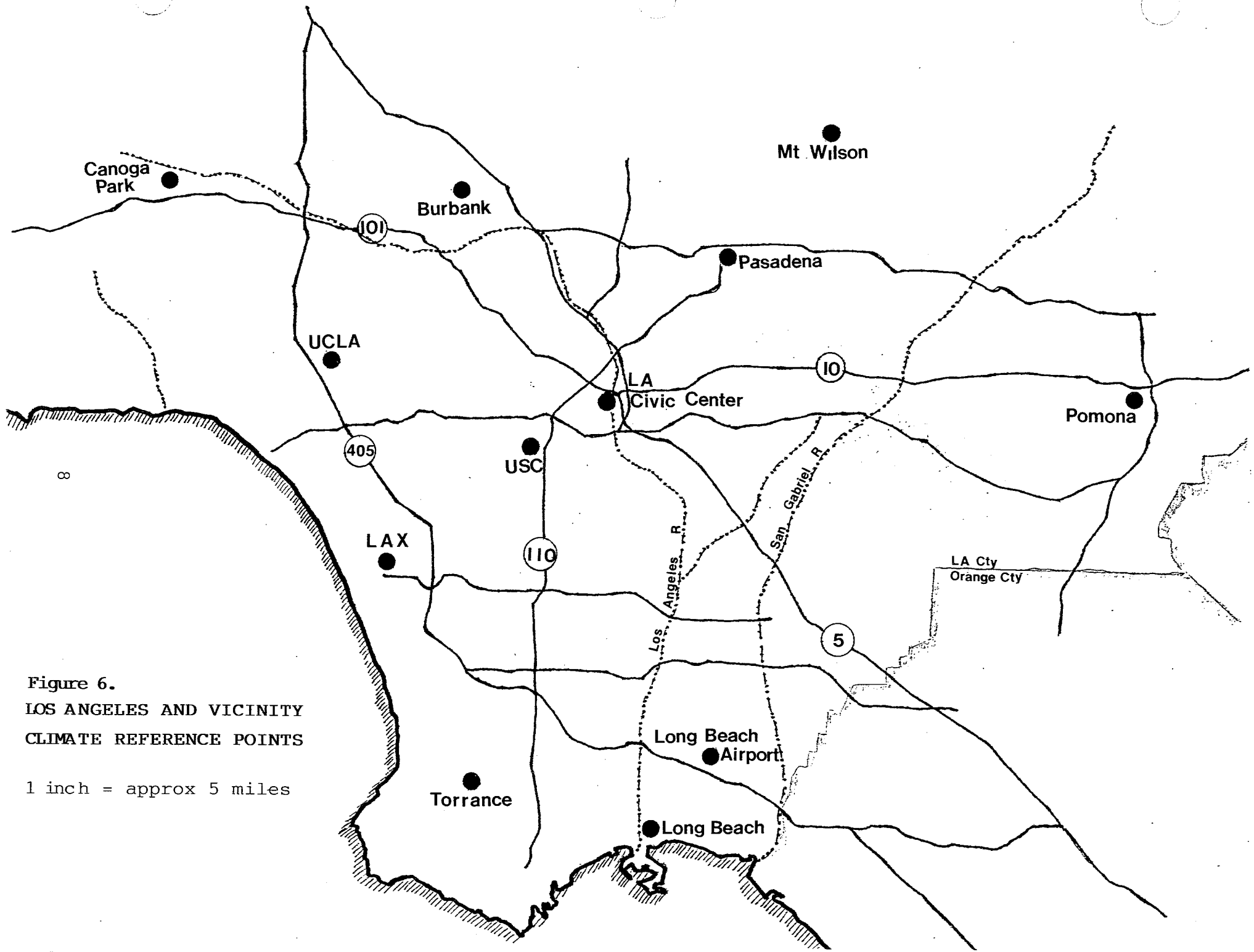


Figure 6.
LOS ANGELES AND VICINITY
CLIMATE REFERENCE POINTS

1 inch = approx 5 miles

3. WEATHER RECORDS AT LOS ANGELES

Weather records for southern California can be traced as far back as 1849, when regular weather observations began at San Diego. Later, in 1867, routine weather observations were also started both at Santa Barbara and Ventura. Some weather observations exist for Los Angeles prior to 1870, but these records are incomplete. In those early years, the *Los Angeles Star* used a bookstore thermometer at 13 Spring Street to report temperatures, until the federal government established an official weather station.

In 1870, Congress authorized the War Department to set up a standardized national weather reporting network. However, it was not until seven years later that the US Army Signal Corps opened the first federal weather station at Los Angeles. The observation site was 37 feet above the ground, on the roof of the Ducommon Building at the corner of Main and Commercial Streets.

At 4:50 a.m. on Sunday July 1, 1877 Sergeant C. E. Howgate took the first official weather observation for Los Angeles. The weather was overcast with light fog and a temperature of 59°F. The observation was recorded neatly in ink (Figure 7) and telegraphed to Washington D.C.—the next day—since the telegraph office was closed on Sunday.

In late January 1881, the weather station was moved to the roof of a five-story building in the 300 block of North Main Street. There it remained for almost eight years until November 1888, when it was moved again—this time to the roof of the seven-story Wilson Building on South Spring Street.

Because of a scandal within the War Department, national responsibility for weather services was transferred from the Army to civilian authority. The Weather Bureau was established as part of the Department of Agriculture in 1890.

The Los Angeles Weather Bureau Office moved twice more, with instrumentation ascending to the roof of the 18-story Post Office and Courthouse Building at 312 North Spring Street in March 1940. According to official Weather Bureau records, this site was so far above the city that weather measurements, particularly rainfall catch, were adversely affected. To remedy this, all meteorological instruments were re-sited to ground level in May 1948, remaining there until the Civic Center office closed July 1, 1964.

The Los Angeles downtown site became a US Weather Bureau co-operative station in 1964 when automated weather equipment was set up on the roof of a three story downtown building on Ducommon Street. Although officially known as the Los Angeles Civic Center (Station 04-5115), it was no longer located at the Civic Center Courthouse Building. It had moved 3/8 mile east of the Civic Center to the Department of Water and Power offices. In October 1987, the instruments were again moved, this time to the roof of a three story parking garage at 500 Ducommon Street. This automated station measured temperature, humidity and rainfall data and transmitted coded information once each hour.

On June 30, 1999 the National Weather Service, in partnership with the University of Southern California, commissioned an impressive new array of meteorological instruments at downtown Los Angeles. The Automated Surface Observation System (ASOS) on the University Park Campus at USC employs state-of-the-art technology to monitor the weather on a continuous basis, 24 hours a day.

Since its establishment in 1877, the Los Angeles downtown weather record, commonly called the *Civic Center* record, has been produced from eight different locations, ranging from four feet to over 220 feet above the ground. Due to these frequent moves and poor rooftop siting, the city center weather record lacked the consistency in siting, exposure and instrumentation that is the hallmark of other climatological sites in the Los Angeles area. Pasadena, Pomona, Long Beach, Burbank and other cities have first-rate, stable weather records which date from the turn of the century or earlier.

Now, the new official observation site at USC promises a stability for local climate records, along with the improved representative nature of a rare ground-based location within a major downtown metropolitan area. These qualities will result in homogeneous climate records for the city in the twenty-first century.

Primarily to encompass the geographically large and diverse Los Angeles metropolitan area, and partly to offset the climatologically-challenged record from downtown Los Angeles, the scope of this paper was broadly established. The authors included representative climatic data from several key sites within the City of Los Angeles, and added some stations immediately adjacent to the city and within the southern part of the County of Los Angeles. All of these weather stations have maintained outstanding data quality through the period of record.

Please note that this text employs English units of measurement exclusively. This is the system that was in general usage in the United States throughout the twentieth century.

WAR DEPARTMENT, SIGNAL SERVICE U. S. ARMY, DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICU

METEOROLOGICAL RECORD for the week ending July 7, 1877.

DAY AND DATE OF OBSERVATION.	TIME OF OBSERVATION.	BAROMETER.	THERMOMETER. Attached.	THERMOMETER. Exposed.	BAROMETER CORRECTED FOR TEMP. AND INST. ERROR.	CORRECTED BAROMETER.	HYGROMETER. Dry Bulb.	HYGROMETER. Wet Bulb.	RELATIVE HUMIDITY. (per cent.)	WIND. Direction.	WIND. Velocity per hour.	WIND. Daily Velocity.	UPPER CLOUDS. Kind.	UPPER CLOUDS. Amount.	UPPER CLOUDS. Direction. (moving from—)	LOWER CLOUDS. Kind.	LOWER CLOUDS. Amount.	LOWER CLOUDS. Direction. (moving from—)	RAIN OR SNOW. Commenced.	RAIN OR SNOW. Ended.	AMOUNT OF RAIN OR MELTED SNOW.	DEPTH OF WATER.	MAXIMUM AND MINIMUM THERM. (at mid-night obs.)	MEAN Barometer.	MEAN Thermometer.	A. M. MIN. THER.	STATE OF WEATHER.
Sunday — a. m.	4.50	29.714	71	59	29.579	29.933	57	57	87	Calm	0		Cirrus			Stratus	4/4	C			0					57	Cloudy
1 p. m.	1.50	29.716	78	77	29.585	29.904	77	70	69	Calm	4	104	0			0					0						Clear
p. m.	8.15	29.682	74	66	29.559	29.882	66	62	78	Calm	1		0			0					0		79.5				Clear
Monday — a. m.	4.50	29.695	70	61	29.573	29.905	61	59	88	Calm	1		Cirrus			Stratus	4/4	C			0					57	Cloudy
2 p. m.	1.50	29.700	75	75	29.575	29.902	75	66	59	W	8	92	0			0					0						Clear
p. m.	8.15	29.655	74	64	29.532	29.861	64	61	83	NW	6		0			0					0		76.5				Clear
Tuesday — a. m.	4.50	29.634	70	62	29.522	29.852	62	59	83	S	2		Cirrus			Stratus	4/4	C			0					61	Cloudy
3 p. m.	1.50	29.660	75	76	29.535	29.885	76	68	52	W	6	99	0			0					0			29.880	59.2		Clear
p. m.	8.15	29.640	73	64	29.520	29.829	64	61	83	NW	5		0			0					0		78.6				Clear
Wedn'sday, a. m.	4.50	29.650	70	58	29.538	29.871	58	53	81	E	3		0			0					0					58	Clear
4 p. m.	1.50	29.700	77	78	29.569	29.889	78	66	49	SW	8	95	0			0					0			29.875	79.1		Clear
p. m.	8.15	29.690	77	68	29.555	29.886	68	62	69	SW	2		0			0					0		79.5				Clear
Thursday — a. m.	4.50	29.690	70	58	29.578	29.912	58	53	69	E	4	113	0			0					0					58	Clear
5 p. m.	1.50	29.708	79	80	29.572	29.891	80	67	47	W	10		0			0					0			29.852	67.4		Clear
p. m.	8.15	29.675	79	71	29.539	29.863	71	63	62	SW	3		0			0					0		82.5				Clear
Friday — a. m.	4.50	29.638	71	57	29.523	29.855	57	52	69	SE	2		0	0	0	0	0	0			0					57	Clear
6 p. m.	1.50	29.665	82	84	29.527	29.840	84	63	27	NW	9	118	0	0	0	0	0	0			0		85				Clear
p. m.	8.15	29.620	79	69	29.492	29.804	69	61	65	NW	3		0	0	0	0	0	0			0		55				Clear
Saturday — a. m.	4.50	29.620	71	60	29.506	29.836	60	52	53	W	2		0	0	0	0	0	0			0					58	Clear
7 p. m.	1.50	29.690	83	84	29.525	29.844	84	64	29	NW	10	98	0	0	0	0	0	0			0		88				Clear
p. m.	8.15	29.640	80	70	29.502	29.824	70	62	60	NW	4		0	0	0	0	0	0			0		58				Clear

No. of Barometer used during week, 192

Instrumental error ..... +002

Corrected for 31826

Station: Los Angeles Cal.

A. E. Howgate
Sergeant, Signal

Figure 7. First official weather observations at Los Angeles, July 1877.

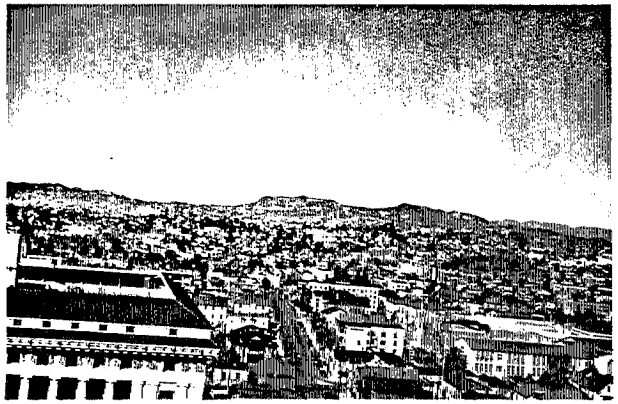
WB Form 038.2-
(Formerly 4007)

U. S. DEPARTME OF COMMERCE
WEATHER BUREAU

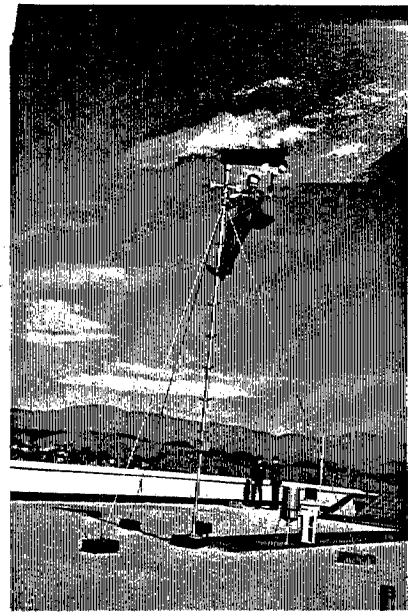
PHOTOGRAPHS

STATION Los Angeles, Calif.
(Name, location, and type)

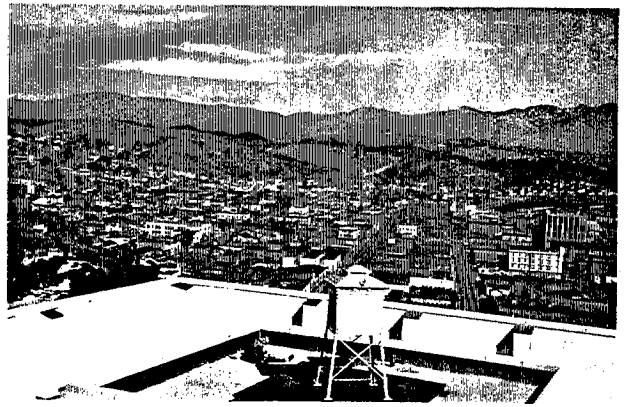
2/15/1940



NW from New Federal Bldg.



N Wind & Rain Equipment



N from Instrument shelter

Shelter & Wind Equipment

Views from Federal Bld.

Figure 8. View from the Weather Bureau Office roof, February 1940.

REGIONAL OFFICE

WB Form 4007

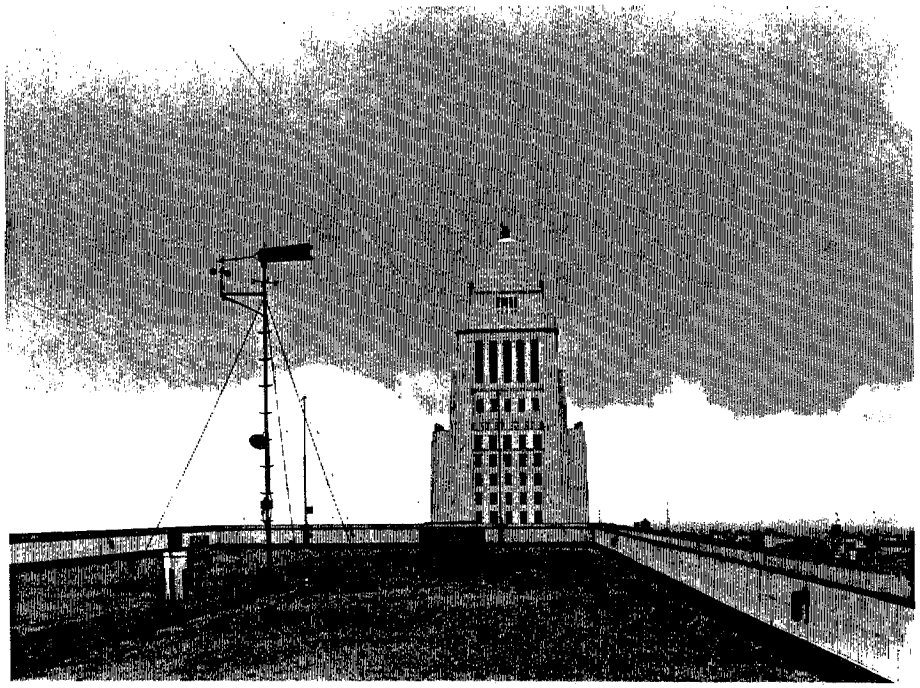
U. S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

SERIAL NO. A-40

PHOTOGRAPHS

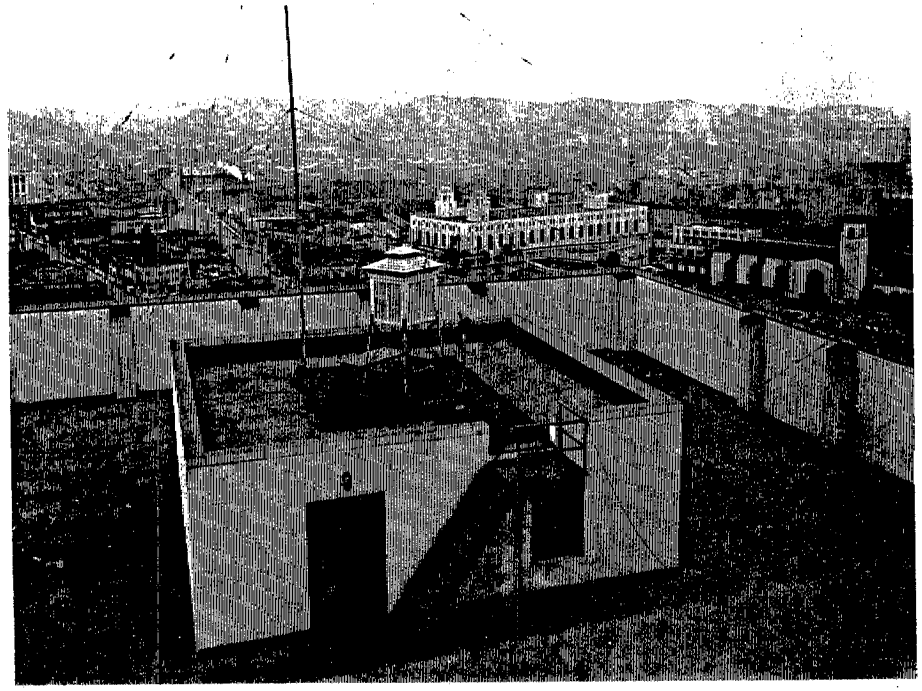
STATION WBO, Los Angeles, California

DATE January 29, 1943



DESCRIPTION

Rain gage instruments on top of Federal Building



DESCRIPTION

View of instrument shelter on top of Federal Building looking northwest.

Figure 9. The rooftop weather station, more than 200 feet above the streets of downtown Los Angeles, January 1943.

TAKEN BY A. A. Lothman STATION

4. TEMPERATURE

The Los Angeles Basin is bound by mountain ranges to the northwest through the northeast, and to the southeast, and by the Pacific Ocean from the south through the west. Beyond the mountains to the north and east lies the Mojave Desert. Due largely to cool ocean waters and modified marine air, temperatures in the basin area are generally comfortable for most of the year—with freezing conditions being quite rare.

With its proximity to the ocean and the desert, in addition to its variable terrain, the Los Angeles Basin frequently experiences a broad range of daily temperatures. On a summer afternoon it is not unusual for temperatures to range from the mid 60s at the beaches near Santa Monica to over 100 degrees at Canoga Park in the San Fernando Valley—a forty degree temperature difference within a distance of only fifteen miles. The wide spectrum of daytime temperatures over a relatively small area makes temperature forecasting surprisingly difficult. Terrain, distance from the ocean, and an ever-changing marine layer can result in wildly fluctuating temperatures on a day-to-day basis. Also, large areas of the basin can experience daily temperature ranges that exceed average seasonal ranges from the coldest to the warmest months.

When a relatively warm and dry airmass moves over a cool body of water, the layer of air in direct proximity to the water's surface is modified—the air is both cooled and moistened. This modified layer of air is the *marine layer.* Being cooler and relatively dense, the marine layer settles over the Los Angeles Basin as a surface-based laminar intrusion, from one hundred up to as much as several thousand feet thick—the extent of the inland intrusion usually being dictated by the terrain contour corresponding to the marine layer's depth. The unmodified warm airmass above the marine layer creates a temperature *inversion*—a layer of air in which temperatures warm with increasing height (Figure 11). The inversion is thermodynamically very stable, preventing significant vertical air currents (mixing) upward within the atmosphere.

Sunshine tends to break up the marine layer, as strong insolation and local winds can vertically mix the lowest layers of the atmosphere above the basin. The extent of this breakup depends on the strength of the layer and the angle of the sun. After dark, the lowest layer of the atmosphere again cools and the marine layer typically re-forms.

The marine air is associated with relatively cool and constant temperatures, low clouds, fog and haze. These are persistent elements in Los Angeles weather, particularly during the late spring through early fall, when warm and dry air aloft from areas of dominant high pressure strengthens the inversion. In the winter and spring months, the marine layer is frequently disrupted by frontal passages—when cool air from the northwest mixes out the marine inversion—or by strong offshore wind patterns, which push the marine layer out to sea.

Sea surface temperatures (SST) are also a factor in the strength of the basin marine layer. At the point of contact with

the Los Angeles County littoral, SSTs range from the mid 50s in spring to the low to mid 70s by early fall. During the late spring and early summer, strong northwest winds cause an increase in upwelling—where cold waters from the depths of the ocean are brought to the surface—resulting in lower SST readings and a strengthened marine layer. In addition, some beaches—such as Cabrillo Beach—are influenced by current-driven upwelling and maintain cooler SST readings all year.

Cool coastal waters in the immediate proximity of a diurnally heated coastal plain result in daily sea breeze and land breeze oscillations typical of coastal climates worldwide. Over the Los Angeles Basin, the sea breeze is typically from the west or southwest at 10 to 15 miles per hour. Afternoon sea breezes tend to reinforce the marine layer, cool surface temperatures and reduce pollutants.

Inland areas, particularly the San Fernando and San Gabriel Valleys do not exhibit pronounced sea breeze effects; the marine layer is less dominant at these locations. Afternoon sea breezes, modified by overland trajectories, reach these locations later in the day, if at all. The sea breeze in the San Fernando Valley is actually an east or southeast wind, bending around the coastal hills. This valley wind is sometimes neutralized by a dry front — a eastward moving mass of hot air descending from higher terrain in the western San Fernando Valley.

The most extreme temperature contrasts across the Los Angeles area occur during the afternoon in a very warm summer pattern with a shallow marine layer—less than 1,000 feet deep. In this situation, temperatures in the warmest valleys can be more than forty degrees higher than those at the beaches. On average however, the difference in daily high temperatures peaks in July, when Los Angeles International Airport (LAX) averages twenty degrees cooler than Canoga Park at Pierce College. Average daily high temperatures are much more uniform during the winter months, with immediate coastal sites averaging about three degrees cooler than the inland valley locations.

The average annual temperature at downtown Los Angeles, based on the current standard climatological 30-year period of record (1961-1990), is 66.0°. Daily maximum temperatures average 67.7° in January and 84.0° in July. Daily average minimum temperatures are 48.9° in January and 63.3° in July. The all-time record high temperature for the downtown weather station is 112° set June 26, 1990. The all-time record low is 28°, which was established on February 6, 1883; equaled on January 7, 1913; and tied again on January 4, 1949. For the official National Weather Service stations across the Los Angeles Basin, the highest temperature of record is 116° at Canoga Park in the San Fernando Valley, set August 24, 1985. The lowest temperature of record is 18°, also at Canoga Park, on February 6, 1989.

In January, soil temperatures in the Los Angeles area, measured at a depth of about six inches, range from 46 to 51 degrees inland and from 53 to 56 degrees along the coast. By early August, soil temperatures climb to between 75 and 84 degrees in all areas.

Seasonal temperature patterns across the Los Angeles Basin show remarkably consistent relative trends from year to year, despite great differences in absolute values from station to station. For statistical comparison, the authors analyzed 50-year temperature records from coastal, inland and valley locations. Fifteen-day statistical running means were computed for each day of the year, then cross-checked with manually recorded temperature data and a concurrent analysis of Western Region Climate Center data.

Individual station data all show that the lowest average daily temperatures—52.2° inland to 55.4° coastal—occur between December 30th and January 3rd. The corresponding diurnal minimum-to-maximum temperature ranges are 24.5° inland and 18.2° coastal. All station records also indicate that the highest average daily temperatures of the year—77.5° inland to 70.3° coastal—occur between July 30th and August 15th. The diurnal ranges for that period are 38.2° inland and 12.7° coastal. In addition, there is a second heat maximum that occurs in all records from August 31st to September 4th. The early August maximum reflects the peak of mid-summer insolation, while the early September maximum marks the beginning of seasonal offshore wind flow patterns.

There is another seasonal periodicity that is reflected in all basin temperature records—a dramatic and pronounced cooling that occurs in each record between November 3rd and 15th. This cooling is especially dramatic with regard to average daily high temperatures, which drop 5.8° inland and 2.8° coastal during that period. This cooling is apparent in other climatic records in coastal California, but the exact cause is unknown.

Warming conditions in springtime are less dramatic and much more diffused than the November chilling, and less definable within the overall record. Inland, significant warming occurs during early April and again in early May. However, all stations wait until mid-June for the strongest seasonal warming. This occurs from June 6th to 25th, when average daily temperatures rise by 4.9° inland and 2.5° along the coast.

While it can get hot on the coastal plain, extended periods of hot weather are quite uncommon near the beaches, where cooling sea breezes have a more direct influence. Streaks of very hot weather, with temperatures exceeding 100°, have run to fourteen days duration at Canoga Park (August 1992), but to only four days at coastal LAX (September 1963).

The average number of days on which temperatures climb to 90° or higher at LAX is only five—although it is not unusual for the temperature to remain below 90° at the beaches for the entire summer. Further inland, at downtown Los Angeles, temperatures reach 90° or more about 25 times per year—but strings of 90°+ days rarely last for more than a week at a time. During the worst heat wave on record, from August 31 to September 7, 1955, downtown Los Angeles reached or exceeded 100° on eight consecutive days (Tables 3, 4).

It is noteworthy that temperatures have reached 90° or higher in every month of the year at downtown Los Angeles.

In direct contrast, cold weather is very uncommon in the Los Angeles area. The all-time low temperature record for downtown Los Angeles is 28°, a temperature that barely qualifies as a "hard freeze". That twenty-eight degree benchmark has been reached three times in downtown L.A. since records began in 1877.

Cold continental air is almost invariably blocked by the mountains that ring the Los Angeles Basin. While nighttime temperatures in late spring and summer are relatively cool for such a southerly latitude, the scarcity of extreme cold is apparent in the long-term record. In the continental United States, only southern Florida has a lower frequency of occurrence of freezing temperatures than downtown Los Angeles.

In most winters, inland valley temperatures drop below freezing at least once—but only on rare occasions do minimum readings drop to more than a few degrees below freezing, or remain below freezing for more than a few hours. The average number of nights on which temperatures drop to or below freezing range from one in every ten years (or more) at the ocean to between 2 and 4 nights per year inland. The coldest valley locations, Canoga Park in the San Fernando Valley and Pomona in the San Gabriel Valley, average 18 and 24 freezing dates per year, respectively.

The coldest weather pattern for southern California occurs when a deep low pressure trough in the western United States forms in conjunction with a very high amplitude ridge across the northeastern Pacific Ocean and the Canadian Yukon. The last severe cold outbreak in the Los Angeles area occurred in December 1990, when temperatures dropped below freezing across a major portion of the coastal plain, and into the low to mid 20s over inland valleys. Temperatures stayed below freezing for up to eight hours at some valley locations, resulting in significant damage to plants and commercial agriculture.

All-time minimum temperatures on the coastal plain are mostly in the mid to upper 20s. Most valley locations have recorded minima in the lower 20s, while the record low for the entire Los Angeles Basin is 18° at the Canoga Park site.

The last occurrence of freezing temperatures at downtown Los Angeles was January 21, 1979—the last time freezing temperatures were reported at LAX was December 21, 1968.

Long-range temperature trends in the Los Angeles Basin reflect substantial warming over the entire period of record, which spans more than 100 years. However, this is not necessarily the result of global warming; there are other factors that must be considered. First, as was earlier discussed, numerous moves of the official observation site have produced a climate record that is homogeneous neither in siting nor in instrumentation. More significantly, recent research by a highly-regarded climatologist, Jim Goodridge, revealed that non-urban weather stations in California have seen virtually no temperature change over more than a century of records. This strongly suggests urbanization as the real cause of the increase in annual average temperatures across the Los Angeles Basin over the past 100 years.

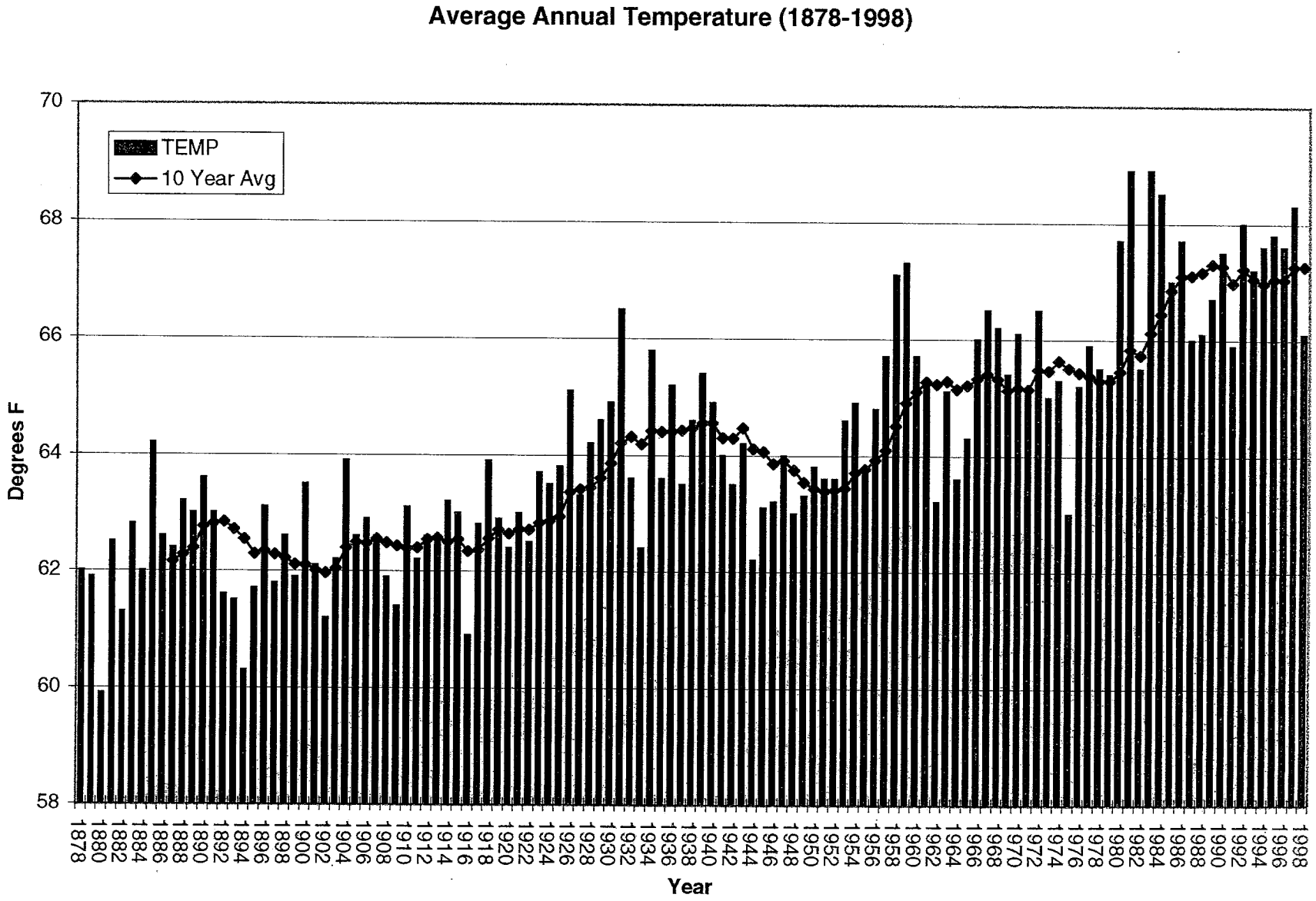
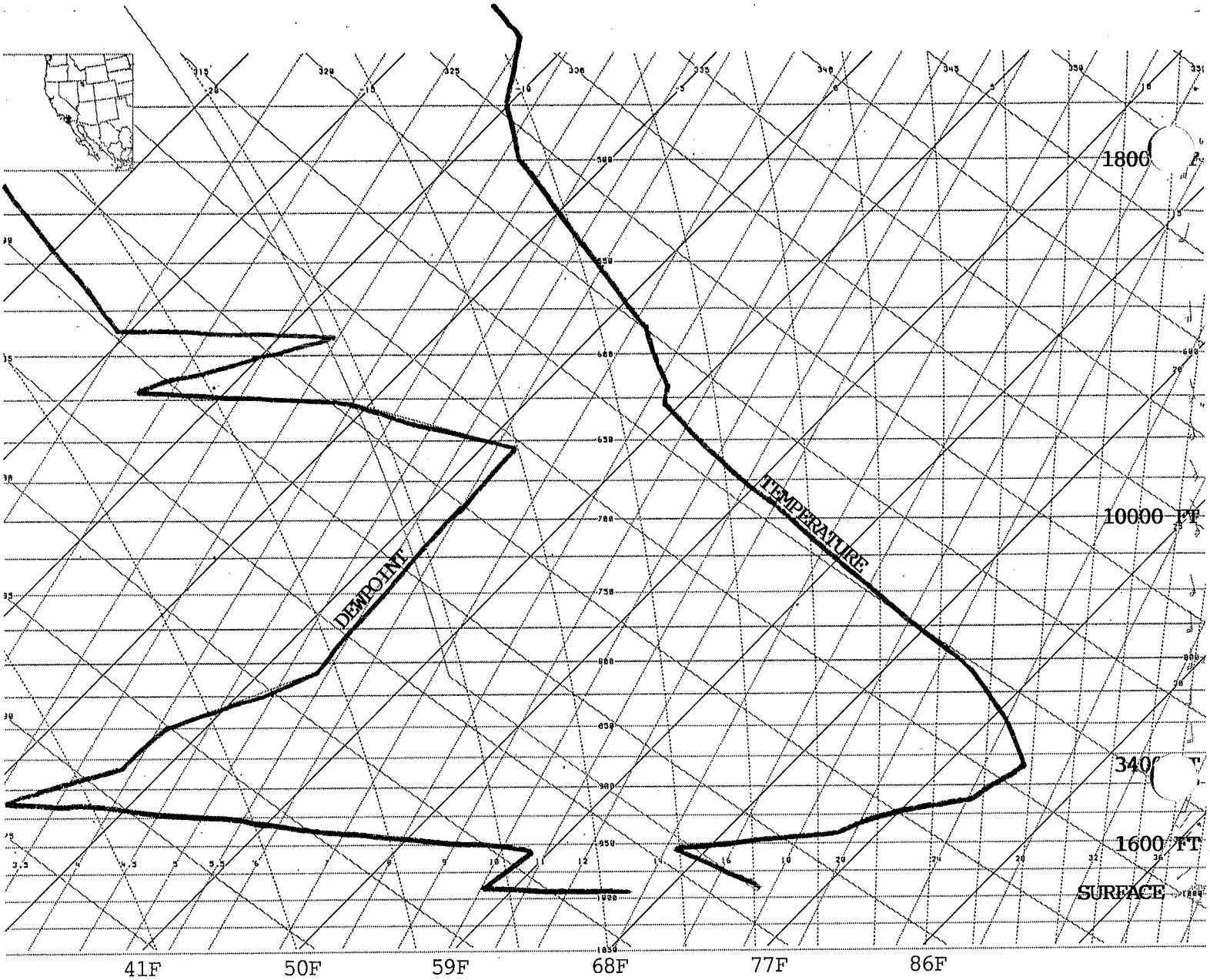


Figure 10. Temperature trend at Downtown Los Angeles between 1878 and 1998, with ten-year rolling mean. The warming is due principally to urbanization, and the moderating of nighttime minimum temperatures which accompany that process.



PRECIP WATER= 0.90 in
LIFTED INDEX= 4.9
K-INDEX= 21
TOTALS INDEX= 48
SWEAT INDEX= 62
CONVECTIVE TEMP= 115°F
FORECAST MAX TEMP=NA
DRY MICROBURST POT=0; GST 30-40 kts
0-6 KM AVG WIND= 170°/21 kts
0-3 KM STM MOTION= 201°/12 kts
0-3 KM STM REL HELICITY= -20 m²/s²
INITIAL PARCEL PRESSURE= 994 mb
INITIAL MEAN PARCEL T/Td= 69/48°F
INITIAL MEAN PARCEL T/Td= 20/9°C
FREEZING LEVEL= 15705 ft AGL
WET-BULB ZERO HGT= 13199 ft ASL

CCL= 10809 ft ASL/ 508 mb
LCL= 6273 ft ASL/ 810 mb
LFC=NA
MAX HAILSIZE=NA
MAX VERTICAL VELOCITY=NA
EQUILIBRIUM LEVEL=NA
APPROX CLOUD TOP=NA
POSITIVE ENERGY ABV LFC=NA
NEGATIVE ENERGY BLW LFC=NA
BULK RICHARDSON NUMBER=NA
TRIGGER TEMP= 36°C/97°F
SOARING INDEX=NA

Figure 11. Profile of an atmospheric temperature inversion near the Los Angeles Basin, August 1999.

Temperatures usually decrease with an increase in altitude, at around five degrees (F) per thousand feet.

In this example, the temperature warms rapidly above the marine layer. From 1600 feet to 3400 feet, the temperature rises from the upper 60s to over 80 degrees.

5. AIR QUALITY

Today, air quality is an important element of meteorological study throughout the world. In southern California, air quality has been monitored, studied, and regulated to an extent unprecedented in the history of the earth. As a result of extensive research, great strides have been made in reducing air pollution in the Los Angeles Basin.

The basin is ringed by mountains, except open to the west and south where the cool marine layer from the Pacific Ocean can envelope the densely populated coastal plain before being confined by the mountain slopes. This marine layer, capped by warm air aloft, traps particulates and gasses—man-made and natural—within about a quarter to a half mile above the earth. Thus, across some 1,600 square miles of basin lies a huge volume of trapped, stable air weighing some 200 million tons. Pollution within this pool of air becomes a problem when it affects the environment directly, or the health of persons living within it. Today, it is recognized that *smog*, the combination of smoke and fog that typifies Los Angeles weather, has a history that is older than the city itself.

In the prehistoric record there is evidence, verified by examinations of ocean sediment cores, of huge fires that occurred in and around the Los Angeles Basin up to two million years ago. Presumably, the atmosphere was sometimes laden with thick smoke from lightning-caused fires. In more recent times, the Native American population used fire extensively in their daily activities. Early Spanish explorers noted a thick smoky haze in the harbors when they first visited the Los Angeles area. In addition, natural pollution sources, primarily oil and gas seepage from beneath the ocean floor, have also contributed to an air pollution problem over the years.

With the rapid industrialization of the basin in the late nineteenth and early twentieth centuries, Los Angeles developed serious problems with smog. By 1903, the haze had become so thick that on one occasion persons in the city mistook a smoggy darkness for an eclipse of the sun. Beginning in 1905, the Los Angeles City Council passed legislation to curtail smoke emissions. But the measures proved ineffective, overwhelmed by the massive and mainly unregulated growth of industry and population.

After World War II, the smog problem was so bad that it began to affect commerce, industry, and the general health of the population to an extent that could no longer be ignored. Special interests could no longer block the necessary studies and regulations aimed at pollution clean-up. Moreover, a series of well-publicized killer smogs occurred in Belgium (1930); Donora, Pennsylvania (1948); and London, England (1948 and 1952) which underlined the potential health hazards associated with severe air stagnation and pollution episodes.

Popular opinion held that industrial smoke and emissions were responsible for most of the air pollution in the Los Angeles Basin—in much the same manner that the infamous smokestack industries had polluted the big industrial cities of the eastern United States. Investigations in

the late 1940s and early 1950s established that the origins of Los Angeles area pollution were multi-causal. However, the chief culprit was ozone produced by photochemical reaction in the lowest levels of the atmosphere. Driven by sunlight, ozone is produced by hydrocarbons and nitrogen oxides emitted mainly from oil refineries and the incomplete combustion process within automobile engines.

Smog, and particularly the ozone component of Los Angeles area smog, is harmful to human health. The lungs are the primary target of ozone—which damages cells in lung tissue, causing edema (swelling) and lowering the ability of the immune system to fight disease. Asthma, emphysema and chronic bronchitis are worsened by the presence of ozone. Children and the elderly are especially vulnerable to ozone concentrations in excess of the federal standard (0.12 ppm). Numerous studies have shown measurable damage to human and animal tissue and shortened life span due to increases in ozone concentration. Additionally, ozone damages plants and destroys certain manufactured materials, such as rubber.

There were a number of other sources of pollution in mid-twentieth century Los Angeles. Backyard incinerators, numbering more than 300,000, belched forth intermittently without controls. The oil industry estimated that 120,000 gallons of gasoline evaporated into the area atmosphere from all sources each day. Citrus growers operated more than one million smudge pots, burning used motor oil and old tires, in a mistaken belief that black smoke helped keep winter minimum temperatures above freezing.

Smog was recognized as a problem created by science and industry—and people turned to science and industry for a solution. One proposal called for the connection of all commercial and industrial emissions to a network of massive exhaust pipes, which would transport the smog above the San Gabriel Mountains, dispersing the offending particulates above the basin's atmospheric inversion. Energy requirements made this idea unfeasible.

Another suggestion was made to spray a chemical (*diethylhydroxylamine*) over Los Angeles each summer to short-circuit the ozone and smog formation process. However, it was determined that the chemical was itself a pollutant, so that proposal was dropped.

Over the past half-century, pollution and ozone levels have been markedly reduced over the entire Los Angeles Basin. This result was accomplished through anti-pollution agency efforts and strict enforcement of controls.

On October 14, 1947 Los Angeles County supervisors established the nation's first Air Pollution Control District. The district required air pollution permits of major industries. Recognizing that air quality management was a regional and not just a county responsibility, three other counties joined Los Angeles to form the South Coast Air Quality Management District (AQMD) in 1977.

Air quality markedly improved over the Los Angeles Basin during the last two decades. By the late 1990s, Los Angeles no longer had the nation's dirtiest air.

Moreover, peak ozone levels at downtown Los Angeles reached 0.68 parts per million (ppm) in 1955 before declining almost two thirds by the mid 1990s.

It should be mentioned that large scale meteorological processes can themselves greatly impact pollution levels in the Los Angeles Basin. Specifically, the global *El Niño* episodes of 1982-83 and 1997-98 were accompanied by much-reduced levels of atmospheric toxicity at Los Angeles. *El Niño* events are usually accompanied by increased atmospheric instability, better vertical mixing and cleaner air across southern California.

The reductions in air pollution in general and ozone in particular came through strict controls on commercial, public, and residential emissions, including incineration sources. But the most effective anti-pollution measures were controls on automotive exhausts, including catalytic converters, which were required beginning in 1975. In addition, a system of vehicle smog inspections was put in place by the City of Los Angeles before 1980.

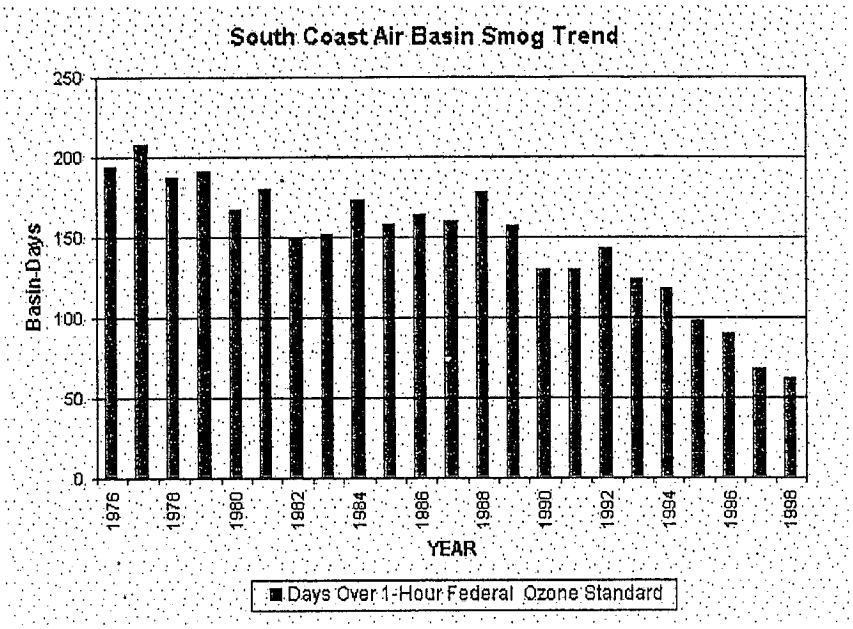
Regulatory measures have sometimes been unpopular with both industry and with citizens. But the effect of the regulations, which have set standards for laws in other parts of the world, has been remarkable. Toxic air pollutants have been markedly reduced over the past several decades. The number of stage one ozone alerts issued by AQMD plummeted from 121 in 1977, to zero in the summer of 1999. In fact, 1999 had the cleanest air quality measurements ever recorded at Los Angeles since records began.

AQMD officials have set new goals to improve air quality even further. The agency estimates that federal clean air quality standards can be met in Los Angeles by 2010.

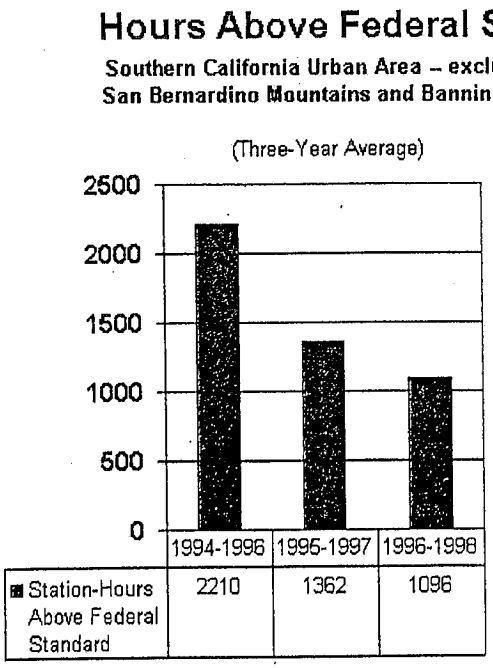
Historical Smog Chart

FIGURE 12.

Ozone is a good indicator of overall air pollution. This chart shows how smog levels have declined in the South Coast Air Basin since 1976 in terms of the number of days exceeding the 1-hour federal ozone air quality standard.



The cumulative number of hours above the federal ozone health standard (0.12 ppm) at all monitoring stations in the urban area -- an indication of population exposure to air pollution -- has declined on a three-year average basis.



Courtesy AQMD.

6. PRECIPITATION

Data Acquisition

A discussion of rainfall data and patterns applicable to the Los Angeles Basin needs to be qualified by the following caveats: First, a published rainfall measurement is only an approximation of site-specific precipitation accumulating within a vertically-oriented conical apparatus mounted approximately four feet above the ground. Second, automated and rooftop-sited rain gauges collect and register significantly less rainfall than their manual and surface-based counterparts due to wind updrafts near buildings and wind circulations within the measuring devices. Third, tipping bucket gauges, in common use in the latter half of the twentieth century, were often nothing more than guides to approximate rainfall totals; their measurements were affected by wind gusts, irregular maintenance, detritus accumulating within the system, fog, dew, and by systemic difficulties in the recording of very heavy precipitation events.

Significantly, the Los Angeles Civic Center rain gauge has been automated since 1964, and has been mounted on a rooftop location for most of the time since 1877. In fact, the Los Angeles Civic Center site used during the 1990s was criticized for under-reporting rainfall. Recent comparisons with ground level standards and adjacent gauges showed a catch shortfall of approximately ten percent of the reported rainfall total for the Civic Center site during those years.

Fortunately, other rainfall gauges across the Los Angeles Basin have been very well-sited, and exhibit the reliability necessary for long-term climatic study. The National Weather Service recognizes the excellent century-long records which exist at Pasadena, Long Beach, Mount Wilson, and Pomona, among others.

In California, annual precipitation is generally described in terms of seasonal rainfall, computed by the National Weather Service from the first of July through the 30th of June. This data acquisition method allows a cohesive projection of the entire winter rainy season. Daily rainfall values are reported from midnight to midnight, except at manned stations where gauge readings are taken at other times, as specified. Precipitation averages are normally based on standard National Weather Service thirty-year normals (1961-1990), or the entire period of record, as identified.

For the purposes of this study, precipitation values are expressed in inches of water.

Precipitation Patterns

When viewed serially, historic seasonal rainfall totals in the Los Angeles area display an almost aggravating randomness. However, when a statistical smoothing method is employed, there appears to be an underlying periodicity in these precipitation statistics. This long-term pattern, approximating a thirty-year cycle, has been noted by Goodridge, Michaelson and others who have studied historic and pre-historic climatic data dating back hundreds of years.

This portion of the study is concerned with the historic period of record, which dates from about 125 years, and the thirty-year (operational) climatological averages ending in 1990.

Two striking features of Los Angeles rainfall are its seasonal nature and its reflection of orographic effects.

Over the entire Los Angeles Basin, excluding mountain locations, the average annual precipitation ranges from less than 12 inches at the immediate coast to more than 20 inches at the foothills. The normal seasonal rainfall measured at downtown Los Angeles is 14.77 inches.

On average, 92% of the seasonal precipitation falls between November 1st and April 30th. This percentage is roughly the same for all stations, regardless of elevation or distance from the ocean.

That it doesn't rain much in the summer in Los Angeles is borne out by statistics furnished by the L.A. Dodgers Baseball Club. The Dodgers have had only sixteen home games rained out in 41 years of baseball—over 3,300 games. The team averages only 0.39 rain-outs per year. Fully half of the rain-outs have occurred in the month of April, and none have ever occurred during the months of June or July.

In a semi-arid climatic type with strong seasonal and periodical variability, "average" precipitation is seldom realized. If achieved, "average" is only a transitional state between extremes of wet and dry, flood and drought. Angelinos must be prepared for extreme rainfall patterns because dry and wet cycles are both inevitable.

Seasonal rainfall variability was strongly demonstrated once again in Los Angeles during the 1998 calendar year. LAX received 352% of normal rainfall in the first six months of 1998 but only 63% of normal in the second half of the year. The end of a very wet *El Niño* episode and the transition to a dry *La Niña* circulation was responsible for the change.

Seasonal precipitation patterns, computed through running means on a daily basis for each day of the year, are very consistent for all weather stations in the Los Angeles Basin. Generally, the chance of having measurable precipitation on any given day increases to between 20 and 25 percent from January 10th-13th; again from February 6th-10th; and for a third time from March 4th-8th. These maxima are present in all basin weather records, and reflect average rainfall accumulations ranging from 0.10 inches per day at the ocean to 0.17 inches of rain near the foothills. There is a smaller seasonal peak which occurs in the autumn, between November 14th and18th. These autumn and winter precipitation maxima may suggest some type of intra-seasonal periodicity in the arrival of north Pacific storms into southern California.

An index of the variability within historic precipitation data at Los Angeles is seen in the large standard deviations observed within the *complete monthly rainfall* data (Tables 8, 14 and 17) in the second section of this paper.

Statisticians have revealed a periodicity

underlying the apparently random nature of year-to-year precipitation data within the historical record (Figure 13). This regularity is seen most clearly in the application of a nine-year rolling mean, which is based on an 18.6 year lunar cycle (Goodridge, 1998). Goodridge believes that these data may reflect changes in sea surface temperatures at 30N/130W and may, furthermore, be related to changes in the solar constant.

On a longer term, the100-year change in rainfall rates within California in general and Los Angeles County in particular is practically nil; however, there was an apparent increase in the number of heavy precipitation events in the last two decades of the twentieth century.

COOL SEASON PRECIPITATION

Winter Rains

Precipitation episodes in Los Angeles, with a few notable exceptions, are largely caused by extratropical disturbances approaching California from the west or northwest during the winter season. In wintertime, southern California is on the southern margin of the northern hemisphere jet stream and receives from ten to thirty of these north Pacific weather systems per year.

Classical synoptic surface analyses show cold maritime polar air masses dropping southward from the Gulf of Alaska during the winter and early spring months. These cold air intrusions interact with relatively warm water in the eastern Pacific, and with other moisture sources streaming toward California from the west or south. With upper air support, surface waves can develop along the frontal boundary of cold air and move over southern California. The cold air may trigger enough atmospheric instability to generate "cold core" thunderstorms, which on occasion can spawn a funnel cloud or small tornado.

As a winter storm approaches southern California from the west, moist subtropical air may become entrained within the system and—depending on the continuity of the eastward movement of the storm—produce copious amounts of moisture across the coastal plain and mountains adjacent to Los Angeles. In such events, the transverse and coastal ranges of Los Angeles County act as a continental catcher's mitt, capturing huge amounts of water within the Los Angeles Basin. The flow of moisture from the southwest is associated with some of the heaviest rainfalls in southern California. Due to its origins near the Hawaiian Islands, this southwesterly flow of moisture into California is sometimes called the *Pineapple Connection.*

Despite evidence to the contrary, there is a common misconception—even among some Californians—that "it never rains in southern California". A study of record rainfall events that occurred in the state during the 1900s gives an interesting insight into this myth.

Jim Goodridge has studied extreme rainfall events that have occurred in California since 1900. In the years from 1900 to 1943, a clear majority of severe storms that occurred in California also affected southern California: Of the twelve years with very heavy precipitation and flooding listed in his study during this

period, all but four impacted southern California.

However, from 1943 to 1992—a period of almost fifty years—extreme rainfalls occurred in southern California on only five occasions, although central and northern California were affected in fourteen separate years. This time span covered an era of incredible growth within the Los Angeles Basin—and the concurrent flood control construction project which tamed the flood-prone Los Angeles River. With a lessening of the threat of floods, and very few major storms through five decades, it is no wonder, then, that southern California developed a reputation for dry and benign climate.

Since 1992, however, that "shopping mall climate" reputation has begun to tarnish—or, perhaps *rust* is the better term. Beginning in that year, the decade of the nineties turned decidedly soggy. In fact, heavy rainfall events were noted in the basin during the years 1992, '93, '95, '97, and '98—helping to make the decade of the nineties the wettest since the 1930s and early '40s

It is interesting to note that the heaviest rainfalls recorded within the State of California have occurred on the mountain slopes of Los Angeles County. California's greatest 24-hour rainfall, 26.12 inches, occurred at Hoegees—below Mount Wilson on the slopes of the San Gabriel Range—on January 23, 1943. This rainfall is 6.73 standard deviations higher than the mean for that station and has a return period of 11,000 years (Goodridge, 1997).

In fact, the mountains which drain into the Los Angeles Basin have the highest probable 24-hour maximum precipitation rates to be found anywhere in the continental United States—with *theoretical maxima of more than 48 inches near Mount Wilson!*

Short duration maximum rainfall rates are remarkable in the Los Angeles area. The heaviest rainfall observed within the Los Angeles County historic record occurred on January 4, 1995, when 2.60 inches of rain fell in one hour in the Long Beach area at Signal Hill. In the San Gabriel Mountains, where heavy orographic rains would be expected, the record hourly rainfall is a more modest 2.00 inches, set January 4, 1926 at Opids Camp, north of Mount Wilson. (Another storm in the same location produced 0.65 inches of rain in *one minute* in April of that year.)

Following are the record maxima rainfall statistics for downtown Los Angeles:

- One hour - 1.87 inches (November 19, 1967)
- One 24-hour period - 7.36 inches (Dec 31-Jan 1, 1933-34)
- One month - 15.80 inches (December 1889)
- One season - 38.18 inches (1883-84)

Geography acts in other ways to add to winter precipitation within the district. The mountains surrounding the Los Angeles Basin contain and reinforce the marine layer—a shallow pool of ocean-modified air that frequently exists over the basin. Elliott and Hovind describe the marine layer as causing Pacific cold fronts to behave locally like occlusions, producing 12 to 24 hours of steady light

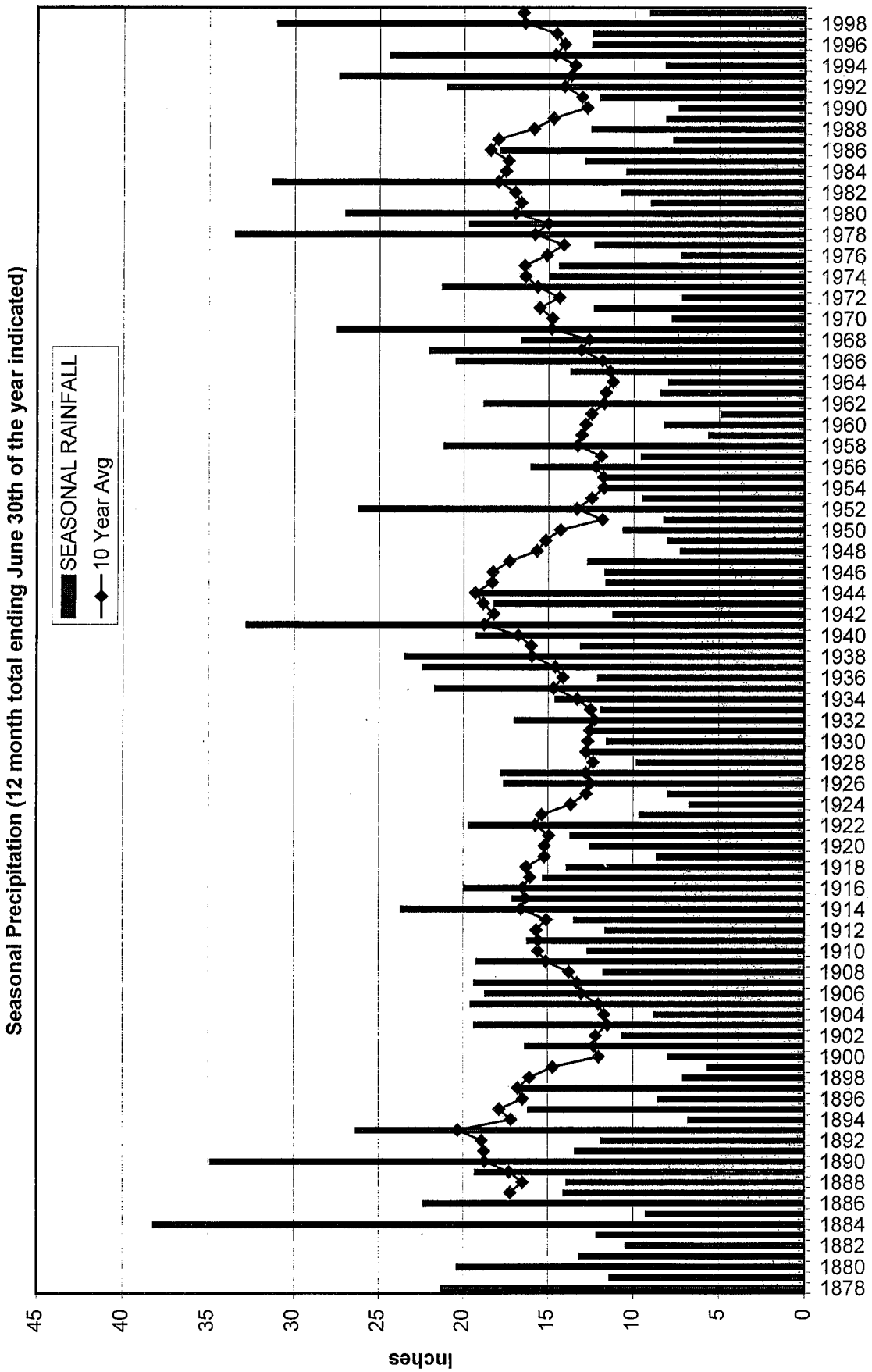


Figure 13. Rainfall trend at Downtown Los Angeles between 1878 and 1998, with ten-year rolling mean.

SANTA MONICA, Dec. 22.—Towering from the ocean into heavy dark clouds, a giant waterspout appeared off the coast here at dusk today.

Thousands rushed to the beaches and other vantage spots to view the phenomenon. Others, frightened, telephoned police for an explanation of the "tornado at sea," which is just what it was.

Lifeguards estimated the water towered at least 1500 feet before its funnel-shaped top disappeared in the clouds. Its diameter was judged to be from 15 to 50 feet.

Near the pointed bottom, the water was greatly agitated, flinging out huge clouds of spray. The heaving disturbance attracted thousands of sea gulls.

First noticed about 5:15 p. m., some 15 miles at sea, the great 'spout moved threateningly within a quarter mile of shore before turning south, gathering speed and breaking up about 5:45 p. m.

SEA MONSTER—While thousands, like seaman in foreground, stared and pointed, this giant waterspout moved through Santa Monica Bay late yesterday. Note disturbed area at its base. Height was estimated at 1500 feet. It subsided after 30 minutes.

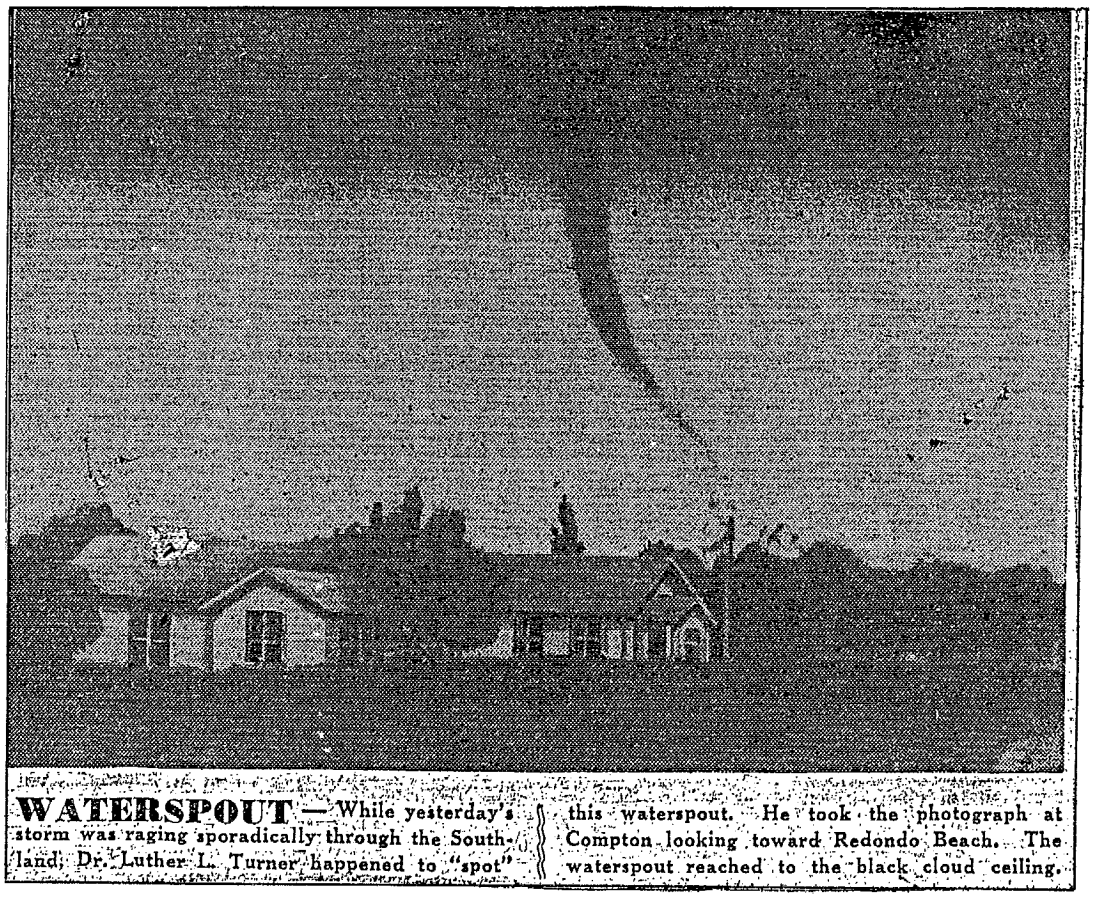
—Pacific Press photo.

Figure 14. Waterspout at Santa Monica Bay, Wednesday December 22, 1943. (Los Angeles Examiner photo)

TORNADO REPORT

Approximately 3:00 P.M. Sunday, November 5, 1944, I was at 158th and Normandy Avenue in Gardena, California.
A very heavy thunderstorm was in progress to the East extending from North Northeast to Southeast.
On the Southeastern edge of the storm a large funnel was observed to form and dip toward the ground. A few minutes later a second and much smaller funnel was observed a little farther South. This smaller funnel dropped down then receded and finally dissipated. Then it formed a second time and a short time later dissipated for good. In the meantime the large funnel was growing larger and getting closer to the ground. It is estimated that the large funnel was approximately three (3) miles Southeast of my observation point. Due to buildings in my line of vision, it was not possible to see whether or not the funnel ever made contact with the ground.
The large funnel finally dissipated after approximately thirty (30) minutes.

A. W. Youmans
Observer.



WATERSPOUT — While yesterday's storm was raging sporadically through the Southland, Dr. Luther L. Turner happened to "spot" this waterspout. He took the photograph at Compton looking toward Redondo Beach. The waterspout reached to the black cloud ceiling.

Figure 15. A tornado was reported in the Los Angeles area in 1944. Small tornadoes and funnel clouds are frequent occurrences in the Los Angeles Basin.

WB Form 4007

U. S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

SERIAL NO. 6-48-58

PHOTOGRAPHS

STATION WBO, Los Angeles, Calif.

DATE TAKEN January 11, 1949

(Type description below before mounting print
pass points when applicable. Be sure
are in proper order.)

mounting print here. Show cardinal com-
cable. Be sure names of personnel
n proper order.)

DESCRIPTION

DESCRIPTION

Looking N from the 17th floor 0815PST
of the U. S. Post Office Building
showing unusual occurrence
of snow in downtown
Los Angeles.

Figure 16a.

TAKEN BY H. E. Root

STATION RO, Los Angeles, Cali

(WB—11-3-47—2M) 282

BLIZZARD SWEEPS SOUTHLAND

SNOW FIGHT— ---garet Shepherd, on one side of car on Verdugo road in Los Angeles outskirts, in last night's snow got "pelted" by (left to right) her brother Art, sister Marion, and a playmate Quentin Durham.

DRIVING HAZARD— Floyd Stubbs Jr., Montrose, is almost "snowbound" there by heavy flurry and slick stre-- . He peers through the windshield.

GLISTENING FOLIAGE— In the Glendale, Burbank, North Hollywood, La Crescenta areas this scene in Montrose last night was duplicated in thousands of gardens with shrubbery covered with snow.—All L. A. Examiner photos.

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9 A.M. FINAL

VOL. XLVI—NO. 30 — LOS ANGELES, MONDAY, JANUARY 10, 1949 — S — Two Sections—Part I—SEVEN CENTS

Snow, Hail in L.A.

Snow and hail, sleet, rain

Figure 16b. Los Angeles Examiner "blizzard" headline, January 1949.

Los Angeles Times ★ 9 A.M FINAL

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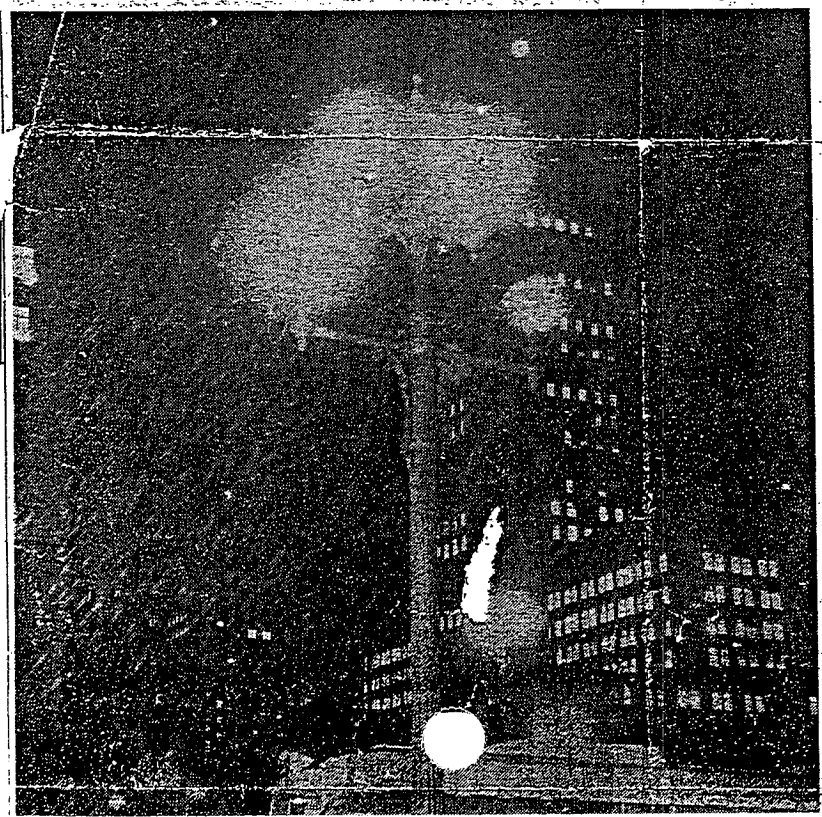
VOL. LXVIII — TUESDAY MORNING, JANUARY 11, 1949 — DAILY, SEVEN CENTS

SNOW COVERS L.A.; CANYONS BLOCKED



Beach Cities Get Fall as Crop Loss Piles Up

(Rainfall figures on Page 5)

Fluffy white coated the Southland scene yesterday and last night as snow, hail and sleet drove across Los Angeles and suburbs on a wintry blast.

Wind swirled snow deep from the Santa Monica Mountains into San Fernando Valley, forcing police to halt all traffic at both the West Los Angeles and valley ends of Sepulveda Blvd., Beverly Glen, Coldwater, Laurel and Benedict Canyons.

A score of cars were reported trapped in a foot of snow in Laurel Canyon, with several children among the occupants.

Early this morning, officers were allowing occasional cars through the canyons at the motorists' own risk.

Highways Closed

Only one major highway out of Los Angeles—Coast Route 101 to San Francisco and San Diego—was free of ice, the State Highway Patrol reported early today. Automobiles with chains w permitted over the other main arteries—U.S. 99 t Francisco and ea

State Highwa toiled through t icy roads and cl which piled more

SIDELIGHTS ON SNOW

Somebody whispered that it was snowing outside last night. So the manager of the Puente Theater stopped the movie, climbed up on the stage and announced the phenomenon. The picture was held up until the audience trooped outdoors, looked at the snow and trooped back in again.

Sun Valley, Calif., made a start at collecting the stuff that made Sun Valley, Ida., famous—snow.

Figure 17. Los Angeles Times coverage of 1949 snowfall.

Snow Blankets Lowlands Here for First Time in 17 Years

WHITE—Students of Glendale City College engage in a snowball fight on campus. Snowfall seemed to be heaviest in the foothill areas, particularly the Montrose district, although the widespread storm deposited substantial snow in some of the beach cities. On the other hand, most parts of San Fernando Valley received none.
W. A. Wilson photo

Figure 18. Snowball fight in Glendale, 1949.
(Los Angeles Times photo)

precipitation, consisting of small droplets. During the approach of a frontal boundary, the pre-existing marine layer typically merges with middle troposphere features, producing continuous precipitation which continues until frontal passage.

Almost all significant precipitation occurring within the Los Angeles area can be attributed to the general winter pattern dynamics previously described. However, there are other weather types which are less frequently observed, but nonetheless important.

Snow

In southern California, much of the winter precipitation falls as snow above 8,000 feet elevation. About 80 inches of snow falls annually in parts of the San Gabriel Mountains. When augmented by snow-making equipment, this is sufficient to support several ski areas within a short drive from the Los Angeles Basin. However, all of these ski slopes are at elevations above 5,500 feet. While the ski season is relatively short compared to other parts of the nation, snow cover in the highest elevations of the San Gabriel and San Bernardino Mountains is not unusual during much of the year. It is not uncommon to have a mountain snowfall in October. In 1995, a rare June snowfall occurred. In that event, Mount Wilson reported 1.5 inches on Father's Day, a record for the month.

Snowfall is infrequent below 4,000 feet elevation, but not exceptionally rare. Such events can occur several times during a winter season. The primary impact of low snow levels is on tourists and residents traveling to and from mountain resorts, and on travelers driving over the higher mountain passes. In particular, Interstate 5 at Tejon Pass reaches a height of 4,183 feet, and is sometimes closed for several hours due to snow and ice. This can snarl freeway traffic badly on the major north-south route that connects southern California with the rest of the state.

Snow levels down to the floor of the basin are extremely rare. Since statehood, measurable snowfall has occurred at downtown Los Angeles only three times: On January 12, 1882; on January 15, 1932; and on January 9, 1949. The 1932 snowfall was the heaviest of these at two inches. In the 1949 event, only 0.3 inches of snow was recorded downtown, but three inches was common at higher elevations within the city. The 1949 snowfall was, of course, heavily reported by the media, with photos of Glendale College students hurling snowballs at each other (Figure 18).

Minnich (1986) reports that snow levels drop into the intermediate elevations of the mountains during the course of a normal winter season, and that the usual 2,500 foot average decrease in snow levels which occurs between November and April is accompanied by a concurrent 9°F drop in offshore sea surface temperatures (SST).

The primary correlation that was noted by Minnich is the inverse relationship between total seasonal precipitation and areal snow cover. Seasons with heavier precipitation totals correlate with higher snow levels; drier years, with more cold air advection, produce light snow over a wide area and at lower elevations.

Tornadoes

The south coastal region of California, including the Los Angeles Basin, has the greatest incidence of tornadoes in the state. In the period from 1950 to 1992, the basin had 99 confirmed tornadoes. According to Blier and Battan (1994), this area has a tornadic incidence similar to that of the State of Oklahoma. However, these researchers go on to point out that the size, severity and duration of California tornadoes is less than those common to the plains states, and the tornado count in the Golden State may be inflated due to inaccuracies within the database. Nevertheless, the fact that tornadoes occur with great frequency in a very densely populated urban area makes the occurrence of tornadoes in the Los Angeles Basin particularly relevant.

Severe storms researcher John E. Hales, Jr. (1983) stated that "a tornado can hardly find a place to touch down around Los Angeles that won't hit something". That assertion notwithstanding, there is no record of a Los Angeles tornado ever causing a fatality.

Unlike their plains counterparts, southern California tornadoes occur mainly in the winter. Of the 99 tornadoes that were reported in the Los Angeles Basin between 1950 and 1992, the vast majority—83—occurred in the months November through March. March had the highest number of incidents, with 22. The fact that few tornadoes occur in the Los Angeles Basin during the warm season is primarily due to the stabilizing effect of the marine layer, and the lack of dynamic forcing during the warmer months.

Roughly a quarter of the tornadoes listed by Blier and Battan originated as waterspouts over either Santa Monica Bay or San Pedro Channel. There were many more waterspouts that never made landfall; these were not included in the tornado count.

The cause of many, if not most, Los Angeles Basin tornadoes seems to be linked to the terrain layout of the basin. Hales specifically mentioned the natural curvature of the shoreline and the location of the coastal mountains. Due to frictional and barrier flow effects, a convergent cyclonic wind pattern is established in the vicinity where most L.A. tornadoes occur. Blier and Battan discussed several features that require further investigation, including convergence to the lee of the Palos Verdes Peninsula and Santa Catalina Island.

In conjunction with topographic features which set up favorable cyclonic, low-level wind patterns, Hale further identified a number of synoptic weather features—more common to the cool season—that are associated with the strongest of the tornadoes that he studied. These include:

♦ Closed cyclonic circulations from the surface to 500 millibars (mb).

♦ A west-southwest oriented, 120 knot or stronger, 300 mb jet that crosses the coast near San Diego. The tornadoes always form on the cyclonic side of the jet.

♦ A dewpoint at San Diego of 51° or greater.

♦ The 500 mb temperature on the Vandenberg sounding -5° (-20°C) or colder.

♦ A mean cold front position on the California/Arizona border. Usually, tornadoes occur well behind the surface cold front.

♦ A time of occurrence between 1200 and 1500 PST, coincident with maximum solar heating.

♦ A strong increase in wind speed with height—similar to wind profiles in the central United States.

In the 1997-98 *El Niño* episode, the Pacific storm track was located over southern California for much of the winter season. This produced a number of days in which Hale's criteria were approximated over the Los Angeles Basin and adjacent waters. In that season, there were over twenty days in which either waterspouts, funnel clouds or tornadoes were reported—including 30 separate sightings. Two tornadoes touched down within the City of Long Beach.

WARM SEASON PRECIPITATION

There are three main warm-season rain producers for the Los Angeles Basin. These are: (1) Light rain or drizzle from a deep marine layer, (2) monsoonal thunderstorms, and (3) showers or thunderstorms from the occasional tropical storm.

Marine Layer Drizzle

When the marine layer reaches several thousand feet in depth, air parcel cooling and droplet growth will occur within the marine layer stratus. Drizzle or light rain, with small droplets measuring approximately .02" in diameter, can occur during these periods. This type of precipitation can result at any time of year, but is most likely during the relatively stagnant period of weather which is typical from late May through mid October.

Thunderstorms

A mass of warm, moist subtropical air occasionally overlies the Los Angeles Basin during the mid to late summer. The subtropical airmass originates in Mexico, then moves northwesterly into Arizona about the first week in July. The humid, sultry air, with its characteristic high dewpoints, frequently pulses into southern California deserts and occasionally extends into the coastal plain. During these periods, thunderstorms form mostly over the mountains of southern California in the afternoons, then occasionally meander over the coastal lowlands during evening and nighttime hours.

The mean number of days per year on which thunderstorms occur (i.e. days on which thunder is heard, regardless of precipitation) is 4.1 in the downtown Los Angeles area.

Because they are an infrequent visitor to the heavily populated southern California coast, thunderstorms are very notable

when they do occur. Even when they produce only light precipitation, they can be a source of serious inconvenience by wetting an area that had been dry for weeks, or even months. Also, they may cause shifting surface winds with local gusts to 50 miles per hour or more. This combination, more or less innocuous in other parts of the United States, is actually dangerous in Los Angeles. The inevitable result of even small summer thunderstorms is a rash of highway accidents, freeway traffic jams and local power outages.

During one afternoon in the spring of 1999 when scattered thunderstorms occurred across the Los Angeles Basin, a cluster of traffic accidents was reported, including one 70-car pileup on Interstate 10.

Tropical Storms

The average number of tropical storms in the eastern Pacific Ocean is 16.7 per year, of which about seven develop into hurricanes. Only once in the twentieth century did an eastern Pacific tropical storm directly impact the Los Angeles area with gale force winds and heavy rain. About once every two years, however, eastern Pacific tropical storms or hurricanes indirectly impact southern California with residual rains and/or heavy surf.

A tropical storm crossed the Los Angeles County coastline in 1939. In the event, a tropical depression had developed off the coast of Panama on September 15th. The storm quickly grew into a hurricane. The lowest pressure (28.67") occurred on September 22nd, when the storm was centered approximately 300 miles southwest of Cabo San Lucas. On Sunday, September 24th the dying storm crossed Catalina Island, where southeast winds gusted to 50 miles per hour. The storm came ashore near San Pedro. Torrential rains fell Monday morning and again Monday night across the Los Angeles coastal plain. The Civic Center received 5.62 inches of rain and Mount Wilson reported 11.60 inches. Forty-five lives were lost at sea, and property losses were placed at $2 million.

The 1939 tropical storm had other repercussions for Los Angeles. The Weather Bureau Forecast Office in San Francisco had been completely surprised by the storm. Largely in response to this tragedy, the Weather Bureau decided to establish a new forecast office for southern California. In February 1940, the first forecast office in southern California was opened in the Lockheed Terminal at Burbank Airport.

The heaviest property damage caused by the remains of a tropical storm occurred in September 1976, when heavy rains from the remains of Tropical Storm Kathleen caused $160 million in agricultural and urban flooding damages.

The *El Niño* Effect

El Niño is one of several major ocean-atmosphere teleconnection patterns that influence the weather around the globe. In fact, for southern California, it is arguably the most significant of all such patterns. Due to its importance, it has been extensively studied by researchers

since the 1960s. With the success of certain predictors related to these studies, the popular media have linked the Spanish name with rainy episodes in California to an almost tiresome extent.

There is now little doubt that inter-annual variation in rainfall patterns in southern California is related to sea surface temperature (SST) anomalies in the Pacific Ocean. Equatorial eastern Pacific SST maxima are the signature of the initialization of an *El Niño* pattern. Eastern Pacific SST maxima seem to cause the strengthening and southward shift of the northern hemisphere jet stream. The result is usually above normal rainfall for southern California.

The authors compared twenty-three *El Niño* events of various magnitudes (as identified by the National Oceanic and Atmospheric Administration) with the Los Angeles Civic Center rainfall record. It was determined that above normal rainfall at Los Angeles occurred in 78% of the *El Niño* years, with precipitation during the selected years averaging 134% of normal. Statistical sampling techniques employed within this study reflected some uncertainty; a blind data sampling method has produced similar results.

However, it should be noted that strongly positive *El Niño* anomalies have invariably produced heavy rainfall in southern California. Of the four strong *El Niño* anomalies recorded in the past century, all resulted in seasonal rain totals in excess of 30 inches at the Civic Center, with an average of 215% of normal.

Heavy rainfall seasons in the Los Angeles area are almost always followed by unusually dry years. Heavy seasonal rainfall, defined by the authors as 25 or more inches of rain ($\approx$ 1.5 standard deviations above the mean), occurred ten times during the 122-year period of record. In nine of the years following heavy rainfall, precipitation was below normal. The averages are impressive: Wet years averaged 30.48 inches of rain or 202% of normal. The years following the wet seasons averaged only 10.49 inches of rain or 69% of normal. Thus there is a strong suggestion of a significant oscillation in the seasonal dynamics controlling southern California precipitation.

FLOOD CONTROL

The Los Angeles County Drainage Area comprises a 1,459 square mile watershed which flows to the Pacific Ocean mainly through the Los Angeles River and the San Gabriel River. The Los Angeles River is approximately 55 miles long and has an aggregate tributary system which is 225 miles in length. Stream slopes range from extremely steep, 200 feet per mile or more in the mountains, to about three feet per mile over the coastal plain.

Due to steep terrain, runoff from the mountains concentrates quickly. Runoff from urban watersheds is generally uncontrolled and is characterized by high flood peaks of short durations, because a high percentage of the rain falls on impervious cover. Hydrographs illustrate that Los Angeles area flood events are typically of less than twelve hour durations (Figure 20). The lower Los Angeles River will respond to heavy rain by rising from 2/3 channel capacity to full in less than an hour, and reversing to 2/3 channel capacity within two hours. Such

events have been noted recently, in 1980, 1993 and 1995.

Through historic times, and as evidenced in a variety of pre-historic sources, the Los Angeles area has been periodically pounded by heavy rains and inundated by floods. Some of the heaviest rains ever recorded on the west coast of North America occurred near Los Angeles as a result of the high transverse orographic barrier catching a moist subtropical airflow. Historical references highlight eight major floods across the coastal plain in the Los Angeles area between 1815 and 1876. From 1884 to 1938, nine more floods wreaked havoc. In the latter half of the twentieth century, enormous public work projects were completed which served to mitigate flood damage in the Los Angeles area.

Prior to 1915, little was done to control flooding within the county. To the contrary, uncontrolled growth and economic development did much to exacerbate a growing urban flood problem, which in fact had become one of the worst in the United States.

Through the early twentieth century, the Los Angeles River, at 55 miles long, was the county's major (and most capricious) drainage. The Los Angeles River had a long history of meandering almost at random across the coastal plain, emptying into the Pacific Ocean at various places from Santa Monica to Long Beach.

Flood destruction and loss of life awakened the growing population of the Los Angeles Basin to the need for flood control. The Los Angeles County Flood Control District was established in 1915, and Congress authorized the U.S. Army Corps of Engineers to work on the Los Angeles River problem at about the same time.

The river posed major difficulties: An intermittent and swampy slough in the late summer, it became an unpredictable and raging torrent during periods of heavy rain. In flood stage, the river was gorged with huge volumes of water, strong current velocities, large debris loads, and unstable channels. As the population of the Los Angeles area grew rapidly in the early twentieth century, each flood produced increasing damage to the district, and scores of lives were lost. Flood control had become absolutely essential.

Between 1917 and 1965, the huge public works projects undertaken by the Corps of Engineers and its partners bore fruit. With great leaps forward in technology and in ecological sensitivity, a series of catchment basins and concrete or stone-lined channels controlled the Los Angeles River, its tributaries, and other streams within the district. The cost was high — over two billion dollars in federal and local funds for the entire project — but great benefits were realized. There were no more catastrophic floods after the 1950s, in spite of the sharp upward trend in urbanization and an increase in the number of heavy rainfall events late in the century. In addition, valuable recreation land was set aside for the public trust as a result of construction of catchment basins along channels.

The last major flood destruction in Los Angeles occurred on March 2, 1938. Forty-nine lives were lost. A major rainfall event occurred in 1969, in which an

estimated $1.5 billion in damage was saved by flood control projects. Other heavy rains in 1983, 1992 and 1998 were well-handled by the complex system of drainages, catchments and bridges built by the Corps of Engineers within the Los Angeles area.

Turhollow (1975) rightly suggests that "early Spanish settlers probably would not recognize these 'new' rivers, like the Los Angeles, but no doubt would appreciate the modifications."

The current Los Angeles County Drainage Area flood control system is one of the world's largest and most extensive flood protection infrastructures. This flood protection includes:

- 15 flood control reservoirs
- 5 flood control basins
- 143 debris control basins
- 225 stabilization dams
- 33 storm water pumping plants
- 470 miles of open, improved channel
- 2,400 miles of underground drains
- 75,000 catch basins

The Corps of Engineers estimates that the value of damages prevented by the system in storms during its lifetime has already reached $3.6 billion.

Projects now underway in the lower Los Angeles River will expand the channel capacity from 133,000 cubic feet per second (cfs) to 182,000 cfs, which would approximate a 133-year flood (Plates 1-5).

Heavy rain still poses a flooding threat in the Los Angeles Basin, but the greatest problems are now associated with urban flooding, ponding of water in poorly drained areas, and high outflow of water, mud and debris below canyons draining higher terrain.

Drought

A dictionary defines *drought* as "an extended period of dry weather, especially one injurious to crops." But *drought* is a subjective term, with different meanings for different users; there is no standard or official meteorological definition.

The common meaning of the word hardly applies to southern California, where extended periods of dry weather occur every year, from May through October, as part of the normal Mediterranean climatic regime.

Los Angeles' annual rainfall, less than fifteen inches, is only about one-third of the precipitation received each year at New York City. Moreover, the Los Angeles area, with its large population, always operates under a water deficit, which has been made up mostly by water imports through a massive aqueduct system, established in 1913.

Water for the Los Angeles metropolitan area is currently purchased from northern California, the Sierra Nevada, and the Colorado River. Local water sources, such as reservoirs and ground water, make up a shrinking or unstable portion of the total water supply. The market for partially or totally desalinated ocean water may grow in the future in response to continued economic and population growth in the area.

The driest rainfall season at the Los

Angeles Civic Center was 1960-61, when only 4.85 inches of rain were recorded. On an intra-seasonal basis, the greatest number of consecutive days without measurable rain was 219, from February 18th to September 24th, 1997. It was this "drought" that was effectively broken by the *El Niño* episode of 1997-98.

A number of dry cycles are easily observed within the historic rainfall record of Los Angeles. Dry periods seem to occur about every thirty years, beginning at about the time of the Civil War. There are clusters of dry seasons—years with less than ten inches of rainfall—around, or just before 1870, 1900, 1930, 1960 and 1990 (Figure 13). There is some suggestion that droughts, like heavy rainfalls, are related to changes in the solar constant, to SST changes in the equatorial Pacific, or to some other heat transfer mechanism in the oceans. Future studies may help to better understand these relationships.

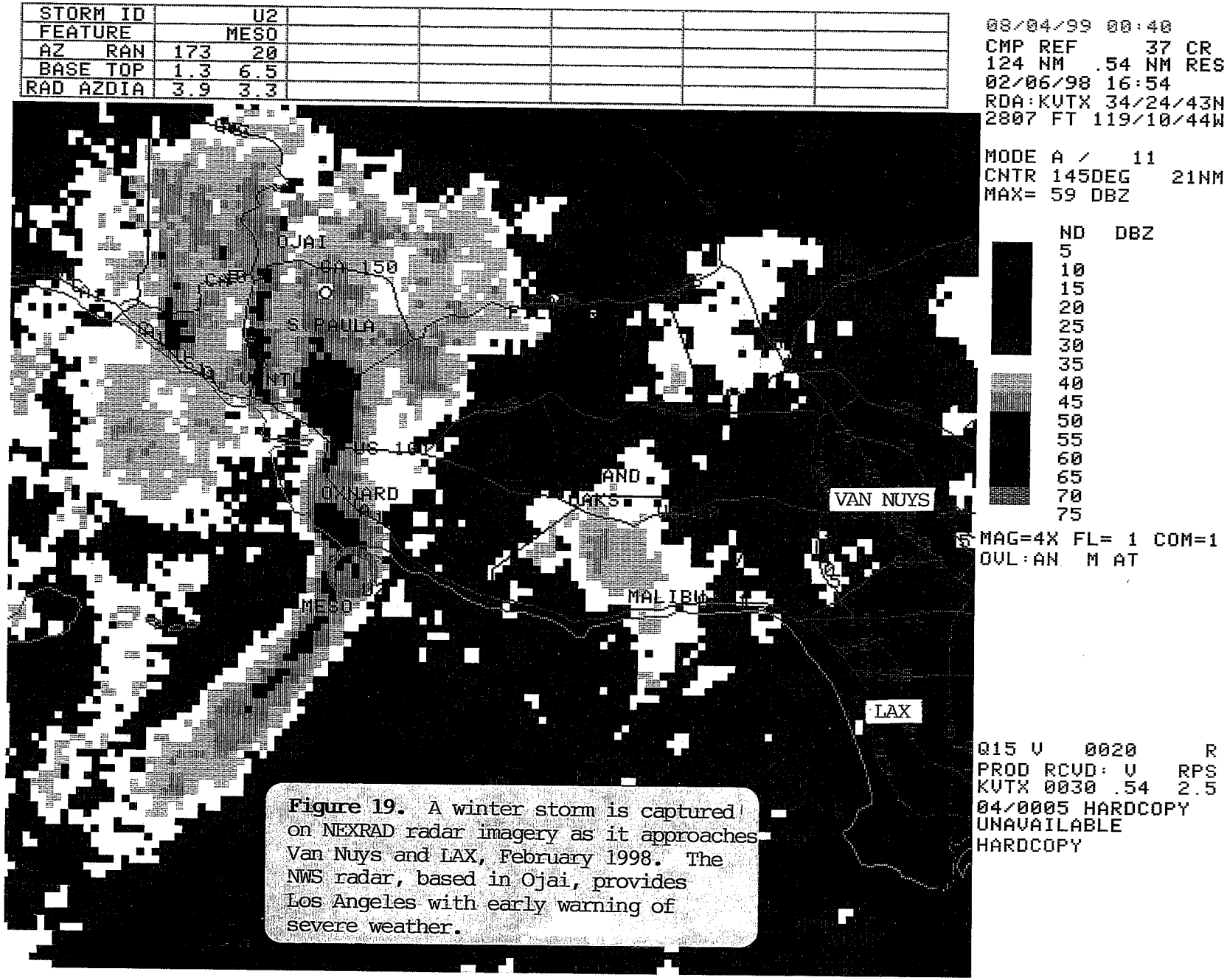


Figure 19. A winter storm is captured on NEXRAD radar imagery as it approaches Van Nuys and LAX, February 1998. The NWS radar, based in Ojai, provides Los Angeles with early warning of severe weather.

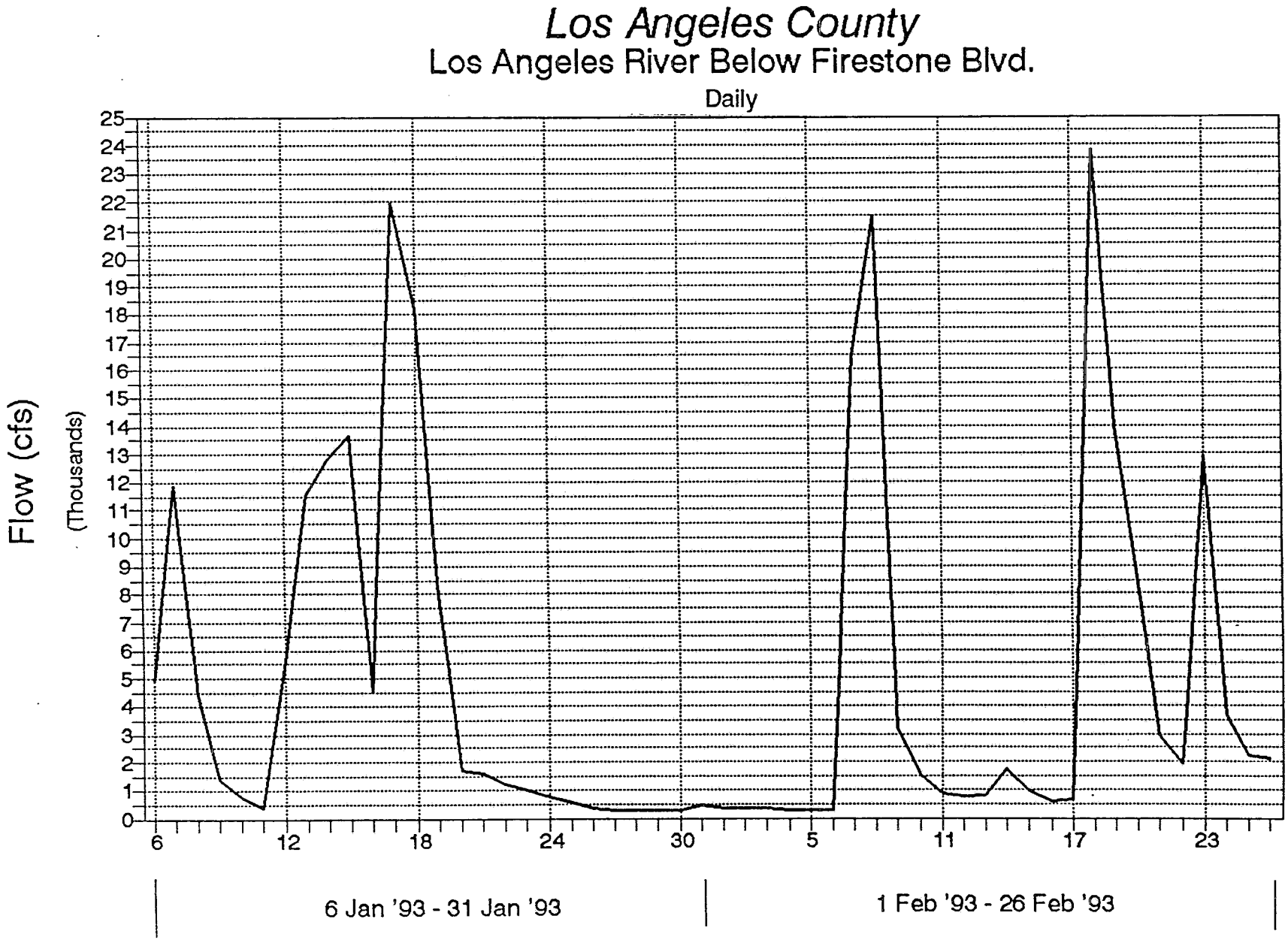


Figure 20. This hydrograph shows the rapid increase and decrease in flow levels (cubic feet per second) in a period of intermittent heavy precipitation in 1993.

Figure 21. Flood waters of the Los Angeles River in 1884 left horse car No. 5 in a precarious position. Photo is courtesy of Los Angeles County Flood Control District.

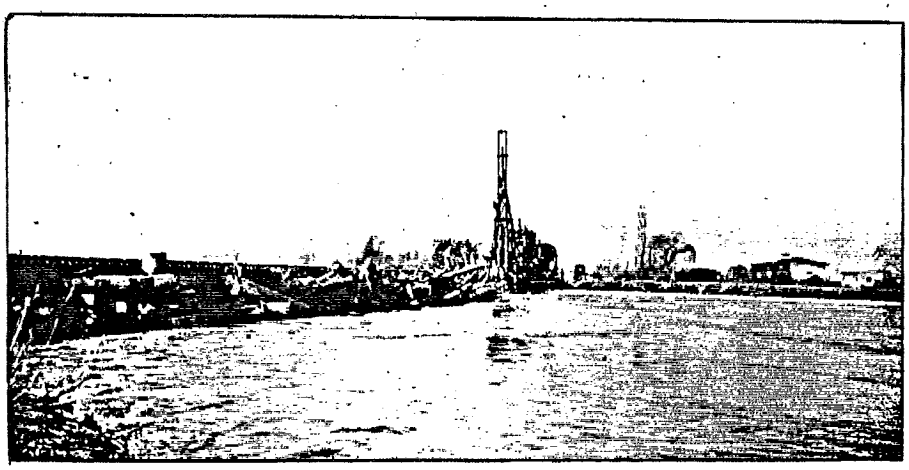


Figure 22. Los Angeles River at the Southern Pacific Railroad bridge during flood of January 17, 1916. Los Angeles County Flood Control District photo.

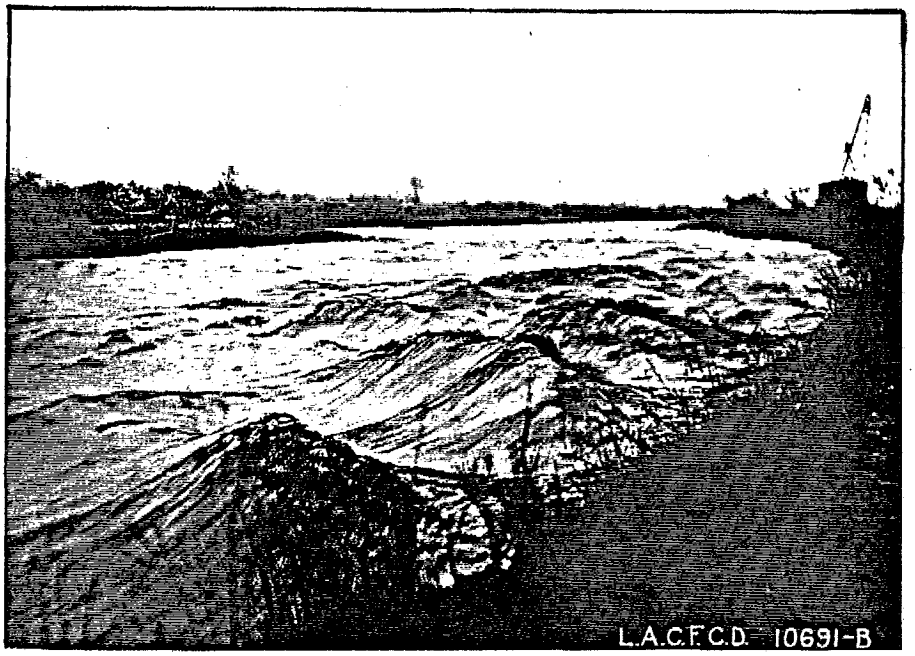


Figure 23. Flood of December 19, 1921. Rapids on the Rio Hondo, one mile above the confluence of the Los Angeles River. (L.A. County Flood Control District)

Figure 24. The March 1938 flood was one of the worst natural disasters in the history of the city.

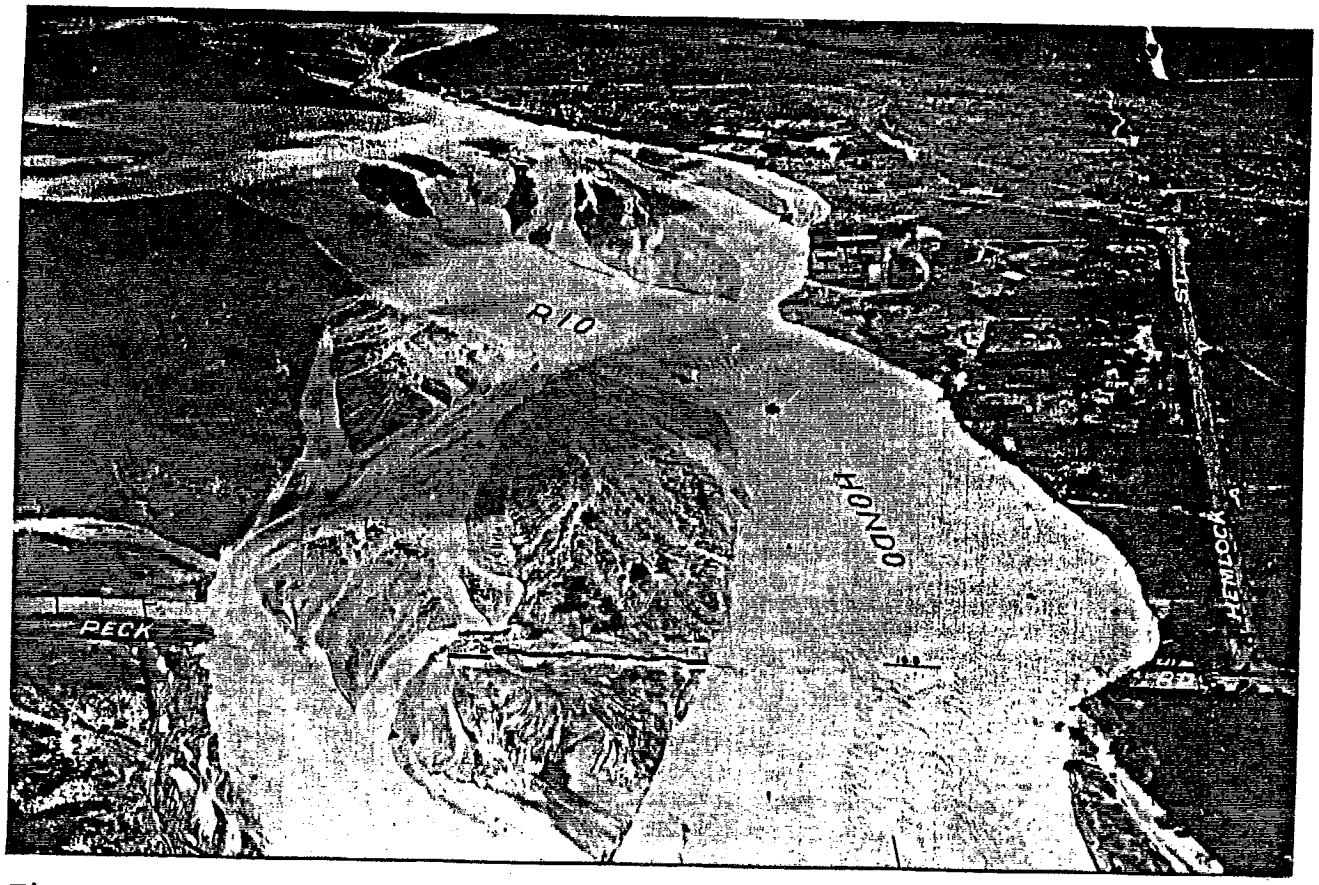


Figure 25. The Rio Hondo during the flood of March 1938. (US Army Corps of Engineers photo)

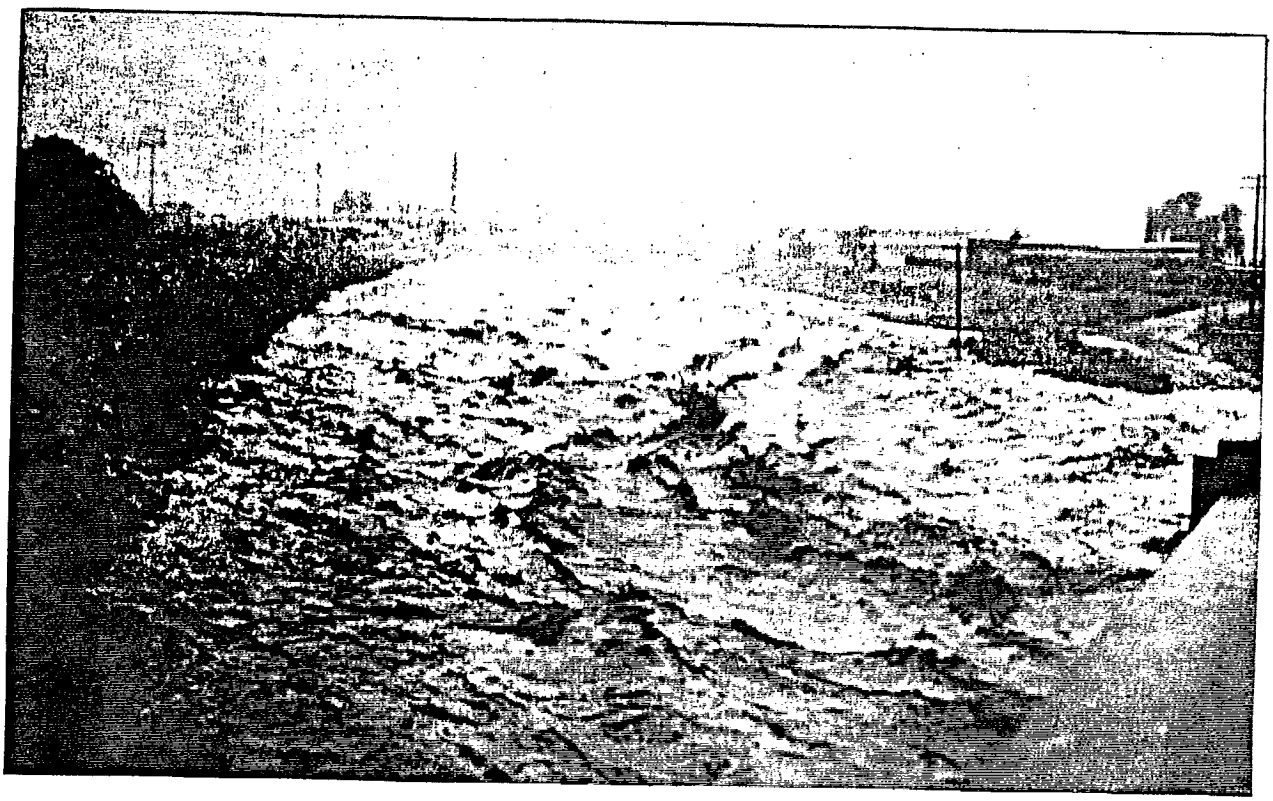


Figure 26. Rapids on the Los Angeles River, upstream from the Soto Street Bridge, March 1938. (US Army Corps of Engineers photo)

Figure 27. Floodwaters from Pacoima Wash in business district of Van Nuys during the flood of January 1952. (Corps of Engineers photo)

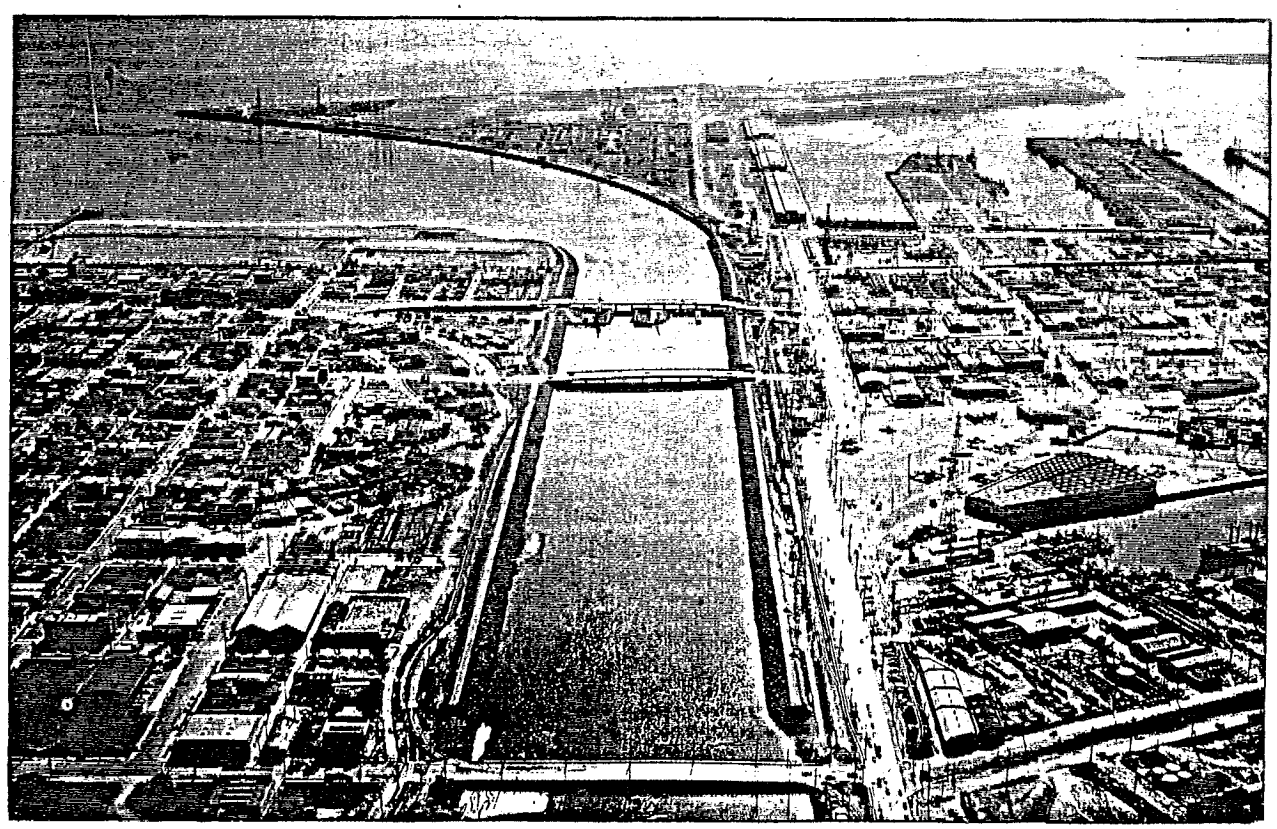


Figure 28. Flood control channel on the lower Los Angeles River at the Pacific Ocean was completed in 1953. (US Army Corps of Engineers photo)

Figure 29. Upstream view of Los Angeles River Channel above the Butte Street Bridge before improvement. (US Army Corps of Engineers photo)

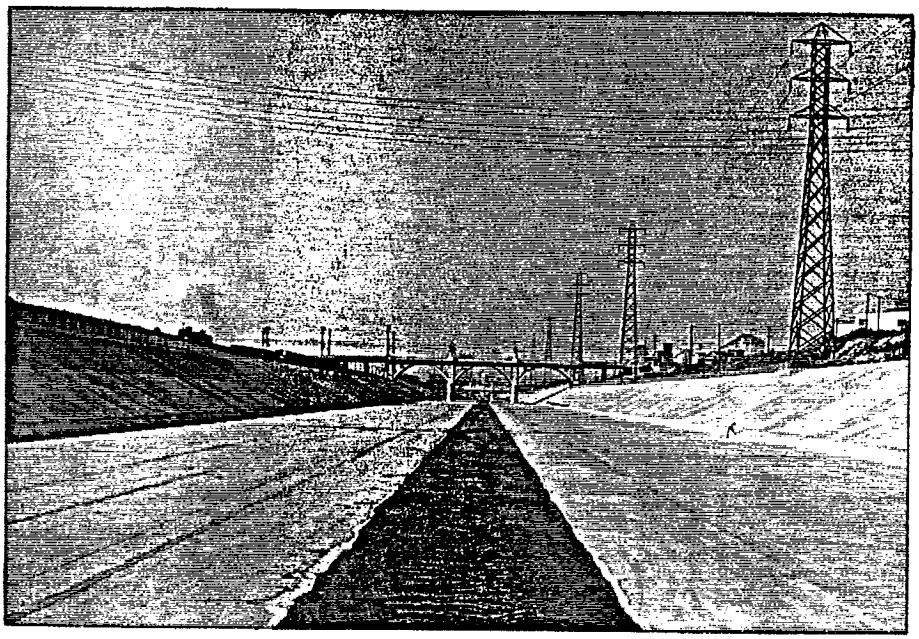


Figure 30. View of the Los Angeles River Channel at the same location as in Figure 29, after improvements. (US Army Corps of Engineers)

PLATES 1-5 FLOOD PLAIN MAPS

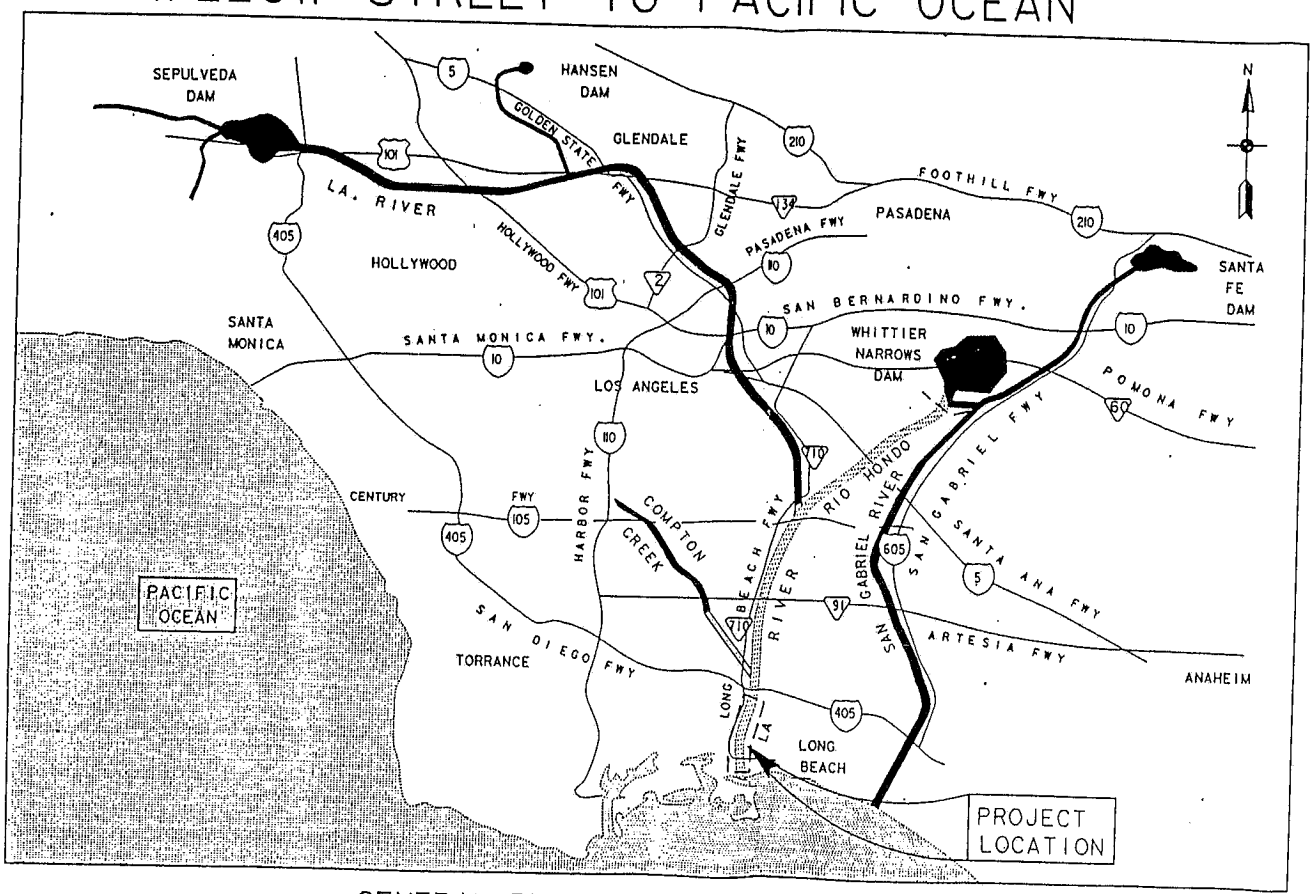
The following plates were furnished by the U.S. Army Corps of Engineers, Los Angeles. The maps detail flood plain inundation potential within the Los Angeles Basin.

The maps were prepared by the Corps of Engineers in December 1991, as part of a projected improvement project on the lower Los Angeles River and San Gabriel River watersheds. Since the focus of this project is the southern part of Los Angeles County, the maps are not intended to be a comprehensive survey of flood potential over the entire basin.

The Corps of Engineers and Los Angeles County Flood Control District project will bring protection from a 133-year flood from the Whittier Narrows Dam southward. Construction has been underway since late 1997.

Gray shading indicates areas subject to flooding if current (133-year upgrade) were not built. Black shading indicates areas subject to flooding regardless of current project improvements.

LOS ANGELES RIVER IMPROVEMENTS
WILLOW STREET TO PACIFIC OCEAN



GENERAL PROJECT LOCATION

SCALE 1"=2 MILES
2 0 2 4

plate 1 - 50-year flood

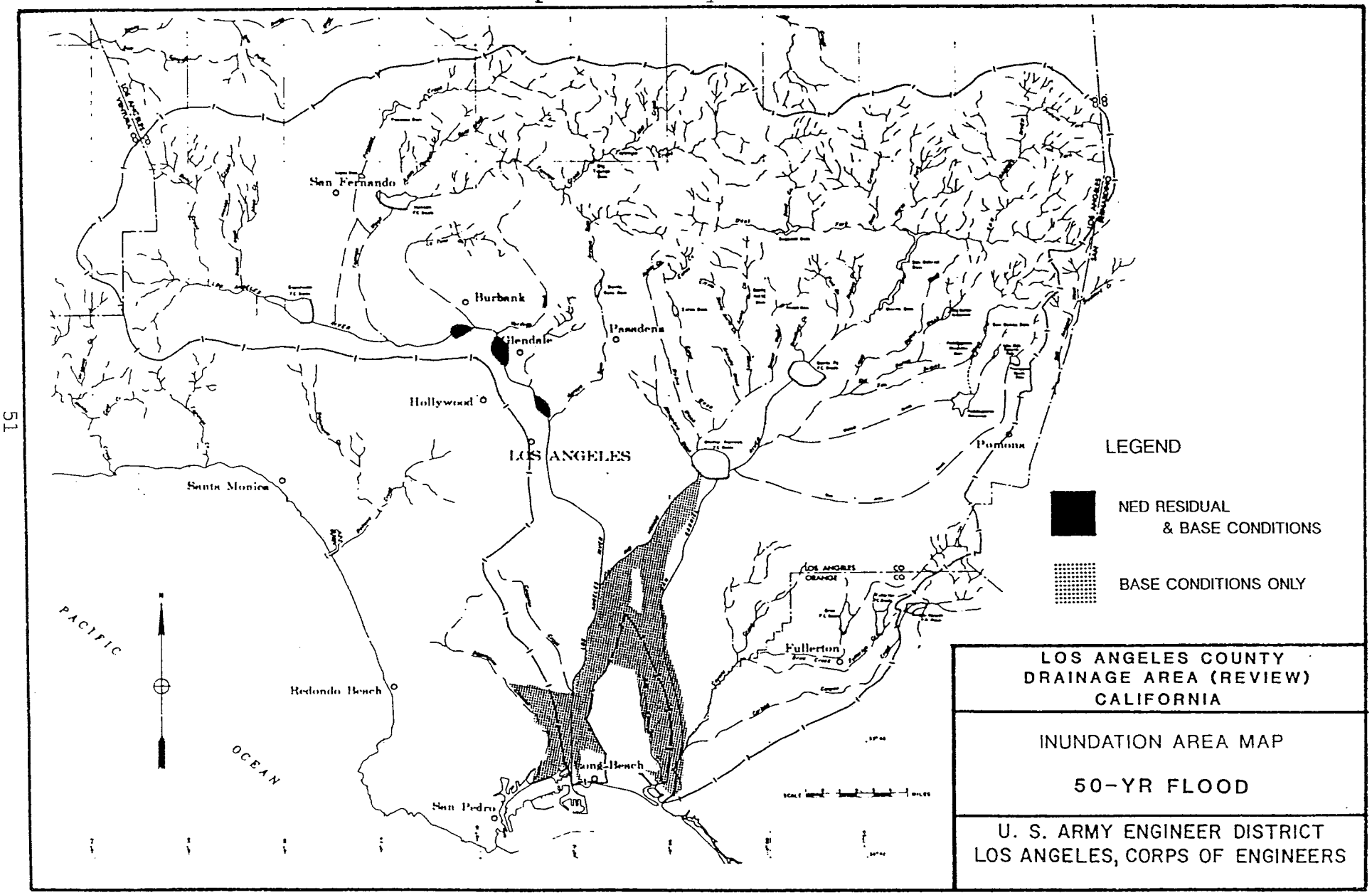


plate 2 - 100-year flood

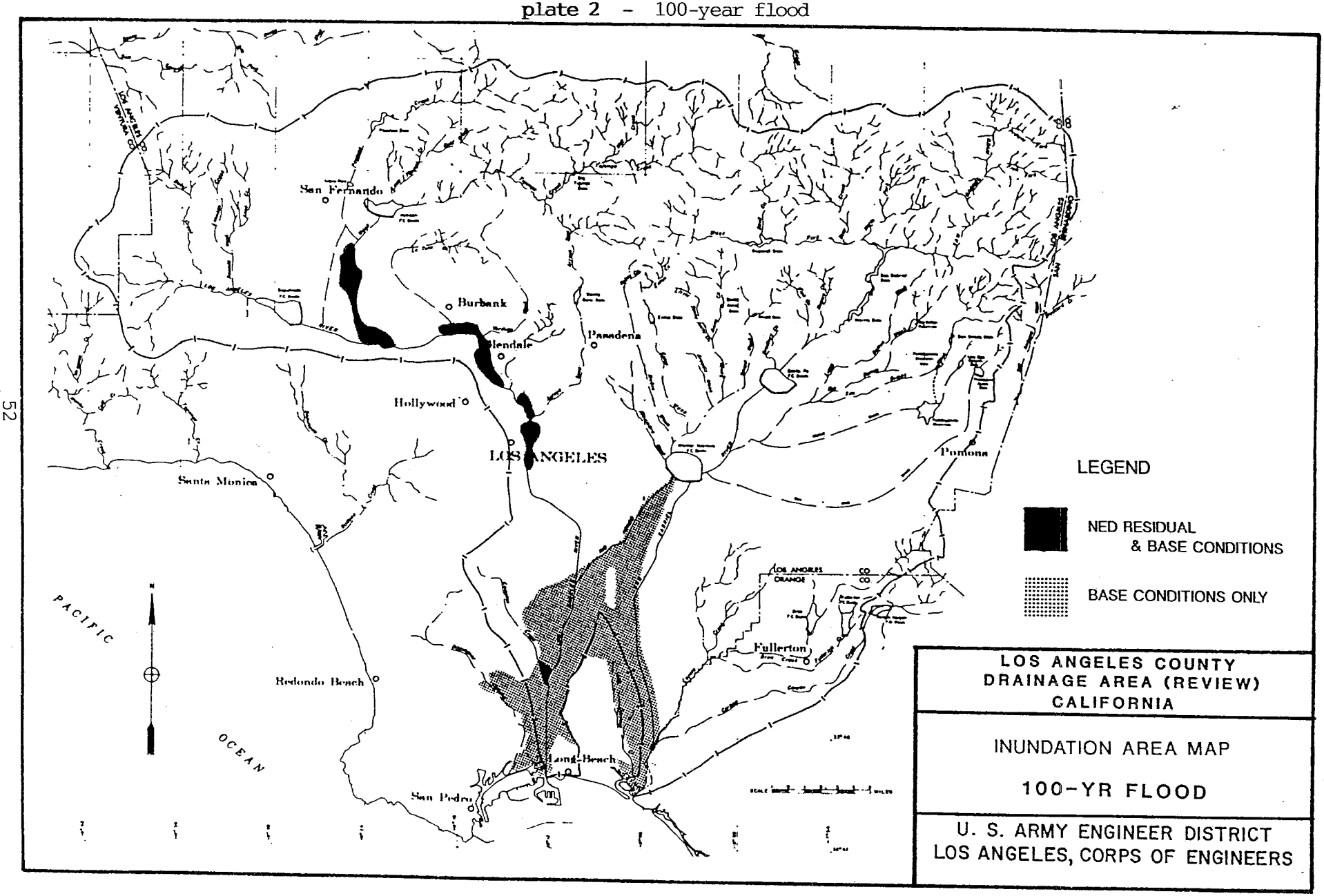


plate 3 - 133-year flood

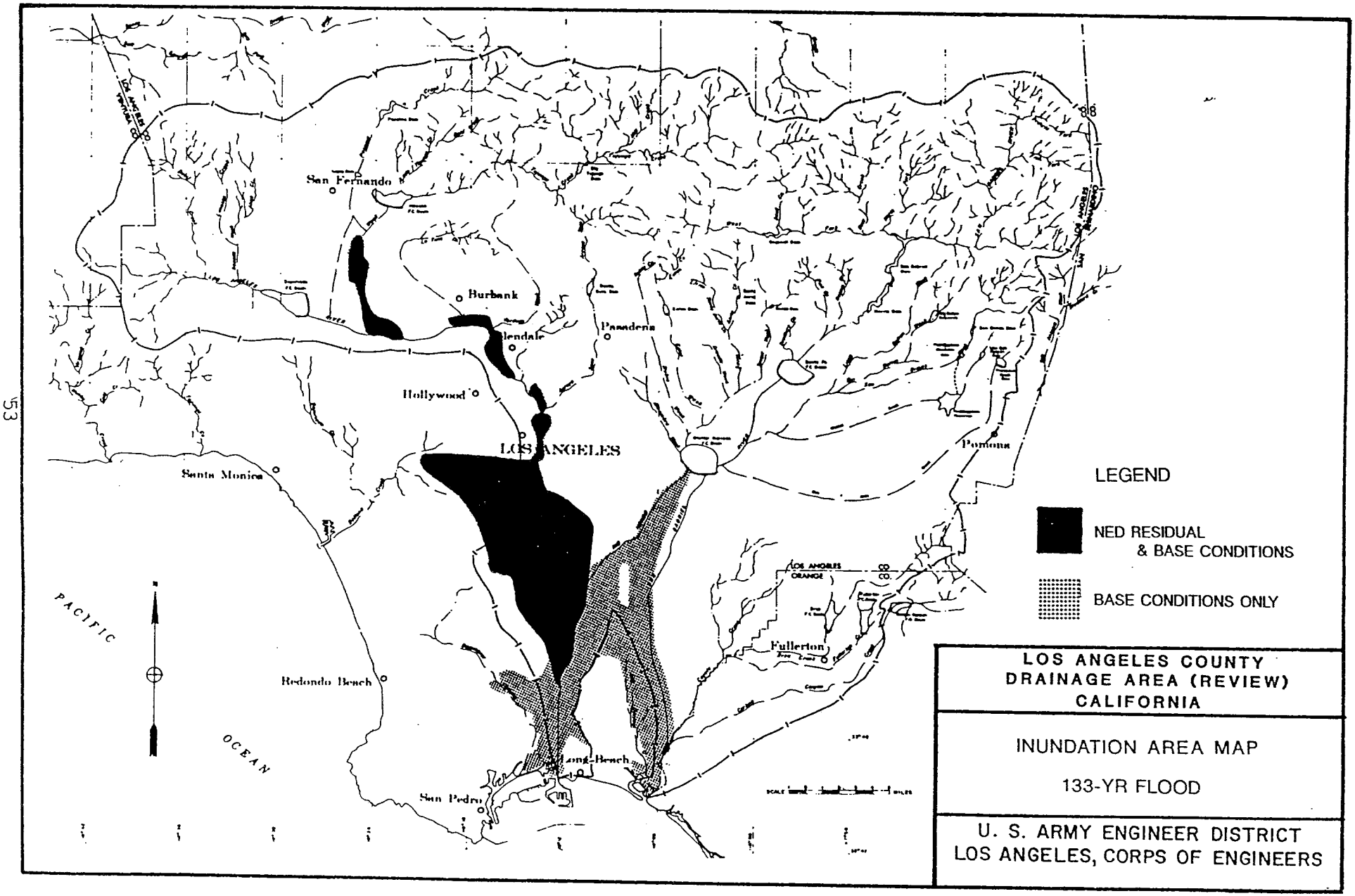


plate 4 - 200-year flood

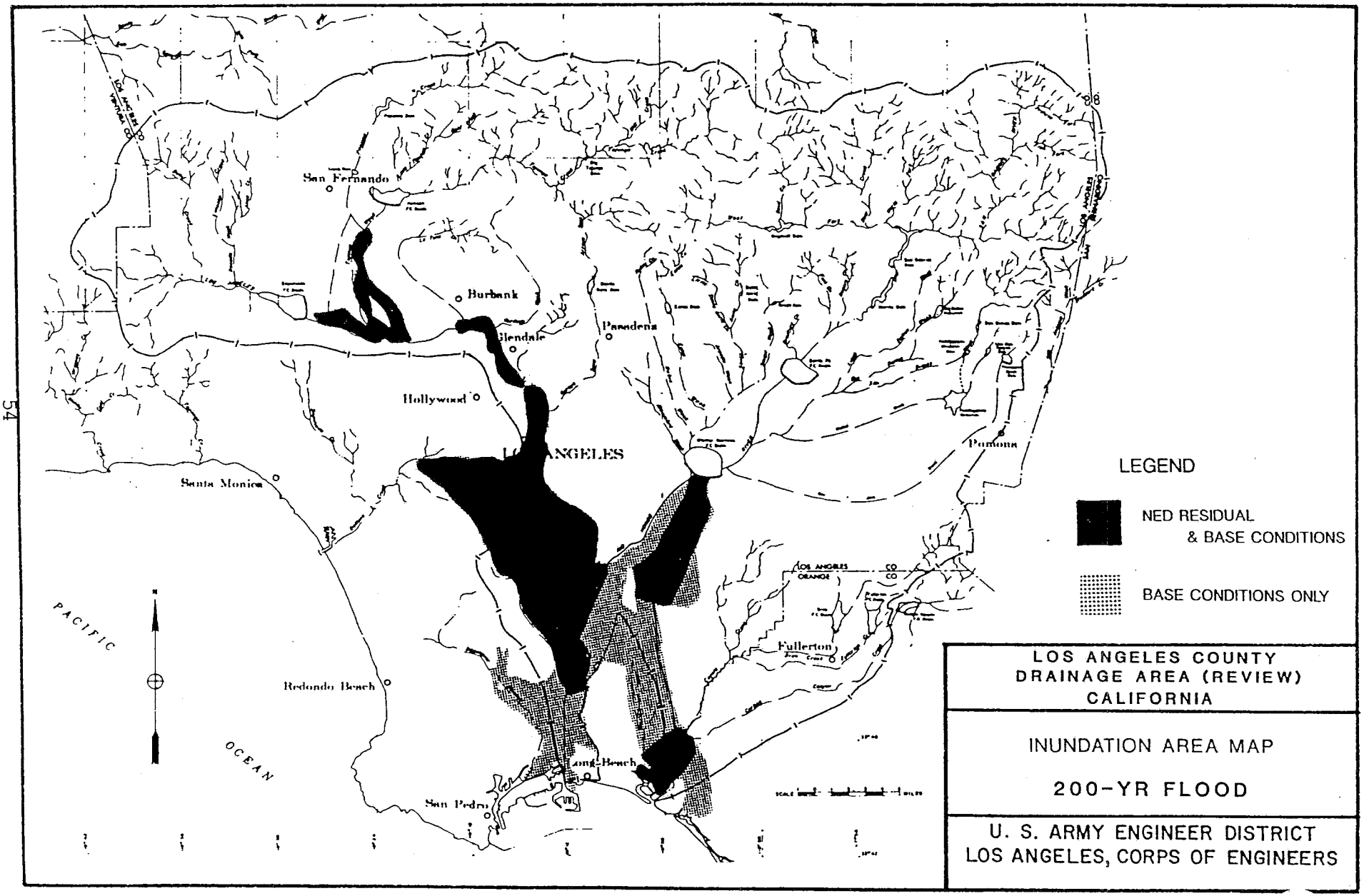
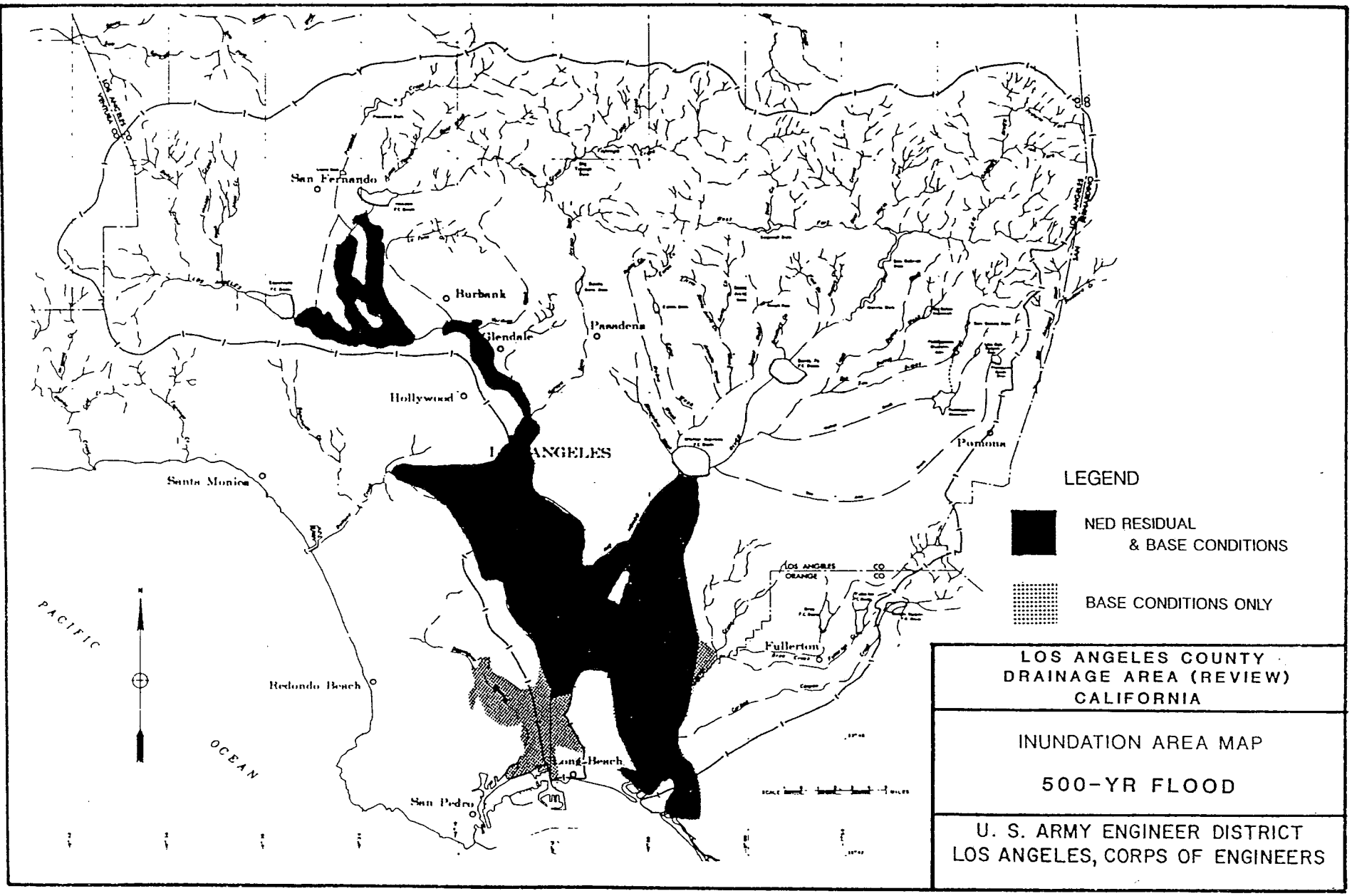


plate 5 - 500-year flood



7. LOS ANGELES CLIMATE AND STORM HISTORY

Prehistoric (Paleoclimatology)

Paleoclimatological data are lacking over the United States in general, and over the southwest in particular. To complicate matters, some of the studies of prehistoric weather in the region have been contradictory. Moreover, global and North American climatic patterns and dynamics are not necessarily reflected in Los Angeles Basin. Los Angeles has always been a modifier of world climatic change by virtue of its encapsulated topography, and by its unusual maritime interface. A brief overview of Pleistocene and recent climatic change globally—and in the Los Angeles area—illustrates this relationship.

The Quaternary Period (i.e., the past one million years) has been distinguished by two remarkable events: (1) Glacial-interglacial climatic oscillation, and (2) the increasing dominance of the Earth by hominids.

During the past 130,000 years, the global climate has swung broadly from warm interglacial to cold glacial and back to warm. Within this framework, there have been many sharp oscillations in global and regional temperature and rainfall patterns.

Between 130,000 and 110,000 years ago (ya) the climate of southern California may have been much like today, perhaps even warmer. About 110,000 ya a very rapid shift occurred (in the space of a few decades) which plunged the planet into glacial conditions. Following the initial chilling, a gradual and uneven cooling continued until about 70,000 ya. This marked one of two glacial maxima in the past hundred millennia.

From 60,000 to 30,000 ya, there was an intermittent warming trend, but temperatures did not moderate to the relatively mild levels of the present interglacial.

Beginning about 30,000 ya there was a major cooling trend which culminated in the Last Glacial Maximum (LGM) at 21,000 ya. This very cold stage lasted for about 4,000 years.

At the time of the LGM, it is suggested that Los Angeles area climate was cooler than now by an average of about 4-9°F, This local cooling was much less dramatic than that observed elsewhere on the North American continent, much of which was buried under thousands of feet of ice.

With the southward suppression of the jet stream over the north Pacific during the LGM, it is believed that the Los Angeles Basin received from 25 to 100% more rainfall than at present. Recent research points more toward the lower end of this estimate. In any case, the cooler climate is certainly indicative of more effective moisture and lower evapotranspiration rates.

During the LGM, vegetation in the Los Angeles area was similar to what is found today on the Monterey Peninsula. Stands of closed-cone pines predominated, with redwoods at higher elevations. The LGM was characterized by alpine glaciation at highest elevations, and permanent ice was believed to exist at elevations above 6,500 feet in the Sierra Nevada in east-

central California. At the close of the LGM, large glacial lakes existed in the Mojave River drainage, and elsewhere in southern California.

Approximately 14,500 ya, a rapid transition to a warmer and wetter Earth occurred. This change is now thought to have happened quickly, in the space of only a few years. The moderating trend was interrupted by the Younger-Dryas cooling between 12,800 and 11,500 ya. The effect of Younger-Dryas on Los Angeles area climate is uncertain. However, at the end of that interval, global warming again occurred rapidly, most of it within the space of only 15 years.

Between 9,000 and 6,000 ya, during the so-called "Holocene optimum", Los Angeles weather was mild and somewhat wetter than today, except that a strong cool and dry spike occurred within the record about 8,200 ya which lasted for one or two hundred years.

From 6,000 to 3,000 ya, Los Angeles climate was slightly warmer and drier than at present. At 2,600 ya, strong global cooling occurred in phase with a 1,500-year temperature cycle. Following that event, the climate across southwestern California has remained more or less the same as at present, except for occasional warm/cool spikes.

A climatological anomaly occurred between 1,500 and 1,400 ya which caused a sharp irregularity in world climatic patterns. An unknown singular event may have precipitated the climate shifting circa 540 Christian Era (CE). At any rate, the latter half of the sixth century CE was marked by *El Niño* circulations of unprecedented strength and persistence. There is an assumption of very strong rains and flooding across southern California during that period. However, we are not aware of any core data which support these conclusions.

Investigations into ocean bottom sedimentation and tree ring patterns have indicated wet and dry cycles, and even statistically wet single-season outliers, within the framework of the past five or six hundred years. Such surveys are considered quite reliable because of historical cross-referencing.

Using such techniques, Michaelson and Haston (1988) have identified two years, **1565** and **1568**, in which rainfall was very heavy throughout southern California. The 1568 event is suspected of approaching extreme values.

The first decade of the seventeenth century was notable for exceptionally cold conditions worldwide. Beginning in 1600/01, a cluster of volcanic events occurred. Strong El Niño conditions developed in 1604 in the eastern Pacific Ocean, displacing storm tracks into southern California.

Recent research by Schimmelmann, et al. (1997) suggests an extreme precipitation event occurring in southern California in approximately **1605**. These heavy rains occurred in a region which had experienced years of drought in preceding years. This extreme rainfall caused massive erosion and unusually heavy sedimentation within the Santa Barbara Basin. These very heavy stream flows predate European settlement in the area, thus no written record exists. Nevertheless, confidence is high that

such events did occur.

Historic Storms

Flooding in the Los Angeles Basin was mentioned by Spanish missionaries as early as the eighteenth century. But from the time of the establishment of the civil settlement at Los Angeles in 1781 until the second decade of the nineteenth century, rainfall rates were remarkably low in the area. Then in **1815**, a massive flood cut a channel across what is now the downtown district, re-routing the Los Angeles River westward, where it emptied into the Pacific Ocean south of Santa Monica, at Ballona Lagoon. A decade later, an **1825** storm returned the Los Angeles River to its present channel, which now flows southward into the Pacific Ocean at San Pedro Bay.

From December 24, **1861** to January 31, **1862** almost continuous heavy rainfall deluged all of California. Heaviest rains were recorded at San Francisco—which averaged almost an inch of rain per day for 30 days, in what was computed to be a 37,000 year event (Goodridge, 1997). In Los Angeles, measurable rain occurred on thirty consecutive days. Flooding and massive mudslides occurred throughout Los Angeles County, destroying property and roadways.

Immediately following the flooding, In the fall of 1862, a severe drought settled into Los Angeles County. No significant rains fell again in Los Angeles until the fall of 1864. This drought doomed the embryonic cattle and livestock industry within the basin.

Almost 26 inches of rain fell at Los Angeles in February and March **1884**. The 1883-84 rainfall season was the wettest in recorded history, with 38.18 inches recorded downtown. There was some loss of life in the February and March floods, and a great deal of property damage. Fifty houses were washed away in floods.

The heavy rains of January 25-26, **1914** were followed by a second and larger storm three weeks later. Large areas of the basin were flooded by the Los Angeles River,. This flooding led directly to the establishment of the Los Angeles County Flood Control District in 1915.

In January **1916** Los Angeles was on the northern fringe of the storm that drenched San Diego County with its all-time record rainfalls. Los Angeles was spared the worst of the disaster, but still received nearly eleven inches of rain between January 14th and 28th, and widespread flooding occurred within the district.

Beginning December 31, **1933** and continuing into New Year's Day **1934**, very heavy rains caused destructive flooding and mudslides across Los Angeles County from Malibu to Covina. Fourteen weather stations in the Los Angeles area reported record maximum two-day rainfalls, with two locations recording 1,000-year events. A rain gauge located on the slopes below Mount Wilson recorded almost fifteen inches of rain on New Year's Day. Glendale and Montrose—along the La Crescenta delta cone northwest of Pasadena—were severely affected by a huge debris flow. The effect of the heavy canyon outflows of mud, debris and boulders was

exacerbated by a fire which had burned over the district during the previous summer. In all, the flooding left more than forty persons dead and destroyed or damaged 500 homes. The City of Pasadena measured 6.21 inches of rain on that New Year's Day in 1934, but the Tournament of Roses Parade went ahead as scheduled.

The storm of March 2, **1938** produced another astounding precipitation and flooding event in Los Angeles County. This flood was the most destructive and violent of the twentieth century. Leading up to the March rains, Los Angeles had received about ten inches of rain in February. On March 2nd—with the ground already saturated—five to seven inches of rain fell across the basin. Rainfall in the surrounding mountains was much heavier. Seventeen mountain gauges recorded ten inches or more of rain—with a few receiving up to 18 inches. Stream flows recorded by gauging stations within the San Gabriel Mountain watershed were phenomenal. Forty-nine persons were killed and millions of dollars of destruction was reported. Turhollow wrote that

> *...the City of Los Angeles endured a 2-day nightmare in which the break-down of rail, telephone, highway and mail services left the city with the radio as the sole means of communications. Over an emergency national hook-up, Mayor Frank L. Shaw...reassured the world that: 'The sun is shining over southern California today and... Los Angeles is still smiling.'*

Less than five years later, in **1943**, it rained extremely hard on January 22nd and 23rd. The greatest 24-hour rainfall in California history occurred in this storm when 26.12 inches fell at Hoegees, below Mount Wilson. Fifteen weather stations in the transverse ranges received storm totals exceeding twenty inches—Hoegees had a storm total of 36.34 inches—while many more stations in the foothills and valleys of Los Angeles County reported a one hundred-year event. Goodridge (1998) stated that the area encompassing a 100-year or more return period covered 11,000 square miles, and extended from Santa Barbara County to Riverside County.

Southern California received heavy precipitation through the **1968-69** season, particularly during January and February, when almost 23 inches of rain fell at downtown Los Angeles. A low pressure trough had anchored off the southern California coast, setting up a steady-state subtropical moisture flow across the district. During this event, almost three hundred rain gauges recorded the highest-ever 60-day rainfall totals.

Flood control projects completed before 1968 mitigated property damage in Los Angeles. When the 1969 *El Niño* rains finally ended, Frank G. Bonelli of the Los Angeles County Board of Supervisors stated that "the overall flood control system prevented one of the worst catastrophes in the history of Los Angeles." To the north, across Santa Barbara County and San Luis Obispo County, losses and damage from these heavy rains had been much more severe.

In the month of February **1980**, thirteen inches of rain fell after an abnormally wet January. The Los Angeles River slightly

overflowed the levees at the lower end of the river at Wardlow Road. The 129,000 cfs river gauge measurement at that location was the highest recorded since records began in 1928. This 40-year flood event broke through a barrier that was supposed to withstand a 100-year flood, which caused the Corps of Engineers to re-evaluate flood protection for the lower Los Angeles River.

The January 4, **1995** storm caused about six million dollars damage, mostly as a result of urban flooding from record rainfalls in the south portion of the Los Angeles Basin. Between 3:00 and 4:30 p.m. on January 4th, the area in south Los Angeles County between Long Beach and Carson was deluged with up to 3.40 inches of rain, while a gauge near LAX received only 0.12 inches and the Pomona area reported 0.55 inches. Two hundred structures were flooded and one hundred vehicles abandoned. Flood control facilities operated at peak capacity at many locations for short periods of time during the event, but the Los Angeles River did not approach capacity because intense rainfall occurred over only a relatively small portion of the lower drainage basin.

In **1998**, another strong *El Niño* episode produced the wettest February of all time at downtown Los Angeles, with 13.68 inches recorded during the month. Over nineteen inches fell at Montebello Fire Station, just east of the downtown weather station. In the Los Angeles metropolitan area, seasonal rainfall records were established at six key area stations, including Chatsworth with an incredible 44.19 inches. For the entire 1997-98 rainfall season, precipitation over the whole district averaged a whopping 230% of normal. With such huge numbers, it was somewhat surprising to note that the only flooding reported was of the urban and small stream variety—more nuisance than disaster. Several reasons are offered to explain the lack of problems associated with this very heavy rainfall season:

♦ Ample warning, well in advance, of the strong probability of heavy winter rains was provided by the National Weather Service and the media. This prompted extra vigilance in the removal of debris from storm basins and flood channels. When rains did occur, the National Weather Service, using latest technologies, communicated warnings to emergency officials. This, in turn, led to appropriate action-response.

♦The rains were spread fairly evenly over the course of the 1997-1998 season.

♦Adequate long-term flood control measures by the U.S. Army Corps of Engineers and their partners were largely completed and in place.

8. LOS ANGELES BASIN WIND PATTERNS

California lies within the "prevailing westerlies" zone of the northern hemisphere. The eastern north Pacific high pressure area is the dominant large-scale meteorological feature, affecting the entire state of California, especially during the summer and early fall. This high pressure area, reflected in surface and upper air circulations, produces a broad northwest wind flow across California. This wind flow is modified to a more westerly direction by continental influences as the maritime air nears the California coast.

Two major regional influences result in further adjustments in the broad scale wind pattern in southern California's coastal zones: (1) The blocking influence of the high mountains which ring the district, and (2) the "edifying" effect of the California bight on the predominant northwest flow.

The transverse ranges divide Los Angeles County into semi-desert and coastal sections and further isolates the Los Angeles area from the rest of California, and vice-versa. The mountains reinforce the predominant sea breeze and land breeze patterns across the coastal plain.

There are a plethora of data, in general remarkably consistent, that have been produced by various agencies to analyze surface and low-level wind patterns across the Los Angeles Basin. The South Coast Air Quality Management District (AQMD) and the California Air Resources Board regularly monitor wind data over southern Los Angeles County. Historic wind data consist principally of Weather Bureau, National Weather Service and FAA airport wind data. These data are stored at the National Climatic Data Center in Asheville, N.C. In addition, most area airports maintain wind rose diagrams, reflecting predominant wind speeds and directions. These diagrams were carefully prepared by federal authorities from the 1930s until the 1950s.

As is often the case with climatological data which span more than half a century, there are some incongruities in National Weather Service and FAA airport wind records. Sometimes data problems occurred because of changes in exposure and equipment at official sites, but also because of differences in methods of wind speed evaluation. For example, the Weather Bureau used six different sites and various types of equipment in measuring wind at downtown Los Angeles. In 1964, wind data evaluation for downtown was transferred to AQMD. Then, the National Weather Service ended its participation in the program altogether in 1974.

Moreover, the LAX wind tower was relocated in 1960 and lowered from 59 feet to 20 feet above ground level. Interestingly, the average annual wind speed at LAX promptly increased from 6.6 mph to 7.9 mph. And in 1996, the United States government changed the official period of evaluation of wind speed from one minute to two minutes.

There are more than fifty official government wind monitoring sites in the Los Angeles area. The National Weather Service and FAA together operate about two dozen of these. A large number of

wind sensors have been installed since 1990 by various agencies, public and private, in addition to a proliferation of wind monitoring equipment owned by private citizens. Only a few of these wind gages archive wind data on a continuous basis, although most instruments report once-hourly or peak winds.

General Wind Patterns

For downtown Los Angeles, the predominant wind direction is from the west-southwest for most of the year. The average annual wind speed is 6.2 mph. But there are significant diurnal and seasonal exceptions to this normal.

Generally, most of the Los Angeles Basin experiences light and variable gravity or land breezes during the night and morning hours. Winds then reverse to onshore sea breeze patterns during the late morning or afternoon hours, depending on distance from the ocean and local topography. The direction of this onshore wind flow varies from west-southwest (at LAX and downtown) to south-southeast (at Long Beach, El Monte and Pasadena) to southeast or east (at Van Nuys and Burbank). Afternoon sea breezes normally range from 10 to 15 mph, but can be enhanced by increases in onshore pressure gradients.

At downtown Los Angeles, strongest mean monthly wind speeds occur in March, with lightest winds usually recorded in August and September. A peak wind (one minute average) of 49 mph was recorded from the north during a Santa Ana windstorm in January 1946. Wind gusts to 70 mph or more have a return period of more than 100 years, while winds can gust from 55 to 60 mph once in 25 years. (Some studies have suggested greater return periods.) Strongest winds, from a northerly direction, occur in winter as a result of Santa Ana katabatic conditions. More rarely, strong southeasterly winds gust to 50 mph or more as a result of the transition of a north Pacific winter storm across the district.

The average annual wind speed at LAX is 7.5 mph, the highest value at any official weather station (excluding beach sites) within the Los Angeles Basin. Average monthly winds are highest at LAX in April, at 8.5 mph, and lowest in December, at 6.6 mph.

Winds are less strong at Long Beach Airport, where the annual average wind speed is 6.3 mph.

Lightest annual average winds across the basin include Pasadena at 3.1 mph, Reseda with 3.0 mph, and San Dimas at only 2.2 mph.

Two wind patterns occurring over south coastal California, the Catalina Eddy and the Santa Ana winds, are locally famous effects of a special combination of terrain and atmospheric pressure gradients. Phenomena similar to these occur in a few other areas of the world, but nowhere do they affect such a large number of people and almost nowhere else do they so impact local climatic conditions.

Catalina Eddy

From April or May through October, the normal west or northwest wind pattern

along the southern California coast is sometimes interrupted by southerly coastal winds, increasing the depth of marine layer and raising the bases of the stratus clouds over the basin.

The low level winds are reflective of a mesoscale vortex which establishes itself near Catalina Island east of the primary northwesterly wind flow offshore. Evident on satellite loops, this *Catalina Eddy* circulation is nature's air conditioner and air purifier for the Los Angeles Basin. It occurs in contradiction to the basic geostrophic wind but, paradoxically, is caused by the geostrophic wind in an interaction with topography.

Such eddy circulations are not unique to southern California; they have been observed to the south of Vancouver Island, British Columbia, and on coastal sections of Oregon and Washington.

Between Point Conception and the Mexican border, the California coastline extends in a more eastward or south-eastward direction, forming the Southern California Bight. Strong winds blowing from the northwest along the central California coast cause a lowering of pressure to the south and east of Point Conception. This tends to turn the winds to a more westerly direction as they head across the inner waters toward the Los Angeles area. When the northwest flow is strong enough, a low-level vortex called a Catalina Eddy is formed. This cyclonic circulation causes further turning of the low level wind field, and westerly flow into the Los Angeles Basin becomes southerly (Figure 31a).

Considerable cyclonic rotation is established in the lowest layers of the atmosphere above the basin, with a sharp increase in the force of southerly and southeasterly surface winds, and considerable mixing up to 5,000 feet above the surface. The south to southeast wind flow is especially significant, averaging 10-20 mph at Torrance, Long Beach, and across the San Fernando Valley.

Although Catalina Eddy circulations can occur at any time of the year, they are most common from April through early October, with a maximum frequency in May and June. This seasonal distribution is largely due to the lack of strong broad-scale weather makers, such as low pressure systems and fronts, which tend to have a deleterious effect on eddy circulations. Certain atmospheric conditions increase the likelihood that an eddy will form. At the surface, high pressure building across the Pacific toward northern California will increase the strong northwesterly low-level flow along the central coast, essential to the development of an eddy. Additionally, surface low pressure located in southern or central Nevada will also assist in the eddy's development. An upper level trough of low pressure along the west coast of the United States will often provide just enough upward air motion to help spin up an eddy circulation.

The process that sets up a Catalina Eddy is analogous to that which initiates a *sundowner* (downslope wind event) in Santa Barbara; indeed the sundowner and Catalina Eddy are closely related cousins and frequently occur together. Sundowner winds near Santa Barbara cause a secondary pressure minimum there, which is the result of mountain wave activity.

This serves to intensify the Catalina Eddy circulation further.

Eddy circulations generally last for 3 to 5 days, or as long as synoptic conditions are stable. The demise of the eddy circulation can be caused by a sufficient decrease in northwesterly flow along the central coast, the disruption from a strong synoptic scale weather system, the deepening of the marine inversion to 6,000 feet, or a combination of all three.

Santa Ana Winds

Santa Ana winds are one of the principal signatures by which Los Angeles weather is known. Santa Anas are offshore winds—usually warm—blowing from the mountains to the coast, and occurring principally in the fall and winter. They are a type of downslope (foehn) wind which occur in many other regions of the planet. But perhaps nowhere else do such winds impact so many people with so much force, and possess such extensive opportunity for damage and destruction.

Fortunately, destructive Santa Ana winds are rare. For most Angelinos and for the great majority of Santa Ana events, the effects of these offshore wind conditions are benign and even welcome. The Santa Ana condition is usually one of warm temperatures when the rest of the United States is in the grip of winter. For most of the district, Santa Anas are marked by light coastal winds, clean air and low humidity.

There is much contradictory information in circulation with respect to Santa Ana winds. An excellent treatment of the technical aspect of Santa Ana winds was authored by Ivory Small in 1995 and is referenced elsewhere in this study. A fine historical perspective of Santa Ana winds was presented by Art Lessard, Don Gales, and Don Lust in 1988.

The name *Santa Ana* was applied to Los Angeles' offshore winds over 100 years ago, with an early article describing "Santa Anas" appearing in the *Los Angeles Evening Express* on November 15, 1880.

On November 21, 1880 one Charles L. Moore of Compton wrote to a relative describing a recent Santa Ana wind episode:

> *We have had some terrible Santa Anna [sic] wind storms which at Santa Anna [sic] blew orange trees out by the roots and stripped cornfields leaving them bare and scattering the corn over other mens [sic] farms. I am told they have their houses propped up with poles.*

It is likely that the Santa Ana name (variously spelled "Santa Anna" or "Santana") derives from Santa Ana Canyon in Orange County from which the winds sometimes blow with considerable force.

An Associated Press account of a strong windstorm which occurred about Christmas Day in 1901 popularized the Santa Ana winds on a national scale. The wire service's exaggerated account of the winds, and the alleged damage caused by them, resulted in an understandable reaction in the city of Santa Ana.

Following this incident, the Santa Ana Chamber of Commerce tried, without success, to have newspaper editors refrain from using the name "Santa Ana" in connection with area's winds. Notwithstanding the city's objections, the U.S. Weather Bureau published a Climatology of California in 1903 which referred to the winds as "Santa Ana", and that designation has remained in common use throughout the twentieth century.

Santa Ana winds are a type of katabatic or downslope winds, generally warm and dry, broadly affecting the Los Angeles Basin with the strongest impact felt below passes and canyons of the coastal mountains.

Offshore winds from the northeast or east must reach 30 mph or more below passes and canyons to reach minimum criteria for Santa Ana wind advisories. More typically wind speeds are in the 40 to 55 mph range, and in extreme cases winds can gust locally to over 100 mph.

An understanding of Santa Ana winds begins with a review of the principles of fluid dynamics, which have been vigorously adapted since 1885 to explain the structure of downslope winds. Jakob Bernoulli's equation relating fluid pressures and velocities has been used in discussions of winds channeling through topographic gaps and canyons. Canyon winds are evidently part of the Santa Ana process.

Hydraulic flow models used in fluid dynamics to describe open channel flow over a barrier were adapted by Long (1953) in a mainly successful application to atmospheric analysis. Horel (1992) states that recent investigation indicates that much of observed downslope wind phenomena can be explained by utilizing the "hydraulic jump" concept. In this model, a breaking wave forms in the airflow on the lee side of a mountain barrier where strongest winds occur as lee waves.

Another factor in the establishment of a Santa Ana wind regime may be the vertical propagation of waves through the atmosphere. Upper atmosphere investigations since the 1970s have suggested the presence of lee waves rotating vertically through a dynamically layered troposphere. These studies appear to be confirmed by recent computer applications at the University of California Santa Barbara.

An indicator of lee wave formation and activity is the rapid hydrostatic lowering of surface pressure during the maximum surface wind occurrence in the affected areas. Rapid increases in surface pressure across the Los Angeles Basin invariably signal the end of the Santa Ana winds, irrespective of diurnal or synoptic scale pressure tendencies.

Some combination of canyon wind (Bernoulli effect) and hydraulic jump or reflective breaking wave is involved in the process that generates Santa Ana winds. The synoptic scale event that initiates this process is the formation of a dome of high pressure over the Great Basin.

High pressure areas build in the fall and winter over the Great Basin as cold air translates into that region from Canada. When the surface pressure gradient reaches or exceeds ten millibars as

measured from Tonopah, Nevada to LAX, wind gusts can reach 70 mph in the mountains and below passes and canyons near Los Angeles. If in addition to strong gradients from the Great Basin, pressure gradients increase to eight millibars or more from San Francisco to LAX, a general Santa Ana condition will ensue that will affect most of the Los Angeles Basin. In this event, winds may gust to 40 mph or more at LAX and at downtown Los Angeles.

Santa Ana winds typically affect southern California via three main sources: (1) The Santa Clara River Valley, impacting the San Fernando Valley, Malibu Hills and Ventura County; (2) Cajon Pass, affecting Fontana, Santa Ana, eastern and southern Los Angeles County; and (3) Banning Pass, which affects southern Orange County (Figure 31b).

Santa Anas may last from one day to up to a week or longer. They occur most often in the fall and winter, with a frequency of occurrence peaking in the month of December.

Santa Anas affect the Los Angeles Basin very unequally; winds tend to channel in "the usual places" below specific passes and canyons. Within these channels, winds tend to come in gust clusters, letting up from time to time and blowing fiercely at other times. Strong winds may blow in one neighborhood, while a few blocks away there are only gentle warm breezes.

In the extreme, Santa Ana winds represent a potential threat to public safety. The winds can spread destructive fires, take roofs off of houses, and uproot trees. They can carry clouds of dust, lowering visibilities, and they can pose serious dangers for motorists, pilots, farmers, and mariners.

In November 1961, flames driven by Santa Anas at speeds in excess of 100 mph resulted in a loss of hundreds of homes in the exclusive Bel Air district of Los Angeles.

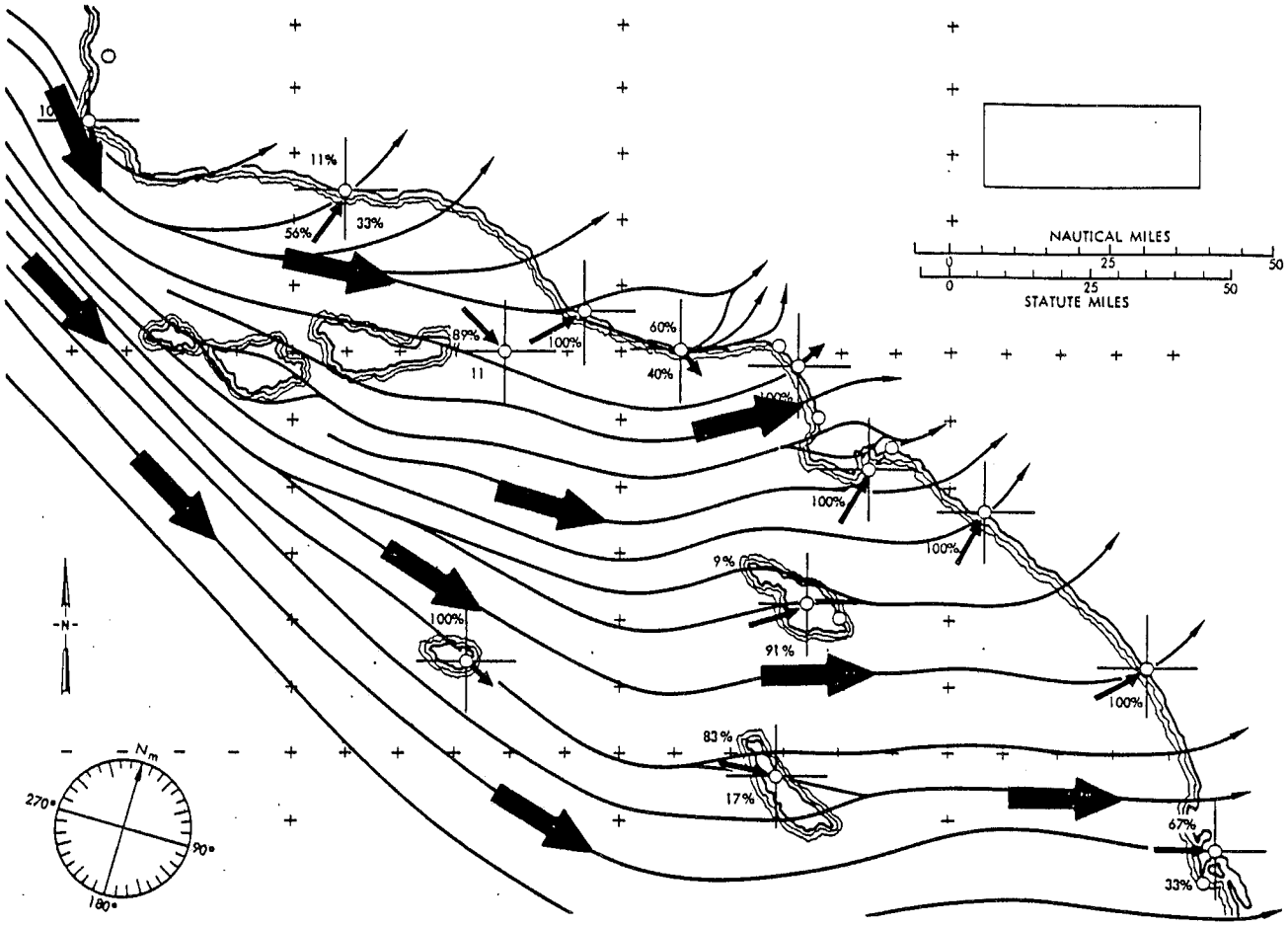
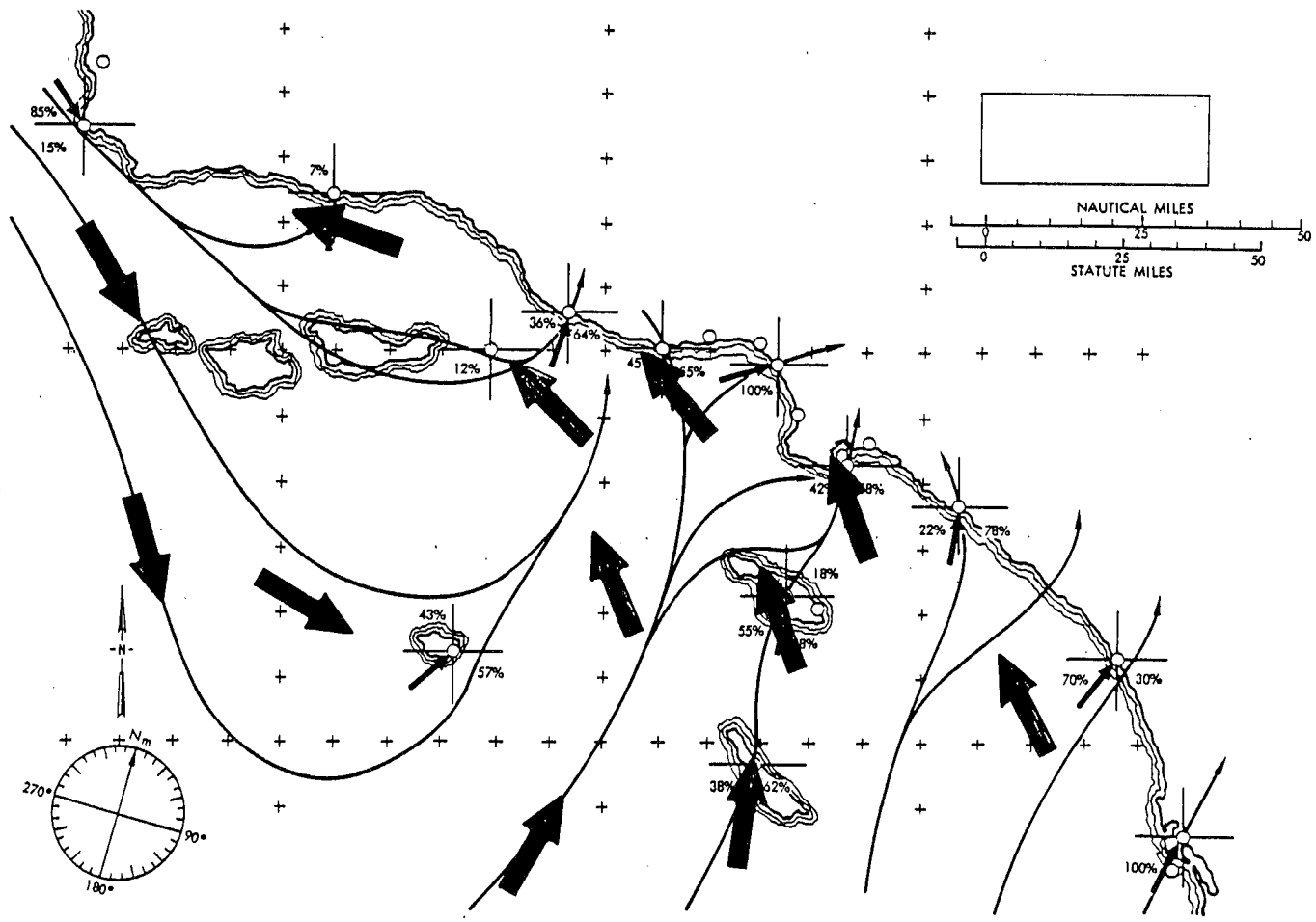


Figure 31a. Typical wind pattern across the Southern California Bight.



Catalina Eddy Circulation

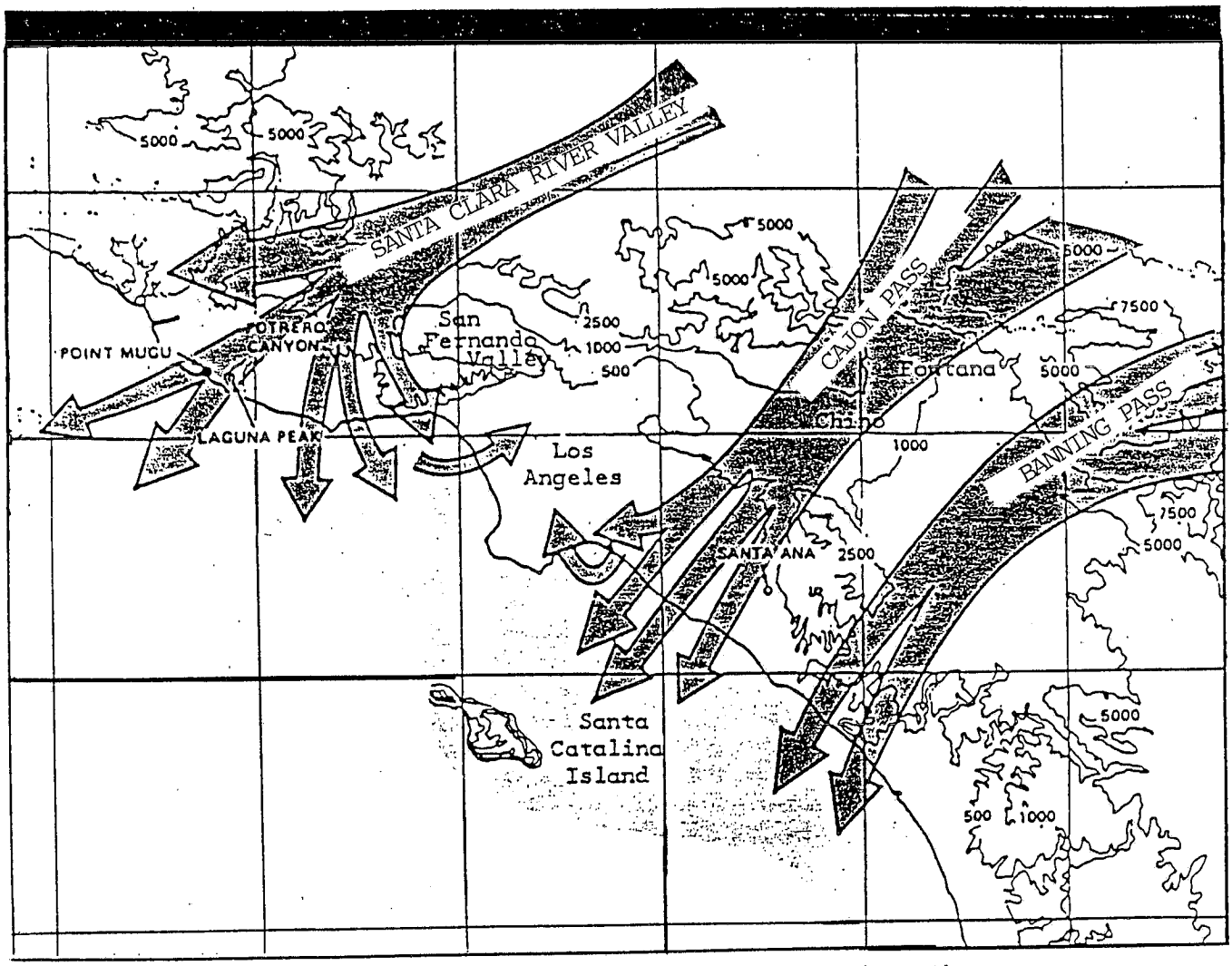


Figure 31b. Three main Santa Ana wind corridors into the Los Angeles Basin.

9. MISCELLANY

Relative Humidity

Humidity is an indicator of the amount of water vapor in the air. Relative humidity is a ratio between the amount of water vapor actually in the air, at a given temperature and pressure, and the amount of water vapor which the same parcel of the air could hold if it were saturated. This is expressed as a percentage.

Moist conditions are common in Los Angeles. The relative humidity averages 63 percent at downtown Los Angeles on an annual basis. The average daily maximum relative humidity is 75 percent, generally occurring in the early morning hours around sunrise. The average daily minimum relative humidity is 53 percent, normally occurring in the early afternoon.

Humidity readings are higher than the annual average, by 10 to 20 percent, during the time from June through early October. Lowest levels of the atmosphere tend to be drier in the Los Angeles area during the winter season; relative humidity levels are generally 10 to 20 percent below average annual levels from November through April. The relative humidity frequently ranges between 90 and 100 percent during late night and morning hours in the summer and early fall.

Dry air with very low relative humidity is infrequently observed at surface weather stations within the Los Angeles Basin. Relative humidity values of less than twenty percent occur mainly with offshore Santa Ana winds, when dry desert air enters the basin from the northeast. These conditions are most likely to occur from October through April, with an annual frequency of about 10 to 15 days. On rare occasions, relative humidity readings of less than five percent have been measured with reliable instrumentation across the Los Angeles Basin.

Evapotranspiration

The term evapotranspiration refers to the total transfer of moisture from the soil to the air over a field growing a well-established crop. Some of the water loss is by evaporation from the surface of the soil, while other moisture is carried upward and transpired from the leaves and other surfaces of plants.

At Los Angeles, the average annual evapotranspiration is 47.5 inches. The average daily evapotranspiration rate is 0.13 inches, with a range from 0.04 inches per day in December to 0.23 inches per day in July.

Average annual evaporation, as measured from a standard four-foot pan, is estimated to be about 70 inches per year, but the rate is highly variable due mainly to surface wind irregularities. Approximately two thirds of total annual evaporation occurs in the months from May through October.

Clouds and Fog

The City of Los Angeles is a mostly sunny place. The city averages 185 clear days per year, with "clear" defined as zero to three tenths of the sky covered by clouds.

At downtown Los Angeles, dense

fog—with visibilities of 1/4 mile or less—occurs on an average of approximately 17 days per year. Thick fog commonly results from a shallow intrusion of marine air over the coastal plain. Dense fog is generally a nighttime phenomenon, and tends to dissipate quickly during morning insolation.

Dense fog—thick enough to suspend aircraft operations—is most likely to be observed at LAX from November through January, with each of these months averaging about six days on which heavy fog occurs for part of the day. Downtown the situation is different, as heavy fog occurs most frequently in September and October, which average three days each with dense fog.

The months with the most persistent low cloud cover are May and June. June averages just nine clear days at LAX, versus a maximum monthly normal of fourteen days in November. Downtown, the average number of clear days ranges from 11 in May to 22 in August.

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Second Section

CLIMATE DATA

LOS ANGELES AREA

CLIMATOLOGICAL AVERAGES AND RECORDS

Notes: *"Average" data columns are based on standard 30-year climate base from 1961 - 1990.*

All other data are based on period of record.

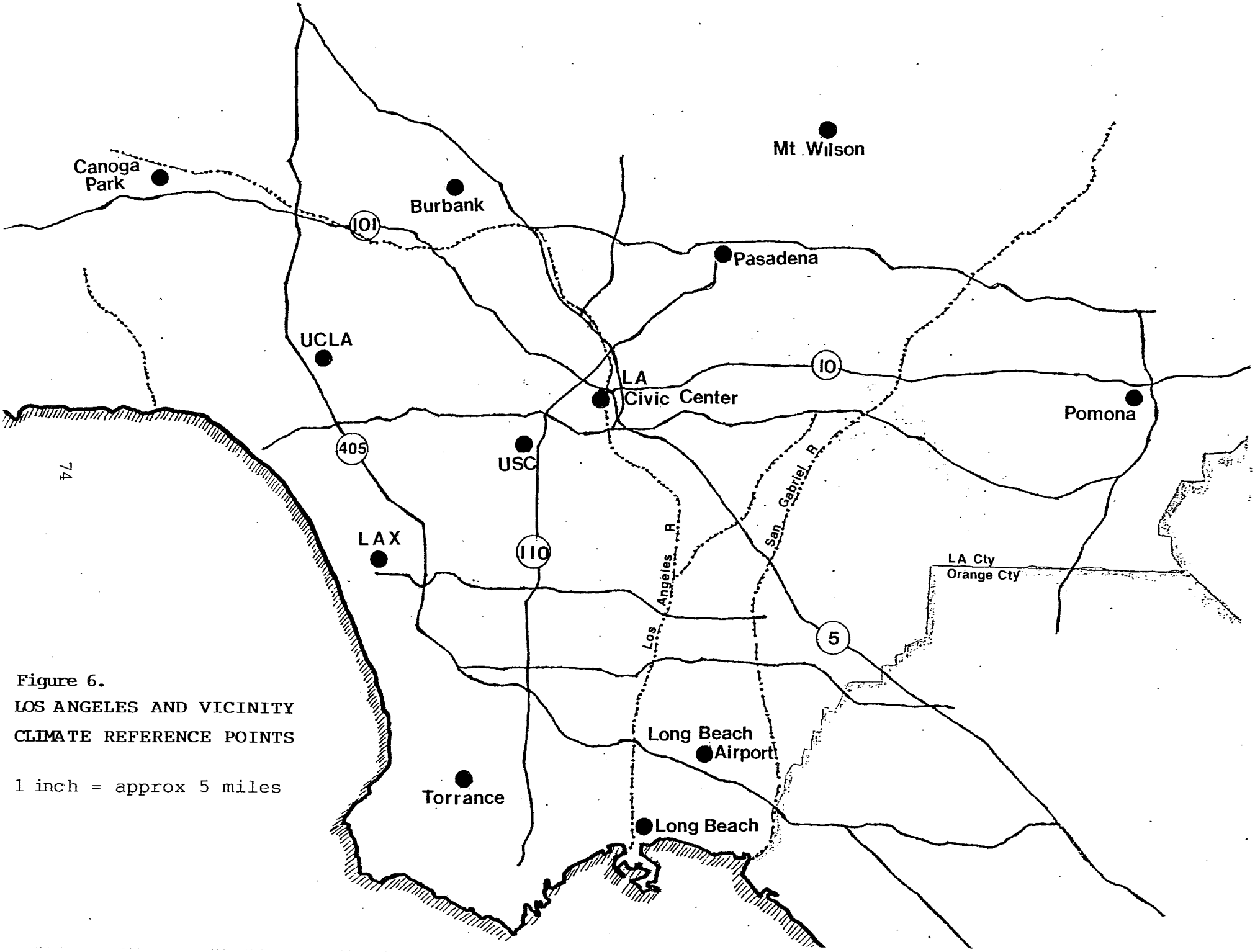

Figure 6.
LOS ANGELES AND VICINITY
CLIMATE REFERENCE POINTS

1 inch = approx 5 miles

Table 1.

Los Angeles Area Climate Stations

STATION	IDENT	LAT/LONG	ELEV	PERIOD OF RECORD*
Burbank Valley Pump Plant	041194	3412/11822	0660 feet	12/1939 to 07/1999
Canoga Park Pierce College	041484	3411/11834	0790	07/1949 to 07/1999
Long Beach Downtown	045082	3346/11812	0034	12/1920 to 07/1999
Long Beach Airport	045085	3349/11809	0040	04/1958 to 07/1999
Los Angeles Airport	045114	3356/11824	0100	12/1931 to 07/1999
Los Angeles Civic Center	045115	3403/11814	0270	07/1877 to 07/1999
Mount Wilson Post Office	046006	3414/11804	5710	03/1940 to 07/1999
Pasadena Civic Center	046719	3409/11809	0860	12/1927 to 07/1999
Pomona Cal Poly	047050	3404/11749	0740	01/1931 to 05/1995
Torrance Airport	048973	3348/11820	0110	01/1932 to 07/1999
U C L A	049152	3404/11827	0430	01/1933 to 07/1999

* Refers to inclusive dates used for computation of climate averages or daily extremes within the scope of this paper. Actual period of record may extend beyond dates indicated.

Table 2. Selected Cities Temperature and Precipitation Data
(by Month)

January

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	67.7	41.3	54.5	92	18/1971	22	29/1979	0	1.9	329	0
Canoga Park	68.6	39.6	54.1	93	14/1975	19	07/1950	0.1	6	338	0
Long Beach	66.8	44.9	55.9	91	16/1976	25	13/1963	0.1	0.2	285	0
LA Airport	65.7	47.8	56.8	88	11/1986	27	04/1949	0	0.1	258	0
LA Civic Center	67.7	48.9	58.3	95	18/1971	28	04/1949	0.1	0.1	222	14
Montebello	69.2	47.8	58.5	86	11/1983	30	08/1982	0	0.2	211	10
Mount Wilson	52.5	36.6	44.6	74	17/1971	9	29/1969	0	10.8	632	0
Pasadena	68.0	43.6	55.8	93	18/1971	23	23/1937	0	1	288	0
Pomona	67.8	40.7	54.3	90	26/1987	21	13/1963	0	7.4	335	0
Torrance	66.9	45.3	56.1	89	16/1976	25	04/1949	0	0.7	280	0
UCLA	66.2	50.5	58.4	91	18/1971	30	04/1949	0	0.1	217	12

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	3.01	15.92	1995	0.00	1984	7.76	22/1943	6	2	1	4.7/1949
Canoga Park	3.31	16.80	1995	0.00	1976	4.41	26/1956	6	2	1	0.0
Long Beach	2.47	12.76	1995	0.00	1976	6.71	20/1969	6	2	1	0.0
LA Airport	2.40	12.71	1995	0.00	1976	4.56	26/1956	6	2	1	0.0
LA Civic Center	2.92	14.94	1969	0.00	1976	5.71	26/1956	7	2	1	2.0/1932
Montebello	4.44	16.66	1993	0.53	1984	4.90	07/1993	7	3	2	0.0
Mount Wilson	7.02	37.82	1969	0.00	1976	11.96	25/1969	7	4	2	40.0/1949
Pasadena	3.78	18.46	1995	0.00	1976	7.08	22/1943	7	2	1	3.0/1949
Pomona	3.38	13.79	1995	0.00	1984	8.50	01/1934	6	2	1	0.5/1932
Torrance	2.98	16.92	1995	0.00	1976	6.53	26/1956	7	2	1	1.2/1949
UCLA	3.41	20.11	1995	0.00	1976	5.75	26/1956	6	2	2	0.0

February

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	70.2	43.6	56.9	92	16/1977	27	15/1942	0.2	0.6	234	7
Canoga Park	71.1	40.9	56.0	94	26/1986	18	06/1989	0.2	3.2	258	6
Long Beach	67.7	46.9	57.3	93	23/1954	33	12/1965	0.2	0	221	5
LA Airport	65.9	49.3	57.6	92	03/1963	34	14/1949	0.1	0	215	8
LA Civic Center	69.4	50.6	60.1	95	20/1995	28	06/1883	0.2	0	170	32
Montebello	71.1	49.0	60.0	93	02/1995	30	15/1990	0.4	0.2	159	20
Mount Wilson	53.2	36.9	45.1	80	14/1985	11	27/1962	0	9.8	557	0
Pasadena	70.1	45.3	57.7	92	20/1995	26	09/1929	0.1	0.5	217	12
Pomona	69.6	42.7	56.2	94	04/1995	23	06/1989	0.2	4.3	253	7
Torrance	67.7	46.5	57.2	92	23/1954	33	15/1990	0.1	0.1	225	7
UCLA	66.9	50.8	58.9	91	03/1995	36	18/1975	0.1	0	188	17

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	3.29	15.52	1998	0.00	1984	4.50	08/1993	6	2	1	0.0
Canoga Park	3.30	18.02	1998	0.00	1964	5.07	10/1992	5	2	1	0.5/1989
Long Beach	2.47	12.09	1998	0.00	1964	4.06	06/1937	6	2	1	0.0
LA Airport	2.51	13.79	1998	0.00	1964	3.91	08/1962	5	2	1	0.0
LA Civic Center	3.07	13.68	1998	0.00	1984	4.80	24/1913	5	2	1	0.0
Montebello	4.27	19.13	1998	0.00	1984	3.70	17/1990	6	3	1	0.0
Mount Wilson	7.55	30.71	1980	0.00	1961	9.79	11/1973	6	3	2	22.0/1951
Pasadena	3.90	19.70	1980	0.00	1984	4.50	28/1991	6	3	2	0.0
Pomona	3.52	16.14	1980	0.00	1984	3.97	27/1983	6	2	1	0.0
Torrance	2.63	13.08	1998	0.00	1964	3.60	10/1963	6	2	1	0.0
UCLA	3.72	20.51	1998	0.00	1984	5.60	08/1993	5	2	2	0.0

March

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	71.0	45.2	58.1	98	26/1988	32	05/1945	0.3	0.4	229	15
Canoga Park	72.3	42.0	57.2	101	26/1988	26	13/1954	0.7	1.8	256	14
Long Beach	68.0	49.0	58.5	98	26/1988	33	08/1964	0.2	0	214	13
LA Airport	65.5	50.5	58.0	95	26/1988	35	05/1945	0.1	0	224	7
LA Civic Center	69.5	51.8	60.7	99	29/1879	31	09/1893	0.3	0	169	36
Montebello	72.8	50.7	61.7	100	26/1988	38	03/1985	0.6	0	127	26
Mount Wilson	53.7	36.4	45.1	79	19/1997	14	03/1966	0	11.5	624	7
Pasadena	70.6	46.5	58.5	96	19/1997	31	09/1935	0.3	0.1	214	13
Pomona	69.9	43.9	56.9	100	26/1988	26	01/1939	0.3	2	261	9
Torrance	67.7	47.6	57.7	96	26/1988	N/A	N/A	0.1	0	233	7
UCLA	66.4	50.6	58.5	94	26/1988	37	02/1953	0.1	0	213	12

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	3.01	12.87	1978	0.00	1997	5.45	01/1983	6	2	1	0.5/1950
Canoga Park	2.88	12.39	1983	0.00	1997	6.06	01/1983	6	2	1	0.0
Long Beach	1.96	8.75	1983	0.00	1997	3.46	01/1983	6	1	0	0.0
LA Airport	1.98	6.37	1983	0.00	1997	3.10	07/1968	6	1	0	0.0
LA Civic Center	2.61	12.36	1884	0.00	1997	5.88	02/1938	6	2	1	0.0
Montebello	3.38	10.23	1983	0.00	1997	3.80	01/1983	6	3	1	0.0
Mount Wilson	6.68	25.15	1983	0.00	1959	8.86	02/1983	7	3	2	25.0/1979
Pasadena	3.53	12.86	1978	0.00	1997	7.70	02/1938	7	2	1	0.0
Pomona	2.93	11.87	1978	0.00	1989	4.21	03/1938	6	2	1	0.0
Torrance	2.11	8.90	1983	0.00	1997	3.04	01/1983	6	1	1	0.0
UCLA	2.89	9.52	1983	0.00	1997	4.37	08/1968	6	2	1	0.0

April

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	74.9	48.2	61.6	105	06/1989	32	05/1978	1.7	0	155	53
Canoga Park	77.1	44.4	60.8	105	06/1989	30	09/1953	3.5	0.3	179	53
Long Beach	71.5	51.8	61.7	105	06/1989	38	07/1975	0.9	0	134	35
LA Airport	67.4	52.8	60.1	102	06/1989	42	01/1998	0.3	0	158	11
LA Civic Center	72.3	54.2	63.3	106	06/1989	36	08/1901	1	0	128	77
Montebello	77.9	53.6	65.8	104	07/1989	40	02/1982	2.9	0	54	77
Mount Wilson	58.9	39.9	49.4	86	06/1989	18	21/1963	0	7.1	496	28
Pasadena	74.5	49.2	61.8	105	06/1989	34	19/1933	1.8	0	153	57
Pomona	74.4	46.4	60.4	104	06/1989	29	09/1953	1.7	0.3	180	42
Torrance	70.4	50.0	60.2	104	06/1989	N/A	N/A	0.5	0	172	28
UCLA	68.4	52.5	60.4	103	06/1989	40	08/1953	0.3	0	162	24

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	1.15	5.66	1965	0.00	1997	2.30	12/1956	4	1	0	0.0
Canoga Park	1.02	6.76	1965	0.00	1997	2.49	14/1988	3	1	0	0.0
Long Beach	0.68	4.42	1965	0.00	1997	1.61	11/1999	3	0	0	0.0
LA Airport	0.72	4.60	1926	0.00	1997	1.26	27/1960	3	1	0	0.0
LA Civic Center	1.03	7.53	1926	0.00	1997	2.74	05/1926	3	1	0	0.0
Montebello	0.92	4.02	1983	0.00	1997	1.20	16/1995	2	1	0	0.0
Mount Wilson	2.79	16.55	1965	0.00	1979	4.15	20/1988	4	2	1	21.0/1958
Pasadena	1.42	7.77	1983	0.00	1997	3.30	04/1929	4	1	0	0.0
Pomona	1.16	6.98	1965	0.00	1993	2.96	27/1931	4	1	0	0.0
Torrance	0.87	5.06	1965	0.00	1997	1.47	20/1988	3	1	0	0.0
UCLA	0.99	4.86	1965	0.00	1997	2.40	27/1960	3	1	0	0.0

May

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	78.0	53.2	65.6	107	29/1984	39	21/1975	2.3	0	67	86
Canoga Park	81.0	49.3	65.2	113	29/1984	33	04/1950	5.8	0	83	89
Long Beach	73.3	56.3	64.8	103	16/1967	40	07/1964	1	0	69	63
LA Airport	69.0	56.3	62.7	97	13/1979	45	07/1964	0.2	0	96	25
LA Civic Center	73.9	57.7	65.8	103	25/1896	40	16/1883	1.1	0	72	97
Montebello	78.9	57.1	68.0	102	05/1990	44	09/1985	2.3	0	21	115
Mount Wilson	66.2	47.1	56.7	91	29/1984	22	05/1964	0	2.6	305	48
Pasadena	77.1	53.0	65.0	102	20/1942	37	08/1930	2.2	0	76	76
Pomona	77.5	50.9	64.2	106	29/1984	34	21/1948	2.8	0	86	61
Torrance	71.9	53.8	62.8	100	13/1979	N/A	N/A	0.4	0	101	33
UCLA	69.1	55.0	62.1	97	15/1970	45	26/1953	0.3	0	116	26

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	0.22	4.37	1998	0.00	1997	2.29	08/1977	2	0	0	0.0
Canoga Park	0.18	4.06	1998	0.00	1997	2.00	08/1977	1	0	0	0.0
Long Beach	0.17	2.32	1977	0.00	1997	2.03	08/1977	1	0	0	0.0
LA Airport	0.14	3.92	1921	0.00	1999	1.67	08/1977	1	0	0	0.0
LA Civic Center	0.19	3.57	1921	0.00	1997	2.02	08/1977	1	0	0	0.0
Montebello	0.30	4.18	1998	0.00	1997	1.60	12/1998	1	0	0	0.0
Mount Wilson	0.62	10.84	1998	0.00	1997	3.52	05/1998	3	0	0	7.0/1977
Pasadena	0.32	4.41	1998	0.00	1997	1.82	09/1977	3	0	0	0.0
Pomona	0.23	3.57	1930	0.00	1995	1.34	08/1977	2	0	0	0.0
Torrance	0.19	3.48	1977	0.00	1999	2.18	08/1977	1	0	0	0.0
UCLA	0.22	3.70	1977	0.00	1999	2.32	08/1977	1	0	0	0.0

June

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	83.3	57.2	70.3	111	27/1976	43	14/1943	5.1	0	35	194
Canoga Park	87.7	53.5	70.6	113	15/1961	36	07/1950	12.9	0	34	202
Long Beach	77.0	59.8	68.5	109	16/1981	47	02/1967	1.6	0	39	144
LA Airport	71.9	59.5	65.7	104	16/1981	48	08/1950	0.3	0	54	75
LA Civic Center	78.3	61.1	69.7	112	26/1990	46	13/1894	1.8	0	35	176
Montebello	83.7	60.7	72.2	108	11/1979	44	28/1979	5.6	0	2	219
Mount Wilson	75.5	56.0	65.8	97	29/1994	29	07/1950	0.8	0.3	119	143
Pasadena	82.2	56.8	69.5	110	27/1990	43	18/1979	4.5	0	34	169
Pomona	83.0	54.7	68.9	106	19/1929	39	14/1943	6.7	0	30	147
Torrance	74.7	57.2	66.0	104	16/1981	N/A	N/A	0.6	0	55	85
UCLA	72.3	58.0	65.2	108	26/1990	44	11/1950	0.6	0	68	74

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	0.05	1.04	1993	0.00	1997	1.01	05/1993	1	0	0	0.0
Canoga Park	0.02	0.52	1993	0.00	1997	0.52	05/1993	0	0	0	0.0
Long Beach	0.04	0.86	1993	0.00	1997	0.86	05/1993	0	0	0	0.0
LA Airport	0.03	0.74	1993	0.00	1997	0.74	05/1993	1	0	0	0.0
LA Civic Center	0.03	1.39	1884	0.00	1997	0.76	05/1993	1	0	0	0.0
Montebello	0.09	0.80	1993	0.00	1997	0.80	05/1993	0	0	0	0.0
Mount Wilson	0.10	1.81	1993	0.00	1996	1.78	05/1993	1	0	0	1.5/1995
Pasadena	0.09	1.93	1995	0.00	1996	1.58	16/1995	2	0	0	0.0
Pomona	0.03	0.96	1993	0.00	1992	0.96	05/1993	1	0	0	0.0
Torrance	0.03	0.62	1993	0.00	1997	0.62	05/1993	0	0	0	0.0
UCLA	0.04	1.29	1993	0.00	1997	1.29	05/1993	1	0	0	0.0

July

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	90.2	60.9	75.6	108	26/1943	45	02/1979	14.1	0	0	329
Canoga Park	95.4	57.3	76.4	115	16/1960	42	01/1952	24.2	0	0	353
Long Beach	82.7	63.4	73.1	107	01/1985	51	15/1960	3.8	0	0	255
LA Airport	75.3	62.8	69.1	97	10/1959	52	06/1948	0.2	0	9	136
LA Civic Center	84.0	64.5	74.3	109	25/1891	49	12/1888	4.2	0	0	293
Montebello	88.7	64.4	76.5	108	01/1985	56	27/1979	13.9	0	0	357
Mount Wilson	81.1	62.6	71.9	99	14/1972	38	11/1974	2	0	9	223
Pasadena	89.0	60.9	75.0	110	27/1934	45	10/1933	13	0	0	310
Pomona	90.4	58.7	74.6	112	27/1934	41	07/1948	17.9	0	0	298
Torrance	78.8	60.5	69.7	102	01/1985	N/A	N/A	0.7	0	12	158
UCLA	76.8	61.1	69.0	103	10/1959	52	27/1955	0.7	0	17	141

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	0.01	0.21	1986	0.00	1999	0.18	12/1992	0	0	0	0.0
Canoga Park	0.00	0.17	1995	0.00	1999	0.17	16/1995	0	0	0	0.0
Long Beach	0.01	0.21	1986	0.00	1999	0.18	23/1986	0	0	0	0.0
LA Airport	0.01	0.32	1992	0.00	1999	0.28	12/1992	0	0	0	0.0
LA Civic Center	0.01	0.24	1886	0.00	1999	0.24	14/1886	0	0	0	0.0
Montebello	0.02	0.29	1992	0.00	1998	0.15	12/1992	0	0	0	0.0
Mount Wilson	0.04	1.71	1992	0.00	1998	1.11	12/1992	0	0	0	0.0
Pasadena	0.02	0.82	1992	0.00	1998	0.45	12/1992	0	0	0	0.0
Pomona	0.02	0.50	1965	0.00	1993	0.44	30/1965	0	0	0	0.0
Torrance	0.01	0.57	1997	0.00	1998	0.57	22/1997	0	0	0	0.0
UCLA	0.02	0.25	1969	0.00	1998	0.25	11/1969	0	0	0	0.0

August

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	90.3	61.5	76.0	111	26/1944	46	28/1975	14.8	0	0	341
Canoga Park	95.4	58.2	76.8	116	24/1985	42	06/1950	24.7	0	0	366
Long Beach	84.0	64.8	74.4	105	30/1967	53	11/1950	5.7	0	0	295
LA Airport	76.6	64.2	70.5	98	31/1955	51	09/1948	0.3	0	5	176
LA Civic Center	84.5	65.7	75.1	106	19/1885	49	30/1901	5.4	0	0	316
Montebello	89.5	65.2	77.4	106	27/1981	53	03/1981	15.9	0	0	388
Mount Wilson	80.5	61.6	71.1	96	08/1981	37	20/1959	1.8	0	11	200
Pasadena	89.6	61.8	75.7	107	30/1998	48	19/1935	15.1	0	0	332
Pomona	90.7	59.8	75.3	109	29/1967	43	31/1928	18	0	0	319
Torrance	80.0	61.9	71.0	101	06/1983	N/A	N/A	1.2	0	8	194
UCLA	77.8	62.4	70.1	98	31/1967	51	16/1950	1.2	0	18	176

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	0.19	2.97	1977	0.00	1998	2.86	17/1977	1	0	0	0.0
Canoga Park	0.18	2.49	1977	0.00	1998	2.35	17/1977	1	0	0	0.0
Long Beach	0.11	2.03	1977	0.00	1998	1.75	17/1977	0	0	0	0.0
LA Airport	0.15	2.47	1977	0.00	1998	2.10	17/1977	0	0	0	0.0
LA Civic Center	0.14	2.26	1977	0.00	1998	2.06	17/1977	1	0	0	0.0
Montebello	0.03	0.32	1984	0.00	1998	0.31	15/1984	0	0	0	0.0
Mount Wilson	0.30	3.44	1983	0.00	1997	1.85	17/1977	1	0	0	0.0
Pasadena	0.20	2.27	1977	0.00	1997	2.16	17/1977	1	0	0	0.0
Pomona	0.13	2.40	1977	0.00	1993	1.22	18/1977	0	0	0	0.0
Torrance	0.13	3.08	1977	0.00	1998	2.80	17/1977	0	0	0	0.0
UCLA	0.19	3.23	1977	0.00	1998	3.07	17/1977	0	0	0	0.0

September

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	87.6	59.1	73.4	113	12/1971	43	26/1941	11.9	0	13	265
Canoga Park	91.0	55.4	73.2	115	06/1955	38	20/1954	17.5	0	11	257
Long Beach	82.1	62.7	72.4	110	26/1963	49	26/1948	5.9	0	15	237
LA Airport	76.6	63.2	69.9	110	26/1963	47	26/1948	1.3	0	22	169
LA Civic Center	82.7	64.6	73.7	110	04/1988	44	29/1880	6.5	0	10	271
Montebello	88.2	63.7	76.0	110	04/1988	51	20/1985	12.7	0	0	327
Mount Wilson	75.8	56.9	66.4	98	02/1950	34	25/1948	0.9	0	96	138
Pasadena	87.4	60.0	73.7	110	04/1988	44	26/1948	12.4	0	9	270
Pomona	87.9	57.8	72.9	113	10/1948	38	26/1948	13.4	0	11	248
Torrance	79.2	60.6	70.0	111	01/1955	N/A	N/A	2.1	0	22	172
UCLA	77.4	61.8	69.7	107	01/1955	48	30/1955	2.6	0	37	178

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	0.37	3.39	1976	0.00	1998	1.43	10/1976	1	0	0	0.0
Canoga Park	0.26	2.26	1976	0.00	1996	1.12	10/1976	1	0	0	0.0
Long Beach	0.29	1.45	1976	0.00	1998	2.48	25/1939	1	0	0	0.0
LA Airport	0.31	4.39	1939	0.00	1996	1.66	30/1983	1	0	0	0.0
LA Civic Center	0.45	5.67	1939	0.00	1996	3.96	25/1939	1	0	0	0.0
Montebello	0.26	1.57	1986	0.00	1998	0.84	25/1997	1	0	0	0.0
Mount Wilson	1.18	11.17	1976	0.00	1996	5.40	11/1976	2	0	0	0.0
Pasadena	0.55	5.88	1939	0.00	1996	4.90	25/1939	1	0	0	0.0
Pomona	0.42	4.23	1939	0.00	1994	2.60	25/1939	1	0	0	0.0
Torrance	0.31	1.95	1963	0.00	1998	1.20	25/1986	1	0	0	0.0
UCLA	0.37	2.81	1986	0.00	1996	1.73	10/1976	1	0	0	0.0

October

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	82.1	53.5	67.8	108	01/1980	33	30/1971	5.9	0	35	122
Canoga Park	84.3	49.9	67.1	110	01/1980	27	30/1971	9	0.2	38	103
Long Beach	78.4	57.8	68.1	111	15/1961	39	31/1972	3.2	0	24	120
LA Airport	74.4	59.2	66.8	106	14/1961	43	30/1971	1.4	0	32	88
LA Civic Center	79.0	60.3	69.7	108	04/1987	40	22/1892	3.4	0	17	162
Montebello	82.3	58.3	70.3	106	03/1987	44	15/1981	5.3	0	9	173
Mount Wilson	68.4	50.6	59.5	93	02/1980	18	29/1971	0.1	1.1	233	62
Pasadena	82.1	54.9	68.5	108	11/1991	37	30/1971	5.7	0	25	134
Pomona	82.1	52.5	67.3	107	12/1950	29	31/1935	6.4	0.1	46	118
Torrance	76.8	56.4	66.6	106	15/1961	37	29/1956	1.9	0	38	87
UCLA	75.2	59.1	67.2	103	03/1958	40	29/1971	1.8	0	44	113

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	0.45	4.26	1987	0.00	1997	1.63	01/1983	2	0	0	0.0
Canoga Park	0.54	5.93	1987	0.00	1997	3.20	31/1987	2	0	0	0.0
Long Beach	0.27	1.63	1987	0.00	1997	2.70	17/1934	2	0	0	0.0
LA Airport	0.34	2.34	1936	0.00	1998	1.75	18/1972	2	0	0	0.0
LA Civic Center	0.31	6.96	1889	0.00	1998	3.16	20/1889	2	0	0	0.0
Montebello	0.38	1.96	1987	0.00	1998	1.50	30/1996	1	0	0	0.0
Mount Wilson	1.10	9.19	1987	0.00	1995	5.33	30/1992	3	1	0	1.0/1957
Pasadena	0.51	4.03	1934	0.00	1998	3.26	17/1934	2	0	0	0.0
Pomona	0.48	4.88	1934	0.00	1990	3.80	18/1934	2	0	0	0.0
Torrance	0.33	2.59	1987	0.00	1997	1.71	01/1983	2	0	0	0.0
UCLA	0.44	4.76	1987	0.00	1997	1.77	30/1996	2	0	0	0.0

November

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	73.1	45.8	59.5	98	03/1976	29	30/1975	1	0.2	177	12
Canoga Park	74.5	43.2	58.9	99	03/1975	23	17/1958	1.8	1.1	195	12
Long Beach	72.1	50.4	61.3	101	01/1966	34	17/1958	0.8	0	145	34
LA Airport	70.3	52.8	61.6	101	01/1966	38	19/1964	0.5	0	127	25
LA Civic Center	72.4	53.5	63.0	100	01/1966	34	19/1886	0.8	0	105	45
Montebello	75.5	51.6	63.5	100	02/1997	39	19/1994	1.2	0	85	41
Mount Wilson	58.5	42.0	50.3	82	01/1985	15	29/1975	0	4.6	446	5
Pasadena	73.4	48.1	60.8	98	03/1997	29	23/1931	1.1	0.1	147	21
Pomona	73.6	45.6	59.6	97	02/1949	24	12/1938	0.9	2.2	179	17
Torrance	71.3	50.2	60.8	98	04/1949	32	17/1958	0.7	0	144	18
UCLA	70.3	54.5	62.4	97	04/1976	33	17/1958	0.6	0	120	42

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	2.07	10.63	1965	0.00	1992	5.28	29/1970	3	1	0	0.0
Canoga Park	2.48	12.60	1965	0.00	1992	6.57	29/1970	4	1	1	0.0
Long Beach	1.65	6.05	1965	0.00	1992	4.06	21/1967	4	1	0	0.0
LA Airport	1.76	7.92	1946	0.00	1992	5.60	21/1967	4	1	0	0.0
LA Civic Center	1.98	9.68	1965	0.00	1992	3.85	07/1966	3	1	0	0.0
Montebello	1.23	4.75	1982	0.00	1992	2.34	30/1982	3	1	0	0.0
Mount Wilson	5.05	29.92	1965	0.00	1992	7.37	29/1970	4	2	1	15.2/1981
Pasadena	2.60	13.74	1965	0.00	1992	5.55	29/1970	4	1	1	0.0
Pomona	2.00	8.88	1965	0.00	1992	2.61	14/1946	4	1	0	0.0
Torrance	1.96	9.34	1965	0.00	1992	4.60	29/1970	4	1	0	0.0
UCLA	2.37	11.30	1965	0.00	1992	5.13	29/1970	3	1	1	0.0

December

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	67.5	41.0	54.3	92	03/1958	22	08/1978	0.1	1.4	335	0
Canoga Park	68.7	38.8	53.8	96	03/1958	20	29/1954	0.1	5.5	351	0
Long Beach	67.0	45.0	56.0	92	03/1958	28	22/1990	0	0.3	284	0
LA Airport	65.9	47.9	56.9	94	03/1958	32	21/1968	0	0	258	7
LA Civic Center	67.8	48.8	58.3	92	08/1938	30	08/1978	0	0.1	226	18
Montebello	70.7	47.3	59.0	88	04/1979	30	22/1981	0	0.3	195	9
Mount Wilson	53.2	37.2	45.2	78	03/1958	10	14/1967	0	9.2	620	0
Pasadena	67.9	43.6	55.8	93	10/1950	26	23/1990	0.1	0.5	290	0
Pomona	68.3	40.7	54.5	93	04/1979	22	22/1990	0	5.8	332	7
Torrance	66.9	45.6	56.2	94	03/1958	27	22/1990	0	0.4	278	5
UCLA	66.2	50.8	58.6	94	03/1958	33	22/1990	0.1	0	219	20

Precipitation Data

Station	Avg	Monthly Max	Year	Monthly Min	Year	1-Day Max	Day/ Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Yr
Burbank	2.05	8.07	1940	0.00	1989	5.30	29/1965	5	2	1	0.0
Canoga Park	2.14	7.74	1992	0.00	1989	4.98	29/1965	5	2	1	0.0
Long Beach	1.68	5.29	1971	0.00	1989	3.17	04/1974	5	1	0	0.0
LA Airport	1.66	6.57	1936	0.00	1989	2.84	29/1951	5	1	0	0.0
LA Civic Center	2.03	15.80	1889	0.00	1990	4.86	31/1933	5	1	1	0.0
Montebello	2.14	7.87	1992	0.00	1990	4.82	07/1992	4	2	1	0.0
Mount Wilson	5.07	16.88	1966	0.00	1958	6.82	06/1966	6	2	2	25.0/1948
Pasadena	2.45	10.34	1933	0.00	1989	6.17	31/1933	5	2	1	0.0
Pomona	2.32	8.64	1966	0.00	1986	4.07	30/1951	5	2	1	0.2/1932
Torrance	2.02	7.24	1971	0.00	1989	3.47	29/1965	5	1	1	0.0
UCLA	2.37	7.46	1971	0.00	1989	3.77	04/1974	5	2	1	0.0

Table 2. Selected Cities Temperature and Precipitation Data
(Annual Summaries)

Annual

Temperature Data

Station	Avg Max	Avg Min	Avg Mean	Record High	Day/ Year	Record Low	Day/ Year	Days ≥ 90° F	Days ≤ 32° F	Avg HDD	Avg CDD
Burbank	78.0	50.9	64.5	113	9/12/85	22	1/29/79	57.4	4.5	1609	1424
Canoga Park	80.6	47.7	64.2	116	8/24/85	18	2/6/89	100.5	18.1	1743	1455
Long Beach	74.2	54.4	64.3	111	10/15/61	25	1/13/63	23.4	0.5	1430	1201
LA Airport	70.4	55.5	63.0	110	9/26/63	27	1/4/49	4.7	0.1	1458	727
LA Civic Center	75.1	56.8	66.0	112	6/26/90	28	1/4/49	24.8	0.2	1154	1537
Montebello	79.0	55.8	67.4	110	9/4/88	30	2/15/90	60.8	0.7	863	1762
Mount Wilson	64.8	47.0	55.9	99	7/14/72	9	1/29/69	5.6	57	4148	854
Pasadena	77.7	52.0	64.8	110	6/27/90	23	1/23/37	56.3	2.2	1453	1394
Pomona	77.9	49.5	63.8	113	9/10/48	21	1/13/63	68.3	22.1	1713	1273
Torrance	72.7	53.0	62.9	111	9/1/55	25	1/4/49	8.3	1.2	1568	794
UCLA	71.1	55.6	63.4	108	6/26/90	30	1/4/49	8.4	0.1	1419	835

Seasonal Precipitation Data

Station	Avg	Seasonal Max	Water Yr. 7/1-6/30	Seasonal Min.	Water Yr. 7/1-6/30	Monthly Max	Month / Year	Days ≥.01"	Days ≥.50"	Days ≥1.00"	Snow Max/Ssn.
Burbank	15.87	39.39	1977-78	6.14	1960-61	15.92	01/1995	37	10	4	4.7 1948-49
Canoga Park	16.31	40.19	1997-98	6.01	1960-61	18.02	02/1998	34	10	5	0.5 1988-89
Long Beach	11.80	29.68	1997-98	3.20	1960-61	12.76	01/1995	34	7	2	0.0
LA Airport	12.01	31.28	1997-98	4.48	1960-61	13.79	02/1998	34	8	2	0.0
LA Civic Center	14.77	38.18	1883-84	4.85	1960-61	15.80	12/1889	35	9	4	2.0 1931-32
Montebello	17.45	43.43	1997-98	5.55	1986-87	19.13	02/1998	31	13	5	0.0
Mount Wilson	37.50	92.06	1982-83	11.73	1960-61	37.82	01/1969	44	17	10	82.5 1948-49
Pasadena	19.37	46.62	1982-83	7.18	1960-61	19.70	02/1980	42	11	6	3.0 1948-49
Pomona	16.62	40.54	1977-78	6.19	1960-61	16.14	02/1980	37	10	4	0.5 1931-32
Torrance	13.57	31.78	1977-78	3.89	1960-61	16.92	01/1995	35	8	4	1.2 1948-49
UCLA	17.03	43.55	1997-98	5.56	1975-76	20.51	02/1998	33	10	7	0.0

Table 3.

TEMPERATURE EXTREMES

Greatest number of consecutive days in any year on which temperatures climbed to 100 degrees or higher, 90 degrees or higher, or fell to 32 degrees or lower.

	LAX		Downtown		Pasadena		Canoga Pk.	
	# of Days	Dates	# of Days	Dates	# of Days	Dates	# of Days	Dates
100 degrees or higher	4	9/26/63 - 9/29/63	8	8/31/55 - 9/7/55	8	8/31/55 - 9/7/55	14	8/8/92 - 8/21/92
90 degrees or higher	7	9/20/78 - 9/26/78	14	7/29/79 - 8/11/79	25	8/18/97 - 9/11/97	66	6/13/81 - 8/17/81
32 degrees or lower	2	1/4/49 - 1/5/49	2	12/7/78 - 12/8/78	8	1/20/37 - 1/27/37	14	1/3/50 - 1/16/50

Table 4.

TEMPERATURE EXTREMES

Greatest number of days in any year on which temperatures climbed to 100 degrees or higher, 90 degrees or higher, or fell to 32 degrees or lower.

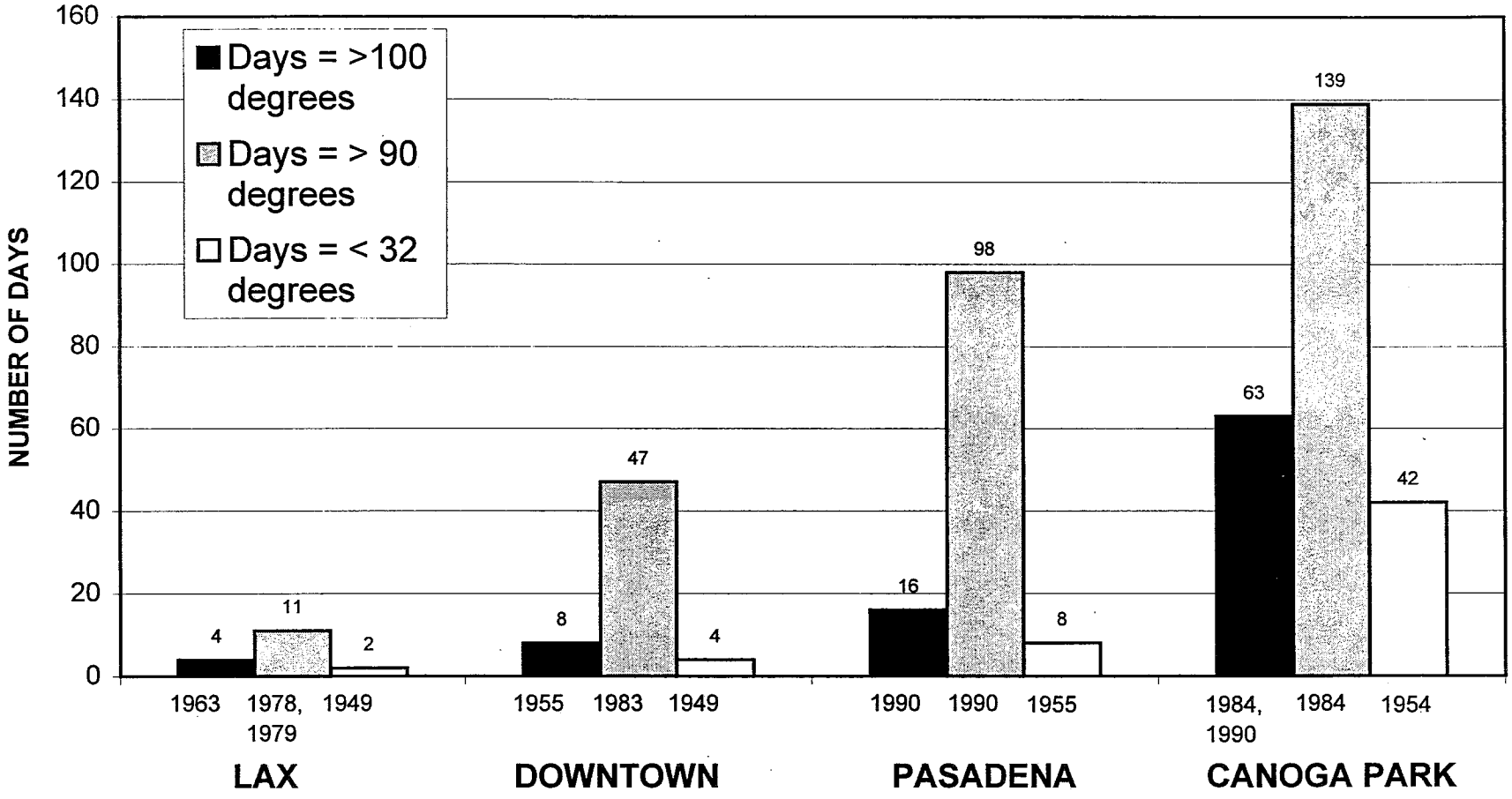

TABLE 5

RAINFALL DEPTH, DURATION AND FREQUENCY

The following tables show the maximum consecutive-day rainfall accumulations, ranging in time from one day to one annual rainfall season. The data are recorded for each station as listed, and for every year of record for that station.

Following the annual data, a chart provides average, standard deviation, and record data for the entire period of record.

The final station tabulation block lists return-period (RP) rainfall data for intervals from two years to ten thousand years.

These tables are provided through the courtesy of Jim Goodridge, State of California, Department of Water Resources.

Please note: The State of California computes Water Years (W-YR) differently than the National Weather Service statistics for seasonal rain.

Table 5-1

Rainfall Depth Duration Frequency for Burbank Valley PP

DWR # U05 1194 00 | Los Angeles County | Latitude 34.186°
Analysis By DWR DLA 707 937 4709 | | Longitude -118.348°
Data from : Climatological Data | 1N/14W-9H | Elevation 655 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1940	2.38	3.38	3.99	4.14	4.14	4.14	4.14	4.15	4.91	4.91	5.73	10.39	*14.44*
1941	2.54	3.47	3.91	5.27	6.97	6.98	6.98	7.44	12.57	14.80	18.28	24.20	**39.26**
1942	2.32	2.73	2.89	2.89	3.12	3.28	3.51	3.51	3.51	5.19	6.44	6.65	13.08
1943	**7.76**	**9.51**	**10.75**	10.75	10.81	11.45	11.49	12.41	12.88	13.14	13.14	20.26	23.13
1944	3.61	5.40	8.48	8.93	9.23	9.24	9.51	9.55	12.33	12.34	12.82	13.58	*22.54*
1945	2.03	3.04	3.04	3.54	4.12	4.12	4.13	4.53	4.77	4.77	4.78	6.07	12.24
1946	1.94	3.75	4.26	4.28	4.30	4.30	4.30	4.30	4.43	4.78	4.84	5.94	11.84
1947	2.29	3.05	3.89	4.66	4.71	4.71	4.84	5.42	6.42	6.55	6.95	10.45	13.21
1948	1.22	1.29	1.43	1.43	1.43	1.44	1.55	1.86	2.71	2.73	3.01	4.13	6.59
1949	0.79	1.51	1.51	1.52	1.52	1.52	1.63	1.64	2.40	2.40	3.39	4.87	7.51
1950	1.20	1.35	1.37	1.47	1.74	1.74	1.80	1.80	2.22	2.22	3.21	5.06	9.56
1951	1.02	1.03	1.03	1.03	1.20	1.29	1.77	1.77	1.78	2.62	2.79	4.60	7.51
1952	4.55	5.04	8.47	9.45	9.45	11.05	12.03	12.04	12.81	14.47	16.12	18.62	29.62
1953	1.62	2.44	2.44	2.44	2.44	2.44	3.05	3.27	3.60	4.32	5.19	7.90	10.32
1954	2.18	3.00	3.00	3.00	3.05	3.05	3.70	3.82	4.47	4.47	6.82	8.03	12.54
1955	1.46	1.72	2.02	2.03	2.04	2.04	2.66	3.08	3.62	3.89	4.23	5.32	11.85
1956	4.06	5.51	5.61	5.61	5.66	6.03	6.08	6.13	6.13	6.13	6.64	7.09	14.17
1957	1.68	2.40	2.40	2.50	2.50	2.52	3.05	3.79	3.79	4.44	5.72	7.84	11.49
1958	2.51	3.26	3.75	3.76	3.76	3.91	3.92	4.08	4.89	6.36	7.49	12.55	21.70
1959	1.90	2.90	2.90	2.90	2.99	3.77	4.04	4.86	5.76	5.76	5.76	8.66	9.24
1960	1.11	1.89	1.99	2.03	2.19	2.29	2.31	2.31	2.31	3.18	3.71	5.19	7.71
1961	1.50	1.79	2.21	2.21	2.21	2.21	2.21	2.54	2.54	2.54	3.39	3.40	6.44
1962	4.35	6.90	8.22	9.44	10.09	10.53	10.90	11.58	13.26	13.30	14.32	16.99	21.90
1963	3.05	3.71	3.71	3.71	3.76	4.04	4.04	4.04	4.61	4.61	4.61	7.82	10.62
1964	1.33	2.02	2.10	2.10	2.12	2.12	2.12	2.12	2.96	2.96	3.10	3.33	8.38
1965	1.76	2.76	2.91	2.97	3.19	3.20	4.50	6.13	6.29	6.29	6.43	6.62	12.16
1966	5.30	5.39	5.42	5.70	5.92	5.92	8.55	9.54	10.63	10.63	11.74	17.47	20.62
1967	3.45	3.45	3.92	3.97	3.97	3.97	3.97	3.99	3.99	4.13	5.72	7.72	18.39
1968	2.60	3.82	5.60	6.82	6.82	6.82	6.82	6.82	7.58	7.61	8.36	8.77	13.36
1969	4.29	5.48	6.50	6.50	8.42	10.59	12.68	12.99	14.11	16.01	17.02	23.94	26.67
1970	1.82	2.37	3.07	3.07	3.36	4.24	4.24	4.24	4.25	4.25	6.21	7.52	9.37
1971	5.28	5.83	6.24	6.24	6.50	6.50	6.75	6.75	7.30	7.56	12.05	12.44	14.87
1972	2.29	3.10	3.42	4.97	5.50	5.85	6.38	6.38	6.46	6.54	6.72	6.94	8.14
1973	3.00	3.45	3.79	4.24	4.26	5.17	5.96	6.15	6.76	6.90	9.99	13.37	19.42
1974	3.07	4.65	6.17	6.98	8.50	8.54	8.54	8.57	8.90	9.24	9.49	9.99	11.38
1975	2.76	2.79	3.18	3.39	3.40	3.65	3.67	4.07	4.13	4.55	4.59	7.22	14.03
1976	1.78	2.31	2.81	4.03	4.38	4.53	4.65	4.65	4.65	4.65	4.65	6.21	10.11
1977	2.86	3.44	3.49	3.53	4.19	4.21	4.26	4.75	4.75	4.75	4.91	5.71	16.28
1978	4.40	5.51	5.69	9.13	10.33	11.44	11.66	11.66	11.70	11.70	13.38	22.48	37.04
1979	2.00	2.72	3.02	3.06	3.16	3.16	3.16	3.16	5.23	5.23	7.77	10.39	20.20
1980	4.15	6.92	9.06	10.78	**12.26**	**13.80**	**14.69**	**15.19**	**15.19**	**18.82**	**20.10**	**27.50**	31.31

Rainfall Depth Duration Frequency for Burbank Valley PP

DWR # U05 1194 00
Analysis By DWR DLA 707 937 4709
Data from : Climatological Data

Los Angeles County

1N/14W-9H

Latitude 34.
Longitude -118.348°
Elevation 655 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1981	1.69	2.49	2.50	3.10	3.88	4.05	4.70	4.76	4.76	5.50	6.44	10.36	11.79
1982	1.80	2.34	2.64	3.57	3.87	4.16	4.82	4.82	4.82	6.68	7.63	8.76	15.68
1983	5.45	8.89	9.47	**10.82**	11.31	11.69	11.82	11.84	11.92	12.15	14.76	18.66	36.85
1984	2.10	2.73	3.29	3.29	3.29	3.29	3.70	3.95	3.97	4.08	4.08	7.04	8.60
1985	1.80	2.32	2.65	2.98	3.31	3.31	3.31	4.45	5.11	6.53	6.74	8.46	11.72
1986	2.85	3.69	3.70	3.70	3.70	3.70	3.89	4.00	4.50	7.19	7.70	12.05	18.21
1987	0.99	1.03	1.10	1.16	1.16	1.16	1.16	1.16	1.31	1.45	2.15	2.82	5.89
1988	1.96	2.37	2.50	2.50	2.50	2.52	2.82	4.23	5.77	5.77	5.80	7.74	15.99
1989	1.27	1.80	1.98	2.35	2.35	2.97	3.13	3.57	3.67	3.88	4.13	4.93	8.56
1990	1.90	2.09	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.77	2.77	4.44	8.17
1991	2.00	3.34	4.56	4.57	4.57	4.82	4.83	4.83	5.08	6.54	10.48	10.48	12.51
1992	3.85	7.05	10.25	10.73	10.73	11.74	12.79	13.55	13.56	13.56	16.43	23.29	30.78
1993	4.50	4.69	4.73	4.73	5.70	7.17	8.00	8.13	11.95	12.71	14.65	25.38	34.16
1994	1.33	1.37	1.37	1.58	1.68	2.02	2.10	2.10	2.64	3.32	3.85	6.21	8.94
1995	4.52	5.71	6.79	7.29	7.77	8.17	10.90	11.49	11.83	15.05	15.92	18.92	31.78
1996	2.79	4.55	4.85	4.85	4.85	5.00	5.11	5.47	6.11	6.11	7.07	9.48	[illegible]
1997	2.47	3.56	3.76	3.76	3.76	3.76	3.80	3.80	4.27	4.64	5.12	9.57	[illegible]
1998													36.88
1999													
Average	2.66	3.55	4.11	4.48	4.77	5.06	5.44	5.72	6.33	6.89	7.89	10.55	16.29
Stdev	1.39	1.86	2.38	2.68	2.89	3.18	3.42	3.49	3.76	4.12	4.57	6.31	9.00
Rec Max	7.76	9.51	10.75	10.82	12.26	13.80	14.69	15.19	15.19	18.82	20.10	27.50	39.26
Rec Min	0.79	1.03	1.03	1.03	1.16	1.16	1.16	1.16	1.31	1.45	2.15	2.82	5.89
Z	3.91	3.22	3.01	2.61	2.91	3.17	3.09	3.05	2.60	3.28	3.02	3.11	3.21
Yrs Rec	58	58	58	58	58	58	58	58	58	58	58	58	59
CV	.520	.523	.579	.597	.606	.628	.629	.611	.595	.598	.580	.598	.552
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	2.70	3.35	3.77	4.08	4.29	4.49	4.82	5.09	5.65	6.15	7.15	9.41	14.85
RP 5	4.17	5.20	6.08	6.61	7.00	7.45	8.00	8.34	9.15	9.98	11.36	15.28	23.13
RP 10	5.15	6.46	7.58	8.22	8.72	9.32	10.02	10.40	11.37	12.41	14.01	19.00	28.35
RP 25	6.36	8.03	9.44	10.22	10.85	11.64	12.52	12.95	14.12	15.41	17.22	23.60	34.65
RP 50	7.25	9.18	10.78	11.61	12.34	13.26	14.26	14.73	16.04	17.51	19.50	26.82	39.14
RP 100	8.11	10.31	12.06	13.00	13.83	14.88	16.00	16.51	17.96	19.61	21.70	30.04	43.46
RP 200	8.95	11.42	13.32	14.34	15.26	16.44	17.68	18.23	19.81	21.63	23.85	33.13	47.69
RP 500	10.01	12.82	14.90	16.08	17.12	18.46	19.86	20.45	22.20	24.25	26.44	37.15	[illegible]
RP 1000	10.86	13.94	16.17	17.31	18.44	19.90	21.41	22.03	23.91	26.12	28.60	40.00	[illegible]
RP 10000	13.52	17.47	20.13	21.43	22.85	24.70	26.57	27.31	29.59	32.34	35.14	49.53	69.91

Table 5-2

Rainfall Depth Duration Frequency for Canoga Park PC

DWR # U05 1484 00 | Los Angeles County | Latitude 34.181°
Analysis By DWR DLA 707 937 4709 | | Longitude -118.573°
Data from : Climatological Data | 1N/16W-8 | Elevation 794 Feet

	est	Maximum Rainfall For Indicated Number Of Concecutive Days											
	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1950	1.35	1.35	1.35	1.58	1.86	1.86	2.02	2.02	2.54	2.54	3.75	5.33	8.90
1951	1.11	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.80	2.38	2.56	4.50	7.52
1952	3.61	4.04	6.63	7.32	7.34	8.31	9.74	9.74	10.54	11.15	13.62	15.33	27.42
1953	1.57	1.57	2.24	2.24	2.24	2.24	2.24	2.24	2.24	2.24	5.03	8.31	10.51
1954	2.23	2.87	3.14	3.16	3.16	3.16	4.12	4.14	4.43	4.45	6.60	8.65	12.09
1955	1.45	1.72	1.90	2.00	2.00	2.00	2.00	3.36	2.55	4.19	4.44	5.69	12.11
1956	4.41	5.61	6.01	6.01	6.09	6.09	6.60	6.68	6.74	6.74	6.74	8.08	14.23
1957	2.00	2.19	2.19	2.19	2.19	2.21	2.33	3.51	3.51	4.30	5.79	7.87	10.45
1958	4.08	4.88	5.59	5.59	5.59	5.59	5.59	5.59	6.60	6.60	8.48	14.48	26.63
1959	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.90	3.92	3.92	7.17	7.57
1960	1.85	1.98	2.68	2.81	3.13	3.28	3.43	3.43	3.48	3.83	5.07	6.24	9.58
1961	1.15	1.97	1.97	2.06	2.09	2.09	2.09	2.22	2.47	2.47	3.36	3.36	6.52
1962	3.12	5.54	6.72	8.05	9.23	9.61	9.63	10.43	12.18	12.26	12.80	14.95	20.18
1963	2.11	3.46	3.67	3.67	3.70	3.74	3.74	3.82	4.63	4.63	4.63	7.46	9.58
1964	1.60	1.85	1.87	1.87	1.95	1.95	1.95	2.60	2.89	2.90	2.92	3.10	8.79
1965	1.80	3.25	3.54	4.48	5.01	5.07	5.07	7.38	8.21	8.21	8.49	8.84	14.60
1966	4.98	5.04	5.83	6.11	6.49	6.49	9.43	11.80	12.60	12.60	13.31	18.75	22.04
1967	3.51	3.58	3.58	3.58	3.58	3.58	3.58	3.58	4.04	4.04	7.05	7.17	16.23
1968	3.40	5.12	6.46	7.24	7.24	7.24	7.24	7.24	7.91	8.04	8.66	9.25	15.64
1969	3.79	5.65	7.50	7.50	8.82	11.58	14.79	15.01	**16.87**	**18.06**	18.06	25.89	29.82
1970	2.15	3.61	4.48	4.48	4.57	5.51	5.51	5.51	5.51	5.51	7.60	9.64	11.69
1971	**6.57**	7.12	7.67	7.67	7.97	8.07	8.35	8.35	8.60	8.75	14.16	14.37	17.80
1972	2.91	3.34	4.05	4.48	4.84	5.73	6.42	6.42	6.42	6.70	6.84	7.03	8.65
1973	3.00	3.54	4.04	4.29	4.30	5.78	6.42	7.66	8.17	8.24	9.29	14.03	19.52
1974	3.26	4.51	6.24	8.28	9.52	9.58	9.60	9.64	9.68	10.09	10.09	11.23	15.79
1975	3.03	3.03	3.11	3.89	3.89	4.47	4.84	4.96	5.04	5.31	5.33	8.36	15.21
1976	1.12	1.76	2.57	3.31	3.83	3.99	4.02	4.02	4.02	4.02	5.07	5.43	8.86
1977	2.35	2.49	2.49	2.49	3.34	3.34	3.34	4.04	4.04	4.04	4.04	4.34	13.49
1978	4.70	5.23	5.50	8.89	10.63	11.16	11.22	11.33	11.33	11.33	13.07	**27.71**	37.15
1979	3.38	4.20	4.32	4.32	4.44	4.44	4.44	4.67	8.28	8.28	11.57	14.19	22.41
1980	4.28	6.82	8.44	9.99	11.17	12.17	13.64	14.38	14.38	16.61	17.86	24.78	28.03
1981	1.39	2.30	2.78	2.78	3.74	4.22	4.69	4.82	4.84	5.02	6.00	9.28	11.06
1982	2.52	2.96	3.16	3.74	3.94	4.50	4.96	4.96	5.00	5.85	6.90	8.46	16.15
1983	6.06	**7.52**	8.83	9.08	10.39	10.93	11.35	11.45	11.66	11.87	14.57	21.74	**38.30**
1984	1.77	2.06	2.22	2.26	2.26	2.26	2.26	2.26	2.26	2.99	3.46	6.23	9.11
1985	1.35	2.11	2.69	2.77	3.35	3.35	3.35	4.09	5.50	5.86	6.13	8.43	11.76
1986	2.24	2.55	2.78	2.78	3.57	3.80	4.09	4.32	4.32	4.88	5.50	6.73	20.93
1987	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.67	2.63	6.18
1988	3.20	3.23	3.45	3.48	3.50	3.53	3.53	5.90	7.01	7.01	7.14	10.70	20.88
1989	2.02	2.36	2.38	2.47	2.47	2.81	3.17	4.10	4.10	4.50	4.67	6.89	8.73
1990	1.95	2.23	2.27	2.27	2.27	2.27	2.27	2.27	2.71	2.78	2.78	5.22	7.62
1991	3.58	4.84	4.84	4.84	5.04	5.04	5.04	5.04	5.29	7.61	11.59	11.59	13.94
1992	5.07	*7.07*	**10.07**	**12.52**	**12.52**	**13.57**	**14.96**	**16.01**	16.02	16.02	**19.59**	24.74	33.62
1993	3.48	4.75	4.99	5.87	6.32	7.97	8.85	9.10	12.15	12.62	14.49	20.35	34.90

Rainfall Depth Duration Frequency for Canoga Park PC

DWR # U05 1484 00 | Los Angeles County | Latitude 34.181°
Analysis By DWR DLA 707 937 4709 | | Longitude -118.573°
Data from : Climatological Data | 1N/16W-8 | Elevation 794 Feet

est Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1994	1.33	1.41	1.34	2.44	2.44	2.44	2.44	2.44	3.85	4.63	5.09	6.91	10.90
1995	3.84	4.63	5.29	5.49	6.04	6.24	10.71	11.37	12.12	12.23	16.80	18.39	30.21
1996	1.90	2.75	2.96	3.04	3.04	3.04	3.24	3.52	3.78	4.04	5.31	7.75	10.45
1997	1.48	2.89	3.99	4.16	4.16	4.16	4.51	4.51	4.86	5.25	6.03	10.21	13.72
1998													**39.83**
1999													
Average	2.78	3.51	4.07	4.48	4.81	5.13	5.59	5.99	6.51	6.85	8.08	10.79	16.88
Stdev	1.33	1.68	2.16	2.57	2.83	3.13	3.61	3.74	3.95	4.05	4.62	6.37	9.24
Rec Max	6.57	7.52	10.07	12.52	12.52	13.57	14.96	16.01	16.87	18.06	19.59	27.71	39.83
Rec Min	1.11	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.34	1.34	1.67	2.63	6.18
Z	2.78	2.19	2.74	3.31	2.96	3.03	3.04	3.07	2.96	3.10	2.78	3.03	3.10
Yrs Rec	48	48	48	48	48	48	48	48	48	48	48	48	49
CV	.479	.479	.531	.572	.587	.610	.646	.624	.607	.591	.572	.590	.548
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	2.85	3.35	3.79	4.10	4.35	4.57	4.94	5.32	5.80	6.12	7.34	9.64	15.40
RP 5	4.27	5.03	5.88	6.54	7.00	7.47	8.31	8.80	9.47	9.89	11.59	15.56	23.91
RP 10	5.21	6.17	7.25	8.08	8.68	9.32	10.44	11.00	11.80	12.28	14.27	19.32	29.27
RP 25	6.38	7.59	8.94	9.99	10.77	11.60	13.08	13.73	14.69	15.24	17.51	23.96	35.74
RP 50	7.23	8.64	10.15	11.33	12.22	13.20	14.92	15.64	16.70	17.31	19.82	27.21	40.36
RP 100	8.05	9.65	11.32	12.66	13.68	14.79	16.76	17.55	18.72	19.37	22.04	30.46	44.80
RP 200	8.86	10.66	12.47	13.94	15.08	16.32	18.53	19.38	20.66	21.36	24.21	33.58	49.15
RP 500	9.89	11.93	13.90	15.61	16.89	18.31	20.84	21.76	23.17	23.94	26.84	37.63	54.40
RP 1000	10.70	12.94	15.05	16.79	18.19	19.73	22.47	23.45	24.96	25.78	29.02	40.51	58.76
RP 10000	13.26	16.14	18.65	20.75	22.50	24.45	27.93	29.10	30.93	31.90	35.63	50.13	71.98

Table 5-3

Rainfall Depth-Duration-Frequency for Long Beach AP

DWR # U05 5080 00 — Los Angeles County — Latitude 33.817°
Analysis By DWR DLA 707 937 4709 — Longitude -118.150°
Data from : Climatological Data — Elevation 30 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1936													
1937	4.06	4.82	5.67	6.53	6.91	7.17	8.77	**11.73**	**13.29**	**14.65**	**15.89**	**20.16**	27.56
1938	3.31	3.89	5.52	6.90	7.38	7.40	7.40	7.43	8.45	8.77	11.50	14.61	18.29
1939	2.48	4.31	4.31	4.32	4.75	5.25	5.68	5.68	5.68	6.03	6.57	10.34	15.96
1940	1.79	1.79	2.55	2.91	2.98	3.21	3.57	3.66	4.72	5.37	7.78	10.27	13.37
1941	2.38	4.18	4.23	4.23	4.23	4.74	5.00	6.45	7.19	8.95	11.60	15.83	**29.11**
1942	1.35	1.94	1.94	1.95	1.95	1.95	2.12	2.13	2.13	2.60	4.16	4.27	9.88
1943	3.62	4.37	4.97	4.97	5.33	5.93	5.97	6.56	6.79	7.13	7.13	11.60	14.39
1944	3.23	3.83	6.33	6.62	6.75	6.77	7.05	7.11	9.77	9.85	10.42	11.02	18.55
1945	2.51	2.80	3.66	4.01	4.30	4.38	4.38	4.80	5.06	5.06	6.34	9.93	15.56
1946	2.10	4.01	4.51	4.52	4.54	4.55	4.55	4.55	4.71	4.79	4.85	5.71	10.57
1947	3.20	5.24	5.60	5.60	5.60	5.75	5.80	6.16	7.10	7.30	7.44	9.61	11.89
1948	1.10	1.31	1.36	1.37	1.50	1.55	1.55	1.55	1.59	1.60	2.24	3.31	5.72
1949	0.85	1.20	1.20	1.23	1.23	1.33	1.65	1.79	2.56	2.57	3.74	5.41	7.50
1950	2.51	2.76	2.88	2.92	2.94	2.94	2.94	2.94	3.49	3.49	4.80	8.21	10.77
1951	1.30	1.32	1.32	1.68	1.74	1.74	2.57	2.57	2.58	2.58	2.58	4.88	7.86
1952	2.01	3.50	4.03	4.88	4.88	5.06	5.89	5.89	7.16	7.33	9.62	10.85	18.14
1953	1.45	1.81	1.88	1.88	1.88	1.88	2.85	3.68	3.76	5.36	5.45	8.83	11.54
1954	2.37	3.12	3.17	3.17	3.21	3.21	4.29	4.31	5.43	5.43	7.41	8.64	13.38
1955	1.35	1.47	1.66	1.73	1.73	1.73	1.76	2.66	3.10	3.66	4.16	5.17	10.55
1956	**4.68**	**6.60**	**7.23**	**7.23**	7.35	7.35	8.00	8.12	8.12	8.12	8.39	8.66	12.99
1957	0.99	1.05	1.05	1.37	1.37	1.42	1.57	1.81	2.37	3.06	3.52	4.77	7.35
1958	3.21	3.21	3.21	3.21	3.21	3.77	4.17	4.17	4.59	6.34	8.41	12.71	21.73
1959	1.43	1.52	1.52	1.56	1.56	2.37	2.46	2.49	2.77	2.77	2.77	3.48	4.65
1960	1.45	1.45	1.68	1.94	2.52	2.67	2.69	2.69	2.69	2.81	4.50	6.43	9.26
1961	1.18	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.42	1.57	3.22
1962	2.38	2.84	3.18	4.21	4.67	4.76	5.55	6.11	7.86	7.88	8.77	11.56	14.59
1963	2.37	4.04	4.07	4.07	4.10	4.39	4.39	4.39	4.78	4.78	4.78	7.40	10.23
1964	0.87	1.59	1.59	1.59	1.59	1.59	2.30	2.30	2.30	2.82	2.82	3.25	5.36
1965	1.14	2.27	2.82	3.65	3.87	3.87	3.97	5.51	5.56	5.56	6.44	6.67	10.78
1966	2.03	2.04	2.76	3.27	3.44	3.44	4.47	5.48	6.05	6.05	7.13	9.49	12.83
1967	2.06	2.06	3.64	3.70	3.91	3.91	3.91	3.91	3.95	4.10	5.69	7.68	13.85
1968	1.83	3.24	4.11	4.12	4.12	4.12	4.12	4.16	4.61	4.77	5.26	5.81	9.15
1969	2.63	4.33	5.04	5.29	5.30	6.42	8.20	8.33	9.40	9.60	10.65	15.99	19.09
1970	1.33	1.33	1.33	1.35	1.98	1.99	1.99	1.99	2.00	2.17	3.12	4.90	6.38
1971	1.93	3.01	3.15	3.17	3.24	3.43	3.52	3.52	3.85	3.91	7.24	7.74	10.12
1972	1.75	1.97	2.68	3.41	3.66	4.34	4.59	4.59	4.59	4.69	5.30	5.51	6.77
1973	1.60	2.03	2.67	3.10	3.10	3.10	3.94	4.11	4.80	5.03	5.54	9.45	16.15
1974	2.42	3.20	3.50	5.17	5.47	5.60	5.73	5.80	5.81	6.12	6.27	7.24	12.41
1975	3.17	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	5.21	8.07	15.45
1976	1.21	1.38	1.38	1.70	2.13	2.33	2.39	2.39	2.39	2.39	3.04	3.61	6.46

Rainfall Depth-Duration-Frequency for Long Beach AP

DWR # U05 5080 00
Analysis By DWR DLA 707 937 4709
Data from : Climatological Data

Los Angeles County

Latitude 33.817°
Longitude -118.150°
Elevation 30 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1977	2.03	2.16	2.16	2.21	2.21	2.21	2.21	2.21	2.21	2.32	2.32	2.86	9.35
1978	2.19	3.03	3.15	4.02	5.75	6.59	6.84	6.84	7.17	7.55	13.46	19.80	28.27
1979	3.72	4.99	5.17	5.40	5.40	5.43	5.43	5.43	5.51	6.58	8.82	11.02	18.17
1980	2.37	4.18	4.39	5.75	**7.56**	**7.77**	**9.31**	9.40	9.40	10.49	11.76	18.73	20.70
1981	1.48	1.71	2.21	2.36	2.98	3.48	3.48	3.76	3.76	3.76	4.53	6.62	8.74
1982	1.24	2.14	2.39	2.39	2.39	2.39	2.39	2.39	2.39	3.21	3.51	3.88	10.52
1983	3.46	4.63	4.81	6.23	7.40	7.58	7.85	7.96	7.98	8.11	11.17	14.96	24.51
1984	0.92	1.29	1.33	1.46	1.46	1.46	1.46	1.52	2.12	2.35	2.93	4.92	8.10
1985	1.29	1.95	1.95	1.95	2.11	2.11	2.11	3.71	4.06	4.78	5.22	6.40	10.30
1986	2.26	3.70	4.31	4.31	4.33	4.33	4.65	4.65	4.96	4.96	6.87	8.08	16.28
1987	1.30	1.48	1.78	1.86	1.86	1.86	1.86	1.86	1.86	1.89	1.89	3.27	6.07
1988	1.39	1.46	1.46	1.52	1.65	1.76	1.82	1.82	2.09	2.09	2.21	3.08	8.19
1989	1.35	1.37	1.47	1.84	1.98	2.00	2.14	2.99	3.09	3.11	3.50	4.25	6.37
1990	1.45	1.65	1.82	1.82	1.82	1.82	1.82	1.82	2.08	2.08	2.08	3.67	6.05
1991	2.08	3.41	4.10	4.10	4.10	4.10	4.10	4.10	4.26	5.23	8.28	8.33	10.15
1992	1.92	1.92	2.81	3.04	3.04	3.04	3.93	4.41	4.54	4.54	5.29	9.85	13.66
1993	3.05	3.57	3.57	3.57	3.57	3.72	4.18	6.11	7.99	8.49	9.61	15.12	22.98
1994	1.62	1.67	1.68	2.82	2.82	2.82	2.82	2.82	4.50	5.17	5.39	6.68	8.98
1995	3.75	4.32	4.32	6.32	6.94	7.51	9.44	9.95	10.01	10.64	12.76	13.69	20.56
1996	2.78	3.23	3.45	3.45	3.45	3.45	3.89	4.11	4.91	5.09	5.33	7.16	9.90
1997	1.69	1.84	2.98	3.00	3.01	3.01	3.11	3.11	5.64	5.66	6.63	10.25	14.13
1998	2.56	2.56	3.32	3.32	3.94	4.34	5.02	5.30	7.79	9.95	12.63	16.40	28.65
1999													
Average	2.11	2.74	3.11	3.42	3.63	3.79	4.13	4.43	4.94	5.29	6.39	8.54	13.07
Stdev	0.88	1.27	1.45	1.62	1.78	1.86	2.10	2.27	2.53	2.73	3.30	4.45	6.28
Rec Max	4.68	6.60	7.23	7.23	7.56	7.77	9.44	11.73	13.29	14.65	15.89	20.16	29.11
Rec Min	0.85	1.05	1.05	1.23	1.23	1.28	1.28	1.28	1.28	1.28	1.42	1.57	3.22
Z	2.50	2.71	2.46	2.06	2.00	1.93	2.33	3.03	3.15	3.35	2.90	2.63	2.80
Yrs Rec	62	62	62	62	62	62	62	62	62	62	62	62	62
CV	.417	.463	.467	.475	.490	.491	.509	.514	.513	.515	.517	.520	.481
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	2.19	2.62	2.93	3.19	3.34	3.45	3.76	4.02	4.48	4.80	5.86	7.74	12.06
RP 5	3.12	3.89	4.34	4.73	5.01	5.18	5.71	6.13	6.84	7.34	8.90	11.88	17.84
RP 10	3.74	4.74	5.26	5.71	6.07	6.28	6.95	7.47	8.33	8.95	10.82	14.50	21.49
RP 25	4.51	5.82	6.39	6.92	7.38	7.64	8.49	9.13	10.18	10.94	13.13	17.74	25.89
RP 50	5.07	6.60	7.20	7.76	8.29	8.59	9.56	10.29	11.47	12.33	14.78	20.01	29.03
RP 100	5.61	7.37	7.99	8.61	9.21	9.54	10.63	11.45	12.76	13.72	16.36	22.28	32.04

Rainfall Depth-Duration-Frequency for Long Beach AP

DWR # U05 5080 00
Analysis By DWR DLA 707 937 4709
Data from : Climatological Data

Los Angeles County

Latitude 33.817°
Longitude -118.150°
Elevation 30 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
RP 200	6.15	8.12	8.76	9.42	10.09	10.45	11.66	12.57	14.00	15.06	17.92	24.46	35.00
RP 500	6.82	9.08	9.72	10.48	11.23	11.64	13.00	14.01	15.62	16.79	19.79	27.29	38.57
RP 1000	7.36	9.84	10.50	11.23	12.04	12.48	13.95	15.04	16.77	18.03	21.35	29.30	41.53
RP 10000	9.05	12.25	12.91	13.73	14.75	15.29	17.13	18.48	20.59	22.15	26.07	36.01	50.52

Table 5-4

Rainfall Depth Duration Frequency for Los Angeles Civic Center

DWR # U05 5115 00 | Los Angeles County | Latitude 34.050°
Analysis by DWR DLA 707 937 4705 | | Longitude -118.233°
Data From :DWR, CD, LA Co # 716 | 1S/13W-27 | Elevation 270 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1872													
1873	2.41	3.84	4.16	4.32	4.58	4.74	4.80	4.80	6.34	6.73	8.03	13.35	14.84
1874	3.48	5.30	5.32	5.54	7.36	7.36	9.27	9.27	9.77	9.77	10.45	15.28	23.78
1875	6.88	8.33	**9.77**	**10.81**	10.81	10.83	10.85	**14.80**	**15.08**	15.10	15.10	15.38	18.93
1876	3.85	3.87	3.87	3.87	3.63	5.99	5.99	7.17	7.17	7.72	11.04	15.06	26.07
1877	1.40	1.84	1.84	1.84	1.84	2.32	2.32	2.32	3.18	3.66	3.66	3.93	5.54
1878	1.78	2.21	2.58	3.11	3.93	4.09	5.02	5.33	6.09	6.69	8.27	11.06	21.26
1879	3.58	4.45	5.86	6.15	6.58	6.98	6.98	6.98	6.98	7.34	7.39	9.13	11.35
1880	4.19	4.67	4.67	4.71	4.71	4.71	5.07	6.10	6.12	6.12	6.58	9.97	20.34
1881	2.26	2.27	4.24	4.25	4.64	5.23	5.67	6.65	6.68	7.27	9.03	10.34	13.13
1882	1.24	1.32	1.85	2.28	2.46	2.49	2.53	2.56	2.56	2.69	4.32	7.05	10.40
1883	1.53	2.42	3.38	3.38	3.38	3.38	3.38	3.47	3.47	3.47	3.47	6.34	12.11
1884	2.84	4.45	4.90	5.19	5.87	7.84	9.67	9.67	10.83	13.81	16.44	**27.22**	**38.18**
1885	3.01	3.15	3.22	3.30	3.37	3.37	3.56	3.71	3.71	4.49	4.76	6.73	9.21
1886	2.05	3.89	5.27	6.13	6.31	6.51	6.51	7.09	7.72	7.72	7.73	10.66	22.76
1887	2.78	4.62	5.19	5.43	5.44	5.44	7.47	8.62	9.22	9.25	9.48	9.69	13.82
1888	2.27	3.49	4.56	4.72	4.72	4.72	6.61	6.61	6.61	6.62	7.92	8.77	13.76
1889	2.63	3.96	4.53	5.61	5.93	5.93	6.29	6.29	6.48	6.48	7.31	10.38	19.78
1890	4.30	4.89	5.52	6.54	7.05	7.05	7.07	7.44	13.47	14.35	16.51	24.34	34.32
1891	2.75	3.62	4.12	4.37	4.37	4.38	7.13	7.64	7.79	7.79	8.56	8.97	13.33
1892	1.96	2.00	2.00	2.20	2.52	2.87	3.07	3.14	3.99	3.99	5.15	6.58	11.80
1893	3.51	4.26	4.28	4.94	6.25	6.28	6.28	6.89	8.50	8.53	8.54	17.07	26.27
1894	1.00	1.89	2.11	2.72	2.72	3.28	3.28	3.28	3.65	3.81	4.00	4.87	7.47
1895	1.54	2.46	2.46	2.85	3.55	4.21	4.54	4.68	5.34	5.81	6.44	10.46	15.37
1896	1.28	1.73	1.97	1.97	1.97	1.97	2.00	2.16	3.23	3.23	3.23	5.20	8.54
1897	2.13	2.19	2.96	3.01	3.11	3.33	3.33	3.33	3.34	5.62	6.31	10.97	16.83
1898	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	2.27	2.27	2.47	2.48	7.15
1899	1.47	1.71	2.08	2.08	2.08	2.08	2.08	2.27	2.64	2.64	2.75	2.78	5.51
1900	1.16	1.44	1.44	1.44	1.44	1.44	1.81	1.81	1.81	2.05	2.20	2.97	7.90
1901	2.30	2.86	4.60	4.72	4.80	6.38	6.53	6.53	6.53	6.53	6.53	7.60	16.41
1902	1.74	1.88	1.88	2.22	3.11	3.20	3.20	4.15	4.57	5.21	5.83	7.66	10.48
1903	2.19	3.37	3.37	3.37	3.37	3.40	5.30	6.06	6.06	6.06	9.07	10.70	19.75
1904	2.08	2.20	2.21	2.57	2.58	2.58	2.59	2.79	4.29	4.50	5.02	7.18	8.74
1905	1.84	2.84	3.49	4.04	4.78	5.43	5.43	5.63	5.63	6.05	7.30	13.30	19.07
1906	1.56	2.32	2.32	3.29	3.30	3.41	3.81	3.85	5.17	6.53	7.35	10.22	18.75
1907	1.48	1.85	3.17	3.51	4.35	4.44	4.48	4.85	6.30	7.39	8.85	12.16	19.20
1908	1.63	1.87	2.39	2.93	3.77	4.31	4.33	4.64	6.20	7.73	8.44	8.72	13.02
1909	2.98	3.62	3.90	4.38	4.66	5.04	5.93	5.93	6.32	8.62	10.80	12.61	17.92
1910	2.29	3.13	3.48	3.59	3.59	3.59	3.59	3.59	4.76	4.76	8.32	9.84	12.64
1911	2.24	3.04	3.31	4.18	4.18	4.25	5.45	5.54	6.32	6.84	7.97	14.75	17.36
1912	2.02	2.62	2.79	3.39	3.51	4.01	4.32	5.80	5.94	5.97	6.99	8.65	10.37
1913	4.80	6.02	7.15	7.17	7.62	7.63	7.65	7.65	7.65	9.15	9.16	11.17	13.45
1914	4.26	5.20	6.89	7.04	7.04	7.04	7.04	8.05	10.35	10.35	12.76	18.02	23.63
1915	2.81	4.44	4.61	4.69	4.69	5.66	5.74	5.92	8.03	8.31	9.58	10.83	17.04

Rainfall Depth Duration Frequency for Los Angeles Civic Center

DWR # U05 5115 00 | Los Angeles County | Latitude 34.050°
Analysis by DWR DLA 707 937 4705 | Longitude -118.233°
Data From :DWR, CD, LA Co # 716 | 1S/13W-27 | Elevation 270 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1916	4.16	5.23	6.05	6.48	6.52	6.90	6.90	6.93	10.01	10.83	13.51	15.82	20.69
1917	2.36	2.53	2.53	2.67	2.80	3.36	3.90	4.46	4.49	4.49	5.63	7.70	14.49
1918	2.05	2.93	3.45	3.84	4.36	4.74	5.58	5.99	5.99	8.38	11.32	12.67	14.53
1919	0.95	1.61	1.61	1.61	1.61	1.62	2.13	2.15	2.15	2.96	3.31	4.09	9.20
1920	1.25	2.03	2.03	2.03	2.21	2.45	2.45	2.59	3.07	3.49	4.31	6.62	11.27
1921	1.58	2.26	2.52	2.75	2.83	2.84	2.85	3.00	3.17	3.57	3.60	6.78	14.23
1922	2.12	4.12	4.62	5.06	5.48	5.64	6.39	7.74	9.05	9.37	9.53	14.74	19.04
1923	1.15	1.40	1.68	1.76	2.04	2.08	2.13	2.44	3.04	3.11	3.11	4.53	10.14
1924	1.11	1.11	1.15	1.71	1.71	1.73	1.73	2.18	2.34	2.82	3.42	4.85	6.12
1925	1.10	1.25	1.35	1.35	1.46	1.61	2.17	2.17	2.29	2.29	2.84	3.49	7.94
1926	3.03	3.82	4.23	6.26	7.34	7.34	7.43	7.43	7.48	7.52	7.59	9.30	17.56
1927	2.55	3.87	4.71	6.18	6.38	6.38	6.40	6.41	8.96	9.07	10.41	11.68	17.76
1928	1.64	1.64	1.64	2.04	2.04	2.04	2.04	2.08	2.46	3.09	3.09	5.33	9.77
1929	1.55	2.49	2.49	2.49	2.50	2.50	2.50	2.50	2.70	2.70	4.41	5.85	12.98
1930	1.74	2.88	3.36	3.40	3.42	3.43	4.10	4.68	5.18	5.18	5.57	6.59	11.21
1931	1.98	2.83	2.85	2.85	3.18	3.18	3.49	3.53	3.60	3.60	3.60	7.15	12.78
1932	2.09	2.48	2.59	3.06	3.06	3.06	3.64	5.31	5.80	7.29	7.34	11.96	16.83
1933	2.69	2.74	3.22	5.48	5.71	5.73	6.62	6.83	8.46	8.46	8.46	10.23	11.75
1934	4.86	7.98	8.26	8.27	8.27	8.27	8.27	8.27	8.27	10.30	11.60	11.74	14.68
1935	2.53	2.75	2.75	2.75	2.75	3.22	3.51	3.52	3.52	3.61	4.77	7.68	21.63
1936	1.30	2.45	2.77	3.87	4.07	4.65	5.02	5.24	5.90	6.75	7.69	8.05	12.02
1937	2.39	3.96	3.96	3.99	3.99	3.99	4.67	6.89	6.89	7.80	8.78	12.82	22.35
1938	5.88	6.36	9.21	10.68	**11.06**	11.06	11.07	11.13	12.26	12.26	16.17	19.38	23.44
1939	3.96	5.58	5.62	5.62	6.15	6.76	7.26	7.26	7.26	7.26	7.95	11.35	18.74
1940	1.66	2.35	3.18	3.34	3.34	3.34	3.34	3.34	4.06	4.06	6.83	9.76	13.54
1941	2.77	4.00	4.72	4.90	5.04	5.81	8.18	8.36	9.40	13.28	14.42	22.74	35.60
1942	1.77	1.90	1.90	1.90	1.90	1.90	2.63	2.63	2.63	3.17	4.61	5.07	11.80
1943	5.40	6.87	7.59	7.59	7.67	8.67	8.68	9.50	9.78	10.15	10.15	17.39	19.65
1944	3.86	4.75	7.09	7.77	7.78	8.02	8.09	8.13	10.52	10.87	11.02	11.61	18.78
1945	1.25	2.38	2.51	3.00	3.01	3.01	3.01	3.33	3.37	3.37	3.62	6.56	10.87
1946	2.41	3.92	4.67	4.81	4.87	4.87	4.87	4.87	5.00	5.00	5.16	5.28	11.07
1947	2.30	3.31	3.97	4.51	4.51	4.51	4.51	5.59	6.52	6.52	6.70	10.19	13.08
1948	1.54	1.54	1.54	1.54	1.54	1.82	2.04	2.48	3.24	3.25	3.62	4.74	7.00
1949	0.93	1.12	1.12	1.20	1.21	1.23	1.28	1.97	2.25	2.26	3.19	5.32	7.73
1950	1.84	2.05	2.05	2.05	2.23	2.23	2.30	2.30	2.68	2.68	4.01	6.48	10.65
1951	1.04	1.04	1.04	1.17	1.27	1.33	1.33	1.71	1.71	2.75	2.82	4.51	7.47
1952	2.76	4.21	6.62	8.07	8.07	8.23	9.67	9.68	10.12	10.89	14.10	16.44	26.98
1953	1.31	1.90	2.40	2.40	2.40	2.40	2.40	2.72	2.89	2.90	3.92	7.29	9.76
1954	3.28	3.33	3.33	3.33	3.40	3.40	3.97	3.97	4.64	4.64	7.30	8.04	13.07
1955	1.44	2.02	2.11	2.20	2.20	2.20	2.20	2.93	3.53	4.15	4.21	5.74	12.79
1956	**7.43**	**8.70**	9.49	9.49	9.49	9.49	9.90	9.90	9.90	9.90	9.90	10.59	18.17
1957	2.22	2.30	2.30	2.57	2.57	2.57	2.57	3.11	3.25	4.13	4.94	7.01	10.66
1958	2.82	2.85	2.98	3.09	3.09	3.09	4.29	4.29	4.29	4.41	7.58	14.60	23.37
1959	1.71	1.71	1.71	1.76	1.76	2.99	2.99	3.46	4.09	4.09	4.09	5.02	6.13

Rainfall Depth Duration Frequency for Los Angeles Civic Center

DWR # U05 5115 00 | Los Angeles County | Latitude 34.050°
Analysis by DWR DLA 707 937 4705 | Longitude -118.233°
Data From :DWR, CD, LA Co # 716 | 1S/13W-27 | Elevation 270 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1960	1.62	1.80	2.66	2.66	3.06	3.32	3.32	3.32	3.32	3.49	4.77	6.10	9.37
1961	1.12	1.39	1.50	1.56	1.56	1.56	1.56	2.03	2.03	2.03	2.91	2.94	5.59
1962	2.96	4.52	5.68	8.60	9.21	9.45	10.73	11.17	13.38	13.39	13.98	17.04	21.46
1963	1.69	3.10	3.11	3.11	3.13	3.58	3.58	3.58	4.18	4.18	4.18	7.52	10.88
1964	1.30	1.57	1.57	1.66	1.66	1.66	1.81	1.85	2.36	2.40	2.40	3.00	7.12
1965	1.60	2.52	3.49	3.54	3.54	3.57	4.91	5.99	6.99	6.99	8.30	8.53	15.57
1966	3.91	3.94	4.09	4.91	5.25	5.25	7.63	9.00	9.69	9.69	11.05	15.43	18.92
1967	3.82	3.85	5.41	5.63	5.63	5.63	5.63	5.90	5.90	5.90	5.90	11.23	22.84
1968	3.44	4.13	7.45	7.93	7.93	7.93	7.93	7.93	8.64	8.76	10.11	10.45	15.72
1969	4.30	5.74	6.71	6.71	7.26	**11.19**	**13.21**	13.31	15.05	15.11	16.45	23.65	27.81
1970	1.50	2.81	3.09	3.09	3.09	4.46	4.46	4.46	4.46	4.46	5.82	7.44	7.77
1971	3.64	4.02	4.29	4.57	4.84	4.84	5.28	5.28	5.59	5.62	9.60	10.02	12.09
1972	3.33	4.18	4.28	4.28	5.00	5.10	6.04	6.04	6.04	6.17	6.46	6.77	7.43
1973	2.44	3.20	3.64	3.72	4.38	5.67	6.43	7.18	7.51	7.51	11.23	13.26	21.14
1974	3.52	5.57	6.02	7.56	7.66	7.69	7.79	7.79	7.80	8.35	9.68	9.68	14.92
1975	1.59	2.33	2.33	2.94	2.95	3.32	3.34	3.59	3.68	4.79	4.83	8.49	14.35
1976	1.01	1.64	1.95	2.35	3.26	3.57	3.69	3.69	3.69	3.71	5.32	5.81	10.12
1977	2.02	2.77	2.77	2.77	2.81	2.81	2.81	2.81	2.81	2.99	3.03	3.59	11.67
1978	2.54	4.21	5.14	5.80	7.89	8.50	8.62	8.62	8.73	8.73	15.32	17.56	31.57
1979	2.11	2.95	3.13	3.40	3.40	3.41	3.41	3.41	5.24	5.35	7.64	10.15	19.29
1980	3.03	4.99	6.41	7.87	9.29	10.47	12.62	12.75	12.75	**15.31**	**16.63**	24.11	26.46
1981	1.25	2.02	2.22	2.35	2.99	3.19	3.21	3.81	3.81	3.81	4.90	7.49	8.98
1982	1.28	1.82	1.97	2.31	2.46	2.46	2.80	2.80	2.99	3.79	4.34	5.08	11.53
1983	3.42	4.68	4.86	6.12	7.20	7.36	7.59	7.73	7.78	8.28	10.85	18.04	33.63
1984	1.16	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.88	2.66	3.23	5.75	8.28
1985	1.71	2.53	2.53	2.53	2.70	2.70	2.81	3.46	4.20	5.04	5.53	6.97	12.38
1986	2.50	3.79	4.61	4.62	4.74	4.74	5.82	5.82	6.09	6.10	8.12	13.40	19.82
1987	1.06	1.12	1.31	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.64	2.92	5.61
1988	1.39	1.45	1.56	1.62	1.90	2.43	2.61	2.63	3.41	3.41	3.50	4.36	12.47
1989	0.88	1.32	1.32	1.43	1.43	2.22	2.82	3.69	3.69	3.85	4.48	5.18	8.34
1990	2.06	2.44	2.51	2.51	2.51	2.51	2.51	2.51	3.12	3.26	3.26	4.36	7.02
1991	*2.44*	*3.26*	*3.93*	*3.93*	*3.93*	*4.15*	*4.15*	*4.15*	*4.24*	*5.27*	*8.36*	*8.56*	*16.03*
1992	2.06	2.99	4.17	4.86	5.33	5.60	6.09	7.84	7.84	7.84	10.59	15.41	20.86
1993	2.78	4.28	4.31	4.34	4.67	4.67	6.81	8.92	11.28	11.68	13.07	19.62	27.36
1994	1.00	1.00	1.00	1.77	1.77	1.77	1.77	1.77	2.51	3.21	3.54	5.40	8.11
1995	3.30	3.55	4.00	5.12	5.37	5.74	8.81	9.43	9.61	10.11	13.62	14.92	24.37
1996	2.39	3.44	4.02	4.02	4.02	4.02	4.31	4.71	5.33	5.41	6.81	10.20	12.44
1997	1.70	2.29	3.04	3.11	3.11	3.11	3.23	3.23	5.11	5.11	5.62	9.67	12.85
1998	2.08	2.63	4.39	4.39	5.11	5.37	5.85	6.17	8.34	11.85	14.70	17.85	30.60
1999													
Average	2.38	3.14	3.62	3.98	4.22	4.48	4.92	5.26	5.86	6.31	7.41	9.95	15.39
Stdev	1.19	1.51	1.85	2.06	2.18	2.31	2.57	2.73	3.02	3.22	3.73	5.07	6.96
Rec Max	7.43	8.70	9.77	10.81	11.06	11.19	13.21	14.80	15.08	15.31	16.63	27.22	38.18

Rainfall Depth Duration Frequency for Los Angeles Civic Center

DWR # U05 5115 00 | Los Angeles County | Latitude 34.050°
Analysis by DWR DLA 707 937 4705 | | Longitude -118.233°
Data From :DWR, CD, LA Co # 716 | 1S/13W-27 | Elevation 270 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
Rec Min	0.88	1.00	1.00	1.17	1.21	1.23	1.28	1.39	1.39	1.39	1.64	2.48	5.51
Z	4.34	3.41	3.15	3.17	3.00	2.75	3.06	3.33	2.92	2.71	2.43	3.36	3.37
Yrs Rec	126	126	126	126	126	126	126	126	126	126	126	126	126
CV	.501	.481	.511	.517	.517	.515	.524	.518	.514	.510	.504	.509	.452
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	2.43	2.99	3.38	3.68	3.86	4.07	4.45	4.77	5.32	5.73	6.81	9.03	14.28
RP 5	3.69	4.50	5.18	5.63	5.91	6.22	6.85	7.31	8.13	8.72	10.24	13.75	20.69
RP 10	4.53	5.52	6.35	6.87	7.21	7.58	8.37	8.92	9.91	10.62	12.40	16.73	24.72
RP 25	5.58	6.80	7.80	8.41	8.82	9.26	10.25	10.91	12.11	12.97	15.02	20.43	29.60
RP 50	6.34	7.73	8.84	9.48	9.94	10.44	11.56	12.30	13.64	14.61	16.88	23.02	33.08
RP 100	7.08	8.64	9.84	10.55	11.06	11.62	12.87	13.70	15.18	16.25	18.67	25.60	36.42
RP 200	7.80	9.54	10.82	11.58	12.14	12.75	14.13	15.03	16.66	17.83	20.43	28.08	39.69
RP 500	8.72	10.68	12.05	12.92	13.55	14.22	15.77	16.77	18.58	19.88	22.55	31.31	43.65
RP 1000	9.45	11.59	13.04	13.87	14.54	15.27	16.94	18.01	19.95	21.33	24.31	33.60	46.94
RP 10000	11.74	14.46	16.12	17.04	17.87	18.76	20.83	22.13	24.50	26.19	29.64	41.25	56.89

Table 5-5

Rainfall Depth Duration Frequency for Mt Wilson 338

DWR # U05 6006 00 | Los Angeles County | Latitude 34.227°
Analysis By DWR DLA 707 937 4709 | | Longitude -118.066°
Data from : Climatological Data | 2N/11W-30J | Elevation 5709 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1905													39.90
1906													44.30
1907													46.02
1908													31.83
1909	6.16	6.46	6.91	7.31	8.11	12.53	12.74	12.74	13.03	14.95	21.71	25.41	41.66
1910	3.93	6.75	8.44	8.44	8.44	8.44	8.44	8.44	10.66	10.66	15.45	19.00	24.13
1911	3.11	3.83	3.83	5.45	6.88	7.01	8.55	10.17	11.87	13.71	16.92	27.39	31.51
1912	5.60	5.81	7.41	7.97	11.78	13.38	13.51	14.82	15.17	15.30	16.33	20.34	26.96
1913	4.73	7.20	7.56	7.74	7.78	7.96	8.01	8.08	8.08	12.40	12.77	15.56	21.28
1914	6.38	12.47	16.95	19.02	19.40	19.40	19.40	19.40	19.40	19.40	29.22	37.29	48.92
1915	3.50	4.85	5.64	6.49	6.88	7.89	8.76	9.62	12.29	13.54	15.02	17.15	30.43
1916	6.38	10.75	11.33	11.89	12.47	12.78	13.40	13.71	19.04	21.27	25.60	27.61	36.70
1917	3.80	4.28	5.12	5.15	5.15	5.31	6.15	6.15	6.97	6.97	9.13	12.89	28.44
1918	4.35	8.25	9.79	9.86	10.85	11.34	12.40	13.03	15.35	21.34	25.75	26.56	28.16
1919	2.45	2.54	2.59	2.59	2.59	2.59	3.44	3.83	3.83	3.96	4.86	8.82	20.62
1920	2.64	3.50	3.82	4.05	4.22	5.32	5.32	5.65	8.42	8.42	10.80	17.07	31.19
1921	5.69	7.19	8.65	8.78	8.78	8.88	9.05	9.05	9.05	11.04	11.04	15.51	34.06
1922	11.00	16.85	20.68	21.88	22.88	23.03	24.93	29.38	32.50	33.80	34.30	49.66	60.51
1923	3.72	4.34	4.88	4.91	5.47	5.49	6.62	6.99	8.64	9.48	9.57	13.90	23.79
1924	2.01	2.36	3.11	4.01	4.36	4.36	5.16	5.76	6.41	7.51	9.26	12.33	17.26
1925	2.92	4.37	4.40	4.40	4.40	5.01	6.24	6.27	6.45	6.45	8.21	10.77	21.91
1926	6.80	10.06	12.08	14.60	14.62	14.65	16.62	16.67	17.08	17.45	17.71	23.26	36.26
1927	5.89	8.50	13.58	13.83	13.88	14.26	14.46	14.46	16.87	17.02	19.44	21.23	33.37
1928	2.38	3.73	4.35	4.35	4.35	4.35	4.35	4.35	4.35	4.53	5.55	8.25	19.78
1929	2.50	3.60	3.63	3.65	3.65	3.65	3.65	3.65	3.92	3.94	6.59	9.61	20.45
1930	3.05	4.80	5.90	6.00	6.02	6.02	6.02	6.02	7.33	7.72	8.59	10.96	23.23
1931	4.08	5.33	6.02	6.12	6.78	7.47	7.47	7.99	9.61	9.69	9.74	13.03	27.62
1932	4.87	6.59	7.02	7.12	7.12	7.12	8.22	11.38	12.58	14.55	14.57	20.90	32.73
1933	6.75	8.23	8.25	12.50	13.98	13.98	15.41	15.61	20.13	20.13	20.13	21.84	24.28
1934	9.44	14.69	15.14	15.21	15.21	15.21	15.21	15.21	15.21	19.96	20.21	21.30	28.01
1935	4.12	6.37	7.60	7.62	7.62	7.69	9.44	9.44	9.44	9.44	13.56	21.39	41.50
1936	2.89	4.83	6.38	7.48	9.13	9.88	10.61	10.85	11.90	15.14	16.89	19.60	24.75
1937	4.00	5.90	5.90	5.90	7.44	7.44	7.44	7.44	10.94	14.26	15.97	21.84	43.35
1938	7.97	11.12	16.62	18.71	20.34	20.34	20.41	20.98	24.10	24.10	24.74	38.73	47.66
1939	3.80	6.60	8.35	8.83	11.54	13.29	14.03	14.03	14.03	14.03	15.43	19.53	24.34
1940	3.28	3.96	5.65	5.81	5.96	5.96	6.30	6.57	6.57	6.57	10.63	17.68	33.94
1941	6.60	9.77	11.18	11.88	13.18	14.59	17.58	18.83	26.25	32.50	38.57	53.26	91.79
1942	2.68	2.77	2.82	2.99	3.52	3.60	3.85	4.06	4.23	6.04	7.69	8.59	21.44
1943	16.10	22.18	23.98	23.98	24.06	25.18	25.33	28.17	28.61	29.14	29.14	49.09	56.56
1944	7.91	10.21	13.98	15.21	15.40	15.56	15.82	15.85	21.27	21.64	22.89	25.47	43.03
1945	5.27	9.06	9.12	9.70	10.32	10.33	10.33	11.02	11.31	11.31	11.56	17.37	32.96
1946	5.90	9.61	12.13	12.24	12.46	12.49	12.49	12.49	15.33	15.68	16.34	19.97	36.35
1947	6.04	10.24	11.82	12.94	12.96	12.96	13.35	17.77	19.96	20.35	21.64	32.52	44.16
1948	2.77	3.10	3.20	3.20	3.23	3.23	3.28	3.28	4.62	4.73	6.10	9.07	16.41
1949	1.77	2.67	2.69	3.25	3.49	3.70	4.12	5.66	7.19	7.20	8.67	12.26	21.52
1950	4.37	5.37	5.40	5.40	5.40	5.40	5.40	5.40	5.56	5.56	7.30	11.91	22.87
1951	5.85	6.44	8.04	8.63	9.62	9.62	10.09	10.09	10.09	10.17	10.89	11.78	23.25
1952	4.66	6.52	8.94	10.81	10.88	13.39	15.26	15.26	16.07	20.05	22.87	29.63	52.45
1953	2.11	3.24	3.44	3.44	3.44	3.44	4.11	4.62	4.68	6.28	7.61	12.34	19.80
1954	4.42	5.97	6.03	6.03	7.44	11.18	12.00	12.00	13.17	13.17	15.19	17.59	26.37
1955	2.45	3.23	3.37	3.92	3.92	3.92	3.92	5.81	6.99	7.98	8.35	11.44	23.28
1956	6.44	8.74	10.45	10.45	10.47	10.47	11.12	11.14	11.16	11.16	12.11	13.02	24.42
1957	2.63	2.85	3.21	3.88	3.95	4.29	4.37	5.31	5.31	7.98	10.12	13.48	22.92
1958	3.94	7.22	7.63	7.65	7.65	7.70	8.18	10.16	11.02	12.11	15.59	26.46	45.91
1959	3.10	3.25	3.35	4.00	4.54	5.38	5.76	6.95	7.84	8.07	8.07	11.17	13.61
1960	2.30	2.55	3.12	3.37	3.37	3.57	3.84	3.84	4.15	5.09	6.06	8.92	13.65
1961	2.46	2.67	3.46	4.42	4.45	4.45	4.45	4.65	5.42	5.42	6.79	7.58	11.98
1962	7.74	10.70	12.68	14.37	16.77	16.99	17.87	18.54	21.21	21.63	23.42	28.59	37.20
1963	5.20	6.59	6.59	6.59	6.66	7.26	7.26	7.26	8.86	8.86	8.86	12.11	20.25
1964	3.05	3.71	3.71	3.71	3.76	3.76	3.76	5.49	5.95	5.99	6.59	7.85	16.47

Rainfall Depth Duration Frequency for Mt Wilson 338

DWR # U05 6006 00
Analysis By DWR DLA 707 937 4709
Data from : Climatological Data

Los Angeles County

2N/11W-30J

Latitude 34.227°
Longitude -118.066°
Elevation 5709 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1965	3.24	5.42	7.11	8.31	9.28	9.44	11.94	15.07	17.52	17.52	17.71	18.79	33.86
1966	6.71	10.73	13.47	15.55	15.91	15.91	23.95	28.71	29.92	29.92	31.77	39.85	46.18
1967	6.82	9.03	10.83	15.00	16.80	16.88	16.88	17.07	17.07	17.77	20.56	24.11	50.53
1968	4.81	7.34	10.33	10.74	10.74	10.74	10.74	10.74	11.69	11.74	12.72	13.40	22.09
1969	11.96	15.99	18.23	18.23	25.70	29.73	34.87	35.31	37.64	39.32	41.69	59.66	66.71
1970	3.97	7.13	7.66	7.66	7.77	9.11	9.11	9.11	9.11	9.11	14.52	16.55	20.36
1971	7.37	9.34	9.61	9.74	10.54	10.54	11.26	11.26	12.04	12.21	19.96	21.29	27.73
1972	3.38	5.10	5.57	7.35	7.56	9.55	10.24	10.24	10.24	10.52	10.89	11.77	13.20
1973	9.79	12.05	13.32	13.32	14.93	16.84	18.27	19.38	19.53	19.75	22.78	33.04	48.43
1974	9.50	13.87	15.27	20.04	20.95	21.28	21.91	22.05	22.41	23.61	24.24	28.91	43.42
1975	3.73	5.71	7.93	9.91	10.16	10.74	10.92	12.19	12.36	12.36	14.06	19.40	34.13
1976	5.51	8.67	10.19	13.19	14.58	15.12	15.32	15.32	15.32	15.32	21.19	21.27	26.88
1977	4.37	7.30	8.20	8.20	10.71	11.07	11.32	12.23	12.23	12.23	12.70	12.70	29.68
1978	7.49	12.21	16.64	18.94	23.66	23.98	23.98	23.98	24.30	24.30	40.98	55.62	79.42
1979	3.68	6.43	7.30	7.51	7.81	7.81	7.81	9.11	11.44	11.93	13.22	19.13	46.21
1980	6.58	10.21	15.32	17.51	20.67	25.78	28.86	30.71	30.71	34.16	39.42	58.14	69.65
1981	4.53	7.80	7.84	7.84	8.21	8.63	9.29	9.52	9.52	10.19	11.50	20.94	26.89
1982	3.64	5.18	6.68	8.13	9.63	9.97	12.03	12.15	12.15	15.41	17.81	20.52	39.32
1983	8.86	16.82	18.47	23.34	24.47	25.47	25.72	26.00	26.15	28.17	33.05	38.39	95.32
1984	3.44	4.19	4.35	4.35	4.35	4.35	4.35	4.35	5.51	6.20	16.40	16.40	23.99
1985	4.23	5.96	7.99	7.99	9.90	9.90	10.05	10.78	11.66	14.67	15.84	21.16	34.47
1986	5.70	7.05	7.05	7.28	7.44	7.75	10.06	12.52	12.61	12.61	19.81	29.92	*45.25*
1987													
1988	3.14	4.94	6.10	6.81	7.37	8.90	9.96	10.07	13.59	13.79	15.05	18.12	45.52
1989	5.59	7.12	7.30	7.76	7.76	7.85	9.64	10.43	11.65	12.21	13.63	16.01	30.89
1990	4.62	5.46	5.51	5.51	5.51	5.52	5.52	5.52	6.09	6.48	6.48	12.49	19.69
1991	6.97	12.20	13.39	13.49	13.49	13.49	14.00	14.00	15.14	17.93	47.45	47.62	35.79
1992	6.23	9.63	12.52	13.17	13.26	16.15	18.05	19.88	20.06	20.06	24.08	31.93	48.60
1993	5.33	6.42	8.60	9.50	12.69	15.89	16.73	16.94	25.68	26.68	30.67	46.52	64.78
1994	2.69	3.14	3.14	3.25	3.80	3.80	4.01	4.01	5.92	7.05	8.39	13.05	20.03
1995	5.29	8.72	11.42	13.35	14.76	15.48	18.84	20.34	21.18	23.29	28.35	34.85	61.80
1996	7.22	12.49	14.09	14.64	14.64	14.64	15.22	15.37	18.01	18.56	21.91	26.23	34.39
1997	3.41	5.89	6.13	6.13	6.13	6.17	6.41	6.41	9.95	10.25	12.64	23.57	33.28
1998	8.35	11.11	13.53	13.53	14.28	14.33	15.56	15.68	17.48	23.99	28.22	37.22	65.52
1999													
Average	5.10	7.36	8.64	9.40	10.16	10.76	11.55	12.22	13.52	14.56	17.28	22.54	35.20
Stdev	2.45	3.77	4.57	5.10	5.63	6.00	6.51	6.86	7.30	7.74	9.30	12.36	16.46
Rec Max	16.10	22.18	23.98	23.98	25.70	29.73	34.87	35.31	37.64	39.32	47.45	59.66	95.32
Rec Min	1.77	2.36	2.59	2.59	2.59	2.59	3.28	3.28	3.83	3.94	4.86	7.58	11.98
Z	4.41	3.87	3.30	2.86	2.83	3.24	3.66	3.47	3.32	3.23	3.40	3.18	3.89
Yrs Rec	89	89	89	89	89	89	89	89	89	89	89	89	93
CV	.481	.512	.529	.542	.554	.558	.564	.561	.540	.531	.539	.548	.468
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	5.23	6.97	8.03	8.66	9.24	9.68	10.38	10.99	12.21	13.17	15.79	20.32	32.57
RP 5	7.83	10.72	12.46	13.49	14.53	15.25	16.44	17.37	19.00	20.37	24.35	31.81	47.71
RP 10	9.56	13.27	15.36	16.56	17.88	18.79	20.28	21.42	23.31	24.93	29.75	39.11	57.25
RP 25	11.71	16.47	18.93	20.35	22.03	23.17	25.04	26.43	28.64	30.58	36.26	48.13	68.78
RP 50	13.27	18.80	21.50	23.00	24.93	26.23	28.36	29.93	32.36	34.52	40.91	54.43	77.00
RP 100	14.79	21.08	23.97	25.65	27.83	29.29	31.68	33.43	36.09	38.47	45.38	60.73	84.90
RP 200	16.28	23.33	26.40	28.20	30.62	32.23	34.87	36.79	39.67	42.26	49.75	66.79	92.64
RP 500	18.16	26.18	29.43	31.51	34.24	36.05	39.02	41.16	44.32	47.19	55.04	74.66	101.99
RP 1000	19.67	28.44	31.87	33.86	36.81	38.76	41.97	44.27	47.63	50.69	59.43	80.26	109.76
RP 10000	24.38	35.60	39.48	41.71	45.40	47.82	51.81	54.63	58.66	62.37	72.73	98.92	133.29

Table 5-6

Rainfal Depth Duration Frequency for Pasadena

DWR # U05 6719 00, LA Co 610BB — Los Angeles County — Latitude 34.1
Analysis By DWR DLA 707 937 4709 — Longitude -118.123°
Data from : Climatological Data — 1N/12W-28C — Elevation 864 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1883	2.27	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07	7.08	12.67
1884	4.67	4.67	6.95	7.82	8.24	11.72	11.72	11.72	13.00	13.00	19.03	33.22	45.13
1885	2.86	3.00	3.02	3.02	3.02	3.08	2.34	3.47	3.30	4.01	4.16	6.30	9.94
1886	4.07	5.21	5.26	5.43	5.60	5.60	5.60	7.32	7.15	7.15	7.41	10.84	24.32
1887	3.53	4.43	5.20	5.20	5.20	5.20	8.76	10.45	10.77	10.82	11.04	11.09	15.65
1888	4.45	5.70	6.03	6.03	6.03	9.10	9.43	9.43	9.43	9.43	11.02	13.28	21.27
1889	3.21	5.26	5.41	8.06	5.71	5.71	8.29	6.48	8.42	8.42	9.50	12.74	24.82
1890	3.46	4.79	7.50	7.92	8.02	8.02	8.13	8.22	14.28	15.44	18.34	*19.06*	40.53
1891													18.17
1892													15.66
1893													29.46
1894													10.74
1895													22.13
1896													10.09
1897													21.76
1898													8.77
1899													8.91
1900													11
1901													24
1902													11.89
1903													24.90
1904													10.72
1905													26.25
1906													25.04
1907													25.04
1908													25.04
1909	3.80	5.73	5.81	5.81	6.63	6.71	8.29	8.29	9.17	11.26	15.09	17.50	25.33
1910	3.28	4.97	6.05	6.05	6.05	6.05	6.05	6.17	7.33	7.33	11.38	13.68	17.99
1911	3.06	3.78	4.31	5.20	5.22	5.74	7.31	7.56	9.05	11.79	11.79	21.79	25.89
1912	2.71	4.10	4.59	5.38	6.20	6.20	8.75	10.83	10.98	10.98	11.83	14.45	15.99
1913	6.25	8.82	8.99	9.10	9.19	9.29	9.29	9.29	9.29	11.12	11.20	14.33	18.25
1914	5.25	6.82	9.87	11.44	11.44	11.44	11.44	12.31	15.25	15.25	18.78	27.64	34.17
1915	3.63	5.28	5.86	5.86	5.86	7.13	7.30	7.53	9.59	10.08	11.39	13.14	21.94
1916	4.68	7.15	7.90	8.31	8.42	8.82	8.82	9.77	12.00	13.70	16.83	19.44	25.49
1917	2.68	2.68	2.68	2.72	2.86	3.65	3.65	4.54	4.67	4.67	6.15	8.89	18.61
1918	2.64	5.17	5.61	5.64	7.01	8.11	8.29	8.29	10.08	15.07	17.15	18.01	19.83
1919	1.56	2.04	2.39	2.70	2.70	2.70	2.70	2.74	3.28	3.50	3.92	6.66	15.66
1920	1.81	2.34	2.54	2.74	2.74	3.27	3.27	3.63	4.10	4.62	6.42	9.84	19.39
1921	2.64	3.12	3.56	3.76	3.20	4.00	4.30	4.32	4.70	5.26	5.43	9.49	19.41
1922	3.36	6.13	7.25	8.09	8.90	8.99	9.66	12.45	14.27	15.20	15.53	22.43	29.61
1923	2.02	2.77	3.09	3.12	3.49	3.50	3.86	4.18	4.82	5.02	5.02	6.88	13.55
1924	1.39	1.59	1.88	2.39	2.59	2.59	2.60	2.86	3.10	3.55	4.74	5.29	9.60
1925	1.76	3.03	3.04	3.04	3.04	3.53	4.40	4.41	4.55	4.55	5.29	6.14	12
1926	3.81	5.25	7.79	9.36	9.46	9.54	9.68	9.79	9.92	9.94	10.46	10.83	22
1927	3.72	5.76	9.12	9.79	9.79	9.92	10.03	10.05	11.61	11.68	13.68	14.98	25.17

Rainfal Depth Duration Frequency for Pasadena

DWR # U05 6719 00, LA Co 610BB
Analysis By DWR DLA 707 937 4709
Data from : Climatological Data

Los Angeles County

1N/12W-28C

Latitude 34.148°
Longitude -118.123°
Elevation 864 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1928	2.95	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.99	6.31	13.59
1929	3.30	3.37	3.38	3.38	3.38	3.38	3.38	3.38	3.61	3.61	6.37	7.52	16.42
1930	2.36	4.06	4.46	4.52	4.66	4.66	4.66	5.32	5.86	5.86	6.25	8.05	15.79
1931	2.73	3.74	4.32	4.32	4.87	5.45	5.95	5.96	6.60	6.61	6.61	9.84	17.63
1932	2.88	3.97	4.12	4.14	4.14	4.14	5.06	7.91	8.21	9.63	9.67	15.24	22.37
1933	4.73	5.49	5.51	9.00	9.76	9.78	11.10	11.21	12.54	12.54	12.59	14.31	16.16
1934	6.21	12.38	12.86	12.88	12.88	12.88	12.88	12.88	12.88	16.53	16.69	16.96	21.38
1935	3.26	4.03	4.03	4.03	4.03	4.14	4.98	4.98	4.98	4.99	7.91	12.71	26.98
1936	1.85	3.63	4.01	4.27	5.30	6.24	6.69	6.73	7.64	7.64	10.09	12.29	15.73
1937	3.05	3.61	3.87	4.70	6.41	6.44	7.08	7.08	7.87	9.46	10.71	17.02	28.82
1938	7.70	9.88	12.41	14.13	14.81	14.81	15.27	15.28	16.86	16.86	21.11	25.73	32.02
1939	3.17	5.35	6.36	7.14	9.54	10.55	11.18	11.18	11.18	11.18	12.38	16.49	25.24
1940	2.40	3.18	4.13	4.34	4.35	4.35	4.35	4.35	4.89	4.89	9.29	12.82	17.83
1941	4.22	5.75	7.18	8.52	8.52	9.86	11.34	12.56	13.78	17.53	22.28	30.51	46.10
1942	2.11	2.59	2.81	2.83	3.23	3.36	3.65	3.76	3.76	5.56	6.64	6.86	15.09
1943	**8.35**	**14.69**	**14.86**	**14.93**	**15.07**	15.66	15.83	17.66	17.83	18.61	18.61	30.58	35.80
1944	5.00	6.11	9.20	9.32	9.54	9.76	9.76	9.84	13.22	13.52	13.86	14.97	26.95
1945	2.47	4.09	4.55	4.82	5.31	5.31	5.31	6.05	6.09	6.09	6.34	9.59	18.20
1946	3.41	5.19	6.97	7.03	7.15	7.15	7.15	7.15	7.34	7.45	7.54	9.50	17.30
1947	3.19	5.57	6.20	6.52	6.52	6.52	6.77	8.98	10.22	10.47	11.01	16.33	21.90
1948	1.75	2.31	2.31	2.31	2.31	2.31	2.31	2.31	3.34	3.37	4.54	6.29	11.43
1949	1.30	1.59	1.70	1.99	2.07	2.07	2.07	2.70	3.08	3.56	4.22	7.43	12.63
1950	2.63	3.43	3.43	3.43	3.45	3.45	3.46	3.45	4.34	4.34	5.87	9.28	16.72
1951	1.15	1.59	1.59	1.59	1.59	1.59	1.88	2.54	2.66	3.73	3.85	5.77	11.60
1952	5.45	6.98	10.66	11.26	11.26	14.50	14.50	14.50	15.36	15.89	20.18	23.35	39.49
1953	1.66	2.81	3.31	3.31	3.31	3.31	3.31	4.10	4.10	5.68	6.50	9.72	14.05
1954	3.01	3.33	3.61	3.61	3.61	4.45	4.86	4.86	5.63	5.63	7.91	8.78	15.89
1955	1.67	2.01	2.39	2.44	2.44	2.44	2.47	4.07	4.65	5.35	5.37	7.27	17.14
1956	7.19	8.45	9.45	9.45	9.50	9.50	9.52	9.94	9.96	9.96	11.16	11.31	19.35
1957	2.40	2.43	2.43	2.43	2.43	3.13	3.13	3.13	3.13	3.19	4.27	8.18	14.58
1958	3.19	3.43	4.44	4.70	4.78	5.12	6.48	6.51	7.30	8.51	11.72	20.39	32.08
1959	3.41	3.41	3.41	3.41	3.41	4.13	4.28	4.88	5.48	5.48	5.48	8.89	11.81
1960	1.66	1.66	2.28	2.34	2.68	2.96	3.02	3.02	3.05	3.23	4.26	6.72	16.54
1961	1.59	1.66	1.74	2.30	2.33	2.33	2.33	2.78	3.23	3.23	4.01	4.09	7.26
1962	3.02	4.44	5.58	7.50	8.92	9.16	10.22	10.69	12.00	12.14	12.84	17.86	24.24
1963	2.65	3.80	3.85	3.85	3.86	4.56	4.56	4.56	5.24	5.24	5.24	7.59	11.69
1964	1.62	2.66	2.66	2.66	2.70	2.70	2.70	2.83	3.07	3.28	3.41	3.99	10.51
1965	1.58	2.41	3.67	3.82	3.82	3.89	5.05	6.73	7.44	7.44	7.97	8.29	16.30
1966	4.51	4.80	6.07	6.88	7.19	7.19	10.42	12.95	13.74	13.74	15.36	20.49	24.18
1967	3.40	3.69	5.74	6.42	6.42	6.42	6.42	6.59	6.59	6.59	9.75	12.79	26.05
1968	3.67	5.24	7.48	7.64	7.64	7.64	7.68	7.74	8.43	8.43	9.45	10.05	16.33
1969	4.62	6.23	7.49	7.49	9.88	12.08	14.80	15.17	16.69	18.12	19.65	28.91	32.76
1970	2.44	3.99	4.40	4.40	4.41	5.64	5.64	5.64	5.64	5.64	7.72	9.49	11.42
1971	5.55	5.90	6.02	6.41	6.53	6.53	6.91	6.91	7.11	7.18	11.88	12.72	15.78
1972	2.66	3.29	3.85	5.20	5.60	6.39	6.79	6.79	6.79	6.88	7.05	7.40	8.76

Rainfal Depth Duration Frequency for Pasadena

DWR # U05 6719 00, LA Co 610BB — Los Angeles County — Latitude 34.1
Analysis By DWR DLA 707 937 4709 — Longitude -118.123°
Data from : Climatological Data — 1N/12W-28C — Elevation 864 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1973	4.12	4.72	5.30	5.75	6.50	7.60	8.63	8.85	9.55	9.79	13.09	17.63	25.80
1974	3.77	5.58	7.34	7.89	9.57	9.61	9.73	9.77	10.01	10.43	10.63	12.31	18.72
1975	2.71	2.78	3.61	3.97	4.13	4.49	4.52	5.12	5.21	5.82	6.03	8.65	15.49
1976	1.53	2.07	2.53	3.96	4.40	4.63	4.78	4.78	4.78	4.78	7.02	7.22	9.58
1977	1.77	1.79	1.79	2.24	2.54	2.54	3.63	5.00	5.00	5.00	5.21	5.45	17.57
1978	4.98	6.75	8.26	9.95	11.72	12.52	12.66	12.66	12.85	12.85	20.14	29.02	42.99
1979	3.22	4.22	4.57	4.57	4.57	4.57	4.74	5.37	7.07	7.36	9.26	14.88	24.61
1980	3.94	7.04	10.43	12.45	14.44	**16.78**	**18.63**	**19.70**	**19.70**	**22.04**	**24.64**	**34.67**	39.63
1981	1.96	2.74	2.95	2.95	3.75	3.96	4.01	4.48	4.48	4.48	5.81	9.53	11.76
1982	2.23	2.85	3.45	3.85	4.45	4.48	5.12	5.15	5.17	8.02	8.77	10.00	20.44
1983	4.14	8.09	9.69	11.09	11.92	12.58	12.84	12.88	12.98	13.58	16.26	25.30	**48.73**
1984	2.57	2.74	2.77	2.79	2.79	2.79	2.79	2.79	2.79	3.71	4.42	7.31	11.28
1985	1.67	2.44	2.85	3.78	4.19	4.19	4.19	5.32	5.88	7.01	7.74	10.88	15.72
1986	2.80	3.26	3.81	4.04	4.35	4.57	5.39	6.91	6.91	6.91	9.03	15.94	24.28
1987	1.50	1.83	2.03	2.18	2.18	2.18	2.18	2.18	2.18	2.25	2.64	4.13	10.09
1988	2.20	2.41	2.41	2.63	2.76	3.48	4.00	4.11	5.55	5.64	5.74	8.41	17.71
1989	2.02	2.97	2.97	2.97	3.01	3.09	4.04	4.27	4.91	5.01	5.93	7.69	12.61
1990	3.10	3.50	3.56	3.56	3.56	3.56	3.56	3.56	4.16	4.35	4.35	7.19	11
1991	4.50	6.69	7.49	7.51	7.51	7.51	7.96	7.96	8.41	10.10	14.61	14.63	18
1992	3.30	6.51	7.88	8.60	8.60	9.88	11.20	12.43	12.47	12.47	15.47	21.61	30.65
1993	3.54	4.00	5.77	5.90	6.07	6.11	8.44	10.80	15.41	16.30	18.01	27.20	38.68
1994	1.25	1.30	1.30	2.00	2.25	2.25	2.25	2.25	3.30	4.25	4.65	6.84	10.95
1995	5.30	6.52	7.16	8.35	9.18	9.66	12.28	13.24	13.77	13.91	18.46	22.05	36.51
1996	3.70	5.35	6.02	6.10	6.10	6.25	6.40	6.93	7.80	7.88	9.88	13.08	17.81
1997	2.00	3.70	4.25	4.48	4.49	4.69	4.70	4.70	4.70	5.92	7.05	12.85	17.52
1998	2.75	3.25	5.31	5.81	5.81	7.43	7.93	7.95	10.25	12.40	15.15	19.33	38.47
1999													
Average	3.21	4.39	5.16	5.60	5.88	6.29	6.79	7.25	7.96	8.54	10.06	13.46	20.63
Stdev	1.41	2.22	2.69	2.94	3.13	3.40	3.64	3.79	4.13	4.44	5.20	7.15	9.09
Rec Max	8.35	14.69	14.86	14.93	15.07	16.78	18.63	19.70	19.70	22.04	24.64	34.67	48.73
Rec Min	1.15	1.30	1.30	1.59	1.59	1.59	1.88	2.18	2.18	2.25	2.64	3.99	7.26
Z	3.28	4.51	3.50	3.08	2.89	3.07	3.17	3.16	2.74	3.00	2.82	3.05	3.10
Yrs Rec	98	98	98	98	98	98	98	98	98	98	98	98	116
CV	.441	.506	.522	.525	.532	.540	.536	.522	.518	.519	.517	.531	.440
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	3.32	4.16	4.80	5.17	5.37	5.68	6.13	6.57	7.22	7.75	9.23	12.18	19.17
RP 5	4.81	6.37	7.41	7.96	8.31	8.84	9.51	10.09	11.06	11.87	14.02	18.82	27.53
RP 10	5.81	7.87	9.11	9.73	10.17	10.84	11.66	12.32	13.49	14.49	17.03	23.04	32.80
RP 25	7.05	9.75	11.21	11.92	12.48	13.32	14.31	15.08	16.51	17.73	20.68	28.26	39
RP 50	7.95	11.13	12.72	13.45	14.09	15.06	16.17	17.01	18.61	19.99	23.28	31.90	43
RP 100	8.83	12.47	14.17	14.98	15.70	16.79	18.02	18.94	20.72	22.26	25.77	35.55	48.06

Rainfal Depth Duration Frequency for Pasadena

DWR # U05 6719 00, LA Co 610BB
Analysis By DWR DLA 707 937 4709
Data from : Climatological Data

Los Angeles County

1N/12W-28C

Latitude 34.148°
Longitude -118.123°
Elevation 864 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
RP 200	9.69	13.79	15.60	16.45	17.25	18.45	19.81	20.80	22.74	24.43	28.22	39.05	52.33
RP 500	11.02	15.55	17.45	18.34	19.24	20.60	22.10	23.18	25.34	27.22	31.39	43.56	57.88
RP 1000	11.64	16.80	18.82	19.71	20.69	22.16	23.77	24.93	27.24	29.27	33.63	46.84	61.78
RP 10000	14.35	21.02	23.29	24.24	25.46	27.29	29.26	30.64	33.47	35.97	41.07	57.64	74.78

Table 5-7

Rainfall Depth Duration Frequency for Pomona Cal Poly

DWR # Y01 7050 00
Analysis by DWR DLA 707 937 4709
Data From : Climatological Data

Los Angeles County

Latitude 34.067°
Longitude -117.817°
Elevation 740 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1914													28.12
1915													22.43
1916													26.68
1917													16.09
1918													14.90
1919													12.07
1920													17.03
1921													18.11
1922													26.05
1923													14.51
1924													12.44
1925													13.31
1926													19.92
1927													24.73
1928	1.65	2.61	2.78	2.78	2.78	2.78	2.78	2.78	2.78	3.39	3.39	5.98	
1929	1.48	2.04	2.04	2.04	2.04	2.04	2.04	2.05	2.80	2.80	2.80	5.70	13.52
1930	2.15	2.97	3.14	3.41	3.61	4.67	5.08	5.18	5.99	5.99	6.58	7.44	15.04
1931	2.96	3.41	3.74	4.17	4.32	4.40	4.40	4.40	4.40	4.40	4.85	7.30	13.06
1932	3.40	3.95	4.50	4.66	4.67	4.67	4.70	7.06	7.53	9.72	9.74	14.84	22.57
1933	1.75	2.00	2.16	3.75	3.91	4.03	4.86	4.97	6.82	6.82	6.82	9.68	11.35
1934	**8.50**	**9.75**	**10.52**	**10.56**	10.56	10.57	10.59	10.59	10.59	12.67	13.44	13.54	17.17
1935	3.80	4.72	4.85	4.85	4.85	4.85	4.85	4.85	4.93	4.93	4.96	9.84	21.66
1936	1.95	3.35	3.87	4.59	5.22	5.74	6.23	6.37	7.21	8.02	8.99	10.43	14.18
1937	3.67	4.34	4.34	4.34	4.34	4.34	6.76	7.81	7.81	8.56	10.06	16.05	29.44
1938	4.21	6.38	8.49	9.94	10.13	10.25	10.25	10.25	12.24	12.30	12.68	19.23	27.68
1939	3.15	4.51	5.54	6.06	6.24	7.24	7.76	7.76	7.76	7.82	8.77	12.54	19.53
1940	3.22	3.62	3.72	3.97	4.17	4.27	4.86	5.06	5.06	5.61	7.71	9.93	14.59
1941	2.57	3.43	3.83	4.72	6.54	6.54	5.83	6.82	10.56	10.58	16.89	20.26	37.23
1942	1.19	1.95	1.95	1.95	1.95	1.95	2.56	2.56	2.56	3.52	5.00	5.35	9.81
1943	4.90	8.70	9.38	9.38	9.68	10.24	10.24	11.34	11.35	11.98	11.98	20.77	25.07
1944	2.26	3.19	4.80	5.18	5.40	5.41	5.87	6.04	6.51	7.04	7.04	9.93	20.36
1945	1.75	3.03	3.81	3.98	4.38	4.71	4.71	5.25	5.62	5.62	5.70	9.39	17.60
1946	3.05	6.08	6.15	6.26	6.29	6.32	6.32	6.32	6.45	6.53	6.55	8.03	14.75
1947	2.61	4.21	5.53	5.67	5.78	5.78	6.30	6.30	7.27	8.35	8.72	11.74	*15.43*
1948	1.27	2.01	2.12	2.13	2.30	2.32	2.33	2.33	2.88	3.28	4.53	4.96	9.78

Rainfall Depth Duration Frequency for Pomona Cal Poly

DWR # Y01 7050 00
Analysis by DWR DLA 707 937 4709
Data From : Climatological Data

Los Angeles County

Latitude 34.067°
Longitude -117.817°
Elevation 740 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1949	1.63	2.10	2.10	2.40	2.48	2.48	2.48	2.86	3.82	3.90	4.54	6.58	11.95
1950	2.25	2.58	2.88	2.88	2.88	2.88	2.92	2.92	2.95	2.95	5.60	9.41	14.22
1951	1.02	1.40	1.42	1.42	1.45	1.85	2.50	2.50	2.50	2.56	2.73	3.76	9.78
1952	4.07	4.66	5.28	5.42	5.43	6.93	7.30	7.30	7.99	12.76	13.45	16.53	28.31
1953	1.49	2.20	2.78	2.78	2.78	2.78	2.78	3.51	3.51	5.08	5.24	8.37	12.57
1954	2.97	3.46	3.92	3.92	3.92	4.52	7.00	7.00	7.80	7.80	7.80	10.60	16.80
1955	1.89	1.92	2.54	2.81	2.81	2.81	2.81	4.10	4.47	5.28	5.40	6.88	13.52
1956	6.38	7.62	8.55	8.55	8.61	8.61	8.89	8.91	8.91	8.91	8.91	10.22	15.24
1957	1.82	2.02	2.03	2.63	2.64	2.75	2.97	3.53	3.54	4.26	5.16	6.86	11.18
1958	3.21	4.80	4.85	4.87	4.87	4.87	4.83	4.83	7.22	7.25	9.14	15.27	32.78
1959	2.67	2.67	2.67	2.67	2.67	2.67	2.67	3.13	3.43	3.46	3.46	6.14	7.27
1960	1.33	1.38	2.15	2.15	2.39	2.50	2.50	2.50	2.50	2.82	4.13	6.00	10.26
1961	0.93	1.10	1.16	1.89	1.91	1.91	1.91	2.07	2.22	2.22	2.81	3.59	6.28
1962	2.59	3.49	3.83	4.69	4.99	5.19	5.88	6.32	8.97	9.20	9.20	12.24	17.16
1963	3.03	3.71	3.73	3.73	3.75	3.89	3.89	3.91	4.55	4.55	4.55	6.90	12.68
1964	1.92	2.74	2.74	2.74	2.74	2.74	3.15	3.15	3.15	3.58	3.58	3.88	9.99
1965	1.88	2.57	3.41	4.10	4.32	4.37	4.88	6.98	7.67	7.67	7.67	7.69	15.62
1966	2.20	3.96	5.03	5.47	5.47	5.47	6.29	8.15	8.88	8.88	10.02	13.08	16.31
1967	2.79	5.16	5.60	7.78	8.22	8.22	8.22	8.27	8.46	8.46	8.46	13.50	23.89
1968	3.83	3.98	4.00	4.00	4.00	4.00	4.00	4.00	4.65	4.72	6.02	6.92	13.84
1969	4.32	6.47	7.04	7.04	8.03	10.05	11.78	12.02	13.20	13.59	13.59	25.08	29.44
1970	2.27	4.27	4.46	4.46	5.64	5.83	5.83	5.83	5.84	5.84	8.17	9.81	11.78
1971	2.00	3.29	3.29	3.29	3.97	3.97	4.26	4.26	4.63	4.93	8.44	9.04	11.73
1972	2.54	3.18	3.67	4.66	5.15	5.66	6.60	6.60	6.60	6.74	6.78	7.27	8.77
1973	2.21	2.87	3.24	4.16	5.21	5.85	7.26	7.56	8.39	8.44	11.68	14.37	23.49
1974	2.57	4.66	5.11	7.41	7.57	7.71	7.73	7.91	7.91	8.22	8.42	9.47	14.91
1975	2.37	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.97	3.73	4.38	7.63	14.52
1976	2.11	2.68	2.75	2.78	2.85	2.85	2.86	2.86	2.86	2.86	2.86	2.96	9.33
1977	1.34	2.07	2.97	2.97	3.38	3.48	3.48	3.48	3.48	3.80	4.68	4.68	10.44
1978	3.61	4.83	6.20	7.68	9.52	9.96	10.37	10.37	10.96	11.04	17.92	28.80	**39.65**
1979	2.50	2.82	3.07	3.30	3.30	3.41	3.41	3.66	5.82	5.82	9.23	11.76	24.35
1980	3.64	4.99	7.35	8.89	**11.47**	**13.49**	**15.36**	**16.14**	**16.14**	**16.14**	**21.24**	**30.91**	34.64
1981	2.63	2.63	2.63	2.90	3.22	3.22	3.49	3.49	3.49	3.51	3.65	7.14	8.91
1982	2.41	2.41	3.64	3.64	4.08	5.07	5.40	5.40	5.59	6.09	7.12	8.12	17.23
1983	3.97	4.99	8.23	9.28	10.52	10.74	10.90	11.23	11.23	11.80	14.53	17.31	33.50

Rainfall Depth Duration Frequency for Pomona Cal Poly

DWR # Y01 7050 00 | Los Angeles County | Latitude 34.067°
Analysis by DWR DLA 707 937 4709 | Longitude -117.817°
Data From : Climatological Data | Elevation 740 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1984	1.94	2.01	2.01	2.01	2.01	2.01	2.03	2.03	3.04	3.04	3.15	6.18	10.09
1985	2.12	3.20	3.20	3.20	4.30	4.30	4.30	4.37	4.83	5.60	6.18	8.30	12.43
1986	3.10	4.07	4.07	4.07	4.07	4.37	5.09	5.09	5.35	7.16	8.13	10.87	14.80
1987	3.00	3.85	4.21	4.37	4.37	4.37	4.37	4.37	4.37	4.37	4.41	6.56	7.82
1988	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.85	2.85	3.52	6.75	18.21
1989	2.85	3.29	3.39	3.39	3.39	3.97	4.41	5.07	5.58	6.42	6.79	9.07	11.62
1990	3.10	3.44	3.44	3.44	3.56								*8.74*
1991	3.71	5.69	6.18	6.18	6.18	6.18	6.18	6.18	6.60	9.82	13.58	13.58	17.61
1992	1.73	2.64	3.29	3.90	3.94	4.89	4.31	4.31	4.31	4.31	6.48	11.37	17.39
1993	3.55	4.64	6.02	6.02	6.02	6.28	7.54	10.05	12.63	13.51	17.22	27.42	34.67
1994	2.01	2.04	2.04	2.04	2.04	2.90	2.93	2.93	2.93	2.93	3.25	3.25	5.34
1995	2.83	3.80	4.46	5.43	5.94	6.34	9.41	10.32	10.66	11.16	13.79	14.24	*25.54*
1996													
1997													
Average	2.71	3.62	4.11	4.46	4.75	5.03	5.40	5.72	6.25	6.72	7.82	10.74	17.41
Stdev	1.21	1.64	1.95	2.13	2.36	2.55	2.79	2.93	3.13	3.31	4.13	6.00	7.70
Rec Max	8.50	9.75	10.52	10.56	11.47	13.49	15.36	16.14	16.14	16.14	21.24	30.91	39.65
Rec Min	0.93	1.10	1.16	1.42	1.45	1.85	1.91	2.03	2.22	2.22	2.73	2.96	5.34
Z	4.58	3.51	3.06	2.69	2.81	3.38	3.73	3.76	3.26	2.93	3.69	3.74	3.09
Yrs Rec	68	68	68	68	68	67	67	67	67	67	67	67	82
CV	.447	.452	.473	.478	.497	.507	.516	.513	.501	.493	.528	.559	.442
Reg CV	.466	.482	.510	.508	.505	.497	.494	.485	.486	.479	.465	.502	.413
Reg Skew	1.2	1.3	1.3	1.2	1.2	1.2	1.1	1.0	1.0	1.0	1.0	1.4	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	2.82	3.51	3.85	4.13	4.33	4.53	4.90	5.24	5.73	6.17	7.15	9.39	16.15
RP 5	4.11	5.13	5.73	6.14	6.54	6.90	7.48	7.94	8.62	9.23	10.96	14.97	23.25
RP 10	4.94	6.22	6.98	7.46	7.99	8.45	9.14	9.65	10.44	11.16	13.36	18.76	27.73
RP 25	5.98	7.56	8.54	9.09	9.77	10.36	11.16	11.71	12.64	13.48	16.27	23.51	33.14
RP 50	6.72	8.54	9.67	10.26	11.05	11.73	12.60	13.17	14.20	15.14	18.33	26.98	36.98
RP 100	7.44	9.49	10.77	11.39	12.30	13.07	14.00	14.58	15.71	16.73	20.32	30.37	40.69
RP 200	8.15	10.43	11.85	12.50	13.52	14.37	15.36	15.94	17.16	18.27	22.25	33.71	44.27
RP 500	9.03	11.60	13.21	13.89	15.04	16.00	17.15	17.61	18.94	20.16	24.60	37.96	48.65
RP 1000	9.75	12.55	14.30	15.01	16.27	17.32	18.42	19.00	20.42	21.73	26.56	41.32	52.29

Table 5-8

Rainfall Depth Duration Frequency for Torrance

DWR # U05 8973 00 | Los Angeles County | Latitude 33.800°
Analysis By DWR DLA 707 937 4709 | Longitude -118.333°
Data from : Climatological Data | Elevation 100 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1949													
1950	1.72	1.97	1.97	1.98	1.99	1.99	1.99	2.21	2.71	2.71	4.34	6.33	9.45
1951	1.33	1.64	1.65	1.65	1.92	2.10	2.42	2.42	2.49	2.65	2.72	5.19	7.52
1952	1.63	2.82	3.56	4.13	4.13	5.13	5.47	5.48	6.49	6.64	9.51	10.62	16.32
1953	0.88	1.21	1.38	1.71	1.71	1.71	1.71	1.81	2.08	3.30	3.37	4.63	6.97
1954	1.66	2.01	2.04	2.25	2.25	2.25	3.36	3.59	4.00	4.00	4.00	6.08	17.08
1955	1.26	1.36	1.36	1.36	1.36	1.52	1.52	1.74	2.00	2.50	2.70	4.06	8.96
1956	**6.53**	**8.26**	**8.59**	**8.59**	**8.69**	**8.69**	9.29	9.39	9.39	9.39	9.39	10.18	14.43
1957	1.67	1.69	1.78	2.05	2.07	2.20	2.22	2.55	2.57	3.75	4.20	6.16	7.92
1958	3.35	3.35	3.35	3.35	3.35	3.35	3.38	3.38	3.64	5.68	11.12	11.34	19.70
1959	1.79	1.79	1.82	1.82	1.82	3.14	3.14	3.28	4.69	4.69	4.70	6.38	6.58
1960	1.29	1.52	2.35	2.58	3.58	3.87	4.10	4.10	4.13	4.20	5.29	7.08	10.47
1961	1.11	1.11	1.23	1.23	1.23	1.23	1.23	1.41	1.53	1.53	2.20	2.20	4.19
1962	3.30	3.67	4.33	6.51	6.74	6.89	7.36	7.59	9.48	9.81	10.76	13.34	16.74
1963	3.60	4.60	5.55	5.55	5.57	5.69	5.69	5.69	6.46	6.46	6.46	8.80	12.59
1964	1.23	1.23	1.23	1.23	1.23	1.87	1.87	1.87	2.71	2.71	2.71	2.71	5.01
1965	1.30	1.80	2.46	3.33	3.48	3.48	3.48	5.17	5.93	5.93	5.93	5.93	11.14
1966	3.47	4.41	5.48	6.17	6.47	6.47	6.47	8.70	9.34	9.34	9.81	14.93	17.89
1967	2.16	2.53	3.91	4.28	4.43	4.44	4.44	4.44	4.44	4.44	4.44	8.09	15.40
1968	3.61	4.08	4.28	4.69	4.71	4.71	4.71	4.74	5.21	5.24	7.06	7.54	11.42
1969	3.13	4.71	5.68	5.83	6.01	8.53	**10.61**	**10.94**	**12.95**	**13.26**	**14.17**	19.39	22.38
1970	1.24	1.46	1.82	1.82	1.87	2.85	2.85	2.85	2.85	2.85	4.00	6.23	7.54
1971	4.60	5.18	5.37	5.59	5.78	5.78	5.84	5.84	6.03	6.31	10.08	10.39	18.82
1972	2.88	3.50	3.82	5.15	5.77	6.08	6.70	6.70	7.12	7.12	7.36	7.53	8.17
1973	1.54	2.22	2.83	3.51	3.51	3.51	4.18	4.19	4.19	4.19	5.69	9.31	16.43
1974	2.58	3.70	3.93	5.12	6.24	6.47	6.47	6.57	6.59	6.85	7.00	7.62	12.89
1975	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	2.82	4.86	5.62	12.83
1976	1.15	1.34	1.54	2.10	2.31	2.51	2.67	2.67	2.67	2.67	3.49	3.50	6.89
1977	2.80	3.86	4.02	4.02	4.47	4.63	4.66	5.35	5.35	5.35	5.56	5.89	14.67
1978	2.35	3.47	4.34	5.49	6.61	7.08	7.30	7.30	7.75	7.75	13.78	**21.16**	**29.78**
1979	2.96	3.83	4.63	5.07	5.17	5.17	5.21	5.21	5.21	7.29	10.23	12.44	20.29
1980	3.10	3.17	5.65	6.07	6.49	7.68	9.05	9.57	9.57	10.88	11.76	20.56	23.00
1981	1.36	2.12	2.14	2.15	2.71	3.11	3.77	3.78	3.79	3.61	4.68	7.78	9.14
1982	1.62	1.85	2.07	2.29	2.51	2.55	2.70	2.70	3.01	4.18	4.61	5.20	11.20
1983	3.04	4.74	5.50	6.28	7.38	8.14	8.51	8.68	8.74	9.17	11.50	18.46	27.50
1984	1.71	1.71	1.71	1.71	2.36	2.36	2.57	2.57	2.57	3.04	3.57	6.14	10.91
1985	1.31	1.74	2.08	2.14	2.48	2.48	2.48	2.97	3.57	6.97	4.22	5.85	9.53

Rainfall Depth Duration Frequency for Torrance

DWR # U05 8973 00 — Los Angeles County — Latitude 33.800°
Analysis By DWR DLA 707 937 4709 — Longitude -118.333°
Data from : Climatological Data — Elevation 100 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1986	2.63	2.78	4.86	4.87	4.87	4.87	5.10	5.10	5.51	7.97	8.21	12.29	22.17
1987	1.28	1.56	1.91	2.08	2.08	2.08	2.08	2.08	2.20	2.20	2.20	3.99	4.38
1988	1.70	2.12	2.12	2.12	2.13	2.13	2.13	2.13	2.26	3.11	3.39	5.72	14.30
1989	1.25	1.47	1.57	1.57	2.08	2.09	2.27	2.60	2.96	3.52	3.66	4.78	7.60
1990	2.07	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.64	2.64	2.72	4.45	6.31
1991	2.83	4.14	5.06	5.06	5.06	5.06	5.13	5.13	5.40	5.98	9.54	9.54	11.63
1992	2.57	3.66	4.06	4.57	4.57	4.95	6.40	6.85	6.85	6.85	7.13	14.23	*20.40*
1993	2.06												18.98
1994	1.81	1.81	2.02	2.57	2.57	2.57	2.57	2.57	4.27	5.03	5.37	6.90	9.01
1995	4.41	5.75	6.69	7.20	8.54	**8.88**	**11.69**	**12.71**	12.86	13.20	**16.92**	18.31	28.46
1996	1.40	1.86	2.09	2.09	2.09	2.42	2.50	2.99	4.12	4.12	4.42	6.63	8.86
1997													12.49
1998	2.53	3.55	3.55	3.80	3.80	4.41	5.40	5.65	7.26	8.67	12.40	14.73	25.06
1999													
Average	2.28	2.84	3.29	3.61	3.86	4.13	4.44	4.67	5.07	5.52	6.54	8.73	13.70
Stdev	1.11	1.46	1.70	1.87	2.02	2.16	2.55	2.68	2.81	2.85	3.57	4.83	6.55
Rec Max	6.53	8.26	8.59	8.59	8.69	8.88	11.69	12.71	12.95	13.26	16.92	21.16	29.78
Rec Min	0.88	1.11	1.23	1.23	1.23	1.23	1.23	1.41	1.53	1.53	2.20	2.20	4.19
Z	3.80	3.67	3.00	2.54	2.32	2.11	2.96	3.17	2.89	2.66	3.09	2.75	2.67
Yrs Rec	48	47	47	47	47	47	46	46	46	46	46	46	49
CV	.487	.516	.518	.517	.524	.521	.573	.575	.554	.516	.546	.553	.478
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	2.34	2.68	3.06	3.34	3.53	3.74	3.99	4.18	4.56	5.01	5.97	7.86	12.65
RP 5	3.51	4.14	4.71	5.11	5.43	5.75	6.35	6.68	7.17	7.65	9.26	12.35	18.68
RP 10	4.30	5.13	5.79	6.24	6.63	7.02	7.85	8.26	8.83	9.33	11.33	15.20	22.48
RP 25	5.28	6.37	7.12	7.63	8.12	8.59	9.71	10.22	10.88	11.41	13.83	18.73	27.07
RP 50	5.98	7.28	8.08	8.60	9.16	9.69	11.01	11.59	12.31	12.87	15.62	21.19	30.35
RP 100	6.67	8.16	9.00	9.57	10.20	10.79	12.31	12.96	13.74	14.32	17.33	23.65	33.49
RP 200	7.35	9.03	9.90	10.50	11.20	11.85	13.56	14.28	15.11	15.71	19.01	26.02	36.57
RP 500	8.20	10.14	11.03	11.71	12.50	13.22	15.18	15.99	16.90	17.53	21.04	29.10	40.29
RP 1000	8.88	11.02	11.94	12.58	13.43	14.20	16.33	17.20	18.17	18.82	22.73	31.29	43.39
RP 10000	11.02	13.80	14.78	15.45	16.51	17.45	20.18	21.26	22.41	23.11	27.84	38.58	52.76

Table 5-9

Rainfall Depth Duration Frequency for UCLA

DWR # U05 9152 00
Analysis By DWR DLA 707 937 4709
Data from : Climatological Data

Los Angeles County

1S/15W-22F

Latitude 34.069°
Longitude -118.442°
Elevatiion 430 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1949	1.52	1.79	1.80	1.95	2.25	2.25	2.46	3.12	3.61	3.61	4.77	7.54	11.53
1950	2.82	2.82	2.82	3.19	3.19	3.39	3.39	3.39	3.96	3.96	6.21	7.78	11.84
1951	1.03	1.26	1.27	1.27	1.27	1.27	1.63	2.42	2.67	3.45	3.70	5.13	9.62
1952	3.23	3.88	6.39	8.19	8.19	9.37	9.82	9.82	10.92	11.71	15.55	18.28	31.95
1953	1.55	1.90	2.40	2.40	2.40	2.40	2.40	3.18	3.18	4.55	5.02	7.95	12.47
1954	4.71	6.28	6.28	6.28	6.28	6.35	6.35	6.35	6.35	8.34	12.09	12.26	16.49
1955	1.34	1.74	1.79	1.83	1.83	1.87	1.87	3.19	3.45	4.70	4.70	6.94	14.03
1956	**5.75**	**7.47**	8.71	8.71	8.87	8.87	8.90	8.90	8.90	8.90	9.01	10.32	18.16
1957	3.19	3.19	3.19	3.19	3.19	3.81	3.81	3.81	4.05	4.60	7.07	11.00	15.53
1958	3.24	3.45	3.48	3.48	3.48	3.61	4.92	4.92	6.15	6.36	8.55	15.49	19.81
1959	2.04	2.31	2.34	2.34	2.34	3.06	3.31	4.54	5.35	5.48	5.48	7.46	8.43
1960	2.02	2.02	3.09	3.13	3.46	3.86	3.90	3.90	3.90	4.12	5.91	7.10	11.18
1961	1.52	1.52	1.52	1.80	1.80	1.80	2.30	2.30	2.58	3.02	3.60	3.60	6.40
1962	3.21	5.46	7.15	10.27	10.92	11.52	11.53	13.70	15.54	15.66	18.44	20.27	24.70
1963	1.29	2.43	2.46	2.46	2.50	2.63	2.63	3.10	3.65	3.65	3.65	3.91	10.39
1964	1.80	1.80	1.80	1.80	1.80	2.62	2.62	2.62	3.35	3.35	3.35	4.00	8.57
1965	1.54	2.25	2.48	2.54	2.56	2.62	2.62	2.62	2.62	2.62	3.43	5.63	14.16
1966	3.03	4.20	4.98	5.57	5.73	5.73	8.36	9.93	11.30	11.30	12.77	16.12	20.02
1967	2.60	3.20	4.51	5.23	5.51	5.55	5.55	5.65	5.65	6.03	8.43	8.71	21.89
1968	3.15	5.37	5.70	6.78	6.78	6.78	6.78	7.22	8.63	8.63	8.70	11.16	18.38
1969	4.62	6.37	7.90	8.12	8.12	12.57	15.35	15.53	17.36	17.51	19.23	**24.72**	28.66
1970	1.49	1.93	1.93	1.94	1.97	3.31	3.31	3.31	3.31	3.31	4.83	6.88	7.04
1971	5.13	5.52	5.78	5.78	6.14	6.14	6.50	6.50	6.95	7.07	11.72	12.86	15.73
1972	2.52	3.02	3.61	5.27	5.80	6.36	6.89	6.89	7.12	7.12	7.46	7.86	8.45
1973	2.80	3.40	3.81	4.21	4.89	6.01	7.01	7.39	8.15	8.15	12.11	14.60	22.77
1974	3.10	4.92	6.20	8.04	9.03	9.05	9.08	9.13	9.17	9.47	10.22	12.28	17.85
1975	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	5.21	8.36	15.53
1976	1.73	1.98	1.98	2.46	2.58	2.67	2.79	2.79	2.79	2.79	3.38	4.46	7.84
1977	2.32	3.37	3.52	3.52	4.37	3.59	4.82	5.06	5.06	5.06	5.20	5.73	14.71
1978	2.60												
1979	2.10	2.79	3.18	3.18	3.18	3.18	3.18	4.18	5.42	5.42	7.97	10.92	19.07
1980	4.14	5.27	**9.17**	**12.08**	**14.83**	**16.07**	**17.13**	**18.37**	**18.37**	**18.37**	**22.34**		
1981	1.99	2.56	2.81	2.81	3.49	3.74	4.33	4.35	4.36	4.49	5.34	8.82	11.40
1982	1.82	2.44	2.83	3.74	4.13	4.14	4.90	4.90	4.90	6.15	7.06	8.27	15.71
1983	3.57	4.66	5.88	7.48	8.23	8.86	8.96	9.21	9.28	9.45	13.38	24.15	**38.16**
1984	2.10	2.41	2.44	2.45	2.45	2.45	2.45	2.45	2.45	3.04	4.05	7.72	10.69
1985	1.95	2.15	2.15	2.15	2.15	2.15	2.15	2.39	2.81	4.02	4.19	6.01	11.69
1986	3.83	4.60	6.30	6.45	6.57	6.59	8.13	8.13	8.13	8.13	9.53	16.36	19.63
1987	1.30	1.37	1.51	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.82	2.76	6.30
1988	1.67	2.04	2.14	2.31	2.42	2.42	2.42	2.93	2.93	2.93	2.93	5.26	8.24
1989	1.56	1.77	1.77	2.05	2.05	3.02	3.65	4.29	4.74	4.92	5.40	6.52	10.17
1990	5.26	5.41	5.41	5.41	5.41	5.41	5.41	5.41	5.92	5.92	5.92	7.12	10.19

Rainfall Depth Duration Frequency for UCLA

DWR # U05 9152 00 | Los Angeles County | Latitude 34.069°
Analysis By DWR DLA 707 937 4709 | | Longitude -118.442°
Data from : Climatological Data | 1S/15W-22F | Elevatiion 430 Feet

Maximum Rainfall For Indicated Number Of Concecutive Days

	1	2	3	4	5	6	8	10	15	20	30	60	W-YR
1991	2.32	4.23	5.34	5.34	5.34	5.34	5.53	5.53	5.74	5.74	10.07	10.07	12.27
1992	2.63	4.23	5.59	5.99	6.00	7.50	8.39	9.18	9.20	9.20	11.16	16.27	23.09
1993	5.60	5.85	5.86	5.86	5.86	6.72	6.72	9.43	12.96	13.75	14.19	27.30	32.80
1994	1.75	1.76	1.76	3.24	3.24	3.24	3.24	3.24	4.56	5.37	5.65	6.99	9.73
1995	5.28	6.16	6.84	8.50	9.38	9.88	13.42	14.80	15.21	15.79	20.12	22.27	35.39
1996	3.11	4.70	4.90	5.02	5.02	5.02	5.15	5.60	6.75	6.95	8.11	10.62	13.61
1997	1.80	2.98	4.28	4.42	4.42	4.55	4.69	4.69	5.33	6.55	7.59	13.71	18.03
1998													**43.27**
1999													
Average	2.74	3.46	4.02	4.49	4.72	5.10	5.54	5.95	6.46	6.79	8.26	10.63	16.53
Stdev	1.26	1.61	2.08	2.55	2.84	3.15	3.55	3.77	4.05	4.02	4.87	5.94	8.61
Rec Max	5.75	7.47	9.17	12.08	14.83	16.07	17.13	18.37	18.37	18.37	22.34	27.30	43.27
Rec Min	1.03	1.26	1.27	1.27	1.27	1.27	1.59	1.59	1.59	1.59	1.82	2.76	6.30
Z	2.24	2.23	2.38	3.12	3.95	3.96	3.79	3.83	3.43	3.23	3.32	3.03	3.68
Yrs Rec	49	48	48	48	48	48	48	48	48	48	48	47	48
CV	.460	.464	.518	.567	.601	.618	.641	.634	.626	.592	.589	.558	
Reg CV	.489	.520	.538	.542	.541	.544	.551	.544	.538	.527	.513	.517	.439
Reg Skew	1.3	1.4	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0
FIC	1.14	1.07	1.04	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RP 2	2.83	3.31	3.74	4.11	4.26	4.53	4.90	5.27	5.73	6.07	7.48	9.56	15.16
RP 5	4.16	4.91	5.76	6.53	6.92	7.46	8.21	8.78	9.50	9.81	11.96	15.08	23.08
RP 10	5.06	6.00	7.08	8.06	8.61	9.32	10.30	11.01	11.89	12.19	14.78	18.58	28.07
RP 25	6.16	7.36	8.70	9.96	10.70	11.62	12.90	13.77	14.84	15.12	18.19	22.91	34.10
RP 50	6.97	8.35	9.87	11.28	12.17	13.23	14.71	15.69	16.90	17.18	20.62	25.94	38.40
RP 100	7.75	9.32	11.00	12.61	13.63	14.84	16.52	17.61	18.97	19.23	22.96	28.97	42.53
RP 200	8.52	10.28	12.10	13.88	15.03	16.38	18.26	19.46	20.95	21.20	25.24	31.88	46.58
RP 500	9.49	11.49	13.48	15.53	16.86	18.39	20.53	21.87	23.53	23.76	28.01	35.66	51.47
RP 1000	10.26	12.45	14.59	16.71	18.16	19.82	22.13	23.58	25.37	25.59	30.30	38.35	55.53
RP 10000	12.69	15.50	18.06	20.63	22.48	24.58	27.50	29.28	31.48	31.66	37.26	47.31	67.85

LOS ANGELES
Downtown (Civic Center)
CLIMATE DATA

Notes: Average temperatures and year-to-date rainfall data, which are smoothed, are based on 30-year climate normals.

All other data are period of record, July 1877 - July 1999 inclusive.

Table 6. Los Angeles Downtown Daily Climate Data

JANUARY
Los Angeles Downtown (Civic Center) - Daily Climate Data
Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	67	48	84 1898	35 1884	46 1916	59 1997	3.12 1934	5.00
02	67	48	85 1994	32 1886	51 1910	60 1997	1.41 1879	5.08
03	67	48	87 1902	33 1949	51 1949	59 1994	2.27 1888	5.16
04	67	48	87 1902	**28 1949**	49 1974	60 1986	3.24 1995	5.24
05	67	48	85 1902	31 1949	48 1907	60 1986	2.11 1979	5.32
06	67	48	83 1903	30 1913	47 1913	59 1986	2.30 1993	5.40
07	67	48	87 1996	**28 1913**	50 1913	59 1962	3.52 1974	5.48
08	67	48	90 1923	32 1888	49 1962	63 1923	1.19 1950	5.57
09	67	49	88 1923	31 1888	48 1930	**65 1923**	2.26 1980	5.66
10	67	49	87 1986	31 1888	46 1949	62 1953	3.30 1995	5.75
11	67	49	89 1996	32 1949	47 1949	62 1986	1.28 1960	5.84
12	67	49	87 1996	33 1949	46 1882	60 1980	1.40 1952	5.93
13	67	49	86 1986	34 1950	50 1949	61 1986	1.45 1993	6.02
14	68	49	88 1975	37 1932	48 1957	61 1980	1.56 1978	6.11
15	68	49	84 1976	32 1888	49 1932	60 1980	2.13 1952	6.20
16	68	49	86 1976	31 1888	50 1907	58 1980	2.74 1973	6.30
17	68	49	90 1971	34 1888	47 1907	59 1965	4.16 1916	6.40
18	68	49	**95 1971**	37 1892	52 1955	62 1965	2.30 1914	6.50
19	68	49	92 1971	32 1889	48 1949	63 1971	2.26 1933	6.60
20	68	49	82 1912	30 1883	47 1933	59 1944	3.30 1969	6.70
21	68	49	81 1912	32 1937	49 1962	59 1910	2.98 1909	6.80
22	68	49	84 1994	34 1937	48 1937	59 1910	3.69 1967	6.90
23	68	49	84 1968	33 1937	51 1957	56 1936	1.05 1995	7.00
24	68	49	85 1992	36 1937	53 1937	58 1946	2.04 1969	7.10
25	68	49	86 1986	36 1898	49 1898	60 1951	3.43 1969	7.20
26	68	49	86 1987	31 1898	53 1957	57 1986	**5.71 1956**	7.30
27	68	50	87 1986	32 1898	48 1957	60 1931	2.28 1916	7.40
28	69	50	90 1971	35 1957	49 1957	59 1971	2.81 1915	7.51
29	69	50	88 1971	30 1880	**43 1922**	62 1971	1.96 1922	7.62
30	69	50	85 1992	35 1880	49 1979	60 1911	2.19 1893	7.73
31	69	50	86 1954	32 1880	48 1923	60 1984	3.03 1926	7.84

FEBRUARY

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year		Record Min/Year		Lowest Max/Year		Highest Min/Year		Record Rain/Year		Rainfall YTD
01	69	50	88	1995	34	1880	49	1923	60	1958	2.26	1938	7.95
02	69	50	94	1995	34	1901	**46**	**1979**	**65**	**1935**	2.84	1884	8.06
03	69	50	94	1995	30	1883	49	1939	63	1935	1.84	1905	8.17
04	69	50	91	1995	32	1883	52	1976	62	1995	2.55	1927	8.28
05	69	50	84	1954	33	1899	52	1909	63	1963	2.30	1901	8.39
06	69	50	86	1987	**28**	**1883**	51	1887	58	1963	2.39	1937	8.50
07	69	50	89	1996	32	1883	53	1989	63	1987	1.60	1993	8.61
08	69	50	85	1996	36	1899	52	1895	61	1987	2.43	1962	8.72
09	69	50	85	1988	33	1891	49	1901	60	1945	1.92	1978	8.83
10	69	50	88	1988	37	1890	51	1939	59	1996	2.55	1962	8.94
11	69	50	88	1971	35	1894	51	1911	64	1957	1.63	1973	9.05
12	69	51	91	1971	35	1949	54	1949	63	1957	1.61	1992	9.16
13	70	51	90	1985	35	1903	48	1903	63	1957	2.71	1954	9.27
14	70	51	90	1985	32	1903	50	1884	61	1985	2.50	1986	9.38
15	70	51	88	1985	33	1903	52	1884	62	1985	2.78	1887	9.49
16	70	51	88	1896	35	1903	47	1932	61	1977	3.03	1980	9.60
17	70	51	89	1890	33	1889	51	1882	61	1930	2.18	1884	9.71
18	70	51	89	1981	32	1882	50	1891	61	1923	4.26	1914	9.82
19	70	51	91	1995	34	1880	51	1897	64	1981	2.32	1958	9.93
20	70	51	**95**	**1995**	34	1882	48	1897	63	1995	3.60	1944	10.04
21	70	51	86	1982	35	1897	52	1913	60	1995	2.05	1918	10.15
22	70	51	86	1989	35	1897	54	1944	59	1995	2.19	1944	10.26
23	70	51	90	1954	35	1894	51	1913	62	1963	2.11	1969	10.37
24	69	51	94	1986	35	1890	53	1913	**65**	**1986**	**4.80**	**1913**	10.48
25	69	51	92	1921	40	1962	51	1937	**65**	**1986**	1.30	1958	10.59
26	69	51	87	1980	37	1894	53	1913	60	1988	1.08	1983	10.70
27	69	51	86	1992	38	1894	49	1911	60	1932	2.17	1991	10.81
28	69	51	88	1901	39	1962	52	1945	62	1957	2.85	1938	10.91
29	69	51	83	1936	41	1948	56	1888	57	1992	0.63	1956	10.91

MARCH

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	69	51	88 1967	36 1894	52 1951	61 1986	3.42 1983	11.01
02	69	51	87 1994	35 1896	**47 1896**	62 1986	**5.88 1938**	11.11
03	69	51	85 1931	38 1894	49 1896	60 1931	3.12 1943	11.21
04	69	51	94 1972	35 1976	49 1945	61 1968	2.54 1978	11.31
05	69	51	87 1899	35 1896	53 1893	60 1986	1.98 1884	11.41
06	69	51	90 1899	39 1882	54 1958	62 1914	0.88 1884	11.51
07	69	51	89 1914	40 1893	54 1952	61 1914	2.52 1952	11.61
08	69	51	89 1996	35 1882	49 1893	62 1983	1.71 1968	11.71
09	69	51	90 1934	**31 1893**	54 1917	63 1916	2.67 1884	11.81
10	69	51	96 1916	38 1893	54 1975	**67 1916**	2.24 1995	11.90
11	69	52	93 1916	39 1917	52 1922	**67 1916**	1.45 1995	11.99
12	69	52	87 1959	36 1893	55 1912	59 1959	1.44 1912	12.08
13	69	52	89 1994	40 1907	53 1881	60 1983	2.23 1889	12.17
14	69	52	88 1951	39 1895	50 1942	61 1994	1.74 1930	12.26
15	69	52	85 1978	36 1880	53 1952	61 1994	2.03 1952	12.35
16	69	52	92 1978	36 1880	53 1952	64 1964	2.53 1889	12.44
17	69	52	94 1914	37 1881	55 1963	66 1914	1.28 1982	12.52
18	69	52	87 1997	38 1898	56 1898	62 1994	1.03 1991	12.60
19	69	52	97 1997	37 1886	54 1890	62 1997	1.45 1991	12.68
20	70	52	93 1997	39 1898	52 1919	64 1931	1.48 1893	12.76
21	70	52	93 1931	35 1894	51 1909	66 1931	1.34 1893	12.84
22	70	52	88 1986	37 1894	53 1909	65 1931	1.11 1975	12.92
23	70	52	88 1926	36 1898	53 1964	61 1986	2.08 1904	12.99
24	70	52	94 1988	37 1898	53 1937	65 1930	1.39 1948	13.06
25	70	52	96 1988	37 1902	53 1977	**67 1988**	2.19 1903	13.13
26	70	52	98 1988	39 1907	54 1907	**67 1988**	1.53 1906	13.20
27	70	53	91 1986	37 1884	51 1910	62 1932	1.98 1979	13.27
28	70	53	90 1879	37 1892	56 1962	61 1986	1.54 1895	13.34
29	71	53	**99 1879**	41 1880	54 1897	61 1986	1.03 1883	13.40
30	71	53	89 1934	36 1892	55 1946	63 1934	1.27 1946	13.46
31	71	53	90 1966	40 1897	55 1925	61 1983	1.65 1903	13.52

APRIL
Los Angeles Downtown (Civic Center) - Daily Climate Data
Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year		Record Min/Year		Lowest Max/Year		Highest Min/Year		Record Rain/Year		Rainfall YTD
01	71	53	93	1985	40	1897	55	1967	62	1983	1.01	1958	13.58
02	71	53	96	1985	39	1906	56	1880	67	1985	1.43	1880	13.64
03	71	53	94	1961	40	1892	54	1882	64	1960	1.14	1882	13.69
04	71	53	100	1989	43	1892	55	1998	64	1989	1.43	1929	13.74
05	71	53	105	1989	42	1921	55	1975	71	1989	**2.74**	**1926**	13.79
06	71	53	**106**	**1989**	40	1975	51	1975	**73**	**1989**	0.84	1958	13.84
07	71	53	100	1989	39	1975	57	1975	71	1989	1.21	1926	13.89
08	72	53	92	1989	**36**	**1901**	51	1975	66	1989	2.19	1935	13.93
09	72	53	94	1890	40	1900	56	1912	62	1932	1.71	1884	13.97
10	72	54	96	1904	41	1927	53	1927	64	1885	0.63	1927	14.01
11	72	54	90	1940	40	1896	**50**	**1912**	62	1968	1.97	1886	14.05
12	72	54	97	1888	42	1887	51	1956	69	1947	1.90	1956	14.09
13	72	54	99	1898	41	1893	55	1956	66	1940	0.29	1956	14.13
14	72	54	95	1964	39	1883	55	1887	64	1984	0.83	1884	14.16
15	73	54	99	1966	43	1917	56	1920	64	1948	0.81	1978	14.19
16	73	54	90	1999	42	1917	52	1903	64	1948	2.10	1903	14.22
17	73	54	90	1999	40	1896	56	1891	65	1999	0.90	1903	14.25
18	73	54	91	1939	40	1882	57	1967	63	1999	1.27	1983	14.28
19	73	55	92	1914	40	1880	56	1967	65	1914	0.86	1904	14.31
20	73	55	96	1958	38	1896	57	1988	69	1958	1.28	1983	14.34
21	73	55	94	1997	38	1896	53	1900	63	1998	0.89	1967	14.37
22	73	55	99	1910	44	1882	56	1925	65	1987	0.96	1880	14.39
23	73	55	100	1910	42	1896	58	1921	67	1910	0.98	1988	14.41
24	73	55	93	1898	44	1900	58	1922	64	1992	0.41	1967	14.43
25	73	55	94	1898	42	1882	56	1951	68	1985	0.50	1959	14.45
26	73	55	91	1972	42	1894	58	1932	65	1992	1.62	1931	14.47
27	73	55	94	1881	41	1900	58	1953	64	1992	0.82	1960	14.49
28	73	56	95	1921	41	1900	58	1906	68	1921	0.72	1983	14.51
29	73	56	98	1981	44	1901	59	1933	65	1981	0.89	1983	14.53
30	73	56	96	1996	44	1915	57	1938	66	1996	0.96	1955	14.55

MAY

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	73	56	89 1996	41 1915	**55 1915**	64 1996	0.67 1901	14.57
02	73	56	92 1947	44 1915	**55 1915**	65 1947	0.54 1915	14.58
03	73	56	95 1984	42 1883	58 1892	64 1996	1.76 1892	14.59
04	73	56	93 1987	44 1899	56 1930	64 1983	0.66 1900	14.60
05	73	56	101 1990	46 1920	56 1921	64 1990	0.90 1921	14.61
06	73	57	97 1990	43 1892	58 1976	69 1990	1.53 1883	14.62
07	73	57	97 1941	42 1892	60 1922	67 1941	1.00 1955	14.63
08	73	57	97 1984	43 1879	60 1977	67 1941	**2.02 1977**	14.64
09	73	57	99 1923	44 1879	57 1922	67 1923	0.75 1977	14.65
10	74	57	95 1934	43 1922	61 1946	67 1934	0.15 1933	14.66
11	74	57	93 1996	43 1890	61 1933	66 1996	0.29 1900	14.67
12	74	57	94 1979	44 1887	58 1998	65 1988	1.18 1998	14.68
13	74	57	98 1979	43 1880	61 1968	70 1927	0.84 1998	14.69
14	74	58	96 1890	45 1882	61 1911	65 1997	0.03 1902	14.70
15	74	58	101 1970	42 1883	60 1938	66 1970	1.46 1898	14.71
16	74	58	102 1967	**40 1883**	61 1962	69 1967	0.04 1949	14.72
17	74	58	96 1892	42 1880	60 1950	65 1997	0.17 1883	14.73
18	74	58	96 1892	45 1880	61 1917	70 1983	0.26 1949	14.74
19	74	58	95 1892	45 1893	61 1972	67 1983	0.35 1957	14.74
20	74	58	99 1942	45 1879	62 1946	67 1983	0.84 1921	14.74
21	74	58	100 1883	43 1902	61 1903	66 1983	1.03 1921	14.74
22	74	58	94 1967	44 1879	62 1937	66 1983	0.33 1921	14.74
23	74	59	92 1932	41 1881	60 1917	66 1983	0.10 1977	14.74
24	74	59	95 1896	45 1888	57 1917	66 1983	0.48 1931	14.74
25	74	59	**103 1896**	47 1916	58 1917	70 1896	0.42 1882	14.74
26	74	59	96 1896	46 1917	63 1947	70 1896	0.21 1906	14.74
27	74	59	97 1880	47 1879	63 1921	68 1983	0.57 1906	14.74
28	75	59	101 1973	48 1895	62 1921	**71 1972**	1.14 1990	14.74
29	75	59	99 1978	46 1881	62 1935	70 1997	0.09 1918	14.74
30	75	59	95 1972	48 1878	62 1937	69 1984	0.14 1887	14.74
31	76	59	98 1909	47 1908	62 1967	70 1909	0.09 1894	14.74

JUNE

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	76	59	100 1879	47 1908	63 1965	66 1997	0.57 1899	14.75
02	76	59	104 1879	47 1895	63 1999	68 1879	0.58 1999	14.76
03	76	59	99 1879	49 1908	**60 1925**	66 1997	0.49 1925	14.77
04	76	59	100 1895	47 1885	61 1932	66 1997	0.33 1933	14.77
05	76	60	98 1890	50 1999	65 1952	68 1981	**0.76 1993**	14.77
06	77	60	102 1890	47 1887	63 1933	67 1985	0.02 1953	14.77
07	77	60	105 1890	48 1887	66 1962	70 1985	0.10 1936	14.77
08	77	60	99 1890	49 1894	64 1964	67 1985	0.02 1972	14.77
09	77	60	94 1979	50 1879	64 1892	67 1990	0.32 1964	14.77
10	77	60	102 1979	**46 1892**	63 1938	67 1993	0.22 1976	14.77
11	77	61	105 1979	48 1892	64 1967	**74 1979**	0.11 1963	14.77
12	78	61	100 1979	47 1894	62 1884	72 1979	0.63 1884	14.77
13	78	61	99 1896	**46 1894**	65 1955	**74 1979**	0.53 1884	14.77
14	78	61	100 1917	49 1894	65 1962	69 1983	0.01 1895	14.77
15	78	61	102 1981	48 1892	62 1962	71 1981	0.22 1995	14.77
16	78	61	105 1981	49 1895	61 1995	71 1981	0.38 1995	14.77
17	78	61	105 1917	49 1885	65 1982	**74 1981**	0.02 1890	14.77
18	79	62	104 1957	47 1885	65 1982	71 1957	0.11 1900	14.77
19	79	62	101 1973	48 1892	64 1928	72 1929	0.01 1928	14.77
20	79	62	106 1973	48 1881	66 1923	72 1929	0.05 1884	14.77
21	79	62	105 1973	50 1882	64 1945	71 1973	0.07 1936	14.77
22	80	62	97 1949	51 1885	64 1892	68 1949	0.05 1892	14.77
23	80	62	97 1976	49 1893	67 1965	70 1981	0.03 1936	14.77
24	80	62	102 1976	50 1882	65 1945	71 1976	0.01 1984	14.77
25	80	62	98 1883	49 1892	65 1965	72 1931	0.00	14.77
26	80	62	**112 1990**	48 1894	67 1913	73 1994	0.19 1913	14.77
27	81	62	109 1990	49 1894	66 1945	73 1994	0.39 1913	14.77
28	81	63	98 1980	52 1887	64 1952	71 1994	0.00	14.77
29	81	63	98 1996	50 1893	70 1982	70 1994	0.00	14.77
30	81	63	100 1985	49 1894	71 1918	70 1985	0.01 1918	14.77

JULY
Los Angeles Downtown (Civic Center) - Daily Climate Data
Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	82	63	107 1985	52 1886	**66 1935**	77 1985	0.09 1918	0.01
02	82	63	102 1985	51 1887	67 1912	77 1985	0.00	0.01
03	82	63	100 1985	52 1902	67 1912	75 1985	0.00	0.01
04	82	63	103 1907	53 1900	71 1939	76 1907	0.07 1898	0.01
05	83	64	100 1907	50 1886	70 1915	72 1989	0.02 1896	0.01
06	83	64	94 1992	51 1894	71 1969	68 1992	0.00	0.01
07	83	64	96 1954	51 1894	72 1923	73 1992	0.02 1992	0.01
08	83	64	95 1886	51 1894	71 1916	74 1992	0.13 1991	0.01
09	83	64	100 1985	52 1901	72 1911	71 1992	0.05 1887	0.01
10	83	64	103 1959	55 1903	72 1987	76 1959	0.00	0.01
11	84	64	97 1959	52 1878	70 1880	75 1990	0.03 1888	0.01
12	84	64	98 1953	**49 1888**	72 1894	75 1990	0.05 1992	0.01
13	84	64	98 1990	51 1888	73 1937	76 1990	0.02 1887	0.01
14	84	64	98 1984	52 1908	72 1905	73 1990	**0.24 1886**	0.01
15	84	65	98 1886	50 1893	72 1916	77 1984	0.00	0.01
16	84	65	96 1930	52 1894	70 1987	75 1984	0.02 1995	0.01
17	84	65	98 1998	52 1894	73 1962	74 1984	0.01 1987	0.01
18	85	65	97 1936	53 1884	72 1991	74 1936	0.00	0.01
19	85	65	97 1960	52 1884	71 1991	72 1990	0.00	0.01
20	85	65	100 1960	52 1892	73 1916	71 1992	0.00	0.01
21	85	65	96 1960	53 1903	72 1905	72 1989	0.00	0.01
22	85	65	98 1887	52 1880	72 1928	73 1960	0.10 1986	0.01
23	85	65	97 1890	53 1903	73 1928	71 1960	0.08 1986	0.01
24	85	65	103 1891	52 1882	74 1913	72 1974	0.00	0.01
25	85	65	**109 1891**	52 1903	70 1965	71 1959	0.04 1910	0.01
26	85	65	100 1891	52 1886	72 1909	76 1891	0.02 1906	0.01
27	85	65	102 1972	52 1903	72 1909	75 1931	0.00	0.01
28	85	65	101 1995	52 1883	72 1913	74 1995	0.01 1968	0.01
29	85	65	100 1995	53 1909	74 1901	**78 1972**	0.00	0.01
30	85	66	100 1980	54 1894	73 1913	**78 1980**	0.02 1886	0.01
31	85	66	100 1972	52 1885	71 1950	76 1980	0.01 1886	0.01

AUGUST

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	85	65	99 1959	54 1888	74 1912	76 1980	0.01 1918	0.01
02	85	65	98 1997	51 1888	72 1976	74 1971	0.00	0.01
03	85	65	100 1918	52 1913	74 1933	73 1971	0.01 1939	0.01
04	85	65	94 1971	52 1912	73 1928	72 1971	0.05 1955	0.01
05	86	65	100 1997	52 1887	74 1891	74 1971	0.09 1901	0.01
06	85	66	105 1983	50 1883	72 1933	75 1997	0.02 1983	0.01
07	85	66	99 1884	54 1894	71 1933	72 1983	0.11 1968	0.01
08	85	66	100 1881	54 1916	70 1930	73 1969	0.02 1936	0.01
09	85	66	100 1998	53 1889	71 1914	76 1983	0.19 1942	0.01
10	85	66	99 1882	54 1897	70 1941	76 1994	0.04 1942	0.01
11	85	66	98 1879	53 1894	72 1914	76 1994	0.02 1961	0.01
12	85	66	104 1994	52 1894	72 1935	75 1994	0.32 1972	0.01
13	85	66	102 1994	54 1892	71 1918	**79 1994**	0.13 1904	0.01
14	85	66	97 1885	54 1887	68 1987	76 1994	0.01 1983	0.01
15	85	66	98 1994	52 1894	69 1906	77 1994	0.40 1984	0.01
16	84	66	98 1890	52 1883	71 1916	**79 1983**	0.19 1977	0.01
17	84	66	104 1885	52 1887	68 1938	77 1983	**2.06 1977**	0.01
18	84	66	102 1885	52 1887	71 1900	73 1994	0.44 1983	0.02
19	84	66	**106 1885**	54 1916	71 1905	76 1986	0.14 1983	0.03
20	84	66	97 1986	51 1900	69 1906	73 1986	0.03 1906	0.04
21	84	66	96 1982	53 1899	73 1921	74 1982	0.00	0.05
22	84	66	102 1972	52 1901	72 1924	72 1972	0.04 1904	0.06
23	84	66	100 1968	54 1905	74 1914	72 1998	0.00	0.07
24	84	66	96 1931	53 1900	75 1947	73 1931	0.05 1988	0.08
25	84	66	102 1985	52 1909	70 1941	75 1935	0.01 1984	0.09
26	84	66	98 1981	53 1885	71 1920	76 1981	0.10 1935	0.10
27	84	66	103 1981	53 1902	70 1956	78 1981	0.01 1972	0.11
28	84	65	99 1995	52 1902	70 1956	72 1981	0.10 1951	0.12
29	84	65	102 1884	51 1901	**65 1951**	74 1998	0.08 1888	0.13
30	84	65	101 1998	**49 1901**	71 1907	78 1967	0.21 1886	0.14
31	84	65	103 1967	52 1895	70 1964	76 1998	0.61 1889	0.15

SEPTEMBER

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	84	66	**110 1955**	49 1901	71 1935	81 1955	0.41 1967	0.16
02	84	66	108 1955	51 1881	71 1933	83 1955	0.02 1913	0.17
03	84	66	103 1988	51 1892	70 1933	76 1998	0.05 1976	0.18
04	84	65	**110 1988**	52 1892	67 1973	80 1988	0.30 1963	0.19
05	84	65	105 1984	50 1898	66 1916	82 1984	0.32 1978	0.21
06	83	65	102 1955	48 1898	68 1910	77 1984	0.17 1965	0.23
07	83	65	103 1949	50 1884	69 1920	75 1990	0.00	0.25
08	83	65	103 1984	47 1901	70 1929	72 1990	0.19 1982	0.27
09	83	65	102 1956	48 1884	67 1975	78 1984	0.01 1949	0.29
10	83	65	103 1983	52 1893	69 1933	75 1983	1.74 1976	0.31
11	83	65	101 1983	48 1901	65 1933	79 1959	0.33 1923	0.33
12	83	65	102 1971	48 1884	67 1933	75 1983	0.13 1963	0.35
13	83	65	106 1971	48 1884	70 1927	78 1971	0.07 1918	0.37
14	83	65	99 1894	48 1898	69 1933	72 1984	0.04 1918	0.39
15	83	65	102 1979	49 1895	69 1982	74 1984	0.03 1968	0.41
16	83	65	103 1909	48 1884	68 1927	75 1909	0.07 1989	0.43
17	83	65	108 1913	46 1884	66 1947	79 1984	0.42 1963	0.45
18	83	65	103 1939	48 1884	70 1985	80 1939	1.39 1965	0.47
19	82	64	104 1939	49 1907	67 1924	77 1984	0.27 1989	0.49
20	82	64	107 1939	49 1900	67 1988	81 1939	0.05 1983	0.50
21	82	64	108 1885	47 1880	66 1961	81 1939	0.15 1887	0.51
22	82	64	104 1883	48 1895	69 1961	**84 1939**	0.10 1923	0.52
23	82	64	104 1978	**44 1880**	66 1955	77 1939	0.28 1908	0.53
24	82	64	106 1978	45 1880	**61 1908**	75 1997	1.95 1986	0.54
25	82	64	107 1978	48 1879	62 1916	75 1978	**3.96 1939**	0.55
26	82	64	109 1963	48 1893	69 1982	82 1963	0.24 1982	0.56
27	82	64	106 1963	46 1901	67 1919	80 1963	0.68 1919	0.57
28	82	63	106 1963	49 1901	66 1919	82 1963	0.74 1911	0.58
29	82	63	102 1963	**44 1880**	67 1930	74 1918	0.49 1911	0.59
30	81	63	105 1906	48 1886	66 1903	75 1906	1.58 1983	0.60

OCTOBER

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	81	63	100 1991	49 1901	65 1935	71 1991	0.74 1916	0.61
02	81	63	101 1995	44 1884	63 1916	73 1991	0.53 1986	0.61
03	81	63	**108 1987**	44 1884	64 1916	72 1987	0.37 1912	0.61
04	81	63	**108 1987**	44 1884	60 1912	76 1987	0.24 1983	0.61
05	81	62	101 1971	46 1884	63 1912	73 1953	0.61 1961	0.61
06	81	62	102 1971	44 1881	62 1916	72 1971	0.22 1916	0.61
07	81	62	98 1971	43 1884	64 1939	70 1971	0.17 1904	0.61
08	81	62	100 1994	43 1881	66 1880	68 1983	0.42 1889	0.61
09	80	62	102 1988	46 1879	63 1932	71 1994	0.44 1904	0.61
10	80	62	107 1991	46 1890	63 1983	75 1991	0.71 1916	0.61
11	80	61	100 1971	42 1879	63 1933	72 1991	0.34 1957	0.61
12	80	61	99 1950	43 1886	58 1928	70 1983	0.43 1941	0.61
13	80	61	104 1950	42 1886	61 1899	71 1950	1.09 1899	0.61
14	80	61	103 1961	44 1881	63 1899	70 1958	1.75 1897	0.61
15	79	61	102 1961	43 1881	60 1908	**80 1961**	0.27 1907	0.61
16	79	60	104 1958	44 1881	62 1971	75 1958	0.35 1963	0.61
17	79	60	102 1958	44 1881	62 1971	77 1958	1.72 1934	0.62
18	79	60	97 1940	44 1881	**58 1916**	70 1940	0.48 1932	0.63
19	79	60	99 1940	43 1881	62 1920	74 1940	0.20 1979	0.64
20	78	60	96 1964	43 1886	64 1955	70 1927	**3.16 1889**	0.65
21	78	59	100 1929	45 1882	60 1916	69 1917	0.53 1889	0.66
22	78	59	100 1965	**40 1892**	63 1893	71 1965	0.77 1987	0.67
23	78	59	98 1965	41 1892	59 1921	71 1982	1.87 1889	0.69
24	78	59	99 1909	43 1886	64 1971	68 1965	0.55 1919	0.71
25	77	58	96 1983	43 1886	62 1919	67 1983	1.04 1940	0.73
26	77	58	95 1879	45 1897	60 1892	71 1983	1.74 1901	0.75
27	77	58	99 1890	41 1886	61 1948	69 1987	1.37 1883	0.78
28	77	58	94 1931	45 1903	**58 1942**	66 1987	0.56 1942	0.81
29	76	58	94 1931	43 1878	60 1971	69 1931	0.84 1877	0.84
30	76	57	99 1939	41 1971	60 1996	70 1918	1.02 1996	0.87
31	76	57	96 1918	42 1886	61 1927	70 1918	1.64 1927	0.91

NOVEMBER

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year		Record Min/Year		Lowest Max/Year		Highest Min/Year		Record Rain/Year		Rainfall YTD
01	76	57	**100**	**1966**	38	1886	61	1961	64	1997	0.44	1983	0.95
02	75	57	99	1997	36	1886	62	1935	67	1966	0.35	1957	0.99
03	75	56	96	1900	41	1886	58	1892	**70**	**1997**	0.35	1960	1.04
04	75	56	96	1976	44	1923	59	1916	65	1921	0.42	1987	1.09
05	75	56	94	1898	41	1881	57	1905	68	1941	0.56	1960	1.14
06	74	56	92	1898	40	1879	61	1916	67	1941	1.07	1969	1.19
07	74	55	91	1956	41	1890	60	1920	64	1997	**3.85**	**1966**	1.25
08	74	55	93	1956	40	1888	61	1910	65	1913	1.02	1882	1.31
09	74	55	94	1996	43	1886	57	1982	65	1956	3.41	1879	1.37
10	73	55	93	1990	42	1880	59	1982	66	1956	1.95	1902	1.43
11	73	54	94	1900	39	1881	55	1978	66	1942	1.55	1954	1.50
12	73	54	93	1974	38	1978	53	1946	65	1933	1.88	1946	1.57
13	73	54	96	1933	35	1880	53	1978	69	1933	0.99	1884	1.64
14	73	54	93	1933	36	1880	57	1909	67	1933	1.33	1928	1.71
15	72	53	90	1936	40	1968	56	1952	67	1936	1.64	1952	1.78
16	72	53	93	1924	35	1880	57	1953	64	1967	2.01	1888	1.85
17	72	53	91	1945	36	1886	**49**	**1964**	66	1927	1.58	1900	1.92
18	72	53	94	1895	**34**	**1881**	59	1994	66	1932	1.50	1913	1.99
19	72	53	92	1895	**34**	**1886**	60	1913	66	1936	3.61	1967	2.06
20	71	52	88	1954	37	1906	58	1946	64	1989	1.38	1967	2.14
21	71	52	93	1924	39	1905	58	1918	64	1924	2.97	1967	2.22
22	71	52	89	1950	36	1882	50	1906	67	1924	3.51	1965	2.30
23	71	52	91	1933	39	1886	51	1906	65	1933	0.91	1946	2.38
24	71	52	94	1933	36	1895	55	1984	66	1932	2.03	1926	2.46
25	70	51	92	1977	36	1879	55	1879	64	1932	0.78	1885	2.54
26	70	51	90	1903	40	1880	**49**	**1906**	62	1911	1.28	1926	2.61
27	70	51	90	1903	37	1897	53	1906	60	1957	0.99	1905	2.68
28	70	51	90	1924	36	1906	54	1975	60	1924	3.51	1892	2.75
29	70	51	87	1995	37	1878	52	1906	61	1924	2.26	1970	2.82
30	70	51	88	1964	37	1906	51	1880	60	1935	1.96	1982	2.89

DECEMBER

Los Angeles Downtown (Civic Center) - Daily Climate Data

Period of Record: July 1877 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	69	50	85 1972	38 1880	56 1955	61 1969	1.40 1925	2.96
02	69	50	88 1893	36 1884	55 1985	61 1940	1.10 1961	3.03
03	69	50	89 1958	36 1897	56 1906	64 1940	1.59 1880	3.10
04	69	50	91 1979	37 1909	52 1955	63 1979	1.59 1974	3.17
05	69	50	89 1979	38 1891	51 1894	**65 1979**	1.81 1966	3.24
06	69	50	88 1938	36 1897	53 1978	64 1938	1.01 1997	3.31
07	69	50	88 1940	32 1978	52 1978	64 1938	2.78 1992	3.37
08	68	49	**92 1938**	**30 1978**	53 1978	64 1938	2.29 1909	3.43
09	68	49	85 1973	32 1951	53 1898	59 1934	1.70 1996	3.49
10	68	49	87 1950	36 1951	50 1972	62 1934	1.58 1941	3.55
11	68	49	86 1895	34 1898	**46 1932**	**65 1934**	1.65 1937	3.61
12	68	49	86 1895	34 1878	**46 1932**	60 1934	4.30 1889	3.67
13	68	49	83 1952	31 1901	50 1967	56 1958	1.67 1933	3.73
14	68	49	85 1886	**30 1878**	**46 1931**	58 1877	0.96 1883	3.79
15	68	49	85 1998	36 1901	52 1946	61 1953	2.26 1880	3.85
16	68	49	89 1980	37 1897	49 1914	60 1957	1.24 1940	3.91
17	68	49	85 1998	34 1895	51 1924	59 1890	1.97 1880	3.97
18	68	49	86 1917	35 1895	53 1978	59 1950	2.18 1938	4.03
19	67	48	86 1917	32 1897	54 1978	62 1929	2.12 1921	4.09
20	67	48	83 1985	35 1887	51 1909	61 1929	4.19 1879	4.15
21	67	48	85 1917	**30 1897**	50 1990	58 1944	1.57 1970	4.21
22	67	48	80 1960	33 1990	52 1990	59 1906	2.63 1888	4.28
23	67	48	86 1989	33 1905	47 1926	61 1994	1.84 1940	4.35
24	67	48	87 1985	33 1879	51 1933	59 1989	2.64 1971	4.42
25	67	48	85 1980	**30 1879**	51 1916	60 1972	3.01 1884	4.49
26	67	48	85 1980	35 1987	**46 1916**	61 1919	1.20 1977	4.56
27	67	48	83 1947	36 1916	49 1916	58 1947	1.81 1936	4.63
28	67	48	87 1919	36 1954	49 1916	60 1929	2.09 1931	4.70
29	67	48	89 1897	35 1882	52 1987	62 1917	3.84 1965	4.77
30	67	48	89 1980	37 1945	47 1915	60 1997	1.04 1891	4.84
31	67	48	86 1897	36 1882	50 1988	60 1921	**4.86 1933**	4.92

Table 7.

LOS ANGELES CIVIC CENTER: COMPLETE MONTHLY TEMPERATURES

(Average temperatures were computed by a different statistical sampling technique prior to 1890.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
1877							72.7	71.2	71.0	64.1	62.6	56.6	
1878	55.2	55.2	56.6	58.6	63.4	66.6	69.6	70.6	70.0	64.6	59.2	54.7	62.0
1879	52.6	56.0	59.4	60.2	61.8	67.8	68.8	71.7	69.3	65.6	56.6	53.0	61.9
1880	52.8	50.8	52.4	57.0	64.6	65.7	65.0	68.6	66.1	63.4	56.1	56.3	59.9
1881	52.8	59.2	57.4	62.8	64.0	67.4	71.6	71.5	69.4	61.1	57.2	55.2	62.5
1882	50.0	51.0	55.6	57.6	63.7	66.4	71.2	73.2	69.5	63.3	57.7	56.7	61.3
1883	53.3	52.4	58.1	58.5	63.7	71.4	72.6	72.2	73.6	62.0	59.6	56.0	62.8
1884	53.6	55.4	55.4	58.8	63.5	67.6	72.8	73.5	67.0	62.8	60.6	52.8	62.0
1885	54.7	57.0	61.7	63.4	65.6	67.2	72.2	75.4	70.8	65.8	59.8	58.4	64.2
1886	55.3	60.0	55.4	58.8	64.8	68.8	72.4	74.6	67.5	60.1	56.8	56.4	62.6
1887	55.2	51.3	59.5	60.2	64.6	67.8	71.6	70.2	69.4	66.2	60.2	53.2	62.4
1888	49.7	54.5	55.6	63.2	62.8	69.2	73.4	73.0	73.8	66.0	59.9	57.4	63.2
1889	52.4	56.4	59.2	62.2	62.6	66.4	70.8	71.6	72.6	66.3	61.3	54.8	63.0
1890	49.1	54.2	57.5	59.4	63.2	67.6	73.2	72.8	71.4	67.8	66.2	61.2	63.6
1891	55.8	52.9	58.4	59.4	61.6	66.4	73.7	74.8	73.0	66.0	61.2	52.8	63.0
1892	56.6	54.4	56.0	58.6	62.5	63.8	68.0	71.6	67.8	64.0	61.7	54.4	61.6
1893	57.2	55.0	53.5	57.8	62.6	66.1	69.6	71.4	66.1	63.4	57.3	57.9	61.5
1894	50.7	51.4	53.8	58.8	60.2	62.7	67.4	70.0	69.2	65.8	59.4	53.8	60.3
1895	52.2	56.8	55.5	58.8	63.6	65.9	68.4	68.8	68.8	65.6	60.1	56.4	61.7
1896	57.5	59.6	58.4	56.2	63.0	69.0	70.9	71.2	67.6	65.4	59.8	59.0	63.1
1897	55.6	53.0	53.0	61.2	62.6	65.7	69.5	71.8	70.3	62.0	61.6	55.7	61.8
1898	51.5	57.8	55.3	62.8	60.0	67.1	70.4	73.9	71.0	64.6	60.6	56.8	62.6
1899	55.8	53.7	56.6	59.8	59.6	65.1	69.6	68.6	70.4	63.4	62.1	57.8	61.9
1900	57.7	58.4	60.4	56.8	64.0	67.4	70.8	68.5	67.0	64.2	66.5	60.4	63.5
1901	55.0	57.4	60.3	57.0	60.4	65.5	70.0	71.4	64.6	64.8	60.6	58.4	62.1
1902	55.8	54.5	55.0	57.8	60.7	66.4	68.4	69.1	69.2	63.2	58.2	56.0	61.2
1903	56.6	52.0	56.2	58.0	60.8	66.3	68.4	70.6	69.2	66.3	63.5	58.2	62.2
1904	55.8	55.6	57.2	61.0	62.2	67.6	69.5	73.1	72.2	67.6	65.6	59.7	63.9
1905	59.0	58.3	59.3	59.5	60.6	64.2	69.2	70.4	68.8	65.8	59.2	57.0	62.6
1906	55.8	58.4	57.8	59.2	60.0	67.1	72.2	70.5	69.8	68.6	58.8	56.4	62.9
1907	51.6	61.8	55.5	59.8	61.4	65.0	72.2	69.2	67.2	65.6	63.5	58.4	62.6
1908	56.5	54.2	58.0	61.2	59.8	63.2	70.2	70.2	69.8	64.6	59.4	55.2	61.9
1909	54.6	54.0	55.0	60.6	60.3	65.6	67.7	70.6	68.6	66.3	60.0	53.8	61.4
1910	53.7	55.6	59.0	63.6	63.0	64.4	70.2	70.1	70.5	67.2	60.0	59.8	63.1
1911	56.9	52.5	58.8	58.4	61.4	63.8	69.4	70.6	68.2	66.4	64.1	55.4	62.2
1912	59.0	59.8	54.2	56.4	62.9	65.4	68.8	69.2	68.7	65.2	65.1	56.6	62.6
1913	52.1	53.8	57.8	59.8	60.9	64.4	70.5	71.9	73.6	67.9	61.8	55.4	62.5
1914	56.8	59.4	63.0	62.8	60.3	64.8	66.8	68.2	67.9	68.6	67.0	53.4	63.2
1915	55.9	54.7	61.4	60.4	61.5	66.7	70.0	72.6	68.0	65.2	61.8	57.4	63.0
1916	50.8	58.7	62.0	62.4	61.3	63.6	66.8	68.6	65.2	59.7	59.4	52.6	60.9
1917	51.2	55.3	56.7	57.9	58.7	68.6	72.3	70.0	70.8	68.2	63.7	62.8	63.0
1918	55.7	56.0	59.1	61.7	61.2	69.8	69.9	71.7	72.2	71.0	60.8	57.2	63.9
1919	60.2	53.6	55.6	60.9	61.6	68.7	71.0	70.2	68.3	63.8	61.5	58.9	62.9
1920	56.6	57.6	56.8	58.8	62.1	65.8	71.2	72.4	68.4	63.2	60.1	55.8	62.4
1921	54.1	57.4	59.4	59.0	58.8	65.6	71.8	70.6	69.3	66.7	63.2	60.2	63.0
1922	53.4	54.0	55.6	57.6	62.6	67.7	69.5	73.3	73.1	65.4	59.8	58.3	62.5
1923	58.1	56.6	61.0	58.4	64.6	63.6	70.0	69.6	70.4	66.8	66.4	58.8	63.7
1924	58.5	62.6	56.4	60.4	64.8	68.2	69.4	69.1	70.0	62.6	64.1	55.4	63.4

LOS ANGELES CIVIC CENTER: COMPLETE MONTHLY TEMPERATURES

(Average temperatures were computed by a different statistical sampling technique prior to 1890.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
1925	57.6	57.7	58.8	60.0	62.8	67.4	72.2	69.9	69.2	65.0	62.4	63.2	63.8
1926	59.4	61.2	63.0	63.4	65.4	67.2	69.8	72.6	68.0	67.6	67.0	56.1	65.1
1927	57.2	56.6	57.4	59.5	63.8	65.0	72.1	70.4	68.4	67.4	65.8	56.2	63.3
1928	61.4	60.0	60.6	62.2	64.2	65.4	69.2	70.1	71.0	63.7	63.2	58.8	64.2
1929	55.2	54.5	57.2	57.4	65.0	68.6	72.1	75.8	70.2	70.2	65.8	63.7	64.6
1930	56.0	59.4	60.8	63.6	61.8	67.6	72.8	73.8	67.9	68.7	66.2	60.1	64.9
1931	60.2	60.7	66.0	66.0	67.5	70.5	77.2	76.1	71.5	68.8	58.7	55.0	66.5
1932	53.3	56.5	62.2	62.6	63.6	66.2	69.1	69.6	68.3	67.2	69.0	55.2	63.6
1933	54.4	56.0	59.7	59.1	60.4	65.0	69.4	70.2	64.6	66.7	66.5	57.4	62.4
1934	60.4	59.5	65.5	64.6	67.5	65.2	72.3	71.1	72.7	67.5	62.8	60.8	65.8
1935	57.0	60.0	55.3	60.7	62.0	66.4	70.8	74.0	69.8	67.0	60.8	59.4	63.6
1936	59.4	56.5	59.0	60.6	65.6	69.0	74.1	73.4	70.5	67.4	67.8	58.6	65.2
1937	47.8	55.3	58.5	62.3	64.0	67.8	71.4	71.6	72.4	67.6	61.7	61.9	63.5
1938	61.2	56.8	57.8	61.6	63.3	65.4	69.6	73.9	74.0	66.7	62.7	62.3	64.6
1939	57.0	54.0	56.8	63.0	63.6	66.9	70.6	73.0	76.6	71.6	67.1	64.2	65.4
1940	59.8	59.4	61.2	62.8	66.0	66.0	70.6	70.6	69.6	68.3	63.4	61.2	64.9
1941	57.6	58.8	60.6	59.1	67.9	66.0	70.7	71.2	68.0	66.0	65.4	57.0	64.0
1942	58.6	55.7	58.8	59.4	62.8	65.9	71.8	71.0	67.8	67.6	63.5	58.8	63.5
1943	57.6	60.1	58.8	61.4	65.5	66.4	70.7	71.3	70.6	66.6	65.0	56.8	64.2
1944	57.2	53.7	59.6	58.8	62.4	63.4	66.6	71.3	69.2	64.8	59.0	60.0	62.2
1945	56.6	56.6	54.6	59.4	61.9	64.6	71.0	73.3	73.2	67.2	61.6	57.2	63.1
1946	58.0	54.8	57.4	62.0	61.1	68.7	71.8	72.3	73.0	64.5	58.8	56.4	63.2
1947	55.9	59.8	60.4	62.6	64.0	66.9	73.0	71.4	72.2	66.3	59.0	57.2	64.0
1948	58.6	54.6	55.2	60.4	63.9	67.0	71.0	71.2	71.6	66.3	62.1	53.4	63.0
1949	46.8	52.6	56.0	63.3	64.3	69.7	71.8	73.7	72.9	66.2	67.2	55.6	63.3
1950	50.4	56.7	58.8	62.7	62.2	66.6	73.3	70.9	68.9	69.5	63.7	62.1	63.8
1951	55.7	56.4	60.2	60.4	63.1	66.7	72.8	71.3	71.0	68.8	61.9	54.3	63.6
1952	52.8	58.8	55.3	61.1	66.7	65.7	72.3	74.1	74.3	67.0	59.1	56.1	63.6
1953	60.6	58.9	58.9	58.7	63.9	66.8	74.9	70.7	70.2	69.1	63.6	59.1	64.6
1954	55.6	64.1	57.0	60.9	63.8	67.6	76.7	73.1	72.5	65.7	64.3	58.1	64.9
1955	53.7	57.0	61.3	61.3	63.0	66.7	70.5	75.2	74.5	64.2	61.1	55.9	63.7
1956	56.0	53.1	60.5	58.7	64.4	69.8	71.8	71.9	76.5	66.5	67.2	60.5	64.8
1957	54.2	60.7	61.6	61.7	64.2	72.5	76.0	76.2	72.2	67.1	60.7	61.7	65.7
1958	59.6	60.3	56.9	65.4	68.0	71.0	72.8	75.2	75.9	74.0	63.3	62.0	67.1
1959	60.1	56.3	64.7	66.2	65.0	71.5	77.8	75.5	73.5	70.2	66.6	60.7	67.3
1960	54.6	57.0	62.0	65.3	67.7	70.1	75.5	73.2	75.6	68.0	60.3	58.7	65.7
1961	62.0	61.0	60.1	64.0	63.4	68.8	74.2	74.3	71.0	67.9	60.2	56.9	65.3
1962	57.5	53.8	55.2	64.3	62.9	66.3	70.1	74.1	70.9	65.7	60.6	57.4	63.2
1963	55.6	62.7	58.3	59.6	64.1	66.4	72.1	73.7	77.3	69.1	62.3	60.6	65.1
1964	56.7	59.0	58.6	60.5	61.7	64.8	71.8	73.4	70.2	70.5	59.8	56.5	63.6
1965	58.3	58.0	59.0	61.7	63.4	64.1	70.1	75.6	69.6	73.1	62.0	56.9	64.3
1966	55.7	56.2	61.3	64.4	64.5	70.2	74.4	76.6	73.4	71.2	63.6	60.7	66.0
1967	59.2	62.9	61.0	56.1	67.3	66.3	75.7	79.2	75.2	72.5	66.6	55.6	66.5
1968	58.5	63.8	62.9	64.0	65.5	69.2	74.7	74.1	73.4	69.2	63.3	56.2	66.2
1969	58.3	54.9	59.7	63.8	66.6	67.2	73.8	77.0	71.7	67.3	65.2	59.2	65.4
1970	57.6	61.4	61.2	60.9	67.4	70.0	75.3	76.2	74.4	68.3	63.3	57.2	66.1
1971	58.8	59.2	60.3	62.0	64.0	68.8	74.2	78.9	74.6	67.4	60.2	52.8	65.1
1972	55.5	60.3	63.7	63.9	67.6	72.2	78.0	77.4	72.3	67.2	62.2	58.1	66.5

LOS ANGELES CIVIC CENTER: COMPLETE MONTHLY TEMPERATURES

(Average temperatures were computed by a different statistical sampling technique prior to 1890.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
1973	56.4	60.0	57.9	63.1	65.8	72.0	72.4	73.6	70.0	68.8	60.0	59.9	65.
1974	55.2	59.2	59.6	64.7	65.7	72.2	74.1	72.3	73.2	67.6	64.0	56.2	65.3
1975	57.6	55.8	55.7	56.0	62.7	65.7	72.5	71.9	74.0	66.4	61.2	57.0	63.0
1976	59.4	56.4	58.4	57.8	64.3	71.1	72.6	71.6	72.6	70.7	66.9	60.4	65.2
1977	58.1	63.1	56.9	63.7	61.9	69.2	74.2	75.6	71.8	69.0	66.3	60.8	65.9
1978	58.1	58.9	63.2	60.8	68.6	71.8	73.4	73.7	76.0	70.3	58.4	53.2	65.5
1979	53.3	55.0	57.9	62.7	65.4	71.5	72.1	72.9	77.4	68.7	64.6	63.2	65.4
1980	60.9	64.6	60.9	64.8	63.2	71.8	77.1	76.3	72.6	71.5	65.3	63.7	67.7
1981	61.8	64.3	62.0	66.0	68.9	77.4	77.2	78.3	75.0	68.5	65.0	62.1	68.9
1982	57.1	64.0	59.3	62.2	64.4	65.3	74.0	75.1	73.9	70.9	61.7	58.1	65.5
1983	61.9	63.0	63.9	63.2	70.7	70.7	75.9	80.8	79.1	74.2	63.5	59.8	68.9
1984	61.2	61.9	65.6	65.3	72.4	72.2	78.7	76.4	81.3	68.5	61.0	57.2	68.5
1985	57.5	60.4	59.3	66.8	66.3	73.5	79.2	75.7	71.8	71.3	60.4	61.7	67.0
1986	65.9	62.4	64.5	66.4	68.1	71.2	73.2	76.0	68.8	69.4	66.4	60.1	67.7
1987	57.2	60.3	61.2	67.8	68.1	69.7	70.8	73.0	75.2	71.9	62.9	54.4	66.0
1988	58.3	62.9	64.9	64.1	67.2	67.9	74.3	72.9	72.2	69.7	61.9	57.1	66.1
1989	56.3	56.4	62.4	67.9	66.2	69.8	75.1	72.8	74.5	69.2	66.7	62.7	66.7
1990	59.4	58.0	61.7	65.7	66.9	74.3	77.3	74.0	76.0	73.2	65.6	57.5	67.5
1991	59.2	63.5	56.8	64.2	63.9	67.1	71.0	73.1	73.6	72.1	66.2	59.6	65.9
1992	60.3	62.3	60.8	69.6	69.0	70.4	75.9	78.9	76.6	70.4	65.1	56.5	68.0
1993	57.3	58.3	64.5	67.0	68.9	72.4	73.0	74.4	74.3	71.2	64.6	60.8	67.2
1994	62.2	59.3	64.7	64.3	65.1	74.4	73.6	80.5	76.5	70.4	59.9	59.9	67.6
1995	58.4	65.3	62.6	64.8	64.0	69.0	75.8	77.5	77.0	71.5	67.1	60.9	67.8
1996	60.9	61.3	63.0	68.8	69.0	71.9	75.1	77.2	73.5	67.0	64.3	59.7	67.6
1997	58.7	61.0	65.1	65.7	72.7	71.0	73.2	77.6	79.8	71.1	65.2	58.9	68.5
1998	58.8	57.1	61.9	62.2	64.2	68.8	76.2	79.9	73.6	69.0	62.4	59.1	66.1
1999	60.8	59.9	56.9	59.4	63.3	66.8	71.8						
2000													
AVE	56.5	57.7	59.1	61.5	64.0	67.8	72.0	72.9	71.5	67.3	62.5	57.9	64.2
STDE	3.3	3.4	3.0	3.0	2.7	2.7	2.7	2.8	3.2	2.9	2.9	2.8	2.0

Table 7a.

HIGHEST MEAN MONTHLY TEMPERATURES
LOS ANGELES - DOWNTOWN
(July 1877 - July 1999)

January		
	Temp.	Year
Highest	65.9	1986
	62.2	1994
	62.0	1961
	61.9	1983
	61.8	1981
30-Year Avg	58.3	

February		
	Temp.	Year
Highest	65.3	1995
	64.6	1980
	64.3	1981
	64.1	1954
	64.0	1982
30-Year Avg	60.1	

March		
	Temp.	Year
Highest	66.0	1931
	65.6	1984
	65.5	1934
	65.1	1997
	64.9	1988
30-Year Avg	60.7	

April		
	Temp.	Year
Highest	69.6	1992
	68.8	1996
	67.9	1989
	67.8	1987
	67.0	1993
30-Year Avg	63.3	

May		
	Temp.	Year
Highest	72.7	1997
	72.4	1984
	70.7	1983
	69.0	1996
	69.0	1992
30-Year Avg	65.8	

June		
	Temp.	Year
Highest	77.4	1981
	74.4	1994
	74.3	1990
	73.5	1985
	72.5	1957
30-Year Avg	69.7	

July		
	Temp.	Year
Highest	79.2	1985
	78.7	1984
	78.0	1972
	77.8	1959
	77.3	1990
30-Year Avg	74.3	

August		
	Temp.	Year
Highest	80.8	1983
	80.5	1994
	79.9	1998
	79.2	1967
	78.9	1992
30-Year Avg	75.1	

September		
	Temp.	Year
Highest	81.3	1984
	79.8	1997
	79.1	1983
	77.4	1979
	77.3	1963
30-Year Avg	73.7	

October		
	Temp.	Year
Highest	74.2	1983
	74.0	1958
	73.2	1990
	73.1	1965
	72.5	1967
30-Year Avg	69.7	

November		
	Temp.	Year
Highest	69.0	1932
	67.8	1936
	67.2	1956
	67.2	1949
	67.1	1995
30-Year Avg	63.0	

December		
	Temp.	Year
Highest	64.2	1939
	63.7	1980
	63.7	1929
	63.2	1979
	63.2	1925
30-Year Avg	58.3	

Table 7a.

LOWEST MEAN MONTHLY TEMPERATURES
LOS ANGELES - DOWNTOWN

(July 1877 - July 1999)

January		
	Temp.	Year
Lowest	46.8	1949
	47.8	1937
	49.1	1890
	49.7	1888
	50.0	1882
30-Year Avg	58.3	

February		
	Temp.	Year
Lowest	50.8	1880
	51.0	1882
	51.3	1887
	51.4	1894
	52.0	1903
30-Year Avg	60.1	

March		
	Temp.	Year
Lowest	52.4	1880
	53.0	1897
	53.5	1893
	53.8	1894
	54.2	1912
30-Year Avg	60.7	

April		
	Temp.	Year
Lowest	56.0	1975
	56.1	1967
	56.2	1896
	56.4	1912
	56.8	1900
30-Year Avg	63.3	

May		
	Temp.	Year
Lowest	58.7	1917
	58.8	1921
	59.6	1899
	59.8	1908
	60.0	1898
30-Year Avg	65.8	

June		
	Temp.	Year
Lowest	62.7	1894
	63.2	1908
	63.4	1944
	63.6	1916
	63.6	1914
30-Year Avg	69.7	

July		
	Temp.	Year
Lowest	65.0	1880
	66.6	1944
	66.8	1916
	66.8	1914
	67.4	1894
30-Year Avg	74.3	

August		
	Temp.	Year
Lowest	68.2	1914
	68.5	1900
	68.6	1916
	68.6	1899
	68.6	1880
30-Year Avg	75.1	

September		
	Temp.	Year
Lowest	64.6	1933
	64.6	1901
	65.2	1916
	66.1	1893
	66.1	1880
30-Year Avg	73.7	

October		
	Temp.	Year
Lowest	59.7	1916
	60.1	1886
	61.1	1881
	62.0	1897
	62.0	1883
30-Year Avg	69.7	

November		
	Temp.	Year
Lowest	56.1	1880
	56.6	1879
	56.8	1886
	57.2	1881
	57.3	1893
30-Year Avg	63.0	

December		
	Temp.	Year
Lowest	52.6	1916
	52.8	1971
	52.8	1891
	52.8	1884
	53.0	1879
30-Year Avg	58.3	

Table 7b.

HIGHEST & LOWEST MEAN ANNUAL TEMPERATURES

LOS ANGELES - DOWNTOWN

JULY 1877 - JULY 1999

HIGHEST ANNUAL AVERAGES	
TEMP.	YEAR
68.9	1983
68.9	1981
68.5	1984
68.3	1997
68.0	1992
67.8	1995
67.7	1986
67.7	1980
67.6	1996
67.6	1994

LOWEST ANNUAL AVERAGES	
TEMP.	YEAR
59.9	1880
60.3	1894
60.9	1916
61.2	1902
61.3	1882
61.4	1909
61.5	1893
61.6	1892
61.7	1895
61.8	1897

30-Year Avg: 66.0

Table 8.

LOS ANGELES CIVIC CENTER: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1877							0.00	0.00	0.00	0.86	0.45	3.93	------
1878	3.33	7.68	2.57	1.71	0.66	0.07	0.00	0.00	0.00	0.14	0.00	4.70	21.26
1879	3.59	0.97	0.49	1.19	0.24	0.03	0.00	0.00	0.00	0.93	3.44	6.53	11.35
1880	1.33	1.56	1.45	5.06	0.04	0.00	0.00	0.00	0.00	0.14	0.67	8.40	20.34
1881	1.43	0.36	1.66	0.46	0.01	0.00	0.00	0.00	0.00	0.82	0.27	0.52	13.13
1882	1.01	2.66	2.66	1.83	0.63	0.00	0.00	0.00	0.00	0.05	1.82	0.08	10.40
1883	1.62	3.47	2.87	0.15	2.02	0.03	0.00	0.00	0.00	1.42	0.00	2.56	12.11
1884	3.15	13.37	12.36	3.58	0.35	1.39	0.00	0.00	0.00	0.39	1.06	4.64	38.18
1885	1.05	0.00	0.01	2.00	0.06	0.00	0.00	0.00	0.00	0.26	5.52	1.63	9.21
1886	7.72	1.38	2.50	3.29	0.00	0.01	0.24	0.21	0.00	0.01	1.18	0.18	22.31
1887	0.20	9.25	0.24	2.30	0.20	0.04	0.07	0.00	0.15	0.12	0.78	2.67	14.05
1888	6.03	0.77	3.15	0.11	0.02	0.00	0.03	0.08	0.00	0.36	4.01	6.26	13.87
1889	0.25	0.92	6.48	0.27	0.62	0.00	0.00	0.61	0.00	6.96	1.35	15.80	19.28
1890	7.83	1.36	0.66	0.22	0.03	0.02	0.00	0.03	0.06	0.03	0.13	2.32	34.84
1891	0.25	8.56	0.41	1.26	0.31	0.00	0.00	0.00	0.06	0.00	0.00	1.99	13.36
1892	0.88	3.19	3.39	0.22	2.06	0.06	0.00	0.01	0.00	0.33	4.40	4.18	11.85
1893	6.29	2.27	8.52	0.19	0.06	0.03	0.00	0.00	0.00	0.75	0.20	3.65	26.28
1894	0.94	0.49	0.37	0.13	0.20	0.00	0.00	0.01	0.73	0.02	0.00	4.62	6.73
1895	5.84	0.46	3.77	0.46	0.19	0.01	0.00	0.00	0.00	0.24	0.80	0.78	16.11
1896	3.23	0.00	2.97	0.19	0.30	0.00	0.02	0.01	0.00	1.30	1.66	2.12	8.51
1897	3.70	5.62	2.31	0.02	0.10	0.00	0.00	0.00	0.00	2.47	0.01	0.05	16.86
1898	1.26	0.51	0.98	0.03	1.75	0.00	0.07	0.00	0.02	0.09	0.00	0.12	7.06
1899	2.64	0.04	1.81	0.18	0.04	0.58	0.00	0.01	0.00	1.59	0.90	0.90	5.59
1900	1.17	0.00	0.99	0.54	1.81	0.00	0.00	0.00	0.00	0.26	6.53	0.00	7.91
1901	2.49	4.38	0.45	0.68	1.50	0.00	0.00	0.09	0.03	1.88	0.46	0.00	16.29
1902	1.62	3.35	2.98	0.16	0.03	0.00	0.00	0.00	0.00	0.40	2.08	2.50	10.60
1903	2.10	1.52	6.93	3.77	0.00	0.02	0.00	0.00	0.43	0.00	0.00	0.00	19.32
1904	0.14	2.68	4.50	0.97	0.00	0.00	0.00	0.17	0.28	0.69	0.00	2.45	8.72
1905	2.57	6.06	6.00	0.35	0.95	0.00	0.00	0.00	0.00	0.08	2.98	0.20	19.52
1906	3.85	2.47	7.35	0.69	1.02	0.01	0.02	0.03	0.05	0.00	0.85	5.12	18.65
1907	7.02	1.83	4.12	0.16	0.07	0.03	0.00	0.00	0.00	1.19	0.00	0.88	19.30
1908	5.04	3.66	0.18	0.52	0.25	0.00	0.00	0.08	1.22	0.25	1.08	1.46	11.72
1909	7.27	5.20	2.51	0.00	0.00	0.11	0.00	0.00	0.04	0.28	1.51	7.00	19.18
1910	1.53	0.11	1.86	0.30	0.00	0.00	0.04	0.00	0.01	0.82	0.15	0.07	12.63
1911	6.70	2.91	5.15	0.28	0.02	0.03	0.00	0.00	1.23	0.16	0.10	1.27	16.18
1912	0.07	0.00	6.99	1.66	0.12	0.00	0.00	0.00	0.00	0.56	0.35	0.03	11.60
1913	2.01	9.16	0.33	0.35	0.05	0.58	0.00	0.00	0.03	0.00	3.00	1.66	13.42
1914	10.35	7.04	0.58	0.47	0.43	0.09	0.01	0.00	0.00	0.31	0.20	3.73	23.65
1915	5.42	5.09	0.60	0.81	0.88	0.00	0.00	0.00	0.00	0.00	1.35	2.52	17.05
1916	13.30	1.82	0.90	0.00	0.03	0.00	0.00	0.00	0.77	2.71	0.09	3.67	19.92
1917	2.68	4.42	0.18	0.46	0.21	0.00	0.00	0.00	0.00	0.00	0.36	0.07	15.26
1918	0.50	6.14	6.21	0.15	0.40	0.03	0.09	0.03	0.55	0.00	1.85	1.54	13.86
1919	0.96	1.02	2.18	0.17	0.19	0.00	0.00	0.00	1.29	0.56	0.46	1.99	8.58
1920	0.50	2.37	4.25	1.00	0.10	0.00	0.00	0.00	0.04	0.76	1.15	1.01	12.52
1921	3.22	0.86	2.75	0.28	3.57	0.01	0.00	0.00	0.62	0.59	0.05	7.90	13.65
1922	4.64	3.47	1.64	0.10	0.65	0.00	0.00	0.00	0.00	0.24	1.44	3.09	19.66
1923	1.76	0.75	0.32	1.97	0.00	0.02	0.00	0.00	0.55	0.04	0.04	0.80	9.59
1924	0.36	0.03	3.42	1.43	0.00	0.00	0.00	0.00	0.00	0.63	1.14	1.10	6.67
1925	0.20	0.53	1.56	1.90	0.32	0.56	0.00	0.00	0.00	0.74	0.68	2.45	7.94
1926	3.06	2.70	0.22	7.53	0.18	0.00	0.00	0.00	0.00	0.27	3.45	1.15	17.56

LOS ANGELES CIVIC CENTER: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1927	1.09	9.03	2.07	0.70	0.00	0.00	0.00	0.00	0.00	2.04	0.61	3.09	17.76
1928	0.02	1.43	1.99	0.29	0.29	0.01	0.00	0.00	0.00	0.29	1.67	2.70	9.77
1929	1.20	2.15	2.51	1.99	0.00	0.15	0.00	0.00	0.32	0.00	0.00	0.00	12.66
1930	5.57	0.45	3.99	0.15	1.04	0.00	0.00	0.00	0.01	0.10	1.71	0.00	11.52
1931	3.90	3.25	0.00	3.02	0.52	0.02	0.00	0.02	0.24	0.06	1.95	5.95	12.53
1932	2.94	5.33	0.01	0.30	0.02	0.13	0.00	0.00	0.14	0.08	0.00	1.77	16.95
1933	8.46	0.00	0.19	0.56	0.21	0.47	0.00	0.01	0.00	0.34	0.04	8.48	11.88
1934	3.22	2.04	0.01	0.00	0.00	0.41	0.00	0.01	0.13	2.31	2.79	3.75	14.55
1935	2.91	2.23	4.31	3.19	0.03	0.00	0.00	0.11	0.00	0.05	1.24	0.42	21.66
1936	0.51	7.25	1.34	0.95	0.00	0.20	0.01	0.02	0.03	1.25	0.05	6.63	12.07
1937	1.99	7.87	4.04	0.24	0.28	0.00	0.00	0.00	0.00	0.01	0.00	3.54	22.41
1938	1.63	9.81	7.94	0.48	0.02	0.00	0.00	0.00	0.01	0.01	0.00	7.26	23.43
1939	2.96	1.13	1.44	0.24	0.02	0.00	0.00	0.01	5.67	0.13	0.08	0.38	13.07
1940	4.33	5.43	1.55	1.61	0.02	0.00	0.00	0.00	0.01	1.47	0.34	5.50	19.21
1941	2.21	12.42	8.14	2.67	0.00	0.00	0.00	0.04	0.00	1.53	0.05	4.22	32.76
1942	0.59	1.05	1.26	2.44	0.00	0.00	0.00	0.23	0.00	0.58	0.24	1.01	11.18
1943	7.98	3.07	4.55	0.50	0.00	0.01	0.00	0.00	0.00	0.18	0.05	0.23	18.17
1944	0.97	8.65	2.47	0.60	0.02	0.05	0.00	0.00	0.01	0.06	3.72	0.90	19.22
1945	0.04	3.34	3.43	0.08	0.00	0.01	0.00	0.04	0.00	0.56	0.23	5.05	11.59
1946	0.11	1.52	3.66	0.44	0.04	0.00	0.00	0.00	0.02	0.92	6.04	3.47	11.65
1947	0.38	0.86	0.79	0.04	0.12	0.02	0.00	0.01	0.09	0.14	0.06	1.62	12.66
1948	0.00	1.29	3.07	0.78	0.00	0.16	0.00	0.00	0.00	0.09	0.00	2.20	7.22
1949	2.43	1.41	1.40	0.00	0.46	0.00	0.00	0.01	0.01	0.01	2.18	2.72	7.99
1950	2.57	1.67	0.87	0.56	0.00	0.00	0.01	0.00	0.38	0.24	1.05	0.03	10.59
1951	2.80	1.48	0.44	1.54	0.24	0.00	0.00	0.15	0.00	0.59	1.29	5.80	8.21
1952	10.03	0.63	6.14	1.58	0.00	0.00	0.00	0.00	0.13	0.00	3.13	3.31	26.21
1953	1.08	0.33	0.48	0.91	0.03	0.06	0.00	0.00	0.00	0.00	1.11	0.08	9.46
1954	4.60	2.98	2.99	0.13	0.02	0.08	0.00	0.00	0.00	0.00	2.03	0.86	11.99
1955	4.30	0.68	0.56	2.07	1.43	0.01	0.00	0.05	0.00	0.00	1.68	1.11	11.94
1956	8.39	0.59	0.00	3.72	0.46	0.00	0.00	0.00	0.00	0.12	0.00	0.34	16.00
1957	4.41	1.47	1.02	1.47	0.63	0.08	0.00	0.00	0.00	1.51	0.51	2.14	9.54
1958	2.08	6.46	5.30	3.09	0.04	0.00	0.00	0.39	0.07	0.06	0.00	0.00	21.13
1959	1.24	3.32	0.00	0.50	0.00	0.00	0.00	0.00	0.01	0.00	0.07	1.09	5.58
1960	2.94	2.26	0.31	1.45	0.05	0.00	0.00	0.00	0.00	0.01	2.40	0.15	8.18
1961	1.28	0.15	0.57	0.29	0.00	0.00	0.00	0.03	0.05	0.00	2.02	1.44	4.85
1962	2.56	11.57	1.10	0.00	0.02	0.00	0.00	0.00	0.00	0.12	0.00	0.00	18.79
1963	0.52	2.88	2.78	1.94	0.00	0.14	0.00	0.02	1.31	0.57	2.15	0.00	8.38
1964	1.43	0.00	1.79	0.33	0.01	0.32	0.00	0.00	0.00	0.33	1.72	2.05	7.93
1965	0.84	0.23	2.49	6.02	0.00	0.01	0.00	0.01	1.80	0.00	9.68	5.73	13.68
1966	0.96	1.51	0.53	0.00	0.22	0.00	0.00	0.00	0.30	0.06	4.07	5.26	20.44
1967	5.93	0.11	2.50	3.76	0.01	0.00	0.00	0.00	1.02	0.00	8.67	1.66	22.00
1968	0.90	0.49	3.34	0.49	0.00	0.01	0.01	0.11	0.03	0.55	0.37	1.28	16.58
1969	14.94	8.03	1.49	0.63	0.03	0.00	0.03	0.00	0.00	0.00	1.11	0.06	27.47
1970	1.59	2.58	2.36	0.00	0.00	0.04	0.00	0.00	0.00	0.00	5.05	4.92	7.74
1971	0.43	0.67	0.53	0.50	0.22	0.00	0.00	0.00	0.00	0.04	0.30	6.57	12.32
1972	0.00	0.13	0.00	0.03	0.03	0.07	0.00	0.35	0.02	0.29	3.26	2.36	7.17
1973	4.39	7.89	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.12	1.68	0.67	21.26
1974	8.35	0.14	3.78	0.10	0.08	0.00	0.00	0.00	0.00	0.58	0.07	3.59	14.92
1975	0.12	3.54	4.83	1.53	0.09	0.00	0.00	0.00	0.00	0.27	0.00	0.32	14.35
1976	0.00	3.71	1.81	0.84	0.05	0.22	0.00	0.08	2.82	0.24	0.49	0.75	7.21

LOS ANGELES CIVIC CENTER: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1977	2.84	0.17	1.89	0.00	3.03	0.00	0.00	2.26	0.00	0.00	0.08	4.70	12.30
1978	7.70	8.91	8.02	1.77	0.00	0.00	0.00	0.00	0.39	0.05	2.28	1.45	33.44
1979	6.59	3.06	5.85	0.00	0.00	0.00	0.00	0.01	0.00	0.77	0.21	0.51	19.67
1980	7.50	12.75	4.79	0.31	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.85	26.98
1981	2.02	1.48	4.10	0.53	0.00	0.00	0.00	0.00	0.02	0.49	1.80	0.48	8.96
1982	2.17	0.70	3.54	1.39	0.12	0.00	0.00	0.00	0.84	0.19	4.41	1.05	10.71
1983	6.49	4.37	8.37	5.16	0.36	0.01	0.00	0.79	1.99	0.75	2.52	3.23	31.28
1984	0.17	0.00	0.28	0.69	0.00	0.01	0.00	0.40	0.23	0.15	1.44	5.53	10.43
1985	0.71	2.84	1.29	0.00	0.23	0.00	0.00	0.00	0.19	0.42	2.91	0.33	12.82
1986	2.19	6.10	5.27	0.45	0.00	0.00	0.18	0.00	1.97	0.53	0.94	0.37	17.86
1987	1.39	1.22	0.95	0.06	0.00	0.05	0.01	0.00	0.09	2.37	1.13	1.84	7.66
1988	1.65	1.72	0.26	3.41	0.00	0.00	0.00	0.05	0.04	0.00	0.70	3.80	12.48
1989	0.73	1.90	0.81	0.00	0.05	0.00	0.00	0.00	0.35	0.43	0.29	0.00	8.08
1990	1.24	3.12	0.17	0.58	1.17	0.00	0.00	0.02	0.00	0.00	0.19	0.00	7.35
1991	1.69	4.13	5.92	0.03	0.00	0.01	0.13	0.00	0.09	0.37	0.00	3.22	11.99
1992	1.74	7.96	7.12	0.33	0.04	0.00	0.08	0.00	0.00	0.70	0.00	4.68	21.00
1993	11.77	6.61	2.74	0.00	0.02	0.76	0.00	0.00	0.00	0.16	0.66	0.78	27.36
1994	0.33	3.21	1.86	0.83	0.28	0.00	0.00	0.00	0.00	0.19	0.61	1.35	8.11
1995	12.56	1.30	6.98	0.58	0.18	0.60	0.02	0.00	0.00	0.00	0.09	1.34	24.35
1996	3.16	4.94	2.16	0.71	0.04	0.00	0.00	0.00	0.00	1.06	1.59	4.09	12.44
1997	5.58	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	2.06	2.52	12.40
1998	4.12	13.68	4.06	0.97	3.10	0.05	0.00	0.00	0.01	0.00	1.32	0.54	31.01
1999	1.85	0.57	1.26	2.57	0.02	0.98							9.08
2000													
AVE	3.15	3.21	2.67	1.04	0.31	0.07	0.01	0.05	0.24	0.48	1.34	2.43	15.06
MAX	14.94	13.68	12.36	7.53	3.57	1.39	0.24	2.26	5.67	6.96	9.68	15.80	38.18
STDE	3.087	3.273	2.416	1.343	0.632	0.201	0.032	0.23	0.678	0.828	1.733	2.484	6.848

Table 9.

MAXIMUM RAINFALL BY MONTH
LOS ANGELES - DOWNTOWN
(July 1877 - JULY 1999)

January		February		March		April	
Precip.	Year	Precip.	Year	Precip.	Year	Precip.	Year
14.94	1969	13.68	1998	12.36	1884	7.53	1926
13.30	1916	13.37	1884	8.52	1893	6.02	1965
12.56	1995	12.75	1980	8.37	1983	5.16	1983
11.77	1993	12.42	1941	8.14	1941	5.06	1880
10.35	1914	11.57	1962	8.02	1978	3.77	1903
10.03	1952	9.81	1938	7.94	1938	3.76	1967
8.46	1933	9.25	1887	7.35	1906	3.72	1956
8.39	1956	9.16	1913	7.12	1992	3.58	1884
8.35	1974	9.03	1927	6.99	1912	3.41	1988
7.98	1943	8.91	1978	6.98	1995	3.29	1886

May		June		July		August	
Precip.	Year	Precip.	Year	Precip.	Year	Precip.	Year
3.57	1921	1.39	1884	0.24	1886	2.26	1977
3.10	1998	0.98	1999	0.18	1986	0.79	1983
3.03	1977	0.76	1993	0.13	1991	0.61	1889
2.06	1892	0.60	1995	0.09	1918	0.40	1984
2.02	1883	0.58	1913	0.08	1992	0.39	1958
1.81	1900	0.58	1889	0.07	1898	0.35	1972
1.75	1898	0.56	1925	0.07	1887	0.23	1942
1.50	1901	0.47	1933	0.04	1910	0.21	1886
1.43	1955	0.41	1934	0.03	1969	0.17	1904
1.17	1990	0.32	1964	0.03	1888	0.15	1951

September		October		November		December	
Precip.	Year	Precip.	Year	Precip.	Year	Precip.	Year
5.67	1939	6.96	1889	9.68	1965	15.80	1889
2.82	1976	2.71	1916	8.67	1967	8.48	1933
1.99	1983	2.47	1897	6.53	1900	8.40	1880
1.97	1986	2.37	1987	6.04	1946	7.90	1921
1.80	1965	2.31	1934	5.52	1885	7.26	1938
1.31	1963	2.04	1927	5.05	1970	7.00	1909
1.29	1919	1.88	1901	4.41	1982	6.63	1936
1.23	1911	1.59	1899	4.40	1892	6.57	1971
1.22	1908	1.53	1941	4.07	1966	6.53	1879
1.02	1967	1.51	1957	4.01	1888	6.26	1888

Table 10.

TEN WETTEST MONTHS
LOS ANGELES - DOWNTOWN
(July 1877- July 1999)

	Precipitation	Month	Year
1.	15.80	December	1889
2.	14.94	January	1969
3.	13.68	February	1998
4.	13.37	February	1884
5.	13.30	January	1916
6.	12.75	February	1980
7.	12.56	January	1995
8.	12.42	February	1941
9.	12.36	March	1884
10.	11.77	January	1993

Table 11.

MAXIMUM & MINIMUM SEASONAL RAINFALL TOTALS

LOS ANGELES - DOWNTOWN

RAINFALL SEASON : July 1 - June 30

MAXIMUM SEASON RAINFALL	
PRECIP.	YEAR
38.18	1883-84
34.84	1889-90
33.44	1977-78
32.76	1940-41
31.28	1982-83
31.01	1997-98
27.47	1968-69
27.36	1992-93
26.98	1979-80
26.28	1892-93

MINIMUM SEASON RAINFALL	
PRECIP.	YEAR
4.85	1960-61
5.58	1958-59
5.59	1898-99
6.67	1923-24
6.73	1893-94
7.06	1897-98
7.17	1971-72
7.21	1975-76
7.22	1947-48
7.35	1989-90

30-Year Avg: 14.77

LOS ANGELES
International Airport (LAX)
CLIMATE DATA

Notes: Average temperatures and year-to-date rainfall data, which are smoothed, are based on 30-year climate normals.

Complete monthly rainfall tables are based on historic station record, January 1919 - July 1999 inclusive.

Table 12. Los Angeles Airport Daily Climate Data

JANUARY
Los Angeles Int'l Airport (LAX) - Daily Climate Data
Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	65	47	79 1984	38 1972	55 1965	59 1997	0.87 1982	4.29
02	65	47	79 1980	35 1952	55 1977	60 1997	0.44 1993	4.35
03	65	47	82 1953	34 1952	50 1949	57 1994	0.75 1995	4.41
04	65	47	82 1953	**27 1949**	52 1974	56 1986	3.50 1995	4.48
05	65	47	82 1969	32 1949	55 1971	57 1986	1.32 1979	4.55
06	65	47	76 1963	34 1950	50 1955	56 1980	3.23 1993	4.62
07	65	47	86 1962	36 1971	53 1992	56 1993	1.67 1974	4.69
08	65	48	77 1983	35 1982	52 1974	59 1980	1.06 1950	4.76
09	65	48	82 1983	35 1949	51 1949	59 1980	1.70 1998	4.83
10	66	48	84 1953	31 1949	48 1949	59 1980	2.92 1995	4.90
11	66	48	**88 1986**	33 1949	48 1949	57 1981	1.16 1980	4.97
12	66	48	87 1983	34 1949	48 1950	**63 1980**	1.20 1954	5.04
13	66	48	83 1975	30 1963	54 1950	59 1980	0.93 1993	5.12
14	66	48	87 1975	36 1963	48 1950	59 1983	1.51 1978	5.20
15	66	48	86 1976	35 1949	54 1960	57 1970	1.61 1952	5.28
16	66	48	**88 1976**	31 1947	54 1987	57 1970	1.70 1973	5.36
17	66	48	**88 1976**	33 1987	57 1982	58 1976	1.40 1988	5.44
18	66	48	86 1971	35 1947	53 1955	57 1965	1.19 1952	5.52
19	66	48	86 1975	40 1955	49 1949	58 1971	1.70 1969	5.60
20	66	48	85 1976	36 1947	53 1957	57 1999	2.63 1969	5.68
21	66	48	83 1976	37 1966	51 1962	58 1969	0.52 1964	5.76
22	66	48	82 1976	38 1966	51 1962	56 1976	1.94 1983	5.84
23	66	48	86 1953	37 1945	51 1957	55 1997	1.16 1995	5.92
24	66	48	83 1951	35 1947	55 1971	55 1997	1.53 1969	6.00
25	66	48	86 1951	36 1947	54 1949	59 1969	2.77 1956	6.09
26	66	48	83 1988	35 1950	54 1957	56 1997	**4.56 1956**	6.18
27	66	48	83 1986	35 1950	50 1957	57 1984	1.50 1983	6.27
28	66	48	86 1971	32 1948	49 1957	56 1971	1.82 1980	6.36
29	66	48	83 1962	34 1979	**46 1957**	55 1971	0.98 1951	6.45
30	66	49	83 1992	36 1945	49 1975	57 1978	1.17 1979	6.54
31	66	49	86 1954	34 1946	57 1974	57 1980	1.25 1996	6.63

FEBRUARY

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	66	49	79 1954	37 1950	55 1985	58 1963	1.55 1960	6.72
02	66	49	88 1995	39 1956	**49 1979**	55 1996	0.82 1988	6.81
03	66	49	**92 1963**	36 1948	54 1989	57 1958	3.10 1998	6.90
04	66	49	83 1963	36 1948	54 1946	58 1978	0.56 1958	6.99
05	66	49	79 1963	37 1946	53 1989	56 1996	1.42 1978	7.08
06	66	49	84 1987	35 1989	53 1989	58 1978	1.53 1950	7.17
07	66	49	91 1954	37 1948	54 1989	60 1987	2.41 1993	7.26
08	66	49	85 1954	38 1948	52 1989	60 1987	**3.91 1962**	7.35
09	66	49	79 1964	39 1966	54 1989	57 1968	1.66 1963	7.44
10	66	49	83 1988	38 1946	54 1950	59 1970	2.50 1963	7.53
11	66	49	88 1988	37 1999	55 1946	58 1957	0.91 1962	7.62
12	66	49	88 1977	**34 1948**	53 1949	61 1957	1.38 1992	7.71
13	66	49	85 1985	35 1948	53 1949	57 1963	3.28 1954	7.80
14	66	49	85 1985	**34 1949**	54 1990	58 1985	2.66 1986	7.89
15	66	49	84 1977	37 1949	54 1990	59 1980	1.54 1962	7.93
16	66	49	84 1953	39 1990	57 1990	58 1982	1.82 1980	8.07
17	66	49	81 1981	37 1956	54 1990	58 1996	1.88 1990	8.16
18	66	49	82 1981	40 1946	54 1990	60 1980	1.29 1993	8.25
19	66	49	87 1995	38 1955	54 1949	58 1996	3.49 1958	8.34
20	66	49	90 1995	38 1945	57 1979	**63 1981**	1.90 1996	8.43
21	66	50	85 1981	40 1953	56 1969	59 1968	0.78 1996	8.52
22	66	50	83 1989	36 1953	57 1969	58 1958	1.01 1998	8.61
23	66	50	90 1954	42 1975	52 1953	59 1958	1.87 1998	8.70
24	66	50	87 1986	40 1987	56 1977	58 1995	0.48 1998	8.79
25	66	50	84 1989	39 1962	54 1996	57 1986	1.04 1958	8.88
26	65	50	83 1980	38 1964	54 1996	58 1968	2.34 1983	8.97
27	65	50	83 1992	37 1996	54 1962	58 1988	1.59 1991	9.06
28	65	50	84 1967	37 1962	53 1945	58 1995	1.61 1978	9.14
29	65	50	77 1968	40 1948	60 1960	56 1992	0.72 1952	9.14

MARCH

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - January 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	66	50	80 1961	36 1945	54 1951	58 1986	2.55 1983	9.22
02	66	50	80 1994	38 1953	54 1966	58 1986	1.45 1980	9.30
03	65	50	78 1972	41 1953	54 1976	57 1995	0.90 1980	9.38
04	65	50	86 1987	38 1951	**52 1945**	57 1972	2.27 1978	9.46
05	65	50	80 1997	**35 1945**	56 1985	59 1987	1.89 1995	9.54
06	65	50	84 1979	42 1976	57 1999	57 1995	0.53 1962	9.62
07	65	50	87 1955	41 1951	55 1952	58 1993	**3.10 1968**	9.70
08	65	50	83 1996	39 1964	54 1974	57 1978	0.78 1986	9.77
09	65	50	79 1946	38 1952	57 1966	57 1967	0.18 1957	9.84
10	65	50	87 1997	39 1962	54 1975	58 1983	1.67 1995	9.91
11	65	50	88 1959	40 1969	57 1999	58 1982	0.75 1995	9.98
12	65	50	86 1959	41 1952	57 1990	58 1959	0.36 1967	10.05
13	65	50	86 1994	39 1990	55 1969	58 1993	0.59 1979	10.12
14	65	50	86 1951	41 1962	56 1952	59 1994	0.42 1982	10.19
15	65	50	83 1959	40 1977	54 1991	57 1972	2.30 1958	10.26
16	65	50	93 1978	40 1991	55 1952	57 1978	1.89 1986	10.32
17	65	51	91 1978	39 1952	57 1972	63 1978	0.89 1982	10.38
18	65	51	79 1988	41 1963	58 1983	61 1978	0.68 1991	10.44
19	66	51	87 1997	42 1948	54 1948	60 1978	0.76 1981	10.50
20	66	51	87 1988	43 1948	**52 1946**	60 1978	1.04 1992	10.56
21	66	51	83 1986	41 1948	55 1987	59 1996	0.72 1958	10.62
22	66	51	82 1976	41 1952	55 1945	58 1986	0.71 1992	10.68
23	66	51	80 1953	42 1948	55 1964	58 1993	0.52 1983	10.74
24	66	51	88 1988	43 1964	55 1949	58 1993	0.70 1948	10.79
25	66	51	93 1988	42 1949	53 1977	**65 1988**	1.39 1998	10.84
26	66	51	**95 1988**	42 1977	57 1991	63 1988	0.70 1991	10.89
27	66	51	87 1952	40 1945	57 1991	59 1988	1.61 1979	10.94
28	66	51	82 1956	42 1945	55 1962	59 1986	1.13 1963	10.99
29	66	51	85 1950	41 1945	57 1998	60 1978	0.53 1954	11.04
30	66	51	85 1945	43 1998	56 1946	59 1978	0.85 1946	11.08
31	66	51	84 1955	44 1998	56 1975	59 1968	1.03 1965	11.12

APRIL
Los Angeles Int'l Airport (LAX) - Daily Climate Data
Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	66	51	89 1985	**42 1998**	56 1998	60 1960	0.97 1982	11.16
02	66	52	90 1985	43 1999	58 1982	59 1985	0.62 1965	11.20
03	66	52	88 1960	45 1954	57 1965	60 1992	0.78 1965	11.24
04	67	52	99 1989	**42 1945**	54 1976	61 1992	0.22 1978	11.28
05	67	52	101 1989	44 1955	59 1964	64 1989	0.24 1969	11.32
06	67	52	**102 1989**	44 1964	**53 1975**	**70 1989**	0.87 1984	11.35
07	67	52	93 1989	45 1964	58 1999	67 1989	0.36 1958	11.38
08	67	52	88 1989	45 1953	54 1975	61 1989	1.19 1965	11.41
09	67	52	86 1968	43 1945	58 1999	60 1992	0.98 1965	11.44
10	67	52	90 1968	43 1945	59 1965	59 1992	0.70 1952	11.47
11	67	52	87 1958	**42 1945**	56 1999	59 1989	0.74 1998	11.50
12	67	52	90 1947	44 1965	**53 1956**	61 1958	1.11 1956	11.53
13	67	52	90 1947	44 1945	55 1956	59 1990	0.41 1956	11.56
14	67	53	93 1964	46 1965	60 1998	59 1989	0.66 1971	11.58
15	67	53	95 1966	43 1945	60 1998	61 1958	0.69 1978	11.60
16	68	53	85 1948	44 1976	56 1995	60 1958	0.69 1995	11.62
17	68	53	87 1999	44 1976	59 1971	61 1958	0.33 1983	11.64
18	68	53	78 1999	44 1963	57 1967	60 1992	0.65 1983	11.66
19	68	53	83 1986	46 1995	58 1981	61 1992	0.38 1988	11.68
20	68	53	86 1986	47 1972	58 1957	63 1958	0.87 1953	11.70
21	68	53	89 1987	44 1963	58 1945	62 1958	0.90 1955	11.72
22	68	53	90 1987	45 1971	58 1980	61 1997	0.52 1955	11.74
23	68	54	82 1984	47 1971	59 1988	60 1997	0.06 1988	11.76
24	68	54	82 1995	47 1963	61 1964	61 1997	0.09 1983	11.78
25	68	54	80 1992	46 1974	58 1951	62 1992	0.36 1959	11.79
26	68	54	80 1992	44 1994	60 1994	62 1992	0.74 1960	11.80
27	68	54	82 1991	46 1945	59 1953	61 1992	**1.26 1960**	11.81
28	68	54	82 1991	46 1984	61 1973	61 1992	0.70 1983	11.82
29	68	54	94 1996	44 1948	60 1951	62 1992	0.26 1983	11.83
30	68	54	86 1996	47 1967	61 1980	65 1996	0.59 1955	11.84

MAY

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	68	55	86 1996	48 1967	60 1971	62 1993	0.09 1955	11.85
02	68	55	86 1970	49 1991	60 1991	61 1996	0.11 1998	11.86
03	68	55	94 1970	48 1955	62 1978	61 1982	0.06 1998	11.87
04	68	55	88 1953	46 1950	60 1964	60 1992	0.34 1998	11.88
05	68	55	94 1953	46 1964	61 1964	61 1992	0.45 1998	11.89
06	68	55	84 1953	48 1964	**57 1971**	63 1992	0.29 1955	11.90
07	68	55	80 1984	**45 1964**	60 1964	62 1992	0.34 1977	11.91
08	68	55	92 1984	47 1950	62 1977	63 1992	**1.67 1977**	11.92
09	69	55	86 1993	48 1964	60 1977	63 1992	0.28 1977	11.93
10	69	56	79 1996	50 1948	62 1985	63 1992	0.04 1980	11.94
11	69	56	85 1953	49 1980	63 1964	65 1992	0.03 1957	11.95
12	69	56	91 1979	49 1961	60 1998	62 1959	0.66 1998	11.96
13	69	56	**97 1979**	50 1998	62 1998	64 1978	0.58 1998	11.97
14	69	56	87 1967	51 1995	62 1964	63 1996	0.06 1962	11.98
15	69	56	94 1956	49 1955	62 1964	62 1987	0.61 1995	11.98
16	69	56	**97 1956**	50 1955	60 1950	65 1967	0.04 1996	11.98
17	69	56	88 1971	50 1962	61 1950	66 1971	0.12 1949	11.98
18	69	57	87 1955	48 1945	61 1948	63 1997	0.19 1949	11.98
19	69	57	78 1971	48 1948	62 1949	63 1997	0.08 1957	11.98
20	69	57	79 1960	46 1948	62 1980	62 1997	0.04 1975	11.98
21	69	57	75 1988	46 1948	62 1991	63 1997	0.04 1957	11.98
22	69	57	76 1967	49 1948	62 1950	63 1997	0.01 1947	11.98
23	69	57	81 1949	49 1960	61 1977	62 1993	0.07 1977	11.98
24	70	57	80 1949	50 1980	62 1995	63 1997	0.06 1977	11.98
25	70	57	79 1986	49 1980	63 1991	63 1981	0.00	11.98
26	70	57	85 1968	49 1980	62 1982	63 1992	0.00	11.98
27	70	57	83 1968	50 1953	63 1975	63 1997	0.06 1990	11.98
28	70	58	84 1973	50 1946	64 1971	65 1997	0.77 1990	11.98
29	70	58	95 1978	50 1953	65 1998	**67 1997**	0.01 1971	11.98
30	70	58	84 1972	51 1953	64 1947	66 1997	0.00	11.98
31	70	58	76 1997	51 1991	62 1955	66 1997	0.01 1973	11.98

JUNE

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	70	58	77 1996	50 1971	64 1965	65 1997	0.03 1948	11.99
02	70	58	82 1951	50 1967	64 1950	64 1997	0.52 1999	12.00
03	71	58	86 1949	52 1948	65 1991	66 1997	0.02 1963	12.01
04	71	58	86 1957	52 1999	64 1948	65 1997	0.02 1945	12.01
05	71	58	81 1981	51 1948	63 1952	65 1981	**0.74 1993**	12.01
06	71	58	77 1981	51 1948	65 1993	65 1981	0.03 1987	12.01
07	71	59	77 1954	49 1950	64 1989	65 1997	0.06 1972	12.01
08	71	59	77 1979	**48 1950**	65 1991	65 1997	0.03 1964	12.01
09	71	59	91 1979	52 1952	64 1964	65 1990	0.26 1964	12.01
10	71	59	103 1979	52 1954	63 1963	66 1981	0.28 1976	12.01
11	71	59	101 1979	53 1953	63 1967	66 1981	0.19 1963	12.01
12	71	59	87 1979	52 1952	67 1999	64 1979	0.00	12.01
13	72	59	87 1979	53 1952	65 1955	66 1979	0.01 1954	12.01
14	72	59	90 1981	54 1952	63 1988	**72 1981**	0.07 1955	12.01
15	72	59	99 1981	54 1952	65 1988	69 1981	0.24 1995	12.01
16	72	60	**104 1981**	52 1995	**61 1995**	67 1981	0.36 1995	12.01
17	72	60	99 1981	52 1995	64 1988	69 1981	0.01 1982	12.01
18	72	60	100 1957	53 1950	65 1982	67 1981	0.00	12.01
19	72	60	88 1957	55 1948	68 1965	67 1957	0.00	12.01
20	72	60	92 1973	54 1948	67 1964	65 1997	0.00	12.01
21	73	60	90 1973	56 1975	64 1945	65 1957	0.01 1945	12.01
22	73	60	93 1949	56 1964	65 1988	66 1981	0.00	12.01
23	73	60	92 1978	57 1964	66 1964	66 1981	0.00	12.01
24	73	60	99 1976	55 1962	66 1964	69 1976	0.02 1950	12.01
25	73	61	88 1970	54 1950	65 1965	66 1976	0.01 1965	12.01
26	73	61	89 1990	52 1965	66 1964	66 1959	0.00	12.01
27	73	61	93 1976	54 1965	68 1987	69 1994	0.00	12.01
28	73	61	98 1980	54 1950	62 1952	68 1976	0.00	12.01
29	74	61	85 1996	54 1964	67 1967	65 1976	0.00	12.01
30	74	61	90 1996	55 1964	69 1967	65 1994	0.00	12.01

JULY
Los Angeles Int'l Airport (LAX) - Daily Climate Data
Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	74	61	**97 1985**	55 1952	67 1968	68 1959	0.00	0.00
02	74	61	93 1985	55 1947	**66 1945**	70 1985	0.00	0.00
03	74	62	87 1981	56 1952	**66 1945**	69 1959	0.00	0.00
04	74	62	96 1981	54 1948	67 1968	67 1981	0.00	0.00
05	74	62	85 1957	53 1948	68 1968	69 1981	0.00	0.00
06	74	62	88 1957	**52 1948**	68 1968	67 1981	0.00	0.00
07	75	62	85 1992	53 1948	67 1952	68 1992	0.02 1992	0.00
08	75	62	92 1992	53 1996	67 1987	69 1992	0.09 1991	0.00
09	75	62	96 1985	54 1947	69 1978	69 1999	0.00	0.00
10	75	62	**97 1959**	57 1952	69 1987	**73 1959**	0.03 1957	0.00
11	75	62	93 1959	56 1952	69 1970	71 1959	0.14 1969	0.00
12	75	63	93 1990	55 1952	70 1949	71 1990	**0.28 1992**	0.00
13	75	63	89 1953	55 1947	68 1951	72 1990	0.02 1953	0.00
14	75	63	86 1953	58 1952	69 1948	70 1953	0.01 1955	0.00
15	75	63	86 1984	57 1948	68 1948	68 1990	0.00	0.00
16	75	63	87 1954	56 1946	69 1945	70 1984	0.06 1995	0.00
17	76	63	83 1954	56 1947	69 1945	68 1984	0.04 1987	0.00
18	76	63	83 1951	58 1952	68 1952	68 1990	0.00	0.00
19	76	63	84 1951	56 1952	69 1991	69 1954	0.04 1991	0.00
20	76	63	84 1974	58 1952	70 1978	68 1992	0.00	0.00
21	76	63	92 1960	57 1947	67 1980	70 1960	0.00	0.00
22	76	63	85 1960	57 1952	69 1980	69 1984	0.04 1986	0.00
23	76	63	84 1974	57 1947	70 1978	69 1974	0.04 1986	0.00
24	76	63	83 1974	57 1947	69 1997	70 1974	0.01 1954	0.00
25	76	64	85 1959	56 1948	**66 1965**	70 1959	0.00	0.00
26	76	64	86 1996	54 1965	70 1970	70 1959	0.00	0.00
27	76	64	88 1967	57 1965	71 1999	69 1954	0.00	0.00
28	76	64	85 1947	58 1965	70 1991	69 1959	0.04 1968	0.00
29	76	64	89 1995	59 1986	70 1962	68 1995	0.00	0.00
30	76	64	91 1980	56 1948	68 1949	69 1974	0.01 1966	0.00
31	76	64	86 1959	59 1986	70 1986	69 1969	0.02 1991	0.01

AUGUST

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	76	64	89 1980	58 1944	70 1986	70 1969	0.00	0.01
02	76	64	86 1959	56 1944	71 1991	70 1971	0.00	0.01
03	76	64	85 1971	55 1944	70 1950	69 1971	0.04 1954	0.01
04	76	64	84 1971	58 1953	69 1944	70 1971	0.00	0.01
05	76	64	84 1997	56 1950	70 1970	70 1971	0.00	0.01
06	76	64	97 1983	57 1950	69 1970	71 1997	0.12 1983	0.01
07	76	64	89 1983	58 1948	71 1965	**73 1983**	0.04 1983	0.01
08	76	64	88 1947	57 1951	71 1991	69 1983	0.01 1963	0.01
09	76	64	89 1971	**51 1948**	71 1949	72 1971	0.00	0.01
10	76	64	90 1971	56 1948	68 1952	72 1971	0.00	0.01
11	76	64	87 1965	55 1950	68 1953	71 1971	0.21 1961	0.01
12	77	64	94 1991	56 1949	70 1952	72 1965	0.06 1972	0.01
13	77	64	95 1994	58 1995	70 1987	**73 1994**	0.02 1973	0.01
14	77	64	92 1994	57 1950	67 1987	72 1992	0.00	0.01
15	77	64	89 1994	56 1950	71 1953	71 1958	0.29 1984	0.01
16	77	64	85 1994	57 1950	69 1950	72 1983	0.36 1977	0.01
17	77	65	89 1994	57 1949	70 1988	72 1983	**2.10 1977**	0.02
18	77	65	88 1986	58 1950	71 1987	71 1984	1.00 1983	0.03
19	77	65	90 1997	57 1950	69 1988	71 1984	0.00	0.04
20	77	65	86 1994	55 1947	70 1988	70 1984	0.00	0.05
21	77	65	87 1972	58 1947	69 1950	69 1994	0.00	0.06
22	77	65	89 1972	55 1947	72 1989	69 1994	0.00	0.07
23	77	64	90 1968	56 1948	70 1950	72 1959	0.00	0.08
24	77	64	85 1979	55 1948	71 1946	70 1959	0.02 1988	0.09
25	77	64	84 1984	55 1944	70 1986	69 1984	0.00	0.10
26	77	64	94 1985	57 1944	70 1975	71 1981	0.00	0.11
27	77	64	91 1981	57 1953	70 1989	69 1994	0.00	0.12
28	77	64	84 1995	57 1947	68 1989	69 1984	0.04 1951	0.13
29	77	64	90 1996	55 1947	**66 1951**	71 1984	0.02 1951	0.14
30	77	64	97 1996	56 1947	71 1973	71 1984	0.00	0.15
31	77	64	**98 1955**	55 1947	69 1968	71 1996	0.00	0.16

SEPTEMBER

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	77	64	108 1955	58 1951	69 1961	75 1955	0.00	0.17
02	77	64	104 1955	57 1989	68 1950	77 1955	0.01 1967	0.18
03	77	64	92 1982	58 1989	68 1973	75 1998	0.04 1985	0.19
04	77	64	106 1988	58 1947	66 1973	72 1997	0.39 1963	0.20
05	77	64	95 1988	55 1948	68 1947	73 1984	0.36 1978	0.21
06	77	64	94 1984	55 1946	70 1950	72 1984	0.02 1965	0.22
07	77	64	93 1984	56 1956	67 1950	71 1984	0.00	0.23
08	77	64	93 1984	55 1964	68 1948	71 1984	0.14 1982	0.24
09	77	64	96 1984	57 1950	68 1975	77 1984	0.01 1949	0.25
10	77	64	92 1983	56 1948	69 1988	73 1984	1.45 1976	0.26
11	77	64	103 1959	55 1952	68 1969	74 1959	0.04 1976	0.28
12	77	64	94 1963	53 1952	69 1991	74 1959	0.01 1959	0.29
13	77	63	92 1960	54 1949	68 1991	72 1971	0.00	0.30
14	77	63	90 1979	55 1966	66 1953	70 1984	0.00	0.31
15	77	63	101 1979	55 1946	68 1953	71 1971	0.01 1982	0.32
16	77	63	98 1979	57 1954	68 1991	72 1984	0.04 1961	0.33
17	77	63	93 1979	55 1952	66 1947	74 1984	0.48 1963	0.34
18	77	63	92 1946	56 1954	68 1970	74 1984	0.14 1966	0.35
19	76	63	88 1979	53 1947	67 1988	71 1984	0.25 1963	0.36
20	76	63	91 1978	53 1954	68 1988	71 1983	0.07 1988	0.37
21	76	63	93 1978	53 1944	69 1988	70 1983	0.00	0.38
22	76	63	94 1987	51 1944	70 1980	69 1984	0.00	0.39
23	76	63	104 1975	52 1944	64 1955	68 1984	0.08 1987	0.40
24	76	63	105 1978	54 1944	**63 1986**	74 1978	1.44 1986	0.41
25	76	62	105 1978	52 1948	68 1953	74 1978	0.26 1997	0.42
26	76	62	**110 1963**	**47 1948**	68 1980	**78 1963**	0.22 1982	0.43
27	76	62	105 1963	53 1949	67 1952	77 1963	0.00 1997	0.44
28	76	62	104 1963	53 1948	68 1986	74 1963	0.41 1967	0.45
29	76	62	101 1963	52 1948	67 1953	70 1963	0.18 1983	0.46
30	76	62	87 1965	52 1948	66 1952	71 1963	**1.66 1983**	0.47

OCTOBER

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	76	62	95 1965	53 1955	67 1953	69 1963	0.48 1983	0.47
02	76	62	97 1945	52 1944	68 1998	68 1997	0.13 1968	0.47
03	76	61	103 1958	52 1950	65 1955	67 1997	0.02 1946	0.47
04	76	61	103 1987	52 1950	66 1949	71 1987	0.19 1983	0.47
05	76	61	101 1971	54 1946	64 1949	67 1985	0.04 1985	0.47
06	75	61	101 1971	50 1946	67 1980	71 1971	0.16 1945	0.47
07	75	61	96 1951	53 1955	66 1974	68 1972	0.14 1983	0.47
08	75	61	98 1994	51 1946	67 1985	66 1983	0.04 1973	0.47
09	75	60	98 1994	48 1949	66 1954	67 1994	0.01 1985	0.47
10	75	60	95 1991	49 1949	64 1955	66 1994	0.06 1993	0.47
11	75	60	93 1971	52 1960	66 1954	66 1958	0.58 1957	0.47
12	75	60	91 1950	50 1944	66 1955	65 1991	0.00	0.47
13	75	60	97 1950	51 1981	63 1955	66 1950	0.51 1957	0.47
14	75	60	**106 1961**	51 1981	66 1981	66 1961	0.08 1968	0.48
15	75	59	104 1961	52 1981	62 1952	**76 1961**	0.07 1971	0.49
16	74	59	103 1958	50 1971	64 1971	73 1958	0.42 1963	0.50
17	74	59	100 1958	48 1971	62 1955	70 1958	0.21 1984	0.51
18	74	59	89 1967	49 1946	62 1949	65 1976	**1.75 1972**	0.52
19	74	59	93 1981	47 1949	62 1949	64 1961	0.04 1979	0.53
20	74	59	94 1965	45 1949	63 1949	66 1978	0.22 1979	0.54
21	74	58	100 1965	45 1949	65 1961	67 1976	0.28 1985	0.55
22	74	58	101 1965	46 1949	65 1954	70 1965	0.51 1987	0.57
23	74	58	97 1965	47 1949	67 1974	67 1982	1.44 1976	0.59
24	74	58	96 1965	48 1953	65 1969	65 1982	0.14 1958	0.61
25	73	58	92 1983	48 1971	64 1971	66 1959	0.19 1951	0.63
26	73	57	91 1983	49 1975	61 1955	66 1983	0.06 1991	0.65
27	73	57	91 1973	47 1949	62 1971	67 1987	0.14 1946	0.68
28	73	57	88 1973	48 1949	64 1956	66 1983	0.45 1974	0.71
29	73	57	90 1958	45 1971	**60 1971**	65 1983	0.24 1945	0.74
30	73	56	92 1962	**43 1971**	**60 1996**	64 1983	1.45 1996	0.77
31	73	56	91 1949	44 1971	62 1974	64 1983	1.13 1987	0.81

NOVEMBER

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	73	56	**101 1966**	44 1971	64 1995	62 1987	0.38 1983	0.85
02	72	56	96 1997	49 1947	63 1975	63 1997	0.32 1957	0.89
03	72	56	94 1950	42 1946	62 1948	**66 1997**	0.22 1960	0.93
04	72	55	96 1976	43 1946	63 1975	63 1976	0.18 1987	0.98
05	72	55	91 1976	44 1946	60 1975	63 1997	0.66 1960	1.03
06	72	55	89 1956	45 1947	61 1969	62 1983	1.26 1969	1.08
07	72	55	92 1956	45 1945	59 1971	63 1997	2.44 1966	1.13
08	72	54	95 1956	42 1945	60 1966	64 1958	0.19 1994	1.18
09	71	54	95 1956	42 1945	60 1982	64 1956	1.31 1982	1.24
10	71	54	93 1990	42 1946	59 1982	64 1956	0.91 1949	1.30
11	71	54	91 1974	44 1982	57 1978	62 1969	1.11 1946	1.36
12	71	53	94 1974	43 1978	56 1985	63 1969	2.66 1946	1.42
13	71	53	90 1949	43 1985	54 1978	64 1969	1.17 1946	1.48
14	71	53	89 1949	43 1985	59 1953	61 1969	1.27 1972	1.54
15	70	53	87 1949	44 1944	58 1952	61 1959	1.43 1952	1.60
16	70	53	84 1989	39 1964	58 1964	63 1967	1.37 1965	1.66
17	70	52	91 1949	41 1958	**49 1964**	62 1986	1.12 1986	1.72
18	70	52	88 1989	41 1964	58 1994	61 1977	0.28 1973	1.79
19	70	52	90 1989	**38 1964**	59 1946	61 1967	0.82 1967	1.86
20	70	52	90 1954	40 1964	60 1946	61 1989	0.64 1946	1.93
21	69	52	87 1954	42 1964	59 1983	61 1996	**5.60 1967**	2.00
22	69	52	89 1950	42 1983	59 1978	61 1986	2.11 1965	2.07
23	69	51	84 1990	**38 1947**	60 1973	62 1965	1.64 1946	2.14
24	69	51	88 1959	**38 1947**	58 1985	58 1989	1.69 1985	2.21
25	69	51	91 1977	42 1947	56 1988	59 1958	0.96 1961	2.27
26	69	50	87 1956	42 1984	56 1960	60 1976	0.79 1997	2.38
27	68	50	85 1977	40 1948	57 1981	57 1993	1.56 1981	2.39
28	68	50	85 1977	39 1945	57 1981	60 1966	1.79 1970	2.45
29	68	50	85 1977	41 1975	58 1952	59 1977	1.64 1985	2.51
30	68	50	86 1964	40 1945	59 1997	58 1969	0.81 1982	2.57

DECEMBER

Los Angeles Int'l Airport (LAX) - Daily Climate Data

Period of Record: August 1944 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	68	50	88 1959	42 1948	57 1952	**61 1969**	0.50 1952	2.63
02	68	50	86 1959	38 1946	55 1985	58 1969	0.72 1966	2.69
03	67	50	**94 1958**	42 1973	59 1971	59 1969	0.95 1966	2.75
04	67	49	86 1979	39 1948	53 1955	56 1979	1.71 1974	2.81
05	67	49	85 1979	37 1948	55 1947	56 1979	1.49 1966	2.87
06	67	49	85 1979	39 1960	54 1951	57 1984	1.51 1997	2.92
07	67	49	82 1989	37 1978	54 1978	58 1995	1.70 1992	2.97
08	67	48	85 1975	33 1978	53 1978	**61 1988**	0.50 1949	3.02
09	66	48	85 1973	33 1951	52 1972	56 1965	1.37 1996	3.07
10	66	48	87 1958	36 1951	**49 1972**	58 1991	0.79 1996	3.12
11	66	48	84 1958	36 1949	55 1972	60 1958	0.68 1996	3.17
12	66	48	82 1952	35 1949	57 1975	58 1996	0.52 1995	3.22
13	66	48	83 1952	39 1949	**49 1967**	57 1995	0.82 1995	3.27
14	66	48	86 1953	38 1967	51 1967	57 1950	0.38 1993	3.32
15	66	48	79 1980	37 1948	54 1946	60 1958	1.04 1957	3.37
16	66	48	85 1980	40 1971	53 1987	59 1958	0.71 1948	3.42
17	66	48	80 1985	39 1945	53 1955	57 1991	0.34 1977	3.47
18	66	48	82 1985	40 1975	54 1967	57 1969	2.23 1970	3.52
19	65	47	83 1985	35 1946	52 1967	56 1969	1.62 1984	3.57
20	65	47	82 1960	38 1967	51 1968	59 1969	0.70 1952	3.62
21	65	47	79 1954	**32 1968**	51 1990	58 1977	1.62 1945	3.67
22	65	47	78 1960	35 1990	51 1990	57 1977	1.86 1945	3.72
23	65	47	85 1989	35 1990	53 1948	60 1994	0.79 1995	3.77
24	65	47	84 1950	35 1948	53 1987	57 1989	1.59 1971	3.82
25	65	47	83 1947	35 1974	53 1988	60 1977	1.78 1946	3.87
26	65	47	86 1947	34 1987	55 1971	58 1977	1.57 1977	3.93
27	65	47	84 1947	36 1962	50 1971	60 1977	2.25 1971	3.99
28	65	47	82 1963	37 1954	52 1971	60 1977	1.40 1977	4.05
29	65	47	85 1963	37 1954	55 1988	59 1977	**2.84 1951**	4.11
30	65	47	90 1980	37 1982	54 1987	58 1980	1.50 1981	4.17
31	65	47	79 1963	35 1947	50 1988	56 1996	0.14 1988	4.23

Table 13.

LOS ANGELES INT'L AIRPORT: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1919	1.29	0.67	1.70	0.10	0.10	0.00	0.00	0.00	1.45	0.40	0.19	1.88	--------
1920	0.58	1.31	3.21	0.54	0.00	0.00	0.00	0.00	0.00	0.54	1.12	1.10	9.56
1921	3.54	0.76	2.22	0.07	3.92	0.00	0.00	0.00	1.17	0.24	0.15	5.70	13.27
1922	3.63	2.06	1.18	0.06	0.55	0.00	0.00	0.00	0.00	0.12	1.76	2.98	14.74
1923	1.48	1.03	0.31	1.93	0.00	0.19	0.00	0.00	0.00	0.00	0.20	0.60	9.80
1924	0.74	0.03	3.00	1.60	0.00	0.00	0.00	0.00	0.00	0.15	1.33	0.99	6.17
1925	0.46	0.86	1.41	0.98	0.28	0.40	0.00	0.00	0.00	0.63	0.50	1.74	6.86
1926	1.18	1.86	0.53	4.60	0.08	0.00	0.00	0.00	0.00	0.31	2.38	1.42	11.12
1927	0.98	6.85	2.26	0.88	0.00	0.00	0.00	0.00	0.00	1.03	1.47	3.34	15.08
1928	0.08	1.63	2.27	0.10	0.25	0.02	0.00	0.00	0.00	0.38	1.01	2.24	10.19
1929	1.25	1.80	2.16	1.65	0.00	0.06	0.00	0.00	0.30	0.05	0.00	0.00	10.55
1930	4.52	0.55	2.71	0.10	1.37	0.00	0.00	0.00	0.00	0.00	1.85	0.00	9.60
1931	3.21	2.87	0.01	2.78	1.12	0.00	0.00	0.08	0.18	0.14	1.51	5.76	11.84
1932	1.41	5.13	0.03	0.32	0.06	0.13	0.00	0.00	0.01	0.25	0.00	1.79	14.75
1933	6.02	0.00	0.13	0.55	0.23	0.64	0.00	0.01	0.00	0.32	0.05	4.11	9.62
1934	4.35	1.54	0.01	0.00	0.00	0.52	0.00	0.02	0.13	1.29	3.57	2.69	10.91
1935	2.25	1.95	4.55	2.18	0.01	0.00	0.04	0.36	0.01	0.14	1.75	0.40	18.64
1936	0.54	6.54	1.21	0.19	0.00	0.04	0.05	0.00	0.00	2.34	0.30	6.57	11.22
1937	1.70	8.14	3.12	0.42	0.09	0.00	0.00	0.00	0.00	0.00	0.07	3.14	22.73
1938	1.02	6.69	5.98	0.20	0.02	0.02	0.00	0.00	0.02	0.00	0.00	5.16	17.14
1939	2.17	1.72	0.84	0.20	0.08	0.00	0.00	0.00	4.39	0.10	0.09	0.46	10.19
1940	3.66	5.06	0.77	1.41	0.01	0.00	0.00	0.00	0.00	1.74	0.17	5.70	15.95
1941	3.44	7.31	5.96	3.14	0.43	0.00	0.00	0.02	0.00	0.97	0.03	2.61	27.89
1942	0.50	0.84	1.14	2.44	0.00	0.00	0.00	0.00	0.00	0.66	0.26	1.10	8.55
1943	6.12	2.58	2.14	0.75	0.00	0.00	0.00	0.00	0.00	0.26	0.12	6.41	13.61
1944	0.60	6.40	1.74	0.43	0.00	0.00	0.00	0.00	0.00	0.06	3.77	0.54	15.96
1945	0.15	2.74	3.21	0.00	0.00	0.03	0.00	0.00	0.00	0.46	0.18	4.45	10.50
1946	0.25	0.53	3.29	0.65	0.00	0.00	0.00	0.00	0.01	0.80	7.92	2.91	9.81
1947	0.09	0.44	1.02	0.23	0.04	0.00	0.00	0.01	0.03	0.25	0.03	0.98	13.46
1948	0.15	1.00	2.24	0.63	0.00	0.04	0.00	0.00	0.00	0.03	0.00	2.22	5.36
1949	2.30	1.55	1.44	0.01	0.42	0.00	0.00	0.00	0.01	0.00	1.46	2.21	7.97
1950	2.53	2.04	0.47	0.41	0.00	0.02	0.03	0.00	0.11	0.12	0.94	0.01	9.15
1951	2.82	0.84	0.38	1.37	0.02	0.00	0.00	0.06	0.00	0.23	0.71	4.63	6.64
1952	7.23	0.72	4.33	1.21	0.00	0.00	0.00	0.00	0.06	0.00	2.76	2.28	19.12
1953	1.13	0.10	0.44	1.78	0.00	0.00	0.02	0.00	0.00	0.00	1.23	0.06	8.55
1954	4.78	3.36	2.60	0.11	0.02	0.01	0.01	0.04	0.00	0.00	1.24	0.74	12.19
1955	4.12	0.88	0.15	2.20	0.42	0.07	0.01	0.00	0.00	0.00	1.35	0.94	9.87
1956	8.07	0.51	0.00	2.07	0.56	0.00	0.00	0.00	0.00	0.01	0.00	0.49	13.51
1957	3.88	1.94	0.95	1.33	0.27	0.06	0.03	0.00	0.00	1.27	0.46	2.10	8.93
1958	1.49	6.26	5.25	2.04	0.01	0.00	0.00	0.02	0.03	0.32	0.00	0.01	18.91
1959	1.11	3.72	0.00	0.39	0.00	0.00	0.00	0.00	0.04	0.01	0.06	1.11	5.60
1960	2.83	2.90	0.21	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	0.06	9.16
1961	1.27	0.00	0.46	0.02	0.00	0.00	0.01	0.30	0.04	0.00	1.88	1.07	4.48
1962	2.68	11.07	1.11	0.00	0.06	0.00	0.00	0.00	0.00	0.07	0.02	0.01	18.22
1963	0.62	4.48	2.42	1.41	0.02	0.24	0.00	0.01	1.13	0.42	2.76	0.00	9.29
1964	1.49	0.00	1.20	0.20	0.01	0.29	0.00	0.00	0.00	0.30	1.07	1.95	7.51
1965	0.43	0.34	1.63	4.52	0.00	0.03	0.00	0.12	0.11	0.00	6.38	3.25	10.27
1966	0.84	1.40	0.49	0.01	0.02	0.00	0.01	0.00	0.19	0.04	2.69	3.67	12.62
1967	2.71	0.05	1.47	2.68	0.03	0.00	0.00	0.00	0.44	0.00	7.47	1.05	13.54
1968	0.84	0.44	3.77	0.49	0.00	0.00	0.04	0.00	0.00	0.32	0.24	1.42	14.50

LOS ANGELES INT'L AIRPORT: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1969	9.60	3.76	0.42	0.38	0.00	0.00	0.15	0.00	0.01	0.00	1.37	0.01	16.18
1970	1.44	1.39	1.29	0.00	0.00	0.01	0.00	0.00	0.00	0.02	3.68	4.12	5.67
1971	0.66	0.36	0.23	0.68	0.17	0.00	0.00	0.00	0.00	0.28	0.22	5.70	9.92
1972	0.00	0.16	0.00	0.00	0.01	0.06	0.00	0.06	0.03	1.79	3.13	1.88	6.43
1973	3.16	4.87	2.42	0.00	0.01	0.00	0.00	0.02	0.00	0.08	1.92	0.45	17.35
1974	5.68	0.13	2.49	0.14	0.02	0.00	0.00	0.00	0.00	0.54	0.00	3.76	10.93
1975	0.01	3.21	2.98	0.74	0.04	0.00	0.00	0.00	0.00	0.24	0.00	0.10	11.28
1976	0.00	2.15	0.83	0.77	0.00	0.28	0.02	0.03	1.85	1.50	0.87	0.95	4.37
1977	3.21	0.26	1.23	0.00	2.55	0.00	0.00	2.47	0.00	0.00	0.04	3.92	12.47
1978	7.48	7.66	5.75	1.23	0.00	0.00	0.00	0.00	0.39	0.04	1.20	0.83	28.55
1979	5.26	2.53	4.74	0.00	0.00	0.00	0.00	0.00	0.04	0.31	0.22	0.42	14.99
1980	6.97	9.13	3.69	0.17	0.07	0.00	0.00	0.00	0.00	0.00	0.00	1.57	21.02
1981	1.51	1.58	3.24	0.46	0.00	0.00	0.00	0.00	0.05	0.40	2.63	1.52	8.36
1982	2.78	0.66	3.41	1.61	0.11	0.01	0.00	0.00	0.78	0.18	3.48	0.66	13.18
1983	5.25	5.64	6.37	3.18	0.04	0.03	0.00	1.25	1.91	0.94	2.74	2.11	25.61
1984	0.39	0.01	0.14	1.16	0.00	0.00	0.00	0.29	0.09	0.28	1.24	4.21	10.65
1985	0.70	1.91	0.72	0.00	0.16	0.00	0.00	0.00	0.28	0.36	4.75	0.44	9.60
1986	2.31	5.36	4.89	0.30	0.00	0.00	0.09	0.00	1.44	0.10	1.14	0.30	18.69
1987	1.27	0.64	0.92	0.02	0.00	0.09	0.08	0.00	0.08	1.74	0.60	1.79	6.01
1988	1.61	1.79	0.08	1.14	0.00	0.00	0.00	0.02	0.07	0.00	0.73	2.52	8.91
1989	0.59	1.72	0.86	0.00	0.04	0.00	0.00	0.00	0.26	0.34	0.38	0.00	6.55
1990	1.18	2.60	0.14	0.34	0.83	0.00	0.00	0.02	0.00	0.00	0.10	0.03	6.07
1991	1.38	2.53	3.96	0.00	0.00	0.00	0.17	0.00	0.09	0.06	0.00	2.86	8.02
1992	1.61	4.70	5.08	0.18	0.04	0.00	0.32	0.00	0.00	0.50	0.00	4.16	14.79
1993	10.63	5.48	1.83	0.00	0.00	0.74	0.00	0.00	0.00	0.09	0.93	0.97	23.66
1994	0.33	4.36	1.01	0.44	0.08	0.00	0.00	0.00	0.00	0.14	0.66	1.05	8.21
1995	12.71	0.62	5.67	0.74	0.61	0.60	0.06	0.00	0.00	0.01	0.10	2.16	22.80
1996	1.94	4.19	1.36	0.42	0.05	0.00	0.00	0.00	0.00	1.46	1.93	4.74	10.29
1997	5.12	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	2.66	3.93	13.30
1998	3.71	13.79	3.37	1.00	2.46	0.09	0.00	0.00	0.01	0.00	1.89	0.74	31.28
1999	1.17	0.50	2.12	2.23	0.00	0.57							9.23
AVE	2.61	2.71	1.98	0.86	0.22	0.06	0.01	0.07	0.22	0.35	1.32	2.05	12.49
MAX	12.71	13.79	6.37	4.60	3.92	0.74	0.32	2.47	4.39	2.34	7.92	6.57	31.28
STDE	2.580	2.776	1.731	1.030	0.610	0.160	0.046	0.311	0.624	0.504	1.644	1.788	5.719

PASADENA CLIMATE DATA

Notes: Daily climate data based on period of record, December 1927 - July 1999. Average temperatures are smoothed.

Complete monthly rainfall tables are based on historic station record, July 1882 - July 1999, inclusive.

Table 14. Pasadena Civic Center Daily Climate Data

JANUARY
Pasadena Civic Center - Daily Climate Data
Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	66	41	85 1964	32 1952	50 1955	55 1962	6.21 1934	n/a
02	65	42	78 1994	28 1952	52 1944	52 1996	1.12 1931	n/a
03	66	41	84 1969	30 1952	48 1949	55 1997	1.77 1977	n/a
04	66	41	81 1928	**23 1949**	47 1974	53 1969	1.90 1995	n/a
05	66	42	86 1969	25 1949	49 1974	55 1986	2.00 1939	n/a
06	66	42	85 1969	29 1950	47 1955	59 1969	2.82 1959	n/a
07	66	42	88 1962	28 1950	49 1989	56 1962	3.37 1974	n/a
08	66	42	82 1962	29 1937	47 1937	55 1953	2.25 1940	n/a
09	67	43	84 1990	24 1937	45 1930	55 1995	2.41 1980	n/a
10	67	43	85 1953	26 1937	44 1949	55 1990	5.30 1995	n/a
11	67	43	83 1986	28 1937	44 1949	54 1940	1.22 1995	n/a
12	67	43	85 1928	30 1949	44 1930	56 1980	1.42 1952	n/a
13	68	43	85 1973	27 1963	48 1949	55 1957	2.68 1957	n/a
14	68	43	89 1975	27 1932	46 1950	58 1986	1.48 1969	n/a
15	67	43	85 1976	31 1949	43 1932	54 1938	1.93 1978	n/a
16	67	43	85 1976	31 1947	48 1933	53 1980	4.61 1952	n/a
17	68	43	89 1971	30 1949	51 1933	54 1976	2.20 1988	n/a
18	67	43	**93 1971**	30 1928	46 1955	55 1971	4.32 1952	n/a
19	66	43	91 1971	30 1943	45 1949	57 1971	4.73 1933	n/a
20	65	42	85 1975	28 1935	47 1933	54 1977	2.20 1969	n/a
21	66	42	80 1968	25 1937	50 1939	56 1969	2.63 1969	n/a
22	66	43	80 1994	24 1937	**41 1962**	54 1994	**7.08 1943**	n/a
23	67	42	85 1953	**23 1937**	44 1937	51 1981	5.86 1943	n/a
24	67	43	88 1951	28 1937	48 1937	52 1953	2.53 1967	n/a
25	67	43	89 1951	32 1937	48 1933	54 1961	4.62 1969	n/a
26	68	43	88 1971	30 1937	54 1999	55 1969	6.51 1956	n/a
27	68	43	86 1971	30 1950	47 1957	**64 1984**	1.00 1956	n/a
28	67	43	85 1971	29 1957	46 1957	59 1941	1.23 1981	n/a
29	67	43	88 1971	29 1979	45 1933	59 1984	3.94 1980	n/a
30	67	43	86 1971	33 1969	49 1979	63 1984	2.80 1986	n/a
31	67	43	85 1976	32 1946	51 1932	55 1984	2.07 1979	n/a

FEBRUARY

Pasadena Civic Center - Daily Climate Data

Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	67	44	89 1995	32 1950	50 1932	55 1995	2.08 1932	n/a
02	68	44	90 1995	30 1939	49 1979	58 1980	2.34 1945	n/a
03	68	44	89 1995	29 1932	44 1939	57 1980	2.76 1958	n/a
04	68	44	88 1995	32 1979	50 1989	55 1963	2.95 1928	n/a
05	68	44	88 1995	31 1946	50 1976	56 1980	1.35 1935	n/a
06	68	45	87 1963	30 1989	52 1989	54 1978	2.99 1937	n/a
07	68	45	88 1996	31 1929	53 1989	56 1987	2.00 1992	n/a
08	67	45	85 1996	31 1933	52 1939	55 1996	3.20 1993	n/a
09	67	44	87 1951	**26 1929**	51 1929	56 1987	3.05 1978	n/a
10	67	44	88 1971	29 1929	47 1939	54 1996	2.65 1963	n/a
11	68	45	89 1971	33 1929	53 1949	60 1957	4.12 1973	n/a
12	69	44	90 1971	30 1949	53 1949	58 1957	3.21 1992	n/a
13	68	44	87 1971	29 1948	49 1949	58 1957	1.95 1954	n/a
14	68	44	89 1943	27 1990	50 1938	55 1957	3.51 1980	n/a
15	69	44	88 1943	29 1942	55 1941	59 1991	3.53 1980	n/a
16	68	45	89 1977	31 1942	**43 1932**	56 1997	3.39 1980	n/a
17	69	45	90 1930	33 1990	51 1990	55 1996	3.10 1990	n/a
18	69	45	88 1981	33 1990	53 1932	56 1980	1.99 1980	n/a
19	68	44	90 1995	32 1955	50 1969	56 1996	2.94 1958	n/a
20	68	45	**92 1995**	33 1945	46 1944	58 1995	4.36 1941	n/a
21	70	44	91 1995	34 1955	49 1944	55 1968	1.92 1979	n/a
22	70	44	87 1954	36 1955	51 1944	57 1981	4.46 1944	n/a
23	70	46	90 1954	37 1955	45 1953	**63 1963**	2.40 1957	n/a
24	70	45	91 1986	33 1975	53 1977	56 1986	1.66 1969	n/a
25	69	45	89 1986	33 1962	46 1937	57 1986	2.25 1969	n/a
26	69	45	90 1986	34 1937	51 1944	56 1986	0.83 1983	n/a
27	69	44	86 1992	33 1944	49 1945	56 1988	1.72 1938	n/a
28	68	44	87 1967	32 1951	50 1945	54 1992	**4.50 1991**	n/a
29	68	46	83 1936	37 1948	56 1960	54 1992	0.77 1988	n/a

MARCH
Pasadena Civic Center - Daily Climate Data
Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	68	45	88 1967	34 1962	48 1951	57 1936	4.98 1978	n/a
02	67	45	87 1994	33 1953	53 1944	56 1936	**7.70 1938**	n/a
03	67	44	86 1931	34 1952	54 1983	53 1986	2.25 1992	n/a
04	69	44	92 1972	34 1976	**45 1945**	55 1972	4.47 1943	n/a
05	68	45	90 1972	33 1945	52 1928	57 1972	1.64 1995	n/a
06	70	45	86 1993	36 1945	57 1981	54 1986	2.41 1975	n/a
07	70	45	86 1993	36 1945	48 1952	56 1986	3.67 1952	n/a
08	71	46	86 1996	33 1964	53 1974	56 1989	2.90 1968	n/a
09	70	45	91 1997	**31 1935**	54 1951	56 1943	0.59 1986	n/a
10	69	46	93 1997	33 1935	50 1952	57 1984	2.67 1929	n/a
11	69	46	89 1997	33 1935	55 1975	**59 1984**	3.14 1995	n/a
12	69	46	87 1959	34 1952	56 1969	55 1941	1.55 1941	n/a
13	69	46	89 1994	32 1990	53 1944	56 1994	1.30 1967	n/a
14	70	45	88 1994	35 1975	52 1952	58 1993	1.70 1930	n/a
15	71	45	86 1931	34 1942	50 1952	57 1980	2.36 1930	n/a
16	71	46	86 1978	34 1991	52 1952	56 1978	2.63 1986	n/a
17	70	47	88 1978	33 1952	54 1982	58 1976	1.83 1982	n/a
18	71	47	92 1997	33 1963	56 1982	**59 1978**	1.02 1980	n/a
19	71	47	**96 1997**	36 1937	52 1948	57 1997	2.30 1991	n/a
20	73	47	95 1997	33 1935	51 1946	58 1990	1.10 1992	n/a
21	71	47	94 1931	37 1948	50 1945	56 1931	1.40 1992	n/a
22	70	46	90 1931	35 1935	51 1945	56 1990	1.19 1937	n/a
23	70	46	87 1953	32 1929	51 1964	55 1980	1.50 1992	n/a
24	70	46	92 1988	**31 1929**	49 1964	**59 1930**	1.44 1948	n/a
25	70	46	**96 1988**	**31 1929**	51 1977	58 1988	1.17 1950	n/a
26	71	46	**96 1988**	34 1936	54 1939	57 1978	3.54 1993	n/a
27	72	47	92 1988	35 1945	53 1973	58 1988	1.59 1991	n/a
28	71	47	88 1968	37 1945	56 1939	**59 1957**	0.50 1963	n/a
29	71	47	90 1971	37 1998	54 1962	56 1986	2.05 1941	n/a
30	72	47	92 1934	36 1938	51 1946	58 1950	2.50 1946	n/a
31	73	48	95 1966	37 1938	56 1941	**59 1934**	2.16 1936	n/a

APRIL
Pasadena Civic Center - Daily Climate Data
Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year		Record Min/Year		Lowest Max/Year		Highest Min/Year		Record Rain/Year		Rainfall YTD
01	72	47	93	1959	37	1936	52	1998	56	1966	2.43	1958	n/a
02	72	47	92	1985	36	1956	55	1949	60	1960	0.55	1965	n/a
03	73	47	99	1961	40	1964	53	1965	62	1960	1.16	1958	n/a
04	74	48	99	1989	37	1947	53	1965	58	1973	**3.30**	**1929**	n/a
05	75	49	101	1989	38	1936	57	1976	62	1989	0.80	1941	n/a
06	74	49	**105**	**1989**	36	1929	57	1951	60	1996	0.86	1999	n/a
07	74	48	104	1989	35	1975	57	1975	63	1989	1.22	1958	n/a
08	74	48	99	1989	36	1929	56	1975	60	1989	2.69	1935	n/a
09	75	48	94	1989	35	1935	50	1965	57	1987	0.83	1965	n/a
10	74	49	94	1988	36	1945	57	1965	58	1989	1.26	1965	n/a
11	75	49	94	1936	36	1965	56	1967	60	1988	0.91	1967	n/a
12	75	49	95	1940	39	1967	**49**	**1956**	61	1947	1.63	1956	n/a
13	75	49	98	1985	41	1983	56	1956	60	1940	1.06	1956	n/a
14	75	49	95	1964	39	1983	58	1949	58	1985	0.55	1963	n/a
15	76	49	97	1966	39	1995	54	1975	60	1966	0.32	1988	n/a
16	75	49	93	1980	37	1995	62	1976	59	1987	1.16	1995	n/a
17	74	50	94	1999	38	1995	59	1971	60	1999	0.40	1990	n/a
18	73	49	95	1999	35	1933	58	1949	59	1999	2.12	1983	n/a
19	74	49	92	1999	**34**	**1933**	**49**	**1967**	59	1999	0.57	1952	n/a
20	74	49	96	1958	39	1967	59	1967	**64**	**1958**	2.36	1983	n/a
21	75	50	93	1987	35	1932	56	1967	61	1958	0.67	1983	n/a
22	74	49	95	1987	36	1932	59	1967	58	1997	0.93	1955	n/a
23	74	50	93	1996	40	1967	58	1931	61	1997	0.51	1931	n/a
24	73	50	92	1992	41	1988	58	1933	60	1996	0.68	1931	n/a
25	72	50	93	1992	40	1944	53	1951	62	1985	0.87	1951	n/a
26	73	50	93	1996	39	1932	56	1963	60	1992	2.73	1931	n/a
27	73	50	92	1992	39	1955	55	1953	60	1996	1.50	1960	n/a
28	73	51	94	1981	37	1970	57	1944	60	1996	0.43	1953	n/a
29	74	50	96	1996	38	1970	52	1933	61	1987	1.70	1983	n/a
30	74	50	96	1996	37	1933	53	1930	60	1996	1.49	1941	n/a

MAY

Pasadena Civic Center - Daily Climate Data

Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	76	51	94 1996	40 1935	59 1955	60 1996	1.78 1955	n/a
02	76	51	98 1947	43 1983	60 1955	60 1993	0.21 1930	n/a
03	76	51	94 1947	40 1938	58 1930	59 1996	1.19 1930	n/a
04	76	51	95 1928	41 1950	**54 1930**	60 1984	0.50 1930	n/a
05	76	51	101 1990	40 1964	60 1964	61 1987	0.10 1930	n/a
06	75	52	101 1990	41 1933	58 1971	63 1997	0.21 1971	n/a
07	75	51	96 1990	39 1979	63 1977	60 1987	0.45 1955	n/a
08	76	51	97 1984	**37 1930**	60 1977	60 1992	1.50 1977	n/a
09	76	52	97 1940	38 1930	56 1977	60 1987	**1.82 1977**	n/a
10	76	52	101 1934	39 1930	56 1933	61 1993	0.26 1980	n/a
11	76	53	96 1996	38 1933	61 1933	61 1987	0.29 1957	n/a
12	77	52	96 1996	43 1951	60 1935	64 1984	0.84 1998	n/a
13	77	53	98 1979	44 1942	59 1968	65 1984	1.30 1998	n/a
14	76	53	96 1979	44 1968	60 1947	62 1987	0.16 1951	n/a
15	75	53	98 1970	43 1955	58 1938	61 1970	0.22 1957	n/a
16	76	53	100 1967	44 1943	59 1962	63 1956	0.58 1962	n/a
17	77	53	96 1970	44 1977	56 1950	66 1956	0.20 1949	n/a
18	78	53	95 1986	44 1935	60 1946	62 1975	0.24 1949	n/a
19	78	53	95 1942	43 1945	59 1949	60 1978	0.69 1949	n/a
20	78	53	**102 1942**	41 1948	60 1975	61 1993	0.15 1975	n/a
21	77	53	95 1988	41 1948	63 1980	59 1988	0.15 1980	n/a
22	77	53	94 1988	39 1933	61 1937	59 1997	0.05 1937	n/a
23	77	53	95 1949	43 1933	61 1955	62 1988	0.10 1977	n/a
24	76	53	92 1933	46 1960	58 1955	63 1967	0.15 1931	n/a
25	77	53	97 1974	45 1950	61 1956	63 1964	0.72 1931	n/a
26	77	54	95 1974	42 1953	62 1947	62 1982	0.08 1937	n/a
27	76	54	96 1997	44 1953	61 1962	63 1983	0.38 1947	n/a
28	77	54	101 1973	45 1929	56 1953	68 1984	1.45 1990	n/a
29	77	54	101 1984	42 1990	59 1937	**70 1984**	0.04 1988	n/a
30	76	54	97 1997	45 1936	59 1937	65 1997	0.07 1955	n/a
31	76	54	92 1938	45 1930	61 1967	61 1984	0.11 1967	n/a

JUNE
Pasadena Civic Center - Daily Climate Data
Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	77	53	97 1996	44 1933	**58 1965**	61 1993	0.05 1983	n/a
02	78	54	100 1996	44 1967	63 1948	62 1996	0.90 1999	n/a
03	78	55	98 1990	44 1933	61 1932	64 1996	0.08 1932	n/a
04	78	54	99 1957	45 1999	**58 1932**	65 1957	0.17 1932	n/a
05	78	55	98 1930	47 1999	63 1933	63 1981	1.25 1993	n/a
06	77	55	98 1985	46 1934	62 1950	63 1987	0.12 1950	n/a
07	77	55	97 1985	44 1950	64 1968	65 1980	0.29 1972	n/a
08	78	55	97 1990	46 1950	63 1968	66 1980	0.10 1972	n/a
09	79	55	97 1990	47 1988	62 1967	63 1981	0.21 1964	n/a
10	79	55	104 1979	46 1964	60 1971	64 1981	0.18 1957	n/a
11	80	56	105 1979	46 1928	63 1969	70 1979	0.20 1963	n/a
12	80	56	105 1979	47 1932	59 1967	69 1979	0.09 1984	n/a
13	81	56	98 1979	48 1952	60 1954	70 1979	0.12 1997	n/a
14	81	56	98 1933	46 1943	64 1941	64 1979	0.05 1973	n/a
15	81	56	99 1981	46 1932	62 1962	67 1981	0.08 1995	n/a
16	81	56	104 1981	46 1944	60 1995	65 1981	**1.58 1995**	n/a
17	81	55	102 1981	46 1995	65 1975	70 1981	0.22 1995	n/a
18	83	56	102 1957	**43 1979**	61 1982	69 1957	0.11 1982	n/a
19	84	57	104 1929	48 1944	62 1975	64 1997	0.17 1928	n/a
20	84	57	104 1973	47 1944	67 1934	65 1989	0.05 1947	n/a
21	84	57	105 1973	48 1928	62 1945	64 1973	0.08 1945	n/a
22	84	57	103 1973	50 1944	65 1945	68 1949	0.06 1948	n/a
23	85	57	99 1994	49 1975	69 1950	68 1992	0.08 1944	n/a
24	84	58	102 1976	47 1944	65 1945	68 1976	0.02 1984	n/a
25	84	58	101 1990	48 1944	66 1952	67 1984	0.04 1965	n/a
26	85	58	109 1990	47 1934	63 1952	67 1994	0.10 1954	n/a
27	86	58	**110 1990**	50 1965	65 1945	**73 1990**	0.05 1945	n/a
28	85	57	107 1990	49 1932	63 1952	69 1976	0.03 1959	n/a
29	86	57	102 1996	47 1989	69 1955	68 1980	0.07 1968	n/a
30	86	58	101 1985	46 1989	73 1982	67 1986	0.01 1941	n/a

JULY
Pasadena Civic Center - Daily Climate Data
Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	86	58	107 1985	52 1952	**62 1935**	69 1985	0.17 1935	n/a
02	86	58	104 1985	50 1928	69 1935	69 1985	0.04 1980	n/a
03	86	58	103 1985	48 1933	75 1979	70 1985	0.00	n/a
04	87	58	104 1989	51 1948	75 1939	70 1970	0.00	n/a
05	87	59	102 1957	49 1948	73 1939	72 1970	0.04 1986	n/a
06	87	58	96 1992	50 1955	78 1969	71 1980	0.00	n/a
07	88	59	100 1954	50 1948	78 1969	70 1992	0.01 1950	n/a
08	88	59	99 1961	50 1934	75 1944	68 1992	0.21 1991	n/a
09	88	59	101 1959	51 1937	73 1944	70 1992	0.12 1950	n/a
10	89	60	105 1959	**45 1933**	75 1936	74 1959	0.00	n/a
11	89	60	103 1934	52 1935	75 1944	74 1990	0.27 1992	n/a
12	89	60	102 1999	49 1994	73 1992	71 1953	**0.45 1992**	n/a
13	89	60	101 1990	48 1932	77 1962	71 1953	0.01 1992	n/a
14	89	60	101 1930	52 1979	77 1943	70 1984	0.00	n/a
15	89	61	104 1930	53 1956	74 1943	**77 1984**	0.01 1976	n/a
16	89	61	103 1998	50 1979	76 1943	70 1954	0.03 1965	n/a
17	88	61	104 1936	52 1943	74 1987	69 1998	0.15 1987	n/a
18	88	61	102 1998	50 1983	79 1987	71 1936	0.00	n/a
19	89	60	104 1960	47 1983	71 1991	70 1955	0.04 1987	n/a
20	89	61	106 1960	51 1940	75 1972	73 1960	0.00	n/a
21	88	61	101 1988	51 1940	78 1973	70 1974	0.00	n/a
22	88	60	98 1988	52 1935	80 1997	70 1960	0.02 1976	n/a
23	89	61	99 1929	52 1977	80 1948	68 1982	0.07 1986	n/a
24	89	61	98 1959	51 1930	78 1941	70 1974	0.01 1974	n/a
25	89	61	104 1933	52 1948	70 1941	69 1974	0.00	n/a
26	90	62	106 1934	54 1930	75 1936	68 1984	0.02 1941	n/a
27	90	62	**110 1934**	53 1955	77 1941	70 1934	0.00	n/a
28	90	62	106 1972	53 1955	77 1940	70 1972	0.01 1968	n/a
29	90	62	106 1995	53 1979	79 1966	75 1972	0.00	n/a
30	90	62	105 1972	48 1979	78 1950	74 1972	0.04 1965	n/a
31	90	62	103 1972	53 1962	75 1950	73 1972	0.00	n/a

AUGUST
Pasadena Civic Center - Daily Climate Data
Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	90	62	103 1938	53 1932	80 1976	73 1959	0.00	n/a
02	90	62	103 1997	53 1933	78 1976	74 1980	0.00	n/a
03	89	61	103 1997	51 1933	72 1928	71 1971	0.00	n/a
04	89	60	101 1998	53 1976	80 1955	69 1997	0.05 1955	n/a
05	89	60	**107 1997**	51 1979	79 1954	73 1971	0.00	n/a
06	90	61	105 1997	50 1950	81 1996	73 1997	0.01 1990	n/a
07	90	61	103 1983	52 1950	82 1973	69 1997	0.09 1990	n/a
08	90	62	102 1970	50 1948	77 1930	72 1947	0.10 1947	n/a
09	90	62	102 1935	51 1948	76 1949	71 1983	0.00	n/a
10	89	62	101 1998	52 1948	70 1941	75 1998	0.51 1942	n/a
11	89	62	**107 1933**	51 1950	78 1949	71 1994	0.08 1991	n/a
12	89	61	104 1994	50 1949	76 1931	72 1994	0.37 1972	n/a
13	89	62	105 1994	52 1932	74 1931	74 1994	0.09 1958	n/a
14	88	61	102 1994	54 1985	76 1987	76 1992	0.10 1987	n/a
15	87	61	99 1994	51 1932	70 1935	73 1992	0.63 1984	n/a
16	88	61	102 1992	50 1932	74 1976	74 1983	0.07 1941	n/a
17	89	60	102 1992	50 1990	71 1938	72 1992	**2.16 1977**	n/a
18	89	61	102 1992	53 1995	79 1976	73 1945	0.44 1945	n/a
19	89	61	100 1992	**48 1935**	71 1983	71 1986	1.04 1983	n/a
20	89	60	100 1986	51 1989	77 1947	73 1986	0.00	n/a
21	89	60	104 1969	52 1936	77 1947	73 1982	0.00	n/a
22	89	60	104 1969	52 1947	78 1950	71 1982	0.00	n/a
23	90	60	**107 1931**	51 1948	80 1954	72 1959	0.00	n/a
24	90	60	106 1931	53 1978	79 1941	68 1998	0.06 1988	n/a
25	90	60	**107 1985**	51 1943	70 1941	74 1935	0.02 1972	n/a
26	89	60	105 1985	51 1987	73 1941	72 1981	0.04 1935	n/a
27	90	60	**107 1981**	52 1990	70 1932	72 1981	0.03 1935	n/a
28	90	61	102 1995	52 1948	68 1956	73 1981	0.00	n/a
29	90	60	106 1998	50 1983	**62 1951**	73 1998	0.19 1951	n/a
30	89	60	**107 1998**	50 1933	72 1951	75 1998	0.02 1951	n/a
31	89	60	**107 1929**	50 1933	70 1942	**78 1967**	0.00	n/a

SEPTEMBER

Pasadena Civic Center - Daily Climate Data

Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	90	60	108 1955	50 1941	74 1942	78 1955	0.00	n/a
02	89	61	108 1982	50 1942	73 1942	76 1987	0.05 1967	n/a
03	90	61	109 1988	50 1942	73 1936	74 1995	0.02 1936	n/a
04	90	60	**110 1988**	49 1942	72 1985	76 1988	0.41 1963	n/a
05	91	60	108 1955	51 1964	70 1929	**81 1984**	0.25 1978	n/a
06	90	61	108 1955	49 1942	69 1929	75 1984	0.50 1965	n/a
07	89	61	104 1949	51 1942	68 1950	71 1995	0.02 1976	n/a
08	89	60	103 1984	50 1943	73 1933	70 1977	0.01 1982	n/a
09	89	60	106 1979	49 1930	74 1947	73 1984	0.12 1982	n/a
10	88	60	107 1948	47 1933	74 1975	74 1984	1.10 1976	n/a
11	88	60	105 1983	50 1952	71 1933	77 1959	2.16 1976	n/a
12	87	59	109 1971	50 1988	73 1939	76 1959	0.01 1984	n/a
13	87	59	109 1971	47 1933	71 1987	80 1971	0.06 1978	n/a
14	87	59	106 1971	48 1939	70 1944	71 1971	0.00	n/a
15	87	58	103 1979	48 1931	72 1982	70 1979	0.12 1976	n/a
16	87	59	106 1929	46 1933	70 1982	72 1989	0.02 1961	n/a
17	85	59	101 1939	50 1933	67 1965	74 1929	0.78 1950	n/a
18	85	59	105 1939	45 1933	68 1945	71 1984	0.54 1929	n/a
19	85	58	105 1939	49 1941	73 1932	72 1984	0.72 1989	n/a
20	86	58	107 1939	50 1944	71 1945	73 1939	0.07 1988	n/a
21	86	58	106 1939	47 1941	67 1945	74 1939	0.17 1983	n/a
22	87	58	107 1943	49 1948	67 1961	71 1939	0.05 1934	n/a
23	87	58	105 1949	49 1945	**64 1934**	76 1939	0.20 1934	n/a
24	88	59	106 1978	50 1945	69 1934	70 1991	0.77 1986	n/a
25	86	58	108 1963	**44 1934**	69 1986	71 1982	**4.90 1939**	n/a
26	86	58	108 1963	**44 1948**	70 1986	75 1963	1.48 1982	n/a
27	85	58	106 1963	47 1941	71 1986	74 1963	0.04 1982	n/a
28	85	58	107 1963	45 1929	69 1930	72 1963	0.20 1967	n/a
29	85	58	102 1963	46 1929	67 1930	72 1963	0.28 1932	n/a
30	85	57	105 1980	45 1955	66 1983	68 1946	1.61 1983	n/a

OCTOBER
Pasadena Civic Center - Daily Climate Data
Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	84	57	104 1991	45 1930	63 1935	70 1991	0.92 1983	n/a
02	84	57	103 1991	45 1930	68 1936	69 1991	1.50 1986	n/a
03	84	56	104 1987	47 1986	66 1954	68 1987	0.11 1986	n/a
04	85	56	105 1987	46 1939	66 1968	70 1987	0.59 1956	n/a
05	84	57	100 1987	47 1937	64 1949	68 1987	0.24 1983	n/a
06	84	56	102 1971	48 1955	66 1939	69 1960	0.05 1939	n/a
07	84	56	101 1996	47 1938	63 1939	66 1964	0.40 1939	n/a
08	83	55	99 1936	46 1939	68 1974	65 1991	0.05 1974	n/a
09	82	55	104 1991	42 1949	62 1932	66 1991	0.15 1930	n/a
10	83	55	106 1991	43 1931	64 1933	68 1991	0.05 1966	n/a
11	83	55	**108 1991**	46 1944	64 1933	70 1991	0.51 1957	n/a
12	82	54	104 1950	43 1928	54 1928	66 1991	0.37 1941	n/a
13	82	54	106 1950	38 1928	64 1957	69 1950	0.34 1928	n/a
14	81	54	101 1961	39 1928	62 1934	64 1958	0.57 1957	n/a
15	81	54	102 1961	43 1928	65 1955	**72 1961**	0.25 1935	n/a
16	81	54	102 1958	44 1935	63 1936	69 1961	0.55 1963	n/a
17	80	54	101 1958	41 1938	59 1934	66 1958	**3.26 1934**	n/a
18	80	54	100 1940	45 1971	61 1934	68 1958	0.77 1934	n/a
19	81	54	101 1940	42 1949	64 1949	63 1981	0.17 1972	n/a
20	80	53	99 1929	40 1949	61 1941	61 1978	0.91 1979	n/a
21	80	53	100 1929	40 1949	62 1955	63 1976	0.42 1957	n/a
22	81	53	99 1939	44 1949	64 1931	63 1993	0.82 1987	n/a
23	81	53	98 1990	44 1949	63 1941	63 1982	1.44 1976	n/a
24	81	53	99 1968	40 1935	66 1942	64 1982	0.16 1992	n/a
25	80	52	97 1965	43 1971	63 1940	62 1959	0.97 1958	n/a
26	78	52	95 1965	43 1975	64 1940	63 1957	0.62 1940	n/a
27	78	52	95 1973	42 1949	59 1948	63 1983	1.00 1991	n/a
28	78	52	95 1965	41 1989	**54 1942**	63 1987	0.89 1942	n/a
29	77	51	95 1962	38 1971	61 1948	60 1987	0.52 1987	n/a
30	77	51	97 1966	**37 1971**	62 1938	60 1995	1.45 1992	n/a
31	77	50	94 1962	39 1971	62 1974	58 1993	1.12 1987	n/a

NOVEMBER

Pasadena Civic Center - Daily Climate Data

Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year		Record Min/Year		Lowest Max/Year		Highest Min/Year		Record Rain/Year		Rainfall YTD
01	78	51	**97**	**1997**	41	1935	59	1938	**63**	**1990**	0.99	1987	n/a
02	79	50	**97**	**1997**	42	1936	61	1974	61	1953	0.51	1983	n/a
03	79	50	**97**	**1997**	38	1945	59	1948	61	1997	0.62	1960	n/a
04	79	50	96	1949	35	1935	63	1944	60	1997	0.39	1987	n/a
05	77	50	92	1991	35	1935	61	1953	60	1983	0.80	1987	n/a
06	78	50	93	1991	39	1947	60	1969	**63**	**1961**	1.17	1960	n/a
07	76	49	92	1956	38	1938	59	1966	59	1991	3.40	1966	n/a
08	76	49	94	1956	38	1945	53	1966	59	1991	1.29	1984	n/a
09	76	49	94	1956	37	1945	59	1935	57	1987	1.42	1964	n/a
10	75	49	94	1990	40	1947	57	1982	61	1953	2.24	1949	n/a
11	74	49	91	1990	37	1950	53	1946	58	1990	1.60	1954	n/a
12	74	48	92	1990	34	1938	**51**	**1946**	59	1990	2.24	1946	n/a
13	73	48	94	1933	30	1938	54	1950	59	1991	3.56	1946	n/a
14	72	48	93	1949	36	1931	56	1950	59	1967	1.30	1928	n/a
15	72	47	90	1936	36	1930	52	1952	58	1969	1.74	1952	n/a
16	72	47	90	1949	36	1964	57	1964	58	1980	1.67	1965	n/a
17	71	47	93	1949	33	1958	**51**	**1964**	62	1943	2.86	1965	n/a
18	72	46	93	1936	36	1964	58	1994	59	1986	1.26	1986	n/a
19	73	46	89	1989	34	1994	59	1994	58	1950	3.67	1967	n/a
20	73	45	88	1954	35	1994	57	1951	60	1950	2.11	1946	n/a
21	71	45	86	1954	35	1979	56	1955	58	1996	2.22	1967	n/a
22	72	45	90	1950	34	1931	52	1931	58	1950	2.91	1965	n/a
23	74	45	91	1950	**29**	**1931**	54	1931	58	1965	1.89	1965	n/a
24	74	46	92	1933	30	1931	59	1985	55	1995	1.27	1965	n/a
25	73	45	92	1977	35	1931	56	1965	56	1958	1.29	1985	n/a
26	73	46	89	1977	35	1984	52	1931	56	1977	0.83	1960	n/a
27	72	45	89	1946	36	1994	**51**	**1931**	58	1953	1.69	1931	n/a
28	72	45	87	1980	34	1931	53	1933	58	1966	1.71	1981	n/a
29	72	45	87	1953	31	1976	55	1955	57	1977	**5.55**	**1970**	n/a
30	71	45	88	1964	36	1945	56	1955	54	1977	3.10	1982	n/a

DECEMBER

Pasadena Civic Center - Daily Climate Data

Period of Record: December 1927 - July 1999

Day	Average Max	Average Min	Record Max/Year	Record Min/Year	Lowest Max/Year	Highest Min/Year	Record Rain/Year	Rainfall YTD
01	71	45	89 1959	35 1933	54 1955	54 1977	0.44 1973	n/a
02	72	45	89 1958	36 1934	58 1985	53 1966	1.83 1961	n/a
03	70	45	**93 1958**	33 1934	55 1941	57 1966	2.99 1966	n/a
04	70	46	90 1939	33 1948	50 1955	57 1946	2.71 1974	n/a
05	70	45	87 1979	34 1948	52 1947	52 1995	1.98 1997	n/a
06	70	45	90 1938	34 1951	52 1951	**60 1966**	1.50 1966	n/a
07	70	44	89 1940	34 1978	52 1978	53 1987	3.50 1992	n/a
08	69	44	92 1938	28 1978	53 1978	59 1988	0.95 1934	n/a
09	69	44	89 1950	27 1951	50 1932	55 1965	0.73 1931	n/a
10	68	44	**93 1950**	33 1951	48 1972	54 1987	2.68 1941	n/a
11	68	44	88 1958	30 1972	42 1932	59 1937	2.23 1937	n/a
12	67	44	83 1988	27 1949	**41 1932**	58 1934	1.21 1951	n/a
13	68	43	85 1958	31 1931	53 1931	53 1934	3.42 1933	n/a
14	67	43	84 1953	33 1945	42 1931	54 1934	0.84 1934	n/a
15	68	43	85 1942	32 1948	52 1987	57 1950	2.55 1938	n/a
16	68	43	85 1980	33 1935	50 1948	59 1957	2.02 1988	n/a
17	68	43	85 1958	32 1928	52 1955	55 1980	2.35 1940	n/a
18	68	43	84 1939	33 1928	52 1984	55 1962	2.43 1938	n/a
19	67	43	84 1939	34 1948	48 1967	53 1959	2.63 1938	n/a
20	68	43	83 1960	32 1967	51 1970	56 1929	1.82 1952	n/a
21	67	43	83 1972	28 1968	52 1998	54 1977	2.23 1970	n/a
22	67	43	81 1960	**26 1990**	50 1948	56 1944	4.32 1945	n/a
23	67	43	86 1950	**26 1990**	53 1990	56 1945	2.08 1940	n/a
24	67	42	87 1950	28 1990	52 1987	56 1964	2.66 1971	n/a
25	66	43	85 1947	31 1948	49 1941	58 1972	2.57 1983	n/a
26	67	42	85 1980	30 1974	53 1927	54 1977	2.83 1946	n/a
27	65	42	85 1947	33 1988	51 1933	52 1964	2.49 1936	n/a
28	65	43	85 1963	31 1954	51 1971	54 1977	2.95 1977	n/a
29	65	43	86 1980	27 1988	53 1955	53 1977	4.51 1965	n/a
30	66	42	87 1945	31 1936	46 1936	56 1985	1.56 1951	n/a
31	66	42	85 1945	31 1947	53 1936	53 1980	**6.17 1933**	n/a

Table 15.

PASADENA, CA: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1882							0.00	0.00	0.00	0.80	1.70	0.00	--------
1883	0.93	4.45	1.80	0.58	2.36	0.05	0.00	0.00	0.00	1.30	0.00	2.73	12.67
1884	6.10	13.21	12.99	5.93	0.77	1.90	0.00	0.20	0.00	0.25	0.89	3.95	44.93
1885	1.22	0.00	0.05	3.00	0.33	0.11	0.00	0.14	0.00	0.00	7.49	2.05	10.00
1886	7.40	2.32	2.45	4.11	0.15	0.00	0.05	0.26	0.04	0.10	1.15	0.17	26.11
1887	0.19	10.66	0.27	2.33	0.28	0.00	0.17	0.00	0.33	0.12	1.12	4.98	15.50
1888	7.40	1.57	5.62	0.46	0.00	0.00	0.00	0.00	0.00	0.45	5.68	6.71	21.77
1889	0.09	1.08	8.83	0.41	0.95	0.00	0.00	0.62	0.00	9.31	1.45	17.17	24.20
1890	7.92	2.66	0.90	0.60	0.20	0.06	0.00	0.00	0.26	0.07	0.35	3.52	40.89
1891	0.14	10.75	0.68	1.84	0.73	0.00	0.00	0.00	0.09	0.00	0.05	2.25	18.34
1892	1.54	3.40	4.23	0.25	3.94	0.00	0.00	0.00	0.00	0.62	3.72	4.30	15.75
1893	7.65	2.07	9.84	0.47	0.00	0.00	0.70	0.09	0.00	0.80	0.20	4.77	28.67
1894	1.51	0.82	0.96	0.13	0.61	0.00	0.00	0.09	0.85	0.04	0.00	7.24	10.59
1895	8.10	1.44	4.53	0.53	0.25	0.00	0.00	0.00	0.00	0.32	1.30	0.91	23.07
1896	2.96	0.00	3.73	0.50	0.17	0.00	0.05	0.15	0.00	2.04	1.88	2.33	9.89
1897	5.94	5.34	3.57	0.00	0.23	0.00	0.05	0.15	0.23	2.40	0.10	0.26	21.53
1898	1.50	0.69	1.14	0.39	1.98	0.03	0.01	0.00	0.27	0.49	0.52	0.64	8.92
1899	3.18	0.00	2.08	0.12	1.88	0.00	0.00	0.00	0.00	2.02	1.43	1.62	9.19
1900	1.11	0.00	1.55	0.82	2.42	0.00	0.00	0.00	0.05	0.34	9.80	0.00	10.97
1901	3.78	6.80	0.67	1.16	1.62	0.00	0.00	0.00	0.00	2.76	0.73	0.00	24.22
1902	1.63	3.01	3.29	0.38	0.09	0.00	0.00	0.00	0.00	0.53	3.24	3.07	11.89
1903	4.03	0.90	9.70	3.09	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	24.56
1904	0.21	3.89	4.81	0.93	0.01	0.00	0.00	0.53	0.34	0.96	0.00	1.90	10.19
1905	2.63	10.44	8.65	0.18	1.44	0.00	0.00	0.00	0.05	0.17	2.55	0.17	27.07
1906	4.44	2.54	10.83	2.64	1.67	0.00	0.01	0.02	0.00	0.00	0.43	8.96	25.06
1907	10.37	2.75	5.10	0.36	0.05	0.17	0.00	0.00	0.12	0.00	2.09	1.14	28.22
1908	6.42	4.72	1.38	0.64	0.00	0.00	0.00	0.02	1.94	0.26	0.82	1.58	16.51
1909	10.45	6.70	4.99	0.07	0.00	0.20	0.12	0.06	0.08	0.65	2.25	8.66	27.03
1910	2.96	0.31	2.56	0.32	0.00	0.02	0.02	0.00	0.05	0.75	0.28	0.15	17.99
1911	9.82	4.70	7.59	0.71	0.02	0.06	0.00	0.00	1.81	0.11	0.08	0.95	24.15
1912	0.18	0.00	11.83	2.62	0.22	0.00	0.00	0.00	0.00	0.69	0.56	0.30	17.80
1913	3.13	11.20	0.35	0.92	0.13	0.76	0.01	0.06	0.14	0.01	3.20	1.84	18.04
1914	15.07	11.44	0.82	0.92	0.46	0.15	0.04	0.00	0.04	0.70	0.25	4.34	34.12
1915	6.87	5.86	0.87	1.61	1.44	0.00	0.00	0.00	0.00	0.00	2.03	2.99	22.02
1916	16.45	1.96	1.36	0.13	0.10	0.00	0.00	0.00	0.47	3.98	0.29	4.12	25.02
1917	3.09	4.67	0.49	1.08	0.89	0.00	0.00	0.00	0.00	0.00	0.33	0.05	19.08
1918	0.36	8.34	9.43	0.25	1.07	0.00	0.45	0.06	1.20	0.02	2.19	1.83	19.83
1919	1.34	2.53	2.91	0.72	0.36	0.00	0.00	0.00	2.70	0.62	1.22	2.94	13.61
1920	0.51	3.59	6.25	1.37	0.19	0.00	0.00	0.00	0.08	1.02	1.15	1.46	19.39
1921	4.96	1.10	3.72	0.56	5.36	0.00	0.01	0.00	0.25	1.51	0.08	12.46	19.41
1922	6.49	5.21	2.31	0.32	0.91	0.06	0.01	0.00	0.00	0.54	1.82	4.97	29.61
1923	2.15	0.92	0.58	2.52	0.00	0.04	0.00	0.00	0.54	0.63	0.11	0.65	13.55
1924	1.30	0.11	4.74	1.52	0.00	0.00	0.00	0.00	0.00	1.00	1.74	1.84	9.60
1925	0.31	0.97	2.13	3.78	0.70	0.38	0.00	0.00	0.00	0.65	0.92	2.31	12.85
1926	2.59	4.96	0.60	9.96	0.33	0.06	0.03	0.01	0.00	0.09	5.09	2.70	22.38
1927	0.97	11.74	3.03	1.30	0.21	0.00	0.00	0.00	0.00	2.34	0.70	3.38	25.17
1928	0.09	3.35	2.22	0.74	0.53	0.24	0.00	0.00	0.00	0.68	1.93	3.01	13.59
1929	1.53	1.93	2.99	3.62	0.00	0.19	0.00	0.00	0.54	0.02	0.00	0.00	15.88
1930	6.25	0.59	5.85	0.64	2.42	0.02	0.00	0.00	0.00	0.16	2.37	0.00	16.33
1931	4.37	5.47	0.02	3.98	0.87	0.11	0.00	0.10	0.18	0.54	3.22	6.63	17.35
1932	2.36	8.23	0.24	0.55	0.05	0.25	0.00	0.00	0.30	0.10	0.00	1.74	22.35
1933	12.54	0.05	0.21	0.82	0.33	0.32	0.00	0.01	0.01	0.48	0.20	10.34	16.41
1934	6.42	3.18	0.03	0.08	0.00	0.39	0.00	0.01	0.25	4.03	2.29	5.94	21.14
1935	4.39	2.64	3.01	4.37	0.05	0.00	0.17	0.09	0.00	0.31	0.93	0.78	26.98

PASADENA, CA: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1936	0.39	9.84	2.45	0.91	0.00	0.10	0.00	0.00	0.02	2.28	0.06	9.60	15.97
1937	2.97	8.04	5.22	0.33	0.29	0.00	0.00	0.00	0.00	0.00	0.00	4.75	28.81
1938	1.89	11.23	12.61	0.75	0.09	0.06	0.00	0.00	0.01	0.05	0.01	9.95	31.38
1939	4.48	1.33	1.38	0.39	0.24	0.00	0.00	0.00	5.88	0.45	0.15	0.69	17.84
1940	5.76	6.37	1.50	2.12	0.01	0.00	0.00	0.00	0.00	1.96	0.62	7.72	22.93
1941	2.66	16.77	11.43	5.08	0.06	0.02	0.02	0.07	0.00	1.73	0.16	6.42	46.32
1942	0.45	1.12	1.69	3.03	0.02	0.00	0.00	0.51	0.00	1.14	0.41	1.26	14.71
1943	16.43	5.51	6.76	1.23	0.03	0.05	0.00	0.00	0.01	0.40	0.05	7.90	33.33
1944	0.90	10.85	3.72	1.31	0.09	0.30	0.00	0.00	0.03	0.03	5.47	1.18	25.53
1945	0.06	5.09	4.04	0.35	0.00	0.15	0.00	0.50	0.00	0.69	0.24	7.02	16.40
1946	0.24	2.27	5.28	0.65	0.10	0.00	0.00	0.00	0.01	1.51	10.25	6.04	16.99
1947	0.46	0.63	0.96	0.29	0.48	0.06	0.00	0.10	0.16	0.12	0.27	1.81	20.69
1948	0.01	2.08	3.63	2.06	0.02	0.50	0.00	0.00	0.00	0.60	0.00	3.04	10.76
1949	3.52	2.11	1.71	0.08	1.19	0.00	0.00	0.00	0.00	0.07	2.55	4.27	12.25
1950	3.18	2.42	1.29	0.69	0.14	0.12	0.13	0.00	0.82	0.48	1.72	0.03	14.73
1951	3.74	1.32	1.02	2.35	0.19	0.00	0.00	0.21	0.00	0.67	1.93	6.74	11.80
1952	14.96	0.66	8.53	3.13	0.00	0.00	0.00	0.00	0.13	0.00	5.15	4.57	36.83
1953	1.53	0.30	0.99	1.22	0.02	0.07	0.00	0.00	0.00	0.00	1.36	0.34	13.98
1954	6.67	3.17	4.40	0.28	0.07	0.18	0.00	0.00	0.00	0.00	2.16	1.17	16.47
1955	5.75	1.29	1.51	1.63	2.42	0.07	0.00	0.05	0.00	0.00	1.81	1.65	16.00
1956	9.05	1.21	0.00	4.03	0.90	0.00	0.00	0.01	0.00	0.62	0.00	0.31	18.70
1957	6.00	3.12	1.89	2.08	1.43	0.18	0.00	0.00	0.00	1.97	0.69	3.76	15.64
1958	2.56	10.05	5.93	5.62	0.00	0.00	0.00	0.20	0.10	1.02	0.12	0.00	30.58
1959	2.84	5.30	0.00	0.65	0.00	0.03	0.00	0.00	0.00	0.00	0.05	1.63	10.26
1960	3.28	2.25	0.56	1.76	0.04	0.01	0.00	0.00	0.00	0.11	4.07	0.16	9.58
1961	1.51	0.00	0.88	0.45	0.00	0.00	0.00	0.06	0.04	0.00	2.57	2.66	7.18
1962	3.42	13.14	1.69	0.00	0.73	0.03	0.00	0.00	0.00	0.19	0.00	0.05	24.34
1963	0.48	4.84	2.35	1.91	0.00	0.36	0.00	0.00	1.51	0.99	2.44	0.02	10.18
1964	2.70	0.04	2.43	1.56	0.03	0.30	0.00	0.00	0.00	0.47	2.75	1.82	12.02
1965	0.86	0.48	1.47	6.83	0.15	0.09	0.07	0.07	1.24	0.00	13.74	6.75	14.92
1966	0.92	1.42	0.65	0.03	0.25	0.00	0.00	0.00	0.42	0.05	3.76	6.25	25.14
1967	6.59	0.12	3.66	5.04	0.18	0.13	0.00	0.00	0.27	0.00	8.43	1.51	26.20
1968	1.01	0.97	3.33	0.63	0.11	0.07	0.01	0.00	0.00	0.35	0.43	0.91	16.33
1969	16.74	11.30	1.82	0.84	0.14	0.22	0.01	0.00	0.00	0.00	1.41	0.11	32.76
1970	1.77	4.52	3.51	0.05	0.00	0.05	0.00	0.00	0.00	0.03	6.54	5.48	11.43
1971	0.84	1.10	0.78	0.46	0.50	0.05	0.00	0.00	0.00	0.23	0.35	7.05	15.78
1972	0.01	0.05	0.00	0.19	0.02	0.44	0.00	0.39	0.06	0.25	3.53	2.25	8.34
1973	4.09	11.15	4.34	0.03	0.07	0.06	0.00	0.03	0.00	0.26	2.07	0.66	26.22
1974	10.49	0.10	4.61	0.40	0.09	0.01	0.01	0.00	0.00	0.92	0.02	3.99	18.72
1975	0.10	2.62	5.97	1.68	0.15	0.03	0.00	0.00	0.01	0.38	0.11	0.53	15.49
1976	0.00	4.80	2.33	1.15	0.12	0.15	0.03	0.24	3.93	1.44	0.83	0.75	9.58
1977	4.46	0.24	1.96	0.00	3.68	0.01	0.00	2.27	0.00	0.02	0.13	5.85	17.57
1978	9.09	9.37	12.86	3.41	0.09	0.00	0.00	0.00	0.77	0.19	2.19	1.99	43.09
1979	7.74	4.26	8.10	0.02	0.03	0.09	0.00	0.00	0.00	0.92	0.30	0.88	25.38
1980	11.10	19.70	5.62	0.08	0.47	0.00	0.04	0.00	0.00	0.01	0.00	1.00	39.07
1981	3.23	1.42	5.26	0.71	0.03	0.02	0.00	0.00	0.08	0.66	2.49	0.77	11.72
1982	3.54	0.77	6.73	3.00	0.42	0.21	0.00	0.00	1.99	0.45	6.80	1.59	18.67
1983	8.86	6.19	12.60	7.77	0.29	0.08	0.00	1.92	2.18	1.27	2.89	4.42	46.62
1984	0.20	0.00	0.49	0.49	0.00	0.16	0.00	0.64	0.72	0.09	3.14	7.74	14.02
1985	0.96	1.89	1.43	0.00	0.32	0.00	0.00	0.00	0.15	0.75	4.28	0.24	16.93
1986	3.59	5.77	6.91	0.65	0.00	0.00	0.11	0.00	1.98	1.61	1.33	0.48	22.34
1987	2.22	1.91	1.54	0.35	0.08	0.11	0.19	0.10	0.17	3.34	2.50	2.79	11.72
1988	2.61	2.17	0.95	3.19	0.06	0.00	0.00	0.06	0.07	0.00	1.76	4.91	18.07
1989	1.05	2.45	1.19	0.06	0.17	0.06	0.00	0.00	0.96	0.55	0.44	0.00	11.78

PASADENA, CA: COMPLETE MONTHLY RAINFALL

(Seasonal totals are for hydrological year ending on June 30th of year indicated on table.)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SEAS
1990	3.05	4.35	0.34	1.19	1.47	0.00	0.00	0.15	0.08	0.00	0.74	0.09	12.35
1991	2.02	5.30	10.01	0.05	0.04	0.00	0.21	0.08	0.15	1.17	0.05	3.68	18.48
1992	2.78	12.47	9.14	0.32	0.14	0.04	0.82	0.00	0.00	1.67	0.00	6.45	30.23
1993	15.99	9.19	4.11	0.00	0.02	1.25	0.00	0.00	0.00	0.19	1.17	1.35	39.50
1994	0.40	4.25	2.19	0.96	0.39	0.05	0.00	0.00	0.00	0.72	0.63	1.00	10.95
1995	18.46	2.18	9.89	1.50	0.18	1.93	0.01	0.00	0.01	0.00	0.07	1.24	36.49
1996	3.20	8.38	2.97	0.70	0.03	0.00	0.00	0.00	0.00	1.18	2.42	5.86	16.61
1997	6.99	0.25	0.00	0.00	0.00	0.12	0.00	0.00	0.70	0.04	2.84	3.74	16.82
1998	4.07	16.87	4.06	2.06	4.41	0.38	0.00	0.48	0.04	0.00	1.52	0.53	39.17
1999	2.26	1.02	1.48	2.88	0.17	1.18							11.56
2000													
AVE	4.23	4.26	3.67	1.45	0.53	0.13	0.03	0.09	0.33	0.72	1.79	3.09	20.29
MAX	18.46	19.70	12.99	9.96	5.36	1.93	0.82	2.27	5.88	9.31	13.74	17.17	46.62
STDEV	4.235	4.249	3.385	1.747	0.935	0.306	0.112	0.297	0.808	1.141	2.331	3.087	9.03

TABLE 16.

ROSE PARADE
FREQUENTLY ASKED QUESTIONS
ABOUT THE WEATHER

The following are the most frequently asked questions regarding the weather history of the Rose Parade.

Q. When was the last time that it rained on a Rose Parade?
A. Over 44 years ago...on the 1955 parade.

Q. Based on long-term climate records...What are the chances of rain in Pasadena on New Year's Day?
A. One chance in five (20%). But the Rose Parade has been favored by an exceptional streak of dry weather.

Q. How many times has it rained on the parade?
A. Nine times: In 1895, 1899, 1906, 1910, 1916, 1922, 1934, 1937, and 1955.

Q. Has the parade ever been canceled due to a storm?
A. No. But in 1934, a heavy rainstorm dumped 6.21 inches of rain on Pasadena during New Year's Day. The storm caused extensive flooding in the foothills above Pasadena and Glendale.

Q. What are normal temperatures in Pasadena on New Year's Day?
A. The average high temperature is 66 degrees, and the average low is 41 degrees. The record high for January 1st is 85°set in 1964. The record low is 32° set in 1952.

Table 17.

Location: W118° 22', N34° 05'

LOS ANGELES, CALIFORNIA
Rise and Set for the Sun for 2000

Pacific Standard Time

Astronomical Applications Dept.
U. S. Naval Observatory
Washington, DC 20392-5420

	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
Day	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
01	0659	1655	0651	1723	0622	1750	0540	1815	0504	1838	0443	1900	0446	1909	0505	1854	0527	1819	0548	1737	0614	1700	0641	1644
02	0659	1656	0650	1724	0620	1751	0539	1815	0503	1839	0443	1901	0446	1909	0506	1853	0528	1817	0549	1736	0614	1659	0642	1644
03	0659	1656	0650	1725	0619	1752	0538	1816	0502	1839	0442	1901	0447	1909	0507	1852	0529	1816	0550	1734	0615	1658	0643	1644
04	0700	1657	0649	1726	0618	1753	0536	1817	0501	1840	0442	1902	0447	1909	0507	1851	0529	1815	0551	1733	0616	1657	0644	1644
05	0700	1658	0648	1727	0617	1754	0535	1818	0500	1841	0442	1902	0448	1908	0508	1850	0530	1813	0551	1732	0617	1657	0645	1644
06	0700	1659	0647	1728	0615	1754	0534	1818	0459	1842	0442	1903	0448	1908	0509	1849	0531	1812	0552	1730	0618	1656	0646	1644
07	0700	1700	0646	1729	0614	1755	0532	1819	0458	1842	0442	1903	0449	1908	0509	1848	0531	1810	0553	1729	0619	1655	0646	1644
08	0700	1701	0645	1730	0613	1756	0531	1820	0457	1843	0442	1904	0449	1908	0510	1847	0532	1809	0554	1728	0620	1654	0647	1644
09	0700	1701	0645	1731	0611	1757	0530	1821	0456	1844	0442	1904	0450	1907	0511	1846	0533	1808	0554	1726	0621	1653	0648	1644
10	0700	1702	0644	1732	0610	1758	0528	1822	0455	1845	0442	1905	0450	1907	0512	1845	0534	1806	0555	1725	0622	1653	0649	1644
11	0700	1703	0643	1733	0609	1758	0527	1822	0455	1846	0441	1905	0451	1907	0512	1844	0534	1805	0556	1724	0623	1652	0649	1645
12	0700	1704	0642	1734	0607	1759	0526	1823	0454	1846	0441	1906	0452	1906	0513	1843	0535	1804	0557	1722	0624	1651	0650	1645
13	0659	1705	0641	1735	0606	1800	0524	1824	0453	1847	0441	1906	0452	1906	0514	1842	0536	1802	0557	1721	0625	1651	0651	1645
14	0659	1706	0640	1736	0605	1801	0523	1825	0452	1848	0442	1906	0453	1906	0515	1841	0536	1801	0558	1720	0626	1650	0651	1645
15	0659	1707	0639	1737	0603	1802	0522	1825	0452	1849	0442	1907	0453	1905	0515	1840	0537	1759	0559	1719	0627	1649	0652	1646
16	0659	1708	0638	1738	0602	1802	0521	1826	0451	1849	0442	1907	0454	1905	0516	1839	0538	1758	0600	1717	0628	1649	0653	1646
17	0659	1709	0637	1739	0601	1803	0519	1827	0450	1850	0442	1907	0455	1904	0517	1838	0538	1757	0601	1716	0629	1648	0653	1647
18	0658	1710	0636	1740	0559	1804	0518	1828	0450	1851	0442	1908	0455	1904	0517	1836	0539	1755	0601	1715	0629	1648	0654	1647
19	0658	1711	0635	1741	0558	1805	0517	1828	0449	1851	0442	1908	0456	1903	0518	1835	0540	1754	0602	1714	0630	1647	0654	1647
20	0658	1712	0633	1742	0557	1806	0516	1829	0448	1852	0442	1908	0457	1903	0519	1834	0540	1752	0603	1713	0631	1647	0655	1648
21	0657	1713	0632	1742	0555	1806	0515	1830	0448	1853	0443	1908	0457	1902	0520	1833	0541	1751	0604	1712	0632	1647	0655	1648
22	0657	1714	0631	1743	0554	1807	0513	1831	0447	1854	0443	1908	0458	1901	0520	1832	0542	1750	0605	1710	0633	1646	0656	1649
23	0656	1715	0630	1744	0552	1808	0512	1832	0447	1854	0443	1909	0459	1901	0521	1830	0543	1748	0606	1709	0634	1646	0656	1649
24	0656	1716	0629	1745	0551	1809	0511	1832	0446	1855	0443	1909	0459	1900	0522	1829	0543	1747	0606	1708	0635	1645	0657	1650
25	0655	1717	0628	1746	0550	1809	0510	1833	0446	1856	0444	1909	0500	1859	0522	1828	0544	1745	0607	1707	0636	1645	0657	1651
26	0655	1718	0627	1747	0548	1810	0509	1834	0445	1856	0444	1909	0501	1859	0523	1826	0545	1744	0608	1706	0637	1645	0658	1651
27	0654	1718	0625	1748	0547	1811	0508	1835	0445	1857	0444	1909	0502	1858	0524	1825	0545	1743	0609	1705	0638	1645	0658	1652
28	0654	1719	0624	1749	0546	1812	0507	1835	0444	1858	0445	1909	0502	1857	0525	1824	0546	1741	0610	1704	0639	1644	0658	1653
29	0653	1720	0623	1749	0544	1812	0506	1836	0444	1858	0445	1909	0503	1856	0525	1823	0547	1740	0611	1703	0640	1644	0659	1653
30	0652	1721			0543	1813	0505	1837	0444	1859	0445	1909	0504	1856	0526	1821	0548	1738	0612	1702	0640	1644	0659	1654
31	0652	1722			0542	1814			0443	1859			0504	1855	0527	1820			0613	1701			0659	1655

Add one hour for daylight time, if and when in use.

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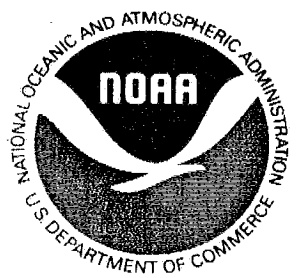

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