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US Army Corps
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Los Angeles District



COAST OF CALIFORNIA
STORM AND TIDAL WAVES STUDY

AD-A167 645

**METEOROLOGICAL
DATA INVENTORY
SOUTHERN CALIFORNIA
COASTAL ZONE**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) THIS REPORT DETAILS THE RESULTS OF A DATA SEARCH ON THE METEROLOGY OF THE COASTAL WATERSHEDS BETWEEN RAGGED POINT SAN LUIS OBISPO COUNTY AND THE UNITED STATES/ MEXICAN BORDER. THIS STUDY IS PART OF THE COAST OF CALIFORNIA STORM AND TIDAL WAVES STUDY CURRENTLY BEING CONDUCTED BY THE US ARMY CORPS OF ENGINEERS. INCLUDED IN THIS REPORT ARE GENERAL METEOROLOGICAL DESCRIPTIONS OF THE DRAINAGE AREAS, FOR THE PURPOSE OF PROVIDING BACKGROUND INFORMATION. DATA OF INTEREST INCLUDE: PERCIPITATION PATTERNS, HISTORICAL HYETOGRAPHS, WIND PATTERNS AND GENERAL WEATHER PATTERNS RESPONSIBLE FOR THE WIND AND PRECIPITATION.		

ALSO OF INTEREST ARE DATA ON PACIFIC STORMS AND STORM PATTERNS.

THE DATA SEARCH WAS DIRECTED TOWARDS IDENTIFYING AND COLLECTING RELEVANT PRECIPITATION AND WIND DATA WITHIN EACH WATERSHED AND LITTORAL CELL IN THE STUDY AREA.

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METEOROLOGICAL DATA INVENTORY
SOUTHERN CALIFORNIA COASTAL ZONE
RAGGED POINT (SAN LUIS OBISPO COUNTY) TO MEXICAN BORDER
Ref. No. CCSTWS 85-7

Coast of California Storm and Tidal Waves Study

U.S. Army Corps of Engineers
Los Angeles District, Planning Division
Coastal Resources Branch
P.O. Box 2711
Los Angeles, California 90053

DECEMBER 1985

APR 18 1986

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prepared by

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1.0 INTRODUCTION

A. Purpose of the Study

This report details the results of a data search on the meteorology of the coastal watersheds between Ragged Point, San Luis Obispo County and the U.S. - Mexican Border. This study is part of the Coast of California Storm and Tidal Waves Study currently being conducted by the U.S. Army Corps of Engineers.

The results of this study can be used to develop detailed plans of study for the three coastal regions within the jurisdiction of the Corps of Engineers, Los Angeles District. These are the South Central Region, which includes San Luis Obispo, Santa Barbara and Ventura counties; the South Coast Region; which includes Los Angeles, San Bernardino, Riverside, and Orange Counties; and the San Diego Region; which includes portions of San Diego, Riverside and Orange Counties. Also included is a study on Pacific ocean storms which affect the entire coast of California.

Included in this report are general meteorological descriptions of the drainage areas, for the purpose of providing background information. These sections are followed by detailed accounts of the sources of meteorological data which are available. Data of interest include precipitation patterns, historical hyetographs, wind patterns and general weather patterns responsible for the wind and precipitation. Also of interest are data on Pacific storms and storm patterns. Included in the discussion are the location of data, data formats available and indications of the quality of the data. Data gaps and limitations are noted, and suggestions are made for reducing these limitations.

This study will allow a serious start towards the development of the necessary data base for the Coast of California Storm and Tidal Wave Study (CCSTWS), since all pertinent data available are identified, and the means recorded for retrieving these data.

B. Scope of the Study

This study was conducted under Contract No. DACW09-85-D-0010, Delivery Order No. 0002, U.S. Army Corps of Engineers, Los Angeles District. The scope includes a meteorological literature survey and data search for the South Central, South Coast and San Diego regions. The literature survey and data search were directed towards:

- (1) Historical precipitation patterns over all watersheds in the study region.
- (2) Precipitation gages in the watersheds.
- (3) Monthly totals of precipitation data, and daily and hourly data for major storms.
- (4) Historical hyetographs of precipitation for major flood events within the study area.
- (5) Historical weather patterns responsible for precipitation patterns.
- (6) Coastline wind patterns responsible for direct erosion and accrual of beach sand.
- (7) Wind gages along the coastline or slightly inland.
- (8) Historical variations in the coastline wind patterns.

The data search was directed towards identifying and collecting relevant precipitation and wind data within each watershed and littoral cell in the study area. An annotated bibliography, submitted separately, is also included in this study.

C. Summary of Findings

Pertinent meteorological conditions and the available data related to these conditions were examined. The following gives a summary of the findings by region.

C.1 San Diego Region

This region has a Mediterranean Dry-Summer climate. Temperatures are strongly influenced by the cool coastal waters, and summers are largely dry, with occasional thunderstorms in the mountains. Most rain falls in the winter months.

This region has more than two hundred present and discontinued rain gages. Many gage records have more than one hundred years of data. The region is well covered in this respect.

Coastal wind data are much more limited, as only one gage has a record of more than fifty years (San Diego Naval Air Station). There are, however, several coastal stations with records on the order of fifteen years, so that recent data are available.

C.2 South Coast Region

This region is characterized by a Mediterranean Dry-Summer climate. Temperatures are influenced by the cool coastal ocean waters, and summers are largely dry, except for rare thunderstorms in the mountain areas. Low clouds and fog, especially in night and early morning hours are prevalent along the coast in spring and early summer. Most rain falls in the winter months.

There are more than 1000 present and discontinued rain gages in this region, and many have more than fifty years of data. This region is extremely well covered in this respect.

Coastal wind data are more sparse, and only one station (Los Angeles Airport) has more than fifty years of data. Several, however, have almost thirty years of data, so the recent period is well covered.

C.3 South Central Region

This region is characterized by a Mediterranean Dry-Summer climate. Summers are dry and temperatures are influenced by the cool coastal waters. North of Point Arguello, prevailing northwest winds are strong; coastal fog and low clouds are common in the spring and summer. Some inland areas (in particular, the Cuyama Badlands) are relatively dry all year; in the rest of the region, winters are usually wet.

There are more than 350 present and discontinued rain gages in the region, many with long reliable records. The region is well covered in this respect.

Unfortunately, there are few long-term coastal wind data in the region of the coastal sand dunes near the San Antonio Creek terminus, and the Pismo Beach area. There are very recent data at Grover City, and relatively long records at Vandenberg Air Force Base, but this is a shortcoming. Coastal wind data are available elsewhere in this region.

2.0 SAN DIEGO REGION

The San Diego Region includes portions of Orange, Riverside and San Diego Counties. The extent of the San Diego Region is defined by the watersheds draining to the Oceanside Cell, which extends from Dana Point to Point La Jolla; the South Oceanside Reach, which includes the short distance between Point La Jolla and False Point; the Mission Bay Cell, which extends from False Point to the Sunset Cliffs; the South Mission Bay Reach, which includes the Sunset Cliffs; and the Silver Strand Cell, which extends from the mouth of San Diego Bay to just south of the mouth of the Tijuana River. Of these areas, the watersheds draining to the Oceanside Cell are the most important from a sediment transport point of view, for reasons which will become apparent in the following discussions. These littoral cells correspond to those defined in the Assessment and Atlas of Shoreline Erosion Along the California Coast (July 1977) and are shown in Figure 2.1, taken from that document. The following sections give general meteorological information regarding the watersheds draining into these regions.

A. Drainage Areas

A.1 Drainage areas and Sub-areas

In the San Diego Region there are seven major river basins and four major drainage groups. The river basins drain to the Tijuana River, the Otay River, the Sweetwater River, the San Diego River, the San Luis Rey River, and the Santa Margarita River. The major drainage groups are the San Diego Group, the San Clemente Canyon Group, the Escondido Creek Group and the Laguna Hills Group. These watershed areas are indicated on Plate 2.1 and their respective surface areas are shown in Table 2.1.

As is seen in Table 2.1, the river basins are extensively controlled, largely by water-supply reservoirs. This is particularly true of the more southern basins, which have from 70% to 90% of their surface areas controlled. The reservoirs have the effect of retaining most sediment which enters, and thus severely limit the quantity of sediment arriving at the coast. For a more complete description, one is referred to the companion report on hydrology.

A.2 Physiography and Topography

The watersheds draining to the San Diego Coast Region are bounded on the east by the Peninsular Ranges and on the north by the southern end of the Santa Ana and San Jacinto Mountains. The Peninsular Ranges run southward and have a complex topography consisting of valleys and canyons with more or less isolated mountains. For a more complete discussion, one is referred to the companion report on hydrology.

A.3 Climate of the San Diego Region

A.3.1 General Features

The climate of the San Diego Region is classified as a Mediterranean Dry-Summer Subtropical type. Along the maritime fringe temperatures are controlled by the sea, with the average winter air temperature about 55°F and an average summer temperature about 68°F. Inland temperatures vary much more, with mean winter temperatures in the 40's in the mountain areas, and summer temperatures in the mid-70's. The average diurnal temperature range in summer is about 16°F on the coast and over 40°F in inland mountain areas, while in winter it is about 12°F on the coast and around 30°F in mountain areas.

An important climatic feature of the region is the formation of low stratus clouds and fog along the coast, especially during night and morning hours. This condition is caused by the cold waters in the coastal region, and is enhanced by the presence of the Catalina Eddy, a low-pressure cyclonic cell which is formed

by the prevailing northwesterly winds past Point Conception. When the eddy is intense, low clouds and fog often develop over the area. Typically, about twenty days per month exhibit low clouds or fog along the coast from April to October, but the year-to-year variations are great in the persistence of this phenomenon. In general, the low clouds and fog are less prevalent in this region than in more northerly areas.

A.3.2 Typical Storm Patterns

The main synoptic feature controlling the weather in the San Diego Region is the North Pacific High, the location and intensity of which affects the tracks of storms associated with low pressure cells. In winter, the Pacific High is often weak and moves south, allowing storms to move in from the west or northwest.

Most rain is associated with winter cold fronts, of which there are two main types: the high-latitude type, in which a blocking high-pressure cell builds east of 160°W and the storms approach from high latitudes, and the low-latitude type, in which blocking takes place between 160°W and 180°W, and storms, often developing in the Hawaiian region, approach from lower latitudes.

A second synoptic feature which affects the weather in this region is the North American High-Level Anticyclone. Occasionally in summer and early fall, masses of moist, tropical air move northward along the western perimeter of this anticyclone, and produce thunderstorms, especially in the mountain areas. The storms associated with this warm, moist air movement are referred to as "Sonoras," and account for about 7% of the rainfall in the region.

Tropical storms in the region are rare, but occasionally tropical storms divert from their usual paths and move through the region, bringing heavy rains. Usually, these storms are in the dissipation stages, because of the cold water near the coast, and their intensities are reduced. The warm, moist air associated with the storms often produces intense thunderstorm activity.

A.3.3 Precipitation Patterns

Precipitation patterns in the San Diego Region are strongly orographic, as can be seen in Figure 2.2, which shows isohyetal contours of mean annual precipitation. In addition to orographic effects, there is a trend towards decreasing rainfall in the south, a result of the fact that fewer winter storms (normally approaching from the northwest) reach the southern part of the region.

Typical precipitation values at selected stations are shown in Table 2.2. From these data, one can see another feature of the precipitation in this region--the wide year-to-year variation in rainfall. Typically, the maximum measured value at a station is twice the annual average, and the minimum value is about 30% of the average. This is due to the fact that rainfall is largely a result of a few storms each season, and a few storms can make the difference between a dry year and a wet year.

A.3.4 Seasonal Precipitation

As was mentioned above, most precipitation in the San Diego Region is associated with winter cold fronts. Typically, 90% of all precipitation in the region occurs during the months of November through April. Table 2.3 shows mean monthly precipitation at selected stations in the region. Note the low values of precipitation in the summer months near the coast, especially in the south. In the high mountain areas, however, there normally is significant precipitation in the late summer and early fall, most of which is due to thunderstorm activity, and very occasionally, tropical storms.

Most precipitation falls as rain in the San Diego Region. Occasionally there are snowfalls in the high mountain areas, but in most of the region, the climate is temperate.

A.3.5 Precipitation Frequency

Precipitation frequency for given intensities and durations is important in this region because of the intermittent nature of precipitation, and the large year-to-year variations. There are two excellent sources of data on this subject. One is the NOAA Precipitation-Frequency Atlas of the Western United States, Volume XI-California. This atlas provides isopluvial contours for 6-hour and 24-hour precipitation with 2-year to 50-year return periods.

The second source is the California Department of Water Resources publication "Rainfall Depth-Duration-Frequency for California", Goodridge (1981^b). This publication contains measured intensities and depth-duration-frequency tables for many stations in California.

In general, the intensities are dependent upon elevation, with the lowest near the coast and highest in the mountain areas. For detailed information, the reader is referred to the above sources.

A.3.6 Coastal Wind Regime

The basic airflow in the San Diego Region is northwesterly, which is due to the eastern North Pacific High. This high is dominant in summer, but usually moves south and weakens in winter. Winter winds are still primarily from the northwest, but are modified by passing fronts and other meteorological disturbances. East and southeast winds are common as cold fronts approach, and often veer south or southwest with the passage of storms.

While the general trend is from the northwest, the flow is influenced by the change in coastline direction at Point Conception. The flow essentially separates at this corner, and produces a large, cyclonic eddy, often centered

around Santa Catalina Island, whence the name "Catalina Eddy." This eddy alters the basic flow, and often produces a westerly or southwesterly flow at the coast (Figure 2.3). When the eddy is intense, low clouds often develop over the coastal area.

This basic pattern of prevailing winds is often modified by various synoptic conditions. These are discussed in the sections which follow.

A.3.7 Land-Sea Breeze

An important factor in the coastal wind patterns of the San Diego Region is the development of a land-sea breeze pattern. The diurnal variation in wind flow is caused by the heating of the land surface during the day, and cooling during the evening. As would be expected, the land breeze is strongest in the winter months, and the sea breeze is strongest in summer.

On the average, the land cooling is sufficiently strong in winter to create a direct offshore flow, countering the general onshore flow of the prevailing winds. In summer, however, the land breeze is weaker, and moves along the coast (Figure 2.4) in the southern part of the region (Demarrais et al, 1965). Wind speeds at night are generally low, on the order of 3 to 5 mph. Daytime sea breezes are often on the order of 10 to 15 mph.

A.3.8 North Pacific Storm Winds

The basic wind pattern is altered by the passage of Pacific storms, most of which arrive in the winter months with active weather fronts. Most fronts are either occlusions or cold fronts, but the occlusions tend to acquire the characteristics of a cold front as they move southwestward over Southern California (DeMarrais et al, 1965). Although there is no single typical flow pattern associated with fronts, there are often strong, and sometime damaging, easterly or southeasterly winds as the fronts approach. This wind can attain 30 mph or more, but this is an infrequent occurrence. With the passage of the front, winds veer toward the southwest.

Storms associated with warm fronts are much rarer, and are usually associated with low-latitude type storms. Winds on the order of 20 to 25 mph are not unusual during the passage of these fronts, and sustained winds can often be much higher.

A.3.9 Santa Ana Winds

Santa Ana Winds are an important factor in this region, especially in fall, when they can produce extreme fire danger. These foehn type winds generally develop a day or two after the passage of a cold front. Although quite rare during summer months, Santa Anas, when they do occur, can produce extraordinarily

hot and dry conditions, with exceedingly high fire danger. In winter, the winds are generally cold, and can extend over 100 miles seaward (Stevenson, 1960). A typical wind pattern is shown in Figure 2.5, where the general offshore pattern is seen in the San Diego Region. Typically, winds are 20 to 30 mph in canyon areas, but severe winds are not unusual, and can attain speeds of over 90 mph.

A.3.10 Winds and Severe Weather

Thunderstorms are rare in the coastal areas, but may occur at any time of the year (DeMarrais et al, 1965). On the average, they occur on one or two days a year in the coastal areas, and 10 to 15 days a year in the mountains. They are generally weak on the coast.

Coastal waterspouts and tornadoes are very infrequent, but have been documented on several occasions. In October 1958, eight waterspouts were sighted off of San Diego (DeMarrais et al, 1965). Goodridge (1979) indicates eight tornado sightings in the region between 1951 and 1978.

Tropical storms are rare, but considerably more frequent than in the more northern regions. In general, the tropical storms which arrive in this region are dissipating, due to the cold water that is usually present off the Southern California coast. This was the case for recent tropical storms Norman (1978), Doreen (1977), and Hyacinth (1972). Tropical storm Kathleen (1976) produced 77 mph winds inland. Goodridge (1979) reports that there is a 10% probability of a tropical storm occurring in southeastern California in any year, while on the coast, the probability is less than 5%.

A.3.11 Topographic Effects on Coastal Winds

Unlike the more northern regions, topography plays a smaller role in coastal wind patterns in the San Diego Region. Aside from the already mentioned Catalina Eddy, produced by the Santa Ynez Mountains and change in coastline direction at Point Conception, there are two main topographic features which affect local winds. One feature is the La Jolla Mesa, which alters the flow near San Diego in a fashion similar to, but not as strongly as, the Palos Verdes Peninsula above Long Beach. The other feature is the Laguna Hills, which rise out of the sea near Dana Point. The rest of the coastal region is relatively flat and has little effect on the prevailing coastal winds (Figure 2.3). The offshore islands of Santa Catalina and San Clemente also alter the local flow, but because of the distance offshore, the effects are not large.

A.3.12 Wind Intensity and Frequency

Tables 2.4, 2.5 and 2.6 summarize the wind intensities and frequencies for the San Diego Region. These data are taken from Goodridge et al. (1979) and Goodridge (1978).

There is only a moderate seasonal variation in mean speed (Table 2.4), but the high winds show a strong seasonal dependence, with over 4.5% of the winds greater than 17 knots in January, a rainy-season month. Winds in general are moderate compared to those north of Point Arguello.

Table 2.5 indicates the wind direction, and the influence of the prevailing northwest winds is seen. However, the frequency of southwest and west winds indicates, in part, the influence of the Catalina Eddy.

B. Historical Perspective

B.1 Historical Outline of Major Wet and Dry Periods

The most comprehensive treatment of the historical rainfall record prior to recorded measurements was done by Lynch (1931). Recent work with tree-ring data by Fritts and Gordon (1980) attempts to extend the record back to 1600. Certain trends may be found in their data, but the uncertainty is large, and caution must be used in the interpretation of their results.

Probably the most interesting feature of Lynch's research is that the Southern California area has experienced many extended drought and wet periods, but that major floods have often occurred during drought periods. Conversely, years of low precipitation have occurred during wet periods.

Figure 2.6 shows the rainfall record at San Diego, along with the accumulated departure from the mean. The record includes Lynch's results for the period 1800 to 1850. One can see that the major wet periods occurred from 1810 to 1825, from 1880 to 1891, and from 1934 to 1945. Major dry periods occurred from 1855 to 1875 and from 1945 to 1975, with several other dry periods. Note the wet years during these dry periods, and the very dry years in wet periods. Although difficult to judge, the past seven years appear to be a wet period.

The extreme variability should also be noted, as there is little in the way of a year-to-year correlation. Extremely dry years can be followed by extremely wet years, and vice versa. This is an important characteristic of the region.

B.2 Historical Outline of Major Storms in the San Diego Region

There is no definitive history of storms in this region, and early accounts are qualitative in nature. The following is a brief outline of some important storms.

B.2.1 Rain Storms

Kuhn and Shepard (1981) document accounts of storms in the last century, including the series of storms in 1862 which produced disastrous floods. Another series occurred in 1884, beginning around February 14, when 13 inches of rain fell in two weeks near Oceanside. An intense thunderstorm dropped 7.5 inches of rain in eight hours at Encinitas on October 12, 1889. In this century, severe flooding was caused by two storms of January 14-19 and 24-29, 1916. These and other major storms are listed in Table 2.7.

The storms of December 27, 1940 to January 7, 1941 brought heavy rains; but the 1943 season, with much less total rainfall, resulted in floods in the San Diego Region, a result of one of the most severe storms on record, that of

January 21-24, 1943.

More recently, severe storms of the 1969, 1978, and 1980 seasons have been well documented (Waananen, 1969; Arvola, et al. 1979; Wahl et al. 1980). One recent storm of interest (because of the high intensities of rainfall) is that of March 8, 1968 (San Diego County, 1968).

B.2.2 Wind Storms

Wind storms get much less attention in this region, since they seldom cause much economic damage. Often, wind storms are associated with large rain storms, such as the January 21-24, 1943 storm. DeMarrais et al. (1965) mention gale force winds that caused damage all along the coast in May 1959 and April 1962.

As previously mentioned, coastal tornadoes and waterspouts have been sighted in April 1926 and October 1958 in the San Diego Region. Santa Ana winds are often severe, but are generally only documented when there are disastrous fires, such as the November 1961 Santa Ana, which mildly affected the San Diego Region, but contributed to the Bel-Air fire in Los Angeles (Sergius, 1962).

C. Data Search and Retrieval Efforts

C.1 Technical Approach

Data were collected from a number of governmental and public organizations. Previous reports and documents on similar topics were located and examined as part of the literature search. These documents often contained or referred to data, whose original sources were noted. Government and public agencies were then contacted, and in many cases visited.

The following is a general description of data sources relevant to the South Coast Region.

San Diego County Air Pollution Control District

Relevant data include:

Wind data at four coastal sites (on hardcopy) includes hourly wind speed, wind direction, wind vector.

People contacted include:

Virginia Engler (Senior Meteorologist) (619) 565-3945
Clayton White (Senior Technician)

San Diego County Flood Control District

Relevant data include:

Precipitation data, with hourly and charts available in hardcopy.

Streamflow data--daily and selected hydrographs on hardcopy.

Storm reports are available for selected recent storms.

No sediment, debris or fire records are kept.

People contacted include:

Carey Stevenson (Hydrology) (619) 565-5821

Orange County Environmental Management Agency

The data sources at this agency include:

Precipitation data with both hourly (tabulated) and charts from recording gages;

Streamflow data, with both daily (tabulated) and charts from recording gages;

Debris data are limited, but a new program on the San Diego Creek is starting;

Sediment data are collected in conjunction with the USGS.

In a new program just starting, the agency will collect its own data. The sediment data are on a computer data base.

The most recent publication covers the 1982-1983 season.

People contacted include:

Emmett Franklin (streamflow, precipitation)
(714) 634-7473

Bob Collicott (sediment, water quality) (714) 634-7463

Tom Rossmiller, Bruce Moore (sediment, water quality)

Dale Dillon (debris, channel cleanouts) (714) 634-7424

Riverside County Flood Control and Water Conservation District

Relevant data at this agency include:

Precipitation data, with both hourly (tabulated) and charts from recording gages available. In addition, most data are on a computer data base and are available in printouts and electronic form.

Debris and sedimentation data are limited, since the county has few debris basins.

The most recent publication covers the 1979-81 seasons.

People contacted include:

Kathy Carter (Hydrology) (714) 787-1264

Tom Clem (Hydrology) (714) 787-1264

Eric Geibersen (Dams, debris basins) (714) 787-2015

California Department of Water Resources

Data from this agency include:

Streamflow, with data available in the Water Data Information System (WDIS). Data are available on microfiche (least expensive) and electronic form.

Precipitation, also available on WDIS.

Wind data are available in limited form, as it is gathered only in conjunction with particular contracts.

People contacted include:

Bill Mork, State Climatologist (916) 445-5800

California Air Resources Board

Data available from this agency include limited wind data, although the agency now maintains few stations relevant to this study. Occasional measurements are made in conjunction with particular projects. Some data are received from Air Pollution Control Districts, but are more readily available from these agencies.

People contacted include:

Dale Secord, John Kinney and Art Lorenzen (Sacramento)

Bob Cross (El Monte)

Southern California Edison Company

This organization maintains wind monitoring equipment at the San Onofre Nuclear Generating Station, as well as at the Oxnard, Ventura, El Segundo, Los Alamitos and Huntington Beach coastal power plants. Except at San Onofre N.G.S., data are of questionable value.

People contacted include:

Stan Marsh (Meteorologist) (818) 302-1189

Other individuals contacted include:

Robert de Violini, Climatologist, Pacific Missile Range, Pt. Mugu; (805) 989-8383

Don Tuttle, Humboldt County Public Works, Natural Resources Division (Coastal Storm History); (707) 445-7741

Gerald Kuhn, Scripps Institution of Oceanography, (Coastal History); (619) 452-4856

Prof. Gary Griggs, University of California, Santa Cruz (Coastal Storm History); (408) 429-2403

There are several reference libraries in the South Coast Region which are extremely helpful. These include:

University of California Los Angeles, Water Resources Archives, Beth Willard, Librarian (213) 825-7734

This reference library has an extensive collection of publications, manuscripts and material relevant to this study. There is a large collection of uncataloged documents from local agencies as well. In addition, material not available at the UCLA Water Resources Archives can usually be obtained from the University of California, Berkeley through UCLA. Sources are well cataloged and easy to find.

California Department of Water Resources, Southern Division, Los Angeles

The records and documents section combine an extensive collection of California State publications. In addition, there is a large collection of relevant documents and publications from local and federal agencies, including the County Flood Control Agencies. Sources are well cataloged and easy to find.

California Institute of Technology Libraries

Extensive collection of relevant journals and some federal and state publications. The best sources are the Environmental Engineering Library, Keck Laboratory, and the Engineering Library (Millikin Libraries). Unfortunately, the collections are spread out over several buildings, and a certain amount of searching is often required.

University of California, Los Angeles, Engineering Library and Geology Library

These two libraries have extensive collections of relevant journals. The Engineering Library has vast holdings of Weather Bureau/Weather Service publications. The geology library has all relevant U.S. Geological Survey Water-Supply Papers and Water Resource Data (as do the Water Resources Archives, where they cannot be checked out) and other U.S.G.S. publications. Both are excellent sources for reference material.

National Weather Service, Wilshire Federal Building

The reference room (normally closed to the public) has an extensive, uncataloged collection of relevant publications, including out-of-print publications and unpublished documents. Wind data are also available.

U.S. Army Corps of Engineers, Los Angeles District, Library

This library has most Corps of Engineers publications, including Beach Erosion Board and CERC publications. Some publications from local and state agencies are also available, as are some U.S.G.S. Water-Supply Papers and Water-Resources Data. References are often miscataloged and difficult to find.

Southern California Metropolitan Water District

The reference library has (in theory) all MWD publications, although relevant ones often seem to be missing. In addition, there is a good collection of California Department of Water Resources publications.

C.2 Meteorological Data Available

Tables 2.8 and 2.9 list some significant rainfall and wind gages in this region. More detailed and complete lists appear in Appendix A. Tables 2.8 and 2.9 are provided as a quick reference.

C.2.1 Precipitation

There are approximately 200 present and discontinued precipitation gages in the San Diego Region. Of these, most are maintained cooperatively with the National Weather Service and the San Diego County Flood Control District. Table 2.8 lists some stations with very long records. The following is a description of the data sources.

C.2.1.a San Diego County Flood Control District

A list of gages maintained by this agency is included in Appendix A. The agency maintains records of daily precipitation for all stations in tabular form. In addition, charts and digitized tape from recording gages are kept and can be used for the development of storm hyetographs. Data can be obtained by specifying the stations and period of record.

C.2.1.b Riverside County Flood Control and Water Conservation District

About ten gages which are of interest in the San Diego Region are maintained by this agency; all are in the upper Santa Margarita River basin. Data are available in tabular form, although most data, including all recent data, are being presently entered on a computer data system. Charts are available, and storm intensity data are maintained and are being entered into the computer data system. Relevant gages are listed in Appendix A.

C.2.1.c Orange County Environmental Management Agency

This agency keeps nine gages in the Laguna Hills Group (San Juan Creek basin). Data are available in tabular form, and charts from recording gages are maintained. Relevant gages are listed in the Appendix, along with examples of data.

C.2.1.d California Department of Water Resources

This agency maintains few stations, but now keeps records of over 4000 stations in California. Goodridge (1981a) has compiled microfiche files for these stations, and these data are being submitted under a separate cover. In addition, updates for 1981 through 1983 provided by William Mork are also being submitted under a separate cover.

These data include monthly precipitation for the period of record, among with useful calculated values (average, departure from the average, cumulative departure, etc.). A second record includes monthly frequency data, with return periods from 0.01 to 10,000 years.

In addition, Goodridge (1980, 1981b) has published in microfiche form measured maximum daily rainfall for over 1100 gages and depth-duration-frequency data from 689 recording and 853 non-recording gages. The former publication includes maximum daily rainfall by month. The latter includes measured intensities from 5 minutes to 60 days by month and year, and includes a frequency analysis.

The above microfiche files are extremely useful for examining rapidly the data characteristics of a particular gage. The latter two publications concentrate on older stations, and are helpful in finding long term records.

The California Department of Water Resources has also published a list of precipitation gages (Bulletin 230-81). Relevant portions of this document are reproduced in Appendix A. Note that these lists often contain errors; it is best to use the list to locate stations in an area of interest, then to find the stations through the agency lists provided in Appendix A.

C.2.1.e National Weather Service

Hourly precipitation for National Weather Service recording gages is now available on microfiche and magnetic tape for data from 1940 to the present. In addition, fifteen-minute recordings from 1971 to the present are available on magnetic tape. The hourly data, as well as daily, monthly and annual data, are available from the National Climatic Data Center. The complete list of data available is lengthy, and will not be repeated here. For reference, see the Selective Guide to Climatic Data Sources, Hatch, (1983).

C.2.2 Wind Measurements Along the Coast

There are relatively few wind gages with records that would be of use to this study. These are listed in Table 2.9. The following is a discussion of the data available.

C.2.2.a National Climatic Data Center

The records of the latter five stations in Table 2.9 are available on microform, and as indicated, on magnetic tape. Exact details of the data available in addition to hourly wind data can be found in the Index of Original Surface Weather Reports, National Climatic Data Center.

The most complete station in Table 2.9 is that of San Diego Naval Air Station, which has data from 1922 to the present; these data are digitized starting in 1946.

C.2.2.b San Diego County Air Pollution Control District

The first three stations in Table 2.9 are supported by the San Diego County APCD. These data extend back to 1972, and are available from this agency in hardcopy only. Data include wind speed, wind direction and wind vector averaged over one hour periods. The data are verified.

C.2.2.c Other Sources of Wind Data

Southern California Edison Company has maintained a meteorological station at San Onofre since the mid-sixties. Wind speed and direction in hourly averages, as well as the original charts, are available. The data at this station are verified and are better than those at other power plants because of nuclear power plant regulations. Data are available through Stan Marsh (meteorologist) at the Southern California Edison Company.

C.2.3 Other Relevant Data Sources

Summaries of wind data are available in the Department of Water Resources Bulletin 185, and in Goodridge (1979). In addition, climatic summaries available through the National Climatic Data Center (ref. Selective Guide to Climatic Data Sources). Additional data summaries are available in Climatological Study, Southern California Operating Area, Naval Weather Service Command (1971) available on microfiche (NTIS # AD-721-117).

C.2.4 Related Topics

Precipitation hyetographs are generally not available, except those done for specific studies. However, charts or digitized tapes from recording gages are almost always available and can be used to develop hyetographs. The digital tapes have the advantage of allowing computer processing; however, they generally record only to the nearest 0.1 inch.

Historical data for wind are extremely limited in this region, but the problem is not as serious as it is for the northern regions of Southern California, where aeolian transport of sand is a significant factor.

D. Data Gaps and Limitations

There are a number of precipitation gages in this region with extremely long records, but many have records of less than forty years, so that there may not be good coverage with long records. For the most part, the data are adequate.

Many of data available are obtainable through the California Department of Water Resources in both microfiche and digital form. These data include monthly values, intensities, and commonly needed statistical values.

Charts or digitized tapes are almost always available, but developing hyetographs can be a tedious task with charts. Digitized tape on the other hand has a limited accuracy (usually 0.1 inch).

Long-term coastal wind data are not available, as the oldest records (at San Diego) go back only sixty years, and the others are generally much more recent. This is not particularly critical in this region, as wind transport of sand is generally not a significant factor.

As is true in other regions, there is no definitive rain and wind storm history for the region. While there are accounts of some very major storms, especially those resulting in flooding, there is no single source from which can be found an account, with meteorological descriptions, of significant storms in this region. An effort should be made (using newspapers and other sources) to document significant storms (rain, wind and Santa Ana conditions) over as long a period as is possible, and to use available weather maps and other data to compile a storm history of the region. The results could be used in the development of statistics on fire frequencies, the identification of significant features of important storms, and could aid in the development of statistics on coastal wind storms as well as rain storms.

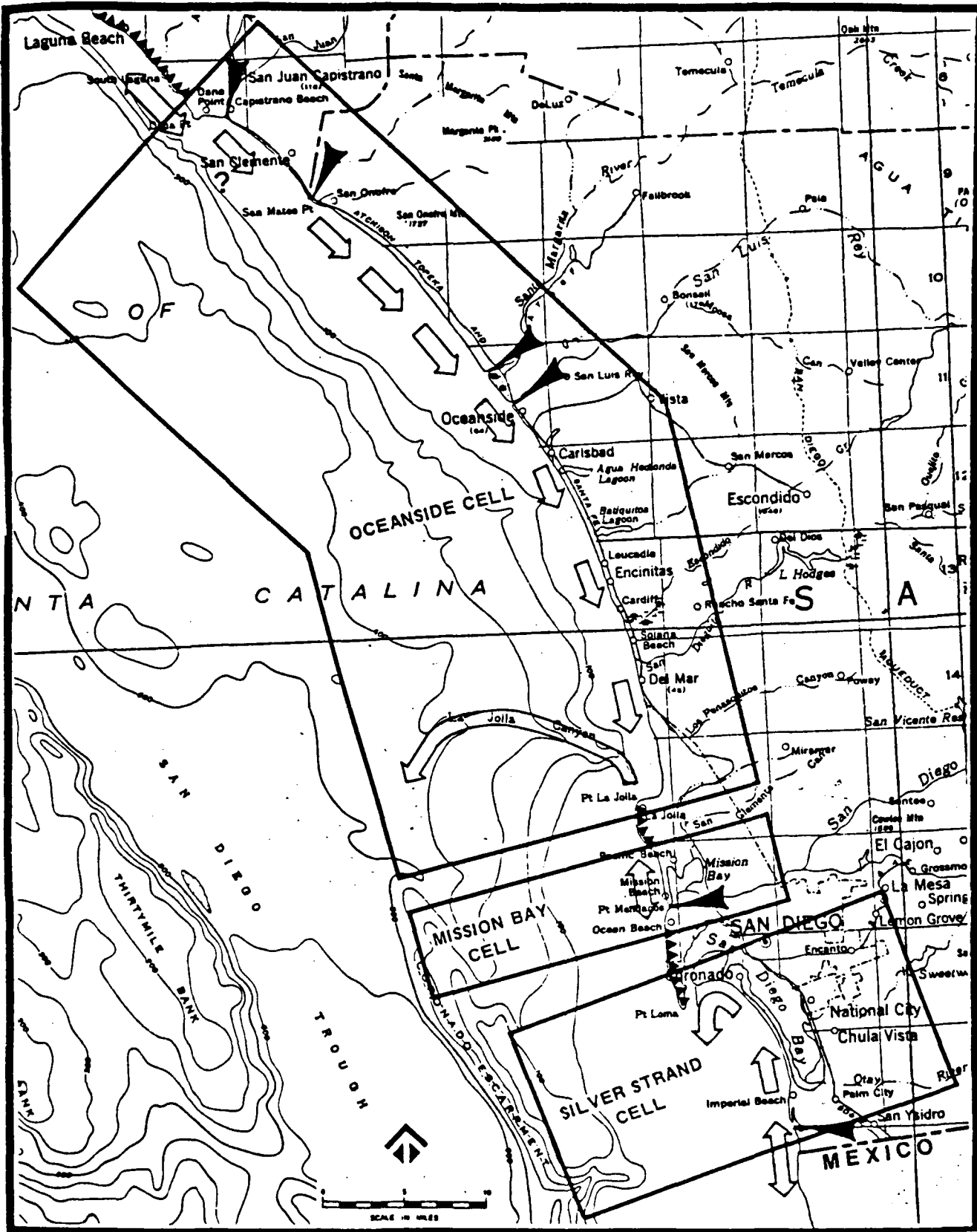


Figure 2.1 San Diego Region

Source: Calif. DNOB Atlas of Shoreline Erosion

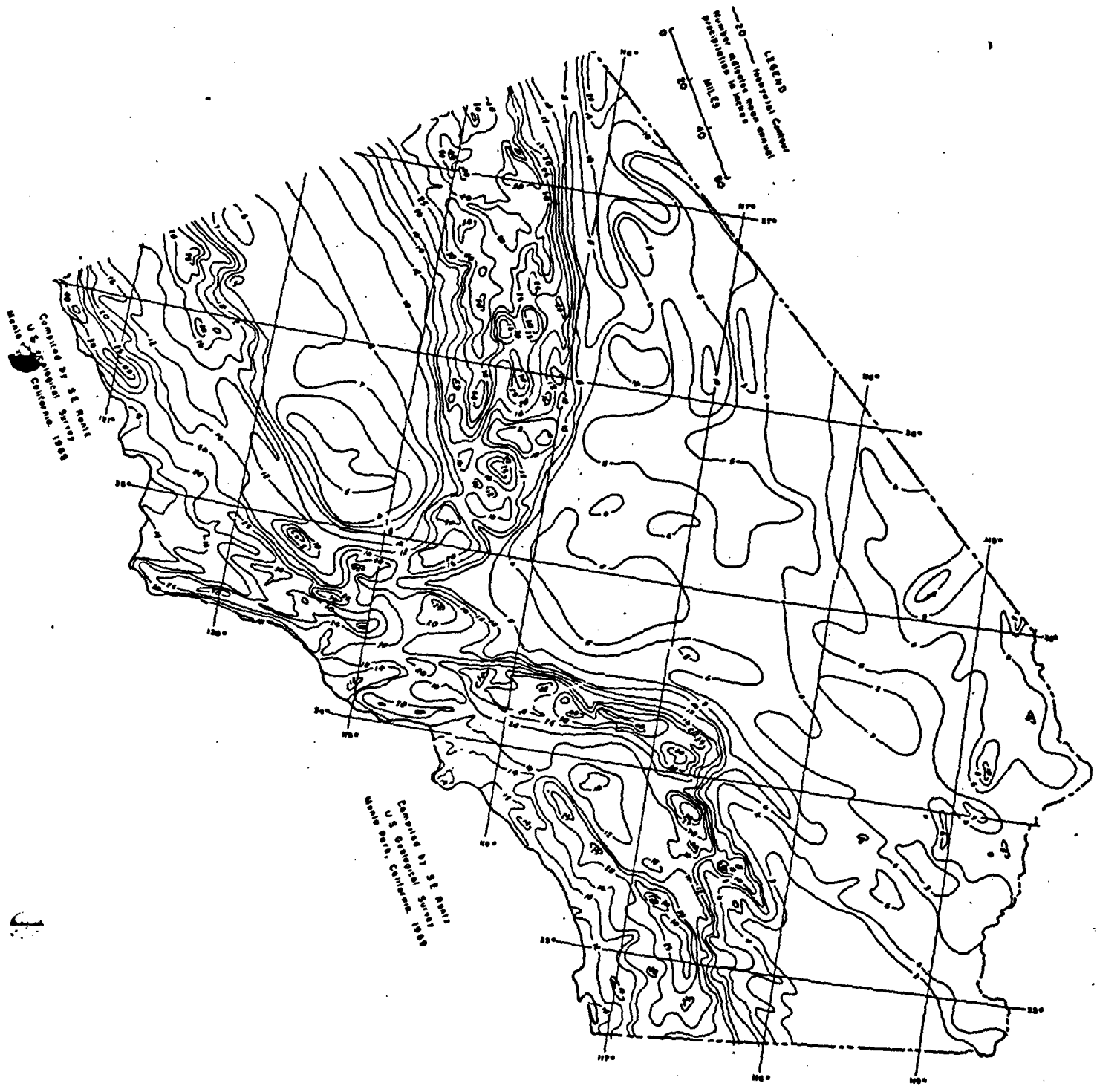


Figure 2.2 Isohyetal Contours, Southern California

Source: Goodridge (1981a)

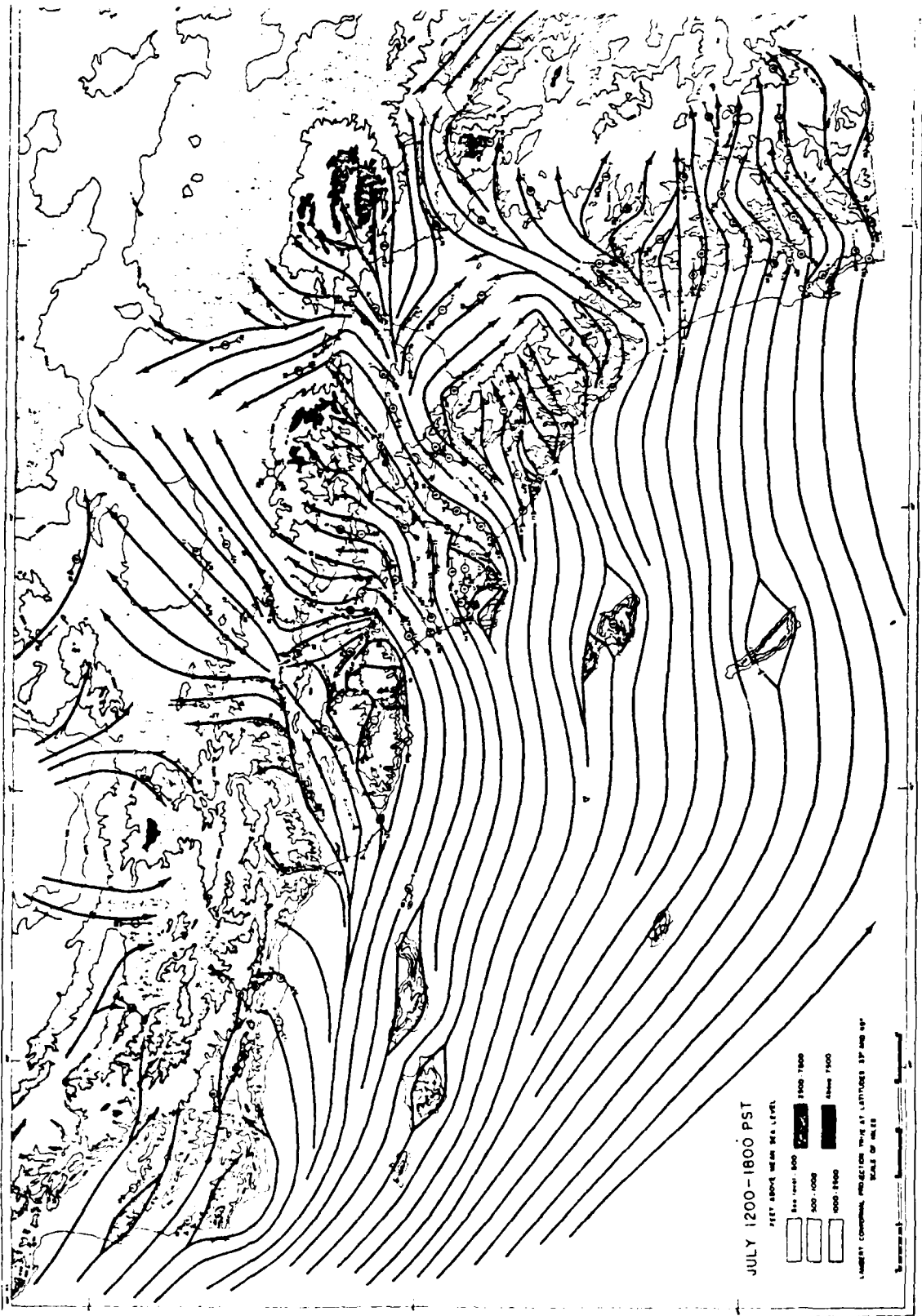


Figure 2.3 Typical Summer Streamlines,
 San Diego Coastal Region
 Source: DetMarrals et al. (1965)



Figure 2.4 Summer Land-Breeze,
 San Diego Region
 Source: DeMarrals et al. (1965)

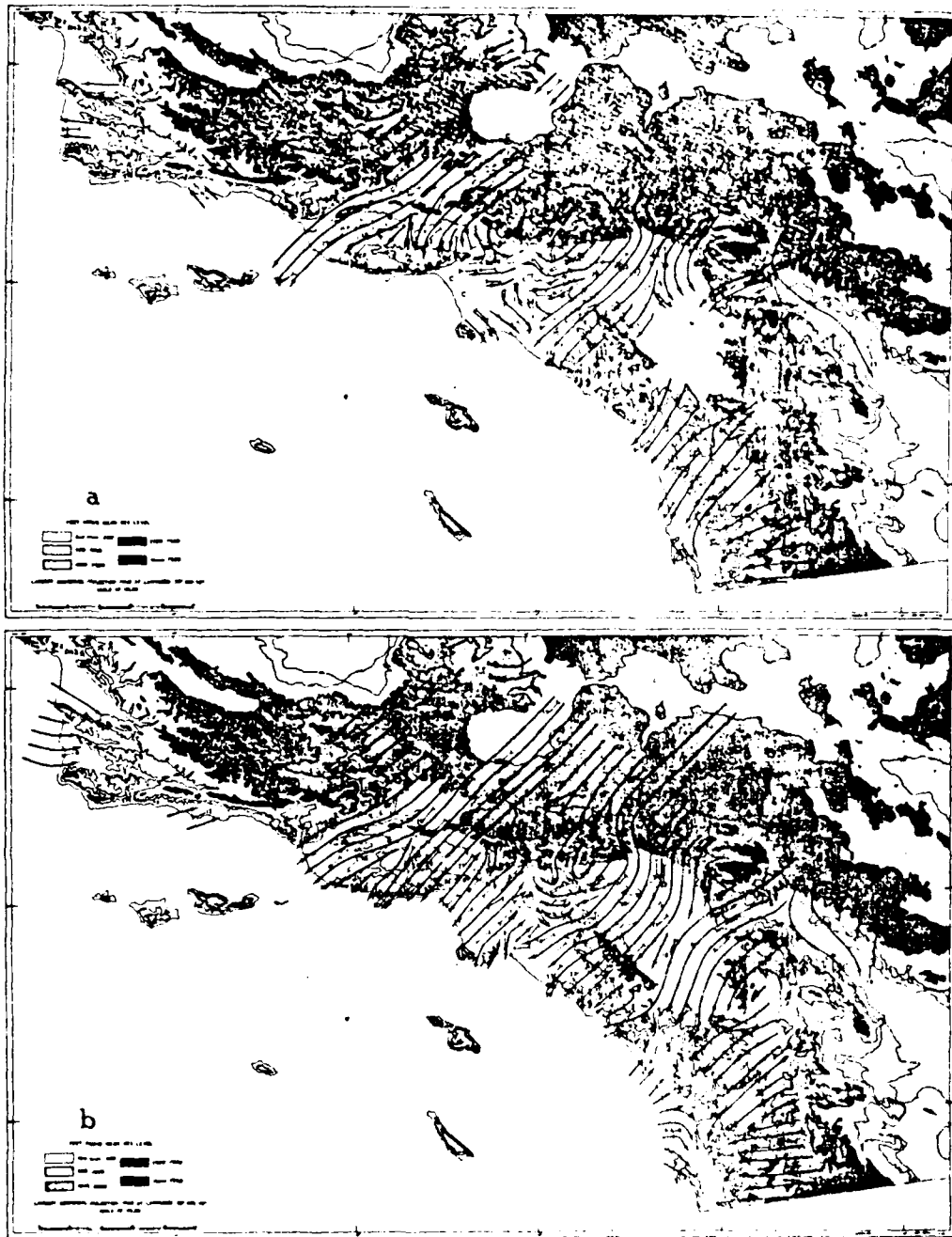
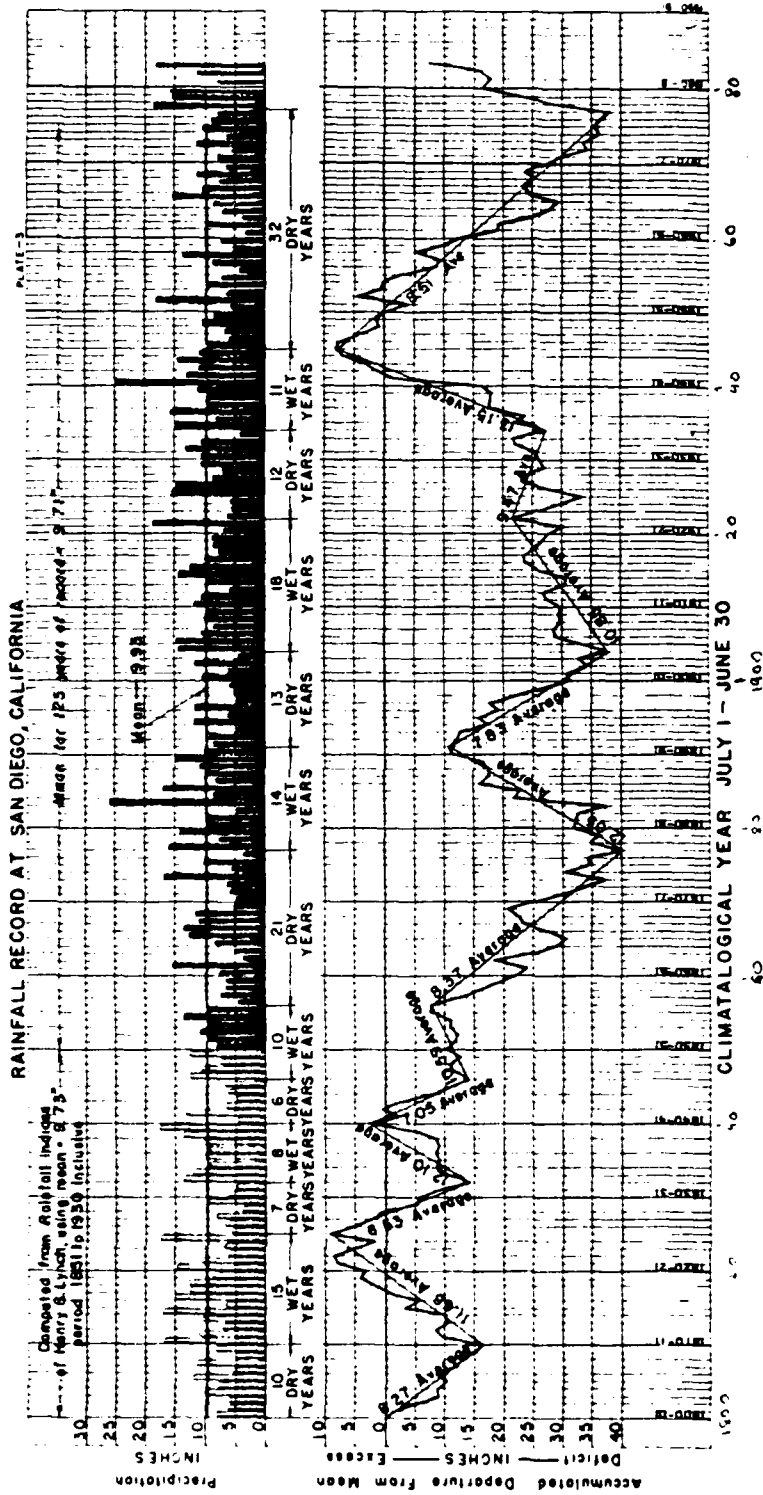


Figure 2.5 Streamlines, Santa Ana Conditions

San Diego Region

Source: DeMarrais et al. (1965)

SAN DIEGO COUNTY WATER AUTHORITY



Rainfall Record at San Diego, California
(San Diego County Water Authority)

Figure 2.6 Cumulative Departure
from Normal Rainfall, San Diego

TABLE 2.1

Major Drainage Areas of the San Diego Region

Basin or Group	Littoral Cell	Drainage Area mi ²	Controlled Area mi ²	Percent Controlled
Laguna Hills Grp	Oceanside	470	---	--
Santa Margarita R	Oceanside	744	370	50
San Luis Rey R	Oceanside	560	205	37
Escondido Cr Grp	Oceanside	220	---	--
San Dieguito R	Oceanside	346	303	88
San Clemente Cyn Grp	Oceanside & Oceanside R	169	---	--
San Diego R	Mission Bay	432	265	61
San Diego Grp	S Mission Bay Silver Strand	60	---	--
Sweetwater R	Silver Strand	220	182	83
Otay R	Silver Strand	143	99	69
Tijuana R	Silver Strand	1730	1225	72
Total		5094	2649	52

Source: Brownlie and Taylor (1981)

TABLE 2.2

Annual Precipitation at Selected Stations, San Diego Region

Location	Elevation ft.	Precipitation (Inches)			Years of Record	Latitude / Longitude
		Average	Maximum	Minimum		
San Juan Capistrano 7836-51	151	14.4	31.4	4.8	73	33-30-45 117-38-10
Temecula 8840-01	1020	15.2	32.7	4.9	39	33-29-45 117-08-57
Palomar 6657-00	5545	27.8	61.7	10.0	38	33-21-21 116-51-40
Henshaw Dam 3914-00	2700	26.5	52.4	8.3	69	33-14-15 116-45-37
Escondido 2862-00	666	15.7	34.6	6.1	82	33-07-10 117-06-35
Miramar 5707-01	650	13.7	30.0	6.3	53	32-54-00 117-06-00
Cuyamaca 2239-00	4650	38.3	66.5	12.1	93	32-59-20 116-35-15
San Diego 7740-00	13	9.9	26.0	3.4	130	32-43-59 117-10-32
Barrett Dam 0514-00	1624	17.7	36.4	6.8	65	32-40-48 116-40-15

Source: DWR Bull. 230-81

TABLE 2.3

Mean Monthly Precipitation in Inches* at Selected Stations, San Diego Region

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Palomar	4.9	4.7	4.7	2.5	0.4	0.1	0.4	0.5	0.4	0.8	3.1	4.6
Henshaw Dam	4.2	3.7	3.9	2.3	0.5	0.1	0.2	0.48	0.3	0.7	2.6	3.7
Escondido	2.6	2.2	2.5	1.4	0.3	0.1	.03	0.1	0.2	0.5	1.8	2.4
Cuyamaca	5.6	5.4	6.1	3.7	1.1	0.2	0.5	0.5	0.6	1.0	3.5	5.2
San Diego	1.9	1.5	1.6	0.8	0.2	.03	.01	0.1	0.1	0.3	1.3	1.7
Barrett Dam	2.9	2.5	2.7	1.8	0.9	0.1	.03	.03	0.3	1.0	3.0	4.4

* 1941-1970

Source: Goodridge, (1981)

TABLE 2.4

Average Wind Speed, MPH, San Diego Region

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
San Diego	5	5	6	7	7	7	6	6	6	5	5	5	6
Imperial Beach	6	6	6	7	6	6	5	5	4	4	4	5	5

Source: Goodridge (1978)

TABLE 2.5

Percent Wind, Mean Speed, MPH, San Diego Region

Location	N	NNE	NE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNN	NNW	Calm		
San Diego %	6.7	2.2	1.4	0.7	2.5	2.7	3.4	3.2	6.6	5.6	5.2	3.8	9.7	11.1	14.1	6.9	14.2
mean speed	4.4	3.8	3.6	3.4	3.1	3.4	3.9	5.4	5.5	6.0	6.1	6.3	7.2	7.9	7.6	7.6	7.6
Oceanside %	1.6	0.8	18.7	4.5	8.3	0.6	3.1	0.6	4.1	0.9	9.3	2.3	16.0	4.0	11.9	0.4	13

Source: Goodridge (1978)

TABLE 2.6

Percent High Wind, Peak Gust San Diego Region

Location	%>17k	%>27k	Peak Gust mph	Month of Max %>17k
San Diego	1.6	0.02	63	Jan (4.9%)
Oceanside	1.7	0.13	N.A.	Jan (4.6%)

Source: Goodridge (1979)

TABLE 2.7

Major Storms in the San Diego Region

Date	Watersheds Affected	Remarks
Dec 1861 - Feb 1862	All	Heavy continuous rain, severe floods.
Feb 1884	All	Continuous rain, severe floods.
Oct 12, 1889	Escondido Co	Severe thunderstorms.
Jan 14-19, 24-29, 1916	All	Two severe storms, heavy floods, especially in the south.
Jan 21-24, 1943	All	Severe storm, heavy floods.
Jan-Feb 1969	Northern	Heavy rains in north of region. 3 storms, well documented. Series of storms, well documented.
Jan-Mar 1978	All	Series of storms, well documented.
Jan-Feb 1980	All	Series of storms, well documented.
Feb-Mar 1983	All	Series of storms.
Sep 30, 1932	Southern	Tropical storm, inland.
Sep 25, 1939	All	Tropical storm, near hurricane.
Aug-Sep 1922	Southern	Tropical storm Hyacinth.
Sep 7-10, 1976	All	Tropical storm Kathleen.
Aug 13-15, 1977	All	Tropical storm Doreen, well documented.
Sep 5-6, 1978	All	Tropical storm Norman, dissipating.

TABLE 2.8 PRINCIPAL RAIN GAGES, SAN DIEGO REGION

STATION	AGENCY	PERIOD OF RECORD	TYPE	DWR #	OTHER #	REMARKS
San Juan Capistrano: Hanke	OC	1924-1978	S	7836-51	(OC) 86	
Fallbrook	SDC	1876-	S,R	2958-50	(SDC) 1050	Changed position several times
Temecula CDF	RC	1902-	R	8840-01	---	
Oak Grove USFS	NWS	1910-	S	6319-00	446-18	
Henshaw Dam	NWS	1912-	R	3914-00	(SDC) 1200	Two stations, data also at SDC Flood Control; Vista Irrigation District
Warner Springs H.S.	NWS	1907-1977	R	9447-00	(SDC) 3636	Two locations, data also available at SDC Flood Control
Escondido	NWS	1894-	S	2862-00	(SDC) 1020	Two locations, data also at SDC Flood Control
Poway Valley	NWS	1879-	S	711-00	134	
Cuyamaca Helix	NWS	1888-	R	2239-00	(SDC) 720	Also available at SDC Flood Control
San Diego NWS	NWS	1850-	R	7740-00	(SDC) 2820	Also available at SDC Flood Control.
Campo	NWS	1877-	S	1424-00	(SDC) 420	Also available at SDC Flood Control

Sources: Calif DWR Bulletin 230 -81
San Diego County Flood Control District
Orange County Environmental Management Agency

TABLE 2.9 COASTAL WIND STATIONS, SAN DIEGO REGION

STATION	AGENCY	PERIOD OF RECORD	W BAN #	LAT/LONG		REMARKS
Oceanside	SDAPCD	1973-	---	33 12'10"	117 22'0"	
Chula Vista	SDAPCD	1972-	---	32 37'22"	117 03'22"	
San Diego	SDAPCD	1973-	---	32 43'38"	117 09'13"	
Imperial Beach	NAS	1943-	93115	32 34'	117 07'	Digital 1952-
San Diego	NAS	1922-	93112	32 43'	117 12'	Long hourly record, digitized 1945-
Carlsbad	A	1959-	---	33 08'	117 17'	1972 - hourly
Oceanside	CAA	1931-1952	23181	33 14'	117 25'	1948-52 Digitized
San Clemente	NF	1960- 1937-1946	93117	33 01'	118 35'	1960 - Digitized

Source: National Climatic Data Center (NCDC) - latter five stations
San Diego Air Pollution Control District (SDAPCD)

NAS = Naval Air Station
CAA = Civil Aeronautics Administration
A = Aviation Reports

3.0 SOUTH COAST REGION

The South Coast Region includes portions of Los Angeles, Orange, San Bernardino and Riverside Counties. The extent of the South Coast Region is defined by the watersheds draining to the Santa Monica littoral cell, which extends from Solromar to Point Vicente; the South Santa Monica Reach, which covers the area from Point Vicente to Point Fermin; the San Pedro littoral cell, which extends from Point Fermin to just south of the Newport Harbor entrance, and the South San Pedro Reach, which covers the area from the San Pedro Cell to Dana Point. The littoral cells correspond to those defined in the Assessment and Atlas of Shoreline Erosion Along the California Coast (July 1977) and are shown in Figures 3.1 and 3.2, which are reproduced from this document. The following sections give general meteorological information regarding the watersheds draining into these regions.

A. Drainage Areas

A.1 Drainage areas and Subareas

From an historical point of view, there were four distinct watersheds which drained into the South Coast Region. These are indicated on Plate 3.1 as the Los Angeles River Basin, the San Gabriel River Basin, the Santa Ana River Basin and the Santa Monica Mountains Group. However, due to the extensive development and flood control projects in the South Coast Region, only the upper reaches of the San Gabriel and Los Angeles Rivers can still be considered as hydrologically distinct. The lower reaches are channeled, and the two rivers are not entirely independent, since they are connected naturally and, more recently, artificially. For details of the basins and sub-basins, one should refer to the companion report on hydrology.

A.2 Physiography and Topography of the South Coast Region

The watersheds draining to the South Coast Region are bounded on the north and west by the western Transverse Range Mountains, including the San Gabriel Mountains, and the eastern end of the Santa Susana Mountains and the Santa Monica Mountains. On the eastern side, the drainage area is bounded by the Puente and East Coyote Hills and by heavy development. Details of the watersheds are presented in Table 3.1. For further details, one is referred to the companion report on hydrology.

A.3 Climate of the South Coast Region

A.3.1 General Features

The South Coast Region is classified as belonging to the Mediterranean Dry Summer Subtropical climatic type. Along the maritime fringe, temperatures are controlled by the sea, with average winter air temperatures of 52° F and average summer temperatures near 71° F. Inland summer temperatures are much higher, with summer highs commonly over 90° F, while winter daytime temperatures are only occasionally below freezing in the mountain areas.

An important part of the climate of this region is the formation of low stratus clouds and fog along the coast, especially during night and morning hours. Low overcast conditions normally prevail on 20 to 25 mornings per month from April to October although there are great year-to-year variations in the persistence of this phenomena. Low clouds and fog are usually less prevalent along the South Coast Region than they are north of Point Arguello.

A.3.2 Typical Storm Patterns

The main synoptic feature controlling the weather in this region is the eastern North Pacific High, which in summer is generally strong and in a more northerly position, preventing storms generated in the North Pacific from moving far south. In contrast to the summers, in which frontal precipitation is rare, the Pacific High is generally weaker and in more southerly position in winter, thus allowing storms to penetrate to Southern California.

The typical winter storms which affect this region usually originate in high or mid-latitudes and approach from the northwest, west and southwest. The nature and general approach of these storms help produce conditions which yield the strong orographic effects in the rainfall patterns observed in this region. The two main types of storms which affect the area are the high-latitude type, in which blocking takes place east of 160° W and the storms approach from high latitudes, and the low-latitude type, in which blocking takes place between 160° W and 180° W, and storms, which often develop in the Hawaiian region, and which approach at lower latitudes.

Tropical storms are extremely rare, but can move into the area on occasion. These rare storms can cause intense rainfall (Kimura, 1974). The eastern Pacific tropical storms remain a threat to the area, although they rarely arrive in full force because of the upwelling along the coastal region which usually maintains a band of cold water near the coast. One did strike with near hurricane intensity in late September 1939, and dumped 2 to 4 inches of rain along the coast and up to 10 inches in the mountains. Another tropical storm, Kathleen in September 1976, produced up to 14 inches of rain in the San Bernardino Mountains. However, most arriving tropical storms are in the dissipation stage because of the cold water, and their intensities are reduced. This was the case with tropical storms Doreen and Norman in 1977 and 1978, which produced thunderstorms and locally heavy rain in the South Coast Region.

There is occasional rainfall from thunderstorms, but this is generally rare and usually limited to late summer and early fall. The Pacific High normally prevents moisture laden air from entering the region in summer, but occasionally, the Pacific High weakens or displaces and allows an inflow of subtropical air. As a result, thunderstorms may occur, especially in the mountain and desert areas. (U.S. Weather Bureau, (1962) Hydrometeorological Report 37).

A.3.3 Precipitation Patterns

The distribution of average annual precipitation varies considerably over the South Coast Region. A glance at a map showing isohyetal contours of mean annual precipitation, such as that reproduced in Figure 3.3, shows that there are strong orographic effects. The isohyetal contours could almost be contours of elevation, especially in the coastal watersheds. Table 3.2 shows typical values for this region.

In the near-coastal region, mean annual precipitation varies from low values

near 12 inches near the mouths of the Los Angeles, San Gabriel and Santa Ana Rivers, to 18 inches at the base of the Santa Monica Mountain Range. The difference is due to orographic effects, as the air masses are lifted over the Santa Monica Mountains in the usual storm patterns. One also sees a slightly higher average in the Palos Verdes peninsula, which is at a higher elevation than the surrounding plain.

Inland patterns also follow topography with typical values of 16 to 20 inches in the valleys and foothills, rising to as much as 40 inches in the mountain peaks. The Santa Monica Mountains, much lower than the San Gabriel and Santa Ana Mountains, have an average annual rainfall of about 20 inches.

In order to emphasize the importance of orographic effects, it is noted that the offshore areas have a typical annual average of about 10 inches. At San Nicolas Island, the value is only 7.5 inches. More northerly areas have slightly higher averages (Kimura, 1974).

It should be noted that the year-to-year variation in rainfall is large, as can be seen from the extreme values noted in Table 3.2. This variation is an important factor in the overall precipitation patterns of this region.

A.3.4 Seasonal Precipitation

While year-to-year variations are large, seasonal variations are also pronounced, as can be seen in Table 3.3. Rainfall rarely occurs in the months of June, July and August, largely because of the blocking effect of the semi-permanent Pacific High upon frontal systems. Thunderstorms occur occasionally in summer, if the Pacific High weakens and allows moist tropical air into the region. In general, thunderstorms are more intense and more frequently observed in mountainous areas. Most rain, however, is associated with winter cold fronts.

A.3.5 Precipitation frequency

Precipitation frequency for given intensities and durations is important in this region because of the intermittent nature of precipitation, and the large year-to-year variation. There are two excellent sources of data. One is the NOAA Precipitation-Frequency Atlas of the Western United States, Volume XI-California. This atlas provides isopluvial contours for 6-hour and 24-hour precipitation with 2-year to 50-year return periods.

The second source is the California Department of Water Resources publication "Rainfall Depth-Duration-Frequency for California" (1981). This publication contains measured intensities and depth-duration-frequency tables for many stations in California.

In general, the intensities are dependent upon elevation, with the lowest near the coast and highest in the mountain areas. For detailed information, the reader is referred to the above sources.

A.3.6. Coastal Wind Regime

The basic airflow in this region is northwesterly, which is due to the eastern Pacific High. This high is dominant in summer, but moves south and weakens in winter. Winter winds are still primarily from the northwest, but are modified by passing fronts and other meteorological disturbances. East and southeast winds are common as fronts approach, and often veer south or southwest with the storm passage. Figure 3.4 shows average wind rose patterns for January and July in the coastal region. The strong westerlies are apparent in the summer months, while the near-coastal wind patterns are typically more uniform in winter.

A second important factor in wind patterns is the Catalina Eddy, which is a cyclonic cell formed by the northwesterly flow past Point Conception. The flow recurves due to the eddy and causes southwesterly and southerly winds in the coastal region, rather than the northwesterly flow. The Catalina Eddy also helps produce the local stratus cloud formation, and when the eddy is intense, low clouds often develop over the coastal area.

A.3.7 Land-Sea Breeze

An important factor in wind regimes in Southern California is diurnal variation. This variation is caused by seasonal land freezes which typically develop throughout the year. The onshore sea breezes are caused by the heating of the land during the day, while the offshore land breezes are caused by land cooling at night. In both cases, the relatively constant ocean temperature is a factor.

There is a strong seasonal variation in the diurnal pattern as well (DeMarrais, et al., 1966). In summer, the strong land heating results in a strong landward pressure gradient, and a strong sea breeze during the day. In winter, the land surface radiates heat at night, and strong land breeze develops. The land breeze in any case has a limited effect; outside the Channel Islands, the air flow is little changed. Typical diurnal streamline patterns are shown by DeMarrais et al. (1966). There are several other regimes which dominate the coastal winds. One is caused by a warm-core high pressure over the Great Basin and is common in winter. This pattern is accompanied by clear skies and often results in the above-mentioned winter diurnal land-sea breeze pattern.

A.3.8 North Pacific Storm Winds

The basic wind pattern is altered by the passage of Pacific storms most of which arrive in the winter months with active weather fronts. Most fronts are either occlusions or cold fronts, but the occlusions tend to acquire the characteristics of a cold front as they move southwestward over Southern

California (DeMarrais et al., 1965). Although there is no single typical flow pattern associated with fronts, there are often strong, and sometimes damaging, easterly or southeasterly winds as the fronts approach. This wind can attain 30 mph or more, but this is an infrequent occurrence. With the passage of the front, winds veer toward the southwest.

Storms associated with warm fronts are much rarer, and are usually associated with low-latitude type storms. Winds on the order of 20 to 25 mph are not unusual during the passage of these fronts, and sustained winds can often be much higher.

A.3.9 Santa Ana Winds

A cold-core high pressure over the Great Basin, commonly occurring after the passage of a cold front, will often result in Santa Ana, or foehn, wind type conditions. These winds are often strong, and sometimes extremely intense and damaging. The general flow pattern results in strong north to northeast winds, with extremely high velocities in canyons. Bailey (1966) reports an intense Santa Ana in 1918 which produced northwest winds of over 60 mph (26 m/s) at Santa Monica for five minute intervals. In fall, the winds are often hot and dry, causing extreme fire danger. Although quite rare during summer months, Santa Anas, when they do occur, can produce extraordinarily hot and dry conditions, with exceedingly high fire danger.

A.3.10 Winds and Severe Weather

Although much rarer than damaging Santa Ana winds, thunderstorms occasionally develop and bring severe weather to this region. Severe weather is least reported in summer (DeMarrais et al., 1966) and nearly always occurs inland from the coast during this season. Fall severe weather is relatively more common, especially on the coast.

Aside from intense Santa Ana winds and thunderstorms, tropical storms are a possible, though rare, occurrence. The tropical storm in 1939 brought 60-knot winds to the Los Angeles coast. As mentioned previously, however, tropical storms arriving in this region are usually in the dissipation stage and are reduced in intensity.

Tornadoes are also an infrequent occurrence in the area, but according to Goodridge (1979), the frequency in Los Angeles is more than ten times the frequency in the state as a whole. Goodridge believes this is in large part due to the fact that tornadoes, rare in California, are more often observed, reported and recorded in populated areas. Tornadoes have the highest frequency in spring and have a secondary peak in October. Most, however, touch ground only for very short periods (Daily, et al., 1974)

A.3.11 Topographic Effects on Wind

The single, largest topographic feature which affects the wind in this region is the change in coastline alignment at Point Conception. With the prevailing northwesterly winds, the sudden change to an east-west coastline produces a recirculation zone in the South Coast offshore area. Often centered over Catalina Island, this recirculating zone is known as the "Catalina Eddy". The cyclonic flow causes southwesterly to southerly winds along the coast at times, depending on the strength and location of the eddy. This eddy, when intense, can cause a deepening of the marine layer, and often results in overcast days in spring and early summer.

Locally important topographic features (Point Conception is well outside of the South Coast Region) include the Santa Monica Mountains, Palos Verdes Peninsula and the offshore islands (including those in the Santa Barbara Channel, which are also outside the region). The alignment of the islands essentially "funnels" the flow along the coast. The hills and cliffs of the Palos Verdes peninsula cause a flow separation resulting in a shadow effect in their lee, often in the Los Angeles Harbor area. The Santa Monica Mountains are relatively high and situated on the coast, so that the usual flow pattern is directed around them. However, the canyons in the Santa Monica Mountains are favorable to intense funneling of winds in Santa Ana conditions, which can result in locally intense winds on the coast.

A.3.12 Coastal Wind Intensities and Frequencies

Table 3.4, 3.5 and 3.6 summarize wind intensities and frequencies in the South Coast Region. These data are taken from Goodridge (1978) and Goodridge et al. (1979).

There is a moderate seasonal variation in wind speed (Table 3.4), but the most interesting feature is the strong probability of southwest winds at Malibu and the west to northwest winds at Long Beach (Table 3.5) reflecting topographic effects as well as the prevailing northwest flow of air. Note also that the frequency of high winds in February (the month of most frequent high winds) is only moderately higher than the annual average.

B. Historical Perspective

B.1 Historical Outline of Major Wet and Dry Periods

The most comprehensive treatment of the historical rainfall record prior to recorded measurements (which start as far back as 1847) was done by Lynch (1931). Recent work with tree-ring data by Fritts and Gordon (1980) attempts to extend the record back to 1600. However, most of their paper is devoted to attempts at verifying the data, a difficult task when typical regression coefficients are on the order of 0.5. Certain trends may be found in their results, but one must use caution in assigning a quantitative value to rainfall and runoff derived from tree-ring measurements.

Probably the most interesting feature of Lynch's research is that the South Coast Region has often experienced extended drought and wet periods, on the order of ten years or so, since 1769. However, major floods have often occurred during drought periods, and, conversely, years of very little precipitation have occurred during wet periods.

Lynch found that the periods of 1781 to 1810, 1822 to 1832, 1842 to 1883 and 1893 to 1904 were periods of below average rainfall, and could be considered drought periods. Figure 3.5 shows the rainfall record since 1870 at Los Angeles, where it is seen that the period of 1944 to 1976 was also a drought period.

By way of contrast, the wet periods noted by Lynch were from 1810 to 1821, from 1883 to 1893, and from 1904 to 1922. To this, we might add the period of 1935 to 1944 and, perhaps, the last seven years, although the historical record should caution one from making historical judgments based on short records.

The extreme variability must be noted, however. Lynch cites many examples; one is the 1839-40 season, in which intense rains were followed by 18 months of almost entirely rainless weather. The 1970-76 dry period was followed by the extremely wet years of 1977-78 and 1979-80.

B.2 Historical Outline of Major Rain and Wind Storms

Historical accounts of major storms are of a quantitative nature only during the more recent years, but some early storm descriptions are found. Kuhn and Shepard (1981) recount the writings of Richard Henry Dana, who described the southeasters of the 1830's, and their ferocious effects. Fifty-foot waves and violent winds were described, but general weather conditions which apparently caused the southeasters are no longer present (Kuhn and Shepard, 1981). Table 3.7 lists some of the major storms which have affected this region.

B.2.1 Rain Storms

More recent accounts go beyond the qualitative descriptions of the 1800's, which in general focus on the number of days of rain, or the intense wind and waves. Recent accounts, however, tend to follow economic losses; thus synoptic accounts are generally available only for storms in which damaging floods occurred. A consequence of this is that short, intense storms are often analyzed, since these sometimes result in local flooding, as occurred on December 30-31, 1933 in La Crescenta (Kraebel, 1934). This flood, partly a result of fires in the high gradient canyon areas, was caused by fourteen hours of rain followed by an intense fifteen minute cloudburst.

Burke (1952) and Carr (1952) give an account of the three-day (January 15-18) 1952 storm. The 1969 storms (January 18-22, 24-27, and February 22-25) have been reported extensively (Waananen, 1969; Los Angeles County Flood Control District, 1969).

A storm with unusually small orographic precipitation effects for this region is discussed by Nestlinger (1975). This storm (December 4, 1974) had 10-, 15- and 30-minute intensities which were not extreme, but the 3-hour intensity was of the 100-year recurrence level.

Pappas (1978, 1980) and Garza and Peterson (1982) give synoptic accounts of the series of storms of the 1977-78 winter and 1979-80 winter.

B.2.2 Wind Storms

Wind storms get somewhat less attention in this region, since the economic damage is generally much less severe than that caused by floods. There are several notable wind storms. The intense Santa Ana wind of November 24-26, 1918 had sustained winds of 60 mph (Bailey, 1966). Bailey also notes that 60-mph winds were measured in a January 11-13, 1946 windstorm.

Santa Anas, a common occurrence and creators of severe fire potential, have been discussed by Sergius (1962) and Aronovitch (1966). Both give details of particular storms: Sergius discusses the Santa Ana conditions which led to the 1961 Bel-Air fire, and Aronovitch discusses the January 15-16, 1966 Santa Ana. Sommers (1981) gives details of the synoptic conditions during the November 14-16, 1977 Santa Ana wind and fire conditions.

C. Data Search and Retrieval Efforts

C.1 Technical Approach

Data were collected from a number of governmental and public organizations. Previous reports and documents on similar topics were located and examined as part of the literature search. These documents often contained or referred to data, whose original sources were noted. Government and public agencies were then contacted, and in many cases visited.

The following is a general description of data sources relevant to the South Coast Region.

Los Angeles County Department of Public Works (Formerly Flood Control District)

The data available at this agency include:

Precipitation data, with both hourly and the original charts or punch tape from recording gages;

Streamflow data, with both daily and charts or punch tape from recording gages;

Debris data, including hand-entered tables of the quantities of debris stored and removed from debris basins;

Fire history, including topographic maps with outlines and dates of fires from about 1910 and reports on recent fires (older fire reports are archived).

Streamflow and precipitation data are on microfilm up to 1977. The most recent publication covers the 1975-77 period.

People contacted include:

John Mitchell, Head, Operations Section (213) 226-4190

Don Carpenter (rainfall), Hadi Nourzi (fires, debris) (213) 226-4184

Tom Alexander (fires, debris), Ed Dingman (streamflow),

Bob Sarasua (streamflow records) (213) 226-4184

Chris Bredehorst (frequency analysis) (213) 226-4089

Orange County Environmental Management Agency

The data sources at this agency include:

Precipitation data with both hourly tabulations and charts from recording gages;

Streamflow data, with both daily tabulations and charts from recording gages;

Debris data is limited, but a new program on the San Diego Creek is starting;

Sediment data is collected in conjunction with the U.S.G.S.

In a new program just starting, the agency will collect its own data. The sediment data are on a computer data base.

The most recent publication covers the 1982-1983 season.

People contacted include:

Emmett Franklin (streamflow, precipitation) (714) 634-7473
Bob Collicott (sediment, water quality) (714) 634-7463
Tom Rossmiller, Bruce Moore (sediment, water quality)
Dale Dillon (debris, channel cleanouts) (714) 634-7424

San Bernardino County Environmental Public Works Agency, Department of Flood Control and Transportation.

Relevant data include:

Precipitation data, with both hourly data (tabulated) and charts available. These data are presently being put on a computer data base, and some are available in electronic form as well.

Fire maps are kept, with fires located on topographic maps.

The most recent publication covers the 1974-76 seasons.

People contacted include:

Art Luther (Asst. Chief, Water Resources Division) (714) 383-2389
Peter J. Rusher (Sr. Hydrologist) (714) 383-2926

Riverside County Flood Control and Water Conservation District

Relevant data at this agency include:

Precipitation data, with both hourly tabulations and charts from recording gages available. In addition, most data are on a computer data base and are available in printouts and electronic form.

Debris and sedimentation data are limited, since the county has few debris basins.

The most recent publication covers the 1979-81 seasons.

People contacted include:

Kathy Carter (Hydrology) (714) 787-1264
Tom Clem (Hydrology) (714) 787-1264
Eric Geibersen (Dams, debris basins) (714) 787-2015

Metropolitan Water District of Southern California

This agency maintains about three rain gages in the study area; more were set up during the 1976-77 drought. Data are available through the California Department of Water Resources.

People contacted include:

Richard Clemmer, Richard Kemsel (213) 250-6210

California Department of Water Resources

Data from this agency include:

Streamflow, with data available in the Water Data Information System (WDIS). Data are available on microfiche (least expensive) and electronic form.

Precipitation, also available on WDIS.

Wind data are available in limited form, as they are gathered only in conjunction with particular contracts.

People contacted include:

Bill Mork, State Climatologist (916) 445-5800

California Air Resources Board

Data available from this agency include limited wind data, although the agency now maintains few stations relevant to this study. Occasional measurements are made in conjunction with particular projects. Some data are received from Air Pollution Control Districts, but are more readily available from these agencies.

People contacted include:

Dale Secord, John Kinney and Art Lorenzen (Sacramento) (916) 322-6206

South Coast Air Quality Management District

Relevant data available from this agency include wind data from coastal stations.

People contacted include:

Joe Casmassi, Head Meteorologist

Southern California Edison Company

This organization maintains wind monitoring equipment at the San Onofre Nuclear Generating Station (S.O.N.G.S) as well as at the Oxnard, Ventura, El Segundo, Los Alamitos and Huntington Beach coastal power plants. Except at S.O.N.G.S., data are of questionable value.

People contacted include:

Stan Marsh (Meteorologist) (818) 302-1189

Los Angeles Department of Water and Power

This organization maintains wind monitoring equipment at the Scattergood (El Segundo) and Haines (Huntington Beach) power plants. Data are of questionable value.

People contacted include:

Kevin McAvoy (213) 481-6037

National Weather Service, Los Angeles

Data available from this agency include coastal wind speed and direction

with hourly and three-hourly averages. The hourly data are reported to the National Climatic Center. The three-hourly data are kept for several years, then discarded (these data are from harbor masters and lifeguards). Data are in tabular form.

People contacted include:

Art Lessard (Chief Meteorologist) (213) 209-7215

Other individuals contacted include:

Robert de Violini, Climatologist, Pacific Missile Range, U.S. Navy, Pt. Mugu; (805) 989-8383

Don Tuttle, Humboldt County Public Works, Natural Resources Division (Coastal Storm History); (707) 445-7741

Gerald Kuhn, Scripps Institution of Oceanography, (Coastal History); (619) 452-4856

Prof. Gary Griggs, University of California, Santa Cruz (Coastal Storm History); (408) 429-2403

There are several reference libraries in the South Coast Region which are extremely helpful. These include:

University of California Los Angeles, Water Resources Archives, Beth Willard, Librarian (213) 825-7734

This reference library has an extensive collection of publications, manuscripts and material relevant to this study. There is a large collection of uncataloged documents from local agencies as well. In addition, material not available at the UCLA Water Resources Archives can usually be obtained from the University of California, Berkeley through UCLA. Sources are well cataloged and easy to find.

California Department of Water Resources, Southern Division, Los Angeles

The records and documents section combine an extensive collection of California State publications. In addition, there is a large collection of relevant documents and publications from local and federal agencies, including the County Flood Control Agencies. Sources are well cataloged and easy to find.

California Institute of Technology Libraries

Extensive collection of relevant journals and some federal and state publications. The best sources are the Environmental Engineering Library, Keck Laboratory, and the Engineering Library (Millikin Libraries). Unfortunately, the collections are spread out over several buildings and a

certain amount of searching is often required.

University of California, Los Angeles Engineering Library and Geology Library

These two libraries have extensive collections of relevant journals. The Engineering Library has vast holdings of Weather Bureau/Weather Service publications. The geology library has all relevant U.S. Geological Survey Water-Supply Papers (as do the Water Resources Archives, where they cannot be checked out) and other U.S.G.S. publications. Both are excellent sources for reference material.

National Weather Service, Wilshire Federal Building

The reference room (normally closed to the public) has an extensive, uncataloged collection of relevant publications, including out-of-print publications and unpublished documents. Wind data are also available.

U.S. Army Corps of Engineers, Los Angeles District, Library

This library has most Corps of Engineers publications, including Beach Erosion Board and CERC publications. Some publications from local and state agencies are also available, as are some U.S.G.S. Water-Supply Papers and Water Resources Data. References are often miscataloged and difficult to find.

Southern California Metropolitan Water District

The reference library has (in theory) all MWD publications, although relevant ones often seem to be missing. In addition, there is a good collection of California Department of Water Resources publications.

C.2 Meteorological Data Available

Tables 3.8 and 3.9 list some significant rainfall and wind gages in this region. These tables are provided as a quick reference; more detailed and complete lists appear in Appendix B.

C.2.1 Precipitation

There are more than 1000 present and discontinued precipitation gages in the South Coast Region. Of these, most are operated by the Los Angeles County Department of Public Works (formerly Flood Control District), the Riverside County Flood Control and Water Conservation District, the San Bernardino County Flood Control and Water Conservation District and the Orange County Environmental

Management Agency. Table 3.8 lists some gages with very long records. The following is a description of the data sources.

C.2.1.a. Los Angeles County Department of Public Works, Hydraulic Division

This agency keeps over 400 rain gages, as well as records on many discontinued gages. Records go back to 1872. Records prior to 1978 are available on microfilm, including hourly tables and charts from recording gages. (Examples of data available are included in Appendix B.) All daily measurements are available in tabular form, as are intensity-duration data. The intensity-duration data are updated regularly, although the last publication from the agency was issued for the 1977 water year. Charts and digitized tape from recording gages are also available. It should be noted that a large number of gages were installed around 1930; the region is well covered with gages of more than 50-year records.

Because of a legal matter, all data from stations between Topanga Canyon and Malibu Creek, from the coast to the top of the watershed are unavailable unless prior permission is obtained from the Los Angeles County District Attorney (John Mitchell, 1985, personal communication).

C.2.1.b Riverside County Flood Control and Water Conservation District

This agency maintains over sixty rain gages in this region. All recent data and most historical data are now available on a computer data system. These data include daily totals and intensity-duration data. Charts are maintained and are available. Because of the computer data system, data can be obtained rapidly by specifying the station and period of record. A list of stations is included in Appendix B.

C.2.1.c San Bernardino County Flood Control and Water Conservation District

This agency maintains over 200 rain gages, of which about 150 are in this region. Data are presently being entered on a regular basis, but most are available only in tabular form. Data include both daily amounts and intensity-duration data. All charts or digitized tapes are maintained and are available. Relevant gages are listed in Appendix B.

C.2.1.d Orange County Environmental Management Agency

This agency maintains records on more than seventy rain gages in this region. Data are available in tabular form. Charts are maintained from

recording gages and are available. Some analyses are made for intensity-duration records. Relevant gages from this agency are listed in the Appendix.

C.2.1.e National Weather Service

Hourly precipitation data for National Weather Service recording gages are now available on microfiche and magnetic tape for the period from 1940 to the present. In addition, fifteen-minute recordings from 1971 to the present are available on magnetic tape. The hourly data, as well as daily, monthly and annual data, are available from the National Climatic Data Center. The complete list of data available is lengthy, and will not be repeated here. For reference, see the Selective Guide to Climatic Data Sources, Hatch (1983).

C.2.2 Wind Measurements Along the Coast

Wind instruments with reasonably long records are listed in Table 3.9. One record (Los Angeles Airport) extends back to 1930. In addition, there are a number of stations with records back to the mid-1950's. The following is a discussion of the data available.

C.2.2.a National Climatic Data Center

The records of the first three stations listed in Table 3.9 are available on microform and, as indicated, on magnetic tape. Exact details of all the data available in addition to wind data can be found in the Index of Original Surface Weather Records, National Climatic Data Center.

The most complete station in this region is that of Los Angeles Airport, where hourly data are available from 1937 to the present.

C.2.2.b South Coast Air Quality Management District

Wind data from several coastal stations are available from this agency. Those with the longest records are listed in Table 3.9, although there are several others with shorter records. Data are available from most stations on a computer file up to 1975. Recent data are tabulated, and there are gaps in some records. A list of all stations and the records available is presented in Appendix B.

C.2.2.c Other Sources of Wind Data

The National Weather Service in Los Angeles receives wind data three to

eight times per day from harbormasters and lifeguards. These data are tabulated and maintained for about five years.

Southern California Edison and the Los Angeles Department of Water and Power maintain wind instruments at power plants on the coast. These data are available, but are unverified, and are in "raw" form (i.e., on strip charts).

C.2.3 Other Relevant Data Sources

Summaries of wind data are available in the California Department of Water Resources Bulletin 185, Goodridge (1978), and in Goodridge et al. (1979). In addition, climatic summaries available through the National Climatic Data Center (ref. Selective Guide to Climatic Data Sources). Additional data summaries are available in Climatological Study, Southern California Operating Area, Naval Weather Service Commands, (1971) available on microfiche (NTIS # AD-721-117). In addition, data records and summaries are available for Point Mugu (Robert de Violini).

C.2.4 Related Topics

Precipitation hyetographs are generally not available, except those done for specific studies. However, charts or digitized tapes from recording gages are almost always available and can be used to develop hyetographs. The digital tapes have the advantage of allowing computer processing; however, they generally only record to the nearest 0.1 inch.

Historical data for wind are extremely limited in this region, but the problem is not as serious as it is for the northern regions, where aeolian transport of sand is a significant factor.

D. Data Gaps and Limitations

This region is well covered with precipitation gages, many with more than fifty years of data. The problem is not one of data gaps, but more of the possibility of being overwhelmed by the quantity of data available.

Fortunately, the California Department of Water Resources has monthly measurements on microfiche for many of the stations (these are being submitted under a separate cover). Also available are depth-intensity-duration data, as well as statistical analyses of many commonly needed values. Most of these data are available on magnetic tape as well.

Charts and/or digitized tapes from recording gages are, in almost all cases, cataloged and archived. Obtaining data from charts is a difficult, and time consuming task, but is more accurate than the digitized tape, which usually records to the nearest 0.1" (usually the precision is +0.1", -0.0").

The historical wind patterns are known only for the past fifty years at one station (Los Angeles Airport). The coast has been well gauged since the mid-1950's, and data are often available in digital form.

Historical trends in rain and wind storms is an area that needs study. There is no definitive historical account of these storms. Many recent rainstorms are identified and well documented in this region, but there is no single source from which one can find a good meteorological summary of the major rainstorms. The situation for windstorms is even worse, with very few windstorms even crudely documented. In both cases, an effort should be made to identify major storms (and even large or moderate storms for comparison) using available documents such as newspapers for as long a period as can be covered, and then to use available daily weather maps and (for more recent storms) satellite photos, to compile a storm history of the region. This in itself would be a lengthy task, but an important contribution. An especially important part would be the identification of Santa Ana wind conditions (as many as can be accounted for with both weather maps and newspapers). This could be used to identify trends in Santa Ana conditions (intensities, frequencies, seasonal distribution). The data could also be used to aid in fire frequency predictions.

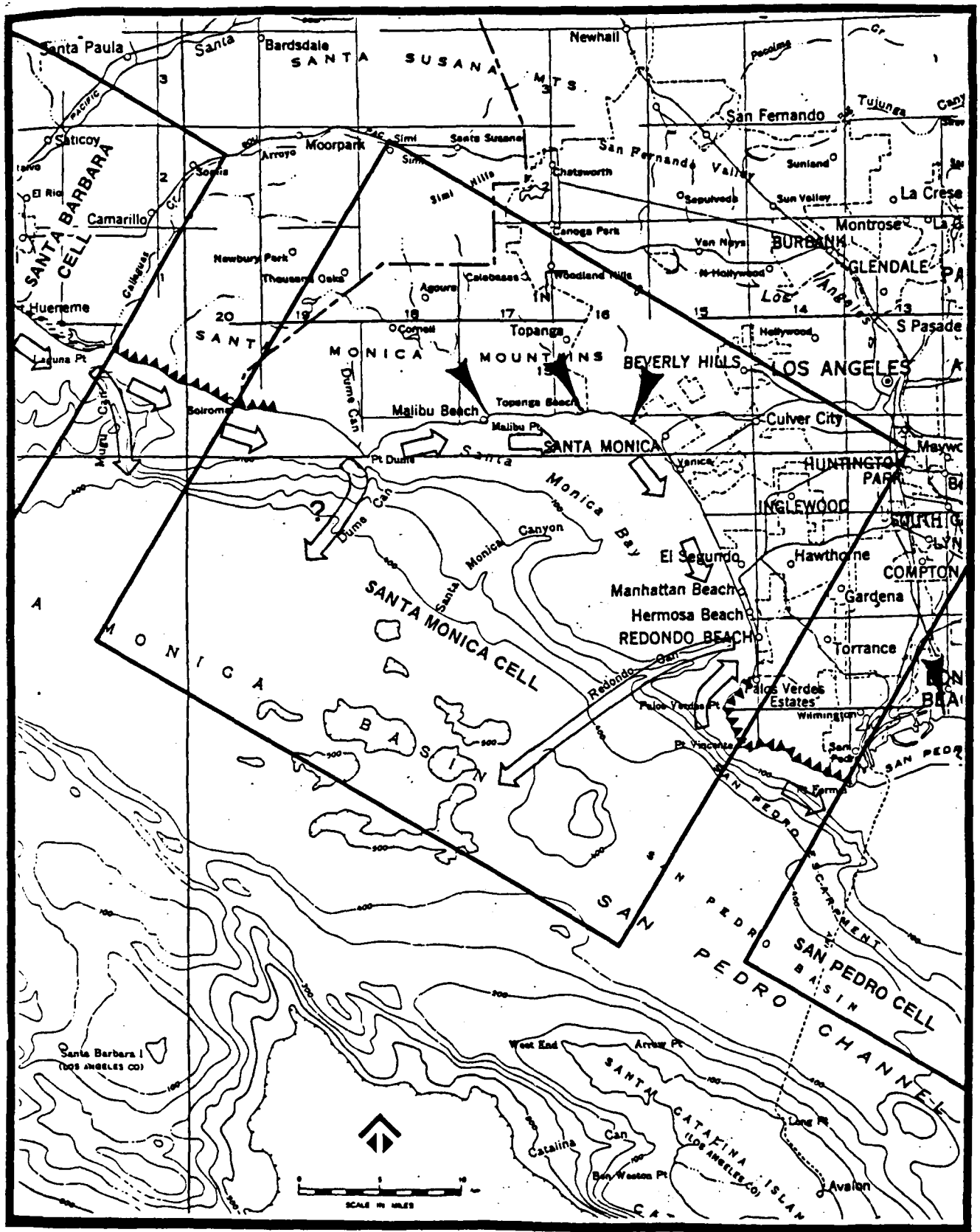


Figure 3.1 South Coast Region

Source: Calif. DNOB Atlas of Shoreline Erosion

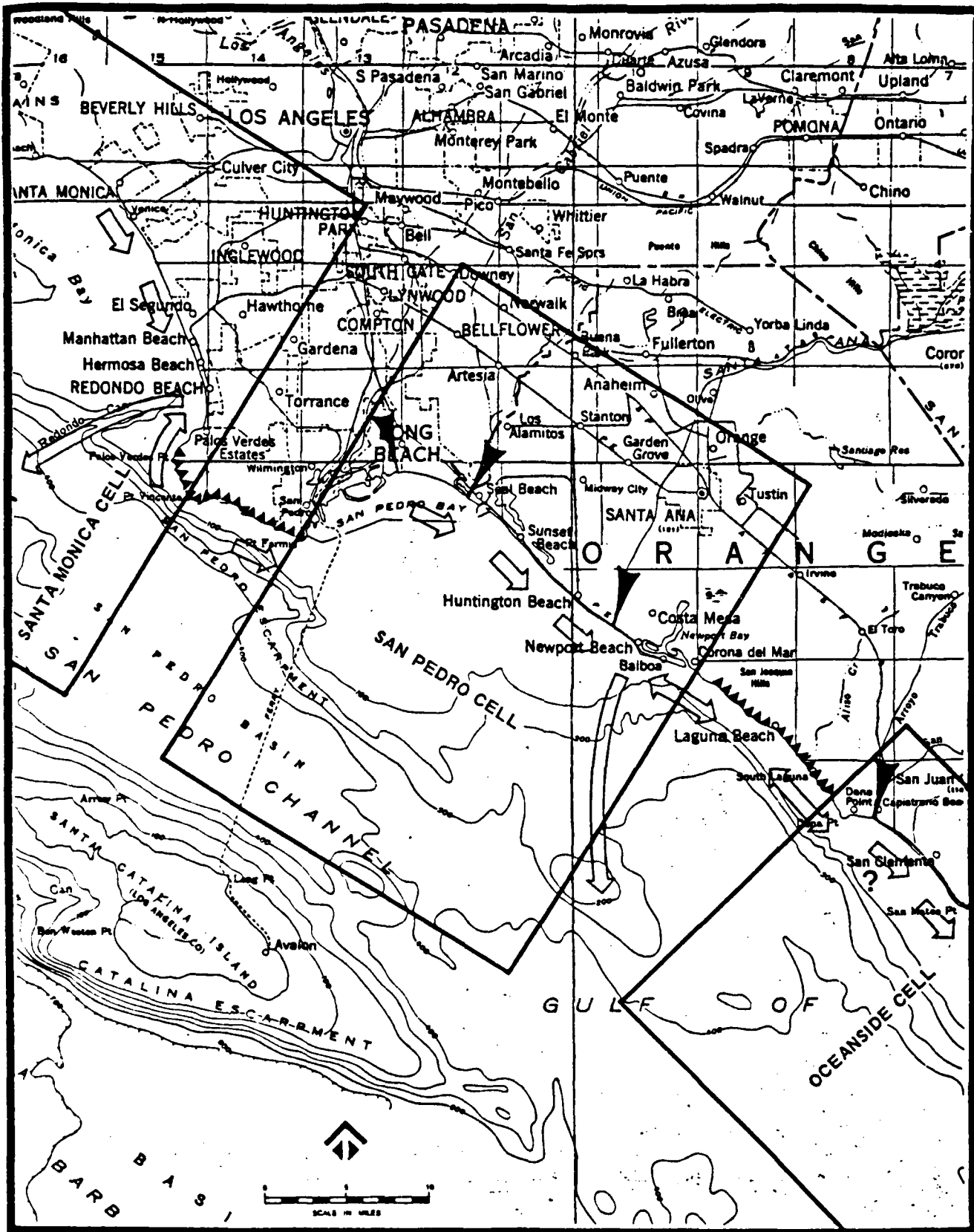


Figure 3.2 South Coast Region

Source: Calif. DNOB Atlas of Shoreline Erosion

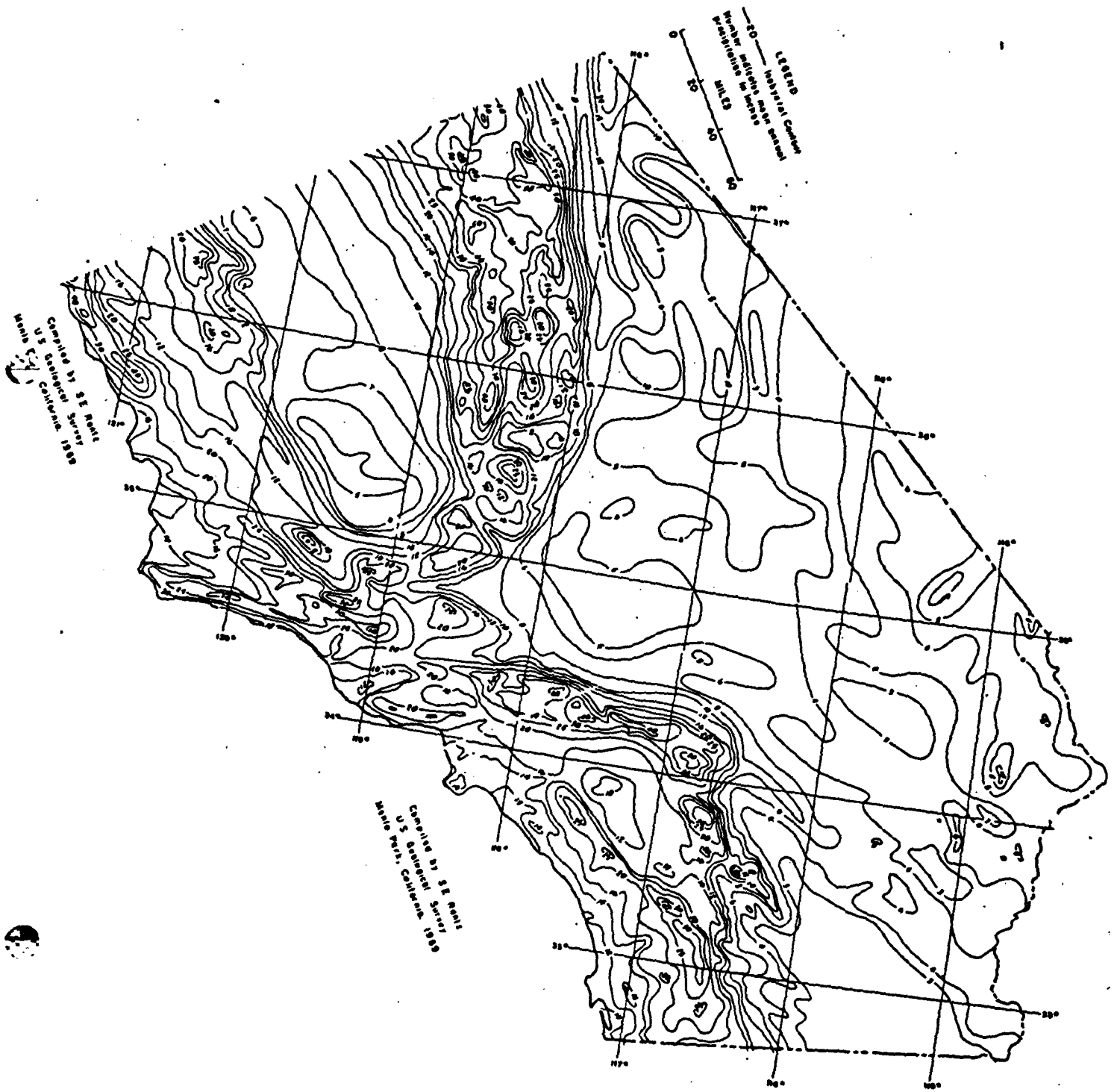
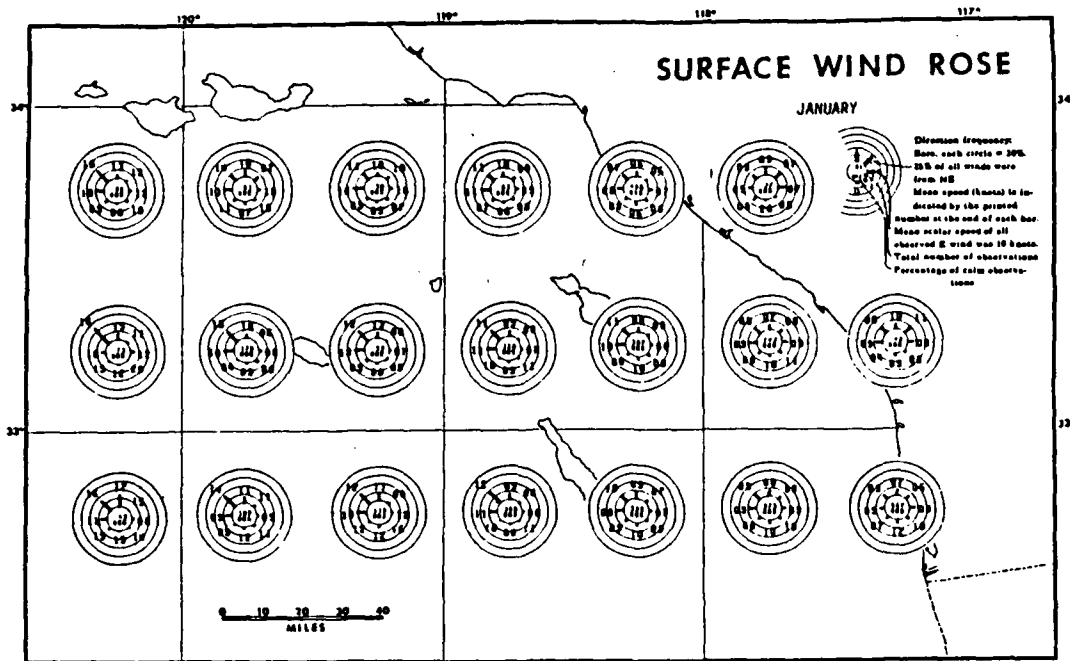
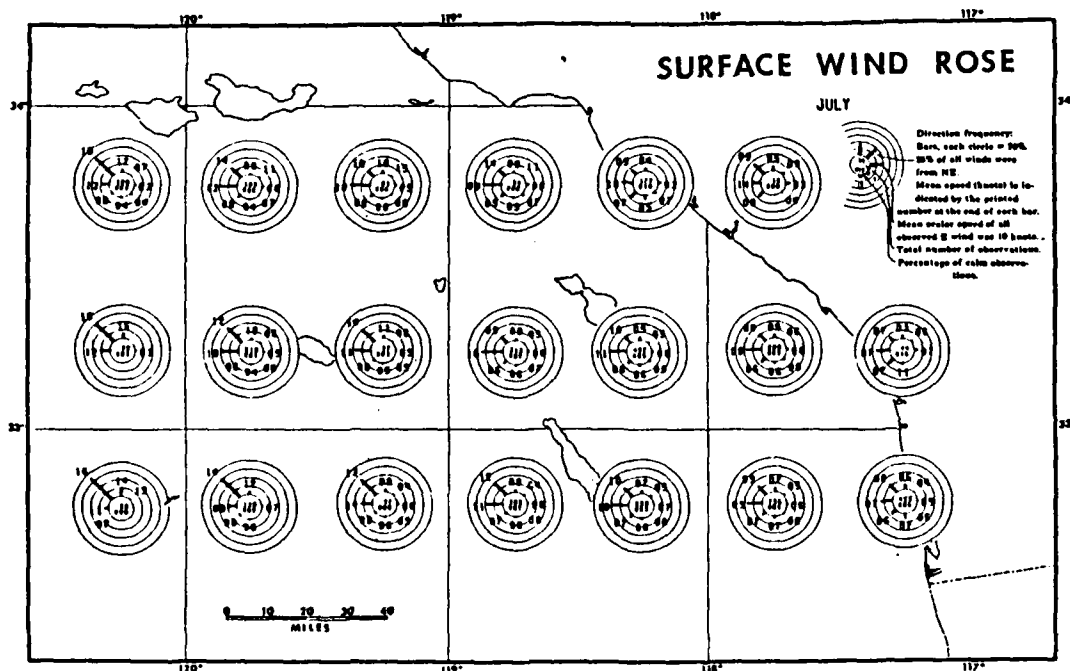


Figure 3.3 Isohyetal Contours, Southern California

Source: Goodridge (1981a)



Source: Climatological Study Southern California Operating Area



Source: Climatological Study Southern California Operating Area

Figure 3.4 Coastal Wind Roses
South Coast and San Diego Regions

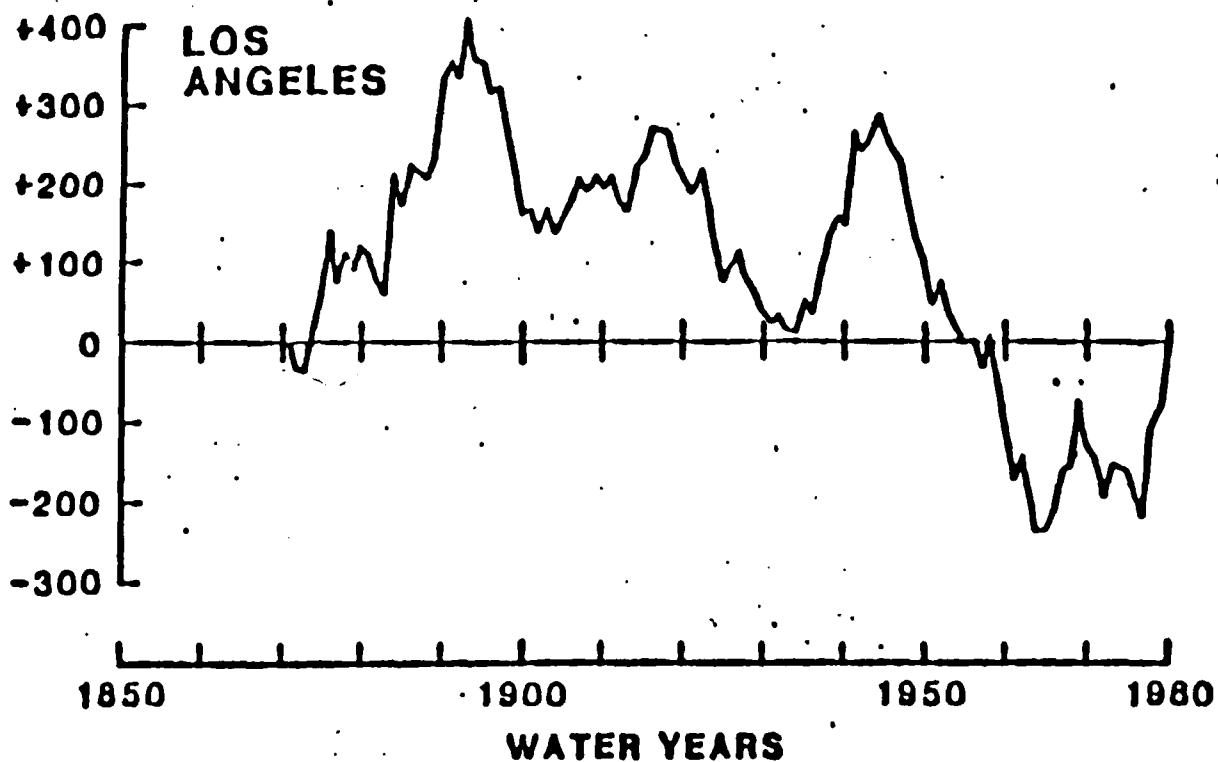


Figure 3.5 Cumulative Departure
from Normal Rainfall, Los Angeles

TABLE 3.1

Drainage Areas in the South Coast Region

Basin or Group	Littoral Cell	Drainage Controlled		Percent Controlled
		Area mi ²	Area mi ²	
Santa Monica Mtn Grp	Santa Monica	417	64	15
Los Angeles River	San Pedro	830	334	40
San Gabriel River	San Pedro	640	537	84
Santa Ana River	San Pedro	1700	1525	90
Laguna Hills Group	S. San Pedro Ranch	200	--	--
		<u>3787</u>	<u>2460</u>	<u>65</u>

Source: Brownlie and Taylor (1981)

Table 3.2

Precipitation at Selected Stations, South Coast Region

Location DRW no.	Elevation ft	Precipitation (inches)			Years of Record	Latitude / Longitude
		average	maximum	minimum		
Santa Monica 7950-00	66	14.4	32.4	6.3	47	34-00-43 118-29-27
Los Angeles 5115-00	269	15.1	32.5	4.92	108	34-03-10 118-14-13
Pasadena 6719-00	862	20.0	46.4	7.3	98	34-08-54 118-08-36
Opids Camp 6465-00	4752	38.9	89.1	13.9	47	34-15-18 118-05-41
Hoegees FC 4017-00	2650	37.2	80.5	13.7	52	34-12-30 118-02-00
Palos Verdes 6663-01	1276	12.8	28.4	3.5	29	34-46-43 118-20-36
Zuma Cyn 9990-11	1500	26.2	57.5	9.1	43	34-05-58 118-49-38
Santa Ana 7888-01	124	13.0	32.1	3.6	70	33-45-05 117-52-11
San Bernardino 7723-00	1125	16.7	42.9	6.0	110	34-07-40 117-16-00
Big Bear Lake 0742-00	6814	34.3	86.9	11.1	34	34-14-29 116-58-29

Source: Calif DWR Bulletin 230-81

Table 3.3

Mean Monthly Precipitation at Selected Stations, South Coast Region, inches

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Santa Monica	3.0	7.8	2.1	1.3	.09	.03	.03	.06	0.8	0.3	2.0	2.3
Los Angeles	3.0	2.8	2.2	1.3	0.1	.03	0.	.04	0.2	0.3	2.0	2.2
Pasadena	4.0	3.8	2.7	1.8	0.3	0.1	.01	.06	0.2	0.4	2.7	2.8
Hoegoes FC	7.4	7.0	5.1	3.7	0.6	0.2	.04	0.1	0.3	0.8	4.9	5.7
Palos Verdes	2.3	2.3	1.7	1.0	0.1	.04	0.	0.	.08	0.2	1.6	1.7
Santa Ana	2.6	2.5	2.0	1.3	0.2	.03	.02	.04	0.1	0.3	1.7	2.2
San Bernardino	3.1	2.9	2.5	1.6	0.5	0.1	.04	0.1	0.3	0.5	1.9	2.6
Big Bear Lake	5.9	5.2	5.6	3.6	0.8	.06	0.7	0.7	0.6	1.0	4.7	5.8

Source: Goodridge (1981a)

TABLE 3.4

Average Wind Speed, MPH, South Coast Region

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
Long Beach	5	5	6	7	6	6	6	6	5	5	5	5	6
Los Angeles AP	6	6	7	7	7	7	7	7	6	6	6	6	6

Source: Goodridge (1978)

TABLE 3.5

Average Wind Speed, MPH South Coast Region

Location	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm
Long Beach mean speed	3.6	1.3	2.5	2.3	4.7	3.0	4.4	3.1	9.2	4.6	3.6	2.1	9.8	8.9	10.1	3.5	23
Malibu mean speed	4.5	4.6	4.6	5.4	4.7	4.9	4.9	6.3	7.0	7.7	6.6	7.5	8.3	7.2	6.3	5.4	
	6.8	4.3	6.5	3.9	5.7	3.3	4.0	3.3	3.0	7.3	18.3	9.5	3.2	1.9	4.8	13.9	1
	6.3	2.4	2.5	3.2	3.5	3.8	4.1	3.0	3.4	4.3	6.9	6.7	3.1	3.2	5.8	5.7	

Source: Goodridge (1978)

TABLE 3.6

Percent High Wind, Peak Gust South Coast Region

Location	%>17k	%>27k	Peak Gust mph	Month of Max %>17k
Long Beach	0.9	0.01	44 (fastest mile)	Feb (1.8%)
Los Angeles	1.3	0.05	62 (fastest)	Feb (3.0%)

Source: Goodridge (1979)



TABLE 3.7
Major Storms in the South Coast Region

Date	Watersheds Affected	Remarks
Dec 1861 - Feb 1862	All	Heavy continuous rain, severe floods.
Feb 1884	All	Continuous rain, severe floods.
Jan 14-19, 24-29, 1916	All	Two severe storms, floods.
Dec 30-31, 1933	Los Angeles R	Fire-flood sequence, heavy downpour.
Sep 1939	All	Tropical storm.
Dec 27, 1940- Jan 7, 1941	All	Series of moderate to intensive storms.
Jan 15-18, 1952	All	3 days intense storm.
Jan 25-26, 1956	Southwestern	
Jan-Feb 1969	All	3 intense storms, well documented.
Dec 4, 1974	Santa Ana R	High 3 hr intensity.
Jan-Mar 1978	All	Series of storms, well documented.
Feb-Mar 1983	All	Series of storms.

TABLE 3.8

Selected Precipitation Gages, South Coast Region

Station	Agency	Period of Record	Type	DWR #	Other #	Remarks
Santa Monica SPRR	LAC	1879-1922	S	7950-70	F-635	
Artesia	LAC	1918-	S	0331-11	F208B	
Los Angeles CC	LAC	1872-	S, R	5111-04	F-716	Also F-577A, B, C, D, E at nearby locations.
Van Nuys	LAC	1905-	S	--	F-15A	
Colby's	LAC	1898-	S, R	1896-00	F-530	
Big Tujunga Dam	NWS/LAC	1917-	S, R	0798-00	F-46D, E	
Clear C School	LAC	1929-	S, R	1798-11	F-470	
Mount Wilson	DWR/LAC	1905-	S	6000-00	F-338A	
Glendora West	LAC	1883-	S	3452-00	F-18	
Falling Springs	LAC	1929-1974	S	2961-11	F-51	
Idylwild FD	RIV/NWS	1901-	SA	4211-00	5S/3E 07P01	
Beaumont	RIV/NWS	1888-	R	0606-00	35/1W-10P01	
San Bernardino Med Center	SBDO/NWS	1871-	S	7723-00	(SBDO) 146	
Riverside F.S.	RIV/NWS	1881-	S, R	7470-00	2S/5W-34P01	
Anaheim W.W.	OC	1880-	S, R	0194-00	33	

Source: Calif DWR Bulletin 230-81
 Los Angeles County (LAC) Dept of Public Works
 Orange County Environmental Management Agency (OC)
 Riverside County (RV) Flood Control and Water Conservation District
 San Bernardino (SBDO) Flood Control and Water Conservation District

TABLE 3.9

Selected Wind Gages, South Coast Region

Station	Agency/Type	Period of	#	Lat/Long	Remarks
Santa Monica	LAWR	1961-	----	34° 01' 118° 27'	4x per day.
Los Angeles	WBAS	1930-	23174	33° 56' 118° 23'	LAX, digitized 1947- hourly 1937-.
San Pedro NAS	NAS	1938-1947	93113	33° 45' 118° 15'	Hourly.
Malibu	SCAQMD	1957-1975	002W-ZUM	34° 1'9" 118° 49' 37"	Hourly, mag tape.
Los Angeles LAX	SCAQMD	1956-	013W-LAX	33° 56'24" 118° 23'45"	Digitized.
Venice	SCAQMD	1956-	014W-VEN	33° 59' 4" 118° 23'13"	Digitized to 1975.
Newport	SCQQMD	1956-	063W-NP	33° 36' 3" 117° 54'58"	Digitized to 1975.
Long Beach	WBAS	1957-	93106	33° 4' 118° 09'	Digitized.

Sources: National Climatic Data Center
 South Coast Air Quality Management District (SCAQMD)
 Art Lessard, National Weather Service

WBAS= Weather Bureau Airport Station

NAS = Naval Air Station

LAWR = Limited Weather Aviation Reporting Station

4.0 SOUTH CENTRAL REGION

The South Central Region includes portions of San Luis Obispo, Santa Barbara, Ventura and Los Angeles Counties. The extent of the South Central Region is defined by watersheds draining to the Morro Bay Cell, which extends from ragged Point to Point Buchon; the South Morro Bay Reach, which extends from Point Buchon to Point San Luis; the Santa Maria River Cell, which extends from Point San Luis to Point Sal; the South Santa Maria Reach, the Santa Ynez River Cell, which extends from about four miles south of Point Sal to Point Arguello; the Santa Barbara Cell, which extends from Point Arguello to the Mugu Submarine Canyon off of Calleguas Creek; and the South Santa Barbara Reach, which extends from the Mugu Canyon to Solromar. The littoral cells correspond to those defined in the Assessment and Atlas of Shoreline Erosion Along the California Coast (July 1977) and are shown in Figures 4.1, 4.2 and 4.3, taken from this document. The following sections give general meteorological information regarding the watersheds draining into these regions.

A. Drainage Areas

A.1 Drainage Areas and Sub-Areas

The South Central Region has four major river basins, three creek basins and two drainage groups. The river basins are those of the Santa Clara, Ventura, Santa Ynez and Santa Maria Rivers; and the creek basins are those of the Calleguas, San Antonio (Santa Barbara County) and Arroyo Grande Creeks. In addition, there are the Santa Ynez Mountains and the Morro Bay stream groups. These regions are shown on Plate 4.1 and some characteristics are listed in Table 4.1. For a more detailed description, one is referred to the companion report on hydrology.

A.2 Physiography and Topography

The watersheds draining to the South Central Coast Region are separated into two distinct regions. In the north, the coast runs northwest, and the drainage area is bounded by the Santa Lucia Mountains and the Caliente Range. South of Point Conception, the coast runs generally east-west and the watersheds are bounded on the north by the San Andreas Rift Zone, and on the east by the San Gabriel and Santa Susana Mountains. Other important ranges in the region include the Santa Ynez Mountains, the San Rafael Mountains and the Sierra Madre Mountains. For a more complete discussion, one is referred to the companion report on hydrology.

A.3 Climate of the South Central Region

A.3.1 General Features

While the climate of the South Central Region is generally classified as having a Mediterranean Dry-Summer Subtropical climate, the climate in fact varies considerably due to topographic effects. North of Point Conception, the coast and coastal mountain ranges run in a northwesterly direction; south of Point Conception, they run in a generally east-west direction. Because of the typical storm approach and the prevailing northwest winds, the two regions exhibit somewhat different climatic features.

Along the coast, temperatures are controlled by the cool ocean temperatures, and the temperature range is small. Average coastal winter temperatures are about 53°F, and average summer temperatures run from 69°F in the south to 63°F in the north. Inland, however, there are much greater variations. In the upper Santa Maria River Watershed, it is usually hot and dry in the summer and much colder in winter. Daily temperature ranges differ by region as well. On the coast, the range is about 14°F in July and varies from 15°F in the north to 22°F in the south in winter. Inland, the temperature range is as high as 42°F in

summer and 30°F to 35°F in winter. The extremes are greatest in the "Cuyama Badlands" of the Cuyama River watershed.

An important part of the climate of this region is the marine layer, which allows the development of low stratus clouds and fog along the coast, especially at night and in the morning. The low cloud development is especially prevalent in coastal areas and in coastal valleys near the Santa Maria, Santa Ynez and Santa Clara Rivers. The marine layer is responsible for the cool, moderate temperatures along the coast, and is caused by the cold surface waters off the coast in the region. Typically in the northern coastal areas, five days per month have fog in winter, whereas twenty days per month are foggy in the dry season. In the southern coastal area, fog is less prevalent, but on the average twenty days per month exhibit low overcast conditions in the dry season.

A.3.2 Typical Storm Patterns

The main synoptic feature controlling the weather in the South Central Region is the North Pacific High, the location and intensity of which affects storm tracks associated with low pressure cells. In winter, the Pacific High is often weak and moves south, allowing storms to move in from the west or northwest.

Most rain is associated with winter cold fronts, of which there are two main types: the high-latitude type, in which a blocking high-pressure cell builds east of 160°W and the storms approach from high latitudes, and the low-latitude type, in which blocking takes place between 160°W and 180°W, and storms, often developing in the Hawaiian region, approach from lower latitudes.

Thunderstorms are rare in the coastal areas, but occur occasionally in summer and fall in the inland mountain areas. Thunderstorms in the area are generally of low intensity, with relatively light rainfall, so that forest fires started by the associated lightning strikes are not uncommon.

Tropical storms in the region are extremely rare, but occasionally a dissipating storm approaching from the south will cause local perturbations in the weather. In general, one will find increased thunderstorm activity as humid air associated with the storm moves into this region, but the thunderstorms are usually confined to lower latitudes.

A.3.3 Precipitation Patterns

Precipitation patterns are more complex in the South Central Region than in the San Diego and South Coast Regions. There are strong orographic effects near the coast and along the coastal ranges, and there tends to be a general trend towards increasing rainfall to the north, but topographic effects result in some interesting deviations from the usual trends.

Figure 4.4 shows isohyetal contours of mean annual precipitation in the region. In general, these reveal strong orographic effects, especially in the

coastal areas. There is, however, one region at relatively high altitude with much less rainfall than the surrounding areas--the "Cuyama Badlands." This area lies behind the barrier of the Sierra Madre Range ("behind," in the sense that it is in the lee, with respect to prevailing winds and typical storm tracks); as a result, approaching storms lose much of their moisture in passing the coastal ranges, and have a lower precipitation potential in this region.

The generally increasing precipitation in the northerly direction is broken by the Santa Ynez Mountains and the change in coastline direction at Point Conception. The coastal precipitation averages increase from 14 inches in the Oxnard area to more than 20 inches west of Santa Barbara, which lies at the foot of the Santa Ynez Mountains, drop to below 14 inches at Santa Maria, then rise again to 16 inches in the Morro Bay Area. Typical precipitation values at selected stations are shown in Table 4.2. Note that Ozena, in the "Cuyama Badlands" has an annual average of only 13 inches despite being located at an elevation of over 3700 feet. One can see another feature of the rainfall in this area in Table 4.2--the wide variation in the extremes. Generally, the maximum annual value is more than twice the mean, and the minimum is usually about 30% of the mean. This is due to the intermittency of rainfall in the region. It is not unusual for one storm to bring more rainfall than might be measured in an entire season another year.

A.3.4. Seasonal Precipitation

As was mentioned previously, most precipitation in the South Central Region is associated with winter cold fronts. Typically, 90% of all precipitation occurs during the months of November through April. Table 4.3 shows mean monthly precipitation at selected stations in the region. Note the almost total absence of rainfall in the summer months. Unlike areas further south, which are occasionally subject to influxes of moist tropical air in the late summer, sometimes producing thunderstorms, this area shows only a very slight increase in precipitation at higher elevations in early fall (Juncal Dam, and Ojai), indicating that thunderstorm activity in the region is less intense than in areas to the south.

It is to be noted that in most areas of the South Central Region, snowfall is extremely rare, and that almost all precipitation is due to rainfall. Exceptions are in the higher elevations of the San Rafael Mountains and in the Mount Piños area, where snowfall is common in the winter, and often lasts several weeks, especially on northern slopes.

A.3.5 Precipitation Frequency

Precipitation frequency for given intensities and durations is important in this region because of the intermittent nature of precipitation, and the large year-to-year variation. There are two excellent sources of data on this subject. One is the NOAA Precipitation-Frequency Atlas of the Western United States, Volume XI-California. This atlas provides isopluvial contours for

6-hour and 24-hour precipitation with 2-year to 50-year return periods.

The second source is the California Department of Water Resources publication "Rainfall Depth-Duration-Frequency for California", Goodridge (1981). This publication contains measured intensities and depth-duration-frequency tables for many stations in California.

In general, the intensities are dependent upon elevation, with the lowest near the coast and highest in the mountain areas. For detailed information, the reader is referred to the above sources.

A.3.6 Coastal Wind Regimes

The basic airflow in the South Central Region is northwesterly, which is due to the eastern North Pacific High. This high is dominant in summer, but moves south and weakens in winter. Winter winds are still primarily from the northwest, but are modified by passing fronts and other meteorological disturbances. East and southeast winds are common as storms approach, and often veer to the southwest or west with the passage of the storm's cold front.

While the general flow trend is from the northwest, local topography results in local variations. The most prominent feature is the change in coastline direction at Point Conception and the Channel Islands which result in a more westerly flow in the Ventura area, and almost southwesterly in the Santa Barbara area (Figure 4.5). The Channel Islands form something of a barrier to surface winds, and tend to "funnel" the prevailing winds along the southern part of the region.

There is a similar effect at Point Estero above Morro Bay, but the change in coastal direction is not as radical or pronounced as at Point Conception, so the effect is reduced. In addition, coastal topography north and south of Point Estero is characterized by coastal hills and mountains which rise out of the sea and tend to prevent direct onshore flow.

The basic pattern of the prevailing winds is often modified by several synoptic conditions. These are discussed in the section which follows.

A.3.7 Land-Sea Breeze

An important factor in the wind pattern of the South Central Region is diurnal variation. The strong land heating results in a strong landward pressure gradient, especially during the late spring and summer, and particularly in the basins of the Santa Maria, Santa Ynez and Santa Clara Rivers, which are relatively flat in the coastal areas. At night, the land surface radiates heat, and a seaward pressure gradient develops. These local gradients are superposed on the larger synoptic scale gradients, and result in diurnal variations in wind patterns. The land-breeze is strongest in winter (Figure 4.6, from DeMarrais et al. 1966).

A.3.8 North Pacific Storm Winds

The basic wind pattern is altered by the passage of storms and other weather disturbances, most of which arrive in the winter months. Weather fronts are normally the most prominent feature associated with these storms, and are either occlusions or cold fronts, with the occlusions tending to acquire the characteristics of cold fronts as they move southeastward over Southern California. Although there is no simple typical flow pattern associated with fronts, there are often strong, and sometimes damaging easterly or southeasterly winds as the front approaches. As the storm moves inland, these winds tend to veer to a southerly, southwesterly or westerly direction, and high winds may once again occur. Wind speeds on the order of 20 to 25 mph are not unusual during the passage of storm fronts, and occasionally the sustained speeds are much higher. Storms associated with warm fronts are much rarer and are usually associated with low-latitude type storms. According to DeMarrais et al. (1966), these storms usually lose their identity as warm fronts as they approach the coast.

A.3.9 Santa Ana Winds

A very important climatic feature of the area are the Santa Ana winds which can develop at any time of the year. These warm, dry, foehn-type winds originate from a high-pressure center which develops over the Great Basin, often a day or so after the passage of a cold front. The winds are particularly dangerous in late summer and fall, at the end of the dry season, when they can produce extreme fire danger in the chaparral areas of the inland and costal mountains.

Local topography is an important factor in the wind pattern. Figure 4.6 shows a typical Santa Ana wind condition in the region. Note the flow reversal in the Santa Barbara area, and the intense flow down the Santa Clara River Basin. North of Point Conception, the costal and inland ranges often block or alter the wind pattern, but warm, dry conditions are often prevalent during Santa Ana wind conditions, even when winds are not intense in this region. In the case shown in Figure 4.7, winds are light in the Santa Barbara area, but this is not always the case. Intense north and northeast winds can sweep down the mountain passes in this area as well. Winds are typically 20 to 30 mph in canyons, but can approach 100 mph during intense storms.

Another warm, dry wind, which often occurs during the late afternoon or early evening of a warm day is the "Sundowner" (as it is locally known). This northwest to north wind is of the foehn type, exhibiting many of the characteristics of the Santa Ana, including hot, dry air and very high fire danger. Sundowners originate as a high pressure nudges onto the coast of San Luis Obispo (but not all the way into the Great Basin, as occurs in Santa Ana conditions), and the winds blow southward through inland valleys and over the costal ranges. Sundowners, which are normally much more brief than Santa Anas, are most prominent in the Santa Barbara area in the late spring and summer. A legendary Sundowner occurred in Santa Barbara on June 17, 1859, when temperatures (according to unsubstantiated reports) briefly shot up to over 130°F.

A.3.10 Winds and Severe Weather

Coastal severe weather is rare in this area, but intense winds can occur. Tornadoes and waterspouts are a rare occurrence (a tornado was reported in the San Luis Obispo area in 1926). Thunderstorms are not uncommon inland in late summer and fall, but are rare on the coast and are usually not very intense. Dissipating tropical storms are extremely rare in this region.

A.3.11 Topographic Effects on Coastal Winds

As noted previously, the change in coastline direction at Point Conception has a profound effect on the wind patterns in the South Central Region. There are other effects as well. The basins of the three major rivers in the region are neatly aligned with the prevailing winds, so that the winds are able to blow up the river valleys. The result is rather strong, persistent winds from the sea at the mouths of the Santa Maria, Santa Ynez and Santa Clara Rivers, and the San Antonio Creek (Santa Barbara County). These winds are very important in the transport of beach sand. There are large dunes in the northern coastal areas, especially near the Santa Maria River (Pismo Beach) and San Antonio Creek. In the Oxnard area, wind transport of sand is often a problem in residential areas built too near the coast (Inman, 1980).

A.3.12 Wind Intensity and Frequency

Tables 4.4, 4.5 and 4.6 summarize the wind intensities and frequencies for these regions. These data are taken from Goodridge et al. (1979) and Goodridge (1978).

As can be seen from Table 4.4, the seasonal variation is not great for the mean wind speed for the stations shown. However, the mean speed at Port San Luis is 12 mph in late spring and summer and 5 mph in late fall and winter. High wind speeds are seasonally dependent, (Table 4.6), except in the Santa Barbara area which is partly sheltered from the prevailing northwest winds by the Santa Ynez Mountains.

The effects of topography previously mentioned can be seen in Table 4.5, especially in the wind direction frequencies. The high average wind speeds north of Point Arguello should also be noted, as these are very important in the transport of sand on the beaches.

B. Historical Perspective

B.1 Historical Outline of Wet and Dry Periods, South Central Region

The most comprehensive treatment of the historic rainfall record prior to recorded measurements was done by Lynch (1931). Included in his work is a rainfall index for the Santa Barbara area from 1850 to 1930. His work indicates that the period from 1850 to 1882 was generally dry, despite the floods of 1862, as was the period 1894 to 1904. The period 1882 to 1894 was generally wet.

Figure 4.7 shows the cumulative deviation from mean precipitation at Ventura, which indicates a very wet period from 1906 to 1918, and very dry periods from 1918 to 1935 and from 1944 to around 1966.

The extreme variability is an important feature, as very wet years often arrive in the middle of a dry period. Conversely, wet periods tend to contain several dry or very dry seasons.

B.2 Historical Outline of Major Storms in the South Central Region

There is no definitive history of storms in this region, and early accounts are qualitative in nature. The following is a brief outline of some important storms in the South Central Region.

B.2.1 Rain Storms

The floods of 1825 and 1862 were severe, but there are few storm descriptions. The 1862 flood is generally described as being the result of 30 to 60 days of continuous rainfall. Table 4.7 lists some of the major storms in this region.

Many of the storms cross regional boundaries, and cause flooding in large areas. Some were particularly severe in relatively localized regions, such as the 1907 storm which caused a record flood on the Santa Ynez River, the January 1914 storm in Santa Barbara, or the 1967 storm which caused severe flooding in the Santa Barbara and Ventura areas, especially in the coastal areas.

B.2.2 Wind Storms

Wind storms are much less documented, largely because they seldom cause much economic damage. Wind storms are often associated with large rain storms, such as the 1983 storms. Some important wind storms in the region include the May 2-3, 1926 gale, which affected much of the coast south of Point Conception. Kuhn and Shepard (1981) report that a severe Santa Ana wind on June 17, 1859 drove air

temperatures over 130°F near Santa Barbara. Severe Santa Ana winds have also been associated with major forest fires, such as the September 1955 Refugio fire in Santa Barbara, and the October 1967 fires in the Santa Clara River basin.

C. Data Search and Retrieval Efforts

C.1 Technical Approach

Data were collected from a number of governmental and public organizations. Previous reports and documents on similar topics were located and examined as part of the literature search. These documents often contained or referred to data, whose original sources were noted. Government and public agencies were then contacted, and in many cases visited.

The following is a general description of data sources relevant to the South Coast Region.

San Luis Obispo County Air Pollution Control District

Relevant data include:

Wind data at two coastal stations. Hard copy and computer files.

People contacted include:

Paul Allen (Meteorologist) (805) 549-5912

San Luis Obispo County Flood Control and Water Conservation District

Relevant data include:

Precipitation data, with hourly data (hardcopy) and summaries (daily, intensities) etc. on hard-copy and computer. Charts of recording gages also maintained.

Streamflow: daily averages on hardcopy and computer (recent only).

Hydrographs at selected stations maintained.

No debris, sediment or fire records are maintained.

People contacted include:

Ann Hall (precipitation, streamflow)
(805) 549-5273

Glenn Britten (precipitation, streamflow)
(805) 549-5268

Santa Barbara County Air Pollution Control District

Relevant data include:

Wind data at five coastal stations.

Most data are unreduced, unverified.

People contacted include:

Don Jones (meteorologist) (805) 964-8658

Santa Barbara County Flood Control and Water Conservation District

Relevant data include:

Precipitation data, in hard copy form; charts available from recording gages.

Limited data on debris basin cleanouts, sedimentation in the Goleta Slough. Streamflow data are limited; U.S.G.S. now maintains all stations in the County.

People contacted include:

John Fertig (debris, sedimentation) (805) 963-7125

Wayne Smith (precipitation)

Phil Holland (precipitation)

James Stubchaer (manager)

Ventura County Air Pollution Control District

Relevant data include:

Wind data from two coastal stations.

People contacted include:

Evan Shipp (meteorologist) (805) 654-2668

Ventura County Flood Control and Water Resources Department

Data include:

Precipitation--hard copy and on computer data base.

Streamflow--hydrographs and daily measurements, hard copy and on computer data base.

Debris basin cleanout data.

Beach profiles made monthly.

People contacted include:

Dolores Taylor (streamflow, precipitation)
(805) 654-2014

Fran Solis (beach profiles) (805) 654-2906

Bill Doré (computer data) (805) 654-2908

Southern California Edison Company

This organization maintains wind monitoring equipment at the San Onofre Nuclear Generating Station (S.O.N.G.S), as well as at the Oxnard, Ventura, El Segundo, Los Alamitos and Huntington Beach coastal power plants. Except at S.O.N.G.S., data are of questionable value.

People contacted include:

Stan Marsh (Meteorologist) (818) 302-1189

Los Angeles County Department of Public Works (Formerly Flood Control District)

The data available at this agency include:

Precipitation data, with both hourly data and the original charts or punch tape from recording gages;

Streamflow data, with both daily and charts or punch tape from recording gages;

Debris data, including hand-entered tables of the quantities of debris stored and removed from debris basins;

Streamflow and precipitation data are on microfilm up to 1977. The most recent publication covers the 1975-77 period.

People contacted include:

John Mitchell, Head, Operations Section (213) 226-4190

Don Carpenter (rainfall), Hadi Nourzi (fires, debris)
(213) 226-4184

Tom Alexander (fires, debris), Ed Dingman (streamflow),

Bob Sarasua (streamflow records) (213) 226-4184

Chris Bredehorst (frequency analysis) (213) 226-4089

California Department of Water Resources

Data from this agency include:

Streamflow, with data available in the Water Data Information System (WDIS). Data are available on microfiche (least expensive) and electronic form.

Precipitation, also available on WDIS.

Wind data are available in limited form, as it is gathered only in conjunction with particular contracts.

People contacted include:

Bill Mork, State Climatologist (916) 445-5800

California Air Resources Board

Data available from this agency include limited wind data, although the agency now maintains few stations relevant to this study. Occasional measurements are made in conjunction with particular projects. Some data are received from Air Pollution Control Districts, but are more readily available from these agencies.

People contacted include:

Dale Secord, John Kinney and Art Lorenzen (Sacramento)
(916) 322-6206

National Weather Service, Los Angeles

Data available from this agency include coastal wind speed and direction with hourly and three-hourly averages. The hourly data are reported to the

National Climatic Center. The three-hourly data are kept for several years, then discarded (these data are from harbor masters and lifeguards). Data are in tabular form.

People contacted include:

Art Lessard (Chief Meteorologist) (213) 209-7215

Other individuals contacted include:

Robert de Violini, Climatologist, Pacific Missile Range, U.S. Navy, Pt. Mugu; (805) 989-8383

Don Tuttle, Humboldt County Public Works, Natural Resources Division (Coastal Storm History); (707) 445-7741

Gerald Kuhn, Scripps Institution of Oceanography, (Coastal History); (619) 452-4856

Prof. Gary Griggs, University of California, Santa Cruz (Coastal Storm History); (408) 429-2403

There are several reference libraries in the South Coast Region which are extremely helpful. These include:

University of California, Los Angeles Water Resources Archives, Beth Willard, Librarian (213) 825-7734

This reference library has an extensive collection of publications, manuscripts and material relevant to this study. There is a large collection of uncataloged documents from local agencies as well. In addition, material not available at the UCLA Water Resources Archives can usually be obtained from the University of California, Berkeley through UCLA. Sources are well cataloged and easy to find.

California Department of Water Resources, Southern Division, Los Angeles

The records and documents section combine an extensive collection of California State publications. In addition, there is a large collection of relevant documents and publications from local and federal agencies, including the County Flood Control Agencies. Sources are well cataloged and easy to find.

California Institute of Technology Libraries

Extensive collection of relevant journals and some federal and state publications. The best sources are the Environmental Engineering Library, Keck Laboratory, and the Engineering Library (Millikin Libraries). Unfortunately, the collections are spread out over several buildings and a certain amount of searching is often required.

University of California, Los Angeles Engineering Library and Geology Library

These two libraries have extensive collections of relevant journals. The Engineering Library has vast holdings of Weather Bureau/Weather Service publications. The geology library has all relevant U.S. Geological Survey Water-Supply Papers and Water Resources Data (as does the Water Resources Archives, where they cannot be checked out) and other U.S.G.S. publications. Both are excellent sources for reference material.

National Weather Service, Wilshire Federal Building

The reference room (normally closed to the public) has an extensive, uncataloged collection of relevant publications, including out-of-print publications and unpublished documents. Wind data are also available.

U.S. Army, Corps of Engineers, Los Angeles District Library

This library has most Corps of Engineers publications, including Beach Erosion Board and CERC publications. Some publications from local and state agencies are also available, as are some U.S.G.S. Water-Supply Papers. References are often miscataloged and difficult to find.

C.2 Meteorological Data Available

Tables 4.8 and 4.9 list some significant rainfall and wind gages in this region. More detailed and complete lists appear in Appendix C. Tables 4.8 and 4.9 are provided as a quick reference.

C.2.1 Precipitation

There are over 350 present and discontinued rain gages in the South Central Region. Of these, most are maintained cooperatively with county flood control agencies, and data are available at these agencies. Table 4.8 lists some of the stations with very early records.

Because of the importance of these data, the data are often available through several sources. The following is a description of the better data sources.

C.2.1.a San Luis Obispo County Flood Control and Water Conservation District

A list of the more than 95 gages maintained by this agency is included in Appendix C. The agency maintains records of daily precipitation for all stations. Post-1980 data are on computer files; the rest are in tabular form.

Charts from recording gages are maintained. Monthly totals are also available on computer files. Intensity data are taken from recording gages and maintained. Note that there are only nine recording gages maintained by this agency.

C.2.1.b Santa Barbara County Flood Control and Water Conservation District

Records of more than 120 recording and 120 non-recording gages are maintained by this agency. A list of these gages, updated by Phil Holland for this study, is included in Appendix C. Daily records are maintained in tabular form for all gages. Charts or digitized tapes of recording gages are also available. To obtain the data, normally a specification of the gage or gages and period of record are needed. No data are maintained on computer files.

C.2.1.c Ventura County Flood Control and Water Resources Department

This agency maintains records of 98 rain gages, including 41 recording gages. Fifteen gages are storage type, located in steep, rugged terrain and are read once or twice a year. Recent data are on computer files, and tabular records are maintained on all gages. In addition, recent hourly rainfall and intensity data are now on computer data files. Normally, the data can be obtained by specifying the gage or gages and a period of record.

C.2.1.d Los Angeles County Department of Public Works

Formerly the County Flood Control District, this agency maintains about 35 rain gages in the upper Santa Clara watershed. Daily measurements from this agency are available in tabular form. In addition, data up to 1978 are kept on microfilm, including rainfall charts. Intensity data are available in tabular form, and are updated annually. Data are available by specifying the station and the period of record. A list of gages and some examples of the data available are included in Appendix C.

C.2.1.e California Department of Water Resources

This agency maintains few stations, but now keeps records of over 4000 stations in California. Goodridge (1981a) has compiled microfiche files for these stations, and these data are being submitted under a separate cover. In addition, updates for 1981 through 1983 provided by William Mork are also being submitted under a separate cover.

These data include monthly precipitation for the period of record, among with useful calculated values (average, departure from the average, cumulative

departure, etc.). A second record includes monthly frequency data, with return periods from 0.01 to 10,000 years.

In addition, Goodridge (1980, 1981b) has published in microfiche form measured maximum daily rainfall for over 1100 gages and depth-duration-frequency data from 689 recording and 853 non-recording gages. The former publication includes maximum daily rainfall by month. The latter includes measured intensities from 5 minutes to 60 days by month and year, and includes a frequency analysis.

The above microfiche files are extremely useful for examining rapidly the data characteristics of a particular gage. The latter two publications concentrate on older stations, and are helpful in finding long term records.

The California Department of Water Resources has also published a list of precipitation gages (Bulletin 230-81). Relevant portions of this document are reproduced in the Appendix. Note that these lists often contain errors; it is best to use the list to locate stations in an area of interest, then to find the stations through the agency lists provided in the Appendix.

C.2.1.f National Weather Service

Hourly precipitation for National Weather Service recording gages is now available on microfiche and magnetic tape for data from 1940 to the present. In addition, fifteen-minute recordings from 1971 to the present are available on magnetic tape. The hourly data, as well as daily, monthly and annual data, are available from the National Climatic Data Center. The complete list of data available is lengthy, and will not be repeated here. For reference, see the Selective Guide to Climatic Data Sources, Hatch (1983).

C.2.2 Wind Measurements Along the Coast

In contrast to the precipitation gages, the coastal wind stations are few in number and have relatively short records. A list of the important gages is shown in Table 4.9. The following is a discussion of data available.

C.2.2.a National Climatic Data Center

The publication Index of Original Surface Weather Records for Stations in California, National Climatic Data Center, gives details of the data available for the first nine stations in Table 4.9. The most complete stations (Santa Maria, Vandenberg, Santa Barbara and Point Mugu) have hourly averages of wind speed and direction dating as far back as 1929. Note that Santa Maria is included mainly for the record length in this region, but that the station may be too far inland to give more than an estimate of coastal winds.

Data for these stations is available through the National Climatic Data Center. Data are available on microforms and magnetic tape.

C.2.2.b Air Pollution Control Districts

The San Luis Obispo, Santa Barbara and Ventura County Air Pollution Control Districts maintain coastal wind stations listed in Table 4.9. These are all relatively recent stations; however, in all cases both hourly and strip chart data are available. For the Santa Barbara County stations, most data are kept unreduced and unverified. These data are available through respective agencies.

C.2.2.c Other Sources of Wind Data

There are several other sources of coastal wind data, although these data generally are not necessarily verified and in many cases exist only in "raw" form (i.e., charts). Southern California Edison Company (Stan Marsh) has coastal wind data (charts) available at Oxnard and Ventura. Pacific Gas and Electric Company (Bob Swanson) maintains a wind data station at Diablo Canyon (1973-present). In both cases, these are relatively recent data and are not verified, so the value may be limited. The California Air Resources Board has done short term studies, including one near Carpinteria, where wind measurements were made near the coast. These studies are generally for periods of less than one year, and may also be of limited value.

C.2.3 Other Relevant Data Sources

Summaries of wind data are available in the Department of Water Resources Bulletin 185, Goodridge (1978) and in Goodridge et al. (1979). In addition, climatic summaries available through the National Climatic Data Center (ref. Selective Guide to Climatic Data Sources). Additional data summaries are available in Climatological Study, Southern California Operating Area, Naval Weather Service Command (1971) available on microfiche (NTIS # AD-721-117). In addition, data records and summaries are available for Point Mugu (Robert de Violini).

C.2.4 Related Topics

Precipitation hyetographs are generally not available, except those done for specific studies. However, charts from recording gages, or the digital tapes, are almost always preserved. The digital tapes have the advantage of allowing computer processing; however, they in general record only to the nearest 0.1 inch.

Historical data for wind are extremely limited in this region, with only a few stations with more than 50 years of data. Of more concern is the fact that where the data are most needed (the coastal dune area near Pismo Beach), there are no records kept.

D. Data Gaps and Limitations

There are few precipitation stations, and fewer still with long records, in the Morro Bay Group. Although this area represents a small fraction of the region, the lack of data in this area may be limiting. Most other areas in the South Central Region are adequately covered.

Again, data summaries are available through the California Department of Water Resources for commonly needed precipitation statistics. These summaries can be extremely useful in aiding the initial phases of a study.

Wind data along the coast are limited, and this is a serious shortcoming, since transport of sand by wind is very important in this region, especially in the Oxnard and Pismo Beach areas. The Oxnard area (Pt. Mugu) has good records available, as does the Vandenberg area, but the Pismo Beach area is not well covered (except for very recent measurements at Grover City). Records at Santa Maria may help here, but the station is well inland.

As is true in other regions, there is no definitive storm history of this area. Although there are accounts of very recent major rainstorms, there is little in the way of wind storm history. An effort should be made to develop some sort of wind storm history, as well as rain storm history. In part, this could be done using digitized wind data (when available) and algorithms designed to look for extended periods of high wind. Other historical sources, such as newspapers, should be examined to develop a history as far back as is possible. Available meteorological data (such as weather maps) for the storms identified could then be examined to develop a meteorological history of storms. A study of this sort would be a significant contribution, and would aid in the development of statistics regarding severe weather patterns.

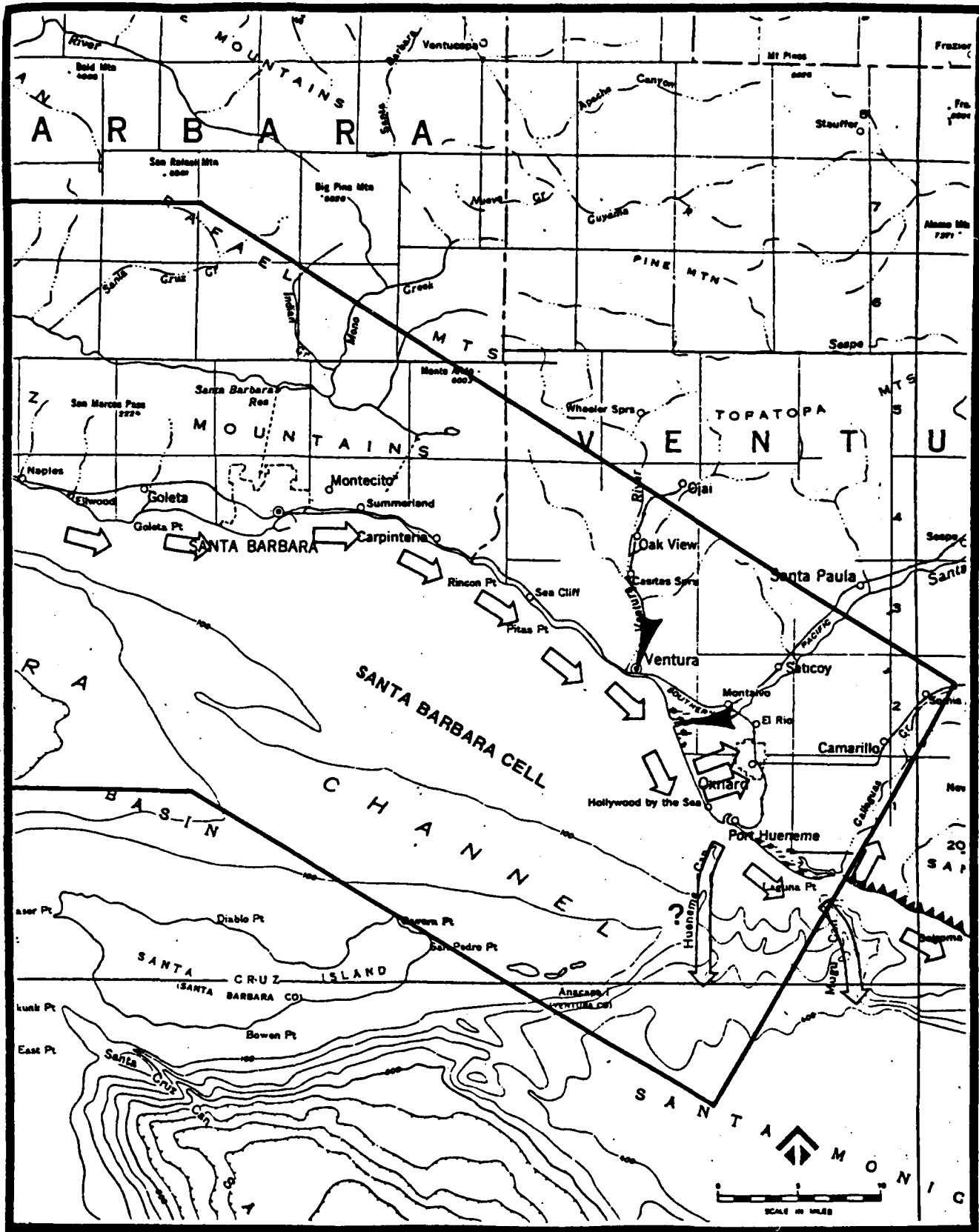


Figure 4.1 South Central Region

Source: Calif. DNOB Atlas of Shoreline Erosion

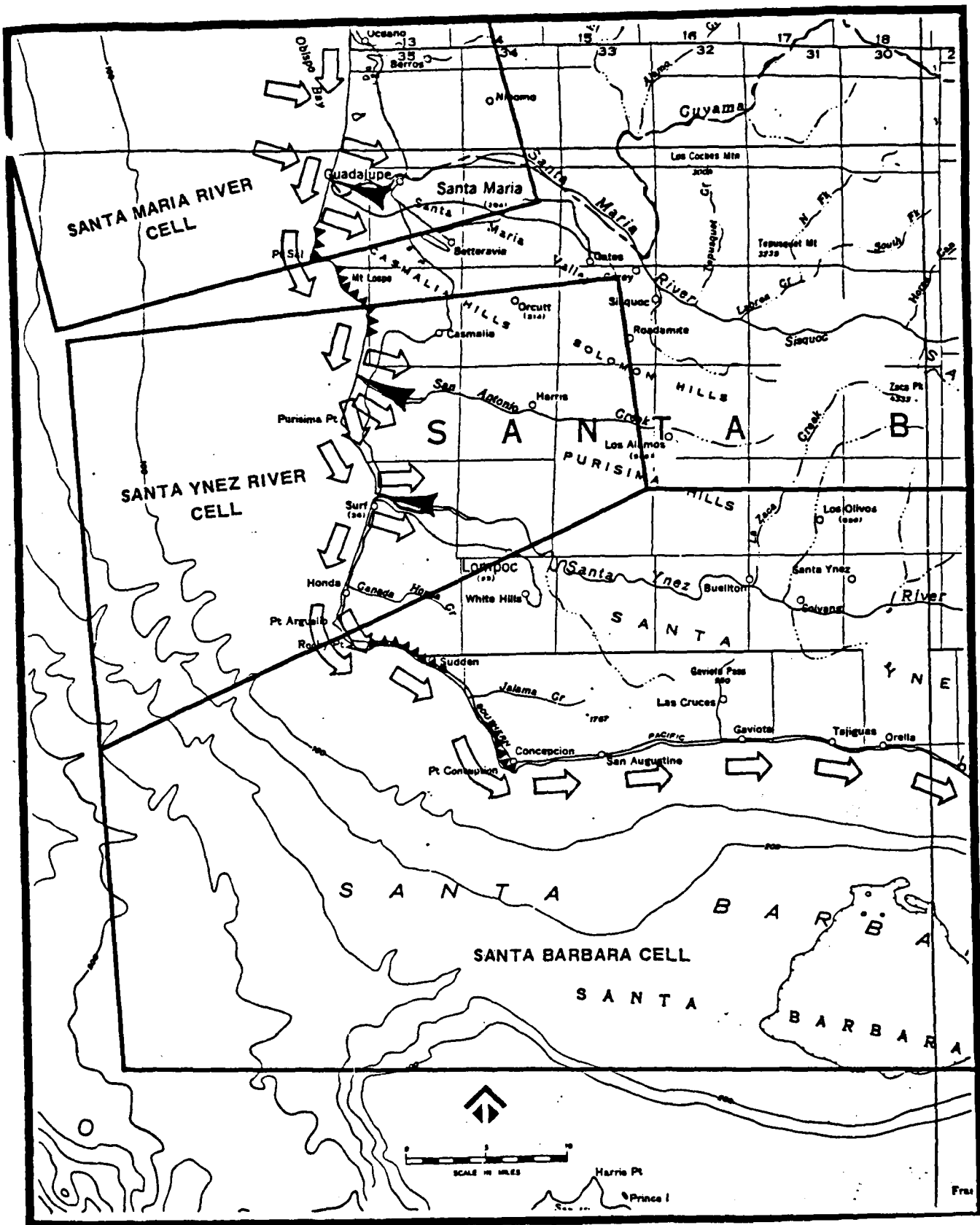


Figure 4.2 South Central Region

Source: Calif. DNOB Atlas of Shoreline Erosion

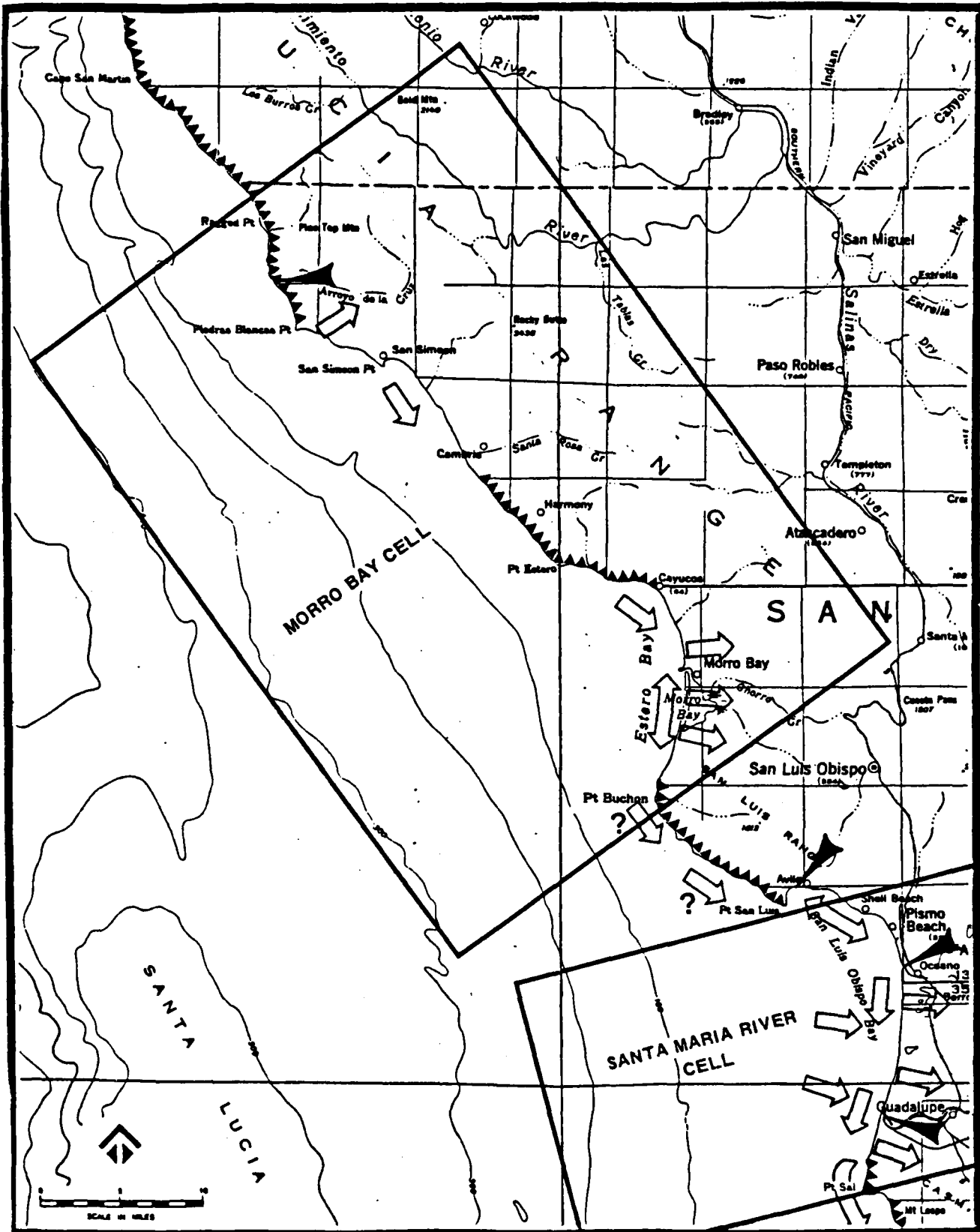


Figure 4.3 South Central Region

Source: Calif. DNOB Atlas of Shoreline Erosion

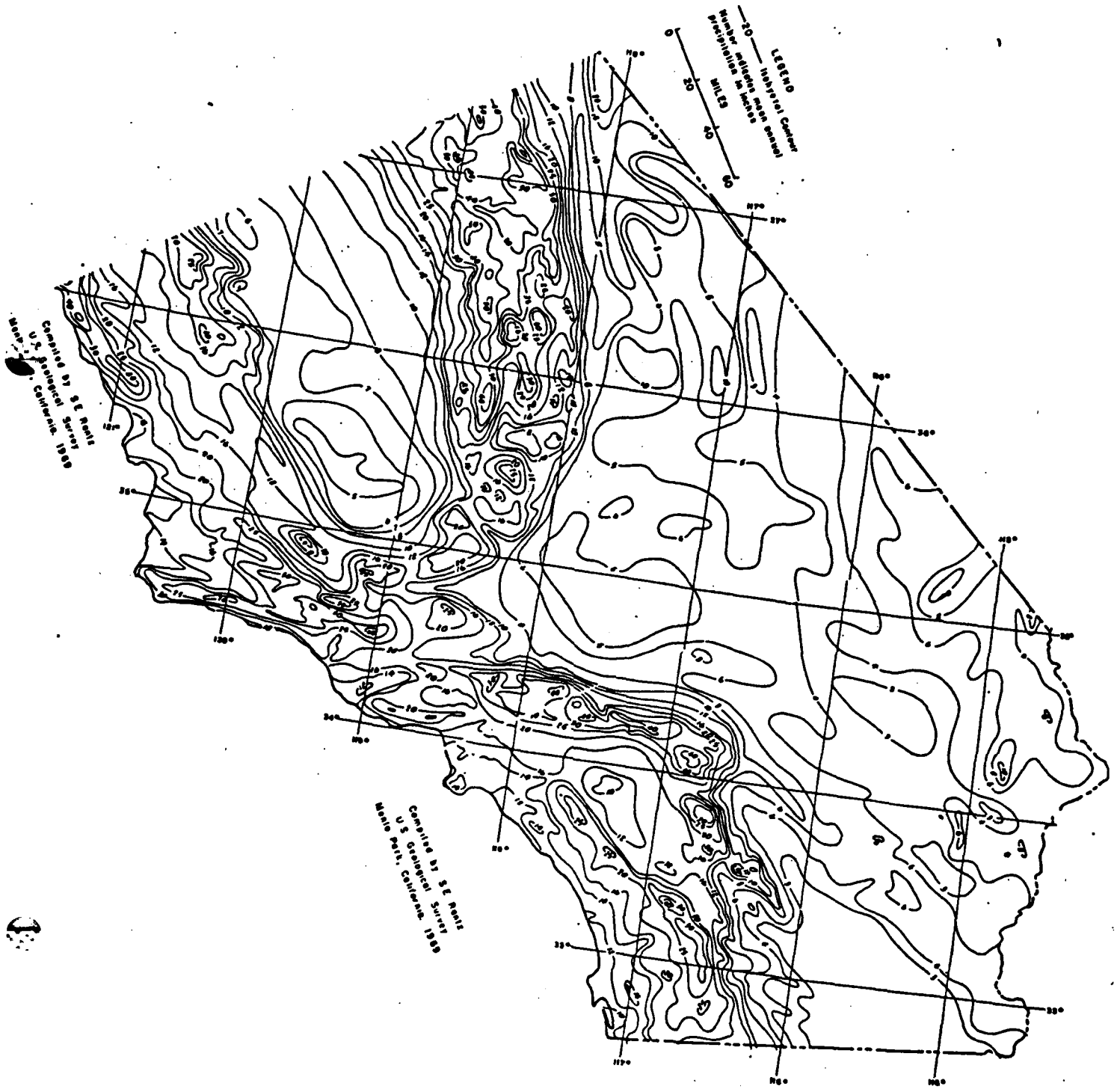


Figure 4.4 Isohyetal Contours, Southern California

Source: Goodridge (1981a)

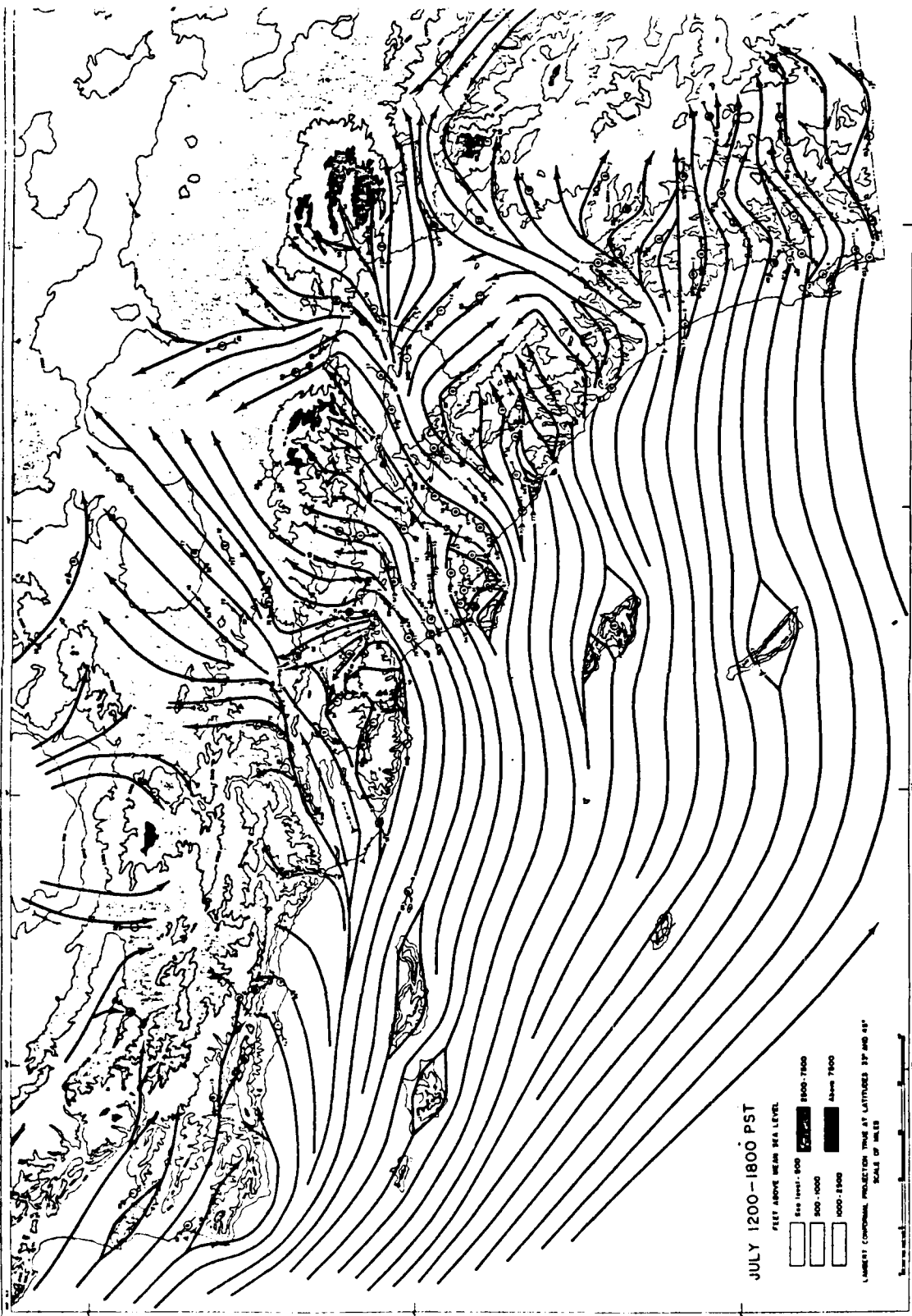


Figure 4.5 Typical Summer Streamlines,
 South Central Region

Source: DeMarrals et al. (1965)

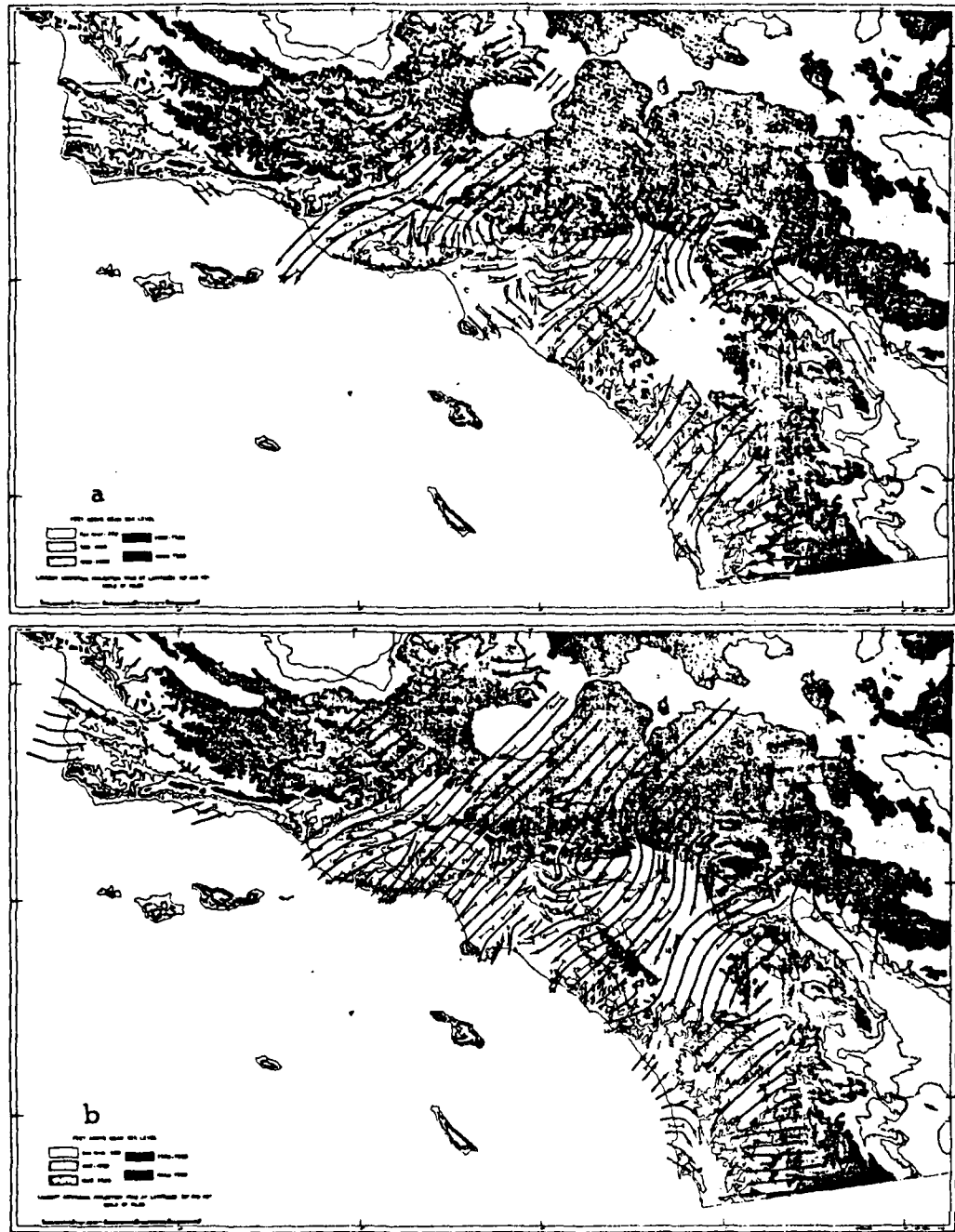
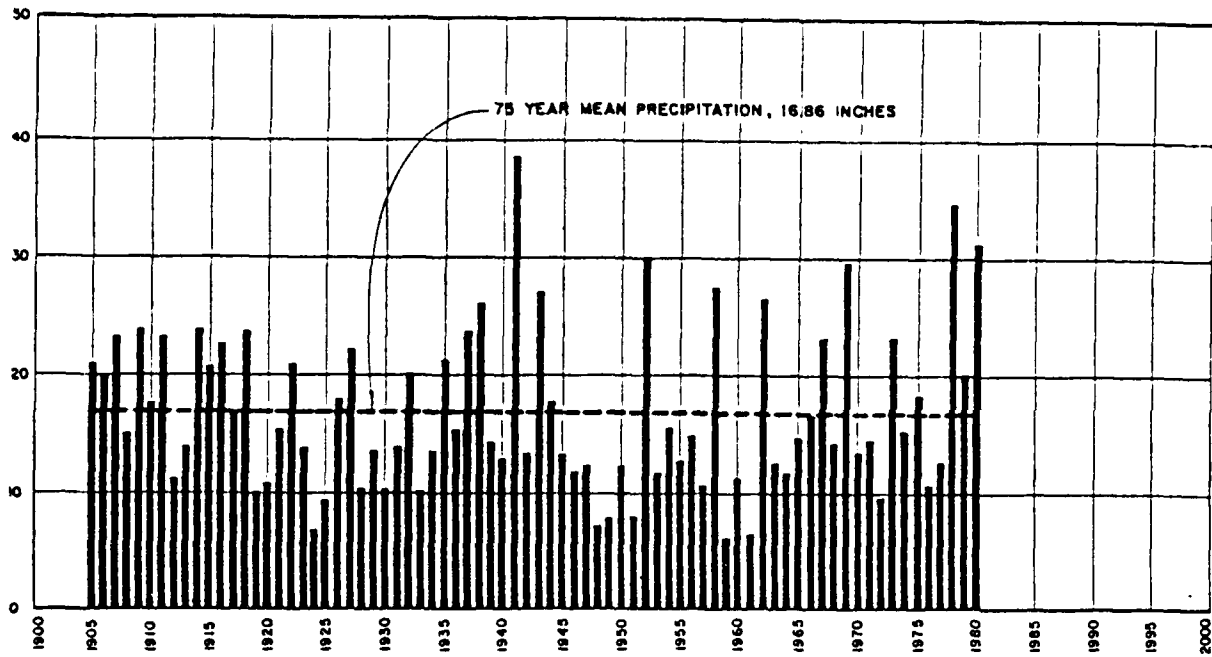
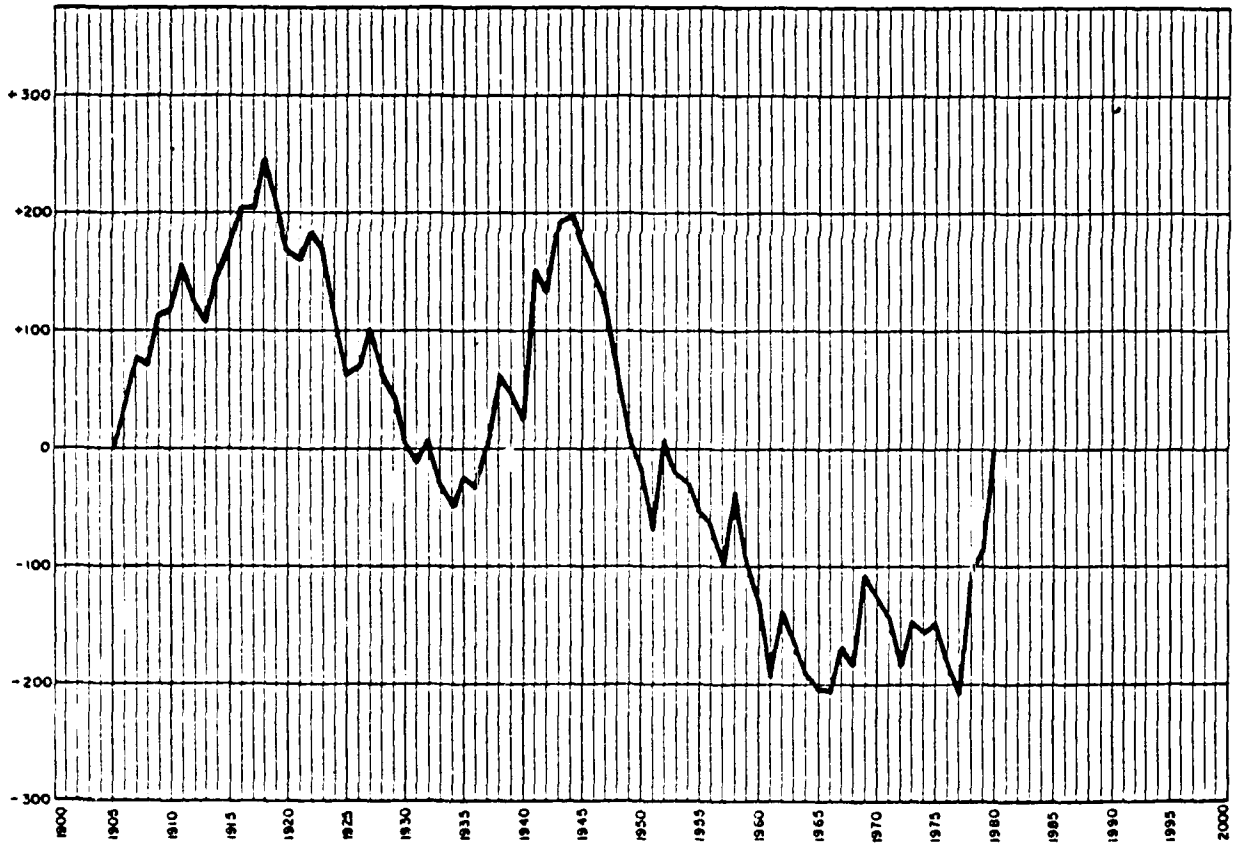


Figure 4.6 Streamlines, Santa Ana Conditions
 South Central Region
 Source: DeMarrais et al. (1965)



PRECIPITATION IN INCHES BY WATER YEAR (OCTOBER 1 - SEPTEMBER 30)



CUMULATIVE DEVIATION FROM MEAN PRECIPITATION AS A PERCENT OF MEAN

Figure 4.7 Cumulative Departure

From Mean Rainfall, Ventura County

Source: Ventura County Flood Control & Water Resources Dept.

TABLE 4.1

Major Drainage Areas of the South Central Region

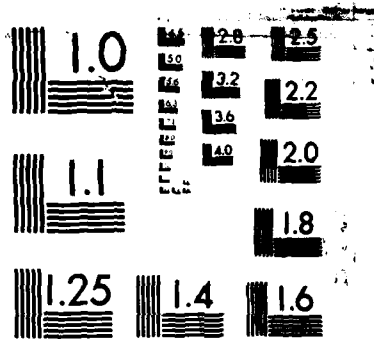
Basin or Group	Littoral Cell	Drainage Area Mi ²	Controlled Area Mi ²	Percent Controlled
Morro Bay Group	Morro Bay S Morro Reach	575	20	3
Arroyo Grande Creek	Santa Maria	190	70	37
Santa Maria River	Santa Maria	1873	1120	60
San Antonio Creek	Santa Ynez	206	-	-
Santa Ynez River	Santa Barbara	901	421	47
Santa Ynez Mtns Grp	Santa Barbara	420	2	-
Ventura River	Santa Barbara	275	94	34
Santa Clara River	Santa Barbara	1690	590	35
Calleguas Creek	Santa Barbara	323	-	-
Total		6453	2317	36

Source: Brownlie and Taylor (1981)

TABLE 4.2
Precipitation at Selected Stations, South Central Region

Location, DWR no.	Elevation Feet	Precipitation (in.)		Years of Record	Latitude, Longitude
		Average	Maximum Minimum		
Hearst Castle, 3888-02	1800	31.4	61.5 10.4	33	35-41-12 121-10-12
San Simeon 7885-11	16	19.1	33.5 11.9	39	35-38-24 121-11-36
Morro Bay 5866-00	115	15.6	29.6 7.1	22	35-22-00 12-51-00
San Luis Obispo 7851-00	298	21.6	54.6 7.3	111	35-18-20 120-39-47
Santa Maria 7940-00	223	13.6	30.7 6.1	76	34-57-00 120-26-00
Ozema 6576-00	3704	13.0	27.1 4.6	51	34-42-33 119-19-00
Juncal Dam 4422-00	2060	27.6	64.2 10.4	36	34-29-00 119-31-00
Santa Barbara 7902-00	16	15.4	36.9 6.9	37	34-25-00 119-42-00
Ventura 9285-00	46	15.2	36.7 5.2	106	34-16-36 119-17-30
Ojai 6399-00	784	21.4	48.0 6.8	72	34-26-48 119-14-31
Oxnard 6569-00	49	14.3	38.2 5.5	51	34-12-05 119-10-30
Gorman 3511-11	3580	12.0	31.2 4.8	38	34-47-16 118-49-55
Elizabeth Lk 2734-25	2073	21.9	43.5 10.2	49	39-40-00 118-21-45
Bouquet Res 1013-00	3054	16.1	33.0 6.9	46	34-35-14 118-21-45
Thousand Oaks 6905-00	800	14.5	31.9 5.5	17	34-10-43 118-51-00

Source: Calif DWR Bull 230-81



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE 4.3

Mean Monthly Precipitation* at selected stations, South Central Region

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
San Luis Obispo	4.6	4.0	3.2	2.3	0.3	.05	.04	.01	.15	0.7	2.6	4.0
Santa Maria	2.3	2.4	2.0	1.3	0.2	.04	.03	.02	0.1	0.5	1.4	2.1
Ozema	2.4	2.5	2.0	1.0	0.3	.05	.06	0.1	0.2	0.5	0.8	2.3
Juncal Dam	6.7	5.7	3.8	2.7	0.3	.06	.01	0.	0.2	0.5	3.8	4.4
Pt. Arguillo	2.6	2.5	2.3	1.5	0.2	.04	.03	.01	.06	0.7	1.6	2.3
Santa Barbara	3.5	3.0	2.4	1.5	0.2	.03	.04	.01	.07	0.4	1.9	2.5
Ventura	2.8	2.6	2.3	1.3	0.1	.04	.01	0.	.04	0.3	1.9	2.2
Ojai	4.6	4.2	3.0	2.1	0.3	.04	.02	.01	0.2	0.4	2.7	3.2
Oxnard	3.1	2.8	2.2	1.4	0.1	.04	.01	.01	.06	0.3	1.9	2.5

*1941-1970

Source: Calif DWR California Rainfall Summary, 1981
Goodridge (1981)

TABLE 4.4
AVERAGE WIND SPEED, MPH
SOUTH CENTRAL REGION

LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
Pt. Mugu	10	9	10	10	9	8	7	8	7	7	7	5	8
Santa Maria	6	6	7	7	7	7	6	5	5	5	6	6	6

Source: Goodridge (1978)

TABLE 4.5
PERCENT WIND, MEAN SPEED
SOUTH CENTRAL REGION

LOCATION	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	MNW	NW	NNW	CALM
Pt. Mugu % Mean Speed (mph)	8.0 4.0	7.3 4.7	7.7 7.0	4.5 8.8	1.3 5.7	0.8 6.6	2.2 8.6	2.9 7.5	4.2 6.6	2.8 6.2	3.2 6.1	5.2 6.8	18.7 8.2	7.8 7.1	4.5 4.6	4.1 4.1	14.8
Santa Barbara % Mean Speed (mph)	2.3 6.7	2.8 6.1	4.5 5.5	4.4 6.2	4.8 7.2	3.8 8.1	6.5 7.4	5.5 7.3	4.5 6.8	3.9 7.0	6.1 7.7	10.0 9.1	6.6 9.2	2.4 9.4	2.1 8.5	1.6 8.9	28.0
Vandenberg % Mean Speed (mph)	8.0 7.2	2.5 6.0	3.2 3.5	2.4 4.4	5.2 4.4	3.1 6.5	4.2 6.8	1.4 6.0	2.1 4.2	1.0 3.7	2.9 4.2	2.4 5.1	5.6 7.6	9.7 11.7	22.2 12.7	13.2 10.9	11.0

Source: Goodridge (1978)

TABLE 4.6
PERCENT HIGH WIND, PEAK GUST
SOUTH CENTRAL REGION

LOCATION	%>17	%>28	PEAK GUST (MPH)	MONTH OF MAX % >17k
Santa Maria	3.9	0.12	46 (fastest mi.)	May (9.9%)
Vandenberg	3.5	2.3	51	May (10.4%)
Santa Barbara	1.0	0.01	N/A	March (2.4%)
Pt. Mugu	6.9	0.72	70	Nov. (16.3%)

Source: Goodridge (1979)

TABLE 4.7
MAJOR STORMS IN THE SOUTH CENTRAL REGION

DATE	WATERSHED(S) AFFECTED	REMARKS
Dec. 1861-Feb. 1862	All	Heavy continuous rain, severe floods
Feb. 1884	All	Continuous rain, severe floods
Jan. 9, 1907	Santa Ynez River	4 day storm, 11.8" rain at San Marcos Pass
Jan.-Mar. 1909	Santa Maria River	Series of storms
Jan. 1914	Santa Barbara	4" in 2 hours at Santa Barbara
Feb. 28, 1914	All	3 day storm, 10" at Ventura
Mar. 2, 1938	All	4 day storm, heavy floods
Jan. 15, 1952	All	4 day storm, 15" at San Marcos Pass
Nov. 20, 1967	Santa Barbara, Ventura River, Santa Clara R.	4 day local storm
Jan.-Feb. 1969	All	Heavy floods, record rainfall, 3 storms, well documented
Jan.-Mar. 1978	All	Series of storms well documented
Jan.-Feb. 1980	All	Series of storms well documented
Feb.-Mar. 1983	All	Series of storms

TABLE 4.8
SELECTED RAIN GAGES, SOUTH CENTRAL REGION

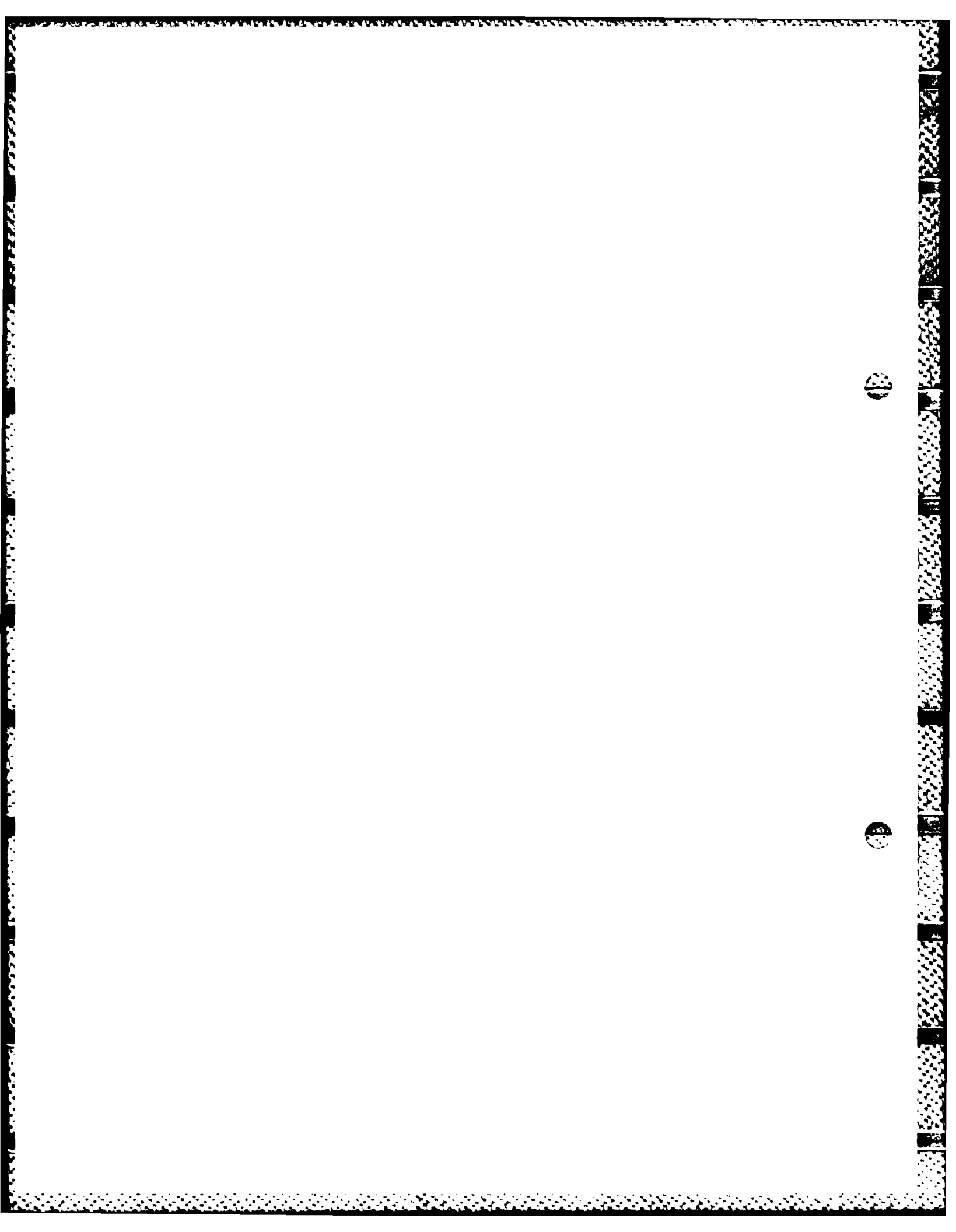
STATION	AGENCY	PERIOD OF RECORD			DWR #	OTHER #
		AGENCY	TYPE	RECORD		
Morro Bay 3N	SLOC	S	1929-	5869-00	052.0	
San Luis Obispo Poly	SLOC	R	1870-	7851-00	001.0R	
Nipomo 2NW	NWS	S	1921-	6207-00	(SLOC) 038.0	
Sisquoc Ranch	SBC	S	1904-	---	415 SIR	
Ozena	NWS	S	1904-	6576-00	(SBC) 399 OZA	
Lompoc Sewage	NWS		1919-	5064-00		
Santa Barbara	NWS	R	1868-	7902-00	(SBC) 225 SBS	
Ventura	NWS	S	1874	9285-00	(VC) 66	
Ojai V.C. F.S.	NWS	S	1906	6399-00	(VC) 30	
Newhall SPRR Depot	CDWR	S	1877-1950	6159-01 6159-03	---	
Acton Escondido Cyn	NWS	S	1938-	0014-00	---	

Sources: Calif DWR Bulletin 230 -81
Santa Barbara County Flood Control and Water
Conservation District (SBC)
San Luis Obispo County Flood Control and Water
Conservation District

TABLE 4.9
COASTAL WIND STATIONS, SOUTH CENTRAL REGION

STATION	AGENCY	PERIOD OF RECORD	WBAN #	LAT/LONG	REMARKS
Pt. Piedras Blancas	CG	1938-1974	23267	35 40' 121 17'	Most data are synoptic observation
Pt. San Luis	CG	1943-1951	23268	35 10' 120 46'	1943-46 hourly wind
Santa Maria	WBAS	1938-	23236	34 56' 120 25'	inland, but long record
Pt. Arguello	AFB	1925-1965	23265	34 33' 120 36'	hourly 1944,59-64
Vandenber	AFB	1958	93214	34 43' 120 34'	long term hourly records
Santa Barbara	FAA	1929-	23190	34 26' 119 50'	long term hourly records
Ventura Marina	CG	1976-	---	34 15' 119 16'	
Port Hueneme	NF	1938-1941	93183	34 09' 119 12'	
Pt. Mugu	NF	1946-	93111	34 07' 119 07'	long term hourly records
Morro Bay	SLOC	1975-	---	35 22' 120 51'	
Grover City	SLOC	1982-	---	35 07' 120 37'	
El Capitan	SBC	1979-	---	34 27'41" 120 01'45"	
Goleta	SBC	1975-	---	34 26'44" 119 49'30"	
Vandenber-Watt Rd.	SBC	1980-	---	34 46'51" 120 36'23"	
El Rio	VC	1982-	---	34 15'15" 119 08'36"	
Ventura	VC	1984-	---	34 17'24" 119 18'49"	

CG = Coast Guard
WBAS = Weather Bureau Airports Stations
AFB = Air Force Base
FAA = Federal Aviation Administration
NF = Naval Facility
SLOC = San Luis Obispo County APCD
SBC = Santa Barbara County APCO



5.0 OCEAN STORMS

A. General Description of Oceanic Storm Regions

A.1 Types of Storms Affecting the California Coast

Waves which affect the California Coast are formed by storms far out to sea and by local winds. The latter, referred to as wind waves, are largely produced by the local prevailing winds, which are dominated by the eastern North Pacific High. These winds are generally from the northwest along the California coast, except in Southern California, where they are often influenced by the California eddy and southwesterly winds often prevail in this area. Mean annual wind speeds are about 8 knots north of San Francisco, 10 knots from San Francisco to Point Arguello and about 6 knots along the Southern California coast.

In addition to wind waves, storms at sea produce swell which can affect the coast. During the late fall, winter, and early spring, swell from North Pacific predominates. Southerly swells occur during summer and fall as a result of tropical storms in the eastern North Pacific and extratropical storms in the South Pacific. The following is a brief description of the types of storms which affect the coast.

A.1.1 High-Latitude North Pacific

These storms are generated when there is a blocking high in the Pacific east of 160° W. Cyclogenesis occurs in the vicinity of the Gulf of Alaska, and the storms generally track along the Aleutian Islands towards Canada. Waves from this type of storm affect the entire coast, although portions of Southern California are sheltered by the westward bulge of the coastline at Point Conception.

A.1.2 Mid-Latitude North Pacific

This type of storm is caused by low pressure in the eastern Pacific, frequently with a blocking high over western North America. Storms move across the Pacific at mid-latitudes and generate swell predominantly from the west. The swell from this type affects the entire coast, although the coastal islands protect Southern California.

A.1.3 Low-Latitude Type

These storms form when there is a blocking high between 160°W and 180° W. Storms are usually generated in the Hawaiian region and track to the northeast. Swell arrives from a generally west and southwest direction, affecting the entire coast, but Southern California is especially vulnerable to this type.

A.1.4 Eastern Pacific Tropical Storms

These storms are generated in the late summer and early fall. The normal storm track is in a westerly or northwesterly direction, and swell generally arrives from the south, south-southeast, or south-southwest. Swell from these storms affects primarily the coast along Southern California.

A.1.5 Southern Hemisphere Storms

The storms, whose swells affect the California coast from the south, generally occur in the South Pacific Ocean during the Southern Hemisphere winter. Important generation areas include the New Zealand area and the high-latitude region of the South Pacific. Swell from the New Zealand area is generally of long period and arrives from the southwest, while swell from the high-latitudes arrives from the south to southwest.

A.2 General Climate of the North Pacific

An excellent summary of the climate of the Pacific Ocean is found in the U.S. Navy Marine Climatic Atlas of the World.

A.2.1 Winter Climate, North Pacific

Because of the moderating effect of the ocean, air temperatures in the Pacific have relatively small variations. Air temperatures range from about 38°F in the north to about 75°F at 20°N.

The North Pacific High is usually centered near 30°N latitude, with a strong low near the Aleutian Islands. There is a large variation in wind patterns due to periodic storm passage. Gales occur with a frequency of 10 to 20 percent in the Gulf of Alaska and in the western North Pacific. Low pressure centers generally move to the west or northwest.

A.2.2 Summer Climate, North Pacific

In summer, the Pacific High is generally located around 40°N, which pushes storm tracks to the north avoiding the California area. Air temperatures are again relatively constant, with mean temperatures of about 55°F in the Gulf of Alaska rising to about 80°F at 20°N. Winds are generally light in the vicinity of the Pacific High, and the frequency of gales is very low.

A.2.3 Winter Climate, South Pacific

This season, corresponding with the California summer, finds a high pressure off the coast of South America at about 25°S. Surface winds are varied because of storms. The frequency of gales is greater than 10% over most of the ocean south of 50°S.

Sixty to eighty percent of all gales in the New Zealand area have winds from the southwest, which means there is a large probability that gales in this region will generate swell directed towards the California coast.

A.2.4 Summer Climate, South Pacific

In the Southern Hemisphere summer, the semi-permanent high off the coast of South America moves slightly south to about 30°S. Gales are still relatively frequent in the high latitudes, but winds are generally generated from the northwest or west, creating waves which do not affect the California coast.

A.3 Effects of Normal and Abnormal Storm Tracks

Griggs and Johnson (1983) examined wave damage in the Monterey Bay area, and concluded that there was no consistent pattern. They found that the number of storms affecting the bay is large, and that waves which damage one section may cause little or no damage elsewhere. However, there has been no definitive study of historical storm patterns as related to damage over large or small areas of the coast.

There are some abnormal tracks, however, which have caused damage. Several studies (Rosendal, 1963; Hansen, 1972) have shown that the usual tracks of tropical storms is to the west, with some slight curvature to the northwest. An abnormal track has strong recurvature to the north, which puts the storms close to, or into, Southern California. The 1939 hurricane which struck Long Beach is an example.

A second type of track which adversely affects the California coast is that of the low-latitude type storms. Although these storms normally track to the

northeast, a slightly low track puts the low pressure center over California. The combination of the long fetch, high winds and low pressure on the coast (which raises the tide level) can cause severe damage. This was the case during the 1983 storm series.

B. Historical Perspective

B.1 Major Periods of Intense Oceanic Storms

Unfortunately, there is no definitive history of major storm periods which have affected the California coast. Kuhn and Shepard (1981) have researched this topic, but most information prior to very recent times is of a qualitative nature.

Kuhn and Shepard (1981) describe an important storm period which was described by Richard Henry Dana in the 1830's. During that era, "southeasters" were not uncommon from November to April in the Southern California region. These storms developed rapidly and produced waves of 50 feet or more; the weather was described as worse than that of Cape Horn. These storms ceased to be a regular occurrence in 1856. Kuhn and Shepard (1981) note that species of sub-tropical fish were identified near San Diego between 1853 and 1857, indicating that the coastal waters were much warmer in that period.

Since this early period, major storm periods seem to have been limited to seasonal anomalies which have produced major erosional problems. Kuhn and Shepard (1981) found that among the most notable of these was the December 1940 through January 1941 period, during which a series of severe storms, originating south of the Aleutian Islands, created high waves which attacked the coast. In addition, they note the 1977-78 and 1980-81 storm periods, during which a series of storms generated in the Hawaiian region caused extensive damage to the California coast. To these periods should be added the 1969, 1978 and 1983 storm seasons.

As noted by Kuhn and Shepard (1981) abundant information exists, primarily in newspaper files, but little attention has been given to documenting this subject.

B.2 Major Individual Storms

This subject is also poorly documented, but there have been a few recent studies. Howe (1978) has examined newspaper and other accounts to document some major damaging storms along the California Coast. Table 3 from his report is reproduced herein as Table 5.1. In addition, a book about to be released by Duke University Press, Living With the California Coast (Gary Griggs, ed.) contains some historical information on storms affecting the California Coast.

Studies on wave damage in limited areas of the California coastline have included some storm history. Among these studies are those of Bixby (1962) and Griggs and Johnson (1983) on the Monterey Bay area, and Tuttle (unpublished c. 1975) on the Humboldt region. However, little work has been done to systematically document wave damage along the coast, much less the storms which produced the waves (Kuhn, 1985; Tuttle, 1985; Griggs, 1985; personal communications). As might be expected, the area with the least information concerns tropical and,

especially, Southern Hemisphere storms. Until recently (with the exception of the hurricane which struck Southern California in 1939) most large waves from the south are described in accounts as "presumably" originating from Southern Hemisphere storms.

C. Data Search and Retrieval Efforts

C.1 Technical Approach

Data were examined from a number of governmental and public organizations. Previous reports and documents on similar topics were located and examined as part of a literature search. These documents often contained or referred to data, whose sources were noted. Government and public agencies were then contacted, and in some cases visited.

The following is a general description of sources relevant to storms in the Pacific Ocean which produce waves damaging to the California coast.

National Climatic Data Center

This agency has become the "clearing house" of climatic data obtained by United States Government Agencies, and has cooperative programs with international and foreign agencies as well. Data cover wide areas, and are discussed in detail in Section C.2. Data are available in a variety of forms, including hardcopy, microforms and magnetic tape. Most out of print documents are available on microforms, and most recent data are available both on microforms and magnetic tape.

Scripps Institution of Oceanography

An on-going program of wave data collection and analysis is a good source of wave data. Monthly and annual reports are published (Seymour et al.) and data are available on magnetic tape.

Continuing research is being conducted on storm history and the relationship of storm periods to geologic events.

People contacted include:

Gerald Kuhn (storm history) (619) 452-4856

Julie Thomas (wave data) (619) 452-3032

U.S. Navy Fleet Numerical Oceanography Central

Data available from this agency are also available from the National Climatic Data Center.

People contacted include:

Lt. D. Pedneau (408) 646-2418

Chief Mate Boushaued (Naval Oceanographic Command Facility, San Diego) (619) 437-7071

National Weather Service

Data from this agency are available through the National Climatic Data Center.

People contacted include:

Art Lessard (Chief Meteorologist) (213) 209-7215

Robert de Violini, (Climatologist, Pacific Missile Range, U.S. Navy, Pt. Mugu) (805) 989-8383

Don Tuttle (Humboldt County Public Works, Natural Resources Division, coastal storm history) (707) 445-7741

Prof. Gary Griggs, University of California, Santa Cruz (coastal storm history) (408) 429-2403

There are several reference libraries which are extremely useful.

These include:

University of California, Los Angeles, Engineering Library

This library has extensive collections of relevant journals and National Weather Service (Weather Bureau) publications. In addition, there is a vast collection of government documents on microfiche. Microfiche reproductions are available.

National Weather Service, Wilshire Federal Building

The reference room (normally closed to the public) has an extensive, uncataloged collection, including Mariners Weather Log, out-of-print publications and unpublished documents.

C.2 Data Available on Ocean Storms

The best single source of data is the National Climatic Data Center (NCDC). The following is a description of data available for various storm regions.

C.2.1 Mid-Latitude North Pacific Ocean

A general summary of the climate of this region can be found in the U.S. Navy Marine Climatic Atlas of the World, volume II. This atlas gives summaries by month of surface winds (wind roses), gale frequency by region, precipitation (with wind direction), mean level pressure and mean storm tracks, areas of cyclogenesis with direction frequency as well as other climatological data. This publication was updated in 1977 and is available on microfiche (NTIS no. AD-A072 498).

An excellent reference for mean storm tracks is that of Klein (1957). This atlas gives mean storm tracks and areas of cyclogenesis and probabilities of low pressure cells by month.

The Mariners Weather Log, published quarterly since 1957, gives North Pacific cyclone-track charts and summaries of weather conditions (monthly) as well as other relevant data. These publications could be useful in determining the source of damaging waves.

Marine Climatological Summaries are published in cooperation with the World Meteorological Organization. These summaries include frequency tables for various meteorological and oceanographic parameters. Data used to produce these summaries are available on magnetic tape from the NCDC. Data are from ships logs, weather buoys and meteorological services (1970 through the present, tape TD-1129; 1800-1969, tape TD-9760).

Daily synoptic weather maps are available from 1899 to the present on microforms from the NCDC. The data include sea level maps and 500-millibar maps (starting in 1944). These data are also available in published form (UCLA Engineering Library).

Digitized extratropical cyclone movements are available from the NCDC on magnetic tape (TD-9616). Data are from May 1965 to December 1974.

The large quantity of data may seem somewhat overwhelming, and unfortunately little has been done with particular periods of storms which have produced damaging waves. Summaries of recent storm events (e.g. Pappas, 1978; 1980) present general information but little of what would be of direct use in predictions or in relating present storm events to past events.

C.2.2 Tropical Storms

There are several studies which document tropical storms in the eastern North Pacific Ocean. Court (1980) documents storms from 1840 and gives statistical data. Hansen (1972) used satellite coverage to document the climatology of these storms in terms of frequency, duration, intensity, tracks, formation areas, dissipation areas and recurvature. Hurd (1929) provides some data on early storms.

The Mariner's Weather Log provides tropical storm tracks and data annually. Publications after 1972 are available on microfiche from the NCDC.

Statistical data summaries on tropical storms are available in the Mariner's Worldwide Climatic Guide to Tropical Storms at Sea, available from NTIS on microfiche or paper copy. (The data are also available on magnetic tape from NCDC, tape TD-9636). Data include track and frequency maps, cyclone roses, as well as narrative descriptions and photographs, and sea surface conditions.

Tropical cyclone tracks from 1949 to the present are available on magnetic tape from the NCDC (tape TD-9697). Data include date, position, wind speed, and

pressure four times per day. North Pacific Tropical Cyclone Vector Mean Charts covering the period 1949-1971 are also available from the NCDC on microfiche.

Surface pressure charts, with fronts, troughs and ridges depicted are available for the tropical regions of the world (30°N to 50°S). Satellite wind measurements from low-level clouds are included. The charts are analyzed for 0000 GMT and 1200 GMT for 1969 to 1978, and every six hours from 1978 to the present.

C.2.3 Southern Hemisphere Storms

This area of the ocean is the least studied and documented.

A good summary of the climate of this region is given in the U.S. Navy Marine Climatic Atlas of the World, volume V. This publication was updated in 1979 and is available on microfiche (NTIS no AD-A089 035). Data in the atlas include surface wind roses, gale roses (limited), precipitation and mean sea level pressure, along with other climatological data.

Constant pressure charts off the Southern Hemisphere for 500-, 300-, and 250-millibars are available from the NCDC from 1975 to the present. These charts are on microfilm. In addition, surface/1000-500 millibar thickness charts are available for the Southern Hemisphere, also on microfilm from the NCDC. The periods of record available are 1967-1971 and from 1975 to the present.

Marine Atlas data from 1800 to the present are available on magnetic tape. Data are from ships logs, ship weather observations, weather buoys, and foreign meteorological services. These tapes are available from the NCDC (TD-9760, TD-1129).

There are also a number of data and research publications on Southern Hemisphere weather patterns by H. Van Loon.

C.2.4 Other Pertinent Data

Heights of wind waves, swell and combined sea are depicted with contour lines on daily charts of the Northern Hemisphere. These charts are available on microfilm from the NCDC from 1979 to the present. These data can be used in conjunction with the weather charts also available from the NCDC to determine wind, storm and wave relationships for particular storms or storm periods.

Deep-water wave statistics for the California coast have been compiled for the period 1946 to 1977 by Meteorology International Inc. (1977). These data could be used with oceanic storm statistics of the same period to develop correlations.

D. Data Gaps and Limitations

The most serious problems with the data available is the lack of a definitive history of coastal storms. While small areas of the coast have been covered (e.g., Monterey Bay), there is a need for a thorough cataloging of coastal storms and storm damage. Sources would include newspapers from coastal cities, long time residents, harbormasters, local fishermen, and previous studies. Once there is an historical reference point, meteorological data can be collected for important, and even lesser, storms which have affected the coast. With the availability of current data base systems, a cataloging by area affected, storm origin, track, intensity, etc., could be made. This would greatly aid in developing statistical information on potential storm damage.

Recent on-going data collection at the Scripps Institution of Oceanography on waves could be combined with meteorological data now available from the NCDC on the South Pacific Ocean to gain some insight on South Pacific storms. This area is poorly studied and of importance, particularly with respect to extreme waves in the California summer as well as the moderate swell which often arrives.

With the advent of satellites and computers, the North Pacific is, in principle, well documented. However, the quantity of data available is almost overwhelming. It is for this reason that a clear objective is needed in any attempt to unravel the data and present a coherent picture. It is for this reason that a complete storm history is needed. It can provide the basis for further studies, in that once major storm damage areas, with dates, are identified, one can track the storm, and storm waves, back to their origins with existing data.

The South Pacific remains poorly documented, with very few data available before 1950. There is little that can be done to remedy this; however, one can attempt to use the recent data available to its fullest extent. Many of the data are available on magnetic tape, and wave data from Scripps are also available on magnetic tape. The wave data could be searched for significant southern swell, and this information used to select dates and regions for selective acquisition of meteorological data.

TABLE 5.1

Damaging Storms, California Coast
From Howe (1978)

<u>Date</u>	<u>Newspaper Account</u> ^b
February, 1878	Breakers over the bar in San Francisco prevented the passage of ships.
December, 1887	Surf broke over the high bluffs near the hotel (in San Diego).
August, 1934	Storms generated the highest breakers in years. Coastal damage extended from Malibu to south of Newport. \$100,000 loss in Long Beach where the Pine Avenue pier was destroyed. Railroad tracks near San Clemente were undamaged.
1932	A Pacific Ocean hurricane (Climbasco) off the west coast of southern Mexico migrated northward along the California coastline as far as Los Angeles. This is the only known record of a climbasco hitting California, and it "wreaked great havoc throughout southern California coastal areas."
December, 1940	Towering breakers and a 7.1 foot high tide washed over the Mission Beach (San Diego) seawall, throwing concrete benches into lots and homes. Public Works crews placed 600 tons of rip rap to dissipate wave energy. Sand, rocks, and tons of kelp had to be removed from streets and beaches. The conditions were caused by storms swinging in from lower latitudes instead of the Gulf of Alaska. At this time, it was the wettest December in Weather Bureau history (in San Diego).
February, 1957	High tides (5.7' to 6.9'), coupled with storms and winds, undamaged homes at San Diego's Imperial and Mission Beaches and in Oceanside.
February, 1960	30 to 40 foot waves pounded the coastline from Monterey to the Oregon border. Homes were damaged or destroyed in Monterey, Santa Cruz, San Mateo County, and Stinson Beach. This was one of the most damaging and costly storms to hit this part of the California coast.
December, 1962	15 foot waves observed at La Jolla and Coronado.
December, 1968	High tides of 7.7' and 40 mile per hour winds battered the Del Mar coast. There was some property damage and tons of mud were washed into the surf zones.
December, 1969	16 to 20 foot waves were observed at Oxnard. Many homes were damaged and flooded. Seabees from Fort Huachuca worked to construct an emergency seawall. Wave borne debris slowed traffic on U. S. 101.

notes: a) partial listing taken from the San Diego Union, the Los Angeles Times, the Ventura Star Free Press, and the San Francisco Chronicle

b) no attempt was made to interpret the descriptive wording used in the newspaper articles.

c) from Magura, 1978

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APPENDIX A

SAN DIEGO REGION

1. Wind Stations in the San Diego Region whose data are available from the National Climatic Data center. Other wind stations are listed in Table 2.9. Appendix D contains an Index for the entire state.
2. Precipitation gages in San Diego County, with location map, from San Diego Flood Control District. Followed by typical data (monthly).
3. Precipitation gages in the San Diego Region from California Department of Water Resources Bulletin 230-81.

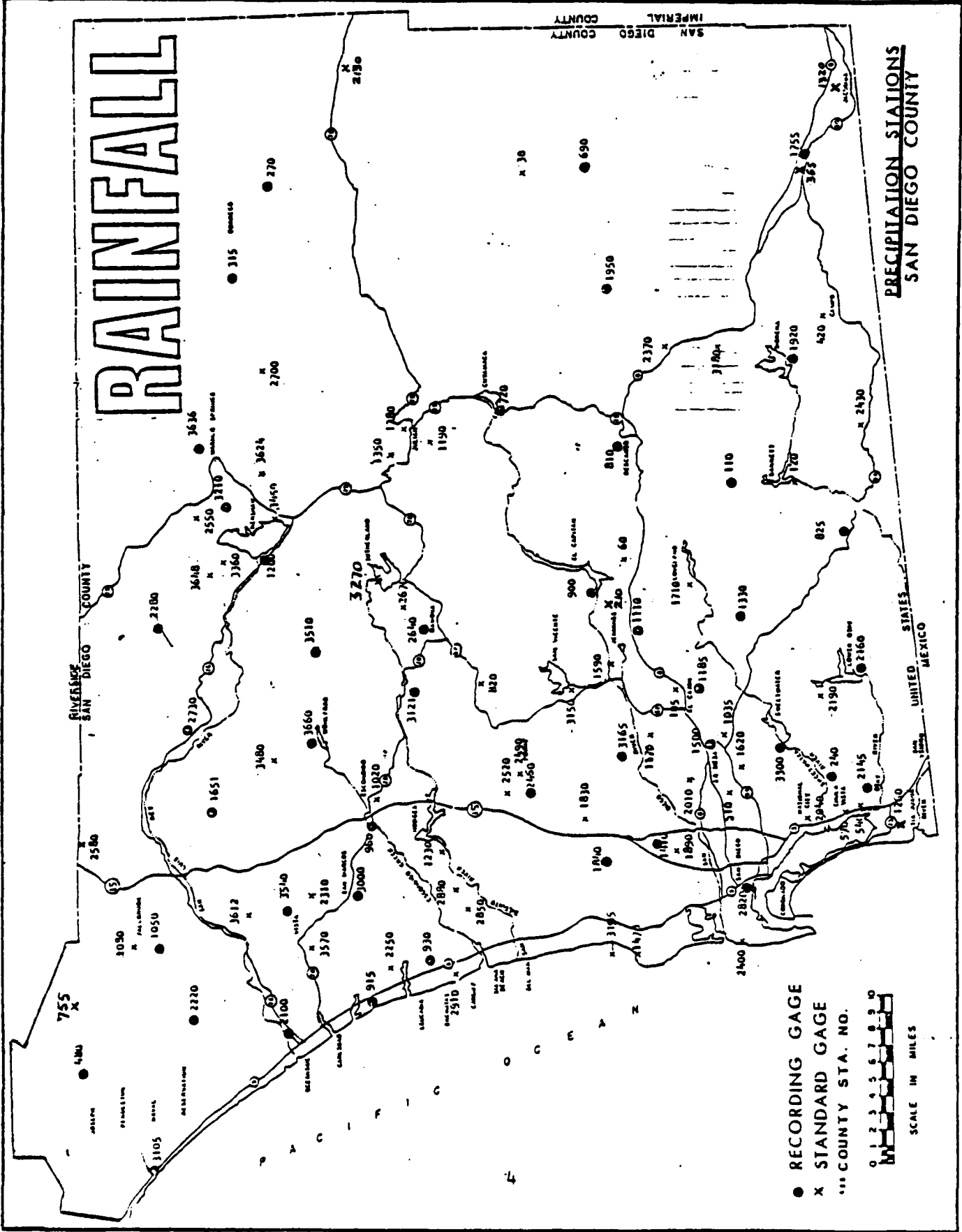
1. Wind Stations in the San Diego Region whose data are available from the National Climatic Data center. Other wind stations are listed in Table 2.9. Appendix D contains an Index for the entire state.

LOCATION	AGENCY NUMBER	LATITUDE	LONGITUDE	HOURLY RECORD START	HOURLY RECORD STOP	OBS/DAY	DIGITIZED RECORD
Dana Pt.	CG	33-27	117-41	1981		3	-
San Mateo Pt.	CG	33-23	117-35	1971	1979	5	-
San Clemente	CG	33-25	117-37	1980		3	-
Oceanside	CAN 23181	33-14	117-25	1928	1930	6	
Oceanside	CG	33-13	117-24	1971	1952	24	1948-1952
Carlsbad	SAUR	33-08	117-17	1974		3	-
Del Mar	NAAF 25198	32-58	117-15	1959		-	-
Mission Bay	CG	32-45	117-14	1973	1976	24	-
San Diego	NAS 93112	32-43	117-12	1943	1945	24	-
San Diego	WBO	32-43	117-10	1975		3	-
San Diego Linderoan	WNAS 23186	32-44	117-10	1922		24	1905-
Imperial Beach	NAS 93115	32-34	117-07	1888	1940	charts	-
	NAS			1929		24	1942-
				1956	1971	6	-
						24	1952-



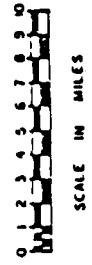
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2. Precipitation gages in San Diego County, with location map, from San Diego Flood Control District. Followed by typical data (monthly).

RAINFALL



PRECIPITATION STATIONS SAN DIEGO COUNTY

- RECORDING GAGE
- X STANDARD GAGE
- COUNTY STA. NO.



<u>STATION</u>	<u>PERIOD</u>	<u>AVERAGE RAIN INCHES</u>	<u>STATION</u>	<u>PERIOD</u>	<u>AVERAGE RAIN INCHES</u>
60 Alpine	1942-79	17.87	2050 Oak Grove	1957-80	17.28
90 Anza	1946-79	11.82	2070 Oceanside	1953-78	10.12
120 Barrett Dam	1909-79	17.17	2130 Ocotillo Wells	1945-74	2.52
210 Blossom Valley	1944-80	15.06	2150 Otay Ranch	1938-80	10.79
240 Bonita-Allen School	1919-80	10.85	2160 Lower Otay Resv	1907-80	11.51
315 Borrego Palm Canyon	1950-80	5.58	2190 Upper Otay Resv	1939-77	11.77
365 Boulevard 2	1936-79	14.35	2220 Lake O'Neill	1877-1979	13.38
420 Campo	1889-1979	17.20	2280 Palomar Mountain	1939-80	27.23
510 Chollas	1940-79	10.74	2310 Pechstein Reservoir	1956-79	12.48
540 Chula Vista	1918-79	9.63	2370 Pine Valley Co Pk	1951-80	20.21
690 Crawford Ranch	1947-78	3.60	2400 Pt Loma Nelson	1954-80	10.74
720 Cuyamaca Reservoir	1887-1980	38.74	2430 Potrero County Park	1916-80	18.54
755 De Luz Garnsey	1930-80	19.76	2490 Poway Valley	1957-79	12.29
810 Descanso RS	1933-80	24.66	2580 Rainbow Camp	1952-76	16.52
900 El Capitan Reservoir	1936-80	16.01	2700 Ranchita	1947-80	13.62
1020 Escondido	1875-1979	15.63	2790 Rodriguez Resv	1936-80	8.56
1050 Fallbrook	1880-1980	16.98	2820 San Diego WSO AP	1850-1979	9.79
1170 Gillespie Field	1952-1979	10.76	2880 San Diegoito Resv	1927-80	13.19
1200 Henshaw Reservoir	1911-80	26.49	3060 San Mateo	1957-79	14.43
1230 Hodges Reservoir	1919-79	14.28	3150 San Vicente Resv	1946-79	13.95
160 Imperial Beach NAS	1956-80	8.49	3180 Sawday Ranch	1950-80	17.59
1500 La Mesa Fire Sta	1934-80	12.81	3195 Scripps Pier	1928-80	9.10
1590 Lakeside 2E	1953-79	14.09	3270 Sutherland Resv	1944-79	21.64
1710 Loveland Resv	1943-77	13.88	3300 Sweetwater Resv	1888-1980	10.91
1770 Marron Valley	1891-1980	14.58	3540 Vista E Reservoir	1936-80	13.03
1800 Mecca Fire Sta	1915-79	2.86	3624 Warner Ranch	1957-80	20.08
1840 Miramar NAS	1946-80	10.61	3636 Warner Springs	1906-78	16.13
1920 Morena Resv	1903-80	20.46	3648 West Fork	1949-80	23.36
2010 Murray Resv	1913-79	12.08	3660 Wohlford Resv	1948-80	17.32
2040 National City FD	1932-77	8.42			

AVERAGE ANNUAL RAINFALL TABLE -- STATIONS WITH MORE THAN 20 YEARS

MONTHLY AND SEASONAL PRECIPITATION 1977-78

San Diego County

STA NO.	SOURCE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	SEASON TOTAL
30	AGUA CALIENTE SPRINGS PARK	.77	3.27	.00	.10	.00	2.05	2.56	1.70	1.84	.24	.00	.00	12.53
60	ALPINE	.03	3.09	.01	.90	.42	3.49	7.37	7.31	9.68	1.92	.38	.00	34.60
90	ANZA	.00	2.46	.00	.07	.60	8.45	3.66	7.04	1.69	.19	.00	.00	24.16C
110	BARRETT CAMP	.00	1.90	.00	.40	.20	3.00	8.60	7.30	7.50	1.30	.30	.10	30.60
120	BARRETT	.00	2.28	.00	.48	.23	3.46	8.95	6.58	8.65	1.92	.73	.00	33.28
210	BLOSSOM VALLEY	.00	1.91	.00	.88	.43	3.09	6.22	6.50	8.23	1.58	.35	.00	29.19
240	BUNITA-ALLEN SCHOOL	.00	1.90	.00	.79	.09	2.42	5.57	3.55	4.71	1.19	.13	.00	20.35
270	BORNEGO C.K.S.	.15	3.26	.00	.04	.00	.89	2.27	1.64	1.09	.07	.00	.00	9.41
315	BORNEGO PALM CANYON	.00	4.70	.00	.10	.00	1.60	4.40	2.50	1.50	.00	.00	.00	14.80
365	BOULEVARD 2	.75	2.60	.00	.13	.21	3.72	7.04	5.95	5.69	1.95	.26	.00	28.30
420	CAMP	.00	1.18	.00	.88	.25	7.79	5.38	5.45	1.48	.53	.00	.00	22.94C
480	CASE SPRINGS	.00	2.64	.00	.19	.22	5.47	14.18	10.28	12.72	1.70	.03	.00	47.43
510	CHULLAS	.00	1.57	.00	1.43	.04	2.27	6.42	5.68	1.24	.00	.00	.00	18.65C
540	CHULA VISTA	.00	2.00	.00	.74	.12	2.11	4.30	2.55	4.34	.96	.05	.00	17.17
570	CHULA VISTA FIRE DEPT.	.00	1.98	.00	.80	.23	2.63	5.46	3.22	5.45	1.33	.00	.00	21.10
690	CRAWFORD HANCH	.03	5.70	.00	.00	.00	.30	2.21	1.20	.89	.00	.00	.00	10.03
720	CUYANACA RESERVOIR	.00	3.80	.00	1.10	.60	7.40	14.50	12.70	16.00	4.40	.60	.00	61.10
755	DE LUZ GANSEY	.00	2.14	.00	.00	.00	5.61	11.62	10.57	14.88	2.14	.06	.00	47.02
810	DESCANSO R.S.	.00	1.70	.00	.90	.40	6.40	9.70	10.40	10.70	3.20	.60	.00	44.00
820	DUS PICUS COUNTY PARK	.00	2.22	.00	.00	.59	3.89	12.31	6.91	10.88	2.37	.28	.00	39.45
825	DULZURA-FLUME	.00	2.00	.00	.20	.30	3.70	8.00	8.50	5.30	1.20	.10	.00	29.30
900	EL CAPITAN RESERVOIR	.00	2.10	.00	.60	.20	3.30	7.70	7.40	7.70	1.70	.30	.00	31.00
915	ENCINA W.P.C.F.	.00	2.30	.00	.10	.00	1.70	7.50	4.40	5.20	1.40	.00	.00	22.60
930	ENCINITAS C.R.S.	.00	2.15	.00	.06	.05	1.89	9.67	4.47	4.78	.86	.01	.00	23.96
960	ESCONDIDO NO. 2	.00	2.10	.00	.10	.10	2.50	6.20	2.20	8.90	1.20	.10	.00	23.40

C = INCOMPLETE

R.S. = Ranger Station

MONTHLY AND SEASONAL PRECIPITATION 1977-78

STA NO.	SOURCE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	SEASON TOTAL
1020	ESCONDIDO	.00	2.13	.00	.10	.28	2.52	11.09	5.73	8.35	1.03	.11	.00	31.34
1035	EUCALYPTUS PARK	.00	2.34	.00	.00	.00	3.10	5.41	6.00	6.59	1.84	.00	.00	25.28
1050	FALLBROOK	.30	2.10	.00	.20	.00	4.20	15.20	9.00	8.00	1.70	.00	.00	40.70
1080	FALLBROOK FIRE DEPT.	.01	2.19	.00	.02	.00	2.94	12.05	7.75	7.91	1.35	.05	.00	34.27
1110	FLINN SPRINGS PARK	.00	1.70	.00	.69	.14	2.98	5.86	6.33	7.21	1.20	.29	.00	26.40
1170	GILLESPIE FIELD	.00	1.77	.00	.87	.02	2.34	5.97	3.99	6.76	1.20	.14	.00	23.06
1185	GRANITE HILLS	.00	1.70	.00	.70	.10	2.90	6.00	4.70	7.30	.90	.00	.00	24.30
1190	HM. HEISE COUNTY PARK	.00	3.80	.00	1.11	.48	6.92	14.29	11.09	13.02	4.53	.62	.00	55.86
1200	HENSHAW RESERVOIR	.00	4.00	.00	.20	.30	5.10	12.30	10.60	11.70	2.30	.20	.00	46.70
1230	HODGES	.00	1.25	.00	.14	.03	2.32	10.34	5.05	6.42	1.74	.35	.00	27.64
1260	IMPERIAL BEACH H.A.S.	.00	2.08	.01	.78	.02	1.75	3.06	2.22	3.84	.79	.07	.00	14.62
1320	JACUMBA	.09	2.13	.00	1.06	.08	2.79	3.91	2.19	2.70	.87	.19	.00	16.01
1330	JANUL-LAS FLORES	.00	1.60	.00	1.07	.16	2.46	5.65	5.41	6.65	1.52	.43	.00	24.95
1350	JULIAN MINULA	.00	3.25	.00	.67	.57	4.98	13.77	9.40	11.67	2.83	.79	.00	47.93
1380	JULIAN BUNCH	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02C
1410	KEARNY MESA	.00	1.82	.00	.47	.07	2.21	7.82	4.93	6.22	.75	.27	.00	24.56
1470	LA JULLA - MCCAULEY	.00	2.36	.02	.30	.00	2.43	10.99	3.60	7.11	1.11	.00	.00	27.92
1500	LA MESA FS	.00	.18	.00	.90	.00	2.70	7.10	5.20	7.10	1.40	.10	.00	24.68
1590	LAKE SIDE ZL	.00	1.68	.00	1.00	.06	3.36	5.21	6.49	8.48	1.52	.24	.00	28.04
1620	LEMON GROVE FIRE DEPT.	.00	1.73	.00	.67	.08	2.79	6.97	4.70	7.39	1.73	.08	.00	26.14
1651	LILAC OAKS	.00	1.90	.00	.00	.30	2.60	10.20	7.50	8.10	1.30	.20	.00	32.10
1755	MANZANITA J.CRT.	.40	2.60	.00	1.30	.20	3.60	6.10	5.00	4.60	1.20	.20	.00	25.20
1770	MARRON VALLEY	.00	1.50	.00	.30	.30	3.40	8.50	5.70	6.80	1.30	.20	.00	28.00
1800	MECCA FIRE STATION	.00	.00	.00	.00	.00	.68	1.83	.17	.05	.00	.00	.00	2.73C
1830	MIHAMAR DAM	.00	1.85	.00	.20	.02	2.30	9.05	5.21	7.83	1.38	.02	.00	27.86

MONTHLY AND SEASONAL PRECIPITATION 1977-78

STA NO.	SOURCE	JULY	AUG	SEPT	UCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	SEASON TOTAL
1840	MIRAMAR N.A.S.	.00	1.42	.00	.37	.01	2.46	7.92	4.29	7.22	2.28	.24	.00	26.21
1890	MONTGOMERY FIELD	.00	1.62	.00	.41	.00	3.03	8.57	4.72	6.55	1.14	.11	.00	26.15
1920	MURENA RESERVOIR	.20	1.40	.00	.90	.40	4.70	9.50	8.30	9.10	2.10	.50	.00	37.10
1950	MOUNT LAGUNA	.70	5.20	.10	.70	.30	5.00	8.50	9.40	8.60	1.90	.20	.00	40.60
2010	MURRAY	.00	1.59	.00	.51	.00	2.09	6.40	4.15	7.23	1.10	.18	.00	23.25
2070	OCEANSIDE	.00	2.81	.00	.04	.00	1.88	7.95	5.49	6.73	1.20	.03	.00	26.13C
2100	OCEANSIDE PUMPING PLANT	.50	2.40	.20	.10	.00	2.80	9.60	6.90	6.90	.50	.00	.00	29.90
2150	DIAY RANCH	.00	2.33	.00	1.04	.04	2.31	5.31	3.49	5.37	2.22	.23	.00	22.34
2160	LOWER OTAY RES.	.00	1.80	.00	.60	.10	2.70	5.50	4.00	5.70	1.40	.10	.00	21.90
2190	UPPER OTAY	.00	1.74	.00						5.70			.00	7.49C
2220	LAKE D'NEILL	.00	2.08	.00	.22	.00	2.25	9.71	7.04	6.53	.84	.00	.00	28.67
2280	PALMAR MOUNTAIN	.10	4.40	.00	.30	.30	7.90	20.10	15.90	15.70	3.90	.10	.00	68.70
2310	PECHSTEIN RESERVOIR	.00	1.86	.00	.00	.15	2.71	9.76	4.71	6.81	1.23	.05	.00	27.28
2370	PINE VALLEY COUNTY PARK	.32	1.72	.00	.51	.48	3.97	9.00	9.77	7.97	1.94	.57	.00	36.25
2380	POINT LOMA - ANDERSON	.00	2.15	.07	.81	.08	2.65	7.11	5.31	5.93	.68	.00	.00	24.79
2400	POINT LOMA - NELSON	.00	2.77	.04	.34	.07	2.21	7.04	4.71	6.57	.00	.00	.00	23.75
2430	POUREND CU. PARK	.00	2.03	.00	1.01	.43	3.38	8.37	6.52	8.79	1.92	.33	.00	32.78
2460	POWAY C.R.S.	.00	12.90	.00	.00	.00	2.50	9.40	5.10	7.30	1.30	.20	.00	38.70
2490	POWAY VALLEY	.00	1.32	.00	.15	.17	2.97	10.50	5.50	7.60	1.15	.26		29.62C
2530	POWAY - WILLIAMS	.00	1.56	.00	.00	.27	2.41	9.87	5.33	8.32	1.56	.27	.00	29.59
2550	PUERTA LA CHUZ	.15	4.70	.00	.25	.15	4.51	11.22	7.18	7.82	1.47	.15	.00	37.60
2580	RAINBOW CAMP	.00	.00	2.40	.18	.03	3.53	.00	.00	.00	1.26	.07	.00	7.47
2640	RANOMA C.H.S.	.00	1.45	.00	.20	.28	2.78	9.99	6.30	8.75	1.47	.22	.00	31.44
2700	RANCHITA	.60	3.98	.00	.19	.00	2.92	6.45	6.48	3.39	.92	.26	.00	25.19
2730	RINCON SPRINGS	.00	2.20	.00	.00	.20	3.10	11.40	6.40	8.10	1.40	.10	.00	32.90

C = INCOMPLETE

MONTHLY AND SEASONAL PRECIPITATION 1977-78

STA NO.	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	SEASON TOTAL
	C = INCOMPLETE												
2790 RODRIGUEZ	.00	1.99	.00	.36	.39	2.59	4.37	4.38	3.94	.84	.06	.00	18.92
2850 SAN DIEGUITO PARK	.00	1.88	.01	.14	.02	2.19	9.06	6.32	3.98	.84	.10	.00	24.54
2880 SAN DIEGUITO RESERVOIR	.00	1.87	.00	.10	.02	2.14	10.32	4.50	6.51	1.41	.11	.00	26.98
2910 SAN ELIJU W.P.C.F.	.00	1.94	1.94	.00	.02	2.06	8.92	4.85	4.29	.57	.00	.00	24.59
3000 SAN MARCUS C.H.S.	.00	1.52	.00	.03	.15	2.02	8.94	4.80	5.87	1.34	.10	.00	24.77
3060 SAN ATEU	.00	1.98	.00	.05	.20	3.18	9.97	6.36	7.49	1.55	.03	.00	30.81
3105 SAN JROFRE SCALE	.00	3.50	.00	.00	.00	1.90	10.10	6.30	5.60	1.70	.00	.00	29.10
3121 SAN PASQUAL-JUDSON	.00	1.78	.00	.17	.15	2.09	8.44	4.74	7.59	1.36	.11	.00	26.43
3150 SAN VICENTE	.00	2.29	.00	.60	.15	3.57	10.56	7.39	8.91	1.61	.26	.00	35.34
3165 SANTEE LAKES	.00	1.60	.00	.70	.00	2.70	9.30	5.40	8.60	.30	.10	.00	28.70
3180 SANDAY RANCH	.15	1.02	.00	.66	.16	3.84	9.54	7.25	7.84	1.64	.50	.00	32.60
3195 SCRIPPS PIER SRG	.00	1.83	.00	.39	.00	2.73	7.29	.00	.00	.71	.04	.00	12.99
3210 SHUP	.04	3.71	.00	.27	.14	3.44	8.22	6.59	6.62	1.38	.32	.00	30.73
3270 SUTHERLAND	.00	3.32	.00	.20	.25	5.24	12.22	8.59	10.55	2.46	.45	.00	43.28
3300 SWEETWATER	.00	1.90	.00	1.07	.11	2.48	4.89	4.24	4.52	1.17	.06	.00	20.44
3360 TEN FOOT WEIR	.04	4.57	.00	.30	.00	4.71	12.21	8.93	9.22	2.53	.48	.00	42.99
3450 V-DITCH	.00	4.60	.00	.24	.25	4.24	10.57	8.40	9.92	2.20	.35	.00	40.77
3480 VALLEY CENTER 2 NNE						.00	6.78	9.65	1.58				18.01C
3510 VINEYARD RANCH	.00	1.80	.00	.10	.60	4.40	12.00	8.80	10.00	1.90	.30	.00	39.90
3540 VISTA E RESERVOIR	.00	1.88	.00	.16	.39	1.94	9.68	4.99	6.30	1.41	.00	.03	26.78
3612 VISTA 2 NNE	.00	1.78	.00	.01	.00	2.33	9.08	4.87	6.84	1.52	.05	.00	26.48
3624 WARNER RANCH	.15	5.87	.00	.10	.20	4.10	10.30	8.31	9.31	1.90	.33	.00	40.57
3636 WARNER SPRINGS	.40	3.20	.00	.20	.10	.00	12.40	7.70	8.10	1.40	.10	.00	33.60
3648 WEST FORK	.05	4.20	.00	.27	.30	5.45	13.16	10.23	6.81	2.63	.05	.00	43.15
3660 LAKE WOLFORD	.00	2.10	.00	.30	.00	3.70	10.70	7.00	9.60	1.10	.20	.00	34.70

3. Precipitation gages in the San Diego Region from California
Department of Water Resources Bulletin 230-81

APPENDIX B

SOUTH COAST REGION

1. Wind stations, South Coast Region, whose data are available from the National Climatic Data Center. State wide index is presented in Appendix D.
2. Index of South Coast Air Quality Management District wind gages (*) indicates coastal station. Period of record indicates period of record on computer files. In general, those ending in 1975 were continued, but are available on hardcopy only.
3. Precipitation gages, Los Angeles County. From the Department of Public Works, Los Angeles County.
4. Typical Precipitation Data Sheets, Los Angeles County Department of Public Works. Courtesy of Don Carpenter. (Includes typical chart from recording gages)
5. Index of precipitation gages, Riverside County, with cross-reference and location maps. Courtesy of Kathy Carter, Riverside County Flood Control and Water Conservation District.
6. Index of precipitation gages, San Bernardino County, with location map. Courtesy of Art Luther, San Bernardino County Flood Control and Water Conservation District. (Followed by typical data sheets)
7. Index of precipitation gages, Orange County, with location map. Courtesy of Emmett Franklin, Orange County Environmental Management Agency.
8. Typical Data sheets, Orange County Environmental Management Agency.
9. Index of precipitation gages, South Coast Region. From the California Department of Water Resources, Bulletin 230-81

1. Wind stations, South Coast Region whose data are available from the National Climatic Data Center. State wide index is presented in Appendix D.

LOCATION	AGENCY NUMBER	LATITUDE	LONGITUDE	HOURLY RECORD START	HOURLY RECORD STOP	OBS/ DAY	DIGITIZED RECORD
Euma Beach	CG	34-01	118-49	1976		3	-
Santa Monica	CG	34-00	118-30	1977		3	-
Santa Monica	LAWR 93197	34-01	118-27	1961		6	-
Marina Del Rey	CG	33-58	118-27	1975		3	-
Los Angeles Airport	SAWR 23174 WBAS WBO	33-56	118-23	1930 1938	1937	3-5 24	1942 -
Hermosa Beach	CG	33-52	118-24	1976		4	-
Pl. Vicente	CG	33-45	118-25	1971		5	-
Santa Monica Beach	CG	33-43	118-17	1973		3	-
St. Fermin	HF 93122	33-43	118-17	1934	1245	5	-
San Pedro	MAS 93113	33-45	118-15	1938	1947	24	-
San Pedro	WBO	33-44	118-17	1937	1560	Charts	-
San Pedro	WBO	33-45	118-16	1976		3	-
Los Angeles	CG	33-43	118-15	1965	1971	5	-
Los Alamitos	NAS 93106	33-48	118-04	1943	1970	24	1950 - 1951
Huntington Beach	CG	33-39	118-00	1975		3	-
Newport Beach	CG	33-36	117-53	1975		5	-
Esperanza	A	33-24	117-46	1979	1976	24	-

2. Index of South Coast Air Quality Management District wind gages, (*) indicates coastal station. Period of record indicates period of record on computer files. In general, those ending in 1975 were continued, but are available on hardcopy only.

PERIOD
OF RECORD

DATE OF RECORD (M-D-Y) OF (LAST-REV) DATE (M-D-Y) OF (LAST-REV) DATE (M-D-Y) OF (LAST-REV)

LINE	DESCRIPTION	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT	DATE	AMOUNT
0001	127A	110	23	50	53	47	50	570.8	3/39.7	1/56-12/57	
0002	127B	110	49	37	54	1	9	331.3	3745.6	1/56-12/75	
0003	127C	110	16	0	55	44	0	308.8	3733.0	NONE	
0004	127D	110	15	45	53	45	50	303.1	3737.7	1/56-12/60	
0005	127E	110	13	28	55	45	45	386.5	3735.7	1/56-12/77	
0006	127F	110	14	0	55	47	20	385.8	3734.2	1/56-12/58	
0007	127G	110	14	36	50	47	50	391.2	3408.8	NONE	
0008	127H	110	14	0	53	50	40	385.9	3745.4	9/55-1/56	
0009	127I	110	16	15	53	43	50	382.3	3732.2	1/56-12/57	
0010	127J	110	17	0	53	31	15	381.3	3746.5	2/56-9/70	
0011	127K	110	20	10	53	51	50	376.4	3747.1	11/55-7/60	
0012	127L	110	20	0	53	48	10	376.4	3740.9	NONE	
0013	127M	110	23	1	53	50	51	372.0	3745.9	7/69-12/75	
0014	127N	110	23	20	53	50	0	371.2	3744.4	4/66-6/69	
0015	127O	110	23	45	53	50	24	371.0	3756.2	1/56-12/81	
0016	127P	110	28	13	53	59	4	364.2	3741.2	1/56-12/75	
0017	127Q	110	25	0	53	59	0	369.1	3761.0	NONE	
0018	127R	110	27	15	54	1	5	365.7	3764.9	NONE	
0019	127S	110	29	50	54	0	50	361.7	3763.9	1/56-3/59	
0020	127T	110	33	15	54	2	15	348.8	3767.3	1/56-6/60	
0021	127U	110	7	30	53	40	50	395.8	3738.2	1/56-6/60	
0022	127V	110	3	15	53	47	58	402.4	3739.6	1/56-2/71	
0023	127W	110	9	14	53	48	59	393.2	3742.2	1/56-12/61	
0024	127X	110	9	31	53	55	36	392.9	3754.5	1/56-12/75	
0025	127Y	110	17	15	53	53	15	381.0	3757.6	1/56-8/59	
0026	127Z	110	13	30	53	53	50	366.7	3750.6	1/56-4/66	
0027	128A	110	21	50	54	3	5	374.1	3768.5	1/56-12/71	
0028	128B	110	18	0	54	1	30	360.0	3763.5	1/56-3/67	
0029	128C	110	19	10	54	5	50	378.3	3772.9	1/56-2/74	
0030	128D	110	26	20	54	4	20	367.2	3770.9	1/57-6/59	
0031	128E	110	30	0	54	13	15	361.8	3787.5	8/55-10/61	
0032	128F	110	36	0	54	16	50	352.7	3793.6	1/56-8/58	
0033	128G	110	54	10	53	46	15	416.4	3740.6	1/56-12/57	
0034	128H	110	2	50	53	54	55	403.7	3752.4	1/56-12/58	
0035	128I	110	8	10	53	59	25	395.0	3754.1	NONE	
0036	128J	110	13	4	53	59	56	387.4	3782.3	1/56-12/75	
0037	128K	110	6	25	53	50	50	394.1	3759.6	1/56-12/56	
0038	128L	110	12	40	54	1	0	388.2	3764.3	1/56-6/58	
0039	128M	110	9	0	54	7	50	393.9	3772.7	1/56-7/69	
0040	128N	110	12	10	54	3	50	369.0	3769.7	NONE	
0041	128O	110	14	40	54	3	0	385.1	3768.2	1/50-12/63	
0042	128P	110	21	12	54	11	58	375.3	3784.9	NONE	
0043	128Q	110	24	50	54	10	25	370.2	3782.1	NONE	
0044	128R	110	23	20	54	14	40	372.1	3789.9	6/55-3/65	
0045	128S	110	27	20	54	15	0	366.0	3790.6	1/56-3/60	
0046	128T	110	32	10	54	0	13	419.7	3762.6	9/55-2/60	
0047	128U	110	31	40	54	0	25	420.5	3763.1	NONE	
0048	128V	110	37	50	54	5	15	411.6	3772.1	1/57-12/64	
0049	128W	110	38	30	54	1	15	410.0	3764.7	8/55-4/60	
0050	128X	110	3	15	54	2	15	402.7	3766.6	8/55-7/61	
0051	128Y	110	3	15	54	2	15	402.7	3766.6	9/61-10/65	
0052	128Z	110	4	4	54	5	21	401.5	3774.2	1/56-8/60	
0053	129A	110	1	10	54	4	45	406.0	3778.6	NONE	

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STATION CALL SIGN CLASS OF SERVICE LAT (DEG:MIN:SEC) LON (DEG:MIN:SEC) UTM(EAST-KM) UTM(NORTH-KM) PERIOD OF RECORD

STATION	CALL SIGN	CLASS OF SERVICE	LAT (DEG:MIN:SEC)	LONG (DEG:MIN:SEC)	UTM(EAST-KM)	UTM(NORTH-KM)	PERIOD OF RECORD
0564	ALT	ALTADENA	110. 7. 55.	34. 16. 10.	395.7	3785.0	1/56-12/62
0564	ALT	ALTADENA	110. 6. 0.	34. 10. 45.	398.6	3782.4	NONE
0544	ALT	LA CARAGA	110. 11. 10.	34. 13. 30.	390.7	3787.5	NONE
0544	ALT	PASADENA	110. 8. 50.	34. 8. 50.	394.2	3778.9	NONE
0544	ALT	PASADENA	-----	-----	-----	-----	9/55-6/59
0564	ALT	LA TRUZE	-----	-----	-----	-----	1/56-10/61
0564	ALT	SAN FERRANDO	-----	-----	-----	-----	NONE
0564	ALT	San Joa	117. 41. 20.	34. 2. 30.	436.4	3766.8	NONE
0544	ALT	SAN GILAS	117. 48. 55.	34. 6. 25.	424.8	3774.1	1/56-3/59
0544	ALT	SAN GILAS	117. 48. 55.	34. 6. 25.	424.8	3774.1	NONE
0604	ALT	ZENESA	117. 53. 10.	34. 8. 10.	418.3	3777.4	8/55-3/62
0614	ALT	UTAHIAU	117. 35. 14.	34. 3. 14.	445.8	3768.1	1/56-12/61
0624	ALT	LAPEER JCT	117. 41. 15.	34. 9. 50.	436.6	3774.8	NONE
0634	ALT	AIRPORT BEACH	117. 54. 50.	33. 36. 33.	415.0	3719.0	1/56-12/75
0644	ALT	EL TORO	117. 41. 24.	33. 37. 40.	456.0	3720.9	1/56-10/60;7/76-12/81
0654	ALT	SANTA ANA	117. 43. 1.	33. 45. 1.	453.6	3734.5	5/60-2/64;5/67-1/72
0544	ALT	SANTA ANA	117. 52. 30.	33. 40. 0.	418.9	3725.3	NONE
0664	ALT	FORTANA	117. 50. 0.	34. 5. 0.	453.9	3771.3	1/56-12/72
0674	ALT	CALUGA PARK	110. 55. 48.	34. 12. 23.	352.9	3786.0	1/56-12/76
0654	ALT	LOS ANGELES	118. 13. 50.	34. 5. 45.	386.5	3773.3	2/56-8/61
0644	ALT	VENNALL	118. 32. 0.	34. 43. 10.	359.0	3805.8	1/56-12/59
0704	ALT	VENNALL	118. 13. 50.	33. 59. 45.	366.3	3762.2	8/55-6/56
0714	ALT	ARAFIRM	117. 55. 7.	33. 49. 16.	415.0	3742.5	1/58-12/75
0724	ALT	VALBUENA	110. 15. 47.	33. 49. 58.	383.1	3744.1	4/62-10/62
0734	ALT	VALBUENA	-----	-----	-----	-----	NONE
0744	ALT	VALBUENA	110. 20. 30.	34. 3. 54.	376.0	3769.4	3/61-10/62
0754	ALT	LOS ANGELES	110. 13. 31.	34. 4. 2.	386.9	3770.1	9/79-12/81
0754	ALT	LOS ANGELES	110. 14. 45.	34. 2. 21.	385.0	3767.0	7/56-8/79
0764	ALT	RIVERSIDE	117. 16. 30.	33. 53. 30.	474.8	3750.0	1/56-12/57;7/76-12/81
0774	ALT	SAN BERNARDINO	117. 14. 14.	33. 39. 59.	478.0	3725.0	1/57-12/60;7/76-12/80
0784	ALT	WASHINGTON	110. 14. 15.	33. 47. 20.	385.4	3739.2	6/56-10/56
0794	ALT	REDONC BEACH	110. 24. 5.	33. 51. 40.	370.4	3747.4	6/56-6/60
0804	ALT	VALBUENA	110. 14. 0.	33. 13. 25.	385.1	3676.6	1/57-7/72
0814	ALT	RIVERA	110. 6. 19.	33. 56. 16.	397.9	3759.3	1/57-12/75
0824	ALT	ARTESIA	110. 4. 10.	33. 51. 20.	401.1	3746.5	1/57-5/60
0834	ALT	WORTHIDGE	110. 51. 50.	34. 14. 20.	328.3	3790.0	1/57-9/66
0844	ALT	WORTHIDGE	-----	-----	-----	-----	1/57-6/60
0854	ALT	VALBUENA	-----	-----	-----	-----	1/57-6/60
0864	ALT	VALBUENA	110. 30. 0.	34. 9. 40.	361.7	3780.6	2/57-12/72
0874	ALT	WASHINGTON BEACH	110. 57. 30.	33. 36. 15.	318.4	3723.5	7/57-12/57
0884	ALT	EL REDONC	110. 24. 23.	33. 55. 13.	370.0	3754.0	1/57-12/57
0894	ALT	PALMDALE	110. 4. 40.	34. 37. 10.	401.2	3831.2	1/58-4/74
0904	ALT	LANCASTER	110. 10. 40.	34. 42. 25.	392.1	3841.0	1/58-5/64
0914	ALT	LANCASTER	-----	-----	-----	-----	3/56-6/71
0924	ALT	AIRPORT BEACH	117. 55. 30.	33. 46. 30.	414.2	3718.9	NONE
0934	ALT	SANTA ANA CANYON	117. 44. 51.	33. 52. 19.	430.9	3748.0	NONE
0944	ALT	LA VERNE	117. 48. 20.	34. 4. 55.	428.0	3770.7	10/58-5/75
0954	ALT	VALBUENA	110. 0. 47.	33. 52. 47.	406.3	3749.1	3/59-12/76
0964	ALT	RIVERSIDE	117. 26. 30.	33. 57. 5.	459.2	3756.7	NONE
0974	ALT	ZENESA	117. 55. 25.	34. 6. 9.	414.9	3777.4	5/60-12/76
0984	ALT	LA HABRA	110. 13. 10.	34. 44. 20.	388.4	3844.0	2/60-10/73
0994	ALT	LA HABRA	117. 57. 7.	33. 55. 26.	412.0	3754.0	8/60-12/75
1004	ALT	VALBUENA	110. 16. 27.	34. 10. 50.	379.5	3783.0	3/62-12/76
1014	ALT	AIRPORT BEACH	110. 11. 19.	33. 49. 24.	390.0	3743.0	1/63-12/75
1024	ALT	AIRPORT BEACH	110. 20. 7.	34. 6. 50.	367.5	3767.5	1/63-12/75

STATION	UTR (SOUTH)	UTR (CENTRAL)	UTR (WEST)	UTR (SOUTH-EAST)	UTR (EAST-SEA)	UTR (NORTHERN)	PERIOD OF RECORD
1201	110	17	31	54	5	11	4/63-12/74
1202	110	41	23	34	1	54	1/64-12/75
1203	110	25	15	34	10	25	2/64-8/67
1204	117	31	36	33	54	41	1/65-12/75
1205	110	31	49	34	11	54	4/65-12/75
1206	110	12	49	34	10	42	5/65-12/76
1207	117	44	20	34	3	60	6/65-12/75
1208	110	7	35	34	9	15	6/59-12/69
1209	110	2	0	34	5	10	10/65-6/71
1210	110	14	17	33	53	19	3/66-12/76
1211	110	27	59	34	16	23	1/67-12/76
1212	110	1	29	33	55	46	6/69-12/75
1213	110	31	42	34	20	59	9/69-12/75
1214	110	32	0	34	23	20	NONE
1215	110	7	24	34	8	1	6/70-4/72
1216	110	7	35	34	8	0	NONE
1217	113	8	6	34	41	36	7/70-12/75
1218	110	22	26	33	53	46	4/71-12/75
1219	110	8	37	34	5	30	1/71-12/76
1220	110	22	37	33	54	32	9/70-12/76
1221	110	35	9	34	20	8	1/72-12/75
1222	110	7	41	34	4	30	5/72-12/75
1223	110	3	4	34	15	54	NONE
1224	117	35	47	33	39	21	NONE
1225	110	1	54	33	47	45	2/72-12/75
1226	117	41	25	33	37	54	1/73-12/75
1227	110	8	20	34	42	43	5/74-12/81
1228	110	12	42	33	55	20	1/74-12/75
1229	117	34	46	34	30	14	1/75-11/75
1230	110	13	10	33	54	55	NONE
1231	110	3	29	34	0	53	NONE
1232	117	46	51	33	32	16	NONE
1233	117	39	51	33	29	36	1/75-12/75
1234	117	44	46	33	20	32	1/75-10/75
1235	117	35	36	33	55	56	NONE
1236	117	25	1	33	54	59	NONE
1237	117	14	31	33	50	10	NONE
1238	117	20	43	33	41	3	NONE
1239	117	20	55	33	40	30	NONE
1240	117	6	43	33	20	50	NONE
1241	110	38	23	33	44	42	NONE
1242	110	33	11	33	55	58	NONE
1243	110	32	27	33	49	25	NONE
1244	110	13	11	33	43	6	NONE
1245	117	39	2	34	5	55	NONE
1246	117	38	0	34	6	10	NONE
1247	117	41	24	34	1	9	NONE
1248	117	29	1	34	7	24	NONE
1249	117	24	25	34	6	0	NONE
1250	117	17	34	34	6	50	NONE
1251	117	15	25	34	6	15	NONE

STATION STATE COUNTY COORDINATES LAT (DEG:MIN:SEC) UTM(EASTING) UTM(NORTHING) PERIOD OF RECORD

STATION	STATE	COUNTY	COORDINATES	LAT (DEG:MIN:SEC)	UTM(EASTING)	UTM(NORTHING)	PERIOD OF RECORD
1517	NEB	DELANO		117. 11. 16.	54. 3. 20.	462.8	NONE
1520	NEB	YORK		117. 3. 15.	54. 3. 10.	495.0	NONE
1536	NEB	VIRGINVILLE		117. 17. 35.	54. 42. 5.	473.1	NONE
1546	NEB	PAWNE		117. 1. 31.	54. 33. 45.	497.7	NONE
1556	NEB	LANE	SEBASTY	117. 15. 56.	54. 14. 50.	475.5	NONE
1561	NEB	LANE	SEBASTY	118. 54. 8.	54. 14. 51.	509.0	NONE
1570	NEB	LANE	SEBASTY	118. 3. 15.	54. 8. 25.	587.2	NONE
1586	NEB	LANE	SEBASTY	118. 23. 1.	54. 3. 6.	372.3	NONE
1596	NEB	LANE	SEBASTY	117. 28. 43.	54. 18. 45.	455.9	NONE
1606	NEB	LANE	SEBASTY	119. 57. 2.	54. 50. 8.	717.9	NONE
1616	NEB	LANE	SEBASTY	117. 9. 0.	54. 4. 0.	466.2	NONE
1626	NEB	LANE	SEBASTY	117. 41. 25.	54. 1. 10.	436.3	NONE
1636	NEB	LANE	SEBASTY	118. 14. 20.	55. 49. 50.	385.4	NONE
1646	NEB	LANE	SEBASTY	116. 53. 0.	54. 25. 0.	357.6	NONE
1656	NEB	LANE	SEBASTY	117. 42. 25.	55. 45. 34.	436.1	NONE
1666	NEB	LANE	SEBASTY	117. 24. 24.	54. 7. 23.	462.5	NONE
1676	NEB	LANE	SEBASTY	117. 54. 31.	53. 52. 54.	446.8	NONE
1686	NEB	LANE	SEBASTY	117. 54. 6.	55. 55. 25.	447.6	NONE

3. Precipitation gages, Los Angeles County. From the Department
of Public Works, Los Angeles County.

RAINFALL STATION LOCATION AND SEASONAL AMOUNT (CONTD.)

STA. NO.	STATION NAME	TYPE OF GAGE	YEARS OF RECORD	ELEV. OF GAGE	NORTH LAT.	WEST LONG.	OBSERVER	SEASONAL RAINFALL 1975-76	1976-77
1190	SHORTCUT CANYON-WEST FORK	A	11	662'	36-15-35	118-00-08	LACPCD PERSONNEL	28.9	25.9
1190	SAN GABRIEL CANYON WEST FORK HELIPORT	A	13	3200	36-15-02	118-01-10	LACPCD PERSONNEL	26.0	23.1
1192	IRON MOUNTAIN	ST	14	532'	36-21-06	118-01-02	LACPCD PERSONNEL	42.41	19.64
1198B	HILL HIGH RANCH	S	5		36-20-03	117-00-19	JAMES GIBBY	13.0000	15.710
1197	PENNER CANYON	S	12	5387	36-23-24	117-00-27	REGISTRATION DEPT. PERSONNEL	15.2000	16.56
1199B	LAKE PIRU	SP	23	1149	36-20-22	118-05-21	FRANK C. BELMETH	17.40	13.93
1170B	THOUSAND OAKS WEATHER STATION	A	21	705	36-10-00	118-01-01	VENTURA COUNTY FLOOD CONTROL	9.03	11.90
1171B	CAMULUS RANCH	SA	21	729	36-20-27	118-05-21	JACK HARRING	9.95	13.02
1172	PIRU CANYON ABOVE PIRU LAKE	AP	21	1150	36-30-00	118-05-26	FRANK C. BELMETH	9.73	16.26
1173A	TAPO CANYON	AP	16	132'	36-12-36	118-02-01	SOIL CON. PERSONNEL	11.35	12.00
1177B	LAKE BARD	A	11	191'	36-10-32	118-00-01	A.L. ALVAR	6.91	9.17
1183B	LA HABRA FIRE STATION	SP	40	312	33-55-33	117-57-17	FIRE STATION PERSONNEL	9.95	11.00
1184	SAN FRANCISCO CANYON CAMP #	S	9	1840	36-13-55	118-28-28	WILLIAM TRITH	9.0000	12.15
1187	HILLARD-CAMP SIERRA	STP	6	2760	36-13-00	118-07-38	U.S.F.S. PERSONNEL	21.29	17.33
1188	BATON-HARRAH SADDLE	SP	6	3067	36-10-11	118-05-38	U.S.F.S. PERSONNEL	17.80	16.17
1199	PACIFICA CANYON NORTH FORK RANGER STATION	SA	8	4187	36-23-17	118-15-00	USFS PERSONNEL	17.20	15.91
1191	BEAR-DIVIDE JUMP STATION	S	7	2700	36-21-35	118-23-37	USFS PERSONNEL	21.42	20.03
1192	CARSON FIRE STATION	0-41"	4	92	33-52-06	118-15-04	FIRE STATION PERSONNEL	7.93	9.41
1193	WESTLAKE VILLAGE	S	4	985	36-30-19	118-00-35	FIRE STATION PERSONNEL	6.99	12.300
1194	SANTA YNEZ RESERVOIR	S	10	735	36-20-27	118-33-59	D.W.P. PERSONNEL	9.94	13.51
1195	CHINO FIRE STATION #2	SP	22	855	33-50-00	117-03-20	SUBC.F.C.D.	9.95	15.34
1196	MONTCLAIR FIRE DEPARTMENT	S	20	905	36-03-01	117-01-19	SUBC.F.C.D.	11.07	15.26
1197	CAJON WEST SUMMIT	AP	30	4880	36-23-00	117-55-00	SUBC.F.C.D.	12.90	11.5
1198	PHILAN FIRE CONTROL	SP	20	4160	36-25-37	117-36-00	SUBC.F.C.D.	9.29	7.380
1199	CLOUDCROFT DEBRIS BASIN	A	4	350	36-12-58	118-34-12	LACPCD PERSONNEL	8.7	6.7
1201	ROZEN HILLS	S	2	1135	36-10-00	118-03-03	COLLEEN HARTMAN	9.91	16.100
1202	CAMP CISQUITO	S	2	2840	36-30-59	118-20-17	LEWIS WARD	13.52	16.310
1203	LITTLE TUJUNGA-ALORA CREEK	ST	2	2825	36-20-53	118-18-50	LACPCD	23.12	19.44
1204-E	WETON SCHOOL	S	2	2760	36-20-23	118-11-00	STUDENTS	7.500	INC.
1205	WOODY SPRING	ST	2	2914	36-36-04	117-00-23	LACPCD	3.57	4.81
1206	MUROC	ST	2	2319	36-00-29	117-55-03	LACPCD	2.05	INC.
1207	ROSAMOND WEST	ST	2	2340	36-00-14	118-11-34	LACPCD	3.28	9.00
1208	LA CRESCENTA-PRAGITH	S	1	1707	36-10-30	118-15-29	CHUCK VERWITZ	4.11	INC.
1212	LAMCASTER PMS/RAA	S	3	2340	36-00-00	118-11	DEPT. OF TRANSPORTATION	4.70	9.01
1190	HI VISTA	S	20	3087	36-00-31	117-00-03	MARY SCHAEFFER	6.76	4.38
1191	COOBS CANYON	SP	21	3400	36-15-52	118-15-11	T. ARNOT	16.45	16.31
1218	DUNSMORE CANYON-UPPER	SP	21	3290	36-15-39	118-13-07	T. ARNOT	20.00	17.17
122	ISLIP SADDLE	ST	20	6942	36-21-27	117-51-04	LACPCD PERSONNEL	29.8000	29.70
123	TORE CANYON	ST	20	7280	36-22-16	117-50-51	LACPCD PERSONNEL	21.75	26.77
124	GRASSY HOLLOW	ST	20	7360	36-22-17	117-50-05	LACPCD PERSONNEL	14.07	14.07
125	BEAN GULCH	ST	20	7880	36-21-58	117-01-27	LACPCD PERSONNEL	22.01	19.31
126	BLUE RIDGE	ST	20	4450	36-20-57	117-00-27	LACPCD PERSONNEL	15.04	12.31
127	GURFF'S CAMP	ST	20	8780	36-20-27	117-10-59	LACPCD PERSONNEL	18.53	15.07
128B	HOLIDAY HILL	A	20	8130	36-21-29	117-00-50	LACPCD PERSONNEL	21.7	16.0
133	EAGLE DEBRIS BASIN	0-41"	18	1890	36-10-07	118-14-12	LACPCD PERSONNEL	19.200	14.120
142B	HORN DEBRIS BASIN	S	9	1230	36-20-15	117-05-39	LACPCD PERSONNEL	9.6700	16.20
143	HARLOW JEARIS BASIN	0-41"	9	1275	36-29-24	117-01-00	LACPCD PERSONNEL	13.4000	7.4
144	ENGLEWILD DEBRIS BASIN	0-41"	9	1310	36-29-24	117-02-08	LACPCD PERSONNEL	16.1100	215.0

LEGEND REGARDING GAGE TYPE, OWNERSHIP, AND RAINFALL AMOUNTS

- S STANDARD 8" DIA. NON-RECORDING GAGE OWNED BY FLOOD CONTROL DIST.
- A AUTOMATIC RECORDING GAGE OWNED BY FLOOD CONTROL DISTRICT
- ST STORAGE TYPE GAGE OWNED BY FLOOD CONTROL DISTRICT
- 0-41" 4.1" DIAMETER NON-RECORDING GAGE OWNED BY FLOOD CONTROL DISTRICT
- 3" 3" DIAMETER NON-RECORDING GAGE OWNED BY OUTSIDE INTERESTS
- 4 1/2" 4 1/2" DIAMETER NON-RECORDING GAGE OWNED BY OUTSIDE INTERESTS
- SP AUTOMATIC RECORDING GAGE OWNED BY OUTSIDE INTERESTS
- AP AUTOMATIC RECORDING GAGE OWNED BY OUTSIDE INTERESTS
- SURFTR 0 OR C DEPTH'S SECOND OR THIRD LOCATION OF STATION IN SAME AREA
- SURFTR E DEPT'S EVAPORATION PAN AT STATION
- 0 ESTIMATED GREATER THAN 10% OF TOTAL
- 0 ESTIMATED LESS THAN 10% OF TOTAL
- INC. INCOMPLETE RECORD
- N.I. NOT INSTALLED
- N.R. NO RECORD
- DISC. STATION DISCONTINUED

4. Typical Precipitation Data Sheets, Los Angeles County
Department of Public Works. Courtesy of Don Carpenter.
(Includes typical chart from recording gages)

SEASONAL PRECIPITATION BY DAY 1982 - 1983

STATION NO. 610B

Pasadena - City Hall

LATITUDE 34 ° 08 ' 54 "
 LONGITUDE 118 ° 08 ' 36 "
 ELEVATION 864 '
 OBSERVATION TIME 5 AM/PM

LENGTH OF RECORD



REMARKS/CERTIFICATION:

SUBAREA CODE
 FOREIGN NO.
 QUAD INDEX NO. 40-55

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1						3.95		.13	.05			
2					.39	4.14		.13				
3					.63	.66						
4						.04						
5					.21		.09					
6					T	.08						
7					.22	.02					T	
8			.01		.60							
9		1.40	.02									
10		1.36	.01									
11							.03		.03			
12												
13					.05	.02						
14						.56					.02	
15											.30	
16											T	
17						.45	T				.42	
18						.18	2.12				.14	
19		.73		.88		.15	.06				1.04	
20							2.36				T	.20
21						1.03	.67					
22			.98	.35		.02						T
23		T	.49	2.12		.18						
24				1.03	.07	.95	T					
25				.01	.19							
26	.38				.83							.10
27				2.95	1.40							T
28					1.60	.17	.05					
29		.21	.04	1.52			1.70					.27
30	.07	3.18	.04				.69					1.61
31								.03				
TOTAL	.45	6.80	1.59	8.86	6.19	12.60	7.77	.29	.08	Φ	1.92	2.18

LACFCO

SEASON TOTAL 48.73 INCHES

SEASONAL PRECIPITATION BY DAY 1977 - 1978

STATION NO. 491C
Pacific Palisades

LATITUDE 34 ° 02 ' 22 "
LONGITUDE 118 ° 31 ' 43 "
ELEVATION 293 '
OBSERVATION TIME 5 /PM

LENGTH OF RECORD

REMARKS/CERTIFICATION:

SUBAREA CODE A7
FOREIGN NO.
QUAD INDEX NO. 24-65



DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1						1.88	.22					
2						1.79						
3				.25		.91						
4				1.33		3.20	.13					
5		.25			1.78	.72						.53
6				.65	.35							.13
7				.03	.83		.22					
8					.19					T	T	
9				1.72	1.98	.20				T		
10				.33	.75							
11						T						
12					1.45	.12						
13					1.46		T					
14				.58								
15				1.14			.62					
16				1.18			.20					
17			.20	.67								
18			.20	T								
19	T			.63								
20												
21			.05			.28						
22						1.02						
23												
24												
25							.27					
26			.85									
27			1.0		1.43							
28			2.25		1.80	T						
29			.89			.08						
30						.31						
31						.86						
TOTAL	T	.25	5.42	8.51	12.02	11.37	1.66	0	0	0	T	.66

LACFD

2979 FCO 7-77

SEASON TOTAL 39.89 INCHES

TABULATION OF PERIODS OF MAXIMUM RAINFALL FOR STORMS HAVING A TOTAL OF .5 INCHES OR OVER

STATION NAME LOS ANGELES - DULCOMMUN STATION NO. 716 DATE INSTALLED _____

K Zone

Date	5 Min.	10 Min.	15 Min.	30 Min.	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.	5 Hrs.	12 Hrs.	24 Hrs.	Storm Total
DEC	.1	.2	.3	.3	.4	.8	1.1	1.3	1.4	1.8	2.2	A. 4.0
25-29	10:31 A	10:38 A	10:58 A	10:58 A	2:53 A	7:43 A	8:03 A	6:53 A	5:53 A	12 MUNT	2:18 P	S.
1977	28	28	28	28	28	28	28	28	28	27	27	

Remarks

STORM DURATION 6:00 P on 12-25 to 10:00 A on 12-29

JAN	.1	.2	.3	.6	.6	.7	.7	1.2	1.3	1.3	1.3	A. 1.9
4-6	11:20 A	11:20 A	11:20 A	11:20 A	11:20 A	2:20 P	2:20 P	11:20 A	11:20 A	11:20 A	11:20 A	S.
1978	4	4	4	4	4	4	4	4	4	4	4	

Remarks

STORM DURATION 11:20 A on 1-4 to 12:35 P on 1-6

JAN	.2	.2	.3	.4	.4	.4	.6	.6	.7	.9	1.4	A. 1.7
9-10	5:25 A	5:25 A	5:25 A	5:25 A	5:25 A	5:25 A	5:25 A	5:25 A	11:35 A	5:25 A	11:35 A	S.
1978	10	10	10	10	10	10	10	10	9	10	9	

Remarks

STORM DURATION 11:35 A on 1-9 to 4:55 P on 1-10

FEB	.1	.1	.2	.3	.6	.9	1.0	1.2	1.3	2.0	2.3	A. 3.7
8-10	1:45 A	1:45 A	1:40 A	1:40 A	1:25 A	1:40 A	11:25 P	10:40 P	9:40 P	2:40 P	10:30 A	S.
1978	9	9	9	9	9	8	8	8	8	8	8	

Remarks

STORM DURATION 4:00 P on 2-8 to 6:10 A on 2-10

FEB 27-	.2	.3	.4	.5	.6	.9	1.2	1.3	1.4	2.4	3.8	A. 8.5
MAR 5	0:10 A	0:05 A	0:05 A	11:50 P	7:15 A	0:25 A	12 MUNT	12 MUNT	10:55 P	2:25 P	11:25 A	S.
1978	5	5	5	4	4	1	2:20	2:20	2:20	2:20	2:27	

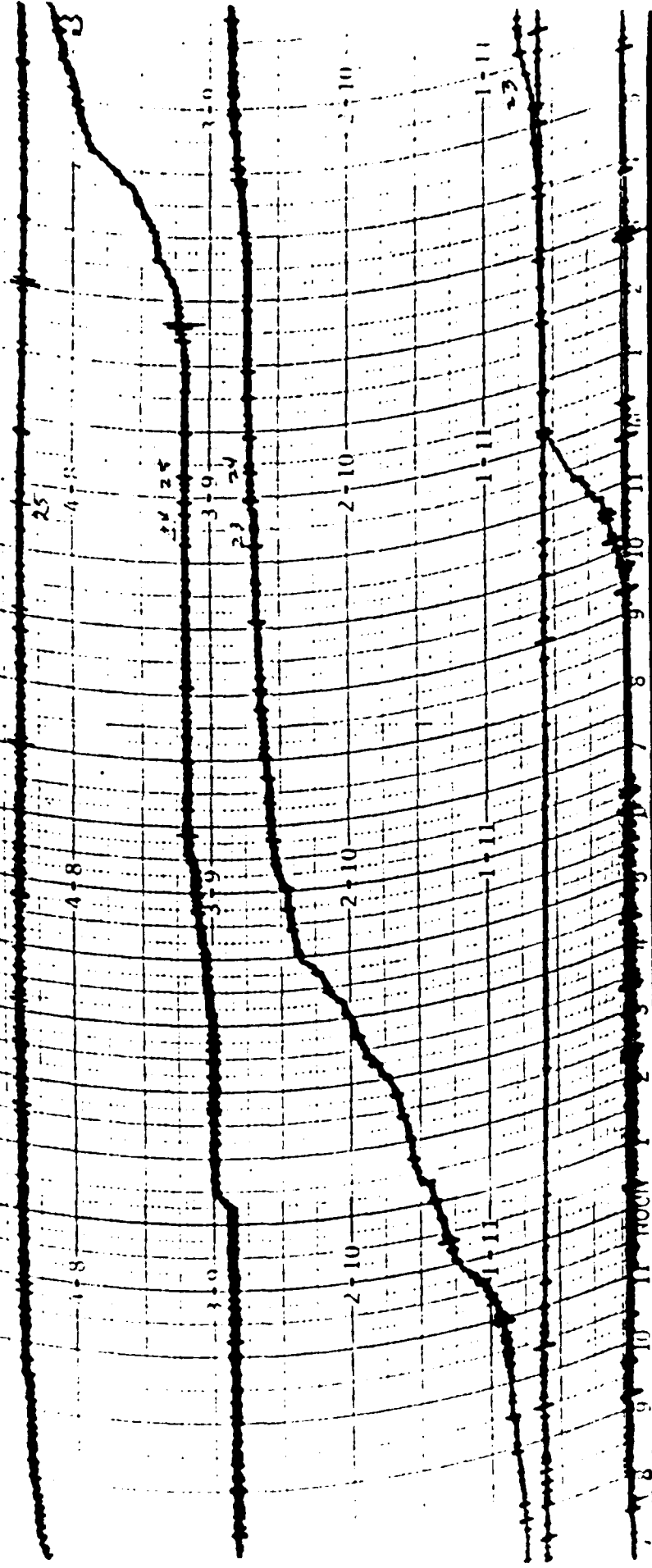
STORM DURATION 2:20 A on 2-27 to 2:40 A on 3-5

NOTE: Time shown is beginning of period indicated.
 A: Indicates recording rain gage amount.
 S: Indicates Standard rain gage amount.

11 10 9 8 7 6 5 4 3 2 1 HOUR

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT			
STA. NO. 776	DATE 11/19/59	EXACT TIME TO MIN. 7:25 AM	INITIAL JF, RC
CHART PUT ON 11/19/59	DATE 11/19/59	EXACT TIME TO MIN. 7:25 AM	INITIAL JF, RC
CHART REMOVED 11/19/59	DATE 11/19/59	EXACT TIME TO MIN. 7:25 AM	INITIAL JF, RC
STANDARD GAGE ART. 51449	INCHES		
AUTO. MEAS. IN STD. 4.95	INCHES		

OFF



5. Index of precipitation gages, Riverside County, with cross-reference and location maps. Courtesy of Kathy Carter, Riverside County Flood Control and Water Conservation District.

RAINFALL STATION INDEX

STATION NAME	STATION NO.	LATITUDE	LONGITUDE	ELEV	EQUIPMENT TYPE	FIRST YEAR	OWNER	OPERATOR
ASUANGA PEADFORC	RS/ 2E-08P01	33-25-12	116-49-10	3380	8 STD	1922	RCFC&MCD	R BRADFORD
ASUANGA VALLEY	8S/ 1E-28P01	33-25-40	116-52-47	1920	8 AUTO	1980	RCFC&MCD	RCFC&MCD
ASUANGA-THOMSEN	8S/ 1E-34P01	33-26-09	116-51-40	1986	8 STD	19030	NWS	PAUL THOMPSEN
ALANDALE	4S/ 2E-34P01	33-42-53	116-45-15	5800	12 AUTO A	1986	RCFC&MCD	RCFC&MCD
ANGELES HILL	4S/ 1E-23P01	33-48-26	116-51-08	3920	8 STOR	1979	RCFC&MCD	RCFC&MCD
ANZA SDF	7S/ 3E-16P01	33-33-18	116-40-22	3915	8 STD & AUTO	1983	RCFC&MCD	SDF & RCFC&MCD
ANZA-CARTIER	7S/ 3E-04P01	33-35-25	116-40-10	4550		19500	PRIVATE	CARTIER
ARLINGTON	3S/ 5W-08P01	33-55-01	117-26-31	805	4 PLAS	1963	RCFC&MCD	RVSD FIRE DEPT
ARLINGTON HEIGHTS	3S/ 5W-30P01	33-53-18	117-26-55	920	8 STD	19230	HEASLET GROVE	F S HEASLET
BANNING	3S/ 1E-16P01	33-55-20	116-52-32	2305	8 STD	19340	MWD	MWD
BANNING BENCH	2S/ 1E-30P01	33-58-26	116-54-41	3500	8 STD	19750	USFS	USFS
BANNING BENCH NO.2	2S/ 1E-17P01	33-59-56	116-54-34	4000	8 AUTO	1976	RCFC&MCD	RCFC&MCD
BANNING WATER CO	3S/ 1E-09P01	33-55-17	116-52-26	2296	8 STD	1879	BANNING WATER	BANNING WATER
BEAUMONT	3S/ 1W-10P01	33-55-44	116-58-27	2613	8 AUTO	1888	NWS	RCFC&MCD
BEAUMONT 1E	3S/ 1W-11P01	33-55-45	116-58-03	2603	8 STD	1942	NWS	MR. PHILLIPS
BEAUMONT NEAR	3S/ 1W-19P01	33-54-00	117-02-00	2560		18750		RING & MURRAY
BEAUMONT PUMP PLNT	2S/ 1W-22P01	33-59-06	116-58-03	3085	8 STD	19110	NWS	B-CV MTR DIST
BEAUMONT SDF	3S/ 1W-11P02	33-55-47	116-57-00	2500	4 PLAS	1957	RCFC&MCD	SDF
BERDOO CAMP	4S/ 6E-16P01	33-49-50	116-08-50	1875	8 STD	19340	NWS	MWD
BERDODAY DUNES SDF	5S/ 7E-07P01	33-44-38	116-17-15	100	4 PLAS	1954	RCFC&MCD	SDF
BLACK MTA-YMCA	4S/ 2E-01P01	33-50-50	116-43-17	6720	8 STOR	1978	RCFC&MCD	RCFC&MCD
BLYTHE AIRBASE SDF	6S/ 22E-31P01	33-36-50	114-42-50	390	8 STD & AUTO	1940	NWS	SDF
BLYTHE SDF	6S/ 23E-32P01	33-36-49	114-35-47	267	8 STD	1909	NWS	SDF
BOX SPRINGS VTR	2S/ 4W-27P01	33-57-43	117-16-47	3090	8 STD	19310	RVSD O COMM DP	L H CLARAUGH
BUNDY CANYON RD	6S/ 3W-20P01	33-38-26	117-12-51	1790	4 PLAS	19660	RCFC&MCD	R FRANCISCO
CABAZON	3S/ 2E-16P01	33-55-02	116-47-03	1820	8 AUTO	1898	RCFC&MCD	RCFC&MCD
CABAZON SDF	3S/ 2E-16P02	33-54-33	116-45-52	1700	8 STD	1984	RCFC&MCD	SDF
CABAZON SHAFT	3S/ 2E-20P01	33-53-38	116-47-30	1800		19380	MWD	M R COONS
CAPULLA	7S/ 3E-11P01	33-32-30	116-44-36	3535	8 STD	19110	NWS	M L SHAWK
CAVALCO #2	4S/ 5W-12P02	33-50-27	117-21-31	1530	8 STD	19340	MWD	MWD
CAVALCO SDF	4S/ 5W-12P01	33-50-06	117-21-02	1520	4 PLAS	1956	RCFC&MCD	SDF
CALTEESA SDF	2S/ 2W-13P01	34-05-13	117-03-29	2400	8 STD	1958	RCFC&MCD	SDF
CAMP SCHEPMAN	6S/ 4E-17P01	33-38-50	116-35-40	5350	8 STD & AUTO A	1977	RCFC&MCD	H FRIEDMAN
CATHEDRAL CITY RD	4S/ 5E-33P03	33-47-00	116-27-57	295	8 AUTO	1969	RCFC&MCD	RCFC&MCD
CATHEDRAL CITY SDF	4S/ 5E-33P01	33-46-49	116-27-27	294	8 STD	1949	RCFC&MCD	SDF
CHASE & TAYLOR	4S/ 7W-02P02	33-50-37	117-34-32	1055	8 STD & AUTO	1930	RCFC&MCD	CLC/RCFC&MCD
CHERRY VALLEY SDF	2S/ 1W-22P02	33-54-32	116-58-20	2450	4 PLAS	1911	RCFC&MCD	SDF
CHERRY VALLEY-LEE	2S/ 1W-27P01	33-58-19	116-58-24	2820	3 STD	19560	RCFC&MCD	RICHARD LEE
CORONA BARNEZ E 57	4S/ 7W-12P02	33-48-57	117-33-32	1820	3 STD	19350		A C HARNES
CORONA FIRE DEPT	3S/ 7W-25P03	33-53-05	117-33-45	593	8 STD	1989	NWS	CORONA FIRE DP
CORONA FLC#4	4S/ 5W-05P01	33-51-45	117-32-09	990		19320	CORONA LEM CO	CORONA LEM CO
CORONA FLC#5	3S/ 7W-35P01	33-52-25	117-35-05	725		19370	CORONA LEM CO	CORONA LEM CO
CORONA FLC#6A	3S/ 7W-36P01	33-51-55	117-34-02	790		19410	CORONA LEM CO	CORONA LEM CO
CORONA JAYSON	4S/ 7W-01P01	33-51-13	117-33-11	900		19310		MR BLACMAN

* P = Discontinued

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT 1965

RAINFALL STATION INDEX

STATION NAME	STATION NO.	LATITUDE	LONGITUDE	ELEV.	EQUIPMENT	TYPE	FIRST YEAR	OWNER	OPERATOR
CORONA REAR	3S/ 6W-30P01	33-52-30	117-32-57	540	9	AUTO	1940	USDA	USFS
CORONA SDF	3S/ 7W-13P01	33-54-07	117-33-40	638	4	PLAS	1951	RCFC&MCO	SDF
CORONA SIAS	4S/ 7W-02P01	33-35-39	117-33-23	1020			1912	THOMAS SIAS	THOMAS SIAS
CORONA SOUTH	4S/ 6W-07P01	33-50-15	117-32-42	1070	2	MAN	1912	CIT. ORCH. SERVICE	C. BELL
COTTONWOOD WASH	5S/ 11E-10P01	33-44-40	115-42-35	3100	8	AUTO	1961	USGS	USGS
COVINGTON FLAT	2S/ 4E-12P01	34-00-20	116-19-00	5000	8	STOR	1982	RCFC&MCO	RCFC&MCO
COYOTE CANYON	8S/ 5E-31P01	33-26-05	115-30-05	2275		STOP	1945	NWS	HOWARD RAILLEY
CRESTMORE	2S/ 5W-03P01	34-01-47	117-23-38	1030	8	STO	1943	SBCFCD	A K SMITH
DANSON CANYON	4S/ 6W-35P01	33-45-00	117-28-00	980			1880		
DECKERS RANCH	4S/ 2E-26P02	33-44-00	116-45-00	5550	8	STO	1921	NWS	I W DECKER
DEEP CANYON AGAVE	6S/ 6E-19P01	33-30-23	116-23-50	2750	4	PLAS	1973	RCFC&MCO/UC	UC
DEEP CANYON LAB	6S/ 6E-17P01	33-31-52	116-22-34	1000	8	STO & AUTO	1963	NWS & UC	RESEARCH CTR
DELUZ	8S/ 4W-29P02	33-27-04	117-19-29	440	4	PLAS	1903	RCFC&MCO	FELIX GARNISAY
DESERT CENTER	5S/ 16E-05P01	33-46-15	115-20-20	537	8	STO	1967	CHARLENE CARNEY	OWNER
DESERT HOT SPR. SDF	2S/ 5E-30P01	33-57-43	116-30-35	1080	8	STO	1949	RCFC&MCO	SDF
DESERT HOT SPR. W. C	2S/ 5E-30P02	33-58-03	116-29-40	1220	8	AUTO	1965	RCFC&MCO	RCFC&MCO
DESERT WTR AGEASY	4S/ 5E-19P01	33-44-18	116-22-43	353	4	PLAS	1979	RCFC&MCO	DWA
EAGLE MOUNTAIN	4S/ 15E-19P01	33-48-40	115-27-00	973	8	STO	1933	MWD	MWD & NWS
EAGLE VALLEY	3S/ 6W-35P01	33-31-38	117-24-59	1345	3	STO	1964	CORONA LEM. CO.	CORONA LEM. CO.
EDMONT COE	3S/ 4W-11P01	33-55-27	117-15-32	1555	4	PLAS	1966	RCFC&MCO	SDF
EL CARIPO STATION	6S/ 5W-16P01	33-39-00	117-24-43	2660	8	STO & AUTO	1966	RCFC&MCO	RCFC&MCO
EL CARIPO SDF	4S/ 6W-16P01	33-49-29	117-30-33	800	4	PLAS	1963	RCFC&MCO	SDF
ELSTIMORE PRAY	6S/ 5W-11P01	33-40-15	117-19-16	1312	4	PLAS	1978	RCFC&MCO	BONNIE PRAY
ELSTIMORE ACE	6S/ 4W-23P01	33-38-00	117-15-00	1450	8	AUTO	1941	NWS	P M ALBRIGHT
ELSTIMORE #5SE	6S/ 4W-28P01	33-37-08	117-18-37	1305	8	AUTO	1957	NWS	J L EWING
ELSTIMORE SDF	6S/ 4W-07P01	33-40-07	117-19-50	1285	8	STO & AUTO	1987	SDF & NWS	SDF & RCFC&MCO
ELSINDORE ST PARK	6S/ 5W-02P01	33-40-32	117-22-21	1265	4	PLAS	1966	RCFC&MCO	STATE PARKS
ELSINDORE-SHERMAN	5S/ 5W-35P01	33-41-11	117-23-07	1372	8	STO	1917	E M SHERMAN	E M SHERMAN
GAVILAN HILLS	4S/ 4W-30P01	33-47-34	117-20-20	2150			1919	MWD	R E JAMES
GAVILAN SPRINGS	4S/ 5W-33P01	33-47-30	117-23-47	2050	8	AUTO A	1978	RCFC&MCO	RCFC&MCO
GILMAN HOTSPRINGS	4S/ 1W-09P01	33-50-00	116-59-17	1470	8	STO	1944	RCFC&MCO	LEO JOHNSON
GLEN AVON GDF	2S/ 6W-02P01	34-00-44	117-23-11	750			1928	USDA	J B FREYDOZ
GLEN IVY	2S/ 6W-10P01	34-00-43	117-23-37	745	4	PLAS	1962	RCFC&MCO	SDF
GLEN WADSWORTH	5S/ 6W-03P01	33-45-54	117-28-10	1100	8	MAN	1905	TEMESCAL WATER	TEMESCAL WATER
GODD HOPE	4S/ 4W-33P01	33-46-20	117-17-43	1780	3	STO	1978	RCFC&MCO	MARTHA GRAHAM
GUN RIVER GOLF C	3S/ 8W-36P01	33-52-23	117-40-17	450	9	STO	1970	OCFCD	GOLF COURSE
HAGADOR RIDGE	4S/ 7W-10P01	33-50-07	117-35-59	1200	8	AUTO	1978	USFS	USFS
HARRISON APS #2	3S/ 5W-32P02	33-52-11	117-25-51	1184	9	STO & AUTO	1965	USARS	USARS
HARRISON DAM	3S/ 5W-32P01	33-53-14	117-25-04	1275	8	AUTO	1962	RCFC&MCO	RCFC&MCO
HAYFIELD PUMP PLANT	5S/ 13E-28P01	33-42-30	115-38-07	1370	9	STO & AUTO	1935	MWD	MWD & NWS
HAYSTACK-WMT	5S/ 5E-29P01	33-42-08	116-28-44	2800	8	AUTO	1980	RCFC&MCO	RCFC&MCO
HEMET	5S/ 1W-11P01	33-44-53	115-55-43	1660	8	STO	1911	NWS	LAKE HEMET MWD
HEMET RESERVOIR	6S/ 3E-09P01	33-40-07	115-40-33	4355	8	STO	1897	LAKE HEMET WTR	CECILE HEACH
HENDRICKS RANCH	3S/ 3W-14P01	33-51-00	117-10-00	1750			1924	MORENO MUT WTR	O W SCOTT
HIGHBORNE SDF	2S/ 4W-07P01	34-01-55	117-19-44	962	4	PLAS	1956	RCFC&MCO	SDF

RAINFALL STATION INDEX

STATION NAME	STATION NO.	LATITUDE	LONGITUDE	ELEV.	EQUIPMENT TYPE	FIRST YEAR	OWNER	OPERATOR
HIGHGROVE STEAM PL	2S/ 4W-06P01	34-01-27	117-17-50	945	8 AUTO	1961	SHCFCD	RCFC&MCO
HOMELAND	5S/ 2W-17P01	33-45-23	117-07-45	1640	4 PLAS	1962	RCFC&MCO	S MILLER
HORSE CANYON	6S/ 4E-14P01	33-28-00	116-33-00	2900	STD	19430	USCE	USCE
HOWELL RANCH	7S/ 4W-03P01	33-35-41	117-15-47	1300	4 PLAS	1966D	MELLIE HOWELL	OWNER
HUMBER PARK FVWD	5S/ 3E-05P01	33-45-50	116-41-15	6320	8 STOP	1980	RCFC&MCO	RCFC&MCO
HURKEY CREEK PARK	6S/ 3E-04P01	33-40-32	116-40-47	4390	8 AUTO	1962	NWS	RCFC&MCO
LOYLLA WILD FIRE CPT	5S/ 3E-07P01	33-44-50	116-40-55	5397	8 STD & AUTO	1961	NWS	LOYLLA WILD F D
INDIAN WELLS	5S/ 6E-23P01	33-43-20	116-20-13	144	4 PLAS	1944	RCFC&MCO	SDF
INICIO DATE GARDEN	5S/ 7E-22P01	33-43-38	115-19-39	31	8 STD	1978D	NWS	US DATE-C STA
INDIO HILLS MORLEY	4S/ 7E-11P01	33-50-05	115-13-45	1160	8 AUTO	1978	RCFC&MCO	RCFC&MCO
INDIO SDF	5S/ 7E-26P01	33-42-47	115-11-24	8	4 PLAS	1978	RCFC&MCO	SDF
JOSHUA TREE 5000	3S/ 8E-07P01	33-55-47	116-10-30	5040	8 STOP	1981	RCFC&MCO	RCFC&MCO
JOSHUA TREE L S RS	2S/ 8E-07P01	34-01-09	116-11-24	4200	8 AUTO	1969	RCFC&MCO	RCFC&MCO
JUNIPER FLATS	5S/ 2W-03P01	33-45-49	117-04-57	2110	4 PLAS & AUTO A	1964	RCFC&MCO	EILEEN BANKS
JURUPA RUTILE	2S/ 6W-22P01	33-59-23	117-29-46	708	4 PLAS	1983	RCFC&MCO	DON TRACY
LA CRESTA	7S/ 4W-17P01	33-33-23	117-19-39	2200	8 AUTO	1980	RCFC&MCO	RCFC&MCO
LA QUINZA SDF	6S/ 7E-06P01	33-40-25	115-17-50	85	4 PLAS	1953	RCFC&MCO	SDF
LA SIERRA FIRE STA	3S/ 6W-10P01	33-55-07	117-29-12	712	4 PLAS	1956	RCFC&MCO	RVSD FIRE DEPT
LA SIERRA RANCH	5S/ 1W-20P01	33-45-00	117-00-00	1550		1915D		J E FARRAR
LAKE MATHEWS	4S/ 5W-01P01	33-51-07	117-25-47	1447	8 STD	1939	WWD	WWD
LAKE MATHEWS IS #1	4S/ 5W-07P01	33-50-33	117-25-47	1390	8 STD	1947D	WWD	WWD
LAKE MATHEWS SH #2	4S/ 5W-10P01	33-50-00	117-23-00	1400		1945D	WWD	WWD
LAKELAND VILL SDF	6S/ 5W-13P01	33-38-13	117-20-44	1319	4 PLAS	1956	RCFC&MCO	SDF
LAKEVIEW	4S/ 2W-08P01	33-50-00	117-07-00	1458		1910D		J WOODKROUGH
LAWLOR CO PARK	4S/ 2E-26P01	33-47-40	116-44-41	5290	8 STD	1975	RCFC&MCO	RVSD CO PARKS
LAWRENCE ADIT	3S/ 1E-28P01	33-53-08	116-53-34	2640		1938D	WJD	W R COONS
LITTLE LAKE SDF	5S/ 1W-13P01	33-44-42	115-55-53	1695	8 STD	1960	RCFC&MCO	SDF
LOS ALAMOS GREENWD	7S/ 2W-15P01	33-34-01	117-04-28	1440		1912D	W R GREENWOOD	W R GREENWOOD
LOS ALAMOS VALLEY	7S/ 2W-12P01	33-35-00	117-01-50	1480		1953D		
LOWER RANCH	3S/ 7W-34P01	33-51-40	117-35-37	860	5 MAN	1933D	CORONA LEW CO	CORONA LEW CO
MARCH AFB	3S/ 4W-25P01	33-52-00	117-15-00	1485	8 AUTO	1930D	USAF	USAF
MECCA SDF	7S/ 9E-08P01	33-34-20	116-04-37	-190	8 STD	1906	RCFC&MCO	SDF
MILKY SPRINGS	6S/ 2E-10P01	33-39-40	116-45-35	4540	8 STOP	1979	RCFC&MCO	RCFC&MCO
MILLARD CANYON	2S/ 2E-16P02	33-59-00	116-47-16	3740	8 AUTO	1980	RCFC&MCO	RCFC&MCO
MILLARD CANYON	2S/ 2E-12P01	33-57-05	116-43-03	2600		1920D	NWS	NWS
MILLARD CYN-ROGER	2S/ 2E-16P01	33-59-30	116-47-05	3680	4 PLAS	1978D	RCFC&MCO	EDVA BEDGER
MILLARD FORKS	2S/ 2E-21P01	33-59-15	116-47-09	3580		1920D	NWS	NWS
MIRA LOMA SPACE C	2S/ 6W-05P01	34-01-27	117-31-47	827	8 AUTO	1909	SHCFCD	SHCFCD
MISSION CREEK	2S/ 3E-12P01	34-00-55	116-37-34	2420	8 STD	1968	DITZ-CRANE	D PRICE
ROCKY MOUNTAIN RESERV	3S/ 5W-01P01	33-53-44	117-24-54	1112	8 STD	1933	GAGE CANAL CO	GAGE CANAL CO
MORENO VALLEY	3S/ 2W-06P01	33-56-27	117-08-14	1840	8 AUTO	1922	RCFC&MCO	RCFC&MCO
MORNING VALLEY	1S/ 4E-28P01	34-04-14	116-32-15	2765	8 STD & AUTO	1942	RCFC&MCO	C MCFARLAND
MT SAN JACINTO WSP	4S/ 3E-23P01	33-48-40	116-30-23	9417	8 STD & AUTO	1966	RCFC&MCO	STATE PARKS
MURCELL BEACH	7S/ 2E-27P01	33-32-00	115-46-00	3705	8 STD	1943D	NWS	USCE
MURRIETA BEACH	7S/ 3W-16P01	33-33-17	117-17-13	1110		1953D	DWR	DWR

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STATION NAME	STATION NO.	LATITUDE	LONGITUDE	ELEV.	EQUIPMENT TYPE	FIRST YEAR	OWNER	OPERATOR
MURRIETA HOT SPRINGS	7S/ 3W-14P01	33-33-28	117-09-16	1140	8 STD	19470	NWS	E MURDEN
MURRIETA SCS	7S/ 3W-17B02	33-33-48	117-13-21	1131	8 STD	1955	SCS	SCS
NARCO FIRE DEPT	3S/ 6W-06P02	33-55-47	117-34-40	620	8 AUTO	1924	RCFC&WCD	RCFC&WCD
NARCO MELANIE	3S/ 6W-07P01	33-55-42	117-32-37	623	4 PLAS	1984	RCFC&WCD	C JOHNSON
NORTH PALM SPR SDF	3S/ 4E-10P01	33-55-28	115-32-44	875	4 PLAS	1959	RCFC&WCD	SDF
NORTH SHOPE SDF	7S/10E-34P01	33-31-14	115-56-13	-180	4 PLAS	1965	RCFC&WCD	SDF
NUVIEA SDF	4S/ 2W-18P01	33-49-03	117-07-55	1457	4 PLAS	1958	RCFC&WCD	SDF
OK FLAT	4S/ 7W-17P01	33-49-15	117-38-18	2700	8 AUTO A	1975	OCFCO	OCFCO
OASIS SDF	8S/ 8E-11P01	33-29-37	116-06-44	-171	4 PLAS	1957	RCFC&WCD	SDF
PALM CANYON	5S/ 4E-23P01	33-43-35	116-31-58	1000		19190	NWS	NWS
PALM CANYON TRIB	7S/ 5E-18P01	33-34-05	116-30-45	4500	8 AUTO	19680	USGS	USGS
PALM CANYON USGS	5S/ 4E-11P01	33-44-42	116-32-05	700	8 AUTO	19780	USGS	USGS
PALM DESERT	5S/ 5E-17P01	33-44-00	116-23-12	195	8 STD	1983	NWS	COLLEGE-DESERT
PALM DESERT SDF	5S/ 5E-19P01	33-43-08	116-23-33	260	4 PLAS	1951	RCFC&WCD	SDF
PALM SPRINGS F D #1	4S/ 4E-15P01	33-49-34	116-32-41	465	8 STD	1938	PALM SPRGS F D	PALM SPRGS F D
PALM SPRINGS F D #2	4S/ 4E-13P01	33-49-37	116-30-35	425	8 STD	1889	NWS	PALM SPRGS F D
PALOMA VALLEY	6S/ 3W-23P01	33-32-13	117-10-33	1340		19400	ZEIDER	ZEIDER
PAJARA RANCH OFFICE	8S/ 2W-16P01	33-28-45	117-05-50	1050		19210	RANCHO CALIF	RANCHO CALIF
PAJARA RANCH STA A	7S/ 2W-26P01	33-32-17	117-02-54	1450		19200	VAIL CO	H M HALL
PAJARA RANCH STA K	8S/ 1W-10P02	33-29-12	116-57-50	1410		19240	VAIL CO	VAIL CO
PEBLEY SDF	2S/ 6W-26P01	33-58-31	117-29-07	710	4 PLAS	1955	RCFC&WCD	SDF
PEBLEY STORE	2S/ 6W-26P02	33-58-31	117-28-23	730	3 STD	19380	A C YOUNG	A C YOUNG
PERRIS I NSW	4S/ 4W-35P01	33-46-46	117-14-42	1502	8 STD	19520	NWS	G M SMITH
PERRIS PESERVICIR	4S/ 3W-09P01	33-50-04	117-11-59	1448	8 STD & AUTO	1964	DMR	EASTERN MWD
PERRIS SDF HCS	4S/ 3W-30P01	33-47-15	117-13-45	1452	8 STD	1912	SDF	SDF
PERRIS ST PK	4S/ 3W-02P01	33-51-40	117-12-03	1520	4 PLAS	1972	RCFC&WCD	STATE PARK
PERPIS VALLEY CH	3S/ 3W-32P01	33-52-00	117-12-46	1460	12 AUTO A	1986	RCFC&WCD	RCFC&WCD
PERRIS VALLEY DRAIN	4S/ 3W-21P01	33-51-59	117-12-46	1413	8 AUTO	19700	USGS	USGS
PIGEON PASS	2S/ 4W-23P01	33-59-15	117-16-08	1910	4 PLAS & AUTO	1957	RCFC&WCD	RCFC&WCD
PIGEON PASS DAM	2S/ 4W-36P01	33-57-10	117-14-45	1700	12 AUTO A	1986	RCFC&WCD	RCFC&WCD
PINE CONE SDF	5S/ 2E-11P01	33-45-40	116-44-12	6220	8 STD	1968	RCFC&WCD	SDF
PINYON FLAT SDF	7S/ 5E-11P01	33-35-04	116-26-50	4000	8 STD & AUTO	1963	RCFC&WCD	SDF & RCFC&WCD
POCKET FLATS	4S/ 1E-02P01	33-50-53	116-51-34	3520	8 STD	1937	RCFC&WCD	B SMITH
POTRERO CANYON	3S/ 1W-34P01	33-52-12	116-56-05	2640	8 AUTO	1937	RCFC&WCD	RCFC&WCD
PRADO DAM	3S/ 7W-20P01	33-53-25	117-39-08	575	4 PLAS & AUTO A	1940	USCE	USCE
PRADO USDA	3S/ 7W-20P02	33-53-25	117-39-39	480	8 STD	19310	USDA	DEAN MUCKEL
QUAIL VALLEY SDF	5S/ 3W-30P01	33-42-07	117-14-22	1550	4 PLAS	1959	RCFC&WCD	SDF
R R CANYON DAM	6S/ 4W-02P01	33-40-28	117-16-26	1440	4 STD & AUTO A	1935	TEMESCAL WATER	TEMESCAL WATER
SAJEC	8S/ 1E-19P01	33-27-30	116-54-50	1700		19520		
RAINBOW COTTAGE	8S/ 2W-30P01	33-56-57	117-07-52	1300	8 STD	19580	*WD	MWD
RANCHO WIPAGE R C	5S/ 5E-02P01	33-46-17	116-26-00	250	8 STD & AUTO	1981	HOB GREGG	BOB GREGG
RANCHO WIPAGE SDF	5S/ 5E-11P01	33-45-17	116-26-50	249	4 PLAS	1974	RCFC&WCD	SDF
RANCHO YAMONA	6S/ 1E-07P01	33-29-07	116-55-07	1400		19510		
RAYMOOD FLAT	1S/ 2E-31P01	34-02-48	116-49-23	7070	8 STD & AUTO A	1919	RCFC&WCD	RCFC&WCD
RECHE CANYON	2S/ 3W-18P01	33-56-42	117-13-52	1900	8 STD	1917	RCFC&WCD	MARIE WANTON

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

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STATION NAME	STATION NO.	LATITUDE	LONGITUDE	ELEV.	EQUIPMENT TYPE	FIRST YEAR	OWNER	OPERATOR
RECHE CANYON AUTO	1S/ 4W-34P01	34-02-35	117-15-55	1120	8 STD & AUTO	1968	SBCFCO	SBCFCO
RED MOUNTAIN	6S/ 1E-23P01	33-38-00	116-52-25	6400	8 STOR & AUTO A	1979	RCFC&MCO	RCFC&MCO
RIPLEY SDF	7S/22E-35P01	33-31-30	114-39-20	250	8 STD	1960	SDF	SDF
ROMOLAND	5S/ 3W-11P01	33-48-45	117-10-02	1460	4 PLAS	1906	RCFC&MCO	MR. BAILEMAN
RUBIDOUX FIRE DEPT	2S/ 5W-15P01	33-55-56	117-24-16	776	4 PLAS	1966	RCFC&MCO	RUBIDOUX F D
RUBIDOUX LAB	2S/ 5W-22P01	33-58-48	117-23-18	338	8 STD	1935	USDA	L E FRANCOIS
RUBIDOUX NAT CTR	2S/ 5W-29P01	33-58-27	117-25-50	730	4 PLAS	1980	RCFC&MCO	PARK DEPT
RUSD CITRUS EX STA	2S/ 4W-30P01	33-50-02	117-20-40	886	8 STD & AUTO	1925	UCR	UCR
RUSD CO FLOOD CONT	2S/ 5W-14P01	34-02-10	117-22-40	800	8 STD & AUTO A	1981	RCFC&MCO	RCFC&MCO
RUSD FIRE STA #3	2S/ 5W-34P01	33-57-04	117-23-15	940	8 STD & AUTO	1981	NWS & RCFC&MCO	RFD & RCFC&MCO
RYAN AIR FIELD SDF	5S/ 1W-17P01	33-43-48	117-01-17	1509	4 PLAS	1956	RCFC&MCO	SDF
SAGE SDF	7S/ 1W-12P02	33-38-54	116-55-55	2290	4 PLAS	1939	RCFC&MCO	SDF
SALTON	RS/11E-18P01	33-28-24	115-53-06	-200	3 STD	1989	NWS	S P CO AGENTS
SAN GORGONIO PASS	3S/ 1W-07P01	33-55-52	117-01-18	2400	MWD	1875	MWD	H MAYNARD
SAN JACINTO	4S/ 1W-22P01	33-47-14	116-58-04	1537	8 STD	1949	NWS	BYRON JOHANSEN
SAN JACINTO RESERV	4S/ 1W-29P01	33-47-45	116-59-55	1500	8 STD	1949	MWD	MWD
SAN JACINTO SDF	4S/ 1W-35P02	33-47-12	116-57-30	1556	8 STD & AUTO	1893	RCFC&MCO & NWS	SDF & RCFC&MCO
SAN TIMOTEC CANYON	2S/ 2W-28P01	33-58-22	117-05-59	1970	4 PLAS	1943	RCFC&MCO	FISHERMAN'S RT
SANTA ANA CANYON	3S/ 4W-25P01	33-52-30	117-39-43	450	MWD	1929	USDA	W TURNER
SANTA ROSA CGA	8S/ 4W-05P01	33-30-20	117-20-00	2140	VAIL CO	1925	VAIL CO	H M HALL
SANTA ROSA MTN	7S/ 5E-26P01	33-32-15	115-26-20	7700	8 STOR	1981	RCFC&MCO	RCFC&MCO
SANTA ROSA RCH	7S/ 4W-35P01	33-30-42	117-16-03	1420	VAIL CO	1923	VAIL CO	H M HALL
SANTA ROSA RCH B	8S/ 3W-07P01	33-29-45	117-14-10	1250		1943		
SANTA ROSA RCH B1	8S/ 3W-07P02	33-28-45	117-14-10	1250		1944		
SANTA ROSA RCH C	8S/ 4W-12P01	33-29-29	117-15-08	900		1943		
SANTA ROSA RCH D	8S/ 4W-12P02	33-29-29	117-15-02	950		1944		
SANTA ROSA RCH DR	8S/ 4W-12P03	33-29-40	117-15-04	1200		1944		
SANTA ROSA RCH E	7S/ 3W-32P01	33-30-45	117-13-00	1450		1943		
SANTA ROSA RCH GTE	7S/ 3W-19P01	33-33-07	117-14-05	1240		1943		
SANTA ROSA RCH WSA	8S/ 4W-03P01	33-30-25	117-16-51	1980	VAIL CO	1924	VAIL CO	H M HALL
SANTA ROSA RCH WSA	8S/ 4W-03P01	33-30-25	117-16-51	1980	VAIL CO	1923	VAIL CO	H M HALL
SANTA ROSA RCH WSA	8S/ 3W-07P03	33-30-12	117-13-20	1600		1946		
SANTA ROSA SUMMIT	7S/ 4E-16P01	33-34-00	116-34-13	5000	8 STOR	1983	RCFC&MCO	RCFC&MCO
SANTIAGO PEAK	5S/ 6W-19P01	33-42-39	117-31-59	5638	8 AUTO A	1950	NWS & OCFCO	OCFCO
SIMS PANCH	4S/ 1E-27P01	33-47-50	116-52-22	2100	MWD	1938	MWD	FLORENCE SIMS
SINGLETON PANCH	2S/ 2W-25P02	33-58-15	117-02-30	2295	MORENO M WATER	1935	MORENO M WATER	MORENO M WATER
SINGLETON RANCH	2S/ 2W-26P01	33-56-30	117-03-40	2210	MORENO IRR CO	1929	MORENO IRR CO	MORENO IRR CO
SKINNER LAKE	7S/ 2W-10P01	33-35-00	117-04-30	1490	8 STD	1962	MWD	MWD
SKINNER LAKE PARK	7S/ 1W-06P01	33-35-23	117-01-39	1550	8 AUTO	1978	RCFC&MCO	STATE PARK
SNOW CREEK	3S/ 3E-21P01	33-53-27	116-41-02	1275	8 STD	1919	NWS	D KENNEDY
SNOW CREEK UPPER	3S/ 3E-23P01	33-52-23	116-40-50	1940	8 STD	1939	RCFC&MCO	DESERT WATER
SOUTH FORK SJ RIV	5S/ 2E-20P01	33-43-20	115-48-00	2320	8 AUTO	1962	USGS	USGS
STEELE VALLEY E S	5S/ 4E-05P01	33-45-24	117-18-52	2000	8 STD	1978	RCFC&MCO	WESTERN UNION
STRATTON PANCH	3S/ 2E-31P01	33-51-45	116-49-00	3300	8 STD	1919	NWS	P C STRATTON
SUN CITY CDF	5S/ 3W-21P01	33-42-55	117-11-25	1426	8 STD & AUTO	1973	RCFC&MCO	CDF & RCFC&MCO
SUN CITY LEWIS	5S/ 3W-22P01	33-41-44	117-12-32	1412	4 PLAS	1973	RCFC&MCO	EASTERN MWD

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PROCESSED COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT 14.4.5

STATION NAME	STATION NO.	LATITUDE	LONGITUDE	ELEV	EQUIPMENT TYPE	FIRST YEAR	OWNER	OPERATOR
SUNNYMEAD HARBETC	3S/ 3W-06P01	33-33-37	117-13-42	1638	4 PLAS	1983	RCFC&MCD	D BARRITO
SUNNYMEAD SDF	3S/ 4W-01P01	33-32-22	117-14-50	1541	4 PLAS	1955	RCFC&MCD	SDF
TACHEWA DAM	4S/ 4E-10P01	33-50-27	116-31-28	580	9 AUTO	1966	RCFC&MCD	RCFC&MCD
TEMESCALA SDF	6S/ 3W-12P01	33-28-48	117-25-57	1220	8 STD & AUTO	1902	RCFC&MCD & NWS	SDF & RCFC&MCD
TEMESCALA ATR CO	3S/ 7W-25P02	33-32-05	117-34-42	760	4 PLAS	1906	RCFC&MCD	TEMESCAL WATER
HERMAL AIRPORT SDF	6S/ 9E-20P01	33-38-05	116-09-49	-119	4 PLAS & AUTO	1951	RCFC&MCD & NWS	SDF
HERMAL FAA A P	6S/ 8E-20P02	33-38-02	116-09-45	-118	8 STD	1941	NWS	FED AVIATION
THOMAS MOUNTAIN	6S/ 3E-28P01	33-37-05	116-40-55	5700	8 STOR	1979	RCFC&MCD	RCFC&MCD
THOUSAND PALMS SDF	4S/ 6E-18P01	33-49-12	116-23-34	240	4 STD & AUTO	1959	RCFC&MCD	SDF & RCFC&MCD
TRAMWAY MT STA	4S/ 3E-23P02	33-48-40	116-38-10	9540	8 AUTO	19640	RCFC&MCD	RCFC&MCD
TRAMWAY VALLEY STA	4S/ 4E-07P01	33-50-13	116-35-45	2700	8 AUTO	1978	RCFC&MCD	RCFC&MCD
TRIP FLATS	7S/ 2E-02P01	33-35-36	116-45-04	3950	8 AUTO & 3 STD	19490	RCFC&MCD	DON FRY
TWIN PINES RANCH	3S/ 2E-32P01	33-52-06	116-47-26	3440	8 AUTO	1919	RCFC&MCD	RCFC&MCD
UNIVERSITY CITY	2S/ 4W-33P01	33-57-04	117-18-32	1515	4 PLAS	19780	RCFC&MCD	DENNIS MOODY
UPPER DRIVE	4S/ 7W-12P01	33-50-02	117-34-45	1250	4 MAN	1931	CORONA LEM CO	CORONA LEM CO
VAIL DAM	8S/ 1W-10P01	33-29-44	116-58-33	1350	8 STD	19630	USGS	USGS
VAIL RESERVOIR	8S/ 1W-14P01	33-29-00	116-57-35	1450		19200	VAIL CO	VAIL CO
VAIL VERDE	4S/ 4W-07P01	33-50-02	117-20-23	1550		19200	H J SMITH	H J SMITH
VISLA GRANDE RANCH	4S/ 2E-16P01	33-49-00	116-47-00	5009		19340	MWD	A W HIBBARD
W N TRIBUT FARM	2S/ 3E-22P01	33-53-23	116-39-20	2200	4 PLAS & AUTO	1975	RCFC&MCD	JOHN SHEARER
WADLEIGH RANCH	6S/ 1E-25P01	33-36-55	116-49-50	3600	4 PLAS	19780	RCFC&MCD	ED WADLEIGH
WARM SPRINGS	5S/ 6W-03P02	33-45-57	117-29-40	1149	4 MAN	1964	CORONA LEMON CO	CORONA LEM CO
WEST PORTAL	4S/ 1W-15P01	33-49-16	116-57-59	1510	8 STD	1944	MWD	MWD
WEST RIVERSIDE SDF	2S/ 5W-07P01	34-02-44	117-26-48	906	4 PLAS	1849	RCFC&MCD	SDF
WESTERN MND	4S/ 5W-11P01	33-50-21	117-22-10	1490	4 PLAS	1971	RCFC&MCD	WESTERN MND
WHITEWATER CANYON	3S/ 3E-02P01	33-56-50	116-38-22	1620	8 STD	19200	NWS	CVCWD
WHITEWATER RANCH	3S/ 3E-10P01	33-55-18	116-39-26	1210	8 STD	19200	NWS	G HERKELRATH
WHITEWATER SPRR	3S/ 3E-14P01	33-54-21	116-38-50	1123		18770	SPRR	
WHITTIER GROVES	5S/ 1E-14P01	33-44-00	116-51-00	1900	STD	19270	W B WEIR	W B WEIR
WISS CANYON DAM	3S/ 6E-05P01	33-56-04	116-23-27	1530	8 AUTO	1962	RCFC&MCD	RCFC&MCD
WILD ROSE P OFFICE	4S/ 6W-07P01	33-47-45	117-29-58	928	3 STD	1914	CORONA LEM CO	CORONA LEM CO
WILD ROSE RANCH 57	4S/ 6W-27P02	33-47-07	117-30-05	1100	8 STD	1972	RCFC&MCD	CORONA LEM CO
WILDOWAR	7S/ 4W-02P01	33-35-51	117-15-35	1250	4 PLAS	1907	RCFC&MCD	DAVID BROWN
WILSON CREEK	7S/ 1E-24P01	33-32-53	116-49-45	2900		19530		
WINCHESTER	5S/ 2W-27P01	33-42-40	117-05-04	1474	8 AUTO	1941	RCFC&MCD	RCFC&MCD
WINCHESTER USDA	5S/ 2W-26P01	33-42-45	117-03-50	1490		19400	USDA	
WOODCREST SDF	3S/ 5W-25P02	33-53-05	117-21-01	1557	8 STD & AUTO	1955	RCFC&MCD	SDF & RCFC&MCD

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT 1965

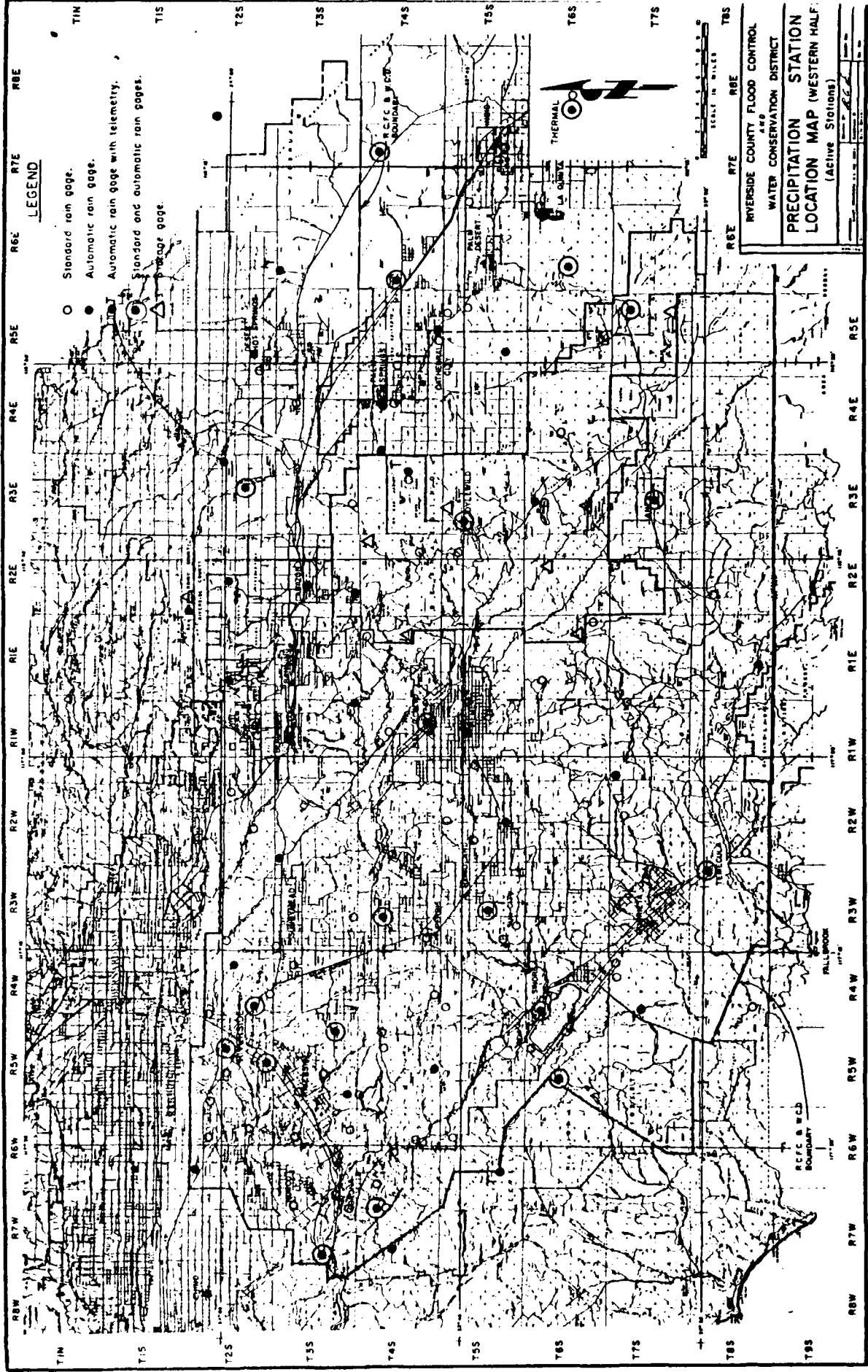
PAINFALL STATION CROSS INDEX

STATION NO.	STATION NAME	STATION NO.	STATION NAME	STATION NO.	STATION NAME
1S/ 4W-34P01	PECHE CANYON AUTO	3S/ 7W-35P01	CORONA FLC#5	4S/ 6W-27P02	WILD ROSE RANCH #7
1S/ 2E-11P01	RAYWOOD FLAT	3S/ 7W-35P01	CORONA FLC#5A	4S/ 5W-35P01	DANSON CANYON
1S/ 4E-28P01	MORONG VALLEY	3S/ 6W-05P02	NORCO FIRE DEPT	4S/ 5W-07P01	LAKE MATHEWS IS #1
2S/ 6W-02P01	GLEN AVON	3S/ 5W-07P01	NORCO MELAYIE	4S/ 5W-10P01	LAKE MATHEWS SH #2
2S/ 6W-06P01	MIRA LOMA SPACE C	3S/ 5W-10P01	LA SIERRA FIRE STA	4S/ 5W-11P01	WESTERN WMO
2S/ 6W-10P01	GLEN AVON SDF	3S/ 5W-30P01	CORONA NEAR	4S/ 5W-12P01	CAJALCO SDF
2S/ 6W-24P01	JURUPA RUTILE	3S/ 5W-35P01	EAGLE VALLEY	4S/ 5W-12P02	CAJALCO #2
2S/ 6W-26P02	PEOLEY STORE	3S/ 5W-04P01	ARLINGTON	4S/ 5W-33P01	GAVILAN SPRINGS
2S/ 5W-03P01	CRESTMORE	3S/ 5W-21P01	MOCKINGBIRD RESERV	4S/ 4W-07P01	VAL VERDE
2S/ 5W-07P01	WEST RIVERSIDE SDF	3S/ 5W-25P02	WOODCREST SDF	4S/ 4W-30P01	GAVILAN HILLS
2S/ 5W-14P01	PVSD CO FLOOD CONT	3S/ 5W-30P01	ARLINGTON HEIGHTS	4S/ 4W-33P01	GOOD HOPE
2S/ 5W-16P01	RUBIDOUX FIRE DEPT	3S/ 5W-32P01	HARRISON DAM	4S/ 4W-36P01	PERRIS I WSW
2S/ 5W-22P01	RUBIDOUX LAR	3S/ 5W-32P02	HARRISON ARS #2	4S/ 3W-02P01	PERRIS ST PK
2S/ 5W-29P01	RUBIDOUX NAT CTR	3S/ 4W-01P01	SUNNYMEAD SDF	4S/ 3W-09P01	PERRIS RESERVOIR
2S/ 5W-34P01	PVSD PIPE STA #3	3S/ 4W-11P01	EDGEWONT SDF	4S/ 3W-21P01	PERRIS VALLY DRAIN
2S/ 4W-06P01	HIGHGROVE STEAM PL	3S/ 4W-25P01	MAPCH AFB	4S/ 3W-30P01	PERRIS GDF HOGS
2S/ 4W-07P01	HIGHGROVE SDF	3S/ 3W-06P01	SUNNYMEAD BARRETO	4S/ 2W-08P01	LAKEVIEW
2S/ 4W-23P01	PIGEON PASS	3S/ 3W-14P01	HENDRICKS RANCH	4S/ 2W-16P01	NUVIEW GDF
2S/ 4W-27P01	BOX SPRINGS MTN	3S/ 3W-32P01	PERRIS VALLEY CH	4S/ 1W-09P01	GILMAN HOTSPRINGS
2S/ 4W-30P01	PVSD CITIUS EX STA	3S/ 2W-05P01	MORENO VALLEY	4S/ 1W-15P01	WEST PORTAL
2S/ 4W-31P01	UNIVERSITY CITY	3S/ 1W-07P01	CAN GORGONIO PASS	4S/ 1W-22P01	SAN JACINTO
2S/ 4W-36P01	PIGEON PASS DAM	3S/ 1W-10P01	HEAUMONT	4S/ 1W-29P01	SAN JACINTO RESERV
2S/ 3W-18P01	FEICHE CANYON	3S/ 1W-11P01	BEAUMONT 1F	4S/ 1W-35P02	SAN JACINTO GDF
2S/ 2W-13P01	CALIMESA SDF	3S/ 1W-11P02	BEAUMONT SDF	4S/ 1E-02P01	POPPET FLATS
2S/ 2W-25P02	SINGLETON RASIN	3S/ 1W-19P01	BEAUMONT NEAR	4S/ 1E-23P01	ANGELES HILL
2S/ 2W-26P01	SINGLETON RANCH	3S/ 1W-36P01	POTRERO CANYON	4S/ 1E-27P01	SIMS RANCH
2S/ 2W-28P01	BEAUMONT PUMP PLNT	3S/ 1E-09P01	BARNING WATER CO	4S/ 2E-01P01	BLACK MTN-YMCA
2S/ 1W-23P01	BEAUMONT PUMP PLNT	3S/ 1E-16P01	BARNING	4S/ 2E-16P01	VISTA GRANDE RANCH
2S/ 1W-28P02	CHEPPY VALLEY SDF	3S/ 1E-25P01	LAKENCE ADIT	4S/ 2E-26P01	LAWLER CO PARK
2S/ 1W-27P01	CHERRY VALLEY SDF	3S/ 2E-15P01	CABAZON	4S/ 2E-26P02	DECKERS LANCH
2S/ 1E-17P01	BARNING BENCH NO.2	3S/ 2E-15P02	CABAZON SDF	4S/ 2E-34P01	ALANDALE
2S/ 1E-30P01	BARNING BENCH	3S/ 2E-20P01	CABAZON SHAFT	4S/ 3E-23P01	MT SAN JACINTO WSP
2S/ 2E-16P01	WILLARD CYN-RADGER	3S/ 2E-31P01	STRATON RANCH	4S/ 3E-23P02	TRAMWAY MT STA
2S/ 2E-16P02	WILLARD CANYON	3S/ 2E-32P01	TWIN PINES RANCH	4S/ 4E-07P01	TRAMWAY VALLEY STA
2S/ 2E-21P01	WILLARD FORKS	3S/ 3E-02P01	WHITEWATER CANYON	4S/ 4E-10P01	TACHEVAH DAM
2S/ 2E-32P01	WILLARD CANYON	3S/ 3E-10P01	WHITEWATER RANCH	4S/ 4E-13P01	PALM SPRGS F D #2
2S/ 3E-12P01	MISSION CREEK	3S/ 3E-11P01	WHITEWATER SPRR	4S/ 4E-15P01	PALM SPRGS F D #1
2S/ 3E-22P01	W TROUT FARM	3S/ 3E-21P01	SNOW CREEK	4S/ 5E-19P01	DESERT WTR AGENCY
2S/ 5E-30P01	DESERT HOT SPR SDF	3S/ 3E-33P01	SNOW CREEK UPPER	4S/ 5E-33P01	CATHEDRAL CITY SDF
2S/ 5E-30P02	DESERT HOT SPR W C	3S/ 4E-10P01	NORTH PALM SPR SDF	4S/ 5E-33P03	CATHEDRAL CITY #2
2S/ 6E-12P01	COVINGTON FLAT	3S/ 6E-05P01	WIDE CANYON DAM	4S/ 6E-18P01	THOUSAND PALMS SDF
2S/ 6E-07P01	JOSHUA TREE L S RS	3S/ 6E-07P01	JOSHUA TREE 5000	4S/ 7E-11P01	INDIO HILLS MORLY
3S/ 8W-35P01	SANTA ANA CANYON	4S/ 7W-01P01	CORONA JAMISON	4S/ 8E-16P01	HERDODD CAMP
3S/ 8W-36P01	GRN RIVER GOLF C	4S/ 7W-02P01	CORONA SIAS	4S/15E-19P01	EAGLE MOUNTAIN
3S/ 7W-13P01	CORONA SDF	4S/ 7W-02P02	CHASE & TAYLOR	5S/ 6W-03P01	GLEN IVY
3S/ 7W-20P01	PRADO DAM	4S/ 7W-10P01	MAGADOR RIDGE	5S/ 6W-03P02	WARM SPRINGS
3S/ 7W-20P02	FRAGO USGA	4S/ 7W-12P01	UPPER DRIVE	5S/ 6W-19P01	SANTIAGO PEAK
3S/ 7W-25P02	TEMESCAL WTR CO	4S/ 7W-12P02	CORONA BARLES F 37	5S/ 5W-35P01	ELSIMORE-BERMAN
3S/ 7W-25P03	CORONA FIRE DEPT	4S/ 7W-17P01	OAK FLAT	5S/ 4W-05P01	STEELE VALLEY #3
3S/ 7W-34P01	LOWEE RANCH	4S/ 5W-01P01	LAKE MATHEWS	5S/ 3W-11P01	POMCLAND
		4S/ 5W-05P01	CORONA FLC#4	5S/ 3W-21P01	SUN CITY SDF
		4S/ 6W-07P01	CORONA SOUTH	5S/ 3W-30P01	QUAIL VALLEY SDF
		4S/ 6W-16P01	EL CERRITO SDF	5S/ 3W-32P01	SUN CITY SEWAGE
		4S/ 6W-27P01	WILD ROSE R OFFICE	5S/ 2W-03P01	MUNIPER FLATS

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RAINFALL STATION CROSS INDEX

STATION NO.	STATION NAME	STATION NO.	STATION NAME	STATION NO.	STATION NAME
55/ 3W-17P01	HOMELAND	55/ 3W-20P01	BURCY CANYON RD	7S/ 3E-04P01	ANZA-CAPITIER
55/ 3W-26P01	WINCHESTER USDA	55/ 3W-23P01	PALOMA VALLEY	7S/ 3E-16P01	ANZA SDF
55/ 2W-27P01	WINCHESTER	6S/ 1E-23P01	RED MOUNTAIN	7S/ 3E-31P01	CAHUILLA
55/ 1W-11P01	HESET	6S/ 1E-25P01	WADEIGH RANCH	7S/ 4E-16P01	SANTA ROSA SUMMIT
55/ 1W-13P01	LITTLE LAKE SDF	6S/ 2E-10P01	MILKY SPRINGS	7S/ 5E-11P01	PINYON FLAT SDF
55/ 1W-17P01	RYAN AIR FIELD SDF	6S/ 3E-04P01	HURKEY CREEK PARK	7S/ 5E-18P01	PALM CANYON TPIR
55/ 1W-20P01	LA SIERRA RANCH	6S/ 3E-09P01	HEMET RESERVOIR	7S/ 5E-26P01	SANTA ROSA Mtn
55/ 1E-14P01	WHITTIER GROVES	6S/ 3E-28P01	THOMAS MOUNTAIN	7S/ 9E-08P01	MECCA SDF
55/ 2E-11P01	PINE COVE SDF	5S/ 4E-17P01	CAMP SCHERMAN	7S/10E-14P01	NORTH SHORE SDF
55/ 2E-20P01	SOUTH FORK SJ PIV	6S/ 5E-17P01	DEEP CANYON LAH	7S/22E-35P01	PIPLEY SDF
55/ 3E-05P01	HUMBER PARK FWD	6S/ 5E-19P01	DEEP CANYON AGAVE		
55/ 3E-07P01	ICVLLWILD PIPE DPT	6S/ 7E-05P01	LA QUINTA SDF	8S/ 4W-03P01	SANTA ROSA RCH MGA
55/ 4E-11P01	PALM CANYON USGS	6S/ 9E-20P01	THERMAL AIRPT SDF	8S/ 4W-05P01	SANTA ROSA CGA
55/ 4E-23P01	PALM CANYON	6S/ 8E-27P02	THERMAL FAA A P	8S/ 4W-12P01	SANTA ROSA RCH C
55/ 5E-02P01	RANCHO MIRAGE R C	6S/22E-31P01	BLYTHE AIRBASE SDF	8S/ 4W-12P02	SANTA ROSA RCH D
55/ 5E-11P01	RANCHO MIRAGE SDF	6S/23E-32P01	BLYTHE SDF	8S/ 4W-12P03	SANTA ROSA RCH DR
55/ 5E-29P01	HAYSTACK-MNT			8S/ 4W-25P02	CELUZ
55/ 6E-17P01	PALM DESERT	7S/ 4W-02P01	WILDOMAR	8S/ 3W-07P01	SANTA ROSA RCH B
55/ 6E-19P01	PALM DESERT SDF	7S/ 4W-03P01	HOWELL RANCH	8S/ 3W-07P02	SANTA ROSA RCH B1
55/ 6E-23P01	INDIAN WELLS	7S/ 4W-17P01	LA CRESTA	8S/ 3W-07P03	SANTA ROSA RCH SAX
55/ 7E-07P01	PEPMUDA DUNES SDF	7S/ 4W-35P01	SANTA ROSA RANCH	8S/ 3W-12P01	YEMECULA SDF
55/ 7E-22P01	INDIO DATE GARDEN	7S/ 3W-14P01	MURRIETA HOT SPRGS	8S/ 2W-16P01	PAUBA RANCH OFFICE
55/ 7E-26P01	INDIO SDF	7S/ 3W-15P01	MURRIETA D&R	8S/ 2W-30P01	RAINBOW COTTAGE
55/11E-10P01	COTTONWOOD WASH	7S/ 3W-17P02	MURRIETA SCS	8S/ 1W-10P01	VAIL DAM
55/13E-28P01	HAYFIELD PUMP PLNT	7S/ 3W-19P01	SANTA ROSA RCH GTE	8S/ 1W-10P02	PAUBA RANCH STA K
55/16E-05P01	DESERT CENTER	7S/ 3W-32P01	SANTA ROSA RCH E	8S/ 1W-14P01	VAIL RESERVOIR
		7S/ 2W-10P01	SKINNER LAKE	8S/ 1E-07P01	RANCHO PAMONA
6S/ 5W-02P01	ELCINGRE ST PARK	7S/ 2W-12P01	LCS ALAMOS VALLEY	8S/ 1E-19P01	RADEC
6S/ 5W-11P01	ELSINORE PRAY	7S/ 2W-15P01	LOS ALAMOS GREENWD	8S/ 1E-28P01	AGUANGA VALLEY
6S/ 5W-13P01	LAKELAND VILL SDF	7S/ 2W-26P01	PAUBA RANCH STA A	8S/ 1E-34P01	AGUANGA-THOMSEN
6S/ 5W-16P01	EL CARISO STATION	7S/ 1W-06P01	SKINNER LAKE PARK	8S/ 2E-08P01	AGUANGA BRADFORD
6S/ 4W-02P01	R R CANYON DAM	7S/ 1W-12P02	SAGE SDF	8S/ 4E-14P01	HORSE CANYON
6S/ 4W-07P01	ELSINORE SDF	7S/ 1E-24P01	WILSON CREEK	8S/ 5E-31P01	COYOTE CANYON
6S/ 4W-23P01	ELSINORE 4SE	7S/ 2E-03P01	TRIPP FLATS	8S/ 8E-11P01	GASIS SDF
6S/ 4W-28P01	ELSINORE 4SSE	7S/ 2E-27P01	MURCELL RANCH	8S/11E-18P01	SALTON



LEGEND

- Standard rain gage.
- Automatic rain gage.
- ⊙ Automatic rain gage with telemetry.
- ⊕ Standard and automatic rain gages.
- ⊖ Storage gage.

RIVERSIDE COUNTY FLOOD CONTROL
 WATER CONSERVATION DISTRICT
**PRECIPITATION STATION
 LOCATION MAP (WESTERN HALF)**
 (Active Stations)

SCALE IN MILES



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ACTIVE - PRECIPITATION STATION INDEX 1977
(ALPHABETICAL)

STATION NAME	STATION NO.	LATITUDE	LONGITUDE	ELEV	EQUIPMENT TYPE	FIRST YEAR (2)	OWNER	OPERATOR
MAYFIELD CUMD FLAT (D) JSS/13E-28001	33-02-20	117-30-07	1370		R STD & AUTO	1935	MWD	MDC & NWS
MAVETACK-MONY (B)	55/ 5E-28001	33-01-08	117-29-44	2400	R AUTO	1980	RCFC8UCD	RCFC8UCD
MEMET	55/ 1U-11001	33-00-53	116-56-43	1460	6 STD	1911	MWS	LAKE MEMET MWD
MEMET RESERVOIR (B)	55/ 3E-08001	33-00-07	116-46-33	4255	A STD	1917	LAKE MEMET MTP	CECILE BEACH
MICHIGAN SPR	25/ 4U-17001	34-00-55	117-19-48	785	4 PLAS	1956	PRFC8UCD	SDF
HOMELAND	55/ 2U-17001	33-00-18	117-06-45	1572	4 PLAS	1967	PRFC8UCD	R STANLEY
MUMFELL RANCH (A)	75/ 4U-03001	33-3E-41	117-16-47	1300	4 PLAS	1966	NELLIE HOWELL	OWNEP
MURPHY PARK FVMT (A, B)	55/ 3E-05001	33-00-50	116-01-15	6320	R STOR	1990	RCFC8UCD	RCFC8UCD
MURPHY CREEK PARK (D)	65/ 3E-06001	33-00-32	116-00-47	4200	8 AUTO	1962	MWS	RUSD CO PARKS
IOYLLWILD FIRE DEPT (D, M, R)	55/ 3E-07001	33-00-40	116-02-55	5397	8 STD & AUTO	1901	MWS	IOYLLWILD F D
INDIO DATE GARDFN	55/ 7E-22001	33-02-38	116-14-39	11	8 STD	1878	MWS	US DATE-C STA
INDIO HILLS MOBIFY (B)	45/ 7E-11001	33-00-05	116-13-45	1160	8 STD R AUTO	1976	RCFC8UCD	RCFC8UCD
INDIO SOF	55/ 7E-28001	33-02-47	116-13-24	8	4 PLAS	1951	RCFC8UCD	SDF
JOSHUA TREE L S RS (E)	25/ 9E-07001	34-01-09	116-11-24	4200	8 AUTO	1969	RCFC8UCD	RCFC8UCD
JUNIPER FLATS	55/ 2U-02001	33-0E-49	117-04-57	2110	4 PLAS	1964	RCFC8UCD	EILFFH BANKS
LA CRESTA (A)	75/ 4U-17001	33-33-29	117-18-30	2270	8 AUTO	1980	RCFC8UCD	RCFC8UCD
LA QUINTA SOF	45/ 7E-06001	33-00-25	116-17-50	85	4 PLAS	1953	RCFC8UCD	SDF
LA SISOPA FIRE STA	35/ 6U-10001	33-55-07	117-29-12	712	4 PLAS	1956	RCFC8UCD	RUSD FIRE DEPT
LAKE WATHEWS	45/ 6U-01001	33-51-07	117-25-47	1447	8 STD	1939	MWD	MWD
LAPELAND VILL SOF	65/ 5U-13001	33-36-13	117-20-44	1719	4 PLAS	1956	RCFC8UCD	SDF
LAWLER CO PARK	45/ 2E-26001	33-07-40	116-04-41	5200	8 STD	1975	RCFC8UCD	RUSD CO PARKS
LITTLE LAKE SOF	55/ 1U-13001	33-04-42	116-55-53	1495	8 STD	1960	RCFC8UCD	SDF
MECCA SOF	75/ 9E-08001	33-34-20	116-04-37	112	8 STD	1906	PRFC8UCD	SDF
MILKY SPRINGS (A, B)	65/ 2E-10001	33-39-40	116-05-35	9640	R STOR	1979	RCFC8UCD	RCFC8UCD
MILLARD CYN-BATCHE (A)	25/ 2E-16002	33-00-00	116-07-15	3740	8 AUTO	1980	RCFC8UCD	RCFC8UCD
MIRA LOVA OW DEPT (B)	25/ 6U-05001	34-01-46	117-31-47	827	8 AUTO	1909	SPCFCC	SPCFCC
MISSION CREEK (D)	25/ 3E-12001	34-00-40	116-37-38	2400	8 AUTO	1968	USGS	USGS
MOCKINGBIRD RESERV	35/ 5U-21001	33-53-44	117-24-54	1112	8 STD	1939	GAGE CANAL CC	GAGE CANAL CC
MORENO VALLEY (R)	35/ 2U-06001	33-56-27	117-08-14	1840	8 AUTO	1922	RCFC8UCD	RCFC8UCD
MT SAN JACINTO VSD	45/ 3E-23001	33-00-40	116-16-23	8417	8 STD	1966	RCFC8UCD	STATE PARKS
MURRIETA SOF	75/ 3U-17002	33-33-48	117-13-21	1131	8 STD	1955	SCS	SCS
NORCO FIRE DEPT	35/ 6U-16002	33-55-47	117-34-40	620	8 STD	1924	RCFC8UCD	MCRCO F D
NORTH PALM SPR SOF	55/ 4E-10001	33-5E-24	116-32-44	875	4 PLAS	1959	RCFC8UCD	SDF
NORTH SPRING SOF (3)	75/ 10E-34001	33-31-14	115-56-13	1140	4 PLAS	1966	RCFC8UCD	SDF
NUVIFY SOF	45/ 2U-18001	33-05-03	117-07-55	1467	4 PLAS	1958	RCFC8UCD	SDF
PAV FLAT (B)	45/ 7U-17001	33-00-18	117-38-18	2700	8 AUTO	1974	OCFCO	OCFCO
PASIE SOF	45/ 8E-11001	33-29-37	116-05-44	-171	4 PLAS	1957	RCFC8UCD	SDF
PALM DESERT SOF	55/ 6E-19001	33-41-08	116-23-33	275	4 PLAS	1951	RCFC8UCD	SDF
PALM SPRINGS F D P	45/ 4E-15001	33-00-34	116-32-41	425	8 STD	1937	PALM SPRING F D	PALM SPRING F D
PALM SPRING F D P	45/ 4E-15001	33-00-37	116-30-35	425	8 STD	1888	MWS	PALM SPRING F D
PEOPLE SOF	25/ 6U-26001	33-58-31	117-29-07	710	8 PLAS	1945	RCFC8UCD	SDF
PEOPLES RESERVOIR (D)	45/ 3U-06001	33-58-04	117-11-59	1448	8 STD & AUTO	1964	DWP	CASTLETON MWD
PEOPLES SPR WOOD	45/ 3U-30001	33-07-15	117-13-45	1452	8 STD	1912	SNE	SDF
PEOPLES ST PW	45/ 3U-02001	33-51-40	117-12-03	1420	4 PLAS	1972	RCFC8UCD	STATE PARK
PIGLEY SOF	25/ 6U-23001	33-58-16	117-16-08	1910	8 AUTO	1957	RCFC8UCD	RCFC8UCD

ACTIVE PRECIPITATION STATION INDEX (ALPHABETICAL)

INDEX 1977

STATION NAME (4)	STATION NO.	LATITUDE	LONGITUDE	ELEV (1)	EQUIPMENT TYPE (1)	FIRST YEAR (2)	OWNER	OPERATOR
PIKE COVE CNE	55/ 2F-11001	33-45-40	117-44-12	4220	R STD	1969	RCFC&MCD	SDF
PINYON FLAT SDF (d,e)	75/ 5F-11001	33-25-52	117-26-50	4000	R STD & AUTO	1963	RCFC&MCD	SDF & RCFC&MCD
POPPY FLATS (Z)	45/ 1F-02001	33-50-53	117-51-34	3520	R STD	1937	RCFC&MCD	P SMITH
POTERO CANYON (X)	35/ 1W-16001	33-52-12	117-54-05	2640	R AUTO	1937	RCFC&MCD	RCFC&MCD
FRANCIS DAM (R, d)	55/ 7W-20001	33-53-25	117-38-08	575	R STD & AUTO	1940	USCE	USCE
QUATE VALLEY SDF	55/ 3W-20001	33-42-07	117-14-22	1550	A PLAS	1959	RCFC&MCD	SDF
C R CANYON DAM (e)	65/ 4W-02001	33-40-28	117-16-26	1440	A STD	1927	TEMESCAL WATER	TEMESCAL WATER
REINFOR COTTAGE	55/ 2W-16001	33-26-57	117-07-59	1300	B STD	1958	MWD	MWD
HANCOCK WTRAGE S F (a)	55/ 5F-02001	33-46-17	115-26-00	250	B STD	1981	R08 GREGG	R08 GREGG
HANCOCK WTRAGE SDF (a)	55/ 5E-11001	33-46-17	116-26-50	249	A PLAS	1978	RCFC & MCD	SDF
KAYWOOD FLAT	15/ 2F-11001	34-02-48	116-45-23	7070	R STOR & AUTO-T	1919	RCFC&MCD	RCFC&MCD
RCFC CAMP (a, b)	25/ 3W-18001	33-50-42	117-13-52	1500	P STD	1917	RCFC&MCD	MARIE MANTON
KID MOUNTAIN (3)	65/ 1E-23001	33-36-00	116-50-25	4490	B STOR	1979	RCFC & MCD	RCFC & MCD
KID MOUNTAIN (Z)	75/ 22E-13001	33-33-30	114-39-20	250	B STD	1960	SDF	SDF
KID MOUNTAIN (Z)	55/ 3W-11001	33-44-45	117-10-02	1460	A PLAS	1906	RCFC&MCD	MR. BATEMAN
RURIDOU FIRE TFFY	25/ 5W-16001	33-56-50	117-24-14	776	A PLAS	1966	RCFC&MCD	RURIDOU F D
RURIDOU LAKE	25/ 5W-22001	33-56-46	117-23-18	878	B STD	1935	USDA	L E FRANCOIS
AVSO CITRUS EX STG (d)	25/ 4W-30001	33-58-52	117-20-40	986	B STD & AUTO	1925	UCR	UCR
AVSO CO FLOOD CONT	25/ 5W-18001	34-00-10	117-22-40	900	B STD & AUTO	1981	RCFC&MCD	RCFC&MCD
AVSO FUEL STG W3	25/ 5W-18001	33-57-04	117-23-15	840	B STD & AUTO	1981	NWS & RCFC&MCD	RFD & RCFC&MCD
EVAN AIR FIELD SDF	55/ 1W-17001	33-43-48	117-01-17	1509	A PLAS	1956	RCFC&MCD	SDF
GAFF SDF	75/ 1W-15001	33-34-54	116-55-55	2200	A PLAS	1939	RCFC&MCD	SDF
GAFF JAC	45/ 1W-15001	33-47-12	116-57-30	1556	B STD & AUTO	1993	RCFC&MCD & NWS	SDF
SAN TIMOTEO CANYON (a,m)	25/ 2W-28001	33-54-22	117-05-59	1570	A PLAS	1943	RCFC&MCD	D CANTRELL
SAN TIMOTEO CANYON (a, s)	75/ 5E-28001			0	B STOR	1981	RCFC&MCD	RCFC&MCD
SANTIAGO CREEK (d)	55/ 4W-16001	33-40-39	117-31-59	5638	B AUTO	1950	NWS & RCFC&MCD	RCFC&MCD
SWINER LAKE (e)	75/ 2W-10001	33-35-00	117-04-30	1490	B STD	1967	MWD	MWD
SWINER LAKE PARK (a)	75/ 1W-04001	33-35-23	117-01-39	1550	P AUTO	1978	RCFC&MCD	STATE PARK
SPON CREEK WFFER	55/ 1E-33001	33-52-23	116-40-50	1040	R STD	1939	RCFC&MCD	DESERT WATER
STEELE VALLEY F S (a)	55/ 4W-05001	33-45-24	117-18-52	2000	B STD	1978	RCFC&MCD	WESTERN UNION
SUN CITY SDF	55/ 3W-21001	33-42-55	117-11-25	1426	R STD & AUTO	1973	RCFC&MCD	SDF & RCFC&MCD
SUN CITY SEWAGE	55/ 3W-32001	33-41-44	117-12-32	1412	A PLAS	1970	RCFC&MCD	EASTERN MWD
SUNSHINE SDF	55/ 4W-01001	33-54-22	117-14-50	1641	A PLAS	1956	RCFC&MCD	SDF
TACHEVAN DAM	65/ 4E-10001	33-50-27	116-33-34	584	P AUTO	1966	RCFC&MCD	RCFC&MCD
TEMESCAL SDF (d, m)	65/ 3W-12001	33-29-48	117-08-57	1020	R STD & AUTO	1902	RCFC&MCD & NWS	SDF
TEMESCAL WTR CO	35/ 7W-05001	33-52-05	117-34-42	700	A PLAS	1906	RCFC&MCD	TEMESCAL WATER
TEMPAL TRIPLET SDF (d)	65/ 4E-02001	33-36-05	116-09-49	-116	A PLAS & AUTO	1951	RCFC&MCD & NWS	SDF
TEMPAL FLA L P (R)	65/ 4E-02001	33-36-02	116-08-45	-118	P STD	1941	MWS	FTD AVIATION
THOMAS MOUNTAIN (a, b)	45/ 4E-20001	33-33-05	116-40-65	6700	B STOR	1979	RCFC&MCD	RCFC&MCD
THOUSAND LAKE SDF (e)	65/ 4E-10001	33-45-12	116-23-34	240	A STD & AUTO	1959	RCFC&MCD	SDF & RCFC&MCD
TRINITY LAKE (E)	45/ 3E-21001	33-44-40	116-30-10	5440	R AUTO-T	1964	RCFC&MCD	RCFC&MCD
TRINITY VALLEY SDF (a)	65/ 4E-07001	33-47-19	116-30-45	2700	B AUTO	1978	RCFC&MCD	RCFC&MCD
TULSA FIRE TOWER (e)	25/ 2E-32001	33-52-04	116-47-26	5440	R AUTO	1930	RCFC&MCD	RCFC&MCD
UNIVERSITY TOWER (a)	25/ 4W-13001	33-57-02	117-10-32	1514	A PLAS	1976	RCFC&MCD	DEWITT WOODY
UPPER BUTTE	65/ 7W-12001	33-50-02	117-34-45	1250	A PLAS	1931	PARONA LEW CO	CORONA LEW CO

ACTIVE PRECIPITATION STATION INDEX 1977
(ALPHABETICAL)

STATION NAME (4)	STATION NO.	LATITUDE	LONGITUDE	ELEV (1)	EQUIPMENT TYPE	FIRST YEAR (2)	OWNER	OPERATOR
LA TRUIT FARM (a)	25/ 3E-22P01	33-56-23	114-36-20	2270	4 PLAS R AUTO	1978	RCFCRUCD	JOHN SHEAVER
MADEIGH RANCH (a)	65/ 1E-27P01	33-16-55	116-48-50	3450	4 PLAS	1978	RCFCRUCD	ED MAGLEIGH
WEST BORTAL	45/ 1W-15P01	33-48-16	114-57-59	1510	8 STD	1963	MWD	MWD
WEST RYDGEVIEW SRF	25/ 5W-37P01	34-06-44	117-26-48	906	4 PLAS	1949	RCFCRUCD	SDF
WESTERN MID	45/ 5W-11P01	33-56-21	117-22-10	1480	4 PLAS	1971	RCFCRUCD	WESTERN MUC
WIDE CANYON DAM (a)	35/ 6F-05P01	33-56-04	116-23-27	1530	8 AUTO-T	1962	RCFCRUCD	RCFCRUCD
WILD HORSE B REFTF	45/ 6W-27P01	33-47-45	117-29-58	928	3 STD	1914	CORONA LEM CO	CORONA LEM CO
WILD HORSE RANCH #7	45/ 6W-27P02	33-47-07	117-30-05	1100	8 STD	1972	RCFCRUCD	CORONA LEM CO
WILDHORSE	75/ 4W-22P01	33-34-51	117-15-35	1250	4 PLAS	1907	RCFCRUCD	DAVID BROWN
WINDCHESTE (L)	55/ 2W-27P01	33-42-40	117-05-04	1474	8 AUTO	1941	RCFCRUCD	RCFCRUCD
WOODPEST SRF	35/ 5W-25P02	33-52-05	117-21-01	1557	8 STD R AUTO	1956	RCFCRUCD	SDF & RCFCRUCD

NOTES:

- The number under equipment type denotes the catchment diameter in inches. Gage type codes are as follows:
 STD - Standard SMS type gage (with inner measuring tube)
 PLAS - Plastic gage of standard design (with inner measuring tube)
 MAN - All non-standard type manual gages
 STOR - Storage gage
 AUTO - Automatic continuous recording rain gage
 T - Telemetry equipped station
- First year denotes first fiscal year, i.e., record beginning in November 1943 would show up as 1944.
- Stations located in eastern Riverside County and not shown on Location Map (Figure 3).
- Major revisions since last report are as follows:

INDEX CODES:

- a - New station
- b - Station not previously published by the District, data not published for 1976-77 for "MIRA LOMA QM DEPOT" and "HEMET RESERVOIR"
- d - Stations not previously published by District in Table 3 (Maximum Annual Short Duration Precipitation Summary)
- e - Equipment change
- f - No record for 1976-77 for "TRAMWAY MT STATION"
- L - Station relocated
- m - Mean seasonal data (years of record and accumulative totals) revised due to combining records with those of compatible discontinued stations, separation of incompatible records, etc.
- r - Station reestablished. No record for 1976-77, 1977-78 and 1978-79 seasons for "ROWLAND", "POZZERO CANYON", and "JOSHUA TREE LH RS"
- R - Revised
- s - Storage gages, annual total only not published



ACTIVE PRECIPITATION STATION CROSS INDEX / 1977
(NUMERICAL)

STATION NO.	STATION NAME	STATION NO.	STATION NAME	STATION NO.	STATION NAME
15/ 2E-31P01	RAYMOND FLAT	45/ 7U-02P02	CHASE & TAYLOR	55/ 2E-11P01	PINE COVE SDF
25/ 4U-05P01	MIRA LOMA OW DEPOT	45/ 7U-12P01	UPPER OPTIVE	55/ 3F-05P01	MURBER PARK FWG
25/ 4U-11P01	CLM PAVN SDF	45/ 7U-17P01	OKA FLAT	55/ 3E-07P01	JOVILLWLD FJRF DPT
25/ 6U-26P01	PEOLEY SDF	45/ 6U-01P01	LAKE MATHEWS	55/ 5E-02P01	RANCHO MIRAGE R C
25/ 5U-07P01	WEST RIVERBIDE SDF	45/ 6U-07P01	CORONA SOUTH	55/ 5F-11P01	RANCHO MIRAGE SDF
25/ 5U-14P01	AVSO CO FLECO COM	45/ 6U-16P01	EL CERRITO SDF	55/ 5E-24P01	HAYSTACK-MNT
25/ 5U-16P01	RUPIDCOX FIRE DEPT	45/ 6U-27P01	WILD ROSE R OFFICE	55/ 6F-19P01	PALM DESERT SDF
25/ 5U-23P01	RUPIDCOX LAB	45/ 6U-27P02	WILD ROSE RANCH 57	55/ 7E-07P01	PERMUDA DUNES SDF
25/ 5U-34P01	EVSP FIRE STA #2	45/ 5U-11P01	WESTER MCD	55/ 7E-22P01	INDIO DATE GARDEN
25/ 4U-07P01	HIGHGROVE SDF	45/ 5U-12P01	CAJALCO SDF	55/ 7E-26P01	INDIO SDF
25/ 4U-24P01	PIGEON PASS	45/ 5U-13P01	GAVILAN SPRINGS	55/ 13E-28P01	HAYFIELD PUMP PLMT
25/ 4U-33P01	EVSP CATRUS EX STA	45/ 4U-33P01	GOOD MOPE	55/ 16E-05P01	DESERT CENTER
25/ 4U-33P01	UNIVERSITY CITY	45/ 3U-02P01	PERRIS ST PK	65/ 5U-02P01	ELSIMORE ST PARK
25/ 3U-14P01	PECHE FANYON	45/ 3U-08P01	PERRIS RESERVOIR	65/ 5U-13P01	LAKELAND VILL SDF
25/ 2U-13P01	CALIFORNIA SDF	45/ 3U-30P01	PERRIS SDF HOOS	65/ 5U-16P01	EL CARISO STATION
25/ 2U-28P01	SPN TYPED CANYON	45/ 2U-18P01	NUVICW SDF	65/ 4U-02P01	R R CANYON DAM
25/ 1U-24P01	CHERRY VALLEY SDF	45/ 1U-09P01	GILMAN HOTESPRINGS	65/ 4U-07P01	ELSIMORE SDF
25/ 1F-17P01	RAVING REACH No.2	45/ 1U-15P01	WEST PORTAL	65/ 1E-08P01	CACTUS VALLEY
25/ 2F-14P01	WILLARD CYN-BATCMA	45/ 1U-35P02	SAN JACINTO SDF	65/ 1E-23P01	RED MOUNTAIN
25/ 3E-12P01	MISSION CREEK	45/ 1F-02P01	POPFLET FLATS	65/ 1E-25P01	WADEIGH RANCH
25/ 3F-22P01	W W TROUT FARM	45/ 1F-23P01	ANGELES HILL	65/ 2E-10P01	MILKY SPRINGS
25/ 5F-31P01	DESERT HOT SPR SDF	45/ 2F-01P01	BLACK MTA-YMCA	65/ 3E-04P01	MURKEY CREEK PARK
25/ 5E-35P01	DESERT HOT SPR W C	45/ 2E-26P01	LAWLER CO PARK	65/ 3E-06P01	HFMET RESERVICR
25/ 6E-03P01	JOSHUA TREE L S RS	45/ 3E-23P01	TRAPWAY MT STA	65/ 3E-28P01	THOMAS MOUNTAIN
35/ 7U-13P01	CORONA SDF	45/ 4E-07P01	TRAPWAY VALLEY STA	65/ 4E-17P01	DEEP CANYON LAE
35/ 7U-21P01	BRADC DAM	45/ 4E-10P01	TACHEVAH DAM	65/ 4E-17P01	LA GUINIA SDF
35/ 7U-24P01	TEMESCAL MTR CC	45/ 4E-13P01	PALM SPRGS F D #2	65/ 8E-20P01	TEMPMAL AIRPRT SDF
35/ 7U-24P01	CORONA FIRE DEPT	45/ 4E-15P01	PALM SPRGS F D #1	65/ 8E-20P02	TEMPMAL FAA A P
35/ 6U-04P01	MORCO FIRE DEPT	45/ 5F-19P01	DESERT MTR AGENCY	65/ 72E-31P01	FLYTHE AIRBASE SDF
35/ 6U-11P01	LA SIFARA FIRE STA	45/ 5E-33P01	CATHEDRAL CITY SDF	65/ 22E-32P01	RLYTHE SDF
35/ 6U-15P01	FACLE VALLEY	45/ 6F-18P01	THOMAS PALMS SDF	75/ 4U-02P01	WILDOPAR
35/ 5U-05P01	ARLINGTON	45/ 7F-11P01	INDIO HILLS MORLEY	75/ 4U-03P01	HOMFELL RANCH
35/ 5U-21P01	MOCKINGBIRD RESFRV	45/ 15E-19P01	EAGLE MOUNTAIN	75/ 4U-17P01	LA CRESTA
35/ 5U-25P01	WOODCREST SDF	55/ 6U-03P01	GLFM IVY	75/ 3U-17P02	MURRIETA SCS
35/ 5U-31P01	MARRISOM DAM	55/ 6U-19P01	SANTIAGO PEAK	75/ 2U-10P01	SKINNER LAKE
35/ 4U-11P01	CUMMERTAD SDF	55/ 4U-05P01	STEELE VALLEY E S	75/ 1U-12P02	SKINNER LAKE PARK
35/ 4U-11P01	EDGEMONT SDF	55/ 3U-11P01	ROMOLAND	75/ 3E-16P01	SAGE SDF
35/ 2U-26P01	WARRNO VALLEY	55/ 3U-21P01	SUN CITY SDF	75/ 5E-13P01	ANZA SDF
35/ 1U-11P01	DEANMONT	55/ 3U-30P01	QUAIL VALLEY SDF	75/ 5F-26P01	PINYON FLAT SDF
35/ 1U-11P02	DEANMONT SDF	55/ 3U-32P01	SUA CITY SEWAGE	75/ 9E-08P01	SANTA ROSA MTN
35/ 1U-16P01	COTTRICK CANYON	55/ 2U-03P01	JUNIPER FLATS	75/ 10E-34P01	MECCA SDF
35/ 1E-06P01	RENTON WATER CO	55/ 2U-17P01	HOMELAND	75/ 22E-34P01	NORTH SHORE SDF
35/ 2F-32P01	TWIN SPRING RAYON	55/ 1U-27P01	WIMCHESTER	85/ 4U-20P02	FFLU7
35/ 2F-37P01	CROW REFER UFFER	55/ 1U-33P01	MEWET	85/ 3U-12P01	TEMPICULA SDF
35/ 4F-11P01	WORTH VALLEY SPP SDF	55/ 1U-13P01	LITTLE LAKE SDF	85/ 2U-30P01	PAJARON COTTAGE
35/ 6E-16P01	WOLF CANYON DAM	55/ 1U-17P01	RYAN AIR FIELD SDF	85/ 1E-28P 01	AGUANGA VALLEY
				85/ 2E-08P 01	AGUANGA-BRAIFORD
				85/ 8E-11P 01	ONASIS SDF

DISCONTINUED PRECIPITATION STATION INDEX /977
(ALPHABETICAL)

STATION NAME (3)	STATION NO.	LATITUDE	LONGITUDE	ELEV	EQUIPMENT TYPE (3)	FIRST YEAR (2)	OWNER	OPERATOR
AGUIRRA-TOMPSON	85/ 1E-38P01	33-26-00	116-51-40	1986	8 STD	19000	MUS	PAUL THOMPSON
ANZA-CARTIER	75/ 3E-48P01	32-35-25	116-40-10	4650		19500	PRIVATE	CARTIER
APLINGTON WEIGHTS RANCH	35/ 5W-30P01	33-53-18	117-24-55	920	8 STD	19250	WASLEY GROVE	F S WEASLEY
	35/ 1E-18P01	32-55-20	116-52-32	2305	8 STD	19340	MVC	MUD
ARROW CANYON	25/ 1E-30P01	33-58-26	116-54-41	3600	8 STD	19750	USFS	USFS
BEAUMONT PUMP PLANT	25/ 1W-22P01	33-50-06	116-50-05	3045	8 STD	19110	MUS	B-CV WTR DIST
BERON CAMP	45/ 2E-18P01	33-49-50	116-08-50	1875	8 STD	19340	MUS	MUD
BOX SPRINGS MTN	55/ 4W-27P01	33-57-43	117-14-47	3000	8 STD	19510	RVSD CO COMM DP	L M CLARAUGH
BUNDY CANYON RP	55/ 3W-20P01	33-38-24	117-12-51	1700	4 PLAS	19660	RCFCRUCD	R FRANCISCO
CAPAZAN SHAFT	35/ 2E-28P01	33-57-30	116-07-30	1820		19380	MUD	W R COONS
CAHUILLA	75/ 3E-21P01	33-32-30	116-44-36	3635	8 STD	19110	MUS	W L SHAWK
CAJALCO RD	45/ 5W-12P01	33-50-27	117-21-31	1430	8 STD	19340	MUD	MUD
CHERRY VALLEY-LEE	25/ 1W-27P01	33-56-19	116-58-24	2820	3 STD	19560	RCFCRUCD	RICHARD LEE
CORONA - STAS	45/ 7W-32P01	33-50-30	117-33-23	1020		19120	THOMAS STAS	THOMAS STAS
CORONA BARNES E 37	45/ 7W-12P01	33-49-57	117-33-32	1220	3 STD	19350		A C BARNES
CORONA FLORES	45/ 6W-8P01	33-50-45	117-32-08	850		19320	CORONA LEM CO	CORONA LEM CO
CORONA FLORES	35/ 7W-38P01	33-52-25	117-35-05	725		19370	CORONA LEM CO	CORONA LEM CO
CORONA FLORES	35/ 7W-34P01	33-51-55	117-34-02	700		19410	CORONA LEM CO	CORONA LEM CO
COTTONWOOD WASH	45/ 1E-10P01	33-44-40	115-45-35	3100	8 AUTO	19610	USGS	USGS
CROYTE CANYON	45/ 5E-31P01	33-24-05	116-30-05	2275	8 STD	19450	MUS	HOWARD BAILEY
CRESTORE	25/ 5W-03P01	34-01-47	117-23-38	1030	8 STD	19430	SECFCD	A M SMITH
DAWSON CANYON	45/ 6W-35P01	33-46-00	117-28-00	900		18800		
DECKERS RANCH	45/ 2E-28P01	33-49-00	116-45-00	5550	8 STD	19210	MUS	I W DECKER
ELSINORE - PRAY (A)	45/ 5W-11P01	33-40-15	117-19-16	1312	4 PLAS	19780	RCFCRUCD	BONNIE PRAY
ELSINORE ASE	65/ 4W-23P01	33-36-00	117-16-00	1450	8 AUTO	19410	MUS	P H ALBRIGHT
ELSINORE ASSC	65/ 4W-22P01	33-37-08	117-18-37	1305	8 AUTO	19570	MUS	J L EYING
ELSINORE-SHERMAN	55/ 5W-35P01	33-41-11	117-23-07	1372	8 STD	19170	F M SHERMAN	E M SHERMAN
GLEH AVCR	25/ 6W-02P01	34-06-44	117-29-11	750		19280	USDA	J P FREYDOZ
GOLD VALLEY RANCH	45/ 4W-30P01	33-47-34	117-20-20	2150		19380	MUD	R E JAMES
HAGANP RIDGE	45/ 7W-10P01	33-50-07	117-35-50	1200	8 AUTO	19780	USFS	USFS
MARIPPO: APC 92	35/ 5W-32P01	33-57-11	117-55-51	3184	8 STD & AUTO	19650	USARS	USARS
MENDRICKS RANCH	35/ 3W-14P01	33-48-00	117-10-00	1550		19280	MORENO MUT WTR	O M SCOTT
LA SIERRA RANCH	55/ 1W-20P01	33-46-00	117-00-00	1550		19180	MUD	I F FARRAR
LAKE MATHEWS IS #1	45/ 5W-07P01	33-45-33	117-25-47	1300	8 STD	19470	MUD	MUD
LAKE MATHEWS SW #2	45/ 5W-10P01	33-45-00	117-23-00	1480		19450	MUD	MUD
LAKVIEW	45/ 2W-08P01	33-50-00	117-07-00	1450		19100	MUD	J MCCONOUGH
LAURENCE ADIT	35/ 1E-28P01	33-57-08	116-57-34	2640		19380	MVC	W R COONS
LOS ALAMOS GREENMUD	75/ 2W-15P01	33-34-01	117-04-28	1440		19120	W R GREENWOOD	W R GREENWOOD
LOS ALAMOS VALLEY	75/ 2W-12P01	33-36-00	117-01-50	1480		19530		
LOWRE RANCH	35/ 7W-34P01	33-51-40	117-35-37	450	5 MAN	19330	CORONA LEM CO	CORONA LEM CO
MARCH AFB	35/ 4W-05P01	33-50-00	117-15-00	1485	8 AUTO	19100	USAF	USAF
MEYBARD RANCH	35/ 1W-07P01	33-47-52	117-01-18	2800		19380	MUD	M WAYNARD
PILLARD CANYON	25/ 2E-32P01	33-47-05	116-49-03	2600		19200	MUS	MUS
WILLARD CYN-RANCHO (B)	25/ 2E-16P01	33-45-30	116-47-05	3580	4 PLAS	19780	RCFCRUCD	EDNA PAGE

DISCONTINUED PRECIPITATION STATION INDEX / 1977
(ALPHABETICAL)

STATION NAME (3)	STATION NO.	LATITUDE	LONGITUDE	CLV	EQUIPMENT TYPE (1)	FIRST YEAR (2)	OWNER	OPERATOR
WILLER POND	76/ 2F-21001	33-55-11	117-07-00	340		1920D	NWS	
WOLFAN ACE RES SER	76/ 2W-07002	33-57-07	117-07-15	350	R STD & AUTO	1962D	APS	NWS
WYCELL RANCH	75/ 2F-27001	33-32-00	116-46-00	3705	8 STD	1943D	NWS	USGS
WYFFTA CUB	75/ 3W-16001	33-21-17	117-12-13	1110		1953D	DWP	DWR
WYFFTA MOUNTAINS	75/ 3W-16001	33-23-28	117-05-16	1140	8 STD	1947D	NWS	E MURDEN
YALM CANYON	55/ 4C-21001	33-47-35	117-21-58	1000		1919D	NWS	NWS
YALM CANYON TEND	75/ 5F-11001	33-34-05	116-30-45	450	R AUTO	1968D	USGS	USGS
YALM CANYON USGS (a)	55/ 4E-11001	33-44-42	116-32-05	700	R AUTO	1978C	USGS	USGS
YALOWA VALLEY	55/ 3W-28001	33-14-13	117-10-33	1540		1940D		ZFIDFR
YALOWA RANCH OFFICE	55/ 2W-16001	33-26-45	117-05-50	1060		1921D	RANCHO CALIF	RANCHO CALIF
YALOWA RANCH STA 1	75/ 2W-26001	33-22-17	117-02-54	1450		1920C	VAIL CO	M W HALL
YALOWA RANCH STA 2	55/ 1W-16002	33-20-12	116-57-50	1410		1924D	VAIL CO	VAIL CO
YALOWA STATION	25/ 6W-26002	33-56-31	117-26-23	730	3 STD	1938C		A C YOUNG
YALOWA 1 USW	55/ 4W-36001	33-04-46	117-14-42	1602	6 STD	1952C	NWS	G M SMITH
YALOWA VALLEY DRAIN	45/ 3W-21001	33-51-50	117-12-46	1413	R AUTO	1970F	USGS	USGS
YALOWA USGS	25/ 7W-20002	33-53-25	117-26-39	480	6 STD	1931D	USDA	DFAN MUCKEL
YALOWA 2	55/ 1F-21001	33-27-30	116-54-50	1700		1952D		
YALOWA 3	55/ 1F-07001	33-26-07	116-56-07	1600		1951F		
YALOWA NAT CTR	25/ 5W-28001	33-56-27	117-23-50	730	4 PLAS	1980D	PCFC/MCD	PARK DEPT
YALOWA 4	55/ 11E-18001	33-26-24	115-53-06	-200	3 STD	1889D	NWS	S P CO AGENTS
YALOWA 5 (a, b)	45/ 1W-22001	33-47-14	116-58-04	1537	R STD	1949D	NWS	PRUDN JOHANSEN
YALOWA 6	45/ 1W-28001	33-47-45	116-56-55	1500	8 STD	1949D	MWD	MWD
YALOWA 7	25/ 4W-28001	33-52-30	117-29-43	450		1929D	USDA	M TURNER
YALOWA 8	55/ 4W-28001	33-50-20	117-20-00	2140		1925D	VAIL CO	M W HALL
YALOWA 9	75/ 4W-35001	33-27-42	117-16-05	1890		1923D	VAIL CO	H W HALL
YALOWA 10	55/ 3W-07001	33-26-45	117-14-10	1250		1943D		
YALOWA 11	55/ 3W-07002	33-26-45	117-14-10	1250		1944D		
YALOWA 12	55/ 4W-12001	33-26-29	117-15-08	500		1943D		
YALOWA 13	55/ 4W-12002	33-26-29	117-15-02	950		1944D		
YALOWA 14	55/ 4W-12003	33-20-40	117-15-04	1200		1944D		
YALOWA 15	75/ 3W-32001	33-27-45	117-17-00	1450		1943D		
YALOWA 16	75/ 3W-19001	33-33-07	117-14-05	1240		1924D	VAIL CO	M W HALL
YALOWA 17	55/ 4W-03001	33-30-25	117-14-51	1400		1923D	VAIL CO	M W HALL
YALOWA 18	55/ 3W-07003	33-27-12	117-13-20	1400		1946D		
YALOWA 19	45/ 1F-27001	33-47-50	114-52-22	2100		1938D	MWD	FLORENCE SIMS
YALOWA 20	25/ 2W-05001	33-56-15	117-02-30	2295		1935D	MORENO W WATER	MORENO W WATER
YALOWA 21	75/ 3F-21001	33-27-07	116-41-02	1275	R STD	1919C	NWS	D KENNEDY
YALOWA 22	55/ 2E-26001	33-44-20	116-46-00	2320	6 AUTO	1945D	USGS	USGS
YALOWA 23	25/ 2E-31001	33-51-45	116-46-00	3400	R STD	1919D	NWS	P C STRATTON
YALOWA 24	75/ 2F-02001	33-25-36	116-45-04	3050	R AUTO & 3 STD	1949D	PFC/MCD	DOE FEY
YALOWA 25 (a)	55/ 1W-10001	33-28-44	116-56-33	1750	8 STD	1953D	USGS	USGS
YALOWA 26	55/ 4W-07001	33-20-00	116-57-25	1450		1920C	VAIL CO	VAIL CO
YALOWA 27	45/ 4W-07001	33-50-22	117-20-23	1600		1920C	M W HALL	M W HALL
YALOWA 28	45/ 2F-16001	33-46-00	117-47-30	500		1944F	MWD	J W HIGGARD
YALOWA 29	55/ 4W-12001	33-26-47	117-26-47	1140		1944D	CORONA LEFOM CO	CORONA LEFOM CO

DISCONTINUED PRECIPITATION STATION INDEX 1977
(ALPHABETICAL)

STATION NAME (3)	STATION NO.	LATITUDE	LONGITUDE	ELEV (1)	EQUIPMENT TYPE (1)	FIRST YEAR (2)	OWNER	OPERATOR
AMTEWATER CANYON	57 3F-22P01	33-52-50	116-38-22	1420	A STD	19200	MUS	CVCMD
WHITEWATER RANCH	34 3E-10P01	33-51-18	116-39-26	1210	A STD	19200	MUS	G HEKELRATH
WHITTIER GROVE	57 3F-14P01	33-48-00	116-51-00	1900	STD	19270	V R WEIR	V P WEIR
WILSON CREEK	75 3F-24P01	33-32-53	116-48-45	2900		19530		
WINCHESTER USNA	55 2W-26P01	33-42-45	117-03-50	1490		19400	USDA	

NOTES:

- The number under equipment type denotes the catchment diameter in inches. Gage type codes are as follows:
 STD - Standard MS type gage (with inner measuring tube)
 PLAS - Plastic gage of standard design (with inner measuring tube)
 MAN - All non-standard type manual gages
 STOR - Storage gage
- First year denotes first fiscal year, i.e., record beginning in November 1943 would show up as 1944.
- Major revisions since last report are as follows:

INDEX CODES:

- a - Station discontinued since last report (1975-76)
- R - Revised

DISCONTINUED PRECIPITATION STATION CROSS INDEX 1977
(NUMERICAL)

STATION NO.	STATION NAME	STATION NO.	STATION NAME	STATION NO.	STATION NAME
25/ 6A-02001	GLEN AVON	45/ 7U-12P02	COMONA FARMS F #3	75/ 4W-35P01	SANTA ROSA RANCH
25/ 6A-02002	PEOPLE STORE	45/ 6U-05E01	CORONA FLORA	75/ 3V-14P01	MURRIETA MCT SPRGS
25/ 6A-02001	PRESTON	45/ 6A-35P01	DAVON CANYON	75/ 1V-16P01	MURRIETA DUP
25/ 6A-02001	PURDUM NAT CTP	45/ 5U-07P01	LAKF MATHEWS JK #1	75/ 3W-18P01	SANTA ROSA RCH GTF
25/ 6A-02001	ROY SEETHAN MTF	45/ 5V-10P01	LAKE MATHEWS SH #2	75/ 3W-32P01	SANTA ROSA RCH E
25/ 2A-25P02	SINGLETON RASTA	45/ 5A-12P02	CAJALCO #2	75/ 2V-12P01	LOS ALAMOS VALLEY
25/ 1A-20P01	FRANKT PUMP PLNT	45/ 4U-07P01	VAL VERDE	75/ 2V-15P01	LOS ALAMOS GREENWD
25/ 3A-05P01	CHERRY VALLEY-LFE	45/ 4V-30P01	GOLF VALLEY RANCH	75/ 2V-24P01	PAUFA RANCH STA A
25/ 1E-23P01	RAVING RANCH	45/ 4V-36P01	PERRIS 1 USV	75/ 1E-24P01	WILSON CREEK
25/ 2E-13P01	WILLARD CYP-RANGE	45/ 3A-21P01	PERRIS VALLY DPAIN	75/ 2E-12P01	TRIPP FLATS
25/ 2E-21P01	WILLARD FORKS	45/ 2V-08P01	LAKFVIEW	75/ 2E-27P01	MURCELL RANCH
25/ 0E-17P01	WILLARD CANYON	45/ 1V-22P01	SAN JACINTO	75/ 3E-04P01	ANZA-CARTIER
25/ 0V-02P01	SANTA ANA CANYON	45/ 1A-29P01	SAN JACINTO RESFV	75/ 3E-31P01	CAHUILLA
25/ 7A-2 P02	BRADCO UGHE	45/ 1F-27P01	SIS RANCH	75/ 5E-18P01	PALM CANYON TRIP
25/ 7A-24P01	LOWER RANCH	45/ 2F-16P02	VISTA GRANDE RANCH	85/ 4V-03P01	SANTA ROSA RCH MSA
25/ 7A-14P01	CORONA FLOCKS	45/ 0E-16P01	DECKERS RANCH	85/ 4V-05P01	SANTA ROSA CGA
25/ 7A-16P01	CORONA FLOWFA		REPOO CAMP	85/ 4V-12P01	SANTA ROSA RCH C
25/ 5A-23P01	ARLINGTON HEIGHTS	55/ 6A-03P02	WARM SPRINGS	85/ 4V-12P02	SANTA ROSA RCH D
25/ 5A-22P02	MARLSON ARS #2	55/ 5V-35P01	ELSINORE-SHERMAN	85/ 4V-12P03	SANTA ROSA RCH DR
25/ 4V-24P01	WIRCH BER	55/ 2A-25P01	WINCHESTER USDA	85/ 3V-07P01	SANTA ROSA RCH E
25/ 3A-74P01	WINDYCKS RANCH	55/ 3V-20P01	LA SIERRA RANCH	85/ 3V-07P02	SANTA ROSA RCH F1
25/ 2A-27P02	PERENO AGR RES SER	55/ 1F-14P01	WHITTIER GROVES	85/ 3V-07P03	SANTA ROSA RCH SAX
25/ 1A-27P01	WYVARD RANCH	55/ 2E-20P01	SOUTH FORK SJ RIV	85/ 2V-16P01	PAUFA RANCH OFFICE
35/ 1F-14P01	BANKING	55/ 4E-11P01	PALM CANYON USCS	85/ 1V-10P01	VAIL DAM
35/ 1E-2 P01	LAWRENCE ADIT	55/ 4E-23P01	PALM CANYON	85/ 1V-16P02	PAUBA RANCH STA K
35/ 2E-21P01	CREAZON SWEET	55/ 11E-10P01	COTTONWOOD WASH	85/ 1V-16P01	VAIL RESERVOIR
35/ 2E-13P01	STRATON RANCH			85/ 1E-07P01	RANCHO RAMONA
35/ 2E-20P01	WHITWATER CANYON	65/ 5V-11P01	ELSTNORE - PRAY	85/ 1E-19P01	RADEC
35/ 3E-10P01	WHITWATER RANCH	65/ 4V-23P01	ELSINORE 4SE	85/ 1E-34P01	AGUANGA-THOMSEN
35/ 3E-21P01	SMOY CREEK	65/ 4V-28P01	ELSINORE 4SE	85/ 2E-07P01	AGUANGA-BERGMAN
45/ 7A-22P01	CORONA - STAS	65/ 3V-20P01	PUNNY CANYON RD	85/ 5E-31P01	COYOTE CANYON
45/ 7U-12P01	MAGNOLIA STAGE	65/ 3V-23P01	PALOMA VALLEY	85/11F-18P01	SALTON

6. Index of precipitation gages, San Bernardino County, with location map. Courtesy of Art Luther, San Bernardino County Flood Control and Water Conservation District. (Followed by typical data sheets)

RAINFALL STATION INDEX SAN BERNARDINO COUNTY

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T. R. S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
1B2	San Bernardino F.C.D.	SD-8	34°06'16"	117°16'05"	1S 4W 11B	1042	31	12.65	S.B.C.F.C.D. (Outside)
2A	San Timoteo	SD-8	33°58'46"	117°07'29"	2S 2W 19R	1846	23	13.10	Mrs. J.A. DeWitt
4A	Rialto	ID-5	34°06'24"	117°21'50"	1S 5W 11K	1220	20	13.64	Marvin Henry
5A	Decluz	SD-8	34°04'40"	117°28'14"	1S 6W 13N	1107	31	13.81	C.D.F.
9A	Reche Canyon	SD-8	33°58'45"	117°14'02"	2S 3W 18K	2030	22	12.37	N.E. Manton
11C	Devore	SP-8	34°12'53"	117°23'50"	2N 5W 27E	2540	11	28.14	Gail Wilmuth
14A	Oak Glen	RD-8	34°03'15"	116°57'20"	1S 1W 26K	4680	6	29.26	S.B.C.F.C.D.
16A	Cajon Junction	SD-RD-8	34°28'31"	117°28'31"	3N 6W 26Q	3118	31	16.79	C.D.H.
17	Fontana 5N	SU-RD-8	34°10'57"	117°26'31"	1N 5W 7Q	1972	48	25.45	R.W. Getchell
19A	Upland	SD-RD-8	34°07'35"	117°40'50"	1N 8W 35J	1609	32	18.69	Tommy Chappell
20C	Chino Fire #2	SD-RD-8	35°59'00"	117°43'20"	2S 8W 16R	655	31	14.13	C.R.F.P.D.
21A	Mira Loma	RD-8	34°01'46"	117°31'47"	2S 6W 5F	827	31	11.46	S.B.C.F.C.D.
23	Redlands	RD-8	34°02'04"	117°12'30"	1S 3W 32R	1282	6	12.92	S.B.C.F.C.D.
24C	Crafton	RD-8	34°02'30"	117°07'28"	1S 2W 31H	2000	6	14.04	Raymond Schneider
25	East Highlands	SP-RD-8	34°07'16"	117°10'18"	1N 3W 35P	1512	64	17.89	E. Highlands Orange
26	Ontario Fire Sta.	SD-RD-8	34°03'55"	117°38'47"	1S 7W 30B	1003	88	16.74	Ontario Fire Dept.
27A	Colton Fire Dept.	SD-RD-8	34°04'16"	117°19'08"	1S 4W 20G	990	14	10.63	Colton Fire Dept.
28	Day Canyon	SD-RD-8	34°10'30"	117°32'11"	1N 6W 17E	2576	24	24.27	S.B.C.F.C.D.
29	Beaumont	SU-8	33°55'45"	116°58'45"	3S 1W 10D	2610	80	17.89	Beaumont Irrig. Dist.
30	Beaumont Pump Plant	SU-8	33°59'00"	116°58'00"	2S 1W 23M	3045	63	20.78	Beaumont Irrig. Dist.
32	Big Bear Lake Dam	RU-8	34°14'30"	116°58'30"	2N 1W 22L	6815	91	37.46	S.B.C.F.C.D.
33	Wrightwood	SD-RD-8	34°22'17"	117°29'00"	3N 7W 8K	6038	18	18.95	Wrightwood C.F.D.
34	Claremont College	RU-SU-8	34°05'48"	117°42'33"	1S 8W 10L	1201	83	17.47	Brackett Observatory
35	Corona	SU-8	33°52'58"	117°34'07"	3S 7W 25K	610	66	12.49	Corona Fire Dept.
37	Lytile Creek Rngr. Sta.	RU-SU-8	34°13'50"	117°28'25"	2N 6W 26F	2730	38	33.42	U.S. Forest Service

RAINFALL STATION INDEX

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T. R. S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
38	Beaumont 1E	RU-SU-8	33°56'00"	116°57'00"	3S 1W 11	2589	33	15.50	B.L. Tate
40	Pomona	SU-8	34°05'00"	117°46'00"	1S 8W 19H	855	97	18.14	J.E. Adamson
41	Carbon Canyon	SU-8	34°05'00"	117°48'00"	3S 9W 12	1775	19	12.20	U.S. C of E
42	Corona C.D.F.	SP-8	33°54'10"	117°33'38"	3S 7W 13R	617	24	10.26	C.D.F.
47	Squirrel Inn #2	SD-8	34°13'40"	117°14'50"	2N 4W 25J	6040	43	39.63	Leon F. Voorhies
48A	29 Palms Nat. Park	SU-8	34°07'45"	116°02'15"	1N 9E 33J	1975	39	3.81	U.S. Park Service
51	Big Pines Park	RD-8	34°22'45"	117°41'30"	3N 8W 2F	6860	49	24.79	U.S.F.S.
52	Cajon West Summit	RU-8	34°23'30"	117°34'35"	4N 7W 35J	4838	32	9.28	S.B.C.F.C.D.
54A	Mt. Baldy	RD-8	34°14'12"	117°39'32"	2N 7W 19P	4320	54	32.77	L.A.C.F.C.D.
58	Crafton - Mentone	SU-8	34°04'10"	117°07'50"	1S 2W 19L	1650	47	15.38	Mentone B.G.O. Co.
59	Needles Pumping Plant	SD-8	34°41'17"	114°36'45"	7N 23E 19G	1400	11	4.57	So. Cal. Gas Co.
60	Prado Dam	RU-8	33°53'30"	117°38'10"	3S 7W 20Q	560	32	11.91	U.S. C of E
61	Riverside Citrus Exp.	RU-SU-8	33°58'02"	117°20'40"	2S 4W 30P	1045	50	10.53	U.C., Riverside
63	Mountain Pass	SU-8	35°28'20"	115°32'40"	16N 13E 14J	4735	18	7.19	Mt. Pass Srv. Sta.
65A	Riverside Co. F.C.D.	SU-RU-8	34°00'10"	117°22'40"	2S 5W 14P	845	34	10.53	R.C.F.C.D. & W.C.D.
67	Chino Sub Station	SU-8	33°59'50"	117°40'40"	2S 8W 13E	670	47	14.52	S.C.E.
70A	Green Canyon Spgs.	SD-8	34°14'00"	116°48'10"	2N 2E 29D	7000	11	15.04	W.R. Hornbeck
71	Devil Canyon Gate	SP-8	34°12'06"	117°19'58"	1N 4W 6H	1880	47	23.25	S.B. City Wtr. Dept.
75	Guasti Winery	RD-8	34°02'39"	117°35'02"	1S 7W 23L	975	61	15.19	S.B.C.F.C.D.
77	Mill Creek Rngr. Sta.	SP-8	34°04'45"	117°02'47"	1S 2W 13P	2980	10	18.92	U.S. Forest Service
79	Chino	SD-8	34°58'30"	117°35'38"	2S 7W 27A	642	46	12.00	Oscar Imbach
85	San Antonio Heights	SU-8	34°09'25"	117°39'03"	1N 7W 19L	1901	83	21.84	C.D.F.
86	San Bdn. Hanford	SU-8	34°06'15"	117°17'20"	1S 4W 10F	1030	45	13.84	S.B. City Wtr. Dept.
88	Upland 3N	SP-8	34°07'58"	117°28'27"	1N 7W 31H	1607	43	19.57	Liberty Groves Corp.
89A	Adelanto	SD-8	34°34'30"	117°24'50"	6N 5W 28L	2875	31	4.24	Frank Ebert

RAINFALL STATION INDEX

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T. R. S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
90	Big Bear Lake F.D.	SD-8	34°14'40"	116°54'35"	2N 1E 20E	6745	24	22.33	Big Bear Lake C.F.D.
91A	Big Bear City	SD-8	34°15'40"	116°50'30"	2N 1E 14A	6800	19	11.69	Big Bear Mut. Serv.
92	Hesperia	SD-8	34°25'16"	117°18'12"	4N 4W 21B	3195	43	7.14	Roy Walters
96	Victorville	RU-8	34°32'00"	117°17'45"	5N 4W 9J	2840	50	5.09	Victorville Co. W.D.
98	Upland Co. Yard	ID-5	34°05'43"	117°37'42"	1S 7W 8J	1215	17	16.02	S.B. Co. Rd. Dept.
102A	Yucca Valley	SD-8	34°07'27"	116°24'30"	1N 5E 36R	3230	17	6.15	J.W. Yale
107	Arrowhead Ranger Sta.	ID-5RD-8	34°14'20"	117°11'25"	2N 3W 27D	5593	17	40.59	U.S.F.S.
110	Needles F.A.A.	SU-8	34°45'45"	114°36'30"	8N 23E 30C	883	34	4.14	F.A.A.
111	Trona	SU-8	35°45'40"	117°22'40"	25S 43E 17F	1656	54	3.88	Amer. Pot. & Chem.
112A	Barstow	SD-8	34°53'56"	117°01'32"	9N 1W 6G	2142	57	4.08	Barstow Fire Dept.
113	Daeggett F.A.A.	SU-8	34°51'10"	116°47'50"	9N 2E 20G	1922	28	3.37	F.A.A.
114	Iron Mountain	RU-SU-8	34°09'00"	115°07'30"	1N 18E 30H	938	40	3.00	M.W.D.
118	Devore	SD-8	34°13'11"	117°24'10"	2N 5W 33B	2080	24	25.98	C.D.F.
119	Etiwanda 1N	SU-8	34°07'57"	117°31'24"	1N 6W 32H	1380	91	19.92	C.D.F.
120	Mentone C.D.F.	ID-5	34°04'15"	117°07'27"	1S 2W 20E	1765	24	12.75	C.D.F.
122	Oak Glen	SP-8	34°03'18"	116°57'15"	1S 1W 27K	4040	22	22.59	P.H. Wagner
124	Rubidoux Lab.	SU-8	33°58'48"	117°23'22"	2S 5W 22P	850	40	10.49	U.S. Dept. of Ag.
125	West Riverside C.D.F.	SU-8	34°00'44"	117°26'48"	2S 5W 7F	880	26	10.79	C.D.F.
126A	Calimesa, East	SP-8	34°00'16"	117°01'00"	2S 1W 18A	2813	10	18.66	So. Mesa Wtr. Co.
128B	Yucaipa	SD-8	34°01'15"	117°02'20"	2S 2W 1Q	2565	5	11.60	Tom Zeich
129	Yucapia	SP-8	34°02'00"	117°02'12"	2S 2W 1A	2660	24	15.35	C.D.F.
130	Panorama Point	SU-8	34°13'31"	117°18'32"	2N 4W 28N	3775	40	30.93	C.D.H.
132	Yucaipa Wat.r Co.	SD-RD-8	34°02'15"	117°02'10"	1S 2W 36Q	2710	23	15.86	S.B.V.M.W.D.
134B	Joshua Tree	SU-8	34°08'00"	116°17'30"	1N 6E 25N	2720	21	4.22	Joshua Basin W.D.
135A	Morongo Valley	SU-8	34°03'00"	116°34'42"	1S 4E 28N	2570	24	8.18	M.V.C.S.D.

RAINFALL STATION INDEX

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T. R. S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
136	Apple Valley	SP-8	34°31'25"	117°12'30"	5N 3W	17G	18	4.10	Apple Valley Ranchos
137	Montclair Fire Dept.	SD-8	34°03'41"	117°41'16"	1S 8W	26B	18	14.76	Montclair Fire Dept.
138	Fontana Kaiser	SP-8	34°04'40"	117°30'20"	1S 6W	21A	23	13.83	Kaiser Steel Corp.
139	Kee Ranch	SU-8	34°09'45"	116°32'30"	1N 4E	14P	26	7.37	U.S. C of E
140	Lake Arrowhead	SU-8	34°14'55"	117°11'10"	2N 3W	22E	82	37.33	Lake Arrowhead C.F.D.
141	Pigeon Pass	SU-8	33°58'41"	117°15'07"	2S 4W	23P1	16	10.30	R.C.F.C.D.
144	Redlands U.S.W.B.	SU-8	34°03'10"	117°11'20"	1S 3W	29E	85	13.86	Redlands Daily Facts
145	Riverside Fire Sta. 3	SU-8	33°57'15"	117°23'45"	2S 5W	34L	94	10.59	Riverside Fire Dept.
146	S.B. County Hospital	SU-8	34°08'05"	117°16'35"	1N 4W	34K	104	16.29	S.B. Co. Hosp.
150	Amboy	SU-8	34°33'30"	115°45'10"	5N 12E	5D	20	2.04	George Summers
151	Carbon Canyon - Workman	SU-8	33°56'30"	117°37'30"	2S 9W	34R	25	14.99	U.S. C of E
153	Daggett IENE	RU-8	34°51'57"	115°52'07"	9N 1E	15N	19	2.90	Coolwater Ranch
154	San Dimas	SU-8	34°06'15"	117°48'15"	1S 9W	11D	47	17.66	L.A.C. Fire Warden
155	Mill Creek Intake #3	RU-8	34°05'00"	116°59'16"	1S 1W	13B	42	25.82	S.C.E. Co.
156	Needles	RU-8	34°50'05"	114°36'07"	9N 23E	32C	72	4.13	N.O.A.A.
157	San Dimas	RU-8	34°12'15"	117°45'30"	1N 8W	6C	46	26.18	U.S.F.S.
158	Raywood Flats	SU-8	34°02'45"	116°48'50"	1S 2E	31D	55	33.37	R.C.F.C. & W.C.D.
159	Lytile Creek-Foothill	RD-8	34°06'30"	117°19'55"	1S 4W	6R	26	13.81	S.B.C.F.C.D.
160	Baker	SU-5	35°16'15"	116°04'10"	14N 9E	30L	20	2.52	City of Baker
162	Santa Ana #3	RU-8	34°06'25"	117°06'00"	1S 2W	4N	68	18.52	S.C.E. Co.
164	Cabazon	SP-5	33°54'40"	116°47'00"	3S 2E	16G	41	12.31	James A Wakeland
165	Upland Fire Sta. #1	SD-8	34°05'55"	117°38'53"	1S 7W	7A	9	16.66	Upland Fire Dept.
166	San Bdn. Newmark Plant	SU-8	34°10'21"	117°18'44"	1N 4W	15C	47	18.67	S.B. City Wtr. Dpt.
169B	Summit Valley	SU-8	34°18'16"	117°23'12"	3N 5W	25J	10	21.93	A.F. Rentfro
170A	Patton - George	SD-8	34°08'16"	117°12'00"	1N 3W	29R	11	16.60	Stuart M. George

RAINFALL STATION INDEX

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T. R. S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
173B	Forest Falls	SP-8	34°04'40"	116°54'20"	1S 1E 17P	5270	35	31.98	A.A. Sterling
175	Alta Loma	SD-8	34°07'25"	117°36'27"	1N 7W 23K	1865	22	18.81	Mrs. Forney
176	Crestline Co. Yd.	SU-5	34°14'10"	117°17'42"	2N 4W 28A	4920	14	32.17	S.B. Co. Rd. Dept.
177A	Arlington Gage Canal	SP-8	33°53'49"	117°24'54"	3S 5W 21M	1007	36	9.24	Robert Schulte
178	Needles County Yard	SD-8	34°50'05"	114°35'55"	9N 23E 32B	451	14	3.86	S.B. Co. Rd. Dept.
180	Del Rosa	RD-8	34°09'42"	117°14'58"	1N 4W 24G	1460	6	20.76	S.B.C.F.C.D.
181	Crestline S.E.	RD-8	34°14'00"	117°16'59"	2N 4W 27G	5160	18	36.07	N.J. Tanguay
184A	Running Springs	RU-8	34°12'16"	117°06'05"	1N 2W 4H	6230	37	38.87	C.D.H.
185	Colton Substation	SU-8	34°03'22"	117°19'28"	1S 4W 29B	940	47	15.30	S.C.E. Co.
186	Corona Foothill #1	SP-8	33°50'39"	117°34'36"	4S 7W 2Q	1050	44	14.34	Charles Colladay
192	Cucamonga Wtr. Dist.	SP-8	34°07'28"	117°35'36"	1S 7W 3R	1225	51	17.33	Cucamonga Wtr. Dist.
193A	Kelso	SD-8	35°00'47"	115°39'05"	11N 12E 25B	2148	7	2.71	Lena Finnell
194	Fontana Union W.C.	SP-8	34°06'00"	117°26'14"	1S 5W 7W	1280	49	15.77	Bert Lutz
195	Hesperia C.D.F.	SD-8	34°25'17"	117°17'56"	4N 4W 21H	3175	18	6.44	C.D.F.
197	Lytle Creek - F.U.W.C.	SP-8	34°12'16"	117°26'58"	1N 5W 6E	2360	49	31.23	Fontana Union Wtr. Co
198	Lytle Creek-S.B.W.D.	SP-8	34°07'26"	117°20'53"	1N 4W 31N	1225	48	16.17	S.B. City Wtr. Dept.
204	Colton County Yard	SD-5	34°04'10"	117°20'32"	1S 4W 19	1020	17	12.98	S.B.C.F.C.D.
205	Phelan C.D.F.	SD-8	34°25'20"	117°34'20"	4N 7W 24E	4160	18	6.56	C.D.F.
206	Fontana Co. Yd.	RD-8	34°06'00"	117°25'02"	1S 5W 8H	1275	17	14.17	S.B. Co. Rd. Dept.
208	Lake Mathews Dam	SD-8	33°51'09"	117°27'15"	4S 6W 2J	1400	36	9.10	M.W.D.
215	Mitchell Caverns	SU-8	34°56'35"	115°30'45"	10N 14E 21H	4306	17	6.97	C.D.B.P.
216	29 Palms Co. Yd.	SD-RD-8	34°09'00"	116°03'15"	1N 9E 20R	1895	14	3.07	S.B. Co. Rd. Dept.
218	Fontana Herald News	ID-5	34°06'03"	117°26'04"	1S 5W 8E	1278	15	14.13	Herald News
219	Barstow Co. Yd.	SD-8	34°55'05"	117°01'26"	10N 1W 32D	2120	14	3.27	S.B. Co. Rd. Dept.
220	Pilot Rock Cons. Camp	SP-8	34°16'20"	117°17'10"	2N 4W 10K	3688	14	31.69	C.D.F.

RAINFALL STATION INDEX

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T. R. S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
222	Highgrove Steam Plant	SD-RD-8	34°00'25"	117°19'45"	2S 4W	945	13	11.28	S.C.E. Co.
223	Ivanpah Co. Yard	RD-SD-8	35°23'20"	115°15'20"	15N 15E	2927	10	3.04	S.B. Co. Rd. Dept.
224	Cushenberry Springs	SD-8	34°21'30"	116°51'25"	3N 1E	10H 4250	13	8.38	Kaiser Permanente
225	Stoddard Valley	SD-8	34°45'30"	117°00'35"	8N 1W	29F 2865	13	3.82	O.W. Osborn
226	Ontario Sheriff Sta.	RD-8	34°05'08"	117°40'06"	1S 8W	14G 1153	13	15.02	S.B.C.F.C.D.
227A	El Mirage Airport	SU-8	34°37'20"	117°36'15"	6N 7W	10L 2863	10	4.66	Geo. Tweed
228	Kramer Junction	SD-8	34°59'20"	117°32'20"	10N 6W	5M 2477	12	3.46	Cal Trans
230	Trona Co. Yd.	SD-8	35°41'50"	117°23'45"	25S 43E	31M 1640	10	3.82	Glenn R. Goins
233	Yermo Inspect. Sta.	SD-8	34°55'30"	116°48'10"	10N 2E	31R 1912	12	3.07	C.D.A.
236	Fontana Sewage Plant	SD-RD-8	34°02'30"	117°27'50"	1S 6W	36E 960	11	12.76	City of Fontana
239	Redlands Co. Club	SD-RD-8	34°01'09"	117°08'55"	2S 3W	12C 2080	10	13.72	H.P. Hinkley
241	Randsburg	SU-8	35°22'05"	117°39'15"	29S 40E	35K 3570	37	5.60	Kern Co. Fire Dept.
242	Pedley C.D.F.	SP-3	33°58'31"	117°29'07"	2S 6W	26D 695	20	10.29	C.D.F.
243	Boron	RU-8	35°00'00"	117°39'00"	11N 7W	31R 2455	15	3.74	Kern Co. F.D.
245	Dale Dry Lake	SD-8	34°09'55"	115°44'30"	1N 12E	17Q 1220	12	2.12	Helen Santos
246	La Sierra C.D.F.	SP-3	34°55'07"	117°29'18"	3S 6W	10Q 714	19	8.86	C.D.F.
247	Sunnymead C.D.F.	SP-3	33°56'22"	117°14'50"	3S 4W	1H 1641	19	10.07	C.D.F.
249	Highgrove C.D.F.	SU-3	34°00'55"	117°19'58"	2S 4W	7H 945	19	10.46	C.D.F.
250	Calimesa C.D.F.	SU-3	34°00'12"	117°03'29"	2S 2W	14B 2405	17	15.83	C.D.F.
251	Cherry Valley C.D.F.	SU-3	34°58'22"	116°58'20"	2S 1W	27C 2880	19	18.10	C.D.F.
255	Johnson Valley	SD-8	34°25'10"	116°26'40"	4N 4E	19M 2794	14	3.61	Mrs. Shehorn
256	Alta Loma	SD-8	34°07'20"	117°35'05"	1N 7W	34R 1384	8	19.51	Mrs. H. Robertds
258	Loma Linda	SD-8	34°02'48"	117°15'39"	1S 4W	35A 1185	8	12.09	Dr. John Roos
259	Heart Bar St. Park	SD-8	34°09'34"	116°47'43"	1N 2E	20F 6688	8	17.32	C.D.B.P.
260	Camp Angelus	SD-8	34°09'00"	116°58'40"	1N 1W	27D 5780	34	31.43	Janet Loenhorst

RAINFALL STATION INDEX

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T. R. S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
261A	Reche Canyon	SD-8	34°02'30"	117°16'50"	1S 4W 34H	1125	22	12.37	Henderson
262	Chino Fire	SD-8	34°00'14"	117°43'32"	2S 8W 11G	730	83	14.97	C.R.F.P.D.
264	Green Valley	SD-8	34°14'22"	117°04'42"	2N 2W 22P	6900	14	33.29	R.J. Eichelberger
268	Arrowhead Springs	SD-RD-8	34°11'10"	117°15'50"	1N 4W 11J	1980	20	21.90	S.B.C.F.C.D.
273	Loma Linda Victoria	SU-8	34°04'52"	117°15'18"	1S 4W 13N	1063	72	13.33	Riverside Water Co.
275	San Dimas	SU-8	34°07'42"	117°46'42"	1N 9W 36F	1215	46	26.18	A.L. Stevens
276	Rim of the World	RD-8(T)	34°14'10"	117°10'35"	2N 3W 27B	5850	5	25.83	S.B.C.F.C.D.
279	Deer Creek	RD-8(T)	34°10'45"	117°34'00"	1N 7W 12P	2860	-	-	S.B.C.F.C.D.
280	Lake Arrowhead F.S. #4	RD-8	34°15'40"	117°12'10"	2N 3W 16E	5205	4	30.08	Station Personnel
281	Lake Arrowhead F.S. #2	SD-8	34°15'45"	117°10'50"	2N 3W 15D	5200	2	32.88	Station Personnel
282	Redlands	SD-4	34°01'56"	117°11'25"	2S 3W 3D	1532	4	10.94	J.C. Funk
283	Fallsvale	RD-8(T)	34°04'55"	116°54'20"	1S 1E 17K	5990	3	28.14	S.B.C.F.C.D.
284	Crestline F.S.	SP-8	34°14'15"	117°17'20"	2N 4W 22L	4880	7	30.32	C.D.F.
286	Lytle Creek F.D.	RD-8(T)	34°15'30"	117°29'50"	2N 6W 15L	3400	3	18.30	S.B.C.F.C.D.
290	Upland F.D. #2	SD-8	34°08'15"	117°40'10"	1N 7W 30N	1800	2	19.86	City of Upland
295	Chino Co. Yard	SD-8	34°01'15"	117°41'15"	2S 8W 11G	727	47	14.52	S.B. Co. Rd. Dept.
296	Lost Horse Rngr. Sta.	SU-8	34°01'00"	116°11'30"	2S 8E 7C	4500	-	-	U.S.P.S.
297	Norton A.F.B.	SU-8	34°05'50"	117°14'30"	1S 3W 7M	1095	21	12.43	A.F. Weather Personr
298	Amboy - Saltus #1	SP-8	34°31'50"	115°41'40"	5N 12E 11P	625	8	2.28	Leslie Salt
300	Amboy - Saltus #2	SD-8	34°28'30"	115°44'30"	5N 13E 32R	595	2	1.99	Leslie Salt
301	Hinkley - 4E	SD-5	34°56'15"	117°07'45"	10N 2W 19P	2195	2	3.32	L.W. Dudney
302	Yucaipa - Orchid	SP-5	34°01'00"	117°02'10"	2S 2W 12A	2610	3	13.44	H. Purkapile
303	Sierra P.H.	SU-8	34°12'30"	117°40'20"	1N 8W 1C	2750	23	30.69	S.C.E. Co.
304	Calico	SD-RD-8	34°57'00"	116°51'50"	10N 1E 22	2340	2	2.00	Co. Reg. Parks
305	Spadra, Pacific Colony	SU-8	34°02'32"	117°48'34"	1S 9W 34G	690	30	14.20	S.B.C.F.C.D.

RAINFALL STATION INDEX

STATION NO.	STATION NAME	TYPE	N. LAT.	W. LONG.	T.	R.	S.	ELEV. FEET	RECORD YEARS	AVER. YEARLY	OBSERVER
309	Cucamonga Canyon	RD-8 (T)	34°10'48"	117°37'36"	IN	7W	8R	2640	-	-	S.B.C.F.C.D.
310	Upland Lemon Ass'n.	SP-8	34°05'47"	117°38'30"	1S	7W	8R	1220	24	16.37	Sam Woodward
317	San Antonio Dam	RD-8	34°10'00"	117°40'00"	IN	8W	24	2125	7	17.97	U.S. C of E
321	Goldstone Echo	SP-8	35°18'03"	116°48'17"	14N	2E	19A	3220	9	5.36	Gaudian
329	Redlands - Bottenberg	SP-8	34°02'30"	117°10'54"	1S	3W	34G	1465	2	13.08	Bottenberg, Mathew
330	Big Bear - Ryan	SP-8	34°15'36"	116°51'00"	2N	1E	10K	7000	2	16.45	Earl Ryan

STANDARD GAGES

- SP-8 Private 8"
- SP-5 Private 5"
- SP-3 Private 3"
- SD-8 F.C.D. 8"
- SD-5 F.C.D. 5"
- ID-5 F.C.D. Indoor 5"
- SD-4 F.C.D. 4"

STANDARD GAGES

- SU-8 Other Governmental 8"
- SU-5 Other Governmental 5"
- SU Other Governmental

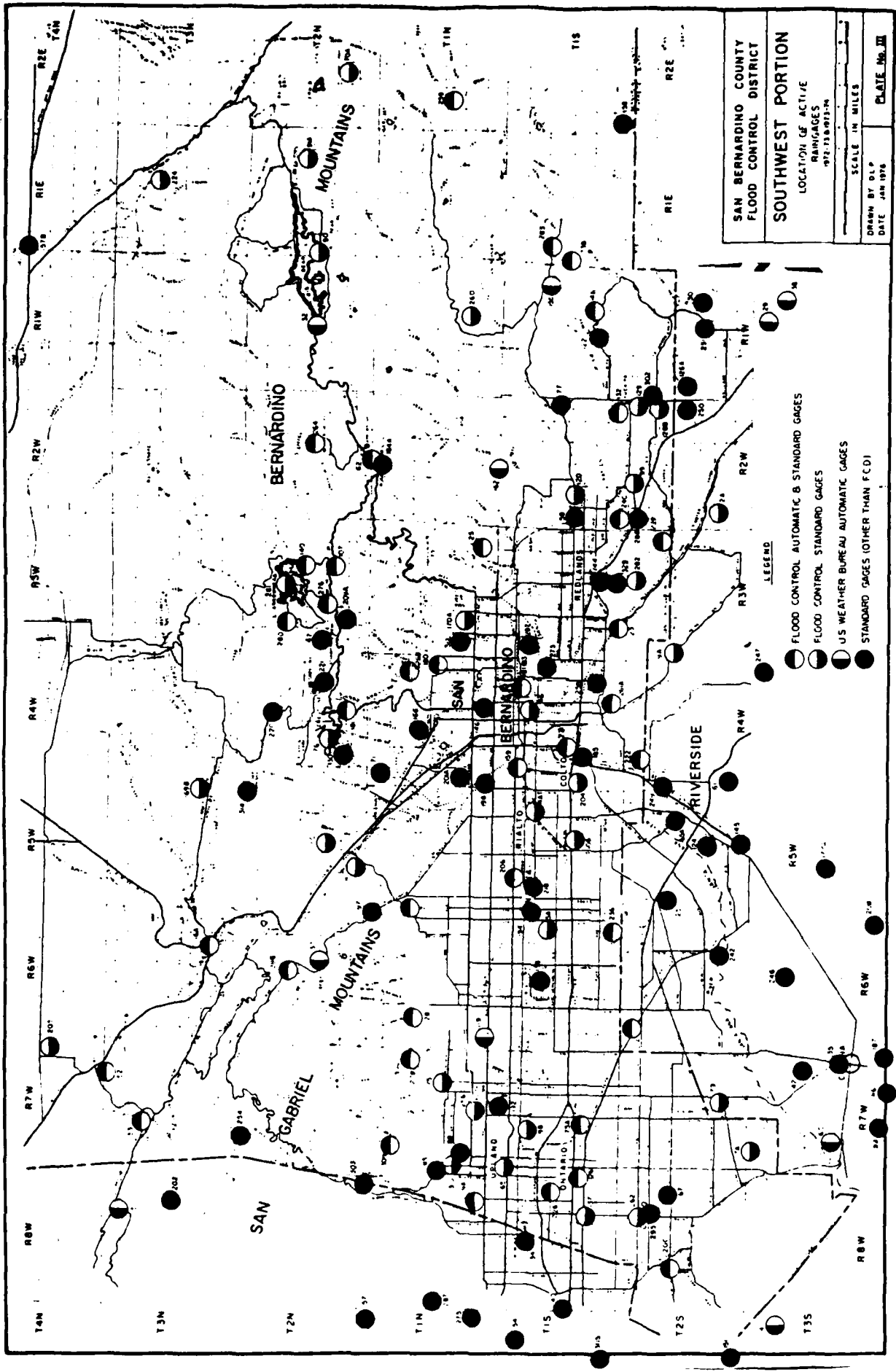
AUTOMATIC RECORDING GAGES

- RD F.C.D. 8"
- RU Other Governmental 8"

RAINFALL STATION INDEX

ABBREVIATIONS

Amer. Pot. & Chem.	American Potash and Chemical
Big Bear Lake C.F.D.	Big Bear Lake County Fire District
C.D.A.	California Division of Agriculture
C.D.B.P.	California Division of Beaches and Parks
C.D.F.	California Division of Forestry
C.D.H.	California Division of Highways
C.R.F.P.D.	Chino Rural Fire Protection District
Crest Forest C.W.D.	Crest Forest County Water District
F.A.A.	Federal Aviation Administration
L.A.C. Fire Warden	Los Angeles County Fire Warden
Mentone B.G.O. Co.	Mentone Blue Goose Orange Company
M.F.P.D.	Muscoy Fire Protection District
M.V.C.S.	Morongo Valley Community Services
M.W.D.	Metropolitan Water District
N.O.A.A.	National Oceanic and Atmospheric Administration
R.C.F.C. & W.C.D.	Riverside County Flood Control and Water Conservation District
S.B.C.W.D.	San Bernardino City Water District
S.B.C.F.C.D.	San Bernardino County Flood Control District
S.B.V.M.W.D.	San Bernardino Valley Municipal Water District
S.C.E. Co.	Southern California Edison Company
So. Cal. Gas Co.	Southern California Gas Company
U.C.R.	University of California at Riverside
U.S.A.F.W. Norton	United States Air Force Weather Norton
U.S.C. of E.	United States Corps of Engineers
U.S. Dept. of Ag.	United States Department of Agriculture
U.S.F.S.	United States Forest Service



SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT

SOUTHWEST PORTION

LOCATION OF ACTIVE
RAINGAGES
1/72, 13, & 1972-74

SCALE 1 IN. = 1 MILE

DRAWN BY DLP
DATE JAN 1976

PLATE No. III

LEGEND

- FLOOD CONTROL AUTOMATIC & STANDARD GAGES
- ◐ FLOOD CONTROL STANDARD GAGES
- ◑ U.S. WEATHER BUREAU AUTOMATIC GAGES
- ◒ STANDARD GAGES (OTHER THAN FCD)

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT
 COMPARATIVE MAXIMUM RAINFALL AMOUNTS IN INCHES
 MAXIMUM PRECIPITATION FOR INDICATED DATED

SEASON 1972-73

Station	Amt. Date	15 Min.	30 Min.	1 Hr.	2 Hr.	6 Hr.	12 Hr.	24 Hr.
Arrowhead Ranger Station #107	.23 10-18-72	.36 3-11-73	.60 2-11-73	1.10 2-11-73	2.35 1-18-73	3.65 2-11-73	5.85 2-11-73	
Arrowhead Springs Hotel #268	.35 10-19-72	.45 10-19-72	.50 10-19-72	.87 1-18-73	1.59 1-18-73	1.75 1-18-73	2.40 2-11-73	
Barstow Fire Department #112	.12 11-11-72	.12 11-11-72	.17 11-11-72	.22 12-04-72	.29 12-04-72	.29 12-04-72	.29 12-04-72	
Big Bear Lake Dam #32	.20 11-11-72	.40 11-11-72	.60 11-11-72	.80 11-11-72	1.10 11-11-72	2.00 11-16-72	2.70 11-16-72	
Cajon Junction #16	.25 2-28-73	.40 2-28-73	.60 2-11-73	1.00 2-11-73	2.72 2-10-73	3.97 2-10-73	4.82 2-10-73	
Cajon West Summit #52	.10 2-11-73	.10 2-11-73	.20 2-11-73	.40 2-11-73	1.10 2-11-73	1.80 2-11-73	2.20 2-11-73	
Calico #304	.10 2-11-73	.12 2-11-73	.20 3-13-73	.22 3-13-73	.37 2-11-73	.53 3-08-73	.58 3-08-73	
Camp Angelus #53	.30 8-01-73	.50 8-01-73	.80 8-01-73	1.20 8-01-73	1.70 2-04-72	2.30 2-11-73	4.00 2-11-73	
Chino Fire Department #2 #20C	.37 10-19-72	.52 2-06-73	.55 2-06-73	.77 11-14-72	1.00 11-14-72	1.70 1-16-73	1.87 2-10-73	

MONTHLY AND SEASONAL PRECIPITATION IN INCHES

STA. NO. & NAME	SEASON	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	SEASON TOTAL
Adelanto	72-73	.36	.72	.27	.72	1.65	1.00	0	T	0	.08	.50	0	5.30
	73-74	.05	.17	.06	3.20	.02	.26	.01	.30	0	.20	.87	0	5.14
Alta Loma	72-73	.33	3.31	2.51	4.06	10.82	5.16	.26	.14	0	0	0	0	26.59
	73-74	.06	1.87	.47	9.23	0	3.94	.63	.12	0	0	0	0	16.32
Alta Loma	72-73	.51	3.15	2.43	3.94	8.25	5.35	.03	.20	0	0	0	0	23.85
	73-74	.02	1.77	.27	8.96	.17	4.26	.77	.15	0	0	0	0	15.77
Amboy	72-73	.30*	.56	0	.24	0*	0*	0	0	0	0	.20	0	1.30*
	73-74	0	0*	0	0*	.27	0	0	0	0	0*	0*	0*	.27*
Amboy - Saltus 1	72-73	.41	.54	.01	.14	.48	.73	.05	0	0	0	.02	0	2.38
	73-74	0	.20	0	.97	0	.33	0	0	0	.15	0	0	1.65
Amboy - Saltus 2	72-73	.43	.45	.02	.13	.42	.49	.03	0	0	0	.05	0	2.02
	73-74	0	.29	0	1.04	0	.35	0	0	0	.28	0	0	1.96
Apple Valley	72-73	.53	.71	.21	.69	1.77	1.77	.06	0	0	0	0	0	5.74
	73-74	0	.61	0	1.55	0	.26	.07	.21	0	.79	.24	0	3.73
Arlington	72-73	.25	2.25	1.07	1.53	2.84	2.22	0	0	.06	0	0	0	10.22
	73-74	.03	1.21	.15	3.95	0	1.93	.27	0	0	0	0	0	7.54
Arrowhead Rngr	72-73	1.91	5.60	4.60	8.10	14.52	11.40	.50	.95	.03	0	T	0	47.61
	73-74	.20	4.50	1.45	20.04	0	3.14	2.36	.47	0	T	0	0	32.16

*Estimated Data



SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

HISTORICAL

MAXIMUM RECORDED PRECIPITATION
FOR DATES AND INTERVALS INDICATED
(INCHES)

Station	15 Min.	30 Min.	1 Hr.	2 Hr.	6 Hr.	12 Hr.	24 Hr.
Arrowhead Ranger Station #107	Amt. Date .40 11-22-65	.65 11-22-65	1.30 11-22-65	2.25 11-22-65	4.95 11-22-65	8.65 1-25-69	13.35 1-25-69
Arrowhead Springs Hotel #268	Amt. Date .32 10-19-62	.40 10-19-62	.55 11-18-73	.90 1-18-73	1.62 1-18-73	2.00 1-04-74	2.52 1-05-74
Barstow Fire District #112A	Amt. Date .51 7-20-69	.65 7-20-69	.80 7-20-69	.81 7-20-69	.81 7-20-69	.81 7-20-69	.81 7-20-69
Big Bear Lake Dam #32	Amt. Date .20 11-18-73	.40 11-11-72	.60 11-11-72	.80 11-11-72	1.60 11-18-73	2.20 11-18-73	2.90 11-18-73
Cajon Junction #16A	Amt. Date .58 1-21-69	.87 1-21-69	1.62 1-21-69	2.62 1-21-69	4.81 1-21-69	7.32 12-29-65	7.52 12-29-65
Chino Fire Station #2 #20C	Amt. Date .60 11-20-67	.85 3-08-68	1.20 3-08-68	1.70 3-08-68	3.27 3-08-68	4.30 1-26-56	6.21 1-26-56
Colton Fire Dept. #27A	Amt. Date .48 9-18-63	.80 9-18-63	1.02 9-18-63	1.26 9-19-63	2.22 1-25-69	3.24 1-25-69	4.72 1-26-56
Crafton #24C	Amt. Date .67 8-23-67	.77 8-23-67	.83 8-23-67	.98 3-08-68	1.95 2-09-63	3.16 1-25-69	4.53 1-25-69
Crestline Fire Dept. #2 #28A	Amt. Date .40 10-19-72	.60 10-19-72	1.00 10-19-72	1.20 8-01-73	2.80 11-18-73	4.20 2-11-73	6.40 2-11-73

7. Index of precipitation gages, Orange County, with location map. Courtesy of Emmett Franklin, Orange County Environmental Management Agency, (OCEMA).

TABLE I
 NUMERICAL LIST OF STATIONS IN THE
 OCEMA PRECIPITATION NETWORK
 1982-83

NO	STATION	COUNTY	LATITUDE	LONGITUDE	ELEVATION (FT)	RECORD PERIOD	TYPE GAGE	COOPERATOR
1	Seal Beach	Orange	33-44-38	118-06-43	12	*	8 in. Standard	City
3	Artesia Fire Station	Los Angeles	33-51-42	118-04-58	51	1917	8 in. non-Recording	LAFCD
4	La Mirada	Los Angeles	33-53-13	118-00-56	86	1925	8 in. non-Recording	LAFCD
5	Buena Park	Orange	33-51-28	117-59-29	80	1926	3 in. non-Recording	City
18	Diamond Bar Horse Camp	Los Angeles	33-59-40	117-48-54	880	1930	8 in. non-Recording	MWS
23	Prado Dam	Riverside	33-53-24	118-38-09	480	*	8 in. Standard	OCEMA
26	Yorba Linda	Orange	33-53-16	117-49-10	345	1912	8 in. Standard	Observer
27	Piacentia Mutual Orange Assoc.	Orange	33-52-04	117-52-24	220	*	5 in. non-Recording	Observer
28	Fullerton Knowlton	Orange	33-52-20	117-53-45	200	1919	8 in. non-Recording	Observer
29	Anaheim Union Water Works	Orange	33-51-32	117-53-06	190	*	8 in. Standard	Observer
33	Anaheim Water Works	Orange	33-49-49	117-54-38	155	1921	8 in. non-Recording	City
36	Anaheim-Katella Substation	Orange	33-48-11	117-54-05	140	*	8 in. English	City
43	Wintersburg-Slater	Orange	33-42-47	117-59-54	25	*	1 1/8 in. Opening	Observer
45	Huntington Beach Fire Department	Orange	33-39-30	117-59-48	40	1927	8 in. non-Recording	City
46	Costa Mesa Park	Orange	33-38-26	117-55-16	95	*	8 in. non-Recording	City
47	Costa Mesa - Shiffer	Orange	33-40-56	117-53-47	47	*	3 in. gage	Observer
50	El Toro-Moulton Ranch	Orange	33-36-26	117-42-08	400	*	6 in. gage	Observer
51	Irvine - Shaddy Camp	Orange	33-37-39	117-47-16	270	*	6 in. gage	Irvine Co.
52	Irvine - Bommer (old cattle)	Orange	33-39-48	117-49-54	80	*	6 in. gage	Irvine Co.
54	Irvine - Markle Road	Orange	33-41	117-48	100	*	6 in. non-Recording	Irvine Co.
55	Irvine - Community	Orange	33-40	117-45	200	*	6 in. non-Recording	Irvine Co.
56	Irvine - Baudino	Orange	33-38-56	117-42-35	355	*	8 in. non-Recording	Irvine Co.
57	Irvine - Lambert	Orange	33-42	117-43	435	*	6 in. non-Recording	Irvine Co.
60	Irvine - San Joaquin	Orange	33-42-08	117-46-06	200	*	6 in. gage	Irvine Co.
61	Tustin - Irvine Ranch	Orange	33-43-46	117-46-58	118	1897	8 in. non-Recording	Irvine Co.
63	Delhi - Holly Sugar	Orange	33-42-33	117-51-15	65	1923	3 in. non-Recording	Observer
74	Irvine - Limestone	Orange	33-45-27	117-42-03	855	1918	6 in. non-Recording	Irvine Co.
77	Silverado - Molts	Orange	33-44-07	117-38-04	1275	*	Non-Recording	Observer
81	Trabuco Canyon - Robinson	Orange	33-39-12	117-34-14	1200	*	6 in. Standard	Observer
86	San Juan Capistrano - Mankey	Orange	33-30-45	117-38-16	150	*	8 in. non-Recording	Observer
88	Newport Beach Harbor Master	Orange	33-36-16	117-53-00	8	1921	8 in. non-Recording	Harbor Dist.
90	Brea - Union Oil	Orange	33-55-49	117-54-53	370	*	3 in. Lists	Observer
91	Anaheim Carroll Ranch	Orange	33-49-54	117-57-49	105	*	8 in. non-Recording	Observer
92	San Juan Substation	Orange	33-30-44	117-39-56	160	*	8 in. non-Recording	SDC & E
93	Fullerton Pumping Plant	Orange	33-50-52	117-55-34	150	1931	3 in. non-Recording	City
96	Fullerton Hillcrest Reservoir	Orange	33-53-00	117-55-12	330	1931	3 in. non-Recording	City
98	Puente Mill - Weisel	Los Angeles	33-57-05	117-55-28	630	1925	8 in. non-Recording	LOCFCD

(Continued)

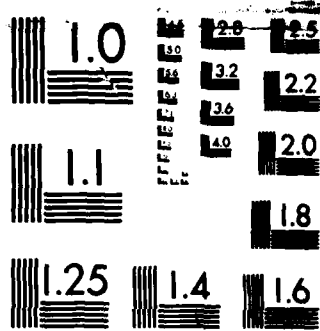
* Historical record for 20 or more years is available. Station has been discontinued; period of record is shown in alphabetical listing on page

TABLE I (cont'd)

NUMERICAL LIST OF STATIONS IN THE
OCEMA PRECIPITATION NETWORK
1982-83

(Continued)

NO.	STATION	COUNTY	LATITUDE	LONGITUDE	ELEVATION (FT.)	RECORD BEGINS	TYPE GAGE	COOPERATOR
99	Laguna Beach Hardware	Orange	33-23-33	117-46-55	30	*	8 in. non-Recording	Observer
100	Laguna Beach - Treatment Plant	Orange	33-32-49	117-46-53	50	1928	8 in. non-Recording	City
109	Villa Park Orchard Association	Orange	33-48-53	117-49-20	300	1928	3 in. non-Recording	Observer
116	Garden Grove - County Yard	Orange	33-46-02	117-56-00	87	*	8 in. Standard	City
118	Santiago Dam	Orange	33-47-13	117-43-16	855	1938	8 in. Recording	NWS
119	Silverado Ranger Station	Orange	33-44-34	117-39-29	1095	1938	8 in. Recording	NWS
121	Santa Ana - OCEMA	Orange	33-45-94	117-52-11	180	1932	18 in. Recording	OCEMA
125	Irvine	Orange	33-40-38	117-45-33	200	1936	18 in. Recording	OCEMA
126	Fullerton Airport	Orange	33-52-23	117-58-24	100	1935	18 in. Recording	OCEMA
130	El Toro Los Alisos Ranch	Orange	33-39-50	117-40-05	680	*	6 in. non-Recording	Observer
131	San Clemente Fire Station	Orange	32-25-38	117-36-31	260	*	3 in. non-Recording	City
132	El Modena	Orange	33-48-28	117-46-36	464	1938	8 in. Recording	NWS
133	Trabuco Canyon	Orange	33-39-26	117-35-32	970	1939	8 in. Recording	NWS
134	San Juan Guard Station	Orange	33-35-30	117-30-47	730	1939	8 in. non-Recording	OCEMA
135	Huntington Beach	Orange	33-40-48	118-00-00	75	*	8 in. non-Recording	OCEMA
136	Olive Heights	Orange	33-50-17	117-50-43	225	1939	4 in. non-Recording	Observer
141	Laguna Beach No. 2	Orange	33-33-03	117-48-01	210	1942	8 in. Digital	NWS
142	Lemon Heights	Orange	33-45-26	117-46-51	380	*	6 in. non-Recording	Observer
143	Irvine - Salt Works	Orange	33-38-50	117-52-03	0	*	6 in. Gage	Observer
144	Brea - Orange County Reservoir	Orange	33-56-10	117-52-38	660	1943	8 in. Recording	NWS
145	Prado Dam	River-Side	33-53-25	117-38-10	560	1942	8 in. Recording	NWS
146	Lambert Reservoir	Orange	33-41-41	117-42-39	470	1945	18 in. Recording	OCEMA
148	Orange - U.S. Forest Service	Orange	33-47-17	117-50-26	215	*	8 in. non-Recording	USFS
151	Aliso Canyon - Cook	Orange	33-40-59	117-37-12	1080	*	8 in. non-Recording	Observer
152	La Habra Fire Dept.	Orange	33-55-53	117-57-13	285	1926	3 in. non-Recording	City
153	Fullerton Dam	Orange	33-53-50	117-53-97	340	1944	8 in. Recording	NWS
154	Brea Dam	Orange	33-52-25	117-55-30	275	1944	8 in. Recording	NWS
156	Santiago Peak	Orange	33-42-59	117-31-59	5660	1949	8 in. Digital	NWS
158	Los Alamitos	Orange	33-48-35	118-04-35	25	1950	8 in. non-Recording	Observer
161	Santa Ana - Scudder	Orange	33-45-07	117-53-22	94	*	8 in. non-Recording	Observer
162	Westminster	Orange	33-45-08	117-59-17	38	1955	8 in. Recording	OCEMA
163	Verba Reservoir	Orange	33-52-19	117-48-37	300	1955	8 in. Recording	OCEMA
164	Capistrano Beach	Orange	33-28-03	117-41-02	20	1955	8 in. Recording	OCEMA
165	Costa Mesa	Orange	33-40-07	117-53-35	55	1955	8 in. Recording	OCEMA
167	Anaheim - Agriculture Dept.	Orange	33-49-12	117-54-48	147	1957	8 in. Recording	OCEMA
169	Corona Del Mar	Orange	33-36-35	117-51-27	300	1959	8 in. Recording	OCEMA
170	Los Alamitos	Los Angeles	33-45-24	118-95-43	5	1958	8 in. Recording	OCEMA



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE I (cont'd)

NUMERICAL LIST OF STATIONS IN THE
OCEMA PRECIPITATION NETWORK
1982-83

(Continued)

NO	STATION	COUNTY	LATITUDE	LONGITUDE	ELEVATION (FT)	RECORD BEGIN	TYPE GAGE	OPERATOR
171	El Modena - Hower	Orange	33-47-11	117-48-03	310	1959	6 in. non-Recording	Observer
173	Villa Park Dam	Orange	33-48-51	117-46-00	572	1961	8 in. Recording	OCEMA
174	Atwood - OCMD	Orange	33-51-12	117-49-35	245	1963	8 in. non-Recording	OCMD
176	El Toro	Orange	33-37-35	117-41-26	455	1964	8 in. Recording	OCEMA
178	El Toro - Industrial Farm	Orange	33-39-52	117-41-43	520	1965	8 in. non-Recording	Observer
181	Modjeska Canyon-McArthur	Orange	33-42-26	117-37-39	1300	1963	1 in. non-Recording	Observer
183	Brea City	Orange	33-54-53	117-54-04	345	"	8 in. non-Recording	City
184	Garden Grove City Hall	Orange	34-46-35	117-55-59	120	1964	8 in. non-Recording	City
185	Carbon Canyon - Gilman	Orange	35-55-24	117-46-31	1625	1954	8 in. Recording	WRS
186	San Clemente - Palisades Reservoir	Orange	33-27-46	117-39-02	360	1963	8 in. non-Recording	Observer
188	Carbon Canyon - Workman	San Bernardino	33-57-30	117-46-42	1180	1949	8 in. Recording	WRS
190	La Habra Mts. Mutual Water Company	Los Angeles	34-56-55	117-57-50	450	1964	8 in. non-Recording	Observer
191	Santa Ana Fire Station	Orange	33-44-39	117-52-02	115	1907	Non-Recording	City
192	El Cariso Guard Station	Riverside	33-39-00	117-24-43	2660	1963	8 in. non-Recording	USFS
196	Irvine Country Club	Orange	33-36-43	117-52-56	105	"	6 in. non-Recording	Irvine Co.
197	Bryant Ranch	Orange	33-52-32	117-42-28	425	1963	8 in. non-Recording	Observer
198	Oak Flat	Orange	33-49-15	117-38-18	2700	1969	8 in. Recording	OCEMA
201	Mission Viejo Cow Camp	Orange	33-31-21	117-35-31	300	1969	2 in. non-Recording	Observer
203	Moulton Miguel Water District	Orange	33-34-41	117-40-23	300	1969	8 in. non-Recording	Observer
204	Green River Golf Course	San Bernardino	33-52-25	117-40-15	450	1969	8 in. non-Recording	Observer
205	Anaheim Walnut Canyon Res.	Orange	33-49-19	117-45-03	800	1969	6 in. non-Recording	City
206	Trabuco Forestry	Orange	33-39-15	117-35-34	800	1971	8 in. non-Recording	USFS
207	Coto De Casa	Orange	33-35-14	117-35-05	974	1971	8 in. Recording	Observer
208	Stauton Yard OCEMA	Orange	33-47-07	118-00-32	600	1974	8 in. non-Recording	Observer
209	Anaheim - OCEMA Yard	Orange	33-48-11	117-52-34	51	1964	8 in. Recording	OCEMA
210	Silverado Canyon - Grouard	Orange	33-44-48	117-36-55	1400	1971	4 in. non-Recording	Observer
211	Laguna Miguel Fire Station	Orange	33-31-29	117-42-58	150	1973	8 in. non-Recording	Observer
212	Anaheim - Lewis Substation	Orange	33-48-37	117-53-51	350	1973	4 in. non-Recording	Observer
214	Modjeska Canyon - Tucker	Orange	33-42-35	117-37-08	1400	1974	8 in. Recording	OCEMA
216	Sulphur Creek Dam	Orange	33-32-59	117-42-20	190	1974	8 in. Recording	OCEMA
217	Huntington Beach - James	Orange	33-43-33	118-02-37	9	1974	8 in. non-Recording	Observer
221	San Juan Capistrano - Lacougue	Orange	33-30-35	117-37-55	140	1979	8 in. Recording	OCEMA
222	Orange - Mardacre	Orange	33-48-53	117-49-20	300	1980	4 in. non-Recording	Observer

TABLE 2
ALPHABETICAL LIST OF STATIONS IN THE
OCEMA PRECIPITATION NETWORK

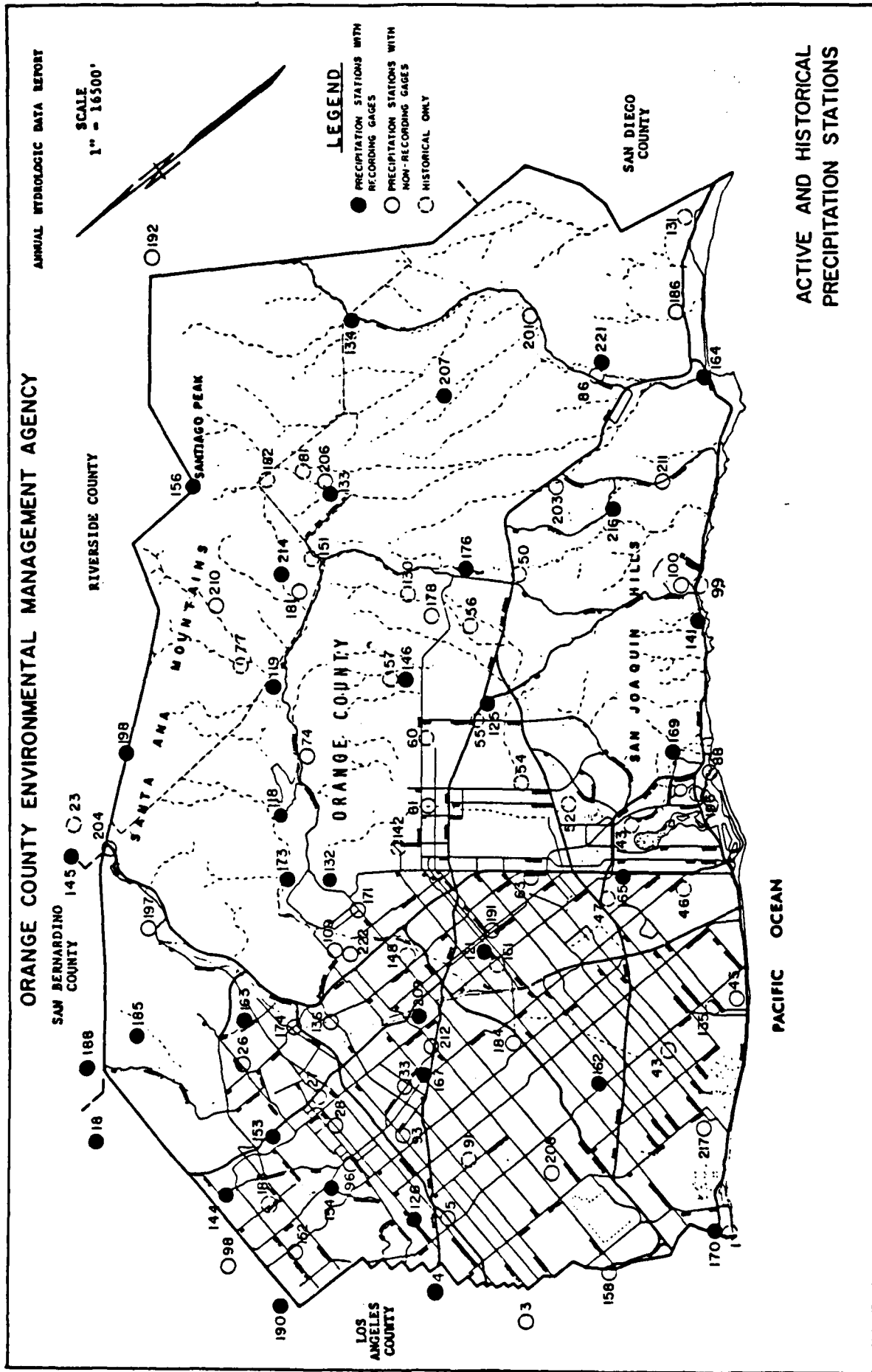
STATION	NO.	PERIOD OF RECORD		STATION	NO.	PERIOD OF RECORD	
		1937	1975			1937	1975
Aliso Canyon - Cook	151	1945	1975	Logans Beach Harbors	99	1926	1978
Anaheim - Agriculture Department	167	1957	•	Logans Beach No. 2	141	1943	•
Anaheim - Carroll Ranch	91	1924	1977	Logans Beach Treatment Plant	100	1929	•
Anaheim - Lewis Substation	212	1974	•	Logans Miguel Fire Station	211	1974	•
Anaheim - Estrella Substation	36	1923	1973	La Habra Fire Department	132	1927	•
Anaheim - OCEMA Yard	209	1975	•	La Habra Heights Mutual Water Co.	190	1961	•
Anaheim - Union Water Company	29	1930	1969	Lambert Reservoir	146	1947	•
Anaheim - Water Works	33	1880	•	La Mirada	4	1926	•
Artesia - Fire Station	3	1918	•	La Mirada	142	1944	1980
Arwood - OGD	174	1964	•	Los Alamitos	158	1951	•
Brea - City	183	1965	1980	Los Alamitos	170	1959	•
Brea Dam *	154	1947	•	Mission Viejo - Cow Camp	201	1970	•
Brea Orange County Reservoir	144	1944	1977	Modjeska Canyon - Nearcher	181	1964	•
Brea Union Oil	90	1923	1966	Modjeska Canyon - Tusher	214	1973	•
Bryant Ranch	197	1945	•	Newton Miguel Water District	203	1970	•
Buena Park	5	1927	•	Novert Beach Harbor Master	80	1922	•
Capistrano Beach	164	1956	•	Oak Flat	198	1970	•
Carbon Canyon - Gilman *	185	1946	•	Olive Heights	136	1940	•
Carbon Canyon - Hartmann *	188	1947	•	Orange - U. S. Forest Service	148	1942	1980
Corona Del Mar	169	1960	•	Orange - Hardacre	222	1980	•
Costa Mesa	165	1956	•	Picoctia Mutual Orange Association	27	1928	1980
Costa Mesa Park	46	1928	1976	Prado Dam	23	1931	1969
Costa Mesa - Shiffer	47	1928	1971	Prado Dam	143	1943	•
Coto De Caza	207	1971	•	Punta Hills - Weibel	98	1926	•
Dalhi - Holly Sugar	63	1924	1982	San Clemente Fire Station	131	1931	1977
Diamond Bar Horse Camp	18	1931	•	San Clemente - Palmdale Reservoir	186	1946	•
El Cerrito Guard Station	192	1946	•	San Juan Capistrano - Hamby	86	1905	1977
El Modena	132	1938	•	San Juan Capistrano - Lacombe	221	1979	•
El Modena - Hower	171	1940	•	San Juan Guard Station	134	1967	•
El Toro	176	1943	•	San Juan Substation	92	1923	1976
El Toro Los Alisos Ranch	130	1929	1977	Santa Ana Fire Station	191	1946	•
El Toro Industrial Farm	178	1946	•	Santa Ana - OCEMA	121	1909	•
El Toro - Newton Ranch	50	1877	1972	Santa Ana - Scudder	141	1954	1978
Fallerton Airport	126	1923	•	Santiago Dam	118	1938	•
Fallerton Dam *	153	1947	•	Santiago Peak	156	1950	•
Fallerton Knottson	28	1919	•	Seal Beach	1	1928	1968
Fallerton Hillcrest Reservoir	96	1931	•	Silverado Canyon - Croward	210	1976	•
Fallerton Pumping Plant	93	1932	•	Silverado - Melts	77	1919	1964
Garden Grove City Hall	184	1965	•	Silverado Ranger Station	119	1938	•
Garden Grove County Yard	116	1938	1970	Stamton Yard	208	1973	•
Gross River Golf Course	204	1970	•	Sulphur Creek Dam	216	1973	•
Huntington Beach	135	1933	1977	Trebozo Canyon	133	1940	•
Huntington Beach Fire Department	45	1928	•	Trebozo Canyon - Robinson	81	1926	1967
Huntington Beach - James	217	1975	•	Trebozo Forestry	206	1970	•
Irvine	123	1937	•	Tustin - Irvine Ranch	61	1898	•
Irvine - Banner (Old Castle)	52	1898	1977	Villa Park Dam	173	1962	•
Irvine - Bandino	56	1911	•	Villa Park Orchard Association	109	1929	1980
Irvine - Community	55	1894	1972	Westminster	162	1956	•
Irvine - Country Club	196	1969	1976	Wintersburg - Slater	43	1928	1971
Irvine - Barkie Road	54	1911	1970	Yerba Linda	26	1913	•
Irvine - Lambert	37	1927	1973	Yerba Reservoir	163	1956	•
Irvine - Limestone	74	1918	•				
Irvine - San Joaquin	60	1921	1974				
Irvine - Shady Camp	51	1903	1970				
Irvine - Salt Works	143	1944	1969				

* Station Currently Collecting Data

* Period of Record Interrupted during 1977-1982

SCALE
1" = 16500'

ORANGE COUNTY ENVIRONMENTAL MANAGEMENT AGENCY



ACTIVE AND HISTORICAL
PRECIPITATION STATIONS

LEGEND

- PRECIPITATION STATIONS WITH RECORDING GAUGES
- PRECIPITATION STATIONS WITH NON-RECORDING GAUGES
- (with dot) HISTORICAL ONLY

SAN BERNARDINO COUNTY

RIVERSIDE COUNTY

SAN DIEGO COUNTY

PACIFIC OCEAN

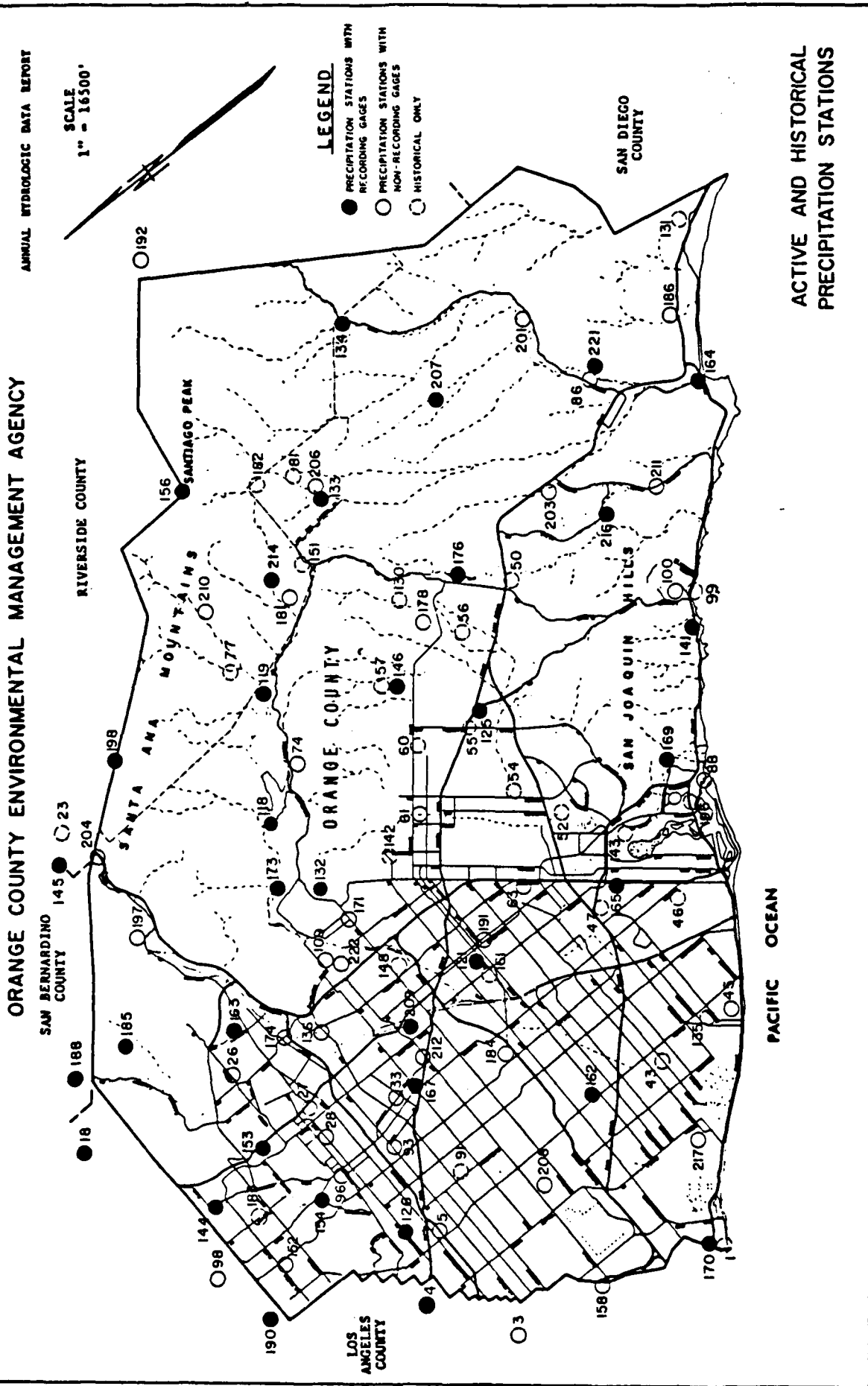
LOS ANGELES COUNTY

ORANGE COUNTY

SANTA ANA MOUNTAINS

SAN JOAQUIN HILLS

SANTIAGO PEAK



8. Typical Data sheets, Orange County Environmental
Management Agency.

ORANGE COUNTY ENVIRONMENTAL MANAGEMENT AGENCY

DAILY PRECIPITATION 1982-83 SEASON

STATION SANTA ANA RAIN

OCEMA NO. 1210

OBSERVATION TIME 0800

OBSERVER OCEMA

DAY	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	DAY
1						0.31			0.16		0.32		1
2									4.37				2
3								0.34	1.73				3
4								0.32	0.08				4
5									0.01				5
6								0.11	0.19	T			6
7								0.16					7
8			0.23					0.29					8
9			0.03		0.09								9
10					1.42								10
11			0.03		0.11								11
12						0.02				T			12
13								0.06					13
14									0.27				14
15													15
16			0.10										16
17									0.62				17
18			0.08						0.54	0.69			18
19					0.18		0.06	0.01	0.59				19
20					0.02					0.39			20
21									0.79	0.30			21
22						0.05			0.01				22
23						0.97	1.15		0.40				23
24								0.15	0.94				24
25							0.29		0.06				25
26			0.41	0.07	0.02			0.36					26
27			0.02	0.06			1.17	0.87					27
28							0.53	0.76	0.04				28
29					0.04		0.71			1.05			29
30					1.52					0.13			30
31				0.07									31
TOT	0.00	0.00	0.90	0.20	3.40	1.35	3.91	3.49	10.80	2.56	0.32	0.00	TOT

— LEGEND —

A- ESTIMATED

C- INCOMPLETE

NR- NO RECORD

B- PARTIALLY ESTIMATED

D- DATE UNCERTAIN

T- TRACE

P- INCLUDED IN FOLLOWING TOTAL

REMARKS _____

40 YEAR BASE MEAN _____ SEASON AS % OF BASE MEAN _____

75 YEAR MEAN 13.03 SEASON AS % OF 75 YEAR MEAN 206.2%

DAYS OF RAIN 61

SEASON TOTAL 26.87

SEASONAL RAINFALL

By Months

July 1st to June 30th

Station No. 64 Name: HILL + SON - SANTA ANA Lat. 33° 45' Long. 117° 52' Elev. 125'

SEASON	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season Total
1908-09	—	—	0.80	0.22	0.25	0.46	5.40	5.34	4.29	0.08	—	—	15.44
09-10	—	—	—	0.11	1.39	6.75	2.97	0.14	1.97	0.29	—	—	13.62
1910-11	0.05	—	0.02	0.53	0.42	0.25	4.47	3.60	2.31	0.68	—	—	12.31
11-12	—	—	0.49	0.74	—	0.69	0.26	—	4.00	1.53	0.14	—	7.85
12-13	—	—	—	0.76	0.45	—	1.27	4.88	0.40	0.18	0.17	0.33	8.44
13-14	—	—	—	—	1.65	1.23	6.60	3.00	0.99	0.91	0.15	0.14	14.67
14-15	—	—	—	1.38	1.82	4.80	5.03	4.66	0.57	0.86	0.88	—	20.00
15-16	—	—	—	—	0.97	2.82	11.18	1.64	1.27	0.03	0.22	—	18.13
16-17	—	—	0.57	1.52	0.12	3.71	2.41	2.91	0.22	0.31	0.10	—	11.87
17-18	—	—	—	—	0.38	—	1.46	3.06	4.82	0.11	0.41	—	10.24
18-19	—	0.09	0.64	0.08	2.53	0.58	0.61	1.32	1.66	0.51	0.29	—	8.31
19-20	—	—	1.27	0.76	0.26	2.11	0.68	3.91	4.01	0.72	0.79	—	14.51
1920-21	—	—	0.08	1.57	0.46	1.02	2.83	0.79	2.35	0.05	3.01	—	12.16
21-22	—	—	—	1.14	—	7.65	3.38	2.78	1.55	0.10	0.54	—	17.14
22-23	—	—	—	0.07	0.94	2.61	1.30	1.58	0.27	1.01	—	—	7.58
23-24	—	—	0.11	0.28	1.71	2.52	0.78	—	4.16	2.48	—	—	12.04
24-25	—	—	—	0.24	0.66	1.30	0.23	0.56	1.23	1.32	0.05	0.33	5.92
25-26	—	—	—	1.86	0.31	1.39	0.40	3.28	0.23	5.82	0.05	0.03	13.35
26-27	—	—	—	0.35	2.07	1.39	1.31	7.28	3.12	0.94	0.05	—	16.81
27-28	—	0.15	0.04	1.20	3.44	3.46	0.24	2.65	2.27	0.02	0.36	0.01	13.84
28-29	—	—	—	0.47	1.55	2.32	1.45	1.16	1.60	1.10	0.01	0.08	9.74
29-30	—	—	0.42	0.05	—	0.02	5.50	0.53	2.89	0.16	2.28	—	11.85
1930-31	—	—	—	0.20	1.81	—	3.33	2.20	—	3.15	0.67	0.06	11.42
31-32	—	0.05	0.21	0.41	2.53	4.90	1.18	5.60	0.02	0.52	—	—	15.40
32-33	—	—	0.14	0.48	—	2.31	5.69	0.02	0.09	0.41	0.56	0.10	9.80
33-34	—	0.23	—	0.37	—	4.47	2.24	1.52	0.06	—	—	0.43	9.32
34-35	—	0.03	0.02	3.08	2.37	2.65	2.82	1.98	3.83	0.98	—	—	17.76
35-36	—	0.05	—	0.11	0.94	0.32	0.09	5.84	1.19	0.23	—	0.01	8.78
36-37	—	0.16	—	0.72	0.15	6.50	2.11	9.85	3.27	0.18	—	—	22.92
37-38	—	—	—	—	—	1.83	1.47	5.69	6.44	1.26	0.59	—	17.28
38-39	—	—	—	0.14	0.10	9.71	1.23	2.11	1.06	0.51	0.03	—	12.89
39-40	—	—	2.87	0.55	0.14	0.32	3.81	4.25	1.11(2)	2.16(4)	—	—	15.21
1940-41	—	—	—	1.22	1.26	5.51	2.13	8.04	9.31	3.03	0.44	—	31.14

OCFCO
Record
Stations

(a) Subdivided on basis of #121

SEASONAL RAINFALL
By Months

July 1st to June 30th

Station No. 121-D Name: Santa Ana - OCEMA

SEASON	Lat.												Long.			Elev. Season Total
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	June	June		
67-68	0.00	0.00	0.46	0.00	2.79	1.76	0.86	0.30	2.20	1.04	0.01	0.00	0.00	0.00	9.42	
68-69	0.13	0.00	0.00	0.23	0.47	1.21	7.90	8.13	0.85	0.75	0.04	0.00	0.00	0.00	19.71	
69-70	0.02	0.00	0.00	0.00	2.11	0.07	2.03	1.76	2.96	0.00	0.00	0.00	0.00	0.00	9.01	
70-71	0.00	0.00	0.00	0.00	2.70	3.30	1.07	0.45	0.25	0.36	0.44	0.03	0.03	0.00	8.60	
71-72	0.00	0.00	0.00	0.21	0.11	4.11	0.00	0.06	0.01	0.06	0.03	0.29	0.00	0.00	4.88	
72-73	0.00	0.61	0.06	0.32	3.20	1.69	3.35	4.90	2.67	0.00	0.00	0.00	0.00	0.00	16.30	
73-74	0.00	0.00	0.01	0.04	1.67	0.25	5.15	0.03	3.81	0.32	0.15	0.03	0.00	0.00	11.46	
74-75	0.00	0.00	0.00	0.62	0.04	4.35	0.96	1.93	3.19	1.86	0.13	0.00	0.00	0.00	12.08	
75-76	0.00	0.00	0.00	0.52	0.38	0.21	0.00	2.62	1.48	1.37	0.04	0.56	0.00	0.00	7.18	
76-77	0.00	0.00	2.14	0.02	0.92	0.59	2.91	0.93	0.87	0.00	2.04	0.00	0.00	0.00	10.42	
77-78	0.00	1.92	0.01	0.00	0.00	2.49	7.99	6.32	8.11	1.53	0.16	0.00	0.00	0.00	28.52	
78-79	0.00	T	1.16	0.03	2.32	1.72	4.94	3.21	5.09	T	0.00	0.00	0.00	0.00	18.47	
79-80	0.07	T	0	0.58	0.62	0.37	7.68	8.16	3.43	0.10	0.19	0	0	0	21.20	
80-81	0.00	0.00	0.00	0.01	0.00	0.81	2.53	1.40	3.62	0.33	0.04	0.02	0.02	0.00	8.76	
81-82	0.00	0.00	0.00	0.65	2.37	0.73	2.52	0.92	4.66	1.09	0.08	0.03	0.03	0.00	13.05	
82-83	0.00	0.00	0.90	0.20	3.40	1.35	3.91	3.43	10.80	2.56	0.32	0.00	0.00	0.00	26.87	
83-84	0.00	0.37	0.61	2.30	3.14	1.73	0.38	0.01	0.08	0.42	0.04	0.00	0.00	0.00	9.08	

SEASONAL RAIN FALL
By Months

July 1st to June 30th

Station No. 1210 Name: SAUTH ANA ENG. BLDG.

Lat. 33°45'04" Long. 117°52'11" Elev. 180

SEASON	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season Total
1932-33	NR	NR	NR	NR	NR	NR	5.42	0.02	0.07	0.38	0.53	0.09	NR
33-34	0.00	0.29	0.00	0.39	0.00	1.22	4.49	1.49	0.00	0.00	0.00	0.44	9.10
34-35	0.00	0.02	0.08	2.83	2.38	2.62	3.22	1.92	3.64	0.98	0.00	0.00	17.69
35-36	0.02	0.05	0.00	0.07	1.19	0.42	0.08	5.58	1.22	0.23	0.00	0.03	8.89
36-37	0.01	0.15	0.00	0.82	0.11	6.35	7.15	9.70	3.19	0.25	0.13	0.07	22.93
37-38	0.00	0.00	0.00	0.00	0.02	1.86	1.56	6.01	6.28	1.23	0.62	0.00	17.58
38-39	0.00	0.00	0.00	0.09	0.09	8.65	2.44	2.26	1.16	0.56	0.04	0.00	15.29
39-40	0.00	0.00	3.22	0.44	0.14	0.40	3.87	4.58	1.21	2.30	0.00	0.00	16.16
40-41	0.00	0.00	0.00	1.25	1.09	5.57	2.30	8.36	2.88	3.24	0.45	0.00	32.14
41-42	0.00	0.00	0.00	1.79	0.32	4.50	0.68	0.90	1.55	2.72	0.09	0.00	12.55
42-43	0.00	0.00	0.00	0.60	0.20	1.00	2.53	2.89	2.69	0.57	0.00	0.00	15.56
43-44	0.00	0.00	0.01	0.13	0.12	7.11	0.65	5.86	1.54	1.20	0.02	0.04	16.68
44-45	0.00	0.00	0.04	0.00	5.04	0.71	0.00	4.40	4.71	0.05	0.00	0.01	14.96
45-46	0.00	0.28	0.00	0.15	0.23	4.79	0.22	0.57	2.82	0.42	0.01	0.00	9.49
46-47	0.00	0.00	0.00	0.89	6.29	2.76	0.26	0.35	0.79	0.11	0.35	0.02	11.82
47-48	0.00	0.05	0.07	0.08	0.79	1.41	0.01	1.22	1.82	1.83	0.06	0.18	7.32
48-49	0.00	0.00	0.00	0.07	0.00	2.86	2.24	1.45	0.96	0.04	0.52	0.00	8.14
49-50	0.00	0.00	0.00	0.00	1.19	2.14	2.30	1.88	0.89	0.63	0.09	0.00	9.12
1950-51	0.01	0.00	0.03	0.00	2.67	0.05	1.89	0.88	0.66	1.36	0.00	0.00	7.55
51-52	0.00	0.17	0.43	0.54	0.46	4.89	0.80	0.15	6.35	1.18	0.00	0.00	22.97
52-53	0.00	0.00	0.28	0.00	3.14	2.91	0.87	0.41	0.78	1.21	0.03	0.03	9.66
53-54	0.00	0.00	0.00	0.00	1.01	0.14	4.21	2.79	2.96	0.09	0.00	0.03	11.23
54-55	0.00	0.00	0.00	0.00	1.49	1.14	3.66	1.21	0.15	0.93	2.10	0.06	10.74
55-56	0.00	0.00	0.00	0.01	0.78	0.44	8.32	0.39	0.00	2.44	0.47	0.00	13.05
56-57	0.00	0.00	0.00	0.24	0.00	0.13	4.00	0.67	1.02	1.41	0.72	0.23	8.42
57-58	0.01	0.00	0.00	1.60	0.39	2.96	1.67	5.78	4.22	5.04	0.00	0.01	21.68
58-59	0.00	0.38	0.06	0.04	0.03	0.05	1.90	3.42	0.00	0.46	0.00	0.00	6.34
59-60	0.00	0.00	0.00	0.00	0.07	1.66	2.98	3.11	0.49	1.88	0.01	0.00	10.20
1960-61	0.00	0.00	0.00	0.04	1.91	0.18	0.67	0.00	0.68	0.02	0.00	0.06	3.56
61-62	0.00	0.01	0.00	0.00	0.77	1.60	2.74	6.70	1.33	0.00	0.36	0.01	13.52
62-63	0.00	0.00	0.00	0.09	0.03	0.03	0.00	2.89	1.63	1.13	0.00	0.08	5.88
63-64	0.00	0.02	1.88	0.57	4.20	0.00	1.30	0.02	1.39	0.49	0.01	0.33	10.21
64-65	0.00	0.00	0.07	0.11	1.08	1.38	0.63	0.23	1.12	3.78	0.00	0.01	10.41
65-66	0.05	0.00	0.17	0.00	6.71	3.54	0.76	1.32	0.20	0.00	0.03	0.00	12.78
66-67	0.00	0.00	0.01	0.04	2.38	5.50	2.98	0.00	1.66	2.92	0.01	0.01	15.41

9. Index of precipitation gages, South Coast Region. From the California Department of Water Resources, Bulletin 230-81

TABLE 8. PRECIPITATION STATIONS BY AREAL CODE (continued)

AREAL CODE	DWR STATION NUMBER	STATION NAME	LATITUDE DEG' MIN' SEC"	LONGITUDE DEG' MIN' SEC"	TOWNSHIP & RANGE	ELEVATION	RECORD		MAXIMUM PRECIPITATION		MINIMUM PRECIPITATION		MEAN ANNUAL	YEARS OF RECORD
							YEAR BEGN	YEAR END	MAX. ANNUAL	YEAR OCCUR	MIN. ANNUAL	YEAR OCCUR		
U-05.F1	1917-00	CARBON CANYON DAM	33-55-00	117-50-00	035/09W-5	123	1973	1977	429.0	1973	227.8	1976	334.3	4
	2250-20	CYPRESS-LOMBY	33-49-50	118-02-22	045/11W-5	12	1953	1962	517.6	1958	46.0	1961	263.6	10
	3268-00	FULLERTON HILLCRST RE	33-52-00	117-54-13		104	1933	1976	919.3	1941	110.0	1961	346.8	44
	3268-01	FULLERTON-KNOWITON	33-52-20	117-53-45	035/10W-5	50	1919	1977	960.7	1941	110.6	1961	356.4	56
	3289-02	FULLERTON PUMP PLANT	33-50-52	117-55-34	045/10W-5	46	1932	1976	808.5	1941	61.2	1961	326.3	47
	3289-03	FULLERTON A P	33-52-23	117-58-24	035/10W-5	29	1935	1976	811.2	1970	108.7	1961	332.1	43
	3289-20	FULLERTON OCFCO YARD	33-52-05	117-54-38	035/10W-5	50	1960	1969	592.6	1969	84.8	1961	308.4	10
	9106-01	LOS ALAMITOS	33-48-35	118-04-35	045/11W-5	8	1911	1977	508.2	1969	91.1	1961	288.2	69
	9106-20	LOS ALAMITOS RR AUT	33-49-24	118-09-48	055/12W-5	2	1959	1980	543.1	1978	78.9	1961	245.7	21
	6959-01	PLACENTIA AUM CO	33-51-32	117-53-06	045/10W-5	58	1930	1969	907.5	1941	98.6	1961	327.9	36
U-05.F2	6959-02	PLACENTIA RUT ORANGE	33-52-24	117-52-24	035/10W-5	69	1928	1976	995.9	1941	114.9	1961	367.6	51
	0355-00	ASSOC OIL ANAHEIM 1	33-54-00	117-53-00	035/10W-5	104	1960	1966	398.6	1962	112.1	1961	246.2	4
	0509-00	BARNESON PARK	33-56-00	117-51-00		175	1960	1966	481.6	1962	155.9	1961	322.2	3
	1057-00	BREA DAM	33-53-26	117-55-36	035/10W-5	84	1960	1978	819.3	1978	177.5	1972	342.4	9
	1057-01	BREA UNION OIL	33-55-46	117-56-53		114	1965	1966	338.8	1966				
	2432-00	DIAMOND BAR MORSE CP	33-58-41	117-49-58	025/09W-5	228	1931	1979	944.6	1941	137.9	1961	398.8	44
	2432-01	DIAMOND BAR RCH 1	33-58-09	117-50-40		219	1930	1959	942.5	1941	189.2	1959	459.0	27
	3279-00	FULLERTON ARROUES RCH	33-54-00	117-55-00	035/10W-5	101	1960	1965	262.1	1963	118.6	1961	190.4	2
	4659-11	LA HABRA	33-55-56	117-57-18	035/10W-5	96	1965	1969	718.4	1969	286.3	1968	461.2	3
	4659-15	LA HABRA FIRE STA	33-55-53	117-57-17		96	1976	1977	296.6	1977	252.8	1976	274.7	2
	4659-21	LA HABRA HEIGHTS	33-55-44	117-56-48	035/10W-5	91	1926	1956	803.0	1941	165.4	1948	362.7	31
	4659-31	LA HABRA RTS RW CD	33-56-59	117-57-31		136	1965	1977	653.7	1969	272.8	1976	390.9	6
	6473-00	ORANGE COUNTY RES	33-56-07	117-52-58	035/10W-5	201	1948	1976	687.3	1969	108.5	1961	307.2	29
	7161-03	PUENTE MILLS-WEISEL	33-57-15	117-59-20		221	1930	1979	912.1	1978	129.1	1961	405.2	49
	8119-00	SHAFFER TOOL WKS	33-59-00	117-56-00		110	1941	1957	682.5	1952	203.8	1949	347.7	15
	8158-00	SHELL ABSORPTION PLT	33-57-00	117-56-00		207	1957	1966	719.5	1958	139.2	1961	356.0	6
U-05.F3	0373-50	ATWOOD - OCVO	33-51-33	117-49-04	045/09W-5	79	1964	1978	862.0	1978	191.8	1972	357.5	15
	1518-00	CARBON CANYON GILMAN	33-56-00	117-47-00	035/09W-5	495	1966	1978	361.3	1974	213.0	1972	271.0	4
	1520-00	CARBON CANYON WORKMAN	33-57-00	117-48-00	025/09W-5	358	1967	1978	861.6	1978	199.6	1972	413.4	12
	3285-00	FULLERTON DAM	33-54-00	117-53-00	035/10W-5	104	1960	1978	640.1	1969	182.7	1972	326.9	9
	4620-00	LA BREA CANY HUNT	33-57-00	117-50-00		213	1942	1956	735.5	1952	234.0	1948	400.3	13
	4639-58	LA VIDA SPRINGS	33-59-53	117-47-43		204	1931	1962	1022.9	1941	136.9	1961	421.9	30
	6432-00	OLINDA	33-55-00	117-51-00	035/09W-5	149	1941	1966	683.4	1958	124.2	1961	318.4	23
	9138-00	UNION OIL STEARNS	33-56-00	117-52-00	035/09W-5	216	1941	1969	685.8	1958	133.4	1961	336.7	22
	9847-00	YORBA LINDA	33-54-00	117-49-00	035/09W-5	123	1913	1980	709.7	1958	118.9	1961	359.6	60
	9847-21	YORBA RESERVOIR	33-52-19	117-48-37	035/09W-5	98	1928	1976	602.5	1978	117.7	1961	356.5	31
U-06.80	7870-00	SAN NICOLAS ISLAND-AIRSTR	33-14-00	119-27-00		153	1948	1976	199.0	1975	55.0	1949	149.8	10
	7871-00	SAN NICOLAS ISLAND-USM	33-15-00	119-30-00		41	1933	1945	548.5	1941	155.3	1934	277.5	11
U-06.00	0395-00	AVALON PLEASURE PIER	33-21-00	118-20-00		8	1910	1980	756.0	1978	124.5	1924	320.2	33
	7910-00	SANTA CATALINA WB AP	33-24-00	118-25-00		479	1963	1968	328.9	1967	151.1	1964	240.0	2
U-06.D1	2801-00	EL SERENO	34-04-49	118-10-51		160	1935	1961	943.5	1941	159.4	1961	419.4	26

APPENDIX C
SOUTH CENTRAL REGION

1. Coastal wind gages, South Central Region, whose data are available at the National Climatic Data Center. Additional stations are listed in Table 4.9. Appendix D contains a state-wide index.
2. Precipitation gages, San Luis Obispo County, with cross-reference and data output samples. Courtesy Ann Hall, San Luis Obispo County Flood Control and Water Conservation District.
3. Precipitation gages, Santa Barbara County. Revised 4/26/85; Courtesy of Phil Holland, Santa Barbara County Flood Control and Water Conservation District.
4. Precipitation gages, Ventura County, with cross reference and location map. Courtesy of Dolores Taylor, Ventura County Flood Control and Water Resources District.
5. Precipitation gages, South Central Region. From the California Department of Water Resources, Bulletin 230-81

1. Coastal wind gages, South Central Region, whose data are available at the National Climatic Data Center. Additional stations are listed in Table 4.9. Appendix D contains a state-wide index.

LOCATION	AGENCY NUMBER	LATITUDE	LONGITUDE	HOURLY RECORD START	HOURLY RECORD STOP	OBS/DAY	DIGITIZED RECORD
Pt Piedras Blancas	CG 23219	35-40	121-19	1943	1945	5	-
Piedras Blancas Field	AAF 23219	35-34	121-07	1943	1944	24	1943-44
Pt San Luis	CG 23268	35-10	120-46	1943	1946	24	-
Santa Maria	CG 23236	34-56	120-76	1930	1933	5	-
Santa Maria	WAS 23236	34-56	120-76	1938	1942	5	-
Santa Maria	WAS 23235	34-54	120-22	1943	1951	24	1948-54
Santa Maria	WAS 23235	34-54	120-22	1951	1964	24	1954-64
Vanderberg	AFB 93214	34-43	120-34	1964	1964	6	1964 -
Vanderberg	AFB 93214	34-43	120-34	1951	1958	5	-
Vanderberg	AFB 93214	34-43	120-34	1958	1974	24	1958-1974
Pt Arguello	CG 23265	34-33	120-37	1975	1969	5	1975 -
Pt Arguello	CG 23265	34-35	120-39	1966	1969	24	1966-69
Pt Arguello	WBO 43215	34-40	120-35	1935	1941	3	-
Pt Conception	CG	34-27	170-28	1943	1945	24	1943-1945
Pt Conception	CG	34-27	170-28	1975	1975	5	-
Pt Conception	CG	34-27	170-28	1959	1965	24	1959-1965
Santa Barbara	AF 23190	34-26	119-50	1972	1973	5	-
Santa Barbara	"	"	"	1929	1941	5	-
Santa Barbara	"	"	"	1949	1941	5	-
Santa Barbara	AF 23190	34-26	119-51	1943	1946	24	1948-1964
Santa Barbara	CG	34-24	119-41	1976	1976	24	-
Santa Barbara	CG	34-24	119-41	1976	1976	4	-

South Central Region

LOCATION	AGENCY NUMBER	LATITUDE	LONGITUDE	HOURLY RECORD START	HOURLY RECORD STOP	OBS/DAY	DIGITIZED RECORD
Ventura Marina	CG	34-15	119-16	1976		5	-
Channel Islands Harbor	CG	34-10	119-13	1972		3	-
Oxnard	SAWR	34-12	119-12	1943		6	-
	"	"	"	1961	1965	24	-
Port Hueneme	NF 93187	34-09	119-12	1938	1941	5	-
Pt. Mugu	NF 93111	34-07	119-07	1946		24	5-6-



2. **Precipitation gages, San Luis Obispo County, with cross-reference and data output samples. Courtesy Ann Hall, San Luis Obispo County Flood Control and Water Conservation District.**

Sample of Precipitation Report

MONTHLY PRECIPITATION

STATION 203.0 CAMBRIA (STATE DIVISION OF FORESTRY)

SEASON	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	ANL
1976 - 1977	.00	1.80	3.19	.16	1.41	2.55	2.23	.55	1.91	.00	.86	.01	14.67
1977 - 1978	.00	.00	.18	.25	1.08	6.69	9.50	6.15	6.40	3.51	.00	.04	33.80
1978 - 1979	.00	.00	1.18	.00	3.62	1.17	6.10	5.15	4.12	.43	.11	.00	21.88
1979 - 1980	.00	.00	.00	1.08	2.32	3.17	6.07	6.16	1.87	1.14	.47	.01	22.29
1980 - 1981	.27	.00	.00	.00T	.07	.95	2.91	1.76	8.11	.15	.00	.00	14.22
1981 - 1982	.00	.00	.00	1.07	2.17	2.22	4.09	4.51	4.87	4.55	.00	.17	23.65
1982 - 1983	.00	.08	.65	1.38	3.57	2.77	6.95	5.77	9.96	3.92	.18	.00	37.01
1983 - 1984	.00	.30	1.25	2.67	3.73	3.93	.20	.85	.93	.78	.00	.00	14.64
AVERAGE	.03	.27	.80	.82	2.24	2.93	4.75	3.86	4.77	1.81	.20	.02	22.77

NOTE: T = TRACE AMOUNT E = ESTIMATED AMOUNT N = NO DATA RECORDED (NOT INCLUDED IN THE AVERAGE).
 AN ANNUAL AMOUNT OF .00 INDICATES THE DATA FOR THAT YEAR IS INCOMPLETE (NOT INCLUDED IN THE AVERAGE).

Sample 10

RED017-RO05

MONTHLY PRECIPITATION IN ORDER OF MAGNITUDE

STATION 203.0 CAMBRIA (STATE DIVISION OF FORESTRY)

MAGNITUDE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
1	-27	1.80	3.19	2.67	3.73	6.69	9.50	6.16	9.96	4.55	.86	.17
2	.00	.30	1.25	1.38	3.62	3.93	6.95	6.15	8.11	3.92	.47	.04
3	.00	.08	1.18	1.08	3.57	3.17	6.10	5.77	6.40	3.51	.18	.01
4	.00	.00	.65	1.07	2.32	2.77	6.07	5.15	4.87	1.14	.11	.01
5	.00	.00	.18	.25	2.17	2.55	4.09	4.51	4.12	.78	.00	.00
6	.00	.00	.00	.16	1.41	2.22	2.91	1.76	1.91	.43	.00	.00
7	.00	.00	.00	.00	1.08	1.17	2.23	.85	1.87	.15	.00	.00
8	.00	.00	.00	.00T	.07	.95	.20	.55	.93	.00	.00	.00
AVERAGE	.03	.27	.80	.82	2.24	2.93	4.75	3.86	4.77	1.81	.20	.02

NOTE: T = TRACE AMOUNT,

E = ESTIMATED AMOUNT,

N = NO DATA RECORDED (NOT INCLUDED IN THE AVERAGE).

Sam p 6

RED014-0003

ANNUAL PRECIPITATION IN ORDER OF MAGNITUDE

STATION 203.0 CAMBRIA (STATE DIVISION OF FORESTRY)

MAG	SEASON	RAINFALL	MAG	SEASON	RAINFALL	MAG	SEASON	RAINFALL
1	1982 - 1983	37.01						
2	1977 - 1978	33.80						
3	1981 - 1982	23.65						
4	1979 - 1980	22.29						
5	1978 - 1979	21.88						
6	1976 - 1977	14.67						
7	1983 - 1984	14.64						
8	1980 - 1981	14.22						

AVERAGE ANNUAL PRECIPITATION 22.77

NOTE: A BLANK IN THE RAINFALL COLUMN INDICATES THE DATA FOR THAT YEAR IS INCOMPLETE (NOT INCLUDED IN THE AVERAGE).

3. Precipitation gages, Santa Barbara County. Revised 4/26/85;
Courtesy of Phil Holland, Santa Barbara County Flood Control
and Water Conservation District.

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D.	STATION NAME	LATITUDE	LONGITUDE	ELEVATION	DATE EST.	DATE CLD.	OWNERSHIP
# 201 L F L	Los Flores Ranch	34° 47'	120° 20'	650	1/1962	1/1974	S.B.C.F.C.D.
# 202 C O N	Confaglia Ranch	34° 44'	120° 14'	680	12/1961	11/1976	S.B.C.F.C.D.
# 203 L U I	Luis Ranch	34° 43'	120° 22'	920	1/1964	1/1974	S.B.C.F.C.D.
# 204 L A L	Los Alamos Fire Sta.	34° 44'	120° 17'	580	10/1964		S.B.C.F.C.D.
# 205 B U R	Burton Mesa Fire Sta.	34° 41'	120° 26'	240	11/1964		S.B.C.F.C.D.
# 206 G A V	Gaviota State Park	34° 28'	120° 14'	5	10/1964		S.B.C.F.C.D.
# 207 O Z E	Ozena R.S.-Ventura	34° 41'	119° 21'	3580	11/1972		U.S.W.B.
# 208 C A R	Carpinteria Fire Sta.	34° 24'	119° 31'	15	3/1965		S.B.C.F.C.D.
# 209 C R R	Carpinteria Reservoir	34° 25'	119° 30'	240	10/1964		U.S.W.B.
# 210 C L D	Cold Springs Deb. Basin	34° 27'	119° 37'	550	12/1964	10/10/1980	S.B.C.F.C.D.
# 211 R D S	S.B. Co. Rd. Yard	34° 27'	119° 46'	220	9/1966		S.B.C.F.C.D.
# 212 S M P	San Marcos Pass Summit	34° 31'	119° 49'	2200	3/1964		S.B.C.F.C.D.
# 213 S M A	Santa Maria Airport	34° 54'	120° 27'	254	5/1940		U.S.W.B.
# 214 V A N	Vandenberg A.F.B.	34° 44'	120° 35'	368	7/1951		U.S.A.F. (no records 2/53 to 7/57)
# 215 L F C	Lompoc F.C. Yard	34° 39'	120° 27'	96	12/1961	1/1971	S.B.C.F.C.D.
# 216 S U R	Surf Treatment Plant	34° 41'	120° 34'	110	6/1897		U.S.W.B.
# 217 J A L	Jalama Beach	34° 30'	120° 30'	15	3/1968		S.B.C.F.C.D.
# 218 S Y F	Santa Ynez Fire Sta.	34° 37'	120° 05'	600	10/1938		U.S.W.B./S.B.C.F.C.D.
# 219 F I G	Figueroa Mt. F.S.	34° 44'	120° 00'	3200	3/1940		U.S.W.B.
# 220 W P R	Wasioja Phoenix Ranch	34° 59'	119° 54'	2370	7/1960		U.S.W.B.

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D.	STATION NAME	LATITUDE	LONGITUDE	ELEVATION	DATE EST.	DATE CLD.	OWNERSHIP
# 221 C U Y	Cuyama Ranch	34°59'	119°40'	2170	11/1947		S.B.C.F.C.D.
# 222 S M P	San Marcos Pass-Fischer	34°31'	119°49'	2300	1/1968		U.S.W.B.
# 223 S S F	Sisquoc S. Fork Camp	34°46'	119°46'	2500	1/1946	8/1965	U.S.W.B./Corps
# 224 P M I	Pine Mt. Inn-Ventura	34°36'34"	119°21'50"	4200	1/1965		U.S.W.B.
# 225 S B S	S.B. City Sanitation Pl.	34°25'	119°49'	5	7/1867		U.S.W.B.
# 226 D P R	Dos Pueblos Ranch	34°27'	119°57'	160	1/1947		Private
# 227 K G U	KGUD Towers	34°28'13"	119°40'32"	2350	9/1965		S.B.C.F.C.D.
# 228 S T A	Stanwood Dr. Fire Sta.	34°27'	119°41'	700	1/1953		S.B. City
# 229 C A T	Cater Treatment Plant	34°26'	119°44'	250	1/1967		S.B. City Water Dept.
# 230 G I B	Gibraltar Dam	34°31'	119°41'	1550	6/1941		U.S.W.B./S.B.C.F.C.D.
# 231 D O U	Doulton Tunnel Univ.	34°27'	119°30'	1930	8/1965		S.B.C.F.C.D.
# 232 J U N	Juncal Dam	34°29'	119°30'	2075	9/1965		S.B.C.F.C.D.
# 233 B U E	Buellton Fire Sta.	34°37'	120°12'	360	9/1965		S.B.C.F.C.D.
# 234 F C D	S.B. Flood Control Off.	34°24'30"	119°42'50"	100	9/1965		S.B.C.F.C.D.
# 235 S M R	Santa Maria Rd. Yard	34°57'	120°27'	200	10/1965	11/1978	S.B.C.F.C.D.
# 236 N O J	Nojoqui Falls Park	34°32'	120°11'	720	9/1965		S.B.C.F.C.D.
# 237 M A Z	Manzana School	34°50'	120°00'	1200	8/1965		S.B.C.F.C.D.
# 238 S B P	Santa Barbara Potrero	34°46'	119°39'	4960	1/1946		S.B.C.F.C.D.
# 239 P O S	Potrero Seco-Ventura	34°38'18"	119°25'18"	4860	1/1946		Ventura County
# 240 N A W	N. Amer. Weather Cons.	34°26'	119°50'	10	1/1968		N.O.R.W.A.C.

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D.	STATION NAME	LATITUDE	LONGITUDE	ELEVATION	DATE EST.	DATE CLD.	OWNERSHIP
# 241 S T B	Stubhaer Res.	34°26'	119°53'	120	12/1965	1/1970	S.B.C.F.C.D.
# 242 T R O	Trout Club	34°29'	119°48'	1200	3/1966		S.B.C.F.C.D.
# 243 M A D	Matilija Dam-Ventura	34°29'02"	119°18'	1060	8/1902		V.C.F.C.D.
# 244 H O R	Horse Gulch	34°50'	120°01'	1100	12/1966	10/1971	S.B.C.F.C.D.
# 245 G O R	Goodchild Ranch-La Brea	34°52'45"	120°07'00"	880	12/1966	10/1971	S.B.C.F.C.D.
# 246 V E N	Ventucopa R.S.	34°51'	119°29'	2749	9/1938	11/1972	U.S.W.B.
# 247 H U S	Husana R.S.	35°06'	120°23'	715	5/1940		U.S.W.B.
# 248 C A C	Cachuma Dam	34°35'	119°59'	781	10/1951		U.S.W.B.
# 249 M M T	Manzanita Mt.	34°54'	120°05'	3193	2/1944		S.B.C.F.C.D.
# 250 C A P	Cal Poly-S.L.O. Co.	34°31'	120°40'	315	8/1894		U.S.W.B.
# 251 M I S	Miguelito Springs	34°34.7'	120°29.7'	1080	11/1967		S.B.C.F.C.D.
# 252 E D I	Edison Trail	34°27'	119°30'	1650	3/1968		S.B.C.F.C.D.
# 253 M A R	U.C.S.B. Marine Lab	34°24'30"	119°50'30"		1969	1969	U.C.S.B.
# 254 E C L	El Capitan Lodge-S.Y. PK	34°32'	120°01'	3500	1/1968	4/1978	N.O.R.W.A.C.
# 255 G R A	Graham Ranch	34°29'30"	119°41'45"	3300	12/1969		S.B.C.F.C.D.
# 256 S I S	Sisquoc Fire Sta.	34°52'	120°18'	420	1/1970		S.B.C.F.C.D.
# 257 J U L	Rancho San Julian	34°31.8'	120°22.2'	640	10/1970		S.B.C.F.C.D.
# 258 M I D	Miguelito Deb. Basin	34°38'	120°27'45"	105	1/1971		S.B.C.F.C.D.
# 259 M A N	Johns Mansville Plant	34°36'	120°27'	570	2/1971		S.B.C.F.C.D.
# 260 S E L	Selby Ranch Ventura	34°25'29"	119°21'15"	660	7/1964		V.C.F.C.D.

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D.	STATION NAME	LATITUDE	LONGITUDE	ELEVATION	DATE EST.	DATE CLD.	OWNERSHIP
# 261 K E L	Stubchaer res.	34° 27' 30"	119° 48' 27"	125	1/1970		S.B.C.F.C.D.
# 262 T A J	Tajiguas Dump	34° 29' 00"	120° 07' 45"	140	3/1973		S.B.C.F.C.D.
# 263 D Q U	Doulton Tun.-Fischer	34° 27'	119° 30'	1930	10/1971		S.B.C.F.C.D.
# 264 R O M	Romero Saddle	34° 28' 50"	119° 34' 28"	2800	9/1966	11/1973	U.S.F.S.
# 265 L O P	Los Prietos R.S.	34° 33' 38"	119° 47' 27"	1000	12/1971		U.S.F.S.
# 266 C A M	Upper Camuesa Creek	34° 34' 12"	119° 42' 42"	2240	12/1968	12/1975	U.S.F.S.
# 267 I N D	Indian Creek	34° 32' 32"	119° 38' 29"	1520	9/1967	1/1978	U.S.F.S.
# 268 B L C	Bluff Camp	34° 40' 19"	119° 39' 44"	4360	10/1966		U.S.F.S.
# 269 J U C	Juncal	34° 29' 23"	119° 28' 32"	2420	11/1966	11/1973	U.S.F.S.
# 270 P E N	Pendola R.S.	34° 30' 37"	119° 34' 30"	1660	1/1967		U.S.F.S.
# 271 O G R	Ogilvy Ranch	34° 34' 08"	119° 36' 49"	1760	10/1966	9/1971	U.S.F.S.
# 272 C A S	Casmalia	34° 50'	120° 32'	300	2/1968	4/1974	N.O.R.W.A.C.
# 273 L O M	Lompoc	34° 37'	120° 28'	320	2/1968		N.O.R.W.A.C.
# 274 L O O	Los Olivos	34° 39'	120° 07'	780	2/1968	4/1974	N.O.R.W.A.C.
# 275 M D S	Midland School	34° 44'	120° 05'	1230	2/1968		N.O.R.W.A.C.
# 276 B G R	Bar-G.O. Ranch	34° 40'	120° 02'	450	2/1968	4/1974	N.O.R.W.A.C.
# 277 L J R	Lamar Johnston Ranch	34° 53'	119° 42'	2900	2/1968		N.O.R.W.A.C.
# 278 C S G	Cachuma Sad. Guard Sta.	34° 44'	119° 55'	3040	2/1968	4/1974	N.O.R.W.A.C.
# 279 S C C	Santa Cruz Creek	34° 38'	119° 52'	1140	1/1968	4/1974	N.O.R.W.A.C.
# 280 N B R	Nash Boulden Ranch	34° 33'	119° 52'	925	1/1968	4/1974	N.O.R.W.A.C.

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D.	STATION NAME	LATITUDE	LONGITUDE	ELEVATION	DATE EST.	DATE CLD.	OWNERSHIP
# 281 H H S	Happy Hollow Guard Sta.	34°36'	119°45'	3880	2/1968	4/1974	N.O.R.W.A.C.
# 282 G O C	Getty Oil Co.-Gaviota	34°29'	120°12'	175	11/1969	4/1974	N.O.R.W.A.C.
# 283 C O R	Cooper Ranch	34°37'	120°20'	220	11/1970	4/1974	N.O.R.W.A.C.
# 284 G O R	Goodchild Ranch	34°53'	120°08'	860	11/1970	4/1974	N.O.R.W.A.C.
# 285 V A N	Vandenberg A.F.B.	34°39'	120°36'	220	12/1970	4/1974	N.O.R.W.A.C.
# 286 D T R	Diamond T. Ranch	34°47'	120°10'	1000	11/1971	4/1974	N.O.R.W.A.C.
# 287 O T A	Ota Ranch	34°23'	119°28'	400	11/1971	4/1974	N.O.R.W.A.C.
# 288 G U A	Guadalupe	35°00'	120°34'	60	1/1973	4/1974	N.O.R.W.A.C.
# 289 R I R	Rinconada Ranch	35°05'	120°03'	1950	2/1970	4/1974	N.O.R.W.A.C.
# 290 B A R	Barca Ranch	34°46'	120°26'	310	11/1969	4/1974	N.O.R.W.A.C.
# 291 A D R	Adams Ranch	35°01'	120°12'	1000	11/1969	4/1974	N.O.R.W.A.C.
# 292 M P K	McPherson Peak	34°53'	119°49'	5747	11/1970	4/1974	N.O.R.W.A.C.
# 293 R I V	Riviera Park	34°26'22"	119°42'18"	525	12/1973	4/1974	S.B.C.F.C.D.
# 294 L C H	Lompoc Court House	34°38'30"	120°27'20"	100	12/1977		S. B. C. F. C. D.
# 295 C F S	New Cuyama Fire Station	34°56'05"	119°36'37"	2275	11/1978		S. B. C. F. C. D.
# 296 C H U	Chuchupate Ranger Station	34°48'30"	119°00'40"	5260	1941		U. S. W. B.
# 297 M C A	Matilija Canyon Ventura	34°30'14"	119°21'17"	1400	7/1960		V. C. F. C. D.
# 298 W H E	Wheeler Canyon Ventura	34°23'27"	119°08'42"	900	1965		V. C. F. C. D.
# 299 L K C	Lake Casitas Ventura	34°24'55"	119°20'12"	600	1960		V. C. F. C. D.

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D.	STATION NAME	LATITUDE	LONGITUDE	ELEVATION	DATE EST.	DATE CLD.	OWNERSHIP
# 503 O R P	Orcutt Recharge Project	34°55'53"		194'	1984		S.B.C.F.C.D.
# 513 T W I	Twitchell Dam	34°59'01"		740'	1984		S.B.C.F.C.D.
# 515 B L D	Bald Mountain	35°09'37"		1500'	1984		S.B.C.F.C.D.
# 517 S H E	Shell Peak	35°04'40"		2080'	1984		S.B.C.F.C.D.
# 519 B R A	Branch Mountain	35°11'06"		3770'	1984		S.B.C.F.C.D.
# 521 C U Y	Cuyama Fire Station	34°56'05"		2275'	1984		S.B.C.F.C.D.
# 523 A P C	Apache Canyon	34°46'27"		4410'	1984		S.B.C.F.C.D.
# 527 L A L	Los Alamos	34°44'01"		800'	1984		S.B.C.F.C.D.
# 529 S I S	Sisquoc River	34°53'38"		354'	1984		S.B.C.F.C.D.
# 531 L O M	Santa Ynez River	34°38'30"		110'	1984		S.B.C.F.C.D.
# 541 S C I	Santa Cruz Island	33°59'39"		1270'			S.B.C.F.C.D.
# 545 F C D	Flood Control Office	34°25'30"		80'	1985		S.B.C.F.C.D.
# 547 M C R	Mission Creek	34°28'14"		2400'	1985		S.B.C.F.C.D.

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D. STATION NAME LATITUDE LONGITUDE ELEVATION DATE EST. DATE CLD. OWNERSHIP

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# 181							
# 182							
# 183							
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# 196							
# 197							
# 198	O R O	34°52'56"	120°26'55"	280'	11/1978		S.B.C.F.C.D.
# 199	W D R	34°31'23"	119°43'06"	250'	1983		S.B.C.F.C.D.
# 200							

SANTA BARBARA COUNTY RECORDING RAINGAGE STATIONS

STATION NO. & I.D.	STATION NAME	LATITUDE	LONGITUDE	ELEVATION	DATE EST.	DATE CLD.	OWNERSHIP
# 70 W B P	West Big Pine	34°41'26"	119°39'52"	6360'	1982		S.B.C.F.C.D.
# 71 G I B	Gibraltar	34°41'26"	119°40'54"	1550'	1982		S.B.C.F.C.D.
# 72 C A C	Cachuma Dam	34°34'47"	119°58'39"	840'	1981		S.B.C.F.C.D.
# 73 F I G	Figueroa Mountain	34°45'05"	120°00'26"	3200'	1981		S.B.C.F.C.D.
# 74 B U E	Ruellton Maintenance Yard	34°37'18"	120°11'32"	530'	1981		S.B.C.F.C.D.
# 75 C A S	Casmalia	34°49'10"	120°31'53"	760'	1983		S.B.C.F.C.D.
# 76 B A T	Bates Bridge	34°55'25"	119°55'00"	5120'	1983		S.B.C.F.C.D.
# 77 M N T	Manzanita Mountain	34°53'38"	120°04'54"	3193'	1983		S.B.C.F.C.D.
# 78 S H P	San Marcos Pass	34°30'36"	119°49'14"	2300'	1984		S.B.C.F.C.D.
# 79 J U N	Juncal Dam	34°29'31"	119°30'25"	2200'	1984		S.B.C.F.C.D.
# 80 S B P	Santa Barbara Portrero	34°46'14"	119°39'07"	5300'	1982		S.B.C.F.C.D.

NON-RECORDING RAINGAGE STATION NUMERICAL INDEX

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 301 G A V	Gaviota Beach State Park Ph: Dial "0", ask for Gaviota Toll Station #5 Address: Gaviota Area, Rt. 1, Box 238 Goleta 93017.	34°28'	120°14'	40	9/1963	
# 302 N J Q	Nojoqui Falls Park	34°32'	120°11'	720	1963	8/1965
# 303 R E F	Refugio Beach County Park Ph: Bill Wratten, 968-1411 Address: Gaviota Area, Rt. 1, Box 238, Goleta 93017.	34°28'	120°04'	10	10/1963	2/1981
# 304 E C B	El Capitan State Beach Ph: Bill Wratten, 968-1411 Address: Gaviota area, Rt. 1, Box 238 Goleta 93017.	34°28'	120°01'	30	4/1965	2/1981
# 305 D M R	Demery Residence 1895 View Drive, Santa Ynez, CA 93463	34°38'21"	120°01'46"	825'	9/1984	
# 306 T V P	T.V. Peak U.S.W.B. #7909	34°32'	119°57'	4000	9/1954	1/1974
# 307 D O S	Dos Pueblos Ranch Ph: 968-1116, 968-1642, 968-7546	34°29'	119°57'	600	11/1926	1952
# 308 D O P	Dos Pueblos Ranch at R.R. - Rt. 1, Box 238 Goleta 93017. Ph: 968-1116, 968-1642, 968-7546	34°26'	119°58'	70	1945	
# 309 G A N	Glen Annie Canyon O. Hove, Rt. 1, Box 293, Goleta, CA 93017. Ph: 968-2872	34°29'	119°53'	410	1963	
# 310 G L C	Sta Barbara Lemon Association Sta Barbara Lemon Assoc., La Patera Lne., Goleta Ph: Mr. Shamel, 967-2355, POB 577, Goleta 93017	34°26'	119°50'	35	9/1936	
# 311 S B A	Santa Barbara Airport U.S.W.B. #7905	34°26'	119°50'	9	9/1941	

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Revised 4/26/1985

STATION NO. & I.D. NON-RECORDING RAINGAGE STATION NUMERICAL INDEX
 STATION NAME & ADDRESS LAT. LONG. ELEV. EST'D CL'D

# 313							
# 314 L P R	Los Pictos Ranger Station U.S.W.B. #5147 Ph: 967-3481. Mailing: Star Rt., S.B. 93105.	34°32'	119°48'	1029	9/1942		
# 315 A T A	4569 Atascadero, Goleta Contact Mary Pinoli of S.B.F.C. for information	34°27'	119°48'	120	9/1967		
# 316 G O B	Goleta State Beach Floyd Campbell, 5986 Sandspit Rd., Goleta 93017 Ph: 967-1300	34°25'	119°50'	10	10/1963	5/78	
# 317							
# 318 C W T	Cater Water Treatment - 1150 San Roque Rd. SB 93105. Ph: City Water Dept., 687-5561	34°27'	119°43'	500	11/1966		
# 319 G I D	Gibraltar Dam U.S.W.B. #3402 Ph: S.B. Water Dept., Clare Steward, 682-4451	34°31'30"	119°41'	1550	9/1919		
# 320 S O P	Santa Barbara Water Department South Portal, Mission Tunnel	34°28'	119°43'		1928		1964
# 321 B O T	Santa Barbara Botanic Garden 1212 Mission Canyon Road, Santa Barbara 93105. Ph: D.E. Emery, 682-4726	34°28'	119°43'	710	9/1944		
# 322 H I L	1750 Hillcrest Road Norman Caldwell, 1750 Hillcrest Road, Santa Barbara Ph: 962-0357	34°27'	119°41'	750	12/1951		
# 323							
# 324							

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 325 M W G	Montecito Water Company 583 San Ysidro Dr., Santa Barbara 93108. Ph: Montecito Water District, 969-2271	34°26'	119°38'	250	1924	
# 326 P I C	Pine Canyon Ph: Bob Blecker, U.S.F.S., 683-6711 U.S.W.B. #6890	35°02'	120°12'	835	3/1938	
# 327						
# 328 S W D	Summerland Water District 2450 Lilley Avenue, Summerland, CA P. O. Box 346	34°25'	119°34'	75	10/1983	
# 329						
# 330 P E F	Pendola Fire Station U.S.W.B. #6791 Ph: Los Prietos R.S., 967-3481	34°31'	119°34'	1622	1/1939	
# 331 J C L	Juncal U.S.W.B. #4422 Ph: Doris Barrow, Montecito Water District, 969-1318	34°29'	119°31'	2060	2/1925	
# 332 C A D	Cachuma Dam U.S.W.B. #1253 Ph: Don Boyd, U.S.B.R., 688-4612	34°35'	119°59'	781	10/1951	
# 333 C A P	Carpinteria Post Office	34°24'	119°31'	40	1939	1975
# 334 G W D	Goleta Valley Water District 4699 Hollister Ave., Goleta 93017 Ph: Williams, 967-2357	34°26'	119°48'	50	9/1954	
# 335 S B H	Santa Barbara State Highway Maintenance Office 3999 State St., Santa Barbara 93105. Ph: 967-5656	34°26'	119°45'	160	9/1954	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 336 T M S	T.M. Storke Ranch Ph: Ragnel Sundsten (former manager), Solvang, 688-6890	34°33'	119°55'	880	9/1943	6/1974
# 337 L A U	Mr. Raquel Sunsten, 1711 Laurel Ave. Solvang, CA 93463. Ph: 688-6890	35°36'	120°08'	530	1974	
# 338 L C W	La Cumbre Mutual Water Company 695 Via Tranquilla, Goleta 93110 Ph: Mr. Dean or Mr. Olson, 967-2376	34°26'	119°46'	240	9/1933	
# 339 S B W	Santa Barbara - U.S.W.B. U.S.W.B. #7902	34°25'	119°41'	5	1867	
# 340 D O S	Doulton Tunnel South Portal Ph: Montecito Water District, 969-2271	34°27'	119°33'	1950	9/1925	
# 341 E N G	County Engineering Building 123 E. Anapamu St., Santa Barbara Ph: 966-1611, Ext. 264 or 265	34°25'	119°42'	100	1962	
# 342 P H I	Philips Residence 847 La Milpita Road, Santa Barbara 93105 Ph: R.M. Phillips, 687-1464	34°27'04"	119°45'23"	300	2/1965	
# 343						
# 344						
# 345						
# 346 V H U	4660 Via Huerto Mr. & Mrs. Dan Grant, 4660 Via Huerto, Goleta 93017. Ph: 967-3619	34°25'	119°47'	200	9/1955	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 347						
# 348 R R R	Rice Ranch Road Orcutt	34°52'	120°26'	440	8/1963	1969
# 349 A L M	Almar Ranch Ph: Manfred Sanders, 937-2772	34°51'	120°22'	900	1963	
# 350 S Y N	Santa Ynez Fire Station Ph: S.B.C. Fire Dept., 688-6481	34°36'46"	120°05'05"	600	1950	
# 351 L A F	Los Alamos Fire Station U.S.W.B. #5107 Ph: Dial "0", ask for 2251	34°44'	120°17'	580	1909	
# 352 P U R	Puritan Ice Company Barbara Chapman, Puritan Ice, 151 Obispo St., Guadalupe, CA 93434. Ph: 1-343-1514	34°57'30"	120°34'	80	1920	
# 353						
# 354 S U E	Suey Ranch U.S.W.B. #8627	35°00'	120°23'	390	1909	6/1977
# 355 N I P	Nipomo U.S.W.B. #6207	35°04'	120°30'	360	1920	6/1977
# 356 T W I	Twitchell Dam U.S.W.B. #9111 Ph: Wilbur Knott, 925-8989	34°59'	120°19'	582	1961	
# 357 S A M	Santa Maria Airport U.S.W.B. #7946 Ph: Clayton Call, 925-0246	34°54'	120°27'	254	1940	



STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 358 S L O	San Luis Obispo Poly U.S.W.B. #7851	35°18'	120°40'	315	1869	
# 359 A R G	Point Arguello U.S.W.B. #7016	34°35'	120°39'	76	1941	
# 360 C U A	Old Cuyama U.S.W.B. #2236	34°56'	119°37'	2255	1937	12/1973
# 361 S R F	Surf U.S.W.B. #8697	34°41.6'	120°35'	50	1943	
# 362						
# 363 L Z S	La Zaca - San Antonio Divide U.S.W.B. #4858	34°42'	120°11'	970	12/1941	2/1958
# 364 S A S	San Antonio - Santa Maria U.S.W.B. #7713	34°49'	120°21'	1000	12/1941	
# 365 S Y L	Santa Ynez Lookout U.S.W.B. #7982	34°32'	119°59'	4290	12/1942	11/1953
# 366 T U C	Tuckers Grove Park 805 San Antonio Creek Road, Santa Barbara 93111 Ph: Bob Ruiz, 967-1112	34°27'	119°47'	160	1/1965	
# 367						
# 368 S E R	3175 Serena 3175 Serena Ave., Montecito, CA	34°25'	119°34'	50	3/1965	10/1973
# 369 S N M	San Marcos Ranch U.S.W.B. #7861 (to 1960) Mr. and Mrs. Laurence Broster, San Marcos Ranch, Box C, Santa Barbara. Ph: 964-4944 95105	34°33'	119°52'	800	10/1951	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 370						
# 371						
# 372 T U O	7209 Tuolumne Carl Chappell, 7209 Tuolumne Dr., Goleta	34°26'	119°53'	80	10/1963	3/1969
# 373						
# 374 A S H	815 Ashley Rd. 815 Ashley Rd., Santa Barbara 93108 Ph: Richard J. Latham, 969-3885	34°27'	119°37'	500	1959	
# 375 J O H	Johns Manville Plant Eldon J. Lomnes, Mining Geologist, Johns-Manville Sales Corp., 2500 Miguelito Rd., Lompoc 93436. Ph: (805) 736-1221	34°36'	120°27'	500	1922	
# 376 G A C	Glen Annie Canyon David Giorgi, 955 Glen Annie Rd., Goleta 93017 Ph: 968-2967	34°27'	119°52'	120	3/1965	
# 377						
# 378 B I R	Bishop Ranch Andrew G. Brydon, Corona Del Mar Ranch, Goleta 93017 Ph: 968-2616	34°27'	119°52'	100	1/1941	
# 379 B A C	Bartlett Canyon Corona Del Mar Ranch, Attn. Mr. Brydon Ph: 968-2616	34°28'	119°52'	160	7/1976	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 380 S M C	Santa Maria City U.S.W.B. #7940 (to 1941) John Zusan, Assistant Civil Engineer, 110 E. Cook St., Santa Maria 93454. Ph: 925-0951 ext. 284.	34°57'	120°26'	224	1885	
# 381 L O W	Lompoc Water Treatment Plant 601 East North Avenue, Lompoc, CA. 93436	34°39'13"	120°26'54"	95	07/1950	
# 382 L O F	Lompoc Flood Control Shop 1016 E. Lemon, Lompoc - Stan Hollister	34°39'30"	120°28'	100	11/1965	1971
# 383 C P R	5805 Casitas Pass Road Bill Catlin, 5805 Casitas Pass Rd., Carpinteria 93013 Ph: 684-3156	34°25'18"	119°29'59"	95	1948	
# 384 B H M	Buellton State Highway Maintenance Yard Ph: Foreman, 688-6649. Obtain data: Caltrans, 3999 State St., S.B.	34°37'	120°12'	360	1937	
# 385 L H M	Lompoc State Highway Maintenance Yard Near Airport P. O. Box 252, Lompoc, CA 93436	34°39'47"	120°28'26"	100	1937	
# 386 P I N	Pine Crest Station Robert L. Lawson, 1501 Mission Canyon Rd., S.B. 93105	34°27'49"	119°42'27"	970	1897	08/1979
# 387 B E T	Union Sugar Company Marilyn M. Stanley, Union Sugar, 2820 W. Betteravia Rd., Santa Maria 93454. Ph: 925-8633.	34°55'	120°31'	160	1897	
# 388 W H I	White House Residence K.M. WhiteHouse, 1422 San Miguel Ave., S.B. 93109 Ph: 965-3114	34°24'	119°43'	200	9/1965	
# 389 R S J	Rancho San Julian Mr. Russel Ph: 756-5911 or 736-5097.	34°32'	120°20'	600	1879	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 390 S M P	Summit, San Marcos Pass	34°31'	119°49'	2200	1898	2/1943
# 391 A L I	Alisal Ranch Ph: Mr. Monson, 688-6411 Alisal Guest Ranch, P.O. Box 26, Solvang 93463.	34°34'	120°08'	470	9/1965	
# 392						
# 393 S O L	Solvang Water District Ph: Solvang Municipal Improvement District, 688-5575 Solvang Improvement District, POB 107, Solvang 93463.	35°35'45"	120°08'20"	496	1964	
# 394						
# 395 T R C	San Marcos Trout Club Ph: 964-4194.	34°29'	119°48'	1200	1945	
# 396 P A I	Painted Cave Road R.H. Eldridge, 2620 Painted Cave Rd., S.B. Ph: 964-2375	34°30'	119°47'	2400	11/1966	
# 397 N E W	New Horizons 250 Moreton Bay Lane, Goleta	34°27'	119°50'	40	9/1966	1974
# 398 S A L	Salsipuedes Gaging Station U.S.W.B. #7661	34°35'	120°24'	250	1941	
# 399 O Z A	Ozena U.S.W.B. #6576 (to 1975) Bill Minger or John Singer, Ventura County Center, 800 S. Victoria, Ventura 93009. Ph: (805) 654-2015.	34° 41'30"	119°19'	3705	9/1904	
# 400 S M H	Santa Maria State Highway Maintenance Yard 125 E. Boone St., Santa Maria 93454 Ph: 922-1987	34°57'	120°26'	220	1954	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	FLYV.	EST'D	CL'D
# 401 L A P	La Patera Rancho Garrett Van Horne, 6400 Cathedral Oaks Rd, Goleta Ph: 967-6248	34°27'	119°51'	80	1941	
# 402 C U N	New Cuyama Highway Maintenance Ph: 766-2215	34°57'	119°41'	2140	1954	
# 403 B U C	Buckhorn CalTrans	35°01'	120°12'	850	11/1954	2/1963
# 404 P A T	Pattaway U.S.W.B. #6754	34°56'	119°23'	3868	1915	
# 405 B S C	Burpee Seed Company Floradale Rd., Lompoc P.O. Box 546, Lompoc 93438. Ph: 736-4110.	34°39'05"	120°29'32"	70	1913	
# 406 U O R	Union Oil Company, Orcutt Harvey Elder, Union Oil, 201 S. Broadway, Orcutt 93454 Ph: 937-6376	34°52'	120°27'	340	1946	
# 407 U G U	Union Oil Company, Guadalupe Ph: Don Hoover, 343-1176. For area office, see #406.	34°59'	120°38'	40	1957	
# 408 U C A	Union Oil Company, Cat Canyon Ph: Jimmy Forester, 733-4442. Area office: see #406.	34°48'	120°16'	1400	1950	
# 409 U O H	Union Oil Company, Orcutt Hill Ph: Bob Huguenard, 937-2576. Area office: see #406.	34°51'	120°27'	720	1959	
# 410 U B A	Union Oil Company, Battles Plant Ph: Paul Blake, 935-4262. Area Office; see #406.	34°56'	120°24'	255	1952	
# 411 U L O	Union Oil Company, Lompoc Ph: Jimmy Forester, 733-4442. Area office; see #406.	34°44'	120°25'	1200	1966	
# 412						

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 413 G O O	Goodchild Ranch Bob Goodchild, POB 1278, Santa Maria, CA 93454.	34°53'	120°07.6'	900	9/1966	
# 414						
# 415 S I R	Sisquoc Ranch Rancho Sisquoc, Santa Maria Office, Rt. 1, Box 147, Santa Maria. Ph: Harold Pfeiffer, 927-3616.	34°51'	120°13'	600	1904	
# 416 T E P	Tepusquet Canyon Road Mrs. V. E. Smith, Route 1, Box 130 Santa Maria, CA 93454	34°54'56"	120°13'26"	840	1945	
# 417 S J R	San Julian Road Frank Beggs	34°35'	120°25'	160	11/1915	1967
# 418 F G L	Figueroa Mountain Lookout U.S.W.B. #3045 U.S.F.S. District Office, 6144 Calle Real, Goleta Ph: Bob Blecker, 683-6711	34°45'	119°59'	4480	10/1946	1976
# 419 F G M	Figueroa Mountain Near Midland School U.S.B.R.	34°44'	120°05'	1198	1957	9/1976
# 420 J A R	Jalama Ranch	34°31'	120°27'30"	440	1940	12/1971
# 421 F G G	Figueroa Mountain Guard Station U.S.W.B. #3048 U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711 Figueroa Guard Station: 688-3017.	34°44'	120°00'	3200	3/1942	
# 422 S Y R	Santa Ynez Road Yard County Road Yard, Airport Road, Santa Ynez. Ph: Agnelli, 688-6619.	34°36'	120°04'	654	1967	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 423						
# 424 S J D	Salsipuedes Jalama Divide U.S.W.B. #7684	34°32'	120°23'	1150	1941	12/1951
# 425 S M S	San Marcos Summit R.S. Tenney, San Marcos Pass Rd., Santa Barbara. 93105 Ph: 967-4957	34°30'	119°49'	2000	1941	
# 426 B A L	Ballard Divelbiss	34°38'	120°07'	640	1967	1970
# 427 O R C	Orcutt 335-A W. Clark, Orcutt. Ph: Darrel Larsen, 937-6703.	34°52'	120°27'	300	11/1967	
# 428 R F L	Refugio Pass - Lower Gage Ph: Refugio Pass Fire Suppression Station, 688-6793.	34°30''	120°04'	400	1957	1976
# 429 R F U	Refugio Pass-- Upper Gage Ph: Refugio Pass Fire Suppression Station, 688-6793.	34°32'	120°04'	2254	1957	3/1975
# 430 M I G	Miguelito Canyon/Frick Springs Ph: Lompoc City Water Dept., 736-1261 (Al Thompson, Supt. ext 271; Jim Lewis ext. 249). 119 W. Walnut 93438.	34°34'43"	120°29'42"	1080	1945	
# 431 S C I	Santa Cruz Island				1904	
# 432 S T O	Stow Grove Mr./Mrs. Harley C. Hastings, 580 La Patera Ln, Goleta 93017. Ph: 964-2311.	34°27'	119°51'	100	12/1968	
# 433 G M R	Graham Ranch Joseph M. Graham, 821 W. Arrellaga St., Sta Barb. 93101 Ph: 962-6756	34°29'30"	119°41'45"	3300	1947	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 434						
# 435						
# 436 C U S	New Cuyama Station #41 U.S.W.B. #6154 County Fire Station #41, POB 261, New Cuyama 93254 Ph: S.B.C. Fire Dept., 766-2489.	34°57'	119°41'	2160	12/1973	
# 437 C A L	Casitas Lake D.D.Taylor, Ventura County Center 800 S. Victoria, Ventura 93009. Ph: (805) 654-2015	34°24'55"	119°20'12"	592	1960	
# 438 P T C	Point Conception U.S.A.F.				1945	8/1972
# 439 L O S	Lompoc Flood Control Shop, Airport Ph: Stan Hollister, 736-8215	34°40'02"	120°28'02"	100	1971	
# 440						
# 441						
# 442 M U R	Murietta Divide D.D.Taylor, Ventura County Center 800 S. Victoria, Ventura 93009. Ph: (805) 654-2015	34°29'24"	119°25'56"	3370	1959	
# 443 O G I	Ogilvy Ranch U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711 Los Priostos Ranger Satation: 967-3481	34°34'08"	119°36'49"	1760	1971	12/1977

STATION NO.
& I.D.

STATION NAME & ADDRESS

	LAT.	LONG.	ELEV.	EST'D	CL'D
# 444 M O N	34°32'20"	119°28'	5450	11/1971	1978
# 445 C A U	34°35'20"	119°43'	2240	1971	1974
# 446 L P I	34°36'	119°44'	4260	11/1971	3/1976
# 447 L I P	34°39'	119°42'30"	4660	11/1971	12/1977
# 448 L O M	34°38'37"	119°37'	4453	1971	12/1977
# 449 O R T	34°34'27"	119°21'37"	5100	1957	
# 450 W B P	34°42'	119°40'	6280	12/1942	
# 451 D O N	34°39'20"	119°31'	3500	1971	12/1977
# 452 R O S	34°28'50"	119°34'28"	2800	1971	12/1977
# 453 M O O	34°28'	119°28'30"	3740	12/1972	12/1977

Monte Arido
U.S.F.S., 3144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481.

Upper Camuesa
U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481.

Little Pine
U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481

Little Pine 4NE
U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481

Loma Pelona Peak
U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481

Ortega Hill
D.D.Taylor, Ventura County Center
800 S. Victoria, Ventura 93009. Ph: (805) 654-2015

West Big Pine
U.S.W.B. #9532 (to 9/1976) - now S.B.C.F.C.D.

Don Victor
U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481

Romero Saddle
U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481

Noon Peak
U.S.F.S., 6144 Calle Real, Goleta. Ph: 683-6711
Los Prietos Ranger Station: 967-3481

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	HELV.	EST'D	CL'D
# 454 H I P	Hildreth Peak U.S.F.S., 6144 Calle Real, Goleta. Ph. 683-6711 Los Prietos Ranger Station: 967-3481	34° 36' 40"	119° 30'	5023	1971	1978
# 455 A L S	Ajamar Saddle U.S.F.S., 6144 Calle Real, Goleta. Ph. 683-6711 Los Prietos Ranger Station: 967-3481	34° 42'	119° 38'	6000	1971	1978
# 456 B A T	Bates Ridge U.S.W.B. #0543 (until 1976) - now S.B.C.F.C.D.	34° 55'	119° 55'	5300	11/1949	
# 457 T E K	Tepusquet Peak S.B.C.F.C.D.	34° 54' 35"	120° 11'	3253	9/1967	
# 458 L A Z	La Zaca Foxen Divide U.S.W.B. #4855 (closed 1958)	34° 46'	120° 07'	1470	12/1941	2/1958
# 459 M R E	Marre Ranch U.S.W.B. #5356	34° 41'	119° 59'	1450	12/1941	6/1957
# 460 P O T	Potrero Seco D.D. Taylor, Ventura County Center 800 S. Victoria, Ventura 93009. Ph. (805) 654-2015	34° 37' 57"	119° 25' 04"	4750	1974	
# 461 A P A	Apache Canyon D.D. Taylor, Ventura County Center 800 S. Victoria, Ventura 93009. Ph. (805) 654-2015	34° 46' 53"	119° 20' 21"	3950	1972	
# 462 L O C	Lockwood-Ozens D.D. Taylor, Ventura County Center 800 S. Victoria, Ventura 93009. Ph. (805) 654-2015	34° 43' 27"	119° 10' 58"	4800	1960	
# 463 M A T	Matilija Dam D.D. Taylor, Ventura County Center 800 S. Victoria, Ventura 93009. Ph. (805) 654-2015	34° 29' 02"	119° 18' 17"	1060	1948	

STATION NO. & I.D.	STATION NAME & ADDRESS	LAT.	LONG.	ELEV.	EST'D	CL'D
# 464						
# 465 M A C	Matilija Canyon D.D.Taylor, Ventura County Center 800 S.Victoria, Ventura 93009. Ph: (805) 654-2015	34°30'14"	119°21'17"	1400	1961	
# 466 O Z G	Ozena Guard Station D.D.Taylor, Ventura County Center 800 S.Victoria, Ventura 93009. Ph: (805) 654-2015	34°40'57"	119°21'08"	3600	1972	
# 467 P I M	Pine Mountain Inn U.S.W.B. #6910 D.D.Taylor, Ventura County Center 800 S.Victoria, Ventura 93009. Ph: (805) 654-2015	34°36'34"	119°21'52"	4200	1965	
# 468 P M T	Pine Mountain D.D.Taylor, Ventura County Center 800 S.Victoria, Ventura 93009. Ph: (805) 654-2015	34°38'22"	119°19'22"	6740	1957	
# 469 S A V	Santa Ana Valley - Selby Ranch D.D.Taylor, Ventura County Center 800 S.Victoria, Ventura 93009. Ph: (805) 654-2015	34°25'29"	119°21'15"	660	1927	
# 470 H A R	Harris Gaging Station U.S.W.B. #3787	34°46'	120°25'	320	1954	12/1964
# 471 C M L	Camuesa Lookout U.S.W.B. #1473	34°33'	119°41'	3200	12/1942	2/1950
# 472 S C C	Santa Cruz Creek U.S.W.B. #7919	34°35'	119°56'	675	11/1941	7/1953

SANTA BARBARA COUNTY NON-RECORDING RAINGAGE STATIONS

STATION NO. & I.D. STATION NAME LATITUDE LONGITUDE ELEVATION DATE EST. DATE CLD. OWNERSHIP

473 C A D Camalia Dump
Clifford Ivey
Camalia Resources
P. O. Box E
Camalia, CA 93429
(805) 937-7544 34°51'34" 120°32'36" 458' 4/1980

474 D D R Doerner Residence
114 La Marina Drive
Santa Barbara, CA 93109
(805) 965-8276 34°23'59" 119°43'22" 75' 9/1981

475 R H S Stern Residence
394 Arroyo Road
Goleta, CA 93110 34°26' 119°46'45" 53.8' 11/1982

476 R P M Rancho Punta Del Monte
3150 Foothill Road
Carpinteria, CA 93013 34°25'35" 119°33'48" 240' 2/1983

477 C A R Carrari Vineyard
Joe Carrari
P. O. Box 556
(439 Waite St.)
Los Alamos, CA 93440
(805) 344-4000 34°44'19" 120°14'41" 680' 2/1985

478 A C R Alisos Canyon Ranch
Mrs. Louise Munoz
P.O. Box 6
Los Alamos, CA 93440 34°44'58" 120°12'09" 760' 2/1985

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4. **Precipitation gages, Ventura County, with cross reference and location map. Courtesy of Dolores Taylor, Ventura County Flood Control and Water Resources District.**

TABLE II-1 PRECIPITATION STATIONS
ALPHABETICAL INDEX

VENTURA COUNTY

STATION NAME	STATION NUMBER	EQUIP TYPE	LATITUDE	LONGITUDE	CAL-ZNS		ELEV	RECORD BEGAN	OBSERVER
					T.	R. S.			
ALAMO MOUNTAIN	211	ST	34 39'43"	118 58'16"	7N	20W 35	6650	1961	VCPCD
APACHE CANYON	240	ST	34 46'52"	119 20'20"	8N	23W 17	3950	1974	VCPCD
BARSDALE-YOUNG RANCH	96	S	34 21'50"	118 56'42"	3N	20W 11	400	1932	A. W. MOULTON
CAMARILLO-ADONE	194	R	34 12'18"	119 0'43"	1N	20W 6	130	1956	VCPCD
CAMARILLO-DAVIS RANCH	177	S	34 9'25"	119 4'41"	1N	21W 22	20	1957	J. G. MCCUNE
CAMARILLO-HAUSER	219	S	34 14'13"	119 1'34"	2N	21W 24	192	1965	DON HAUSER
CAMARILLO-SPRINGVILLE RANCH	3	S	34 12'18"	119 4' 5"	1N	21W 3	73	1903	RALPH LEONARDO
CANADA LARGA	85	RS	34 22'52"	119 13'41"	4N	22W 31	760	1935	VCPCD
CASITAS DAM	4	S	34 22' 8"	119 19'48"	3N	23W 6	400	1928	CMWD PERSONNEL
CERRO MOROESTE	241	ST	34 53'20"	119 21'54"	9N	23W 5	4350	1974	VCPCD
CHANNEL ISLANDS HARBOR	215	S	34 9'36"	119 13'19"	1N	22W 19	5	1964	HARBOR PERSONNEL
CHIEF PEAK	179	ST	34 31' 5"	119 10'48"	5N	22W 16	5000	1958	VCPCD
COOPER CANYON (USBR)	255	RS	34 26'49"	119 19'19"	4N	23W 7	1120	1980	VCPCD
COV SPRINGS	178	ST	34 33'29"	118 54'11"	5N	19W 6	3550	1958	VCPCD
CUDDY VALLEY-CUDDY RANCH	244	S	34 50'24"	119 3'32"	9N	20W 30	5500	1975	CLEAVE F. CUDDY
EL RIO-COUNTY YARD	231	S	34 14'28"	119 10'37"	2N	22W 22	79	1967	VCPCD
EL RIO-UWCD SPREADING GROUNDS	239	S	34 14'28"	119 9' 4"	2N	22W 23	105	1973	UWCD PERSONNEL
FILLMORE-COUNTY FIRE STATION	199	S	34 24'14"	118 55'34"	4N	20W 25	435	1960	STATION PERSONNEL
FILLMORE-DOUBLE HN RANCH	94	S	34 23'53"	118 50'49"	4N	19W 26	600	1932	FRED CARPENTER
FILLMORE-FISH HATCHERY	171	RS	34 23'38"	118 53' 2"	4N	19W 28	465	1957	VCPCD
FILLMORE-RANCHO SESPE	39	S	34 23' 2"	118 57'47"	4N	20W 34	360	1907	RANCH PERSONNEL
FILLMORE-SESPE WESTATES	224	RS	34 28'44"	118 52'52"	5N	19W 29	2840	1967	RICKY J. BENSON
HUNGRY VALLEY-MAXEY RANCH	251	ST	34 45'32"	118 54'54"	8N	19W 20	4650	1973	VCPCD
LAKE BARD	227	RS	34 14'31"	118 49'41"	2N	19W 24	1010	1967	JOHN T. RENSTROM
LAKE CASITAS-UPPER	204	RS	34 24'54"	119 20'13"	4N	23W 19	600	1960	CMWD PERSONNEL
LAKE SHERWOOD-COUNTY FIRE STATION	121	R	34 8'28"	118 52'30"	1N	19W 28	960	1935	STATION PERSONNEL
LAS LLAJAS CANYON	234	R	34 18' 4"	118 41'24"	3N	17W 32	1150	1969	VCPCD
LOCKWOOD VALLEY-COUNTY YARD	209	RS	34 44' 2"	119 6' 0"	8N	21W 33	5150	1961	BOB HUNTER
LOCKWOOD/OZENA-WAGON ROAD CAMP	202	ST	34 43'26"	119 10'59"	7N	22W 11	4800	1960	VCPCD
MATILJA CANYON	207	R	34 30'14"	119 21'18"	5N	24W 23	1400	1961	VCPCD
MATILJA DAM	134	S	34 29' 2"	119 18'18"	5N	23W 29	1060	1949	ROBERT MONNIER
MEINERS OAKS-COUNTY FIRE STATION	218	S	34 26'38"	119 17' 2"	4N	23W 10	730	1965	STATION PERSONNEL
MOORPARK-COUNTY FIRE STATION	141	S	34 17'13"	118 52'52"	2N	19W 4	525	1949	STATION PERSONNEL
MOORPARK-EVERETT	192	RS	34 15'22"	118 50'53"	2N	19W 14	635	1956	HONOR EVERETT
MOORPARK-HAPPY CAMP CANYON	250	R	34 20'46"	118 50'56"	3N	19W 15	1410	1978	VCPCD
MOORPARK-HERRIKEN	191	RS	34 19'34"	118 53'42"	3N	19W 20	1060	1956	GEORGE HERRIKEN
MOUNT PINOS	200	ST	34 48'40"	119 8'20"	8N	21W 6	8750	1960	VCPCD
MURIETTA DIVIDE	203	ST	34 29'24"	119 25'55"	5N	24W 30	3370	1960	VCPCD
MUTAU FLAT	181	ST	34 38'13"	119 2'46"	6N	20W 6	4850	1958	VCPCD
NEWBURY PARK-JENNY DRIVE	188	R	34 11' 6"	118 56'53"	1N	20W 11	665	1956	VCPCD
NEWBURY PARK-RANCHO SIERRA VISTA	182	S	34 9'11"	118 57'40"	1N	20W 22	810	1966	WALTER WATSON
OAK VIEW-COUNTY FIRE STATION	140	S	34 23'42"	119 18' 0"	4N	23W 28	520	1950	STATION PERSONNEL

TYPE: S - STANDARD NON-RECORDING GAGE

R - AUTOMATIC RECORDING GAGE

ST - STORAGE GAGE

PRECIPITATION STATIONS
ALPHABETICAL INDEX

STATION NAME	STATION NUMBER	EQUIP TYPE	LATITUDE	LONGITUDE	CAL-ZMS T. R. S.	ELEV	RECORD BEGAN	OBSERVER
OJAI-BARRETT RANCH	153	S	34 26'28"	119 13'19"	4N 22W 7	780	1952	CHARLES BARRETT
OJAI-COUNTY FIRE STATION	30	S	34 26'49"	119 14'35"	4N 23W 12	740	1906	STATION PERSONNEL
OJAI-STEWART CANYON	165	RS	34 27'40"	119 14'49"	4N 23W 1	960	1957	VCPCD
OJAI-THACHER SCHOOL	59	S	34 27'54"	119 10'48"	5N 22W 33	1440	1916	SCHOOL PERSONNEL
ORTEGA HILL	180	ST	34 36'26"	119 21'36"	6N 23W 31	5100	1958	VCPCD
OXNARD-AIRPORT	168	RS	34 12' 4"	119 12'29"	1N 22W 5	34	1957	VCPCD
OXNARD-VANCE	257	S	34 10'19"	119 11'31"	1N 22W 09	27	1980	MORT VANCE
OXNARD-WATER DEPARTMENT	32	S	34 12' 4"	119 10'41"	1N 22W 3	53	1875	CITY PERSONNEL
PIEDRA BLANCA GUARD STATION	152	RS	34 33'40"	119 9'58"	6N 22W 36	3065	1952	VCPCD
PINE MOUNTAIN	176	ST	34 38'20"	119 19'19"	6N 23W 4	6740	1958	VCPCD
PIRU CANYON	172	RS	34 30'47"	118 45'25"	5N 18W 15	1120	1957	UWCD PERSONNEL
PIRU-CAMULOS RANCH	101	RS	34 24'22"	118 45'22"	4N 18W 27	725	1929	RANCH PERSONNEL
PIRU-COUNTY FIRE STATION	36	S	34 24'47"	118 47'42"	4N 18W 20	700	1926	STATION PERSONNEL
PIRU-NEWMALL RANCH	25	S	34 24' 4"	118 43'23"	4N 18W 25	825	1913	RICHARD A. LYPPTS
PIRU-TEMESCAL GUARD STATION	160	S	34 28'23"	118 45'22"	5N 18W 34	1080	1953	UWCD PERSONNEL
POINT HUGU-USN	223	S	34 7' 8"	119 6'25"	1S 21W 5	0	1946	U. S. NAVY
PORT HUENEME-USN	17	S	34 8'46"	119 12'18"	1N 22W 29	10	1891	CRUCK BULLOCK
POTRERO SECO	252	ST	34 37'55"	119 25' 5"	6N 24W 4	4750	1975	VCPCD
RANCHO MATILIJA-WEST	20	S	34 25'44"	119 18'47"	4N 23W 17	580	1926	RANCH PERSONNEL
SAN GUILLERMO	237	ST	34 39'25"	119 10' 5"	7N 22W 36	5125	1972	VCPCD
SANTA ANA VALLEY-SELBY RANCH	44	RS	34 25'30"	119 21'14"	4N 24W 13	660	1928	JACK SELBY
SANTA MONICA MOUNTAINS-DEALS FLAT	232	R	34 5'17"	118 58' 5"	1S 20W 15	1475	1969	VCPCD
SANTA PAULA CANYON-FERNDAL RANCH	173	RS	34 25'37"	119 5'10"	4N 21W 16	1010	1957	VCPCD
SANTA PAULA-AGRICULTURE OFFICE	19	S	34 21'14"	119 3'47"	3N 21W 10	282	1931	MR. LESLIE HAVORTH
SANTA PAULA-COUNTY FIRE STATION	210	S	34 20'49"	119 4'48"	3N 21W 16	263	1961	STATION PERSONNEL
SANTA PAULA-DAWES	243	S	34 20'35"	119 6'29"	3N 21W 17	325	1974	DONALD DAWES
SANTA PAULA-LIMONEIRA RANCH	18	S	34 19'55"	119 7'30"	3N 21W 19	295	1905	RANCH PERSONNEL
SANTA PAULA-UWCD	245	RS	34 20'42"	119 4'37"	3N 21W 15	250	1961	UWCD PERSONNEL
SANTA ROSA VALLEY-WORTHINGTON RANCH	49	S	34 14'53"	118 56'24"	2N 20W 24	445	1929	WILLIAM WORTHINGTON
SANTA SUSANA-AIRPORT	193	RS	34 16' 5"	118 42'32"	2N 17W 12	965	1956	VCPCD
SATICOY-COUNTY FIRE STATION	175	R	34 17'10"	119 9'18"	2N 22W 11	185	1957	STATION PERSONNEL
SEA CLIFF	221	RS	34 20'46"	119 25' 5"	3N 24W 17	20	1967	CWOD PERSONNEL
SIMI HILLS-BURRO FLAT	248	RS	34 14'42"	118 42'32"	2N 18W 25	1750	1977	JOE GLANTZ
SIMI-COUNTY FIRE STATION	154	S	34 17'38"	118 42'29"	3N 18W 36	1075	1948	STATION PERSONNEL
SOMIS-BARD	190	R	34 16'59"	119 0'25"	2N 20W 5	460	1956	VCPCD
SOMIS-DEBONI	189	R	34 17' 6"	119 4'19"	2N 21W 03	520	1956	JOHN DEBONI
SOMIS-FULLER	206	RS	34 18'40"	118 58'44"	3N 20W 28	730	1961	VCPCD
SOUTH MOUNTAIN-SHELL OIL	238	R	34 19'52"	119 0'29"	3N 20W 19	1630	1971	VCPCD
STATION CANYON (USBR)	254	RS	34 24'32"	119 22'12"	4N 24W 23	630	1980	VCPCD
SULPHUR MOUNTAIN-MEHER MOUNT	163	S	34 24'43"	119 10' 8"	4N 22W 22	2570	1957	AGNES BARON
SUSANA KNOLLS-COUNTY FIRE STATION	187	S	34 15'43"	118 40' 8"	2N 17W 16	1085	1956	STATION PERSONNEL
TAPO CANYON	196	R	34 19'34"	118 43' 5"	3N 18W 24	1390	1956	VCPCD

TYPE: S - STANDARD NON-RECORDING GAGE R - AUTOMATIC RECORDING GAGE ST - STORAGE GAGE

PRECIPITATION STATIONS
ALPHABETICAL INDEX

STATION NAME	STATION NUMBER	EQUIP TYPE	LATITUDE	LONGITUDE	CAL-ZNS		ELEV	RECORD BEGAN	OBSERVER
					T.	R. S.			
THOUSAND OAKS-COUNTY FIRE STATION	128	S	34 13' 5"	118 51' 58"	2N	19W 34	800	1943	STATION PERSONNEL
THOUSAND OAKS-WEATHER STATION	169	RS	34 10' 44"	118 51' 0"	1N	19W 10	805	1957	VCPCD
TOFA TOFA	197	ST	34 34' 5"	119 2' 24"	6N	20W 33	2500	1959	VCPCD
TRIPAS CANYON	242	R	34 22' 5"	118 45' 47"	3N	18W 4	2500	1972	VCPCD
UPPER OJAI SUMMIT-COUNTY FIRE STA.	65	S	34 26' 10"	119 8' 2"	4N	22W 12	1560	1925	STATION PERSONNEL
UPPER OJAI-MAPPY VALLEY	64	RS	34 26' 17"	119 11' 20"	4N	22W 09	1320	1901	VCPCD
VENTURA-COUNTY CENTER	222	S	34 16' 5"	119 12' 32"	3N	22W 8	280	1926	VCPCD
VENTURA-COUNTY SCHOOLS	66	S	34 16' 52"	119 17' 28"	2N	23W 4	60	1874	CARNIS WILLIAMS
VENTURA-DEL MAR RANCH	6	S	34 16' 41"	119 12' 11"	2N	22W 5	315	1925	JOSEPH DUNCNESS
VENTURA-HALL CANYON	167	RS	34 16' 48"	119 15' 29"	2N	23W 02	180	1957	VCPCD
VENTURA-KINGSTON RESERVOIR	122	S	34 20' 35"	119 17' 42"	3N	23W 16	215	1935	CITY PERSONNEL
VENTURA-OLD ADOBE	216	S	34 14' 35"	119 14' 31"	2N	23W 24	37	1965	CITY PERSONNEL
VENTURA-SEXTON CANYON	230	R	34 18' 54"	119 13' 37"	3N	22W 30	880	1973	DAN CROTTY
WHEELER CANYON	225	R	34 23' 28"	119 8' 42"	4N	22W 26	900	1967	CURRY V. MCCARTY

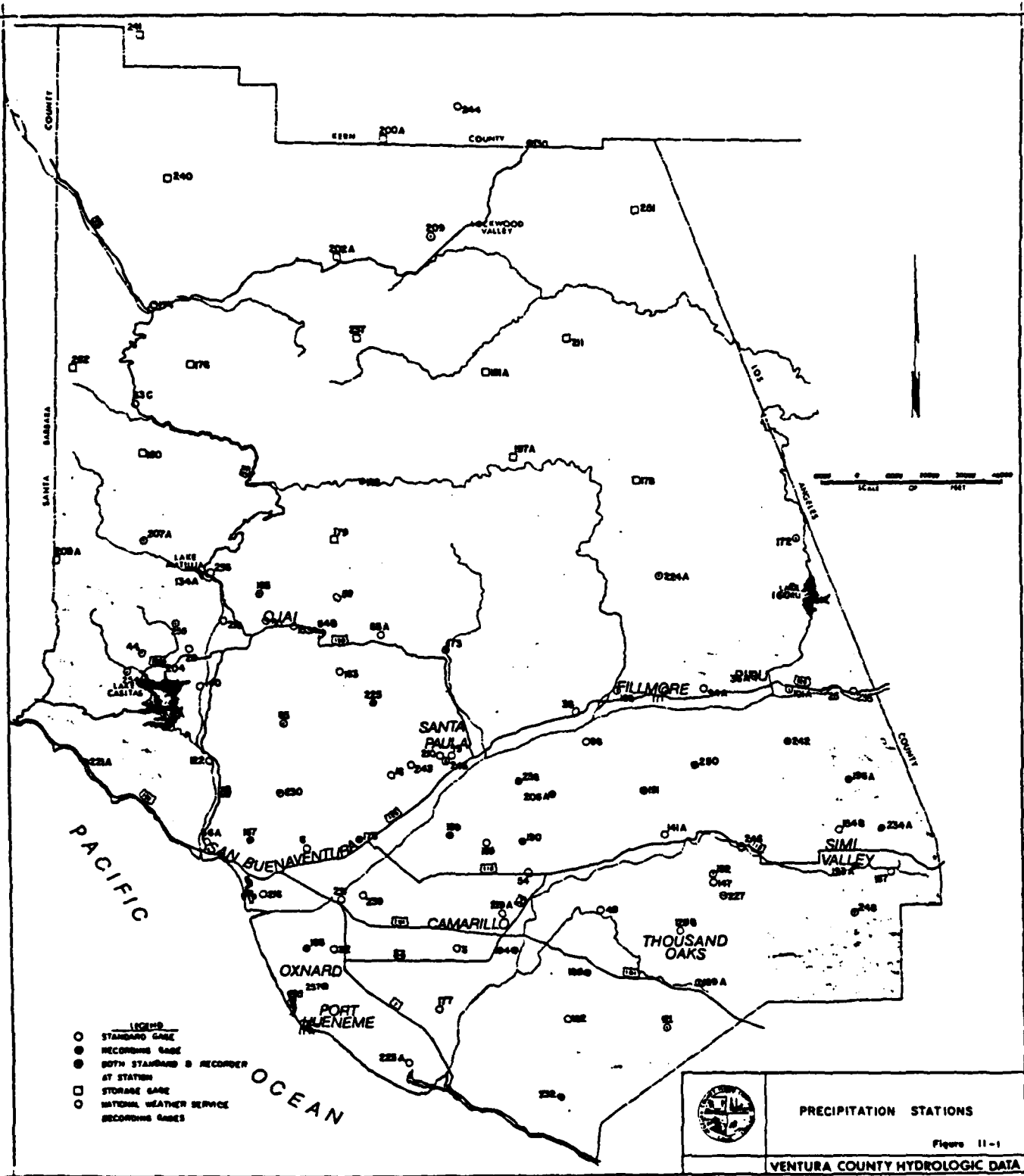
TYPE: S - STANDARD NON-RECORDING GAGE

R - AUTOMATIC RECORDING GAGE

ST - STORAGE GAGE

ACTIVE PRECIPITATION STATIONS
NUMERICAL INDEX

STATION NUMBER	STATION NAME	STATION NUMBER	STATION NAME
3	Camarillo-Springville Ranch	210	Santa Paula-County Fire Station
4A	Casitas Dam	211	Alamo Mountain
6	Ventura-Del Mar Ranch	215	Channel Islands Harbor
17A	Port Hueneme-USN	216	Ventura-Old Adobe
18	Santa Paula - Limoneira Ranch	218	Meiners Oaks-County Fire Station
19	Santa Paula-Agriculture Office	219	Camarillo-Hauser
20	Rancho Matilija-West	221A	Sea Cliff
25	Piru-Newhall Ranch	222	Ventura-County Center
30	Ojai-County Fire Station	223A	Point Mugu-USN
32	Oxnard-Water Department	224	Fillmore-Sespe Westates
36A	Piru-County Fire Station	225	Wheeler Canyon
39	Fillmore-Rancho Sespe	227	Lake Bard
44	Santa Ana Valley-Seiby Ranch	230	Ventura-Sexton Canyon
49	Santa Rosa Valley-Northington Ranch	231	El Rio-County Yard
59	Ojai-Thacher School	232	Santa Monica Mountains - Deals Flat
64B	Upper Ojai-Happy Valley	234A	Las Lajas Canyon
65A	Upper Ojai Summit-County Fire Station	237	San Guillermo
66A	Ventura-County Schools	238	South Mountain-Shell Oil
85	Canada Larga	239	El Rio-UWCD Spreading Grounds
94A	Fillmore-Double HN Ranch	240	Apache Canyon
96	Bardsdale-Young Ranch	241	Cerro Noroeste
101A	Piru-Camulos Ranch	242	Tripas Canyon
121	Lake Sherwood-County Fire Station	243	Santa Paula-Dawes
122	Ventura-Kingston Reservoir	244	Cuddy Valley-Cuddy Ranch
128B	Park Oaks-County Fire Station	245	Santa Paula-United Water Conservation District
134A	Matilija Dam		
140	Oak View-County Fire Station	248	Simi Hills-Burro Flats
141A	Moorpark-County Fire Station	250	Moorpark-Happy Camp Canyon
152	Piedra Blanca Guard Station	251	Hungry Valley-Maxey Ranch
153A	Ojai-Barrett Ranch	252	Potrero Seco
154B	Simi-County Fire Station	254	Station Canyon (USBR)
160	Piru-Temescal Guard Station	255	Cooper Canyon (USBR)
163	Sulphur Mountain-Meher Mount		
165	Ojai-Stewart Canyon		
167	Ventura-Hall Canyon		
168	Oxnard-Airport		
169A	Thousand Oaks-Weather Station		
171	Fillmore-Fish Hatchery		
172	Piru Canyon		
173	Santa Paula Canyon-Ferndale Ranch		
180	Ortega Hill		
181A	Mutau Flat		
182	Newbury Park-Rancho Sierra Vista		
185	Somis-Honda Ranch		
187	Susana Knolls-County Fire Station		
188	Newbury Park-Jenny Drive		
189	Somis-DeBoni		
190	Somis-Bard		
191	Moorpark-Merriken		
192	Moorpark-Everett		
193A	Santa Susana-Airport		
194	Camarillo-Adohr		
196A	Tapo Canyon		
197A	Topa Topa		
199	Fillmore-County Fire Station		
200A	Mount Pinos		
202A	Lockwood/Ozema-Wagon Road Camp		
203A	Murietta Divide		
204	Lake Casitas-Upper		
206A	Somis-Fuller		
207A	Matilija Canyon		
209	Lockwood Valley-County Yard		



5. Precipitation gages, South Central Region. From the California
Department of Water Resources, Bulletin 230-81

APPENDIX D
CALIFORNIA WIND STATION INDEX

TABLE 1. WIND SUMMARIES AVAILABLE FOR CALIFORNIA
from Goodridge (1978)

STATION NAME	LAT	LONG	EL M	INST HGT	NO. OF OBS	START MO YR	END MO YR	SU 1/	TP 1/	MEAN MPS
ALAMEDA NAS	37 47	122 19	9	7	238965	01 45	12 72	2	1	3.83
* ALAMITOS BEACH	19 33 45	118 08	3		37240	12 52	06 60	14	9	2.71
ALHAMBRA	37 34 05	118 09	13	9	87152	09 52	07 69	14	9	1.56
ALHAMBRA	119 34 06	118 08	8	11	36861	06 70	12 74	14	9	1.78
ALTADENA	52 34 11	118 08	9	9	53276	02 53	01 63	14	9	1.60
ANAHEIM APCD	71 33 49	118 25	224	14	128954	01 58	12 73	14	9	1.56
APPLE VALLEY SAWR	34 32	117 13	339		27986	12 60	11 65	2	1	
ARCATA CAA	40 59	124 06	69		7837	12 49	11 58	2	1	2.61
ARTESIA	82 33 52	118 05	15	8	28673	12 56	05 60	14	9	1.65
AUBURN AIRPORT	38 57	121 04	460		39625	01 34	12 38	2	1	
AZUSA	97 34 08	117 56	183	9	127521	04 60	12 74	14	9	1.78
BAKERSFIELD	35 25	119 03	151	6	23155	01 64	12 73	2	1	2.61
BAKERSFIELD MEADOW	35 25	119 03	151	18	43848	01 56	12 60	2	1	2.58
BAKERSFIELD MINTER	35 30	119 11	130		37875	10 41	01 46	2	1	2.67
BALDWIN PARK	47 34 05	117 58	115	15	57295	04 54	03 62	14	9	1.47
BEALE AFB	39 07	121 26	38		111333	08 43	12 70	2	1	2.58
BEAUMONT	33 56	116 56	790		29202	07 38	02 42	2	1	4.05
BELL	35 33 59	118 11	46	11	152439	09 52	12 56	14	9	2.63
BERKELEY LRL R4	37 52	122 15	290	12	40705	03 62	02 68	4	1	
BISHOP WRAS	37 22	118 22	1263	6	109147	01 48	12 72	2	1	3.83
BLUE CANYON WRAS	39 17	120 42	1610	9	92883	01 48	12 64	2	1	4.32
BLYTHE RCAP	33 37	114 43	119		43800	09 69	08 74	2	1	3.25
BROOKINGS ORE	42 03	124 18	46		673	01 37	03 42	8	6	
BUENA PARK	95 33 53	118 01	23	11	126272	03 59	12 74	14	9	2.00
BURBANK	34 12	118 22	221		43773	01 60	12 64	2	1	2.54
CAMBRIA	35 34	121 07	30		12159	06 43	10 44	2	1	3.29
* CAMP PENDLETON MC	33 18	117 21	19	26	23684	07 66	06 72	2	1	2.63
CANOGA PARK	67 34 12	118 36	244	8	159672	12 55	12 74	14	9	1.29
CASTLE AFB	37 22	120 34	54		260322	01 42	12 72	2	1	3.03
CENTRAL STONY	35 58	121 16	402		56842	64	70	5	1	
CHICO AAF	39 48	121 51	77		31535	05 42	12 45	2	1	3.74
CHINA LAKE	35 41	117 40	682	5	207031	01 45	12 72	2	1	3.65
* CHULA VISTA-BROWN	32 35	116 58	160		12852	04 45	05 55	2	1	
CLOVERDALE PEAK	38 53	123 00			12678	11 72	10 74	1	1	3.38
COALINGA	36 08	120 21	196		2532	01 32	12 32	2	1	
COMPTON	24 33 54	118 13	30	12	79341	12 54	04 66	14	9	1.87
COMPTON AP	112 34 04	118 15	30	9	74902	04 66	12 74	14	9	2.54
CONCORD	37 59	122 03	165			01 51	07 53	6	5	
CRESCENT CITY FAA	41 47	124 14	17		45662	10 49	12 54	2	1	4.14
CROWS LANDING NAS	37 25	121 06	40		1227	01 44	02 45	2	1	3.56
DAGGETT FAA	34 52	116 47	588		87556	01 55	12 64	2	1	5.03
DAVENPORT	37 00	122 11	30		7458	01 71	12 71	1	1	3.78
DESERT CENTER	33 45	115 20	165		6469	06 43	03 44	2	1	3.34
* DIABLO CANYON	35 13	120 49		10	17228	05 73	04 75	1	1	4.72
* DIABLO CANYON	35 13	120 49		76	17199	05 73	04 75	1	1	4.67
* DOMINGUEZ WATER80	33 50	118 14	9	9	97940	12 56	12 71	14	9	2.54
DONNER SUMMIT	39 19	120 20	2193	9	43763	01 34	12 38	2	1	

1/ See explanation at end of table.

TABLE 1. WIND SUMMARIES AVAILABLE FOR CALIFORNIA
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO. OF OBS	START MO YR	END MO YR	SU 1/	TP 1/	MEAN MPS
DOWNEY	22 33 57	118 10	37	9	160585	05 53	12 74	14	9	1.91
EDWARDS AFB	34 55	117 54	706	4	86311	01 62	12 72	2	1	3.69
EL CENTRO NAAS	32 49	115 40	-13		121517	02 45	10 60	2	1	3.92
EL MONTE	49 34 05	118 02	85	9	69678	11 53	10 65	14	9	2.09
EL TORO MCAS	33 40	117 44	117	3	236944	01 45	12 72	2	1	2.45
ENCINO	86 34 10	118 30	235	12	131556	12 57	12 72	14	9	1.91
ESTRO	35 26	120 32	9		12722	01 31	12 36	2	1	2.05
EUREKA HIJB PP	40 44	124 12	4		17351	01 66	12 67	1	1	4.27
EUREKA USWB	40 48	124 10	13	27	14510	07 30	12 36	2	1	3.16
FAIRVIEW HOSP	126 33 42	117 55	3	8	16656	02 72	12 73	14	9	1.29
FONTANA	66 34 05	117 30	332	24	139747	01 53	03 73	14	9	5.70
FORT BRAGG CASPER	39 28	123 45	230	6	17271	01 43	05 45	2	1	3.38
FORT ORD/FRITZSCHE	36 41	121 46	44	5	86943	04 60	12 70	2	1	2.89
FRESNO AIR TERM	36 46	119 43	100	6	181408	12 41	12 68	2	1	2.80
FRESNO CHANDLER	36 44	119 49	85				76	9	7	
GEORGE AFB	34 35	117 23	868	4	232810	01 42	12 72	2	1	3.78
GLENDALE AAF	34 09	118 18	141		22379	06 43	12 45	2	1	2.23
HAMILTON AFB	38 04	122 31	4	10	278159	39	70	2	1	2.45
HAWTHORNE	120 33 54	118 06	23	9	32544	10 71	12 74	14	9	1.78
HIGH POINT	35 57	121 14	566		54461	64	70	5	1	
HOLLYWOOD	27 34 06	118 20	76	12	159529	01 55	12 72	14	9	1.82
HOLLISTER NAS	36 53	121 24	61		1828	07 42	02 45	8	6	
HOLTSVILLE NAS	32 50	115 16	18		1703	08 43	02 45	2	1	1.87
* HYPERION	84 33 53	118 27	3	12	29749	01 57	06 60	14	9	3.43
* IMPERIAL BEACH NAS	32 34	117 07	7	5	167334	01 45	12 70	2	1	2.98
INDIO-COACHELLA	33 41	116 10	-19		27948	01 37	08 40	2	1	
JENNER AAB	38 27	123 08	72		13567	06 43	05 45	2	1	4.67
JOLON	36 00	121 14	317	3	60306	07 64	70	5	1	
KLAMATH FALLS KING	42 09	121 44	1247	4	154817	01 48	05 70	2	1	2.45
LA CANADA FS	108 34 12	118 11	366	11	74990	05 65	12 73	14	9	1.47
LA HABRA	99 34 10	117 57	91	8	119089	08 60	12 74	14	9	1.51
LA VERN AP	94 34 05	117 47	305	11	137147	11 58	05 75	14	9	2.71
* LAGUNA BEACH WBO	33 32	117 47	61		43741	01 34	12 38	2	1	
LAKEVIEW ORE	42 11	120 21	811		12419	01 59	05 62	2	1	
LANCASTER	90 34 35	118 08	811	27	55943	10 57	05 64	14	9	3.69
LANCASTER	129 34 44	118 13	715	11	22307	05 74	12 76	14	9	5.65
LAS VEGAS NEV	36 05	115 10	573		32928	34	38	2	1	4.01
LEMOORE NAS	36 20	119 57	73	3	95872	07 61	06 70	2	1	2.40
LIVERMORE LLL	37 41	121 46	149			04 71	03 72	3	1	4.20
LIVERMORE 10 SSE	37 38	121 30	171		7061	01 71	12 71	3	1	8.00
LIVERMORE USWB	37 42	121 48	134		43692	01 34	12 38	8	6	
LIVERMORE 300 WOP	37 40	121 33	525	9	HRLY	10 72	09 73	3	3	6.32
* LONG BEACH NS	33 49	118 09	13	6	163549	01 49	12 72	2	1	2.49
* LOS ALAMITOS NAS	33 48	118 03	8	4	171926	01 49	12 69	2	1	2.45
LOS ANGELES WB	39 34 03	118 14	82	58	127007	08 50	06 64	14	9	2.67
* LOS ANGELES WBAS	33 56	118 23	37	6	153295	01 47	06 65	2	1	2.98
LOS ANGELES CAP75	34 03	118 14		26	174169	08 56	12 76	14	9	5.3

1/ See explanation at end of table.

TABLE 1. WIND SUMMARIES AVAILABLE FOR CALIFORNIA
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO. OF OBS	START MO YR	END MO YR	SU 1/	TP 1/
LOS ANGELES CC	10334 05	118 18	152	14	96105	04 63	12 74	14	9 2
LOS ANGELES	118 33 55	118 18	15	9	30240	04 71	12 74	14	9 1
LOS ANGELES NORM	2634 03	118 18	30	12	95824	01 55	03 67	14	9 2
LOS ANGELES PICO	2534 03	118 22	30	12	142099	01 55	12 71	14	9 2
LOS ANGELES SP	68 34 06	118 14	60	A	16884	03 56	08 61	14	9 1
LOS ANGELES UCLA	2834 04	118 27	131	15	26387	04 54	05 59	14	9 1
LOS BANOS	37 04	120 53		11	8496	04 74	03 75	1	1 4
LYNWOOD	130 33 55	118 12	35	11	9240	12 74	12 74	14	9 2
* MALIBU FS	104 34 02	118 42	3	9	93360	12 63	12 74	14	9 2
MCCLELLFN AFB	38 40	121 24	26	4	283884	39	12 72	2	1 3
MEDFORD ORE	42 22	122 52	404		2920		74	2	1 2
MILPITAS	36 04	121 19	366	3		65	70	5	1 1
* MIRAMAR NAS	32 52	117 08	144	7	212054	07 47	06 72	2	1 2
MISSION HILLS	113			9	70114	12 66	12 74	14	9 2
MODESTO CAA	37 38	120 58	29		15321	01 40	09 41	2	1 1
MOJAVE NAS	35 07	118 09	842		32291	04 45	09 58	2	1 1
MONTAGUE FAA	41 46	122 28	803	4	152521	10 53	12 65	2	1 2
MONTEREY NAF	36 36	121 52	51	2	154998	01 45	12 69	2	1 2
MONTEZUMA	38 05	121 49	3	10	7417	05 70	04 71	1	1 5
MONTROSE	56 34 12	118 14	366	9	44823	03 53	03 62	14	9 2
MOSS LANDING	36 48	121 46			33589	03 69	02 72	1	1 4
MT SHASTA CAA	41 17	122 18	988		37577	01 34	12 38	2	1 1
MT VACA	38 24	122 06			15103	11 72	10 74	1	1 6
NAPA	38 13	122 17	17		19547	66	68	6	5 5
NEEDLES	34 46	114 37	280		43794	69	74	2	1 3
NELLIS AFB	36 15	115 02	573	4	230638	03 42	12 72	2	1 2
NEWHALL	115 34 22	118 33	387	9	54443	09 69	12 75	14	9 1
* NEWPORT BEACH	63 33 36	117 54	3	8	147531	08 54	12 74	14	9 2
NORTON AFB	34 06	117 15	335		259005	01 43	12 72	2	1 1
NORTHRIDGE CSU	83 34 14	118 32	261	A	83768	01 57	09 66	14	9 1
NO HOLLYWOOD	43 34 10	118 25	274	9	82539	06 55	03 65	14	9 1
NORWALK	32 33 55	118 04	30		23781	07 52	02 59	14	9 1
OAKLAND AP	37 44	122 12	5	15	87672	01 51	12 60	2	1 3
* OCEANSIDE CAA	33 13	117 21	8		43761	01 34	12 38	2	1 1
ONTARIO	34 03	117 36	280		23378	49	55	2	1 4
OROVILLE RS	39 32	121 34	91			07 68	07 72	2	5 5
* OXNARD AFB	34 13	119 04	25		143280	04 44	12 67	2	1 2
PALMDALE AP	34 38	118 05	768	9	109166	11 48	73	2	1 4
PALM SPRINGS AAF	33 54	116 33	128		24286	05 43	02 46	2	1 3
* PALO VERDES	1 33 45	118 10	457		12941	09 54	12 57	14	9 3
PASADENA FDEC	3110		240	12	92230	06 59	03 70	14	9 1
PASO ROBLES AP	35 40	120 38	246		141450	48	64	2	1 2
PESCADERO	37 12	122 22	141		11513	06 43	09 44	2	1 4
PITTSBURG DOW	38 01	121 51	3	A		67	76	8	1 3
PITTSBURG POWER PL	38 04	121 54	6	10	23568	12 70	11 73	1	1 4
POINT ARFNA CG	38 55	123 43	79		8251	01 37	02 42	2	1 6
POINT ARENA	38 56	123 42	73	5		08 70	07 72	1	1 6

1/ See explanation at end of table.

TABLE 1. WIND SUMMARIES AVAILABLE FOR CALIFORNIA
(Continued)

MEAN MPS	STATION NAME	LAT	LONG	EL M	INST HGT	NO. OF OBS	START MO YR	END MO YR	SU 1/	TP 1/	MEAN MPS
.36	* POINT ARGUELLO	34 35	120 38	113		35036	59	63	2	1	
.91	* POINT FERMIN	33 43	118 17	11		9392	09 38	09 42	2	1	2.94
.58	* POINT HUENEME	34 09	119 12	5		7120	08 38	12 41	2	1	3.29
.05	POINT MONTARA	37 32	122 31	20		10829	02 38	11 41	2	1	3.56
.91	* POINT MIJGU	34 07	119 07	4	4	109069	64	72	2	1	2.89
.56	* POINT PIEDRAS BLAN	35 40	121 17	21	5	6525	06 38	02 42	2	1	4.76
.90	POINT REYES	38 00	123 00	79		12466	02 38	02 42	2	1	3.52
.00	PAMONA APCO	109 34 04	117 45	259	11	83455	06 65	12 74	14	9	1.42
.23	POTERRO HILL	38 12	121 58	126		34938	01 35	12 38	2	1	
.25	PUENTE	48 34 01	117 59	96	11	38763	02 55	03 60	14	9	1.38
	RANCHO SECO	38 34	121 07	52	10	25893	01 74	12 76	15	1	3.23
	REDDING WBAS	40 34	122 24	220		79033	07 29	12 38	2	1	
.27	* REDONDO KING H	12 33 50	118 24	3	11	74436	04 66	12 74	14	9	2.80
.23	RENO AP	39 30	119 47	1342		43848	01 56	10 59	2	1	2.63
	RENO STFAD AFB	39 40	119 52	1541	4	140000	12 57	03 66	2	1	3.03
	RESEDA	107 34 12	118 32	226	11	84084	05 65	12 74	14	9	1.34
.71	RICE AFB	34 04	114 50	269		3477	06 43	03 44	2	1	3.69
.49	RIVERA	81 33 58	118 06	46	9	154626	01 57	12 74	14	9	1.91
.12	RIVERSIDE/MARCH	33 54	117 15	466		286219	01 33	12 67	2	1	2.31
.27	SACRAMENTO EX AP	38 21	121 30	5	6	87672	01 56	12 60	2	1	4.14
.01	SACRAMENTO/MATHER	38 34	121 18	29	4	227840	04 56	12 67	2	1	3.07
	SALINAS AAB	36 40	121 72	22		28775	08 41	12 44	2	1	3.60
.54	SAM JONES	35 53	121 08	445	3	52755	65	70	5	1	
	SAN CLEMENTE IS	32 57	118 32	276	5	78600	63	72	2	1	3.25
.78	* SANDBERG	34 45	118 44	1377	9	59682	01 32	12 38	2	1	6.81
.98	* SAN DIEGO NAS	32 42	117 12	7	9	238011	01 45	12 72	2	1	2.71
.65	* SAN DIEGO LINDBERG	32 44	117 10	6	6	87672	01 51	12 60	2	1	2.80
.31	SAN DIMAS	59 34 12	117 48	290	9	18651	03 53	03 59	14	9	.98
.78	SAN FERNANDO	45 34 17	118 27	359	8	34777	09 55	02 60	14	9	2.09
.69	SAN FRANCISCO AP	37 37	122 23	27	6	150260	48	12 65	2	1	4.85
.74	SAN JOSE	37 22	121 55	17		87648	01 37	12 47	2	1	
.96	SAN LUIS OBISPO	35 15	120 40	61		17786	05 51	04 56	2	1	
.34	SAN MIGUEL ISLAND	34 03	120 21	168		3440	02 40	06 42	2	1	7.21
	SAN NICOLAS ISLAND	33 15	119 28	153	4	112227	01 45	12 72	2	1	5.07
.05	SAN PABLO	37 59	122 21	79		18487	07 29	02 39	8	6	3.25
	SANTA ANA OCAP	65 33 40	117 53	47	9	68841	02 55	01 72	14	9	2.00
.27	SANTA ANA MCAF	33 42	117 50	19	3	130408	60	12 72	2	1	2.36
.49	* SANTA BARRARA CAA	34 26	119 50	4		43795	60	64	2	1	3.92
.92	SANTA CATALINA AV	33 22	118 29	135		6308	06 43	02 44	2	1	2.89
.07	SANTA CATALINA BS	33 24	119 21	498		7522	07 39	02 42	2	1	
.38	* SANTA MARIA	34 57	120 25	70	12	17544	01 48	12 58	2	1	3.12
.08	SANTA ROSA AAS	38 25	122 45	32		23718	04 43	12 45	2	1	2.58
.94	SANTA ROSA ISLAND	33 55	120 07	455		6261	06 43	02 44	2	1	7.48
.12	SAUGUS CAA	34 24	118 33	368		43747	01 34	12 38	2	1	
.49	SAUGUS SCE	91 34 24	118 32	355	14	112820	03 58	08 71	14	9	2.31
.27	SILVER LAKE	35 20	116 06	276		8732	08 40	07 41	2	1	

1/ See explanation at end of table.

TABLE 1. WIND SUMMARIES AVAILABLE FOR CALIFORNIA
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO. OF OBS	START MO YR	END MO YR	SU 1/	TP 1/
SISKIYOU SUMMIT OR	42 05	122 34	1371		43774	34	38	8	6
SLIDE MTN, NEVADA	38 18	119 53	2941	2	12137	01 68	12 70	16	1
SOUTHEAST FARALLON	37 42	123 00	12		16646	06 35	06 42	8	6
STOCKTON	37 54	121 15	8		47320	01 41	12 45	2	1
SUN VALLEY	44 34	118 22	305		34400	08 52	06 60	14	9
SUNNYVALE MOFFETT	37 25	122 03	6	4	238814	01 45	12 72	2	1
SUSANVILLE	40 23	120 33	1265	13	4134	03 37	02 40	8	6
TAFT GARDENER FLD	35 07	119 18	133		28266	12 41	02 45	2	1
TEHACHAPI	35 08	116 26	1210		18706	11 42	12 44	2	1
TEMPLE CITY	50 34	118 03	122	12	26780	06 56	06 60	14	9
* TERMINAL ISLAND	5 33	118 13	3	15	164901	08 52	12 74	14	9
THE GEYESERS	38 50	122 37	509		13844	11 72	10 74	1	1
THERMAL FAA	33 38	116 10	-35		43823	01 57	12 61	2	1
TORRANCE	9 33	118 18	3		117569	08 52	09 70	14	9
TRAVIS AFB	38 16	121 56	18	4	254948	43 57	12 72	2	1
TWENTY NINE PALMS	34 08	116 02	542		6567	07 42	03 43	2	1
UKIAH	39 07	123 17	427		87495	01 55	12 64	2	1
VALENCIA	121			8	25176	10 71	12 74	14	9
* VANDENBERG AFB	34 43	120 34	116	4	115324	51	12 70	2	1
* VANDENBERG BOAT ST	34 43	120 37	24	16	9313	66	67	2	1
VAN NUYS ANGB	34 13	118 30	242		237378	10 61	08 62	2	1
VAN NUYS LAVC	105 34	118 26	216	9	28665	03 64	08 67	14	9
* VENICE	14 33	118 29	3	14	150177	08 54	12 73	14	9
VISALIA	36 20	118 17	108		8783	01 32	12 32	2	1
WALNUT LACRD	106 34	117 51	163	9	77901	01 65	12 73	14	9
WASCO	35 44	119 32	70	9		03 74	02 75	28	1
WASCO	35 44	119 32	70	46		03 74	02 75	28	1
W LOS ANGELES	102 34	118 26	27	11	95838	11 62	12 73	14	9
WILLIAMS	39 06	122 09	39	9	43777	01 34	12 38	2	1
* WILMINGTON	4 33	118 16	3		44392	01 53	02 61	14	9
WILMINGTON REF	6		3		28003	11 51	02 59	14	9
WHITTIER	114 33	118 02	107	9	38705	08 69	12 73	14	9
YUMA AP ARIZONA	32 40	114 36	63	6	160705	49	71	2	1

FOOTNOTES ARE LOCATED AT THE END OF TABLE 2

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
from Goodridge (1978)

MEAN MPS	STATION NAME	LAT	LONG	EL	INST	NO.OF OBS	START	END	SU	TP
				M	HGT		MO YR	MO YR	1/	1/
	AIRLINE	36 35	121 42			10	08 72	08 73	21	08
8.38	ANACAPA ISLAND	34 01	119 22	52			01 46	01 76	9	7
4.54	ANAHEIM 31	33 48	117 51	229	9	1772	09 52	03 58	14	9
3.52	ARROYO DEL VALLE	37 33	121 40	195					13	
2.49	*ARROYO GRANDE	35 16	120 40			10	05 74	10 76	21	08
2.71	ARVIN-EDISON WSD	35 19	118 56			10	08 75	08 77	22	08
	ATWATER	37 21	120 36	48			08 30	09 33	9	7
2.31	AVALON	33 20	118 20	3			01 61	12 68	9	7
3.74	AVON POWER PLANT	37 24	121 56	3					13	
2.40	AZUSA 60	34 08	117 56	190	9	5366	09 55	03 62	14	9
2.07	BAKERSFIELD CC	35 24	118 56			10	08 75	08 77	22	08
5.07	BAKERSFIELD CHESTE	35 21	119 01			10	08 75	08 77	22	08
	BAKERSFIELD ST COL	35 21	119 06			10	08 75	08 77	22	08
1.96	BALDY MESA	34 20	117 20	1113			02 30	01 34	9	7
5.30	BARCROFT LAB	37 35	118 14	3801					27	7
2.85	BEAR VALLEY	34 31	117 13	893		2798	60	65	2	1
3.38	BEAUMOUNT	33 56	116 57	792			05 29	76	9	7
2.31	BENECIA ACPD	38 03	122 09	12	9		02 70	07 76	10	7
3.12	BERKELEY CT	37 52	122 19	2	9		06 74	07 76	11	8
4.05	BERKELEY ST HEA D	37 53	122 18	10					13	
2.00	BLAIRSDEN CT	39 46	120 36	1341	10		09 73	03 74	18	8
1.38	BLUNTS REEF CG	40 26	124 30	8			49	76	9	7
2.89	BODEGA BAY	33 19	123 03	3				76	9	7
	BONITA	32 39	117 11			10	03 73	05 74	26	08
2.18	BROWN FIELD	32 34	116 59	155	10		12 72	11 73	26	08
	BUELLTON	34 36	120 12		10		01 75	10 76	21	08
	BURRANK APCD 100	34 11	118 29	189	9	11029	04 62	12 74	14	9
1.47	BURLINGAME ACPD	37 35	122 21	12	13		03 73	07 76	10	7
	BURNEY	40 53	121 40	953			06 42	76	9	7
2.45	CAMARILLO	34 17	119 03	128	10		02 72	03 73	32	8
1.60	*CABRILLO BEACH	33 43	118 17	8				76	9	7
1.74	CAMARILLO CT 36	34 13	119 01	37	10		05 74	09 77	32	8
3.43	CAJON	34 18	117 28	933			07 43	06 46	9	7
	CAJON HMS	34 19	117 29	951	11		09 73	08 77	23	8
	CAMP KEARNEY	32 52	117 07	146			08 42	04 45	9	7
	CAMPBELL CT	37 15	121 57	82	9		02 72	04 73	11	8
	CAMPO	32 37	116 28	802			01 50	76	9	7
	CAPELL SCH CT	38 23	122 12	250	9		06 73	11 74	11	8
	CARLSBAD	33 08	117 17	100			08 59	76	9	7
	CARMEL	36 36	121 54		10		07 74	11 76	21	08
	CARMEL	32 56	117 14		10		06 73	09 74	26	08
	CARQUINEZ BG	38 04	122 14	100			03 29	05 31	9	7
	CARSON 189 HARBOR	33 51	118 16	6	10		06 73	09 77	32	8
	CASITAS	34 23	119 23		10		04 75	03 76	21	08
	CASPER FIELD	39 28	123 45	229			06 43	05 45	9	7
	CASTROVILLE	36 46	121 45	5					2	7

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TP 1/
CATALINA ISLAND	33 24	118 25	482				76 9	7	
CHATSWORTH CT	34 17	118 17	366	10		04 72	03 75	32 8	
CHECK 42	34 55	118 35	945			05 76		12 7	
CHICO	39 48	121 51	83			07 48	76 9	7	
CHINA GRADE	35 26	118 59		10		08 75	08 77	22 08	
CHINO	33 58	117 38	211				76 9	7	
CHINO CT	33 59	117 39	192	10		06 75	09 77	32 8	
CHP	36 36	121 41		10		08 73	12 74	21 08	
CLAREMONT BASELINE	34 07	117 44	411	10		03 73	09 77	32 8	
COALINGA	36 08	120 22	206			05 28	06 57	9 7	
COLTON	34 04	117 18	294	11		06 75	08 77	23 8	
COMPTON CT 45	33 53	118 11	18	10		04 76	10 76	32 8	
CONCORD ACPD	37 56	122 01	32	18		02 70	07 76	10 7	
CONCORD BUCHANAN	37 59	122 03	7			06 28	76 9	7	
CONCORD PSS	38 03	122 01	12				76 9	7	
CONTRA COSTA PP	38 01	121 47	3					13	
CORNING	39 56	122 10	87			33	36 9	7	
COSTA MESA CT	33 38	117 56	30	10		09 72	04 74	32 8	
CRAZY HORSE	36 48	121 38		10		12 72	10 74	21 08	
CREST VIEW HMS	37 44	118 58	2438	10		04 74	05 75	24 8	
CROCKETT ACPD	38 02	122 07	84	7		02 70	07 76	10 7	
CROOKED CREEK LAB	37 30	118 11	3094					27 7	
CUDDEBACK	35 16	117 26	864			07 63	12 68	9 7	
CULVER CITY CT 21	33 59	118 22	76	10		12 72	03 75	32 8	
CULVERCITY CT 20	34 00	118 25	9	10		12 72	09 77	32 8	
CUPERTINO CT	37 20	122 03	82	9		12 71	04 74	11 8	
DAVIS POINT	38 03	122 16	18				76 9	7	
DELTA	40 57	122 26	366			02 40	09 44	9 7	
DELTA PUMP PLANT	37 57	121 41	8			74		12 7	
DIDO-ESCONDIDO	33 07	117 06		10		06 73	12 74	26 08	
DONNER SUMIT	39 19	120 20	2193			12 29	01 55	9 7	
EAST SAN FRANCISCO	37 44	122 21	8	14		02 70	07 76	10 7	
DEVERS SUBSTATION	33 56	116 33	274						
EL CENTRO NAS	32 50	115 40		10		01 55	10 60	26 08	
EL SERENO CT	34 05	118 10	152	10		07 72	01 75	32 8	
EL MONTE AP 111	34 05	118 02	101	11	4898	10 65	08 71	14 9	
* EL SEGUNDO SCE 85	33 55	118 26	3		2914	01 56	06 60	14 9	
ERRECA	32 42	117 01		10		06 73	03 75	26 08	
ETIWANDA CT	34 08	117 33	104	10		06 75	09 77	32 8	
FAIR OAKS	38 39	121 18	52	10		01 76	01 77	20 08	
FAIRFIELD CT	38 13	122 08	2	10		06 73	01 75	25 8	
FELICITA	33 06	117 05		10		03 73	03 75	26 08	
FILLMORE CT 23	34 24	118 56	119	10		03 73	05 75	32 8	
FONTANA	34 06	117 25	396			05 31	11 45	9 7	
FORT BRAGG	39 27	123 48	23		7612	01 37	11 42	8 6	
FORT JONES	41 32	122 52	833			11 39	12 41	9 7	

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TP 1/
FREMONT ACPD	37 32	121 58	18	H		02 70	07 76	10	7
FREMONT CT	37 34	121 57	9	9		01 72	07 76	11	8
FRESNO	36 46	119 43	101			88	76	9	7
FRESNO DORABELLA/1	37 07	119 19		10		08 74	06 75	22	08
FRESNO HAMMER F	36 47	119 42	102		35416	12 41	12 45	2	1
FRESNO HMS	36 46	119 50		10		08 75	10 76	22	08
FRESNO TRR DIST	36 46	119 46		10		08 75	03 77	22	08
FRESNO SAAW AVE	36 49	119 50		10		10 75	10 76	22	08
FRESNO ST UN	36 49	119 45		10		08 75	02 77	22	08
FRESNO 41/99	36 43	119 47		10		08 75	02 77	22	08
FRESNO 168/720	37 04	119 20		10		06 74	06 75	22	08
FRESNO 168/830	37 05	119 18		10		06 74	06 75	22	08
FRESNO 180/	36 44	119 42		10		08 75	10 76	22	08
FULLERTON	33 52	117 58	30			06 61	76	9	7
GILLESPIE FIELD	32 50	116 58	113	10		05 72	04 73	26	08
GILROY ACPD	37 01	121 34	55	6		02 70	07 76	10	7
GILROY CT	37 00	121 30	52	9		06 72	07 76	11	8
GLENDALE CT 32	34 09	118 08	372	10		12 73	02 75	32	8
GLENDALE CT	34 08	118 16	137	10		06 75	09 77	32	8
GOFFS	34 50	114 43	791			03 32	05 35	9	7
GOLDEN GATE BRIDGE	37 59	122 29						11	07
GRANADA HILLS CT	34 17	118 32	332	10		10 72	09 77	32	8
GROSSMONT	32 47	117 00	195	10		05 72	05 73	26	08
GULF ATOMIC	32 54	117 13		10		11 72	03 73	26	08
HALF MOON BAY	37 30	122 30	11			06 48	12 68	9	7
HALF MOON BAY CT	37 28	122 26	9	9		10 71	07 76	11	8
HALF MOON BAY	37 28	122 26	1					13	
HARBOR CITY PCH	33 46	118 18	9	10		09 72	04 74	32	8
HAWTHORNE	33 55	118 20	19			01 63	76	9	7
HAYWARD	37 39	122 07	15				76	9	7
MERCULES CT	38 01	122 17	8	9		05 73	06 76	11	8
HIGHLAND PARK CT	34 07	118 08	174	10		04 73	01 75	32	8
HIGHLAND PARK 31	34 07	118 14	140	10		12 73	02 75	32	8
HOLLISTER	36 53	121 24	114			08 28	08 59	9	7
HOLLISTER	36 54	121 22		10		02 75	08 77	21	08
HOLLYWOOD + VINE	34 06	118 19	140	10		12 73	02 75	32	8
HOT SPRINGS CREEK	37 00	118 50	1829	10		75	76	3	8
HUMBOLDT BAY	40 46	124 14	3				76	9	7
HUNTERS POINT PP	37 43	122 22	3					13	
IMPERIAL FAA	32 50	115 34	15			03 59	76	9	7
INDEPENDENCE	36 48	118 12	1202			94	12 44	9	7
JACKASS FLAT NEV	36 49	116 16	1130	29		05 56	02 62	7	1
JACUMBA	32 38	116 11	873			01 32	03 39	9	7
JAMACHA	32 45	116 56		10		09 73	04 75	26	08
KEELER	36 35	117 50	1107			91	94	9	7
KERN CO MAINT YD	35 19	119 02		10		08 75	08 77	22	08

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TF 1/
KERNVILLE	35 43	118 27	1087			09 38	04 47	9	7
KEYES CT	37 34	120 55	30	10		04 73	09 77	25	8
KING CITY	36 13	121 08	117			06 28	04 47	9	7
KIRKWOOD NORTH	38 42	120 05	2200	5		01 74	12 74	29	9
KIRKWOOD NORTH	38 42	120 05	2200	15		01 74	12 74	29	9
KIRKWOOD SOUTH	38 42	120 05	2200	5		01 74	12 74	29	9
KIRKWOOD SOUTH	38 42	120 05	2200	15		01 74	12 74	29	9
LANCASTER	117 34 41	118 08	719	30	39223	07 70	12 74	14	9
LANCASTER	34 45	118 13	716	9		10 59	12 68	9	7
LANCASTER	34 44	118 13	715				76	9	7
LAVERNE	34 05	117 47	305			07 65	76	9	7
LEBEC	34 50	118 52	1090			07 29	03 32	9	7
LINDA VISTA	32 53	117 05	152			08 36	05 40	9	7
* LINDBERGH FIELD	32 44	117 11	4	10		01 59	12 68	26	08
LITTLE ANTELOPE VA37	01 118 53	2286	10			75	76	3	8
LITTLE RIVER	39 16	123 45	174			01 51	12 56	9	7
LIVERMORE 300 ECP	37 39	121 32	366	9	HRLY	10 72	09 73	3	4
LIVERMORE APCD	37 41	121 47	146	7		02 70	07 76	10	7
A LONG BEACH APCD10134	05 118 11	18	12	104217	11 62	12 74	14	9	
LOS ANGELES	74 34 03	118 16	9	14469	03 61	10 62	14	9	
LOS ANGELES	34 03	118 27	94		877		76	9	7
LOS ANGELES CT 43	34 02 118 19	61	10		06 75	09 77	32	8	
LOS ANGELES CT 44	34 02 118 18	61	10		02 75	10 76	32	8	
LOS ANGELES MLD 2334	03 118 18	30	11	29659	12 52	08 59	14	9	
* LOS ALAMITOS NAS2033	48 118 03	8	4	96277	08 52	02 71	14	9	
LOS BANOS	37 06	120 51	31		05 28	08 36	9	7	
LOS PINOS PK	33 44	116 45	1491		08 41	11 44	9	7	
LOST HILLS	35 40	119 51	216		09 28	05 37	9	7	
LYONS PEAK	32 45	116 44	1140		12 44	11 49	9	7	
LYNWOOD CT	33 55	118 08	27	10		08 72	11 73	32	8
MAINTENANCE ST CT				9		02 73	01 75	11	8
* MALIBU SHERIFF 18	34 02 118 42	4	8	21237	03 53	03 59	14	9	
MAMOTH LAKES	37 38	118 51	2174	10		11 74	05 77	24	8
MARTINEZ PP	37 24	121 56	3					13	
MARTINEZ TIDEWATER38	02 122 08	9						13	
MARYSVILLE	39 06	121 34	22		03 47	76	9	7	
MEDIAN	33 01	117 04		10	09 74	04 75	26	08	
MENDOTA	36 40	120 17	53		05 28	08 36	9	7	
MENLO PARK CT	37 30	122 08	2	9	11 75	07 76	11	8	
MERCED	37 17	120 31	46		05 28	76	9	7	
MINTER FIELD	35 31	119 11		10	08 75	08 77	22	08	
* MIRAMAMAR NAS	32 52	117 08	200	10	01 55	12 64	26	08	
MISSION HILLS CT	34 16	118 28	290	10	09 72	02 74	32	8	
MONTEREY	36 35	121 51	67			76	9	7	
MONTGOMERY FIELD	32 49	117 08	107	10	05 72	05 73	26	08	
MOORPARK DONLON	34 16	119 00	134	10	02 72	03 73	32	8	

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TP 1/
MOORPARK GRIMES	34 16	118 56	131	10		02 72	03 73	32	8
MOORPARK SPRING	34 18	118 51	262	10		11 72	12 74	32	8
MOSS LANDING	36 48	121 48	5				76	9	7
MORAGA CT	37 51	122 12	290	9		05 73	03 74	11	8
MORGAN HILL CT	37 08	121 40	107	9		03 72	07 76	11	8
MT GIVEN	37 17	119 06	2806						
MT HAMILTON	37 20	121 39	1285			07 29	08 65	9	7
MOUNT HOPE	32 43	117 07		10		11 72	07 74	26	08
MTGIVENS	37 13	118 06	2806			68	75	31	9
MT LAGUNA	32 53	116 25	1893			10 41	02 50	9	7
MT SHASTA	41 19	122 19	1083			01 32	07 76	9	7
MT ST HELENA	38 40	122 38	1322						
MT TAMALPIAS	37 56	122 35	789	9				13	
MT TAMALPIAS	37 54	122 35	290			06 40	09 57	9	7
MT WILSON	34 14	118 04	1741			05 28	76	9	7
MOUNTIAN PASS	35 28	115 34	1464			12 30	08 37	9	7
NAVAJO	32 48	117 00		10		09 73	02 75	26	08
NAPA ACPD	38 19	122 18	12	7		03 72	07 76	10	7
NEEDLES	34 46	114 37	280			01 17	12 68	9	7
NEWBURY PARK 34	34 11	118 53	189	10		05 74	05 75	32	8
NEWBURY PARK 35	34 11	118 56	198	10		05 74	05 75	32	8
NEWHALL	34 24	118 33	370			01 39	08 49	9	7
NEWHALL SIERRA HWY	34 25	118 28	439	10		03 72	01 74	32	8
NEWPORT BEACH CT	33 38	117 46	61	10		12 72	04 74	32	8
NORCO	33 54	117 34	195	11		12 72	08 77	23	8
NOVATO CT	38 09	121 34	12	9		11 75	07 76	11	8
OCEANSIDE	33 13	117 21	3	10		11 73	03 75	26	08
* OCEANSIDE	33 14	117 25	8			08 28	01 52	9	7
* OCEANSIDE HARBOR	33 13	117 24	9				76	9	7
OILDALE HMS	35 25	119 03		10		08 75	08 77	22	08
OLEUM POWER PLANT	38 02	122 13	10					13	
ORANGE	32 45	117 06		10		06 72	05 73	26	08
ORINDA CT	37 51	122 08	305	9		01 72	05 73	11	8
OWENS LAKE	37 08	118 17	1215	10		06 73	07 74	24	8
PACIFICA CT	37 36	122 30	15	9		03 73	07 76	11	8
PACOIMA CT	34 17	118 24	354	10		10 72	04 74	32	8
PALMDALE AP 89	34 37	118 05	768	12	141738	08 52	04 74	14	9
PALO ALTO	37 27	122 09	17			05 28	03 32	9	7
PALO ALTO METRONIC	37 27	122 08	28					13	
PALOMAR AIRPORT	33 07	117 16		10		11 72	10 73	26	08
PASADENA 122	34 09	118 08	26	9	21912	06 72	12 74	14	9
PASADENA 116	34 08	118 07	29	11	16097	06 70	05 72	14	9
PASADENA CC 55	34 09	118 08	26	14	29624	09 55	06 59	14	9
PASADENA PALMETTO	34 09	118 09	250	10		07 72	10 77	32	8
PATROL	32 34	117 03		10		06 73	09 74	26	08
PEBBLY BEACH	33 20	118 19	6				76	9	7

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TF 1/
PETALUMA CT	38 14	122 37	3	9		03 73	07 76	11	8
PIGEON POINT LS	37 11	122 24	7				76	9	7
PILLAR POINT	37 30	122 30	40				76	9	7
PIRU TELEGRAPH CT	34 24	118 48	198	10		03 73	05 75	32	8
PITTSBURG ACPD	38 02	121 54	2	2		07 70	07 76	10	7
PITTSBURG	38 01	121 51	8	8		56	65	8	6
PITTSBURG CT	38 01	121 52	15	9		05 73	06 76	11	8
PITTSBURG CT	38 01	121 56	9	9		01 73	10 75	11	8
PLEASANTON CT	37 42	121 54	99	9		04 74	07 76	11	8
POINT BLUNT LS	37 51	122 25	73				76	9	7
POINT BONITA LS	37 49	122 32	1				76	9	7
POINT LOMA	32 40	117 27	111				76	9	7
POINT PINOS	36 38	121 36	9				76	9	7
* POINT SAN LUIS	35 10	120 46	27			03 43	10 51	9	7
POINT SUR LS	36 18	121 54	111			03 43	01 46	9	7
POINT VINCENT	33 44	118 25	38					2	7
POTRERO PP	37 44	122 22	3					13	
RAINBOW	33 26	117 09	335	10		05 73	11 74	26	08
RAINER MESA	37 11	116 13	31	30				7	1
REAM FIELD NAS	32 34	117 07		10		01 62	12 70	26	08
RED BLUFF	40 09	122 15	105	18	131496	891	07 76	9	7
RED BLUFF	40 09	122 15	108	18	131496	31	48	8	6
REDDING	40 30	122 18	153				76	9	7
* REDONDO BEACH 79	33 51	118 23	19	24	33121	07 56	06 60	14	9
REDWOOD CITY ACPD	37 29	122 12	5	5		02 70	07 76	10	7
* REFUGIO	34 28	120 05		10		09 72	11 73	21	08
RICHMOND ACPD	37 57	122 21	16	7		03 72	07 76	10	7
RICHMOND CT	37 58	122 25	3	9		04 74	07 76	11	8
RICHMOND STD OIL	37 57	122 25	4					13	
RIO LINDA	38 41	121 31	15	10		01 76	01 77	20	08
RIO VISTA CG	38 09	121 42	12					2	7
RIVERSIDE	33 57	117 27	233			10 56	76	9	7
RIVERSIDE AP	33 57	117 26	256	11		06 75	08 77	23	8
ROMERO OVER LOOK	37 05	121 06	12			01 73		12	4
ROSEVILLE	38 46	121 17	58	10		01 76	01 77	20	08
SACRAMENTO	38 35	121 30	8			893	06 64	9	7
SAC JEFERSON BLVD	38 29	121 35	18	10		02 76	01 77	20	08
SAC MEADOWVIEW	38 30	121 27	15	10		01 76	01 77	20	08
SACRAMENTO CT	38 34	121 39	12	10		01 76	01 77	20	08
SACRAMENTO EX AP	38 31	121 30	7			07 28	07 76	9	7
SAC METRO AIRPORT	38 40	121 36	13	10		01 76	01 77	20	08
SACRAMENTO MET AP	38 42	121 36	7			09 67	07 76	9	7
SALTON	33 18	115 59		10		11 74	05 75	26	08
SALTON SEA	33 12	115 50	-69			01 43	09 45	9	7
SAN BERNARDINO	34 09	117 19	380	11		08 73	08 77	23	8
SAN CARLOS FAA	37 31	122 15	1				76	9	7
SAN DIEGO	32 43	117 10	18			888	02 40	9	7

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TP 1/
SAN DIEGO BROWN	32 34	116 59	160				76	9	7
SAN DIEGO GILLESPI	32 49	116 58	117				76	9	7
X SAN DIEGO LINDBER	32 44	117 10	9			07 29	76	9	7
SAN DIEGO MONTGOM	32 49	117 09	127				76	9	7
SAN FRANCISCO APCD	37 47	122 25		45		02 70	07 76	10	7
SAN FRANCISCO CG	37 45	122 42	8			48	12 68	9	7
SAN FRANCISCO CT	37 47	122 23	3	9		12 75	07 76	11	8
SAN FRANCISCO FOB	37 47	122 25	38			888	04 73	9	7
SAN FRANCISCO PG+E3	37 46	122 27						13	
SAN JOSE ACPD	37 20	121 53	24	8		07 72	07 76	10	7
SAN JOSE RHV	37 20	121 49	41				76	9	7
SAN JOSE ST UN	37 24	121 56	29					13	
X S J CAPISTRANO CT	33 30	117 38	30	10		04 74	03 75	32	8
SAN LEANDRO CT	37 41	122 08	9	9		04 74	07 76	11	8
X SAN MATEO <i>1500 ft</i>	33 23	117 35	23				76	9	7
X SAN ONOFRE N G S	33 24	117 36	27	20		12 64			9
X SAN PEDRO	8 33 43	118 16	1			04 55	03 73	14	9
SAN PEDRO	33 45	118 15	13		14692	09 35	02 45	8	6
SAN RAFAEL ACPD	37 58	122 31	3	8		02 70	07 76	10	7
SAN YSIDRO REAM	32 34	117 07	7		1870	43	45	8	6
SANTA ANA SNA	33 40	117 53	16			06 40	76	9	7
SANTA BARBARA CT	34 25	119 41		10		12 72	11 74	21	08
SANTA BARBARA SG	34 26	119 44		10		03 74	08 77	21	08
SANTA CRUZ	36 58	122 00	1				76	9	7
SANTA CRUZ MTS LMS	37 09	122 00	711					13	
X SANTA MONICA	34 01	118 27	53			05 61	76	9	7
SANTA ROSA	38 31	122 49	45			06 48	76	9	7
SANTA ROSA ACPD	38 27	122 43	8	8		07 72	07 76	10	7
SANTA ROSA CT	38 27	122 41	61	9		12 72	07 76	11	8
SANTEE	32 51	116 58		10		11 72	12 73	26	08
SCOTT ROAD	33 39	117 10	460	11		08 73	08 77	23	8
X SEAL BEACH CT	33 46	118 02	9	10		06 75	09 77	32	8
SEARS POINT CT	38 08	122 28	2	9		02 73	11 74	11	8
SEBASTOPOL CT	38 24	122 40	21	9		11 74	07 76	11	8
SEXTON SUMMIT ORE	42 36	123 22	1172		43394	34	38	8	6
SHANDON	35 39	120 22		10		01 74	03 75	21	08
SHAVER LAKE DAM	37 09	119 19		10		08 74	06 75	22	08
SHELLVILLE CT	38 15	122 29	18	9		11 72	06 76	11	8
SHELTER COVE	40 02	124 04	123				76	9	7
SKYLINE CT	37 30	122 22	265	9		04 74	06 76	11	8
SLOUGHHOUSE	38 31	121 08	98	10		01 76	01 77	20	08
SOUTH PASADINA CT	34 06	118 08	189	10		09 72	01 75	32	8
SPRING VALLEY	32 45	117 00		10		03 73	02 75	26	08
STADIUM	32 46	117 07		10		07 74	05 75	26	08
STOCKTON CT	37 58	121 15	8	10		04 75	09 77	25	8
STUDIO CITY CT	34 08	118 14	180	10		12 73	02 75	32	8
SUMMIT VALLEY	34 19	117 23	1050	11		08 73	06 75	23	8

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TI L,
SUNLAND FENWICK	33 15	118 18	415	10		10 72	07 73	32	8
SUNLAND TUJUNGA	34 15	118 20	354	10		04 72	04 74	32	8
SUNNYVALE	37 21	122 03	9			07 32	03 42	9	7
SUNNYVALE ACPD	37 22	122 02	31	13		10 73	07 76	10	7
TAHOE VALLEY	38 54	120 00	1930			02 50	76	9	7
TAFT	35 10	119 25	267			34	06 44	9	7
TAHOE CITY CG	39 11	120 07	1901				76	9	7
TEJON APT	35 02	118 45	435			05 28	08 34	9	7
TEMECULA	33 29	117 08	311	11		06 76	08 77	23	8
TEMECULA	33 27	117 08		10		09 74	04 75	26	08
TEMESCAL VALLEY	33 46	117 29	344	10		06 75	09 77	32	8
THERMAL AIRPORT	33 37	116 12	311	10		05 50	12 54	26	08
TIBERON CT	37 52	121 27	8	9		11 74	07 76	11	8
TOLL HOUSE/168	37 04	119 22		10		06 74	06 75	22	08
TORRANCE REF 10	33 53	118 18	5		36901	08 52	06 60	14	9
TORRANCE	33 48	118 20	29			03 59	76	9	7
TOWER 5A	36 47	116 20	1111	29		58	64	7	1
TRACY	37 46	121 32	20			05 28	03 39	9	7
TREASURE ISLAND	37 49	122 22	3					13	
TRINIDAD HEAD	41 03	124 09	109				76	9	7
TRUCKEE	39 19	120 08	1800				76	9	7
TRUCKEE APT	39 22	120 09	1777			10 29	03 36	9	7
UKIAH PAA	39 08	123 12	192			03 47	12 68	9	7
VALLEJO 37 CT	38 08	122 15	2	10		06 73	01 75	25	8
VALLEJO 141 CT	38 06	122 16	2	10		04 75	10 76	25	8
VALLEJO ACPD	38 06	122 14	23	8		07 72	07 76	10	7
VALLEJO-NAPA	38 13	122 17	10			03 47	06 53	9	7
VERNALIS	37 36	121 18	59			07 43	01 46	9	7
VISALIA	36 20	119 24	88			12 46	12 68	9	7
WABASH	32 41	117 07		10		11 72	11 74	26	08
WALNUT CIT ASO 46	34 01	117 52	16	9	64286	01 57	11 64	149	
WALNUT CREEK CT	37 52	120 03	92	9		04 74	07 76	11	8
WALNUT GROVE TV	38 14	121 13	18					13	
WATSONVILLE	36 56	121 47	46			03 47	08 56	9	7
WEED CT	41 26	122 21	1066	10		10 73	10 74	18	8
WEST CASITAS	34 23	119 25		10		06 76	08 77	21	08
WEST WOOD	40 18	121 00	1549			01 29	04 33	9	7
WESTMINSTER CT	33 44	117 59	8	10		03 72	04 74	32	8
WHEELER RIDGE	35 01	118 59	366			05 76		12	7
WILLIAMS	39 06	122 09	39			06 31	12 52	9	7
WILTON	38 24	121 17	30	10		04 76	12 76	20	08
WINTERS	38 31	121 58	40			07 28	07 31	9	7
WOOD ROAD	33 51	117 19	532	11		06 75	08 77	23	8
WOODEN VALLEY CT	38 27	122 13	229	9		06 73	11 74	11	8
WOODLAND HILLS CT	34 09	118 38	290	10		08 73	09 77	32	8
YORBA LINDA CT	33 45	117 45	104	10		03 75	09 77	32	8
YUCA FLAT	37 04	116 03	1242	29				7	.

1/ See explanation at end of table.

TABLE 2. NONSUMMARIZED WIND RECORDS FOR 372 CALIFORNIA STATIONS
(Continued)

STATION NAME	LAT	LONG	EL M	INST HGT	NO.OF OBS	START MO YR	END MO YR	SU 1/	TP 1/
YUCA NEV	36 57	116 03	1196						
YUMA TEST STA	32 50	114 21	99		69978	01 55	12 62	2	1

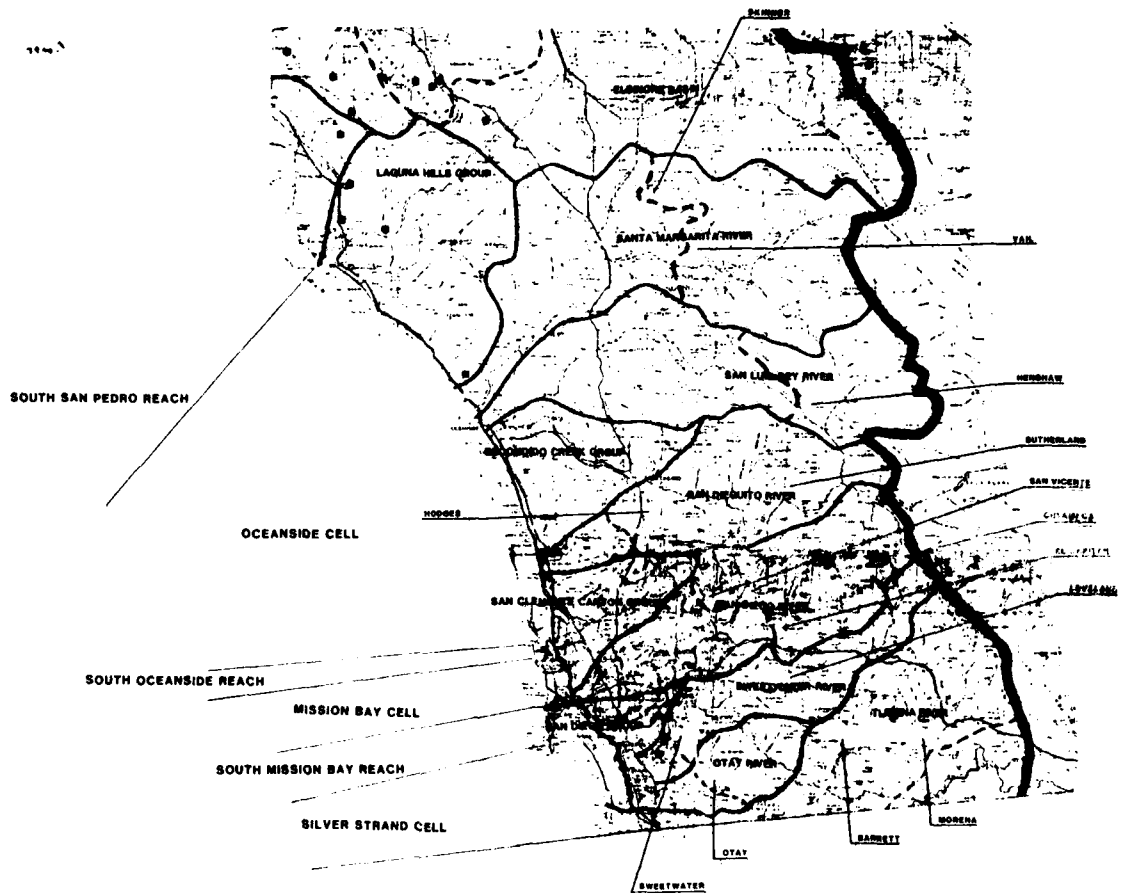
FOOTNOTES FOR TABLES 1 AND 2

SU=RECORD SOURCE

- 1 PACIFIC GAS + ELECTRIC CO.
- 2 NATIONAL CLIMATIC CENTER, ASHVILLE NC
- 3 LAWRENCE LIVERMORE LAB
- 4 LAWRENCE RADIATION LAB
- 5 HUNTER LIGGETT MILITARY R
- 6 BAY AREA AIR POLLUTION DST
- 8 WIND IN CALIFORNIA (1961)
- 9 ORIGINAL WEATHER RECORDS NCC ASHVILLE NC
- 10 BAY AREA AIR POLLUTION CONTROL DISTRICT
- 11 CALTRANS DIST 4 SAN FRANCISCO
- 12 DWR ENERGY DIVISION
- 13 CAL ST UN SAN JOSE, MET DEPT
- 14 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
- 15 SACRAMENTO MUNICIPAL UTILITY DISTRICT
- 16 DESERT RESEARCH INSTITUTE UN
- 17 OREGON ST UN CORVALLIS, ATMO SCI
- 7 ESSA AIR RESOURCES LAB
- 18 CALTRANS DIST 2 REDDING
- 19 CALTRANS DIST 1 EUREKA
- 20 CALTRANS DIST 3 MARYSVILLE
- 21 CALTRANS DIST 5 SAN LUIS OBISPO
- 22 CALTRANS DIST 6 FRESNO
- 23 CALTRANS DIST 8 SAN BERNARDINO
- 24 CALTRANS DIST 9 BISHOP
- 25 CALTRANS DIST 10 STOCKTON
- 26 CALTRANS DIST 11 SAN DIEGO
- 27 UNIVERSITY OF CALIF
- 28 LOS ANGELES DEPT OF WATER AND POWER
- 1 VELOCITY-DIRECTION TABLES AVAILABLE
- 29 U S FOREST SERVICE
- 30 SOUTHERN CALIE EDISON CO
- 31 CAL ST UN NORTHRIDGE GEOGRAPHY DEPT
- 32 CALTRANS DIST 7 LOS ANGELES

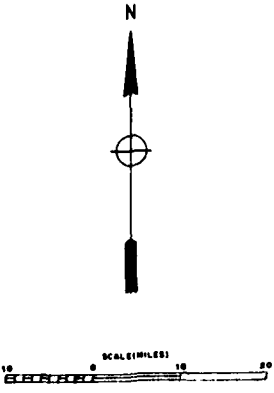
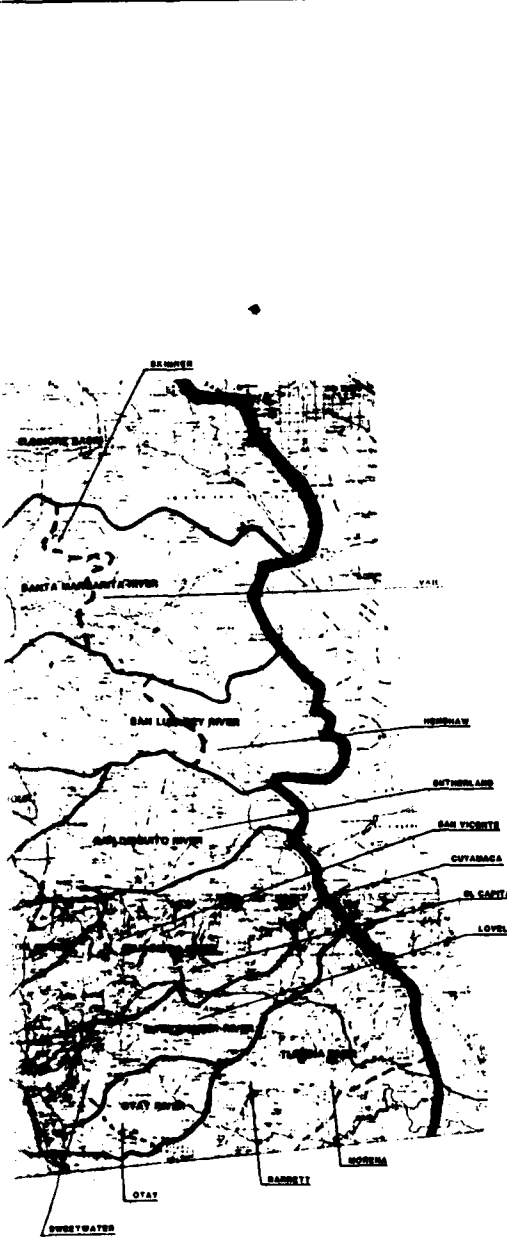
TP=RECORD TYPE

- 2 OBSERVATIONS ON MAGNETIC TAPE
- 3 ENERGY SPECTRA
- 4 AVERAGE DAILY WIND SPEED
- 5 WIND ROSE
- 6 WIND ROSE AND VELOCITY-DURATION DIAGRAM
- 7 UNPROCESSED HOURLY OR 3 HOURLY RECORDS
- 8 STRIP CHARTS MRI MODEL 1071
- 9 ANNUAL SUMMARY UNAVAILABLE



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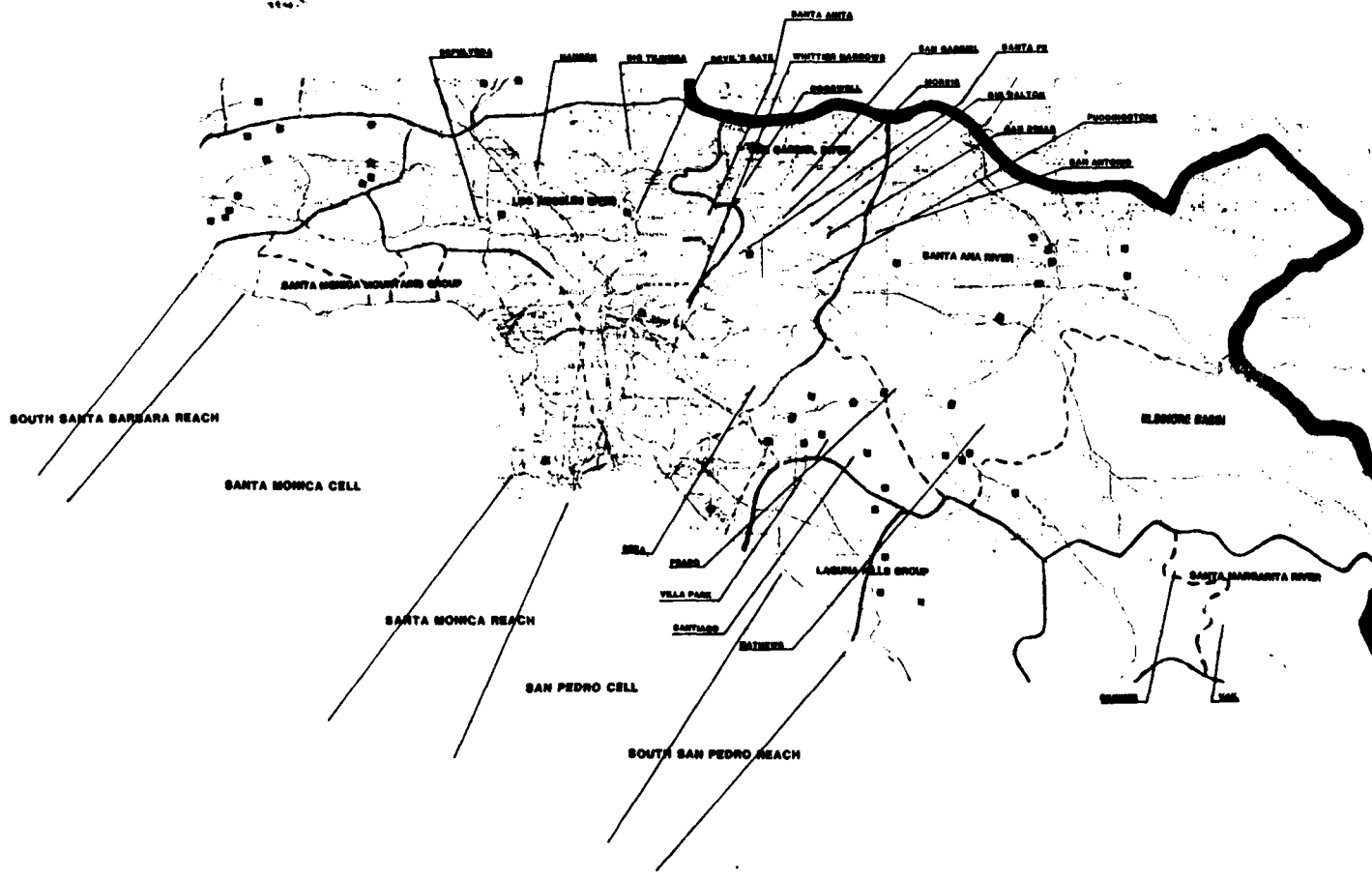


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 1 PIT; SAND & GRAVEL MINING



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PLATE 2.1 SAN DIEGO REGION
 COAST OF CALIFORNIA STORM AND TIDAL WAVES STUDY (CCSTWS)
 LOS ANGELES DISTRICT BOUNDARIES - CALIFORNIA COASTLINE FROM THE MEXICAN BORDER TO RABBED POINT
 PREPARED FOR LOS ANGELES DISTRICT CORPS OF ENGINEERS
 WATERSHED AND LITTORAL CELL BOUNDARIES AND MAJOR CONTROL STRUCTURE LOCATIONS



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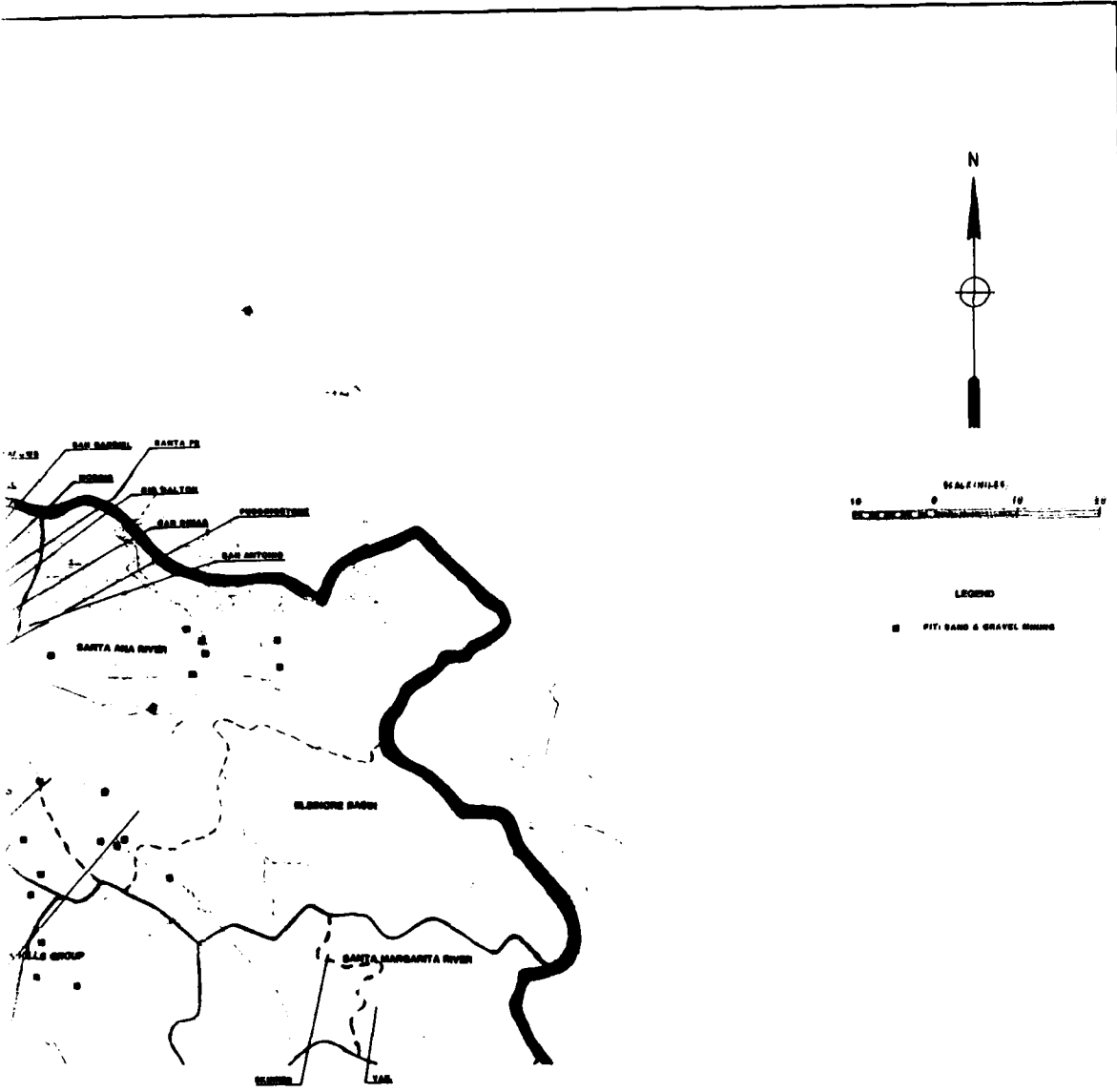
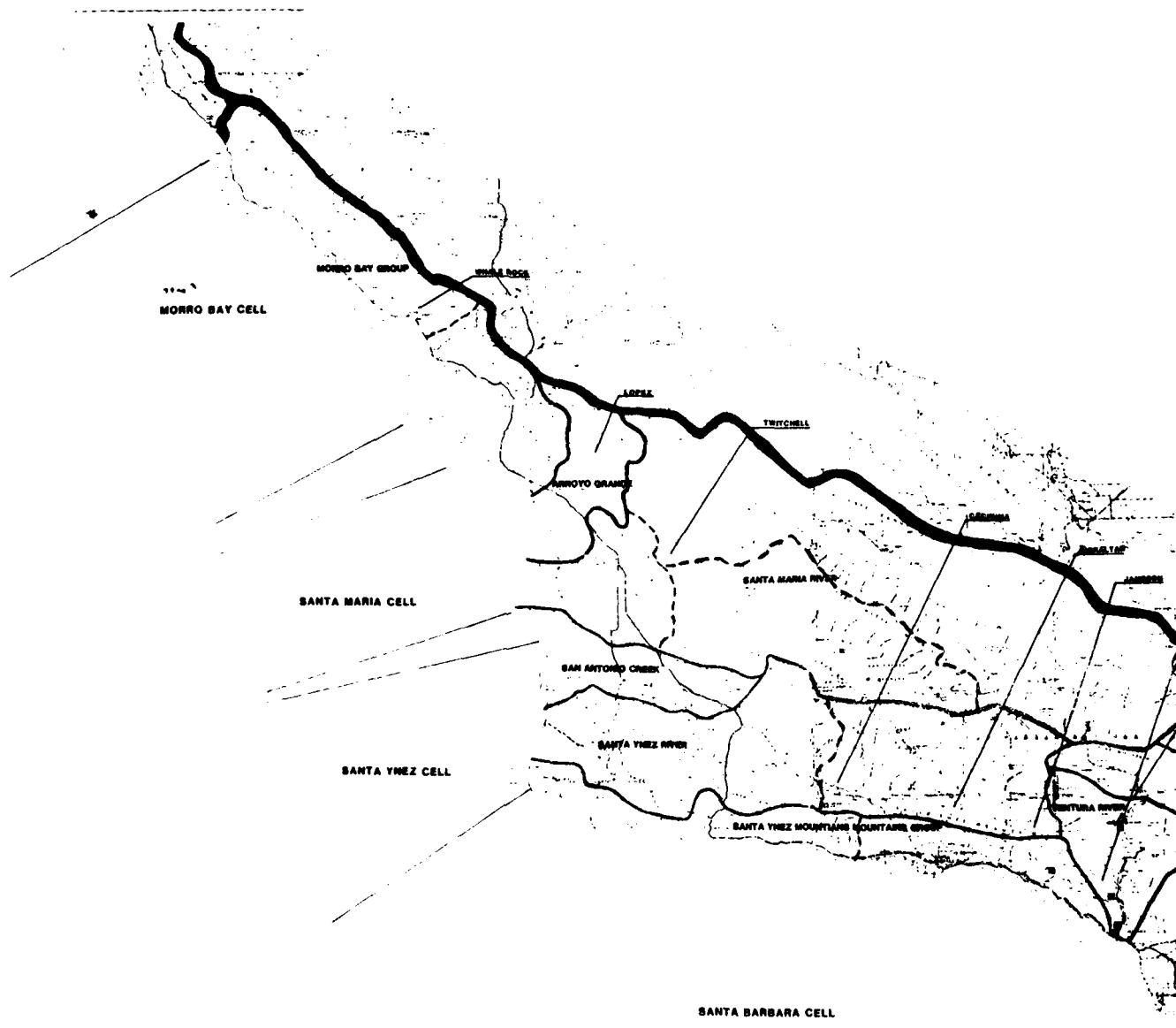


PLATE 3.1 SOUTH COAST REGION
 COAST OF CALIFORNIA STORM AND TIDAL WAVES STUDY (CCSTWS)
 LOS ANGELES DISTRICT BOUNDARIES · CALIFORNIA COASTLINE FROM THE
 MEXICAN BORDER TO RAGGED POINT
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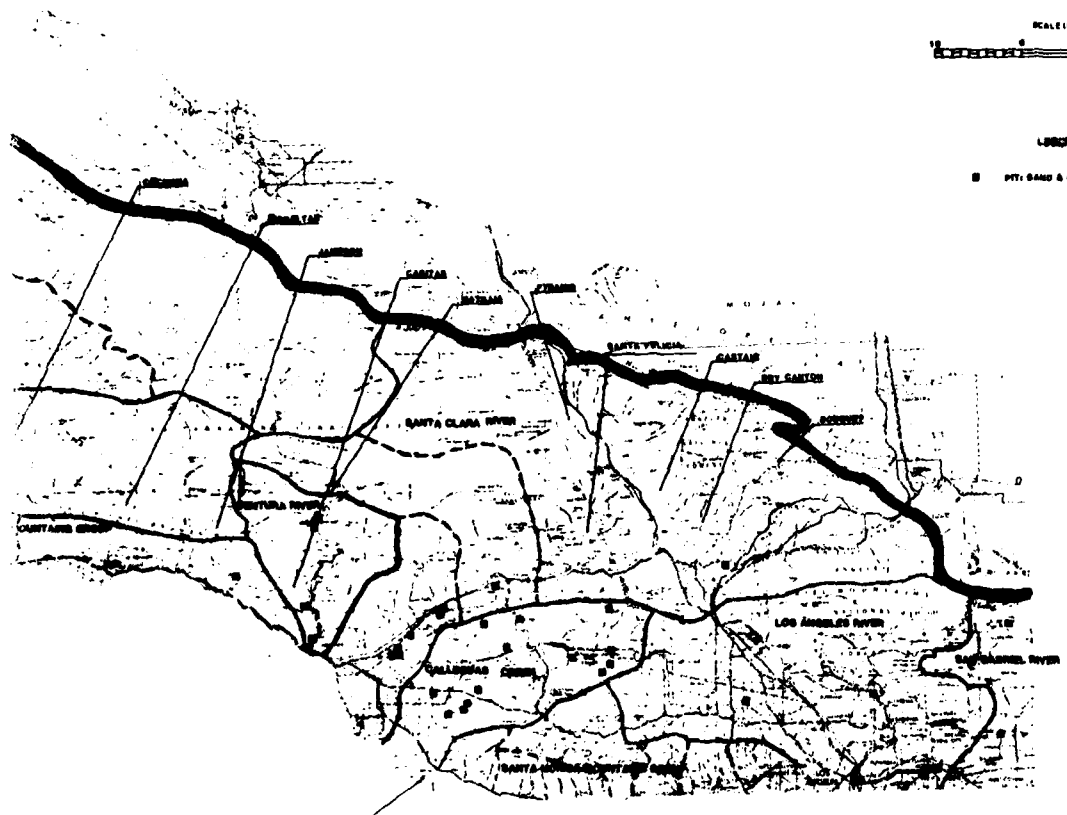


PLATE 4.1 SOUTH CENTRAL REGION
COAST OF CALIFORNIA STORM AND TIDAL WAVES STUDY (CCSTWS)
LOS ANGELES DISTRICT BOUNDARIES · CALIFORNIA COASTLINE FROM THE
MEXICAN BORDER TO RAGGED POINT
PREPARED FOR LOS ANGELES DISTRICT CORPS OF ENGINEERS
WATERSHED AND LITTORAL CELL BOUNDARIES AND MAJOR CONTROL STRUCTURE LOCATIONS

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