Title
AN ENERGY-ENVIROMVENT DATA BOOK FOR THE STATES OF CALIFORNIA, HAWAII, AND NEVADA

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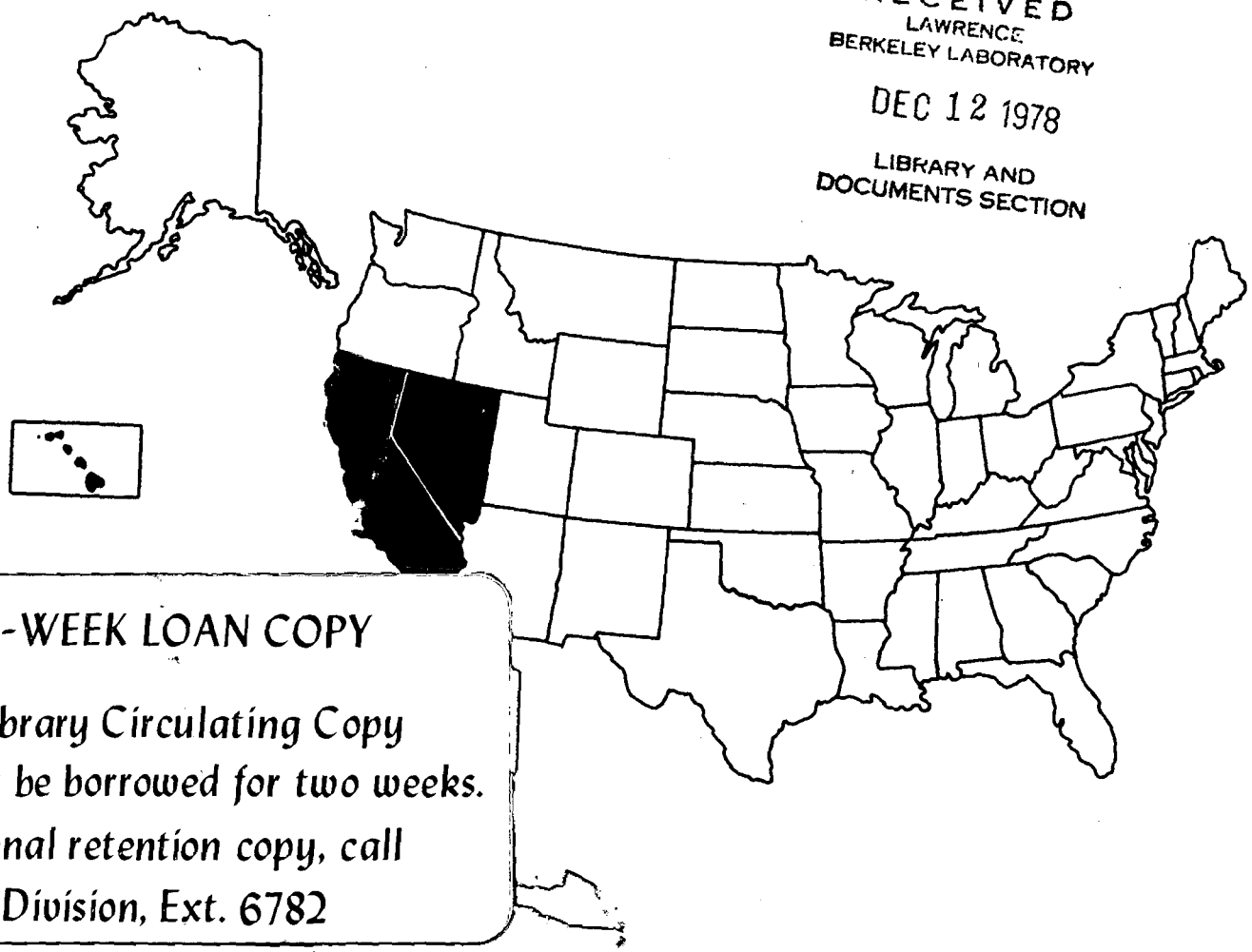
Publication Date
1978-10-01

LBL-7821
UC-13

AN ENERGY-ENVIRONMENT DATA BOOK FOR THE STATES OF CALIFORNIA, HAWAII, AND NEVADA



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Prepared for the Department of Energy under Contract W-7405-ENG-48

LBL-7821

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AN

ENERGY-ENVIRONMENT DATA BOOK

FOR THE STATES OF

CALIFORNIA, HAWAII, AND NEVADA

COMPILED BY

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FOR THE

DIVISION OF REGIONAL ASSESSMENTS
OFFICE OF TECHNOLOGY IMPACTS
U.S. DEPARTMENT OF ENERGY

OCTOBER 1978

Foreword

Following the formation of the Department of Energy (DOE), Dr. James L. Liverman, the Department's Acting Assistant Secretary for the Environment, established an Office of Technology Impacts (OTI). This office is under the direction of Dr. Peter A. House and serves as a focal point for the development and evaluation of environmental policies, plans and programs. In FY 1978 OTI set up a Regional Characterization Program to collect and publish available data relating to the energy, environmental, socioeconomic and institutional characteristics of the various regions and functional subdividions of the country. This issue of the Regional Energy/Environment Data Book represents an initial attempt to organize such data in a uniform format and is the forerunner of a more exhaustive set of Regional Characterization Documents to be developed in FY 1979.

The foundations of this program rest on a large but fragmented data base that is now being brought together for the following purposes:

- Provide DOE with regional information for conducting generic impact studies.
- Further define resources available at the six national laboratories.
- Provide a source book for the regions that can be used by local groups and institutions.
- Permit and encourage data development within the regional offices.
- Help laboratories develop relevant environmental and energy data for conducting case studies and preparing Regional Issue Identification Reports.
- Identify the gaps in regional data bases so that DOE may be better able to allocate resources for data and program development.

This is the first time that a comprehensive data book has been assembled on a state-by-state and county basis. Six national laboratories (Argonne National Laboratory, Brookhaven National Laboratory, Los Alamos Scientific Laboratory, Lawrence Berkeley Laboratory, Oak Ridge National Laboratory and Pacific Northwest Laboratory) have participated in its preparation with the primary responsibility for coordination and development going to the Los Alamos Scientific Laboratory. The program was organized by dividing the country into six regions demarcated by the state boundaries and assigning each region to a specific laboratory. No new data were developed; government sources were emphasized for the sake of consistency and reliability. National data were shared among the laboratories, but regional gaps were inevitable. These gaps will be used to provide DOE with a basis for allocating resources to the laboratories for future data development and regional characterization activities.

Acknowledgments

The primary credit for the development and publication of this data book must go in general to the program managers at the six national laboratories and in particular to Joyce Freiwald of Los Alamos Scientific Laboratory for her diligence and able leadership as lead laboratory coordinator. Paul Cho and John Wilson, both of OTI, served as project co-managers for the Office of Environment, DOE, and deftly guided the program through Department channels to its successful conclusion. Joe Coleman, Ted Williams, Roger Shull, Frank Leone and Bill Coblentz acted as DOE consultants and deserve much appreciation for their advice and encouraging support. Special thanks go to John D. Buffington and Steve Fullerton of the Council on Environmental Quality for their informative support.

At Lawrence Berkeley Laboratory the data book was compiled as part of the Energy Analysis Program, headed by Will Siri. Many thanks are due Jaime Kooser, Ike Lasater, Ron Ritschard, Jayant Sathaye, Rich Sextro and other members of the EAP staff for their advice and encouragement throughout the project. Peter Wood, Virginia Sventek, Deane Merrill and Fred Gey of Computer Science and Applied Mathematics assisted with data retrieval and computer graphics. Carol Backus and Cheryl Wodley of the Engineering Library were of great help in obtaining reference material. Similar assistance was provided by the staffs of the Documents Library and the Map Room of the University of California, Berkeley. Bob Hendrickson, the technical editor, was invaluable in getting the data book published.

Finally, we wish to thank all those individuals in California, Hawaii, and Nevada who kindly consented to review our draft and who provided many useful comments.

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Introduction

This energy-environmental data book is a collection of information on the states of California, Hawaii and Nevada that will be of use to people who make decisions about energy for this region. These three states comprise the region for which the Lawrence Berkeley Laboratory has responsibility under the programs of the Department of Energy's Division of Regional Assessments. Similar databooks covering the rest of the country are being published by five other National Laboratories. The Laboratories have made an effort to keep the structure, content, and coverage of the databooks consistent by using nationwide sources of data where available. These data were supplemented by data from regional sources. Most of the detailed data are presented for 1975, the latest year for which they are published. The institutional and legal data are current to 1977. Because of space limitations, most tabular data are presented on the state or air or water basin level of detail. Wherever possible maps were used to show more geographic detail.

This data book is organized into three chapters. The first one presents data on the energy conditions in the region, the second presents data on the environmental conditions in the region, and the third one presents information on the institutional conditions in the region. A fourth chapter provides the references, appendices, an index, a glossary, and metric conversion factors. An overview to each chapter attempts to integrate a regional perspective of the energy, environmental, or institutional situation. The overviews are followed by a discussion of the quality and availability of data for the region. A summary matrix at the end of each chapter attempts to indicate the additional data available but not used in this databook.

It is hoped that this databook will be of use to federal and state decision makers as well as to others interested in the energy future of the nation.

Chapter I

PERSPECTIVE AND DATA ON ENERGY

I. PERSPECTIVE AND DATA ON ENERGY

I-A. REGIONAL OVERVIEW

I-A-I Regional Overview

This chapter presents data on current and historical trends in the production and consumption of energy within the three-state region consisting of California, Hawaii and Nevada. The energy balance for each state is shown including data on imports and exports of energy. The reserves of fossil fuels and the potential for new sources of energy such as solar, wood, wastes, wind and ocean thermal are also presented. This introductory section highlights the current energy problems facing the states together with the possibilities for the future.

The most salient feature of the region is that it consumes more energy than is produced indigenously. California and Nevada import fossil fuels to supplement their dwindling supplies. Hawaii, which has no fossil fuel resources, depends almost entirely on imports of crude oil and petroleum products.

The main indigenous sources of energy for the region are the oil and gas fields in California. Production of onshore oil and gas peaked in the late 1960's and has declined ever since. Offshore fields have begun to be exploited, and there are a few producing oil wells in Nevada. There are scattered small deposits of uranium ores and coal in the region, but none are currently being worked. Oil shale deposits also exist in California.

Electricity generated in California and Hawaii comes mainly from oil-fired power plants. Hydroelectric generation is also a major source of electricity in California. In Nevada, coal is the primary fuel for power plants; there are no coal-fired plants in the other two states, although about two-thirds of the electrical energy produced from coal in Nevada is exported to California. Three nuclear power plants are on-line in California totaling nearly 1500 MWe, with four

more units under construction. Agricultural waste is an additional source of electricity for Hawaii, as is geothermal energy in California.

Gross energy consumption in the region grew at an average annual rate of 5.0 percent between 1960 and 1973, as compared to the national average of 4.5 percent. After a sharp drop in 1974, the growth has resumed, albeit at a slower rate. The region accounts for about 8.5 percent of the nation's energy consumption. Regulatory actions have curtailed usage of natural gas by the industrial and electric utilities sectors. The growth in residential gas consumption has moderated due, for the most part, to conservation. Most utilities anticipate that natural gas will be unavailable for electricity generation after 1980.

The demand for petroleum products continues to increase, although at a slower pace that five years ago. This growth is primarily in two categories, transportation fuels and residual fuel oil. Transportation accounted for almost 35 percent of California's total energy use during 1975 as compared to 25 percent for the nation as a whole. Transportation is even more dominant in Hawaii; the sector consumed over 60 percent of the state's gross energy requirements in the form of gasoline, diesel and jet fuels. The use of residual oil has increased in California due to the decline in the availability of natural gas for utility boiler fuel.

Coal makes up a smaller fraction of the energy consumption in this region than in the rest of the nation. There is no coal used in Hawaii, while in California it presently constitutes less than 5 percent of industrial energy use. Coal provides about 60 percent of the electricity generated in Nevada. Increased coal use for electricity generation is planned for both California and Nevada.

The excess of consumption over production of energy in the region is made up by imports of fossil fuels from foreign nations and the rest of the country. Natural gas is brought in by pipeline from Canada

and the southwest. Petroleum arrives by tanker from South America, Indonesia, the Middle East and Alaska. Coal comes primarily from Colorado, New Mexico and Utah. Electricity is imported from hydro-electric plants in the Pacific Northwest and the coal-fired power plants in the southern Rocky Mountain States. In 1975, for example, California imported nearly 15 percent of the electrical energy consumed.

Energy consumption in this region is expected to show a continued decline in its rate of growth due to additional conservation efforts. Legislative and institutional awareness of energy problems is strong within California, and the state's Energy Commission has begun to create a significant body of regulations mandating standards for appliance efficiency and building construction. Vigorous public campaigns to increase consumer knowledge regarding conservation measures in general have been instigated.

The region has great potential for the implementation of alternative energy sources. All three states possess areas of high geothermal activity. Additional geothermal generating capacity in California is under construction at the Geysers, and development is proceeding within the Imperial Valley. Geothermal areas in the other two states are also under active investigation. Offshore of Hawaii is the most promising site for developing ocean thermal energy. Hawaii is also the site of ongoing research into biomass generation. Good sites for wind and solar power exist in the region. Both California and Nevada have extensive areas of undeveloped, highly insolated land which could be used for central receiver solar power stations. The development and implementation of these alternative technologies with continued emphasis on energy efficiency and conservation would lead to decreased reliance on imported fossil fuels.

I-A-2. Data Quality and Availability

The data in this chapter are taken primarily from federal sources. We have chosen 1975 as a base year for detailed energy consumption and production data. Time series data are presented for the years 1970 to 1975. In this way we hope to present a more or less consistent set of data to facilitate comparisons among different states and different years.

For energy production data from fossil fuels we have used the Bureau of Mines (BOM) data published in the "Minerals Yearbooks" and other reports. The "Oil and Gas Journal" was used merely to supplement the BOM data on such subjects as production at natural gas processing plants and petroleum refineries. These data are complete on a state basis but there are little data in these sources at the sub-state level. We have used data from state agencies on the locations of oil and gas fields, but not their production data. We could not find detailed maps of coal and oil shale deposits.

Data on electricity generation and capacity are from Federal Power Commission (FPC) and Energy Information Administration (EIA) publications. The FPC data are less detailed in terms of the type of fuel consumed. Similar data are available from state agencies, but, in general, they are not consistent with the federal sources. Maps of power plant locations in Hawaii and Nevada could not be found.

Maps from federal sources showing the potential for geothermal, wind, or solar energy show only the 48 contiguous states. These were supplemented by maps from state sources. No national data are available on the use of wood and waste for energy production. The available data are spotty and based on crude average values of fuel availability.

Energy consumption data by sector are taken from a single source, the EIA Federal Energy Data System. These data are on the state level for 1960 to 1975 and are fairly detailed in terms of fuel used. The other possible national source of energy consumption data, the Bureau of Mines report "Historical Fuels and Energy Consumption" only goes up to 1974. There are inconsistencies between the BOM and EIA data. Data on fuel and electricity purchases by manufacturers comes from a third source, the Bureau of the Census' "Annual Survey of Manufacturers." These data are for 1974 and do not include fuels or electricity produced within the same establishments. The energy storage data are not consistent with similar data from state sources.

The data on fuel and energy prices in 1975 are all from the Federal Energy Administration. These are annual and state wide averages; they do not show temporal and spatial variations within the region. The data on energy flows and regional energy balances are from a variety of sources and thus might not be consistent with the other energy production and consumption figures in this chapter. Note that the interstate energy flow data are for 1974 since 1975 data are not available. On the maps of energy flows the width of lines may differ slightly from the scale because of differences is reduction factors. The maps showing the gas and electric service areas in California show rough outlines of the areas in which service is offered, but service is not necessarily available throughout the region. Similar maps are not available for Hawaii and Nevada.

Because the data in this chapter are taken from a wide variety of sources there are inevitable differences in definition, format and coverage among the sources. The user is therefore cautioned about comparisons among various tables and figures in this databook and is urged to consult the cited references for more detailed information on the data. A table showing the availability of additional or more detailed data is given at the end of this chapter.

I-B ENERGY PRODUCTION

I-B-1 NATURAL GAS

THIS SECTION PRESENTS DATA ON THE PRODUCTION, STORAGE, AND RESERVES OF NATURAL GAS. DETAILED DATA ARE TABULATED FOR THE YEAR 1975, AND A TIME SERIES FOR PRODUCTION FOR THE YEARS 1970 TO 1975 IS PLOTTED. A MAP SHOWING NATURAL GAS PRODUCTION BY COUNTY IS INCLUDED. A MAP SHOWING GAS FIELDS IS INCLUDED IN THE SECTION ON CRUDE OIL AND PETROLEUM PRODUCTS.

THE PRODUCTION DATA ARE TAKEN FROM THE U.S. BUREAU OF MINES, MINERALS YEARBOOK FOR 1975. THE MAP OF NATURAL GAS PRODUCTION BY COUNTY IS FROM THE OAK RIDGE NATIONAL LABORATORY.

TABLE I-1
PRODUCTION, STORAGE AND RESERVES OF NATURAL GAS, 1975
[IN BILLION CUBIC FEET, EXCEPT ENERGY IN TRILLION BTU]

REGION	NUMBER OF PRODUCING WELLS	MARKETED PRODUCTION (PHYSICAL UNITS)	MARKETED PRODUCTION (ENERGY UNITS)	UNDERGROUND STORAGE NUMBER OF RESERVOIRS	UNDERGROUND STORAGE AMOUNT OF STORED GAS	UNDERGROUND STORAGE RESERVOIR CAPACITY	PROVEN RESERVES
CALIFORNIA	1,585	318.3	349	8	202.2	424.5	5,484.0
HAWAII	0	0.0	0	0	0.0	0.0	0.0
NEVADA	0	0.0	0	0	0.0	0.0	0.0
REGION TOTAL	1,585	318.3	349	8	202.2	424.5	5,484.0
UNITED STATES	130,364	20,108.7	22,059	376	4,277.0	6,649.5	228,200.2
PERCENT OF US	1.2	1.6	1.6	2.1	4.7	6.4	2.4

SOURCE - U.S. BUREAU OF MINES, MINERALS YEARBOOK, 1975

NOTES - BTU CONVERSION FACTOR IS 1097 BTU/CUBIC FOOT

TABLE I-2
GROSS WITHDRAWALS AND DISPOSITION OF NATURAL GAS, 1975
[IN BILLION CUBIC FEET AT 14.73 PSIA]

REGION	GROSS WITHDRAWALS FROM GAS WELLS	GROSS WITHDRAWALS FROM OIL WELLS	GROSS WITHDRAWALS TOTAL	DISPOSITION MARKETED PRODUCTION	DISPOSITION REPRES-SURING	DISPOSITION VENTED AND FLARED
CALIFORNIA	173.5	194.2	367.7	318.3	47.8	1.5
HAWAII	0	0	0	0	0	0
NEVADA	0	0	0	0	0	0
REGION TOTAL	173.5	194.2	367.7	318.3	47.8	1.5
UNITED STATE	17,380.2	3,723.2	21,103.5	20,108.7	861.1	133.9
PERCENT OF US	1.0	5.2	1.7	1.6	5.6	1.2

SOURCE - U.S. BUREAU OF MINES, MINERALS YEARBOOK, VOL I, 1975

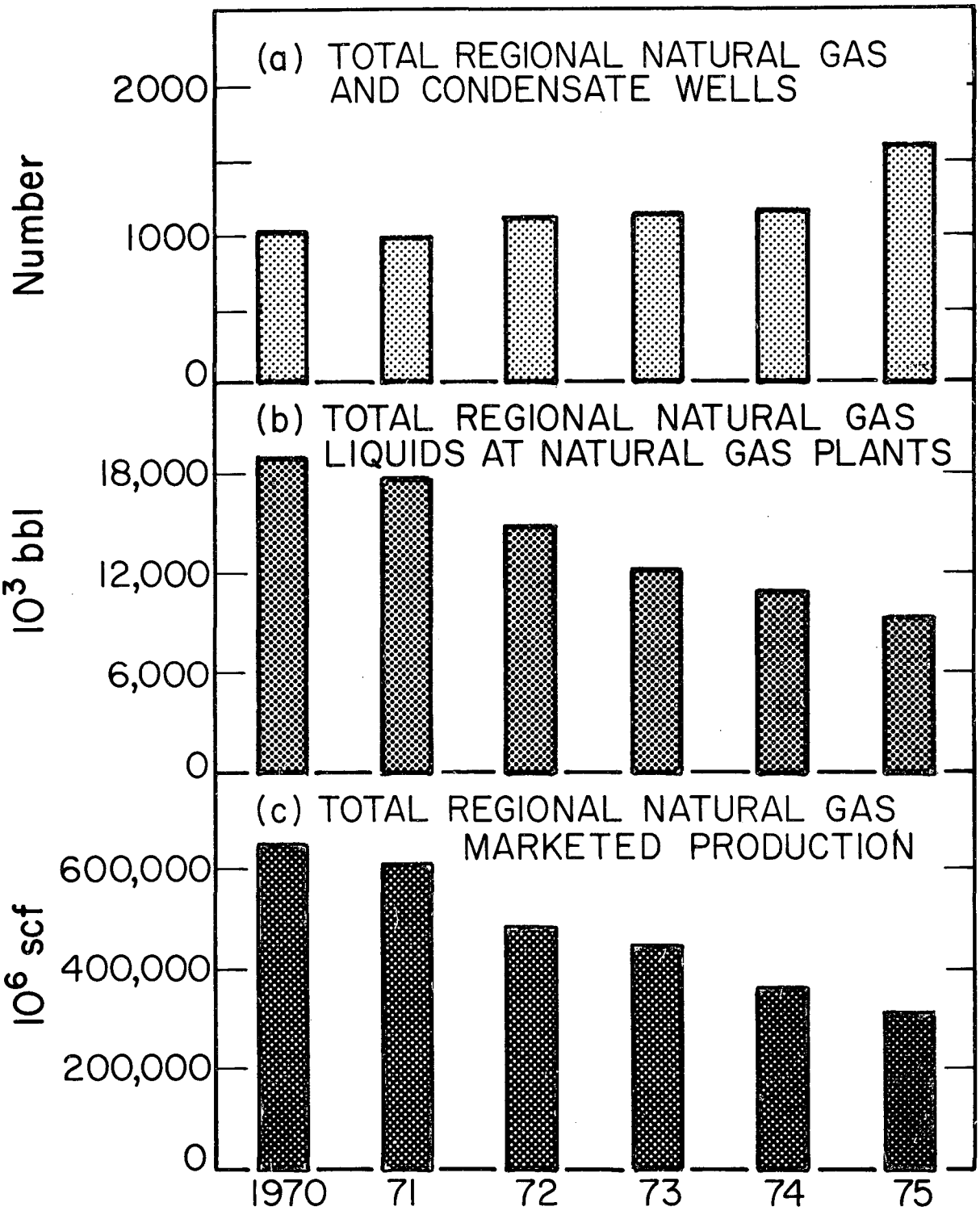


FIGURE I-1 NATURAL GAS AND NATURAL GAS LIQUIDS PRODUCTION, 1970 - 1975

SOURCE: U. S. BUREAU OF MINES, MINERALS YEARBOOK, 1975

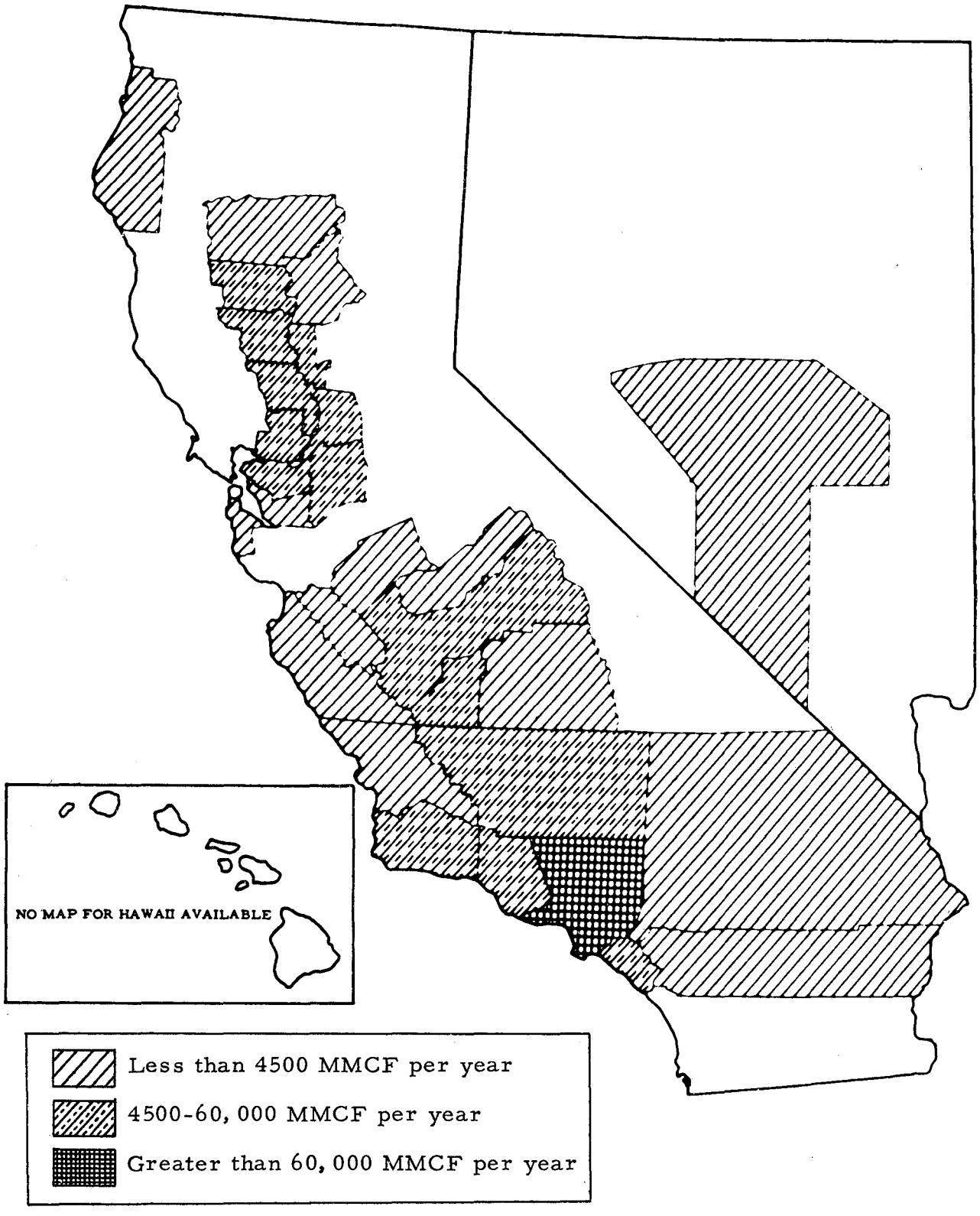


FIGURE I-2 NATURAL GAS PRODUCTION BY COUNTY, 1975

SOURCE: PROVIDED BY OAK RIDGE NATIONAL LABORATORY

I-B-2 NATURAL GAS LIQUIDS

TABULAR DATA ON PRODUCTION AND RESERVES OF NATURAL GAS LIQUIDS (NGL) FOR 1975 ARE GIVEN IN THIS SECTION. THE CAPACITY OF NATURAL GAS PROCESSING PLANTS IS ALSO PRESENTED. A TIME SERIES OF NGL PRODUCTION FROM 1970 TO 1975 IS SHOWN IN THE PREVIOUS SECTION.

THE PRODUCTION DATA ARE TAKEN FROM THE 1975 MINERALS YEARBOOK. THE CAPACITIES OF NGL PLANTS ARE FROM THE OIL AND GAS JOURNAL.

TABLE I-3
CAPACITY AND PRODUCTION AT NATURAL GAS PROCESSING PLANTS, 1975

REGION	NUMBER OF PLANTS	CAPACITY (MILLION CUBIC FEET PER DAY)	THROUGHPUT (MILLION CUBIC FEET PER DAY)	PRODUCTS (THOUSAND GALLONS PER DAY)
CALIFORNIA	41	1,507.5	569.4	1,112.7
HAWAII	0	0.0	0.0	0.0
NEVADA	0	0.0	0.0	0.0
REGION TOTAL	41	1,507.5	569.4	1,112.7
UNITED STATES	754	72,697.4	49,256.9	70,902.8
PERCENT OF US	5.4	2.1	1.2	1.6

SOURCE - OIL AND GAS JOURNAL, JULY 5, 1976

TABLE I-4
PRODUCTION OF NATURAL GAS LIQUIDS, 1975
[IN THOUSANDS OF BARRELS]

REGION	LPG AND ETHANE	NATURAL GASOLINE AND ISO-PENTANE	PLANT CONDEN-SATE	OTHER	TOTAL
CALIFORNIA	4,481	4,435	412	0	9,328
HAWAII	0	0	0	0	0
NEVADA	0	0	0	0	0
REGION TOTAL	4,481	4,435	412	0	9,328
UNITED STATES	444,086	133,824	15,626	2,422	595,958
PERCENT OF US	1.0	3.3	2.6	0.0	1.6

SOURCE - U.S. BUREAU OF MINES, MINERALS YEARBOOK, 1975, VOL I

NOTES - OTHER INCLUDES FINISHED GASOLINE, NAPHTHA, KEROSENE, DISTILLATE FUEL OIL AND MISCELLANEOUS PRODUCTS.

RESERVES OF NATURAL GAS LIQUIDS IN CALIFORNIA AT THE END OF 1975 AMOUNTED TO 107.5 MILLION BARRELS.

I-B-3 CRUDE OIL AND PETROLEUM PRODUCTS

THIS SECTION PRESENTS DATA ON THE PRODUCTION, STORAGE AND RESERVES OF CRUDE PETROLEUM. DETAILED TABULAR DATA FOR 1975 AND TIME SERIES DATA FOR 1970 TO 1975 ARE SHOWN. MAPS SHOWING THE LOCATION OF OIL FIELDS AND OIL PRODUCTION BY COUNTY ARE INCLUDED.

DATA ON PETROLEUM REFINING ARE ALSO PRESENTED IN THIS SECTION. THESE INCLUDE THE LOCATION, CAPACITY AND THROUGHPUT OF REFINERIES AND THE AMOUNT OF PETROLEUM PRODUCTS PRODUCED. A MAP SHOWING THE REFINERY CAPACITY BY COUNTY IS ALSO INCLUDED.

THE CRUDE OIL PRODUCTION DATA ARE FROM THE 1975 MINERALS YEARBOOK. THE DATA ON REFINERIES AND PETROLEUM PRODUCTS ARE FROM THE U.S. BUREAU OF MINES, 1976 MINERAL INDUSTRY SURVEYS AND THE CONGESSIONAL RESEARCH SERVICE. THE CRUDE OIL PRODUCTION AND REFINING CAPACITY MAPS WERE DRAWN AT THE OAK RIDGE NATIONAL LABORATORY. THE MAP OF OIL, GAS AND GEOTHERMAL FIELDS IS FROM THE CALIFORNIA DIVISION OF OIL AND GAS.

TABLE I-5
PRODUCTION, STORAGE AND RESERVES OF CRUDE PETROLEUM, 1975
[IN THOUSANDS OF BARRELS, EXCEPT ENERGY IN TRILLION BTUS]

REGION	NUMBER OF PRODUCING WELLS	CRUDE PRODUCTION (PHYSICAL UNITS)	CRUDE PRODUCTION (ENERGY UNITS)	STOCKS	PROVEN RESERVES
CALIFORNIA	41,029	322,199	1,868	24,217	3,648,000
HAWAII	0	0	0	0	0
NEVADA	6	115	1	0	NA
REGION TOTAL	41,035	322,314	1,869	24,217	NA
UNITED STATES	500,333	3,056,779	17,729	289,269	32,682,000
PERCENT OF US	8.2	10.5	10.5	8.4	>11.2

SOURCE - U.S. BUREAU OF MINES, MINERALS YEARBOOK, 1975

NOTES - INCLUDES OFFSHORE PRODUCTION AND LEASE CONDENSATE.
BTU CONVERSION FACTOR IS 5.8 MILLION BTU PER BARREL.
NA MEANS THE DATA ARE NOT AVAILABLE.
STOCKS OF CRUDE PETROLEUM AS OF JAN 31, 1976. ACCORDING TO THE DOE OFFICE IN HAWAII, CRUDE OIL STORAGE IN HAWAII AS OF THIS DATE TOTALED 3,351,000 BARRELS.

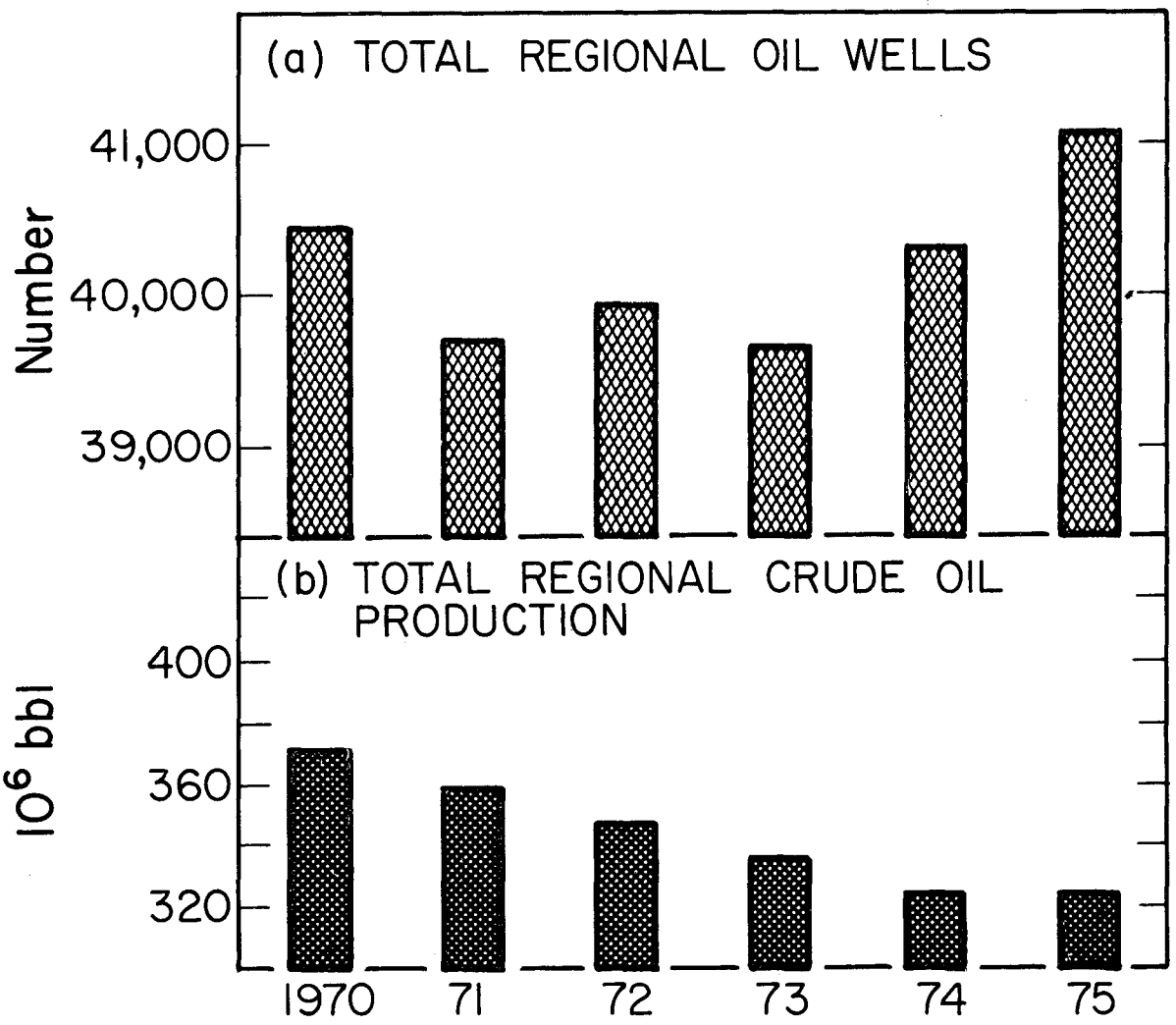


FIGURE I-3 PETROLEUM PRODUCTION, 1970 - 1975

SOURCE: U. S. BUREAU OF MINES, MINERALS YEARBOOK, 1975

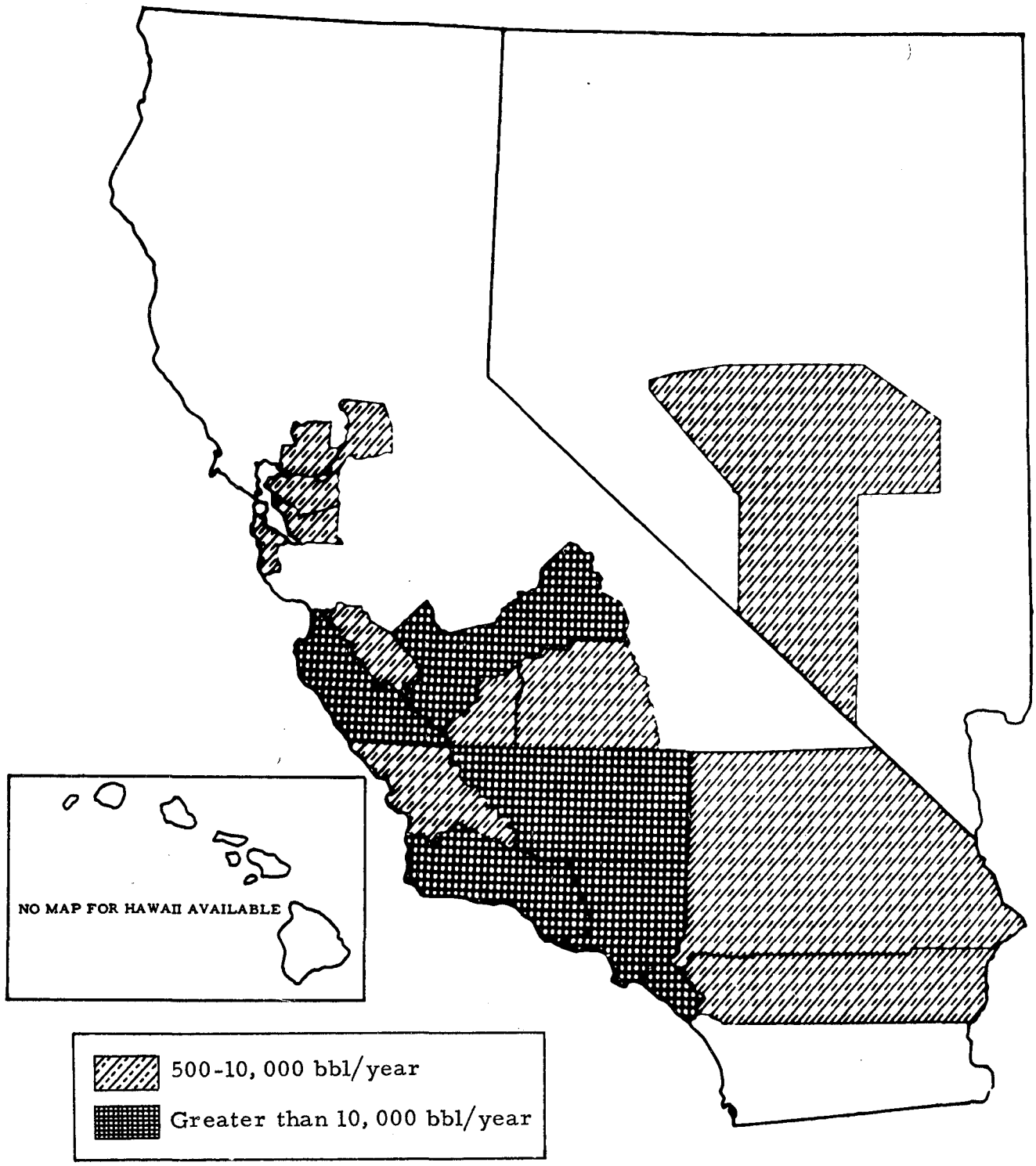


FIGURE I-4 PETROLEUM PRODUCTION BY COUNTY, 1975

SOURCE: PROVIDED BY OAK RIDGE NATIONAL LABORATORY

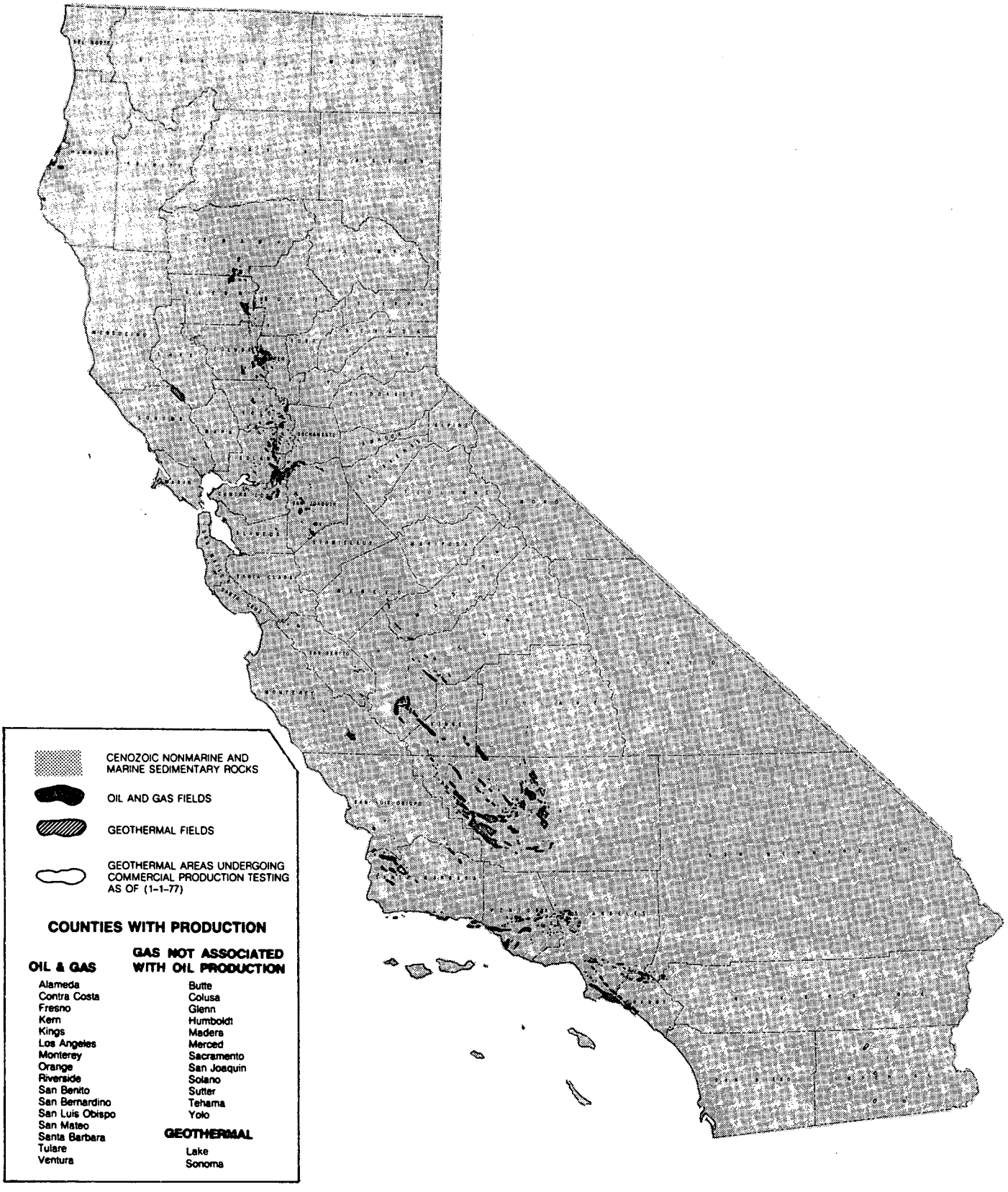


FIGURE I-5 OIL, GAS AND GEOTHERMAL FIELDS IN CALIFORNIA

SOURCE: CALIFORNIA DIVISION OF OIL AND GAS, MAP OF OIL, GAS AND GEOTHERMAL FIELDS IN CALIFORNIA, 1977

TABLE I-6
PETROLEUM REFINING CAPACITY, 1975
[IN THOUSANDS OF BARRELS PER DAY]

REGION	NUMBER OF REFINERIES	CRUDE OIL THROUGHPUT		GASOLINE OUTPUT	
		OPERABLE	INOPER-ABLE	OPERATING	SHUT-DOWN
CALIFORNIA	36	1,882.4	0.0	1,019.6	7.4
HAWAII	1	40.0	0.0	11.6	0.0
NEVADA	1	0.0	0.5	0.0	0.0
REGION TOTAL	38	1,922.4	0.5	1,031.2	7.4
UNITED STATES	287	15,236.6	190.0	6,980.2	266.1
PERCENT OF US	13.2	12.6	0.3	14.5	2.8

SOURCE - U.S. BUREAU OF MINES, MINERAL INDUSTRY SURVEYS, PETROLEUM REFINERIES IN THE U.S., 1976

NOTES - DATA AS OF 1 JAN 1976

TABLE I-7
CRUDE OIL INPUT TO REFINERIES, 1974
[IN THOUSANDS OF BARRELS]

REGION	TOTAL INPUTS	DOMESTIC INPUTS	FOREIGN INPUTS
CALIFORNIA	543,732	377,077	166,655
HAWAII	18,168	10,067	8,101
NEVADA	0	0	0
REGION TOTAL	561,900	387,144	174,756
UNITED STATES	4,434,329	3,396,922	1,201,620
PERCENT OF US	12.7	11.4	14.5

SOURCE - CONGRESSIONAL RESEARCH SERVICE PUBLICATION 95-15, NATIONAL ENERGY TRANSPORTATION, VOL I, 1974

NOTES - THE DATA FOR HAWAII WERE ESTIMATED BY MULTIPLYING THE TOTAL INPUTS TO REFINERIES IN ALASKA, ARIZONA, HAWAII, NEVADA AND OREGON BY THE FRACTION OF REFINING CAPACITY IN HAWAII (0.50).

TABLE I-8
REFINED PRODUCT PRODUCTION, 1974
[IN THOUSANDS OF BARRELS]

REGION	TOTAL	GASOLINE	DISTILLATE FUEL OIL	JET FUEL	RESIDUAL FUEL OIL	ASPHALT, ROAD OIL	LUBE OIL	OTHER
CALIFORNIA	784,766	260,452	56,695	59,736	102,638	20,387	5,620	279,338
HAWAII	20,651	3,039	2,544	3,086	5,071	1,730	0	3,831
NEVADA	0	0	0	0	0	0	0	0
REGION TOTAL	805,417	263,491	59,329	62,822	107,709	22,117	5,620	283,169
UNITED STATES	5,586,505	2,312,022	973,715	607,550	394,115	171,360	39,265	337,361
PERCENT OF US	14.4	11.4	6.1	10.3	27.3	12.9	14.3	83.9

SOURCE - CONGRESSIONAL RESEARCH SERVICE PUBLICATION 95-15, NATIONAL ENERGY TRANSPORTATION, VOL I, 1974

NOTES - THE DATA FOR HAWAII WERE ESTMATED BY MULTIPLYING THE TOTAL INPUTS TO REFINERIES IN ALASKA, ARIZONA, HAWAII, NEVADA AND OREGON BY THE FRACTION OF REFINING CAPACITY IN HAWAII (0.50).

OTHER IS COMPOSED PRIMARILY OF UNFINISHED OILS, WAXES, AND PETROLEUM COKE.

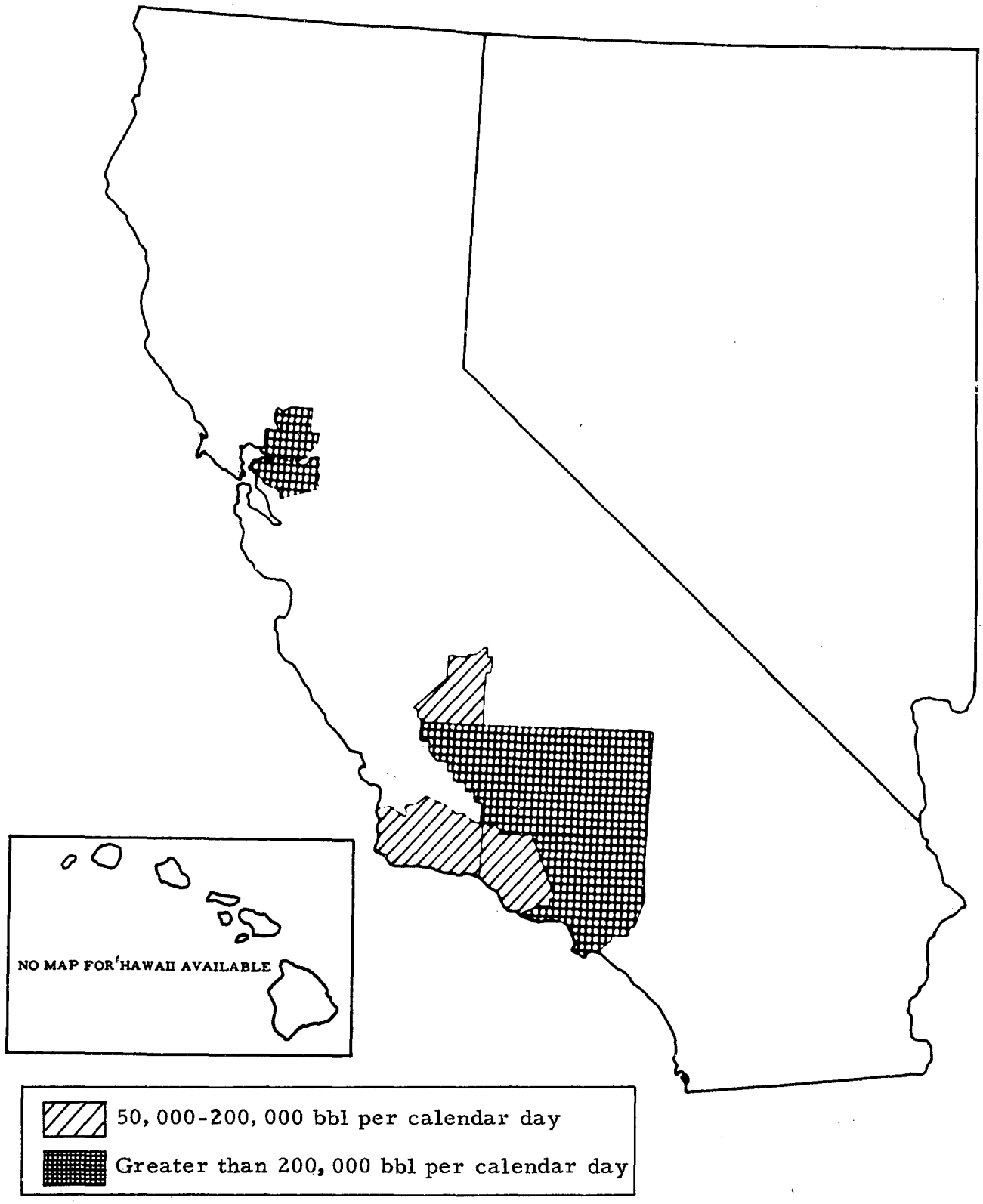


FIGURE I-6 PETROLEUM REFINERY CAPACITY BY COUNTY, 1975

SOURCE: PROVIDED BY OAK RIDGE NATIONAL LABORATORY

I-B-4 OIL SHALE

THIS SECTION CONTAINS A MAP OF THE LOCATION OF OIL SHALE DEPOSITS. THIS RESOURCE IS NOT CURRENTLY BEING UTILIZED. THE MAP IS TAKEN FROM THE U.S. FOREST SERVICE, OUR NATIONS RENEWABLE RESOURCES.

FIGURE I-7 OIL SHALE DEPOSITS

SOURCE: U. S. FOREST SERVICE, THE NATION'S RENEWABLE RESOURCES--AN ASSESSMENT 1975 FOREST SERVICE REPORT #21, JUNE 1977

I-B-5 COAL

THIS SECTION CONTAINS A MAP OF COAL FIELDS IN THE REGION. THESE DEPOSITS HAVE BEEN MINED TO A LIMITED EXTENT IN THE PAST, BUT THEY ARE PRESENTLY NOT ECONOMICAL. THE DEPOSITS CONTAIN MEDIUM- AND HIGH-VOLATILE COAL. THE MAP IS TAKEN FROM OUR NATIONS RENEWABLE RESOURCES.

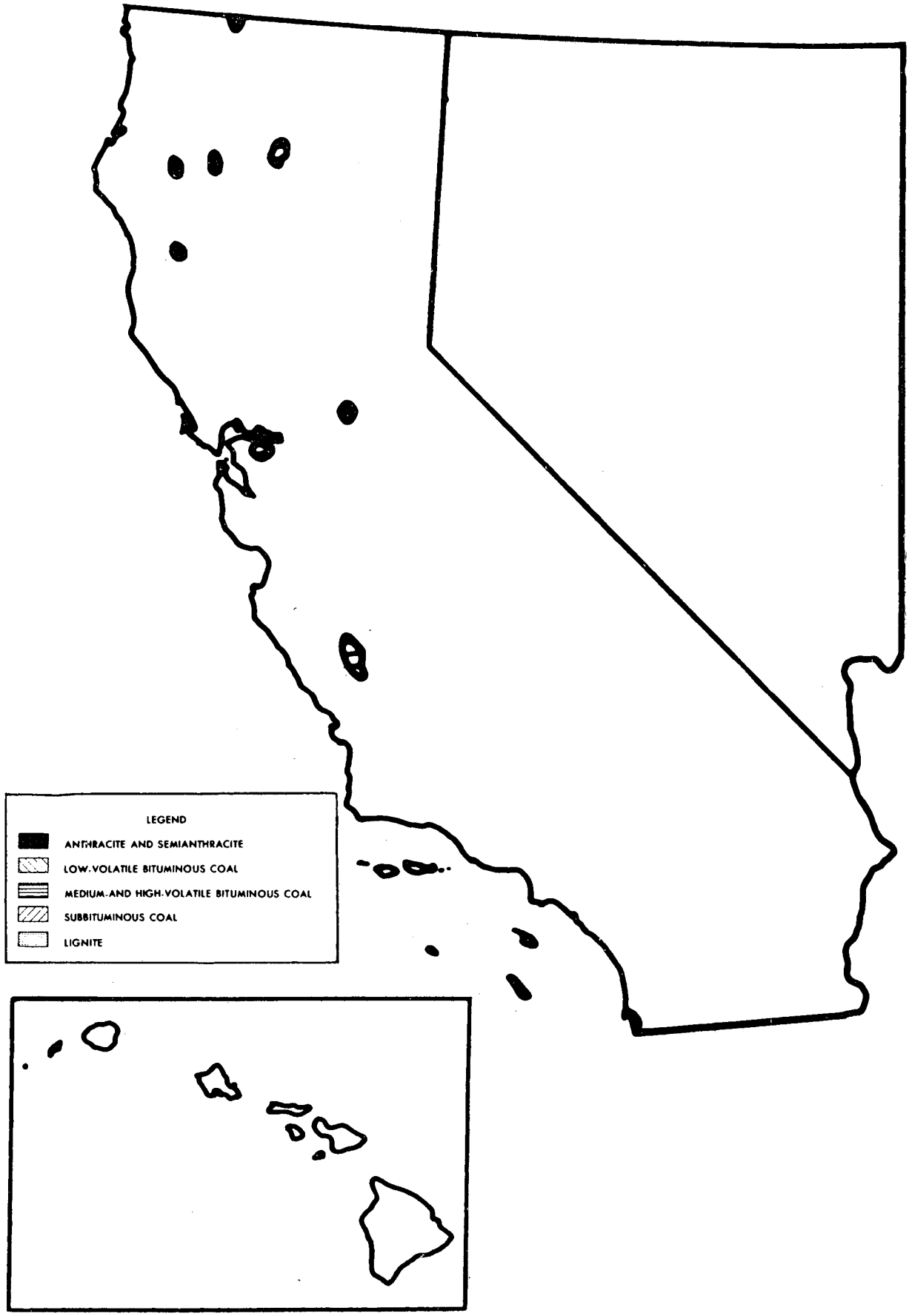


FIGURE I-8 COAL FIELDS

SOURCE: U. S. FOREST SERVICE, THE NATION'S RENEWABLE RESOURCES--AN ASSESSMENT 1975 FOREST SERVICE REPORT #21, JUNE 1977

I-B-6 URANIUM

ALTHOUGH THERE ARE SCATTERED DEPOSITS OF URANIUM IN CALIFORNIA AND NEVADA, THERE ARE PRESENTLY NO OPERATING MINES IN THESE STATES. THERE ARE NO SIGNIFICANT URANIUM DEPOSITS IN HAWAII. FURTHERMORE, THERE ARE NO URANIUM MILLING, CONVERSION OR ENRICHMENT PLANTS IN THE THREE STATES. IN CALIFORNIA THERE IS A FUEL FABRICATION PLANT NEAR SAN DIEGO WHICH IS OWNED BY GULF-GENERAL ATOMICS.

I-B-7 ELECTRIC POWER PLANTS

DATA ON THE GENERATING CAPACITY AND THE AMOUNT OF ELECTRICITY GENERATED ARE GIVEN IN THIS SECTION. THE DATA ARE PRESENTED BY THE TYPE OF FUEL USED. INFORMATION ON THE SERVICE AREAS OF THE MAJOR ELECTRIC UTILITIES IS GIVEN. FOR CALIFORNIA, THERE IS A MAP SHOWING THE LOCATION OF THE POWER PLANTS. MAPS OF ELECTRIC AND GAS UTILITY SERVICE AREAS ARE INCLUDED IN THE SECTION ON ENERGY DISTRIBUTION SYSTEMS.

MOST OF THE DATA FOR THIS SECTION ARE FROM THE FEDERAL POWER COMMISSION AND THE ENERGY INFORMATION ADMINISTRATION. DATA ON UTILITIES ARE FROM STATE AND PRIVATE SOURCES. THE MAP OF POWER PLANT LOCATIONS IN CALIFORNIA IS FROM THE STATE ENERGY COMMISSION.

TABLE I-9
INSTALLED GENERATING CAPACITY, 1975
[IN MEGAWATTS]

REGION	TOTAL	ELECTRIC UTILITIES FUEL	ELECTRIC UTILITIES HYDRO	INDUSTRIAL PLANTS
CALIFORNIA	33,982	25,180	8,403	399
HAWAII	1,421	1,227	3	191
NEVADA	3,580	2,828	682	70
REGION TOTAL	38,983	29,235	9,088	60
UNITED STATES	524,268	439,479	65,603	19,186
PERCENT OF US	7.4	6.7	13.9	3.4

SOURCE - U.S. FEDERAL POWER COMMISSION, ELECTRIC POWER STATISTICS TAKEN FROM THE STATISTICAL ABSTRACT OF THE U.S., 1977

TABLE I-10
PRODUCTION OF ELECTRIC ENERGY, 1975
[IN MILLIONS OF KWH]

REGION	TOTAL	ELECTRIC UTILITIES FUEL	ELECTRIC UTILITIES HYDRO	INDUSTRIAL PLANTS
CALIFORNIA	127,161	85,284	40,100	1,777
HAWAII	6,095	5,469	18	608
NEVADA	13,816	11,969	1,690	157
REGION TOTAL	147,072	102,722	41,808	2,542
UNITED STATES	2,000,723	1,616,010	299,814	84,899
PERCENT OF US	7.4	6.4	13.9	3.0

SOURCE - U.S. FEDERAL POWER COMMISSION, ELECTRIC POWER STATISTICS TAKEN FROM THE STATISTICAL ABSTRACT OF THE U.S., 1977

TABLE I-11
ELECTRIC GENERATING CAPACITY BY PRIMARY FUEL, 1977
[IN MEGAWATTS]

REGION	COAL	OIL	GAS	HYDRO-ELECTRIC	NUCLEAR	GEO-THERMAL	OTHER	TOTAL
CALIFORNIA	0	24,287	497	8,907	1,478	546	1	35,716
HAWAII	0	1,401	0	5	0	0	14	1,420
NEVADA	1,852	159	810	686	0	0	1	3,508
REGION TOTAL	1,852	25,847	1,307	9,598	1,478	546	16	40,644
UNITED STATES	213,592	140,319	78,768	68,458	49,367	546	11,250	561,754
PERCENT OF US	0.9	18.4	1.7	14.0	3.0	100.0	0.1	7.2

SOURCE - U.S. DEPARTMENT OF ENERGY, INVENTORY OF POWER PLANTS IN THE UNITED STATES, DOE/RA-0001, DEC 1977

NOTES - OTHER INCLUDES FUEL UNKNOWN

TABLE I-12
PRODUCTION OF ELECTRIC ENERGY BY SOURCE, 1977
[IN MILLION KILOWATT-HOURS]

REGION	COAL	OIL	GAS	HYDRO-ELECTRIC	NUCLEAR	OTHER	TOTAL
CALIFORNIA	0	77,300	35,592	14,200	8,115	3,610	138,817
HAWAII	0	6,014	0	20	0	26	6,060
NEVADA	10,197	792	3,184	1,617	0	0	15,790
REGION TOTAL	10,197	84,106	38,776	15,837	8,115	3,636	160,667
UNITED STATES	985,450	357,889	305,357	220,435	250,833	4,063	2,124,078
PERCENT OF US	1.0	23.5	12.7	7.2	3.2	89.5	7.6

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, ENERGY DATA REPORTS, DOE/EIA-0049/1, 1977

NOTES - DATA ARE PRELIMINARY

OTHER INCLUDES GEOTHERMAL, WOOD AND WASTE

TABLE I-13
MAJOR ELECTRIC UTILITIES, 1976

UTILITY COMPANY	NUMBER OF CUSTOMERS		GENERATING CAPACITY (MWE)	ELECTRICITY GENERATED (MWH)	SERVICE AREA
	RESIDENTIAL	OTHER			
CALIFORNIA					
PACIFIC GAS AND ELECTRIC	2,670,797	416,503	10,681	66,416,209	NORTHERN AND CENTRAL CALIFORNIA
SAN DIEGO GAS AND ELECTRIC	579,698	65,449	2,104	7,995,726	SAN DIEGO AND OUTLYING AREAS
SOUTHERN CALIFORNIA EDISON	2,497,076	367,327	14,066	59,427,927	SOUTHERN AND EASTERN CALIFORNIA
LOS ANGELES DEPARTMENT OF WATER AND POWER	972,087	151,493	8,191	18,797,702	LOS ANGELES AND LONG BEACH
HAWAII					
HAWAIIAN ELECTRIC	175,581	26,393	1,252	5,253,715	OAHU
HAWAII ELECTRIC LIGHT	24,533	5,261	171	475,712	HAWAII
CITIZENS UTILITY	11,414	2,145	72	257,689	KAUAI
MAUI ELECTRIC	18,412	3,557	119	505,589	MAUI
MAUI ELECTRIC	682	172	3	8,608	LANAI
MOLOKAI ELECTRIC	1,448	437	8	20,278	MOLOKAI
NEVADA					
NEVADA POWER	121,426	15,738	1,355	4,840,387	CLARK COUNTY AND OUTLYING AREAS
SIERRA PACIFIC	93,026	16,665	562	1,741,996	NORTHERN NEVADA

SOURCE - ELECTRIC WORLD, DIRECTORY OF ELECTRIC UTILITIES, 1978; ENERGY USE IN HAWAII, 1977; HAWAII DATA BOOK, 1977; NEVADA PUBLIC SERVICE COMMISSION

NOTES - CAPACITY AND GENERATION FIGURES FOR HAWAII INCLUDE INDUSTRIAL PLANTS WITHIN THE SERVICE AREA.

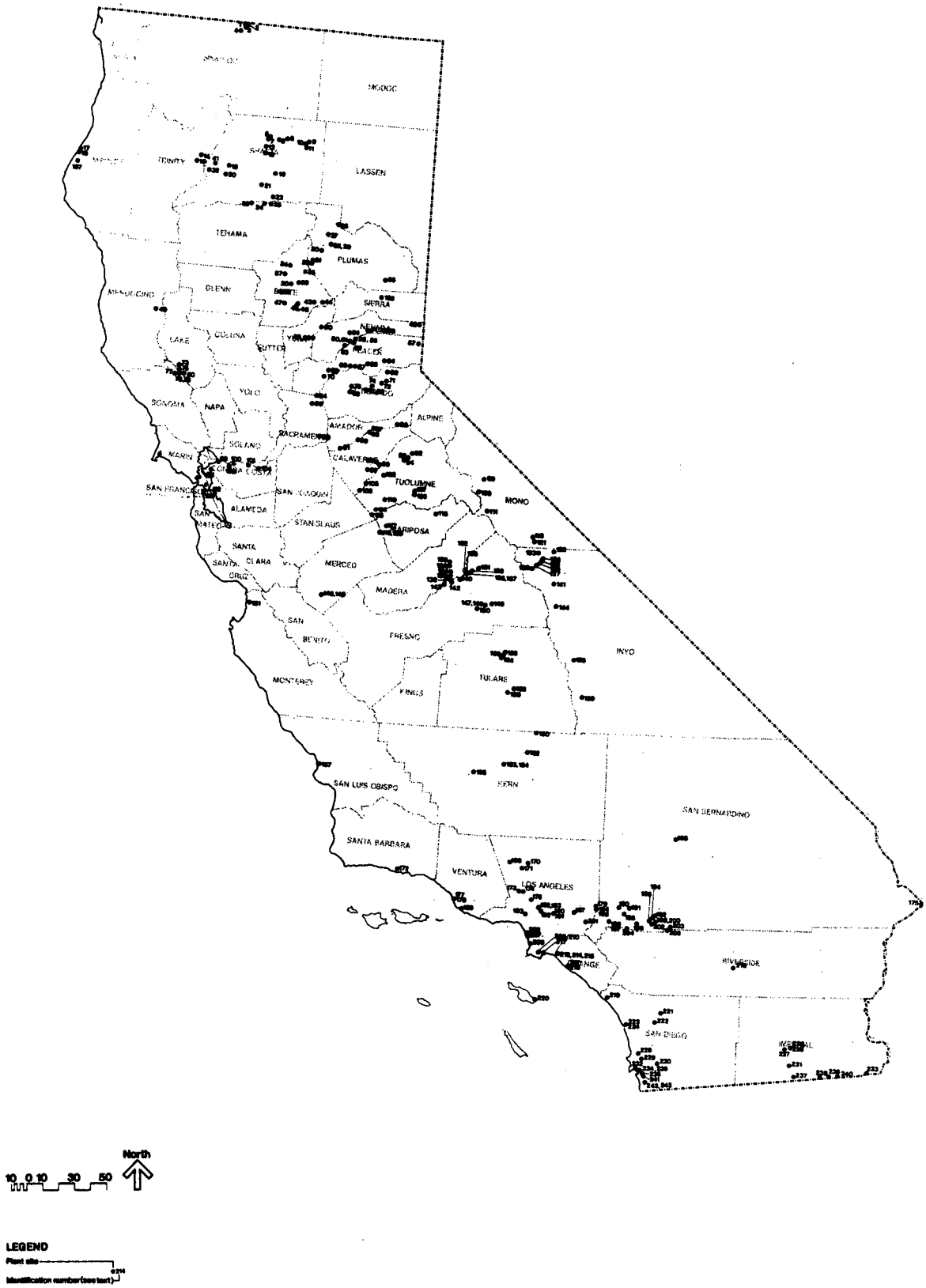


FIGURE I-9 LOCATION OF ELECTRIC POWER PLANTS IN CALIFORNIA, 1976

SOURCE: CALIFORNIA ENERGY RESOURCE CONSERVATION AND DEVELOPMENT COMMISSION, 1977 BIENNIAL REPORT, VOLUME 7, 1977

TABLE I-14
ELECTRIC POWER PLANTS IN CALIFORNIA, 1976

PN	NAME	TYPE	IC
1	Fall Creek	H	2
2	Copco 1	H	20
3	Copco 2	H	27
4	Iron Gate	H	18
5	J. B. Black	H	155
6	Pit 3	H	80
7	Pit 5	H	141
8	Pit 4	H	90
9	Pit 1	H	56
10	Hat Creek 2	H	10
11	Hat Creek 1	H	10
12	Pit 6	H	79
13	Pit 7	H	104
14	Trinity	H	106
15	Lewiston	H	0.4
16	Shasta	H	422
17	Humboldt Bay	F	102
18	Humboldt Bay	N	65
19	Kilarc	H	3
20	Keswick	H	75
21	Cow Creek	H	1
22	Volta	H	6
23	Coleman	H	14
24	Inskip	H	6
25	South	H	4
26	Hamilton Beach	H	5
27	Butt Valley	H	36
28	Caribou 2	H	110
29	Caribou 1	H	75
30	Belden	H	118
31	Bucks Creek	H	66
*32	Judge F. Carr	H	141
33	Rock Creek	H	113
34	De Sabla	H	18
35	Cresta	H	68
36	Portola	F	6
37	Centerville	H	6
38	Poe	H	124
39	Lime Saddle	H	2
*41	Spring Creek	H	150
42	Coal Canyon	H	1
43	Forbestown	H	7
44	Woodleaf	H	49
45	Kelly Ridge	H	9
46	Hyatt (Edward)	H	644
47	Thermalito	H	115
48	Farad	H	3
49	Potter Valley	H	9
50	New Colgate	H	284
51	Spaulding 3	H	6
52	Spaulding 1	H	7
53	Spaulding 2	H	4
54	Deer Creek	H	6
55	Drum 2	H	44
56	Drum 1	H	49
57	Kings Beach	F	17
58	Narrows	H	9
59	New Narrows	H	47
60	Dutch Flat 1	H	22
61	Dutch Flat 2	H	23
62	Alta	H	2
63	Chicago Park	H	37
64	French Meadows	H	15
65	L. J. Stephenson	H	110
66	Oxbow	H	6
67	Ralston	H	79
68	Loon Lake	H	74
69	Halsey	H	12
70	Wise	H	12
71	Robbs Peak	H	24
72	Union Valley	H	33
73	Geysers 11	G	119
74	Jaybird	H	133
75	Geysers 7 and 8	G	119
76	Chili Bar	H	7
77	Geysers 3 and 4	G	58
78	Geysers 5 and 6	G	119
79	Geysers 1 and 2	G	27
80	Geysers 9 and 10	G	119
81	El Dorado	H	20
82	Camino	H	143
83	White Rock	H	190
84	Folsom	H	199
85	Nimbus	H	14
86	Salt Springs	H	39
87	Tiger Creek	H	51
88	West Point	H	14
89	Rancho Seco	N	929
90	Electra	H	89
91	Pardee	H	15
92	Donnells	H	54
93	Beardsley	H	10
94	Spring Gap	H	6
95	Murphys	H	4
96	Stanislaus	H	82
97	Angels	H	1
98	Oleum	F	80
99	Lundy	H	3
100	Avon	F	40
101	Pittsburg	F	2029
102	Phoenix	H	2
103	Martinez	F	40
104	Contra Costa	F	1276
105	Melones	H	24
106	Poole	H	10
107	Holm	H	135
108	Tullock	H	17
109	R. Kirkwood	H	68
110	Moccasin	H	90
111	Rush Creek	H	8
112	Potrero	F	501
113	Hunters Point	F	432
114	Don Pedro	H	137
115	Yosemite	H	2
116	La Grange	H	4
117	New Exchequer	H	80
118	Upper Gorge	H	38
119	McSwain	H	9
120	Merced Falls	H	3
121	Middle Gorge	H	38
122	Control Gorge	H	38
123	Pleasant Valley	H	3
124	Bishop Creek 6	H	3
125	Bishop Creek 5	H	4
126	Bishop Creek 4	H	7
127	Bishop Creek 3	H	7
128	Crane Valley	H	1
129	Bishop Creek 2	H	7
130	San Joaquin 3	H	4
131	Portal	H	10
132	Mammoth Pool	H	129
133	Big Creek 1	H	67
134	San Joaquin 2	H	3
135	Big Creek 8	H	58
136	Big Creek 2	H	58
137	Big Creek 2A	H	80
138	San Joaquin 1A	H	0.3
139	Wishon	H	13
140	Big Creek 3	H	106
141	Big Pine	H	3
142	Big Creek 4	H	84
143	Kerckhoff	H	34
144	Division Ck	H	1
145	San Luis	H	424
146	O'Neill	H	25
147	Balch 2	H	97
148	Balch 1	H	31
149	Haas	H	135
150	Kings River	H	44
151	Moss Landing	F	2175
152	Kaweah 3	H	3
153	Kaweah 1	H	2
154	Kaweah 2	H	2
155	Cottonwood	H	2
156	Tule	H	5
*157	Mobile Emer. GT	F	30
158	Tule River	H	2
159	Haiwee	H	6
160	Kern River 3	H	32
*161	Mobile Emer. GT	F	15
162	Borel	H	9
163	Kern Canyon	H	8
164	Kern River 1	H	16
*165	Downieville Diesel	F	0.8
166	Kern	F	166
167	Morro Bay	F	1056
168	Cool Water	F	147
169	Castaic	H	481
170	San Francisquito 1	H	58
171	San Francisquito 2	H	42
172	Elwood	F	57
173	San Fernando	H	6
174	Foothill	H	11
175	Parker	H	120
176	Valley	F	546
177	Mandalay 3	F	138
178	Mandalay	F	435
179	Sierra	H	0.5
180	Lytle Ck	H	0.4
181	Devil Canyon	H	120
182	Olive	F	170
183	Magnolia	F	99
184	Ontario 1	H	0.6
185	Ontario 2	H	0.3
186	Grayson	F	212
187	Azusa	H	3
188	Fontana	H	2
189	Ormond Beach	F	1613
190	Glenarm	F	129
191	Broadway	F	171
192	Santa Ana 1	H	3
193	Franklin	H	2
194	Santa Ana 2	H	0.8
195	Santa Ana 3	H	1
196	Etiwanda 5	F	138
197	Etiwanda	F	911
198	San Bernardino	F	131
199	Mill Creek 3	H	2
200	Mill Creek 2	H	0.2
201	Garden State	F	16
202	Mill Creek 1	H	0.8
203	San Gorgonio 1	H	2
204	Highgrove	F	169
205	San Gorgonio 2	H	0.8
206	Scattergood	F	823
207	El Segundo	F	997
208	Redondo	F	1579
209	Harbor	F	94
210	Harbor	F	389
211	Long Beach 10 & 11	F	180
213	Haynes	F	1608
214	Alamitos 7	F	138
215	Alamitos	F	1982
216	Coachella	F	92
217	Huntington Beach	F	138
218	Huntington Beach	F	870
219	San Onofre	N	540
220	Pebbly Beach	F	8
221	Rincon	H	0.2
222	Bear Valley	H	0.5
223	Encina	F	18
224	Encina	F	637
225	Brawley	F	13
226	Brawley	F	22
227	Turnip	H	0.4
228	Miramar	F	39
229	Kearny	F	165
230	El Cajon	F	18
231	El Centro	F	189
232	Naval Trng. Cntr. (NTC)	F	18
233	Pilot Knob	H	33
234	North Island	F	39
235	Station B	F	96
236	Silvergate	F	247
237	Double Weir	H	0.6
238	Drop 4	H	20
239	Drop 3	H	10
240	Drop 2	H	10
241	Division	F	18
242	South Bay	F	22
243	South Bay	F	714

PN-Plant Number H-Hydroelectric N-Nuclear F-Fossil Fuel G-Geothermal IC-Installed Capacity (in megawatts) Nameplate Rating

*Indicates plants which appear out of numbering sequence on map - all are in Northern California.

SOURCE: CALIFORNIA ENERGY RESOURCE CONSERVATION AND DEVELOPMENT COMMISSION, 1977 BIENNIAL REPORT, VOLUME 7, 1977

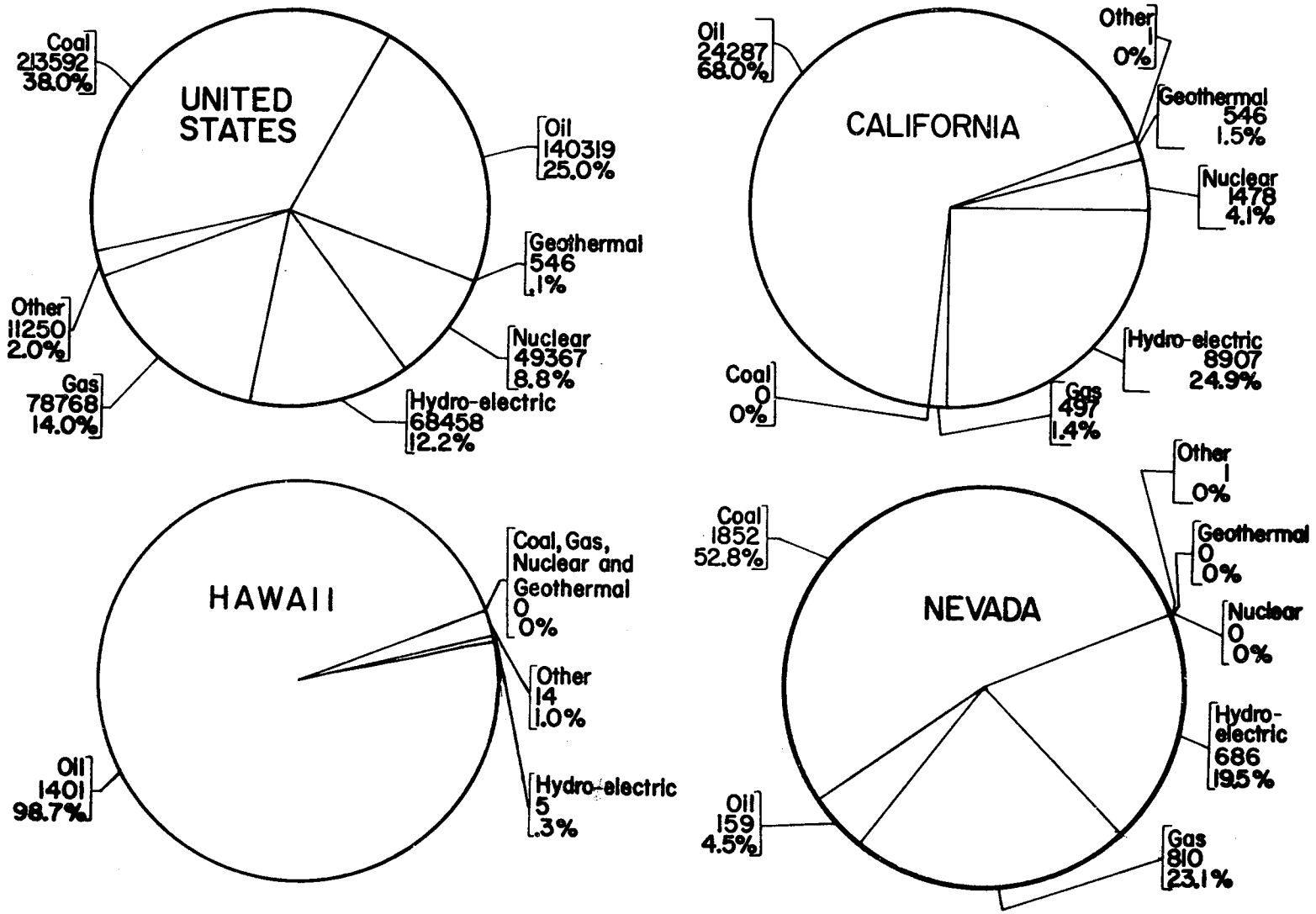


FIGURE I-10 ELECTRIC GENERATING CAPACITY BY FUEL, 1977

SOURCE: U. S. DEPARTMENT OF ENERGY, INVENTORY OF POWER PLANTS IN THE UNITED STATES DOE/RA-0001, DECEMBER 1977

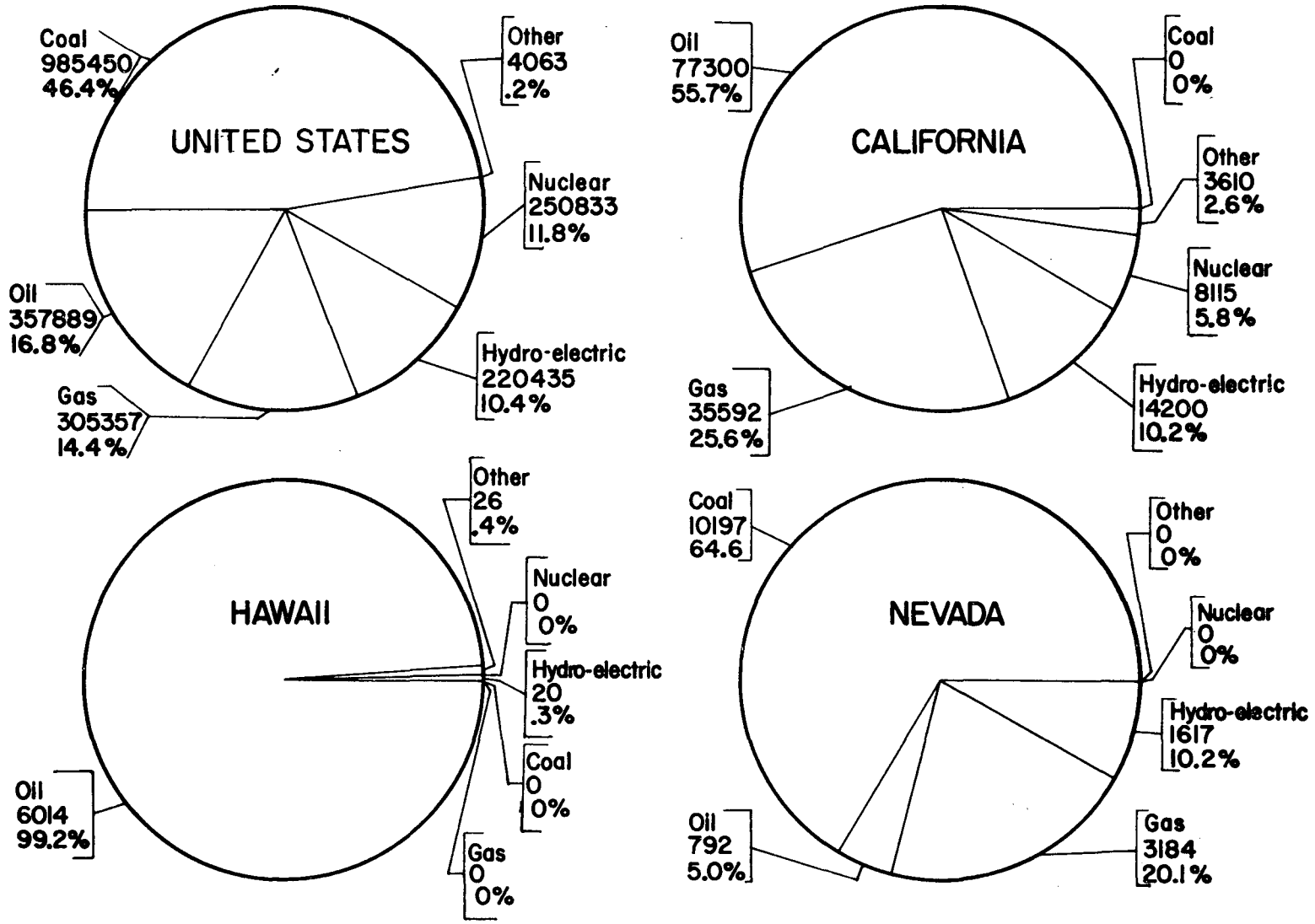


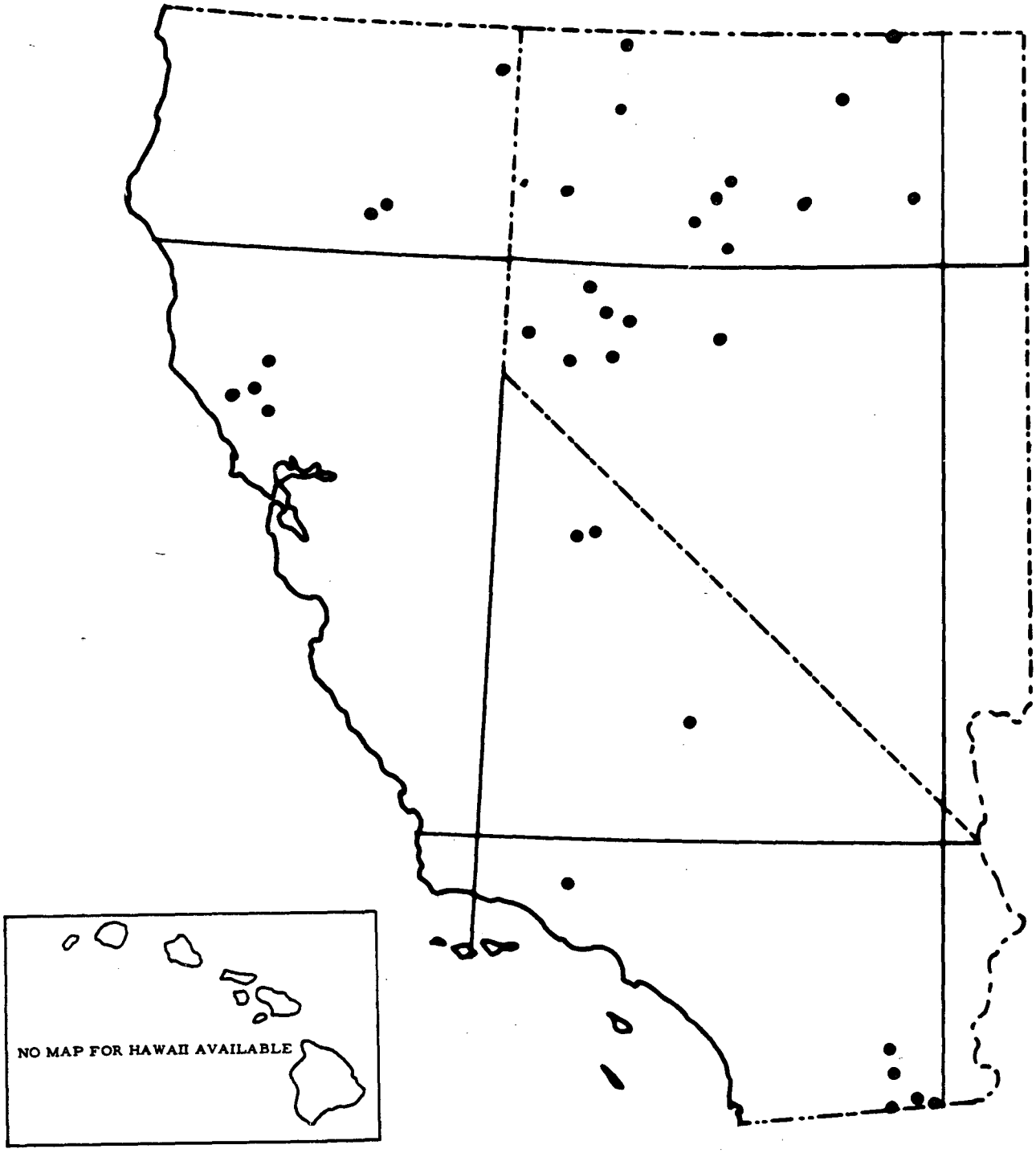
FIGURE I-11 PRODUCTION OF ELECTRICITY BY SOURCE, 1977

SOURCE: U. S. DEPARTMENT OF ENERGY, INVENTORY OF POWER PLANTS IN THE UNITED STATES DOE/RA-0001, DECEMBER 1977

I-B-8 GEOTHERMAL

MAPS SHOWING THE LOCATIONS OF GEOTHERMAL ACTIVITY THAT MAY BE POTENTIAL SITES FOR UTILIZING GEOTHERMAL ENERGY ARE PRESENTED IN THIS SECTION. A MORE DETAILED MAP OF GEOTHERMAL FIELDS IN CALIFORNIA IS SHOWN IN FIGURE I-5. DATA ON ELECTRICITY GENERATION AT THE GEYSERS FIELD IN CALIFORNIA ARE GIVEN IN THE PREVIOUS SECTION.

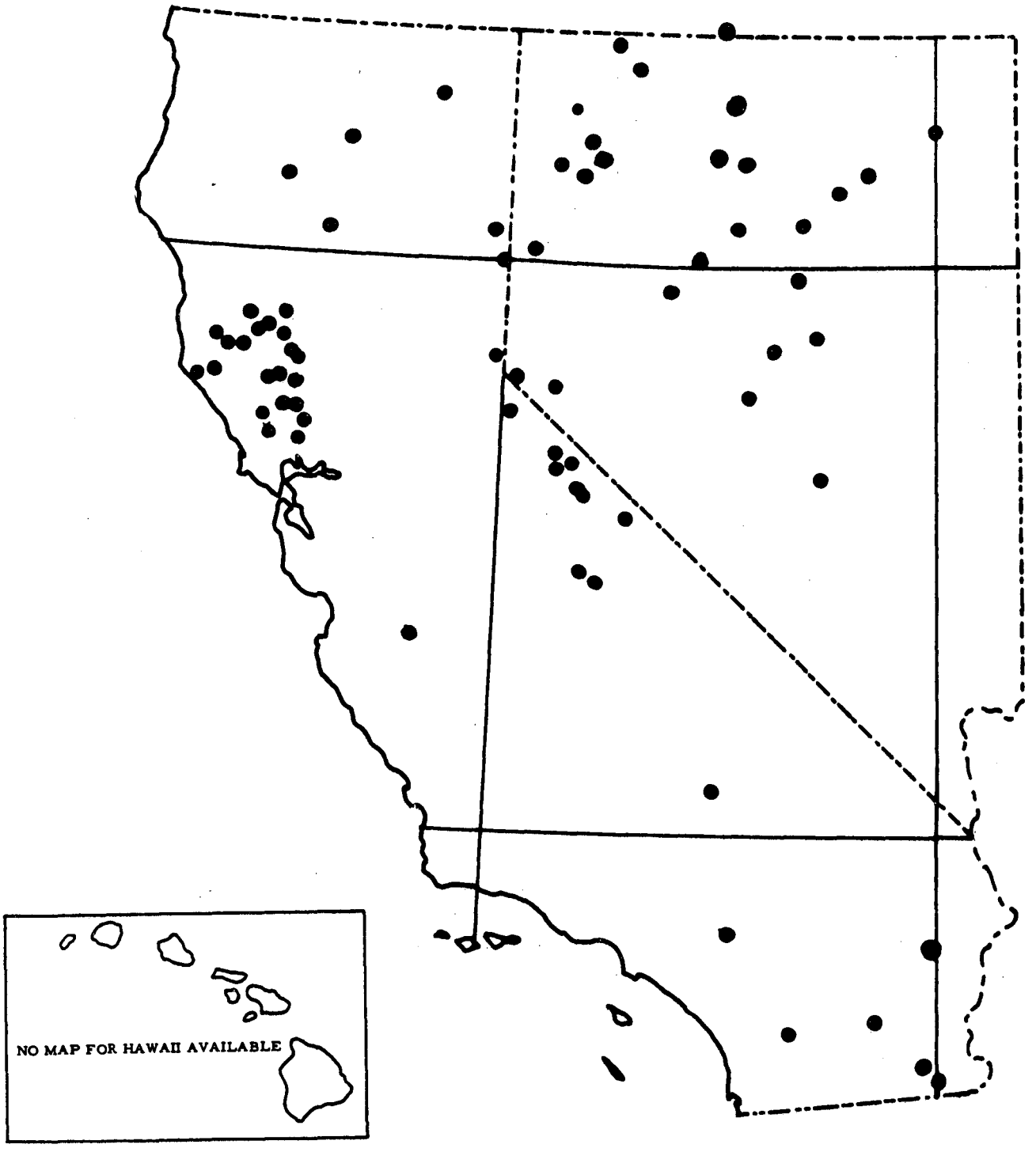
THE MAPS OF GEOTHERMAL ACTIVITY ARE TAKEN FROM A U.S. GEOLOGICAL SURVEY REPORT. THE MAP OF POTENTIAL GEOTHERMAL SITES IN HAWAII IS FROM THE HAWAII NATURAL ENERGY INSTITUTE.



NOTE:GREATER THAN 150°C

FIGURE I-12 LOCATION OF HIGH TEMPERATURE HYDROTHERMAL CONVECTION SYSTEMS

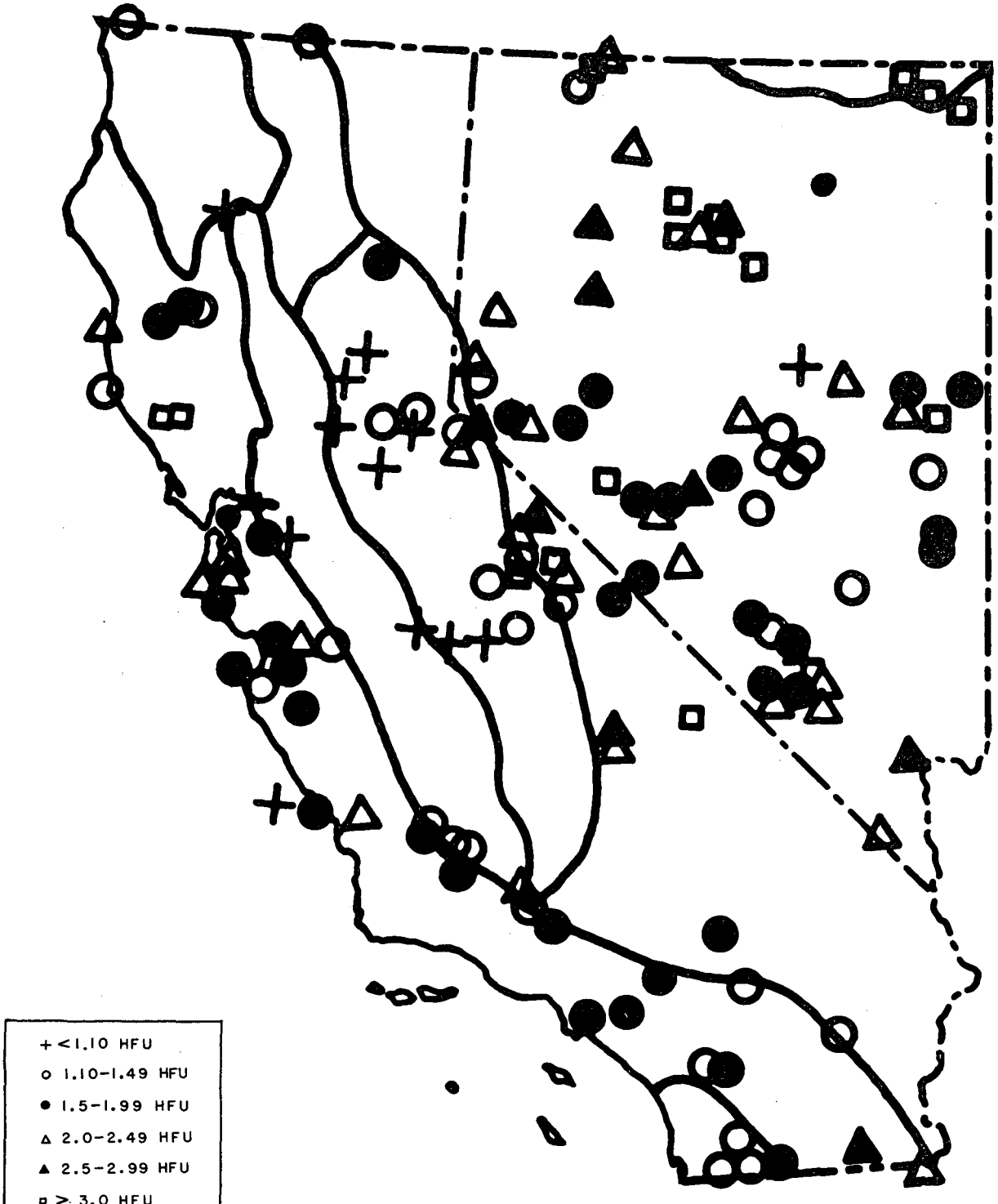
SOURCE: U. S. GEOLOGICAL SURVEY, ASSESSMENT OF GEOTHERMAL RESOURCES OF THE U. S. GEOTHERMAL CIRCULAR #726, 1975



NOTE: LESS THAN 150°C

FIGURE I-13 LOCATION OF LOW TEMPERATURE HYDROTHERMAL CONVECTION SYSTEMS

SOURCE: U. S. GEOLOGICAL SURVEY, ASSESSMENT OF GEOTHERMAL RESOURCES OF THE U. S. GEOTHERMAL CIRCULAR #726, 1975



NOTE: ONE HEAT-FLOW UNIT (HFU) = 1×10^{6} cal/cm^{2}-s

FIGURE I-14 OBSERVED HEAT FLOW

SOURCE: U. S. GEOLOGICAL SURVEY, ASSESSMENT OF GEOTHERMAL RESOURCES OF THE U. S. GEOTHERMAL CIRCULAR #726, 1975

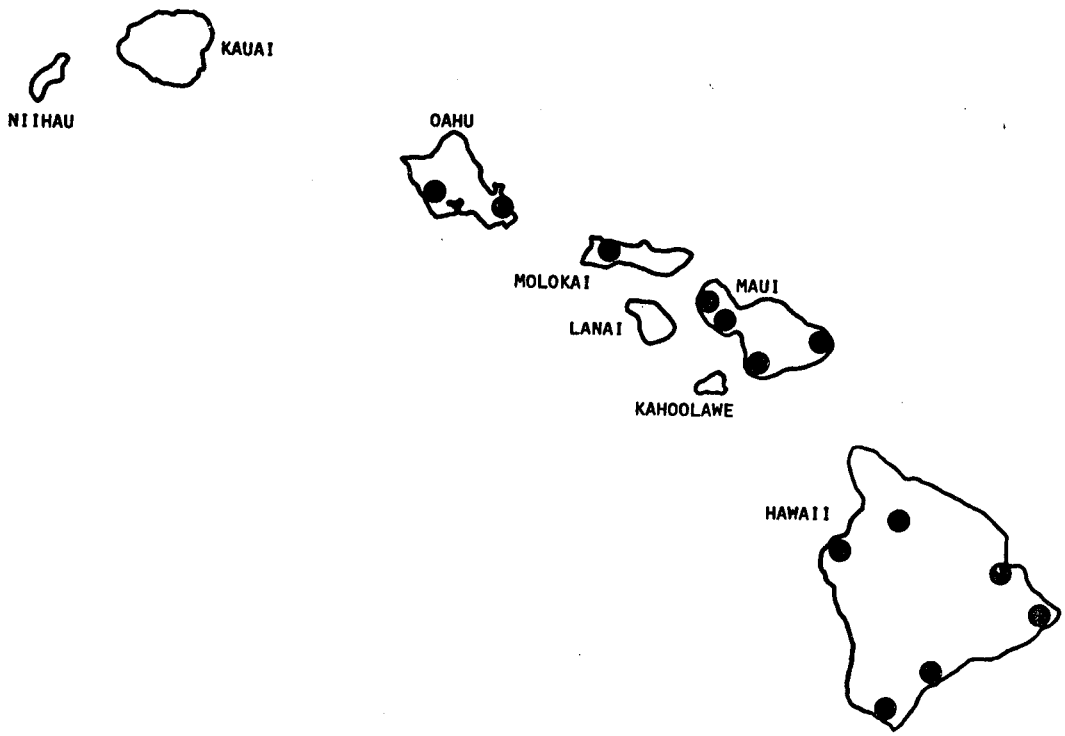


FIGURE I-15 POTENTIAL GEOTHERMAL SITES IN HAWAII

SOURCE: HAWAII NATURAL ENERGY INSTITUTE, 1977 ANNUAL REPORT, 1977

I-B-9 SOLAR ENERGY

THE POTENTIAL FOR USING SOLAR ENERGY IN THIS REGION IS LARGE BECAUSE OF THE HIGH LEVEL OF INSOLATION. THESE DATA ARE PRESENTED IN THE MAP INCLUDED IN THIS SECTION. THE MAP IS FROM THE WEATHER ATLAS OF THE U.S.

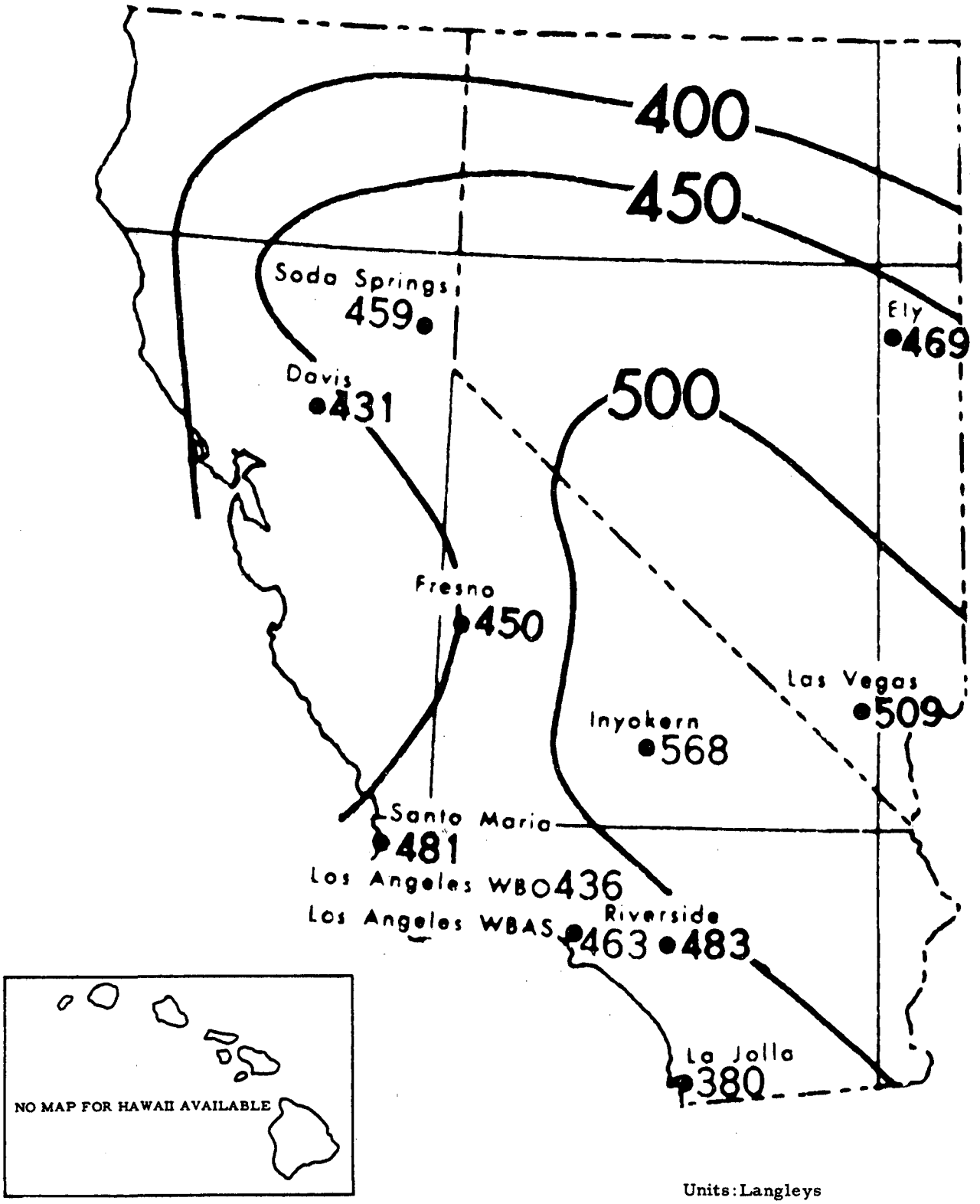
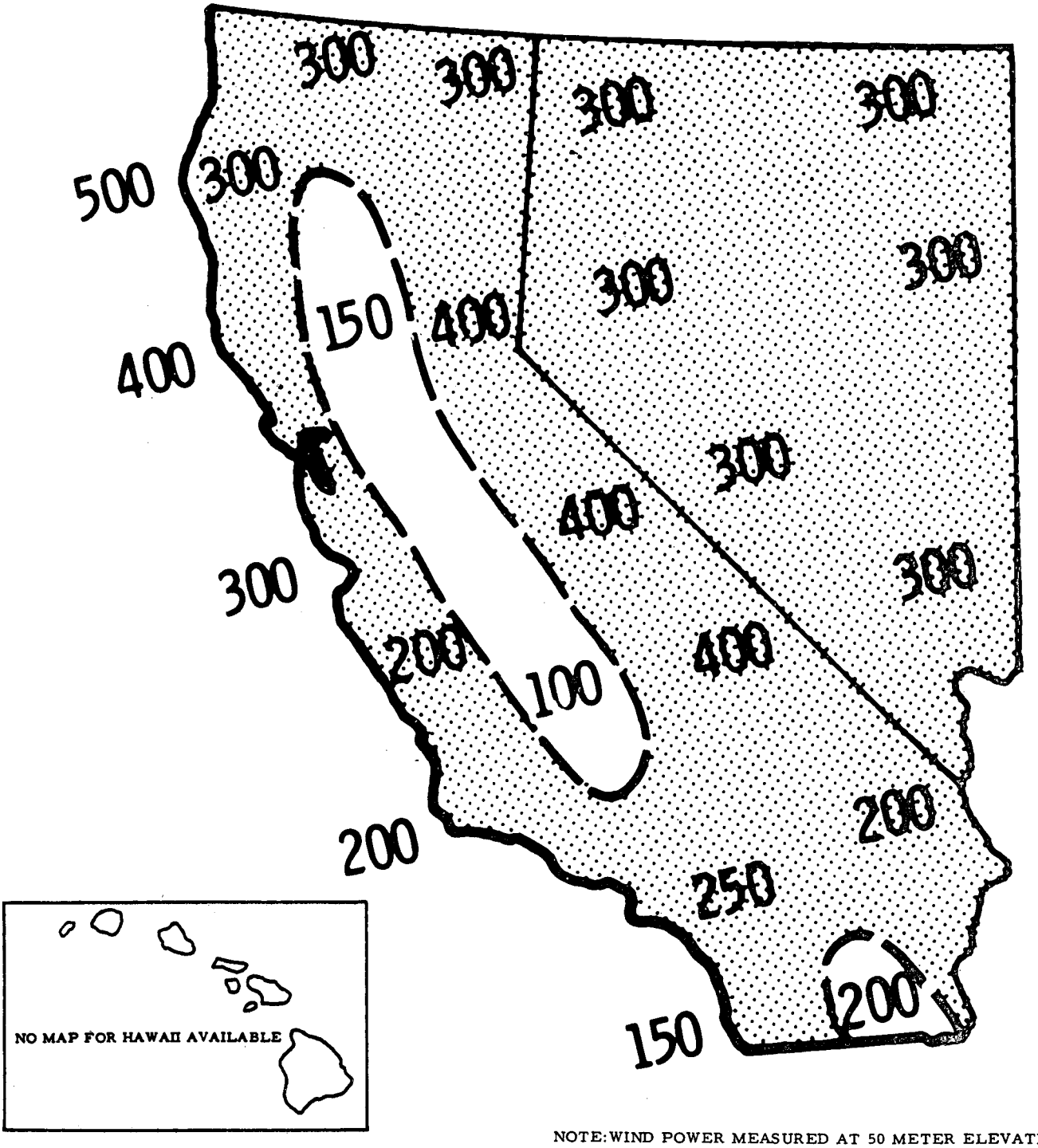


FIGURE I-16 MEAN ANNUAL DAILY SOLAR RADIATION

SOURCE: U. S. ENVIRONMENTAL DATA SERVICE, WEATHER ATLAS OF THE UNITED STATES, 1968 (REPRINTED 1975)

I-B-10 WIND ENERGY

A MAP SHOWING THE MEAN ANNUAL WIND ENERGY FOR CALIFORNIA AND NEVADA IS INCLUDED IN THIS SECTION. THE MAP IS TAKEN FROM A REPORT PREPARED BY THE PACIFIC NORTHWEST LABORATORY. SIMILAR DATA IS NOT AVAILABLE FOR HAWAII.



NOTE: WIND POWER MEASURED AT 50 METER ELEVATION

Units: Watts/meter^2

FIGURE I-17 MEAN ANNUAL WIND POWER

SOURCE: ELLIOTT, D. I., (AN OVERVIEW OF NATIONAL WIND ENERGY POTENTIAL PRESENTED AT THE CONFERENCE ON CLIMATE AND ENERGY: CLIMATOLOGICAL ASPECTS AND INDUSTRIAL OPERATIONS), MAY 8-10, 1978

I-B-11 ENERGY FROM WOOD

THERE ARE NO DATA ON THE PRESENT AMOUNT OF WOOD THAT IS BEING USED AS A FUEL IN CALIFORNIA OR NEVADA.

ESTIMATES HAVE BEEN MADE FOR THE POTENTIAL OF WOOD AND OTHER BIOMASS AS A SOURCE OF ENERGY FOR CALIFORNIA. IN A STUDY BY TEKNEKRON, INC., IT WAS ESTIMATED THAT THE HEAT CONTENT OF A CROP OF FORAGE SORGHUM WOULD AMOUNT TO 450 TRILLION BTUS. THIS WOULD REQUIRE 1.44 MILLION ACRES OF LAND. IF THIS CROP WERE USED TO GENERATE ELECTRICITY WITH AN EFFICIENCY OF 30 PERCENT AND A CAPACITY FACTOR OF 70 PERCENT, THE EQUIVALENT CAPACITY WOULD BE 6400 MW.

IN ADDITION, THE HARDWOODS ON FEDERAL AND PRIVATE FOREST LANDS COULD PROVIDE A TOTAL OF 760 TO 1060 TRILLION BTUS ASSUMING THEY WERE HARVESTED OVER A TWENTY YEAR PERIOD AND THERE IS NO REGENERATION OR GROWTH. ADDITIONAL HARDWOODS CAN BE HARVESTED FROM NON-COMMERCIAL FORESTLAND.

CHAPPARAL, WHICH GROWS IN THE SOUTHEASTERN PART OF THE CALIFORNIA, COULD PROVIDE TWO TRILLION BTU PER YEAR. THIS ESTIMATE IS BASED ON FOUR MILLION ACRES, 0.25 TONS PER ACRE AND TEN PERCENT ACCESSIBILITY.

AGRICULTURAL RESIDUES ARE A SIGNIFICANT SOURCE OF ENERGY FOR HAWAII. THE CURRENT AMOUNT USED AND THE EXCESS THAT MIGHT BE USED IS SHOWN IN THE NEXT SECTION. THE PEPEEKEO SUGAR MILL BURNED 5,000 TONS OF WOOD CHIPS IN 1975. ANOTHER SUGAR COMPANY, HAWAII COMMERCIAL AND SUGAR, ALSO BURNS WOOD CHIPS, BUT THE TOTAL AMOUNT IS NOT KNOWN. BECAUSE OF THE LACK OF RAINFALL THE POTENTIAL BIOMASS AS A SOURCE OF FUEL FOR NEVADA IS LIMITED

SOURCE - TEKNEKRON, INC., A PRELIMINARY ASSESSMENT OF THE POTENTIAL FOR PRODUCING BIOMASS FROM TERRESTIAL SOLAR ENERGY PLANTATIONS IN CALIFORNIA
HAWAII DATA FROM AN ARTICLE IN THE HAWAIIAN PLANTERS RECORD, VOL 59 NO 5, BY DONALD MURATA AND WARREN GIBSON ENTITLED ENERGY INVENTORY FOR HAWAIIAN SUGAR FACTORIES 1975.

I-B-12 ENERGY FROM WASTE

THERE IS GREAT POTENTIAL FOR USING MUNICIPAL AND AGRICULTURAL WASTES AS A SOURCE OF ENERGY IN HAWAII AND CALIFORNIA. DATA FOR CURRENT AND POTENTIAL USE OF AGRICULTURAL WASTES IN HAWAII ARE PRESENTED IN THIS SECTION. THE STATUS OF PROJECTS FOR WASTE UTILIZATION IS ALSO PRESENTED. THE INFORMATION PROVIDED IS DERIVED FROM A VARIETY OF SOURCES AS INDICATED.

TABLE I-15
MUNICIPAL SOLID WASTE RECOVERY SYSTEMS
[CAPACITY IN TONS PER DAY]

LOCATION	PARTICIPANTS	PROCESS	CAPACITY	STATUS	DESCRIPTION
CALIFORNIA					
MENLO PARK	COMBUSTION POWER CORPORATION	FLUIDIZED-BED COMBUSTION	75	GENERATING	DIRECT POWER GENERATION FROM THE EXHAUST GASES. ONE MW EQUIVALENT POWER
SAN DIEGO	SAN DIEGO COUNTY; EPA; OCCIDENTAL PETROLEUM	PYROLYSIS	200	COMMITTED	SHREDDING, AIR CLASSIFICATION, MAGNETIC AND MECHANICAL SEPARATION AND FROTH FLOATATION. PYROLYSIS OIL FOR CO-FIRING WITH OIL. FOUR MW EQUIVALENT POWER.
OAKLAND	EAST BAY MUNICIPAL UTILITY DISTRICT; PACIFIC GAS AND ELECTRIC CO.	PYROLYSIS	1,200	PLANNED	PYROLYSIS GAS CONVERTED TO METHANE. TWENTY-FIVE MW EQUIVALENT POWER.
HAWAII					
HONOLULU	CITY OF HONOLULU; HAWAIIAN ELECTRIC CO.	INCINERATION	2,000	PLANNED	STEAM-ELECTRIC UNIT. FORTY-EIGHT MW EQUIVALENT POWER.

SOURCE - BECHTEL CORP, FUELS FROM MUNICIPAL REFUSE FOR UTILITIES, MARCH, 1975
NRCC SOLID WASTE MANAGEMENT BRIEFS, JUNE 1976

NOTES - THE PLANT IN HONOLULU IS MERELY A PRELIMINARY CONCEPTUAL STUDY. THE HAWAIIAN ELECTRIC COMPANY HAS NO FIRM PLANS TO CONSTRUCT SUCH A PLANT.

TABLE I-16
AGRICULTURAL WASTES USED AS BOILER FUEL IN HAWAII, 1977
[WASTE IN THOUSANDS OF DRY TONS, HEAT IN BILLION BTUS]

	BAGASSE BOILER FUEL			OTHER WASTE BOILER FUEL			EXCESS BAGASSE	
ISLAND	TONNAGE	GROSS HEAT	NET HEAT	TONNAGE	GROSS HEAT	NET HEAT	TONNAGE	GROSS HEAT
HAWAII	557.2	9,228	5,691	38.8	684	440	35.2	582
KAUAI	311.6	5,170	3,063	0.0	0	0	14.9	247
MAUI	293.6	4,873	3,133	NA	(1)	(1)	3.6	59
OAHU	225.4	3,737	2,356	54.4	409	225	6.5	108
TOTAL	1,387.6	23,008	14,243	93.2	1,039	665	60.2	996

SOURCE - HAWAII DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT, ENERGY USE IN HAWAII, NOV. 1977

NOTES - OTHER WASTE INCLUDES WOOD CHIPS, NUT SHELLS AND FIBROUS TRASH.
(1) INSIGNIFICANT

AGRICULTURAL WASTES IN CALIFORNIA AND NEVADA

THE AMOUNTS OF REUSABLE DRY AGRICULTURAL WASTES PRODUCED ARE 24.0 MILLION TONS PER YEAR IN CALIFORNIA AND 0.2 MILLION TONS PER YEAR IN NEVADA. THIS REPRESENTS ABOUT SIX PERCENT OF THE NATIONAL TOTAL.

I-B-13 OCEAN THERMAL ENERGY CONVERSION AND HYDROELECTRIC PUMPED STORAGE

OCEAN THERMAL ENERGY CONVERSION (OTEC)

AT THE PRESENT TIME NO OTEC SITES OFF THE CALIFORNIA COAST ARE BEING ACTIVELY EXAMINED. IN HAWAII, ONE SITE 16 MILES OFF HAWAII POINT ON THE KAUAI ISLAND IS CURRENTLY BEING INVESTIGATED AND A SMALL PROTOTYPE FACILITY IS UNDER CONSTRUCTION.

HYDROELECTRIC PUMPED STORAGE

CALIFORNIA IS THE ONLY STATE IN THIS REGION THAT HAS EXISTING OR PLANNED PUMPED STORAGE CAPACITY. EXISTING CAPACITY TOTALS NEARLY 1700 MEGAWATTS WITH ANOTHER 3560 MEGAWATTS EITHER PLANNED OR UNDER CONSTRUCTION. THESE PLANTS ARE USED PRIMARILY TO PROVIDE PEAKING POWER. THE STATUS OF THE PUMPED STORAGE PLANTS ARE SUMMARIZED IN THE FOLLOWING TABLE.

TABLE I-17
HYDROELECTRIC PUMPED STORAGE, 1976

NAME OF PROJECT	RIVER	CAPACITY (MWE)	INITIAL YEAR	STATUS
CASTAIC	CALIFORNIA AQUEDUCT	481	1972	O
ONEILL	DELTA-MENDOTA CANAL SAN LUIS CREEK	25	1967	O
OROVILLE	FEATHER	644	1968	O
SAN LUIS	SAN LUIS CREEK	424	1968	O
SENATOR WASH	COLORADO	7	1965	O
THERMALITO	FEATHER	115	1968	O
BLACK STAR	SANTIAGO CREEK	1,235	---	UC
CALIFORNIA AQUEDUCT	CALIFORNIA AQUEDUCT	280	---	P
HELMS	KINGS	1,250	---	P
CASTAIC	CASTAIC CREEK	1,275	1977	UC

SOURCE - U.S. ENERGY INFORMATION AGENCY, HYDROELECTRIC PLANT CONSTRUCTION COSTS AND ANNUAL PRODUCTION EXPENSES, 1976 [DOE/EIA-0006/20]

NOTES - ALL PLANTS ARE LOCATED IN CALIFORNIA.
O - OPERATING UC - UNDER CONSTRUCTION P - PLANNED

I-C ENERGY CONSUMPTION

I-C-1 ENERGY CONSUMED BY SECTOR

THIS SECTION CONTAINS DATA ON FUEL AND ELECTRICITY CONSUMPTION BY SECTOR. DATA FOR 1975 ARE PRESENTED FOR THREE FUELS (NATURAL GAS, PETROLEUM PRODUCTS AND COAL) AND FOR ELECTRICITY CONSUMED BY THE RESIDENTIAL, COMMERCIAL, INDUSTRIAL, ELECTRIC UTILITIES AND TRANSPORTATION SECTORS. SIMILAR DATA ARE ALSO PRESENTED FOR THE GROSS CONSUMPTION OF ENERGY. DIFFERENCES IN THE PATTERN OF CONSUMPTION AMONG THE THREE STATES AND THE UNITED STATES ARE HIGHLIGHTED THROUGH THE USE OF PIE CHARTS.

MORE DETAILED DATA ARE PRESENTED FOR THE TRANSPORTATION AND MANUFACTURING SECTORS. DATA ON THE USE OF PETROLEUM FUELS IN TRANSPORTATION FOR 1975 ARE TABULATED. ADDITIONAL DATA ARE GIVEN ON MOTOR VEHICLE REGISTRATION AND MILEAGE. PURCHASES OF ENERGY BY MANUFACTURES ARE TABULATED BY FUEL AND TWO-DIGIT SIC CODE.

FOR REASONS OF CONSISENCY, ALL THE FUEL AND ELECTRICITY CONSUMPTION DATA FOR 1975 ARE TAKEN FROM THE ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM. THE DATA ON ENERGY PURCHASES BY MANUFACTURES ARE FROM THE ANNUAL SURVEY OF MANUFACTURES 1974, FUELS AND ELECTRIC ENERGY CONSUMED.

TABLE I-18
CONSUMPTION OF PETROLEUM PRODUCTS BY SECTOR, 1975
[IN TRILLIONS OF BTU]

REGION	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	ELECTRIC UTILITIES	TRANSPOR -TATION	TOTAL
CALIFORNIA	27.65	40.89	162.93	515.09	1,889.63	2,632.96
HAWAII	2.35	1.25	13.52	58.39	125.49	200.80
NEVADA	3.73	1.77	4.33	9.14	86.25	105.13
REGION TOTAL	33.73	43.91	180.78	582.62	2,101.37	2,938.89
UNITED STATES	2,796.88	2,109.82	2,441.05	3,239.98	17,319.56	27,814.01
PERCENT OF US	1.2	2.1	7.4	18.0	12.1	10.6

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978

NOTES - PETROLEUM PRODUCTS INCLUDE GASOLINE, DISTILLATE AND RESIDUAL FUEL OIL, KEROSENE, DIESEL FUEL, LIQUID PETROLEUM GAS AND JET FUEL.

TABLE I-19
CONSUMPTION OF NATURAL GAS BY SECTOR, 1975
[IN TRILLIONS OF BTU]

REGION	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	ELECTRIC UTILITIES	TRANSPOR -TATION	TOTAL
CALIFORNIA	651.60	247.93	725.05	283.27	20.93	1,928.77
HAWAII	0.00	0.00	0.00	0.00	0.00	0.00
NEVADA	11.45	15.44	10.58	25.96	0.00	63.43
REGION TOTAL	663.05	263.37	735.63	309.23	20.93	1,992.20
UNITED STATES	4,978.48	2,588.74	8,885.92	3,247.57	601.62	20,302.10
PERCENT OF US	13.3	10.2	8.3	9.5	3.5	9.8

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978

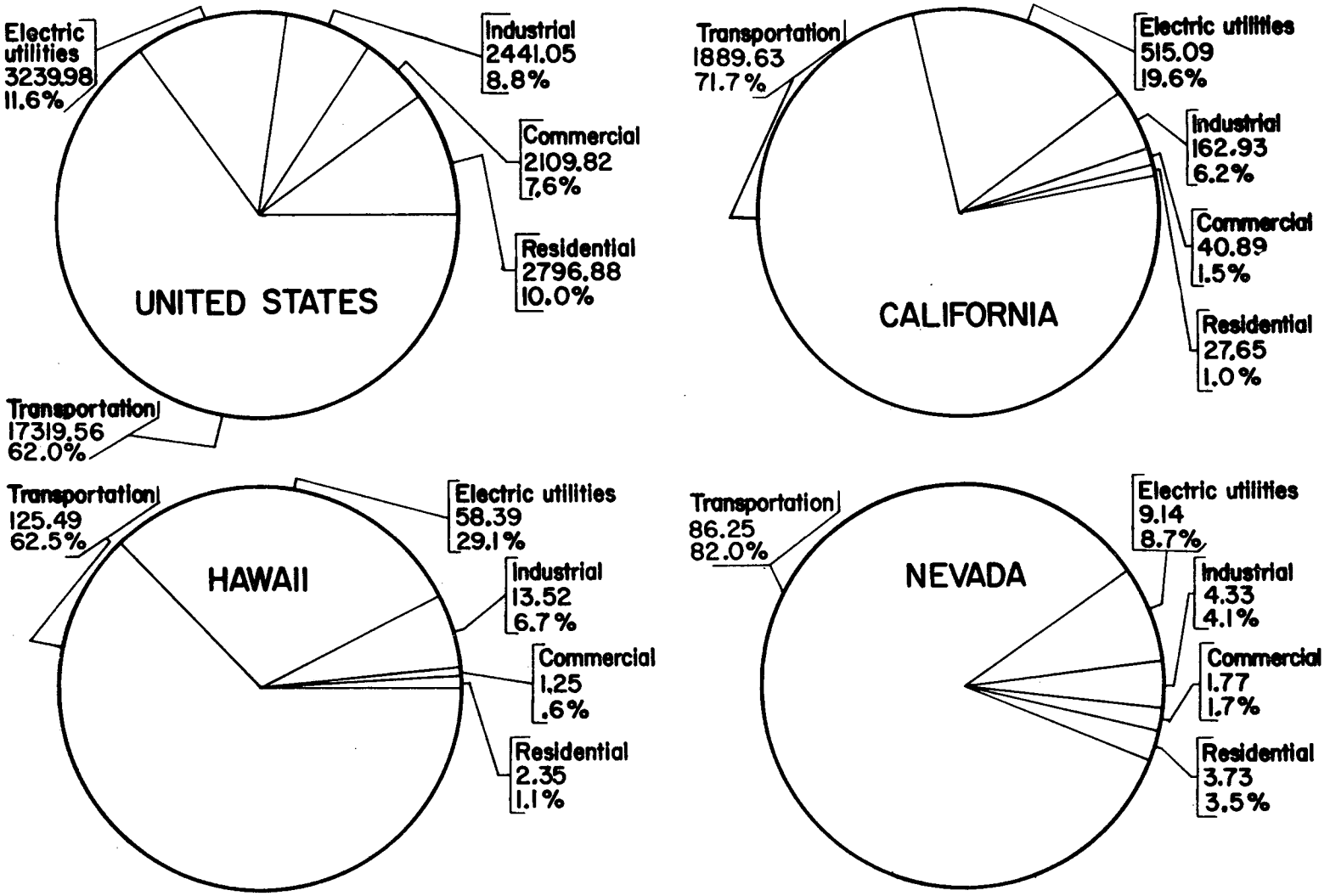


FIGURE I-18 CONSUMPTION OF PETROLEUM PRODUCTS, 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

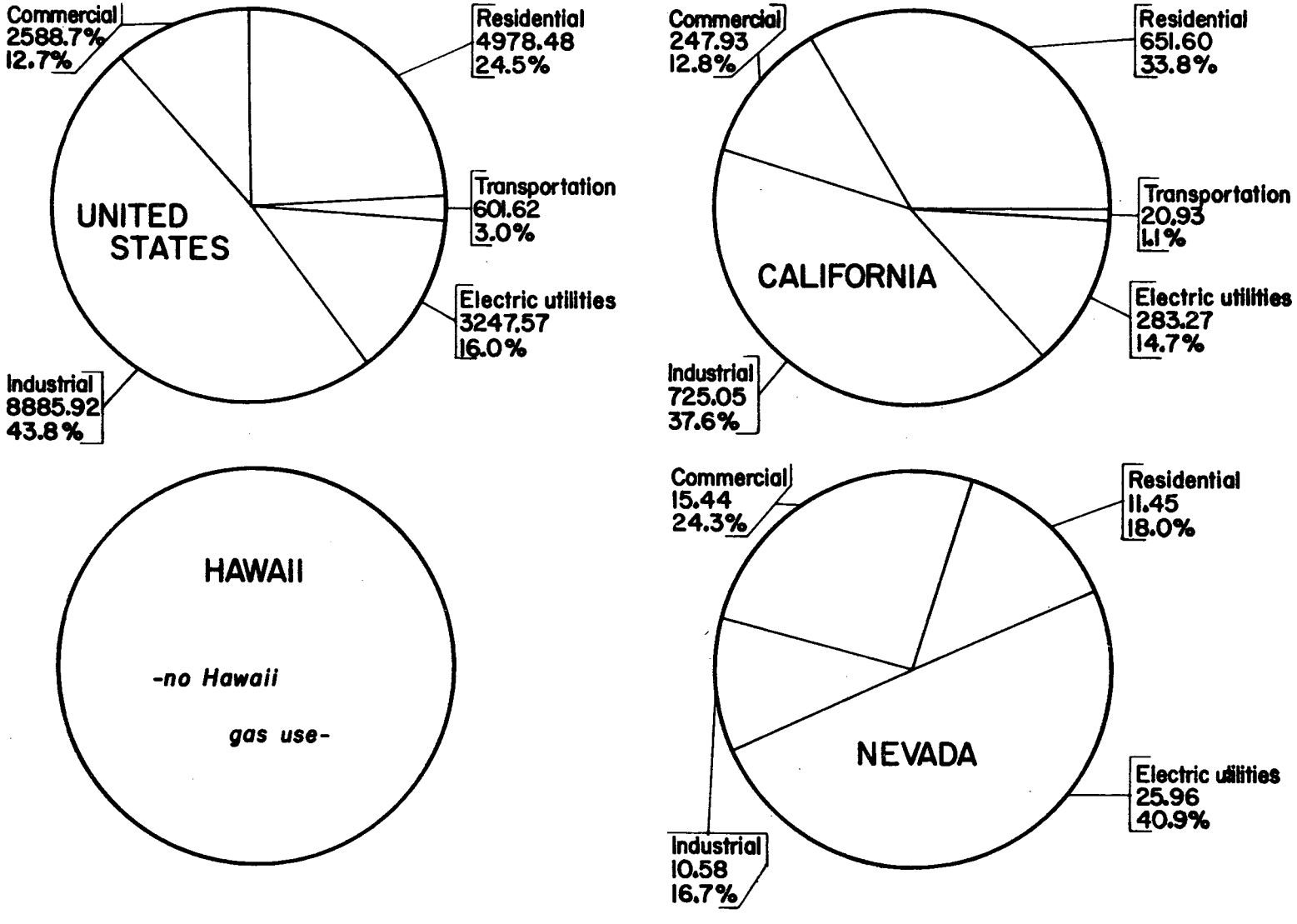


FIGURE I-19 CONSUMPTION OF NATURAL GAS, 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

TABLE I-20
CONSUMPTION OF COAL BY SECTOR, 1975
[IN TRILLIONS OF BTU]

REGION	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	ELECTRIC UTILITIES	TRANSPOR -TATION	TOTAL
CALIFORNIA	0.00	0.00	222.66	0.00	---	54.33
HAWAII	0.00	0.00	0.00	0.00	---	0.00
NEVADA	0.09	0.05	1.69	25.96	---	100.45
REGION TOTAL	0.09	0.05	224.35	25.96	---	154.78
UNITED STATES	111.97	64.25	4,233.27	9,286.95	---	13,153.40
PERCENT OF US	0.0	0.0	5.3	0.3	---	1.2

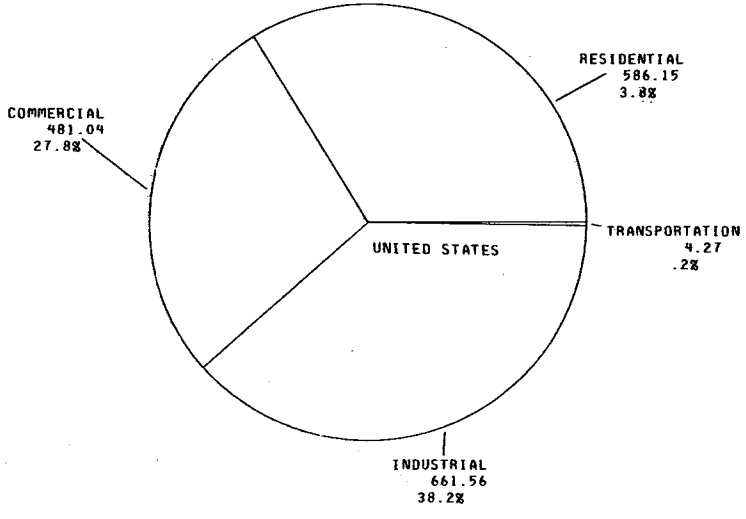
SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978

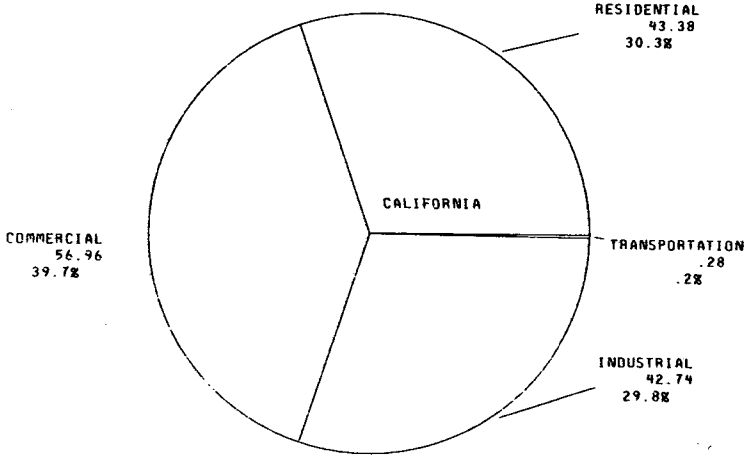
NOTES - INDUSTRIAL CONSUMPTION INCLUDES PETROLEUM COKE. THE REMAINING SECTORS AND THE TOTAL INCLUDE COAL ONLY.

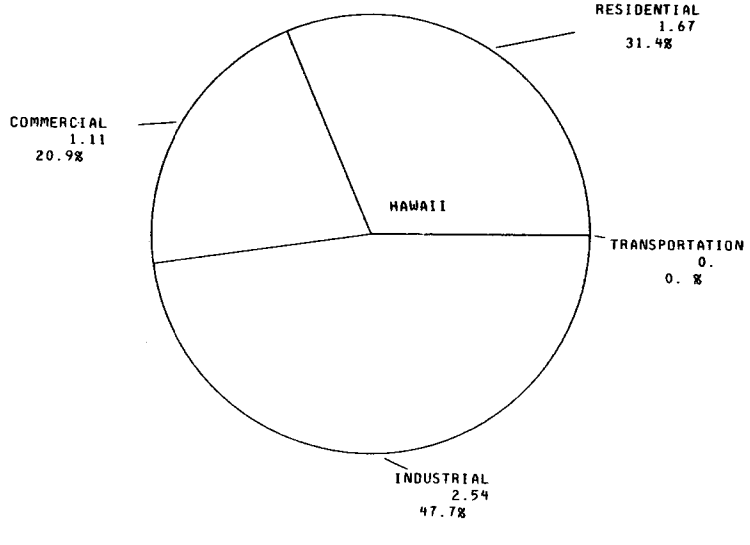
TABLE I-21
CONSUMPTION OF ELECTRICITY BY SECTOR, 1975
[IN BILLIONS OF KILOWATT-HOURS]

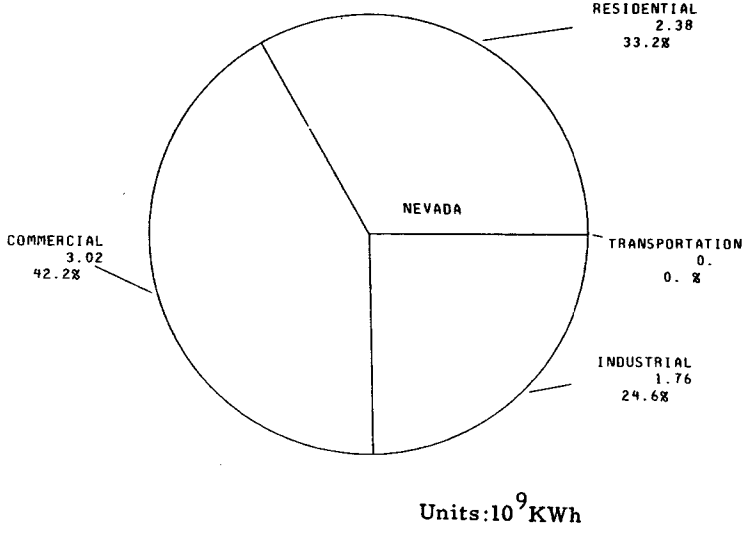
REGION	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	ELECTRIC UTILITIES	TRANSPOR -TATION	TOTAL
CALIFORNIA	43.38	56.96	42.74	---	0.28	143.65
HAWAII	1.67	1.11	2.54	---	0.00	5.32
NEVADA	2.83	3.02	1.76	---	0.00	7.61
REGION TOTAL	47.88	61.09	47.04	---	0.28	156.58
UNITED STATES	586.15	481.04	661.56	---	4.27	1,733.01
PERCENT OF US	8.2	12.7	7.1	---	6.6	9.0

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978









Units:10^9KWh

FIGURE I-20 ELECTRICITY CONSUMPTION BY SECTOR, 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

TABLE I-22
GROSS CONSUMPTION OF ENERGY BY SECTOR, 1975
[IN TRILLIONS OF BTU]

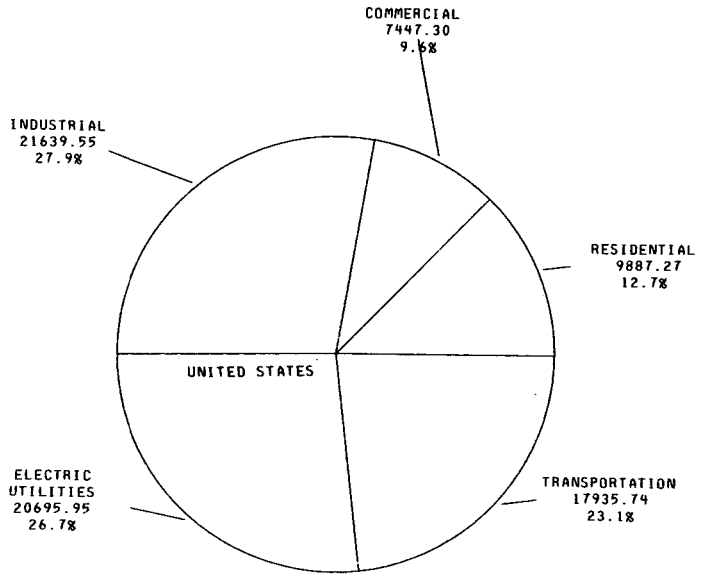
REGION	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	ELECTRIC UTILITIES	TRANSPOR -TATION	TOTAL
CALIFORNIA	827.27	557.06	1,481.00	1,278.72	1,911.52	5,563.16
HAWAII	8.56	7.60	27.46	58.58	125.50	208.86
NEVADA	24.93	33.26	23.84	151.28	86.24	293.48
REGION TOTAL	860.26	597.92	1,532.20	1,488.58	2,123.26	6,065.50
UNITED STATES	9,887.27	7,447.30	21,639.55	20,695.95	17,935.74	71,599.12
PERCENT OF US	8.7	8.0	7.1	7.2	11.8	8.5

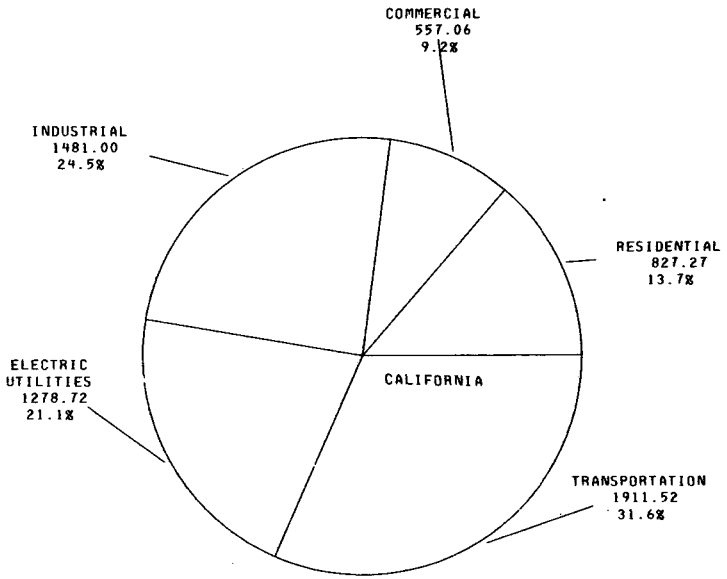
SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978

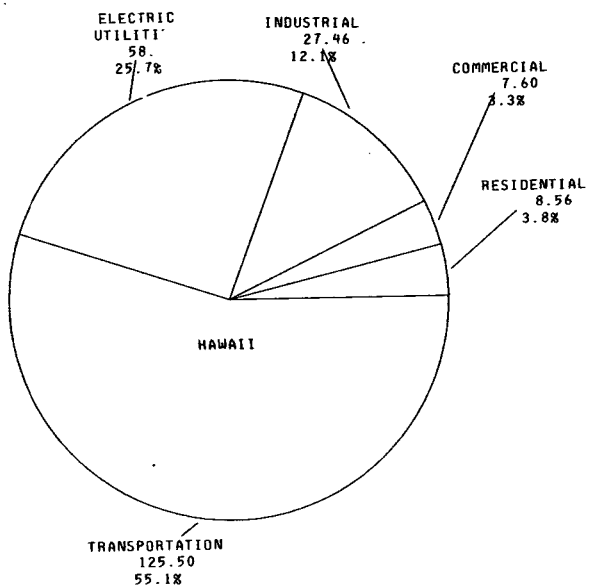
TABLE I-23
CONSUMPTION OF PETROLEUM FUELS FOR TRANSPORTATION, 1975

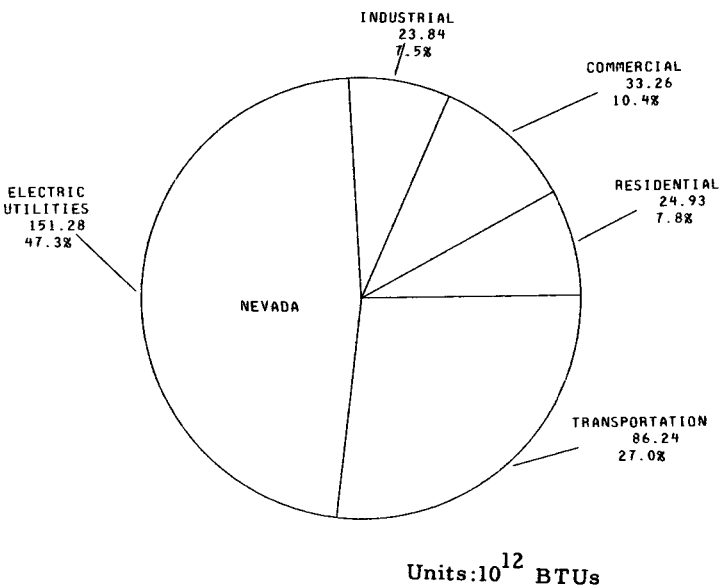
REGION	AUTOMOTIVE GASOLINE (MILLION GALLONS)	AVIATION GASOLINE (MILLION GALLONS)	DISTILLATE DIESEL OIL (MILLION BARRELS)	RESIDUAL FUEL OIL (MILLION BARRELS)	LIQUID PETRO- LEUM GAS (MILLION GALLONS)	JET FUEL (MILLION GALLONS)
CALIFORNIA	10,044.90	49.76	29.18	20.63	40.39	2,477.20
HAWAII	276.53	2.83	0.86	1.04	2.32	598.22
NEVADA	397.90	6.08	1.37	0.00	1.35	210.72
REGION TOTAL	10,719.33	58.67	31.41	21.67	44.06	3,286.14
UNITED STATES	100,080.94	409.71	354.54	116.32	1,162.40	14,145.06
PERCENT OF US	10.7	14.3	8.9	18.6	3.8	23.2

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978





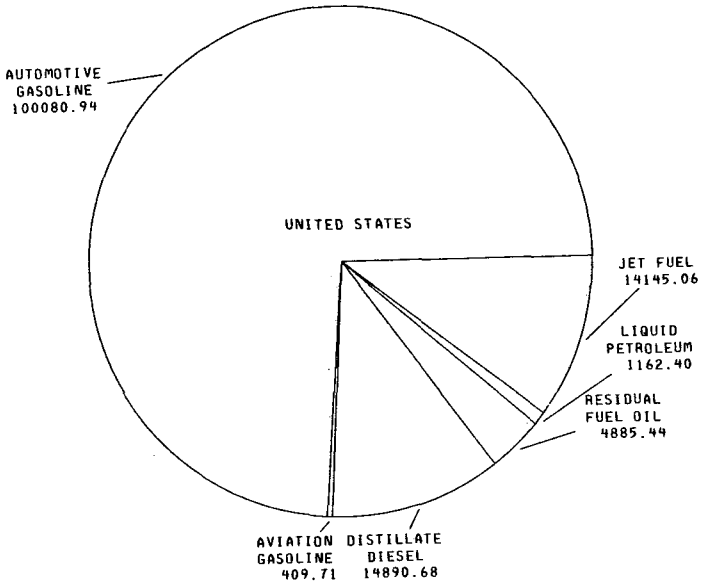


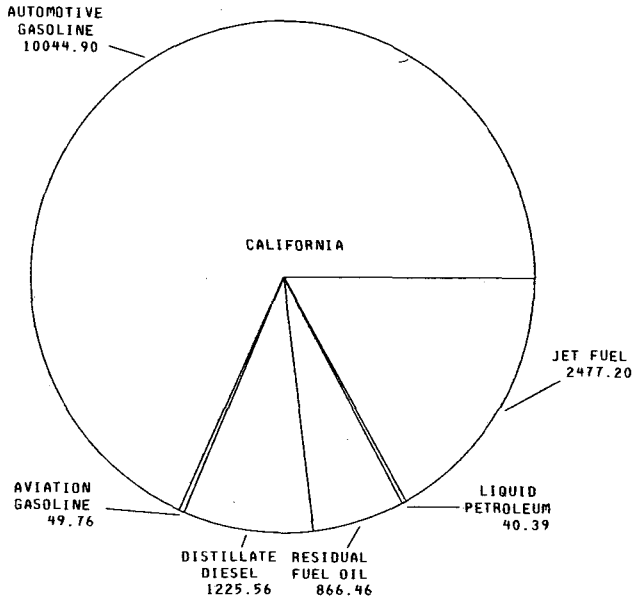


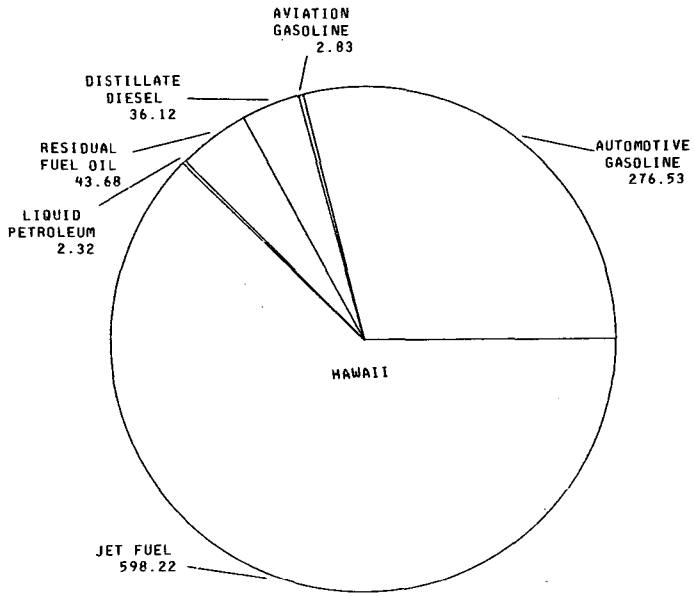
Units: 10^{12} BTUs

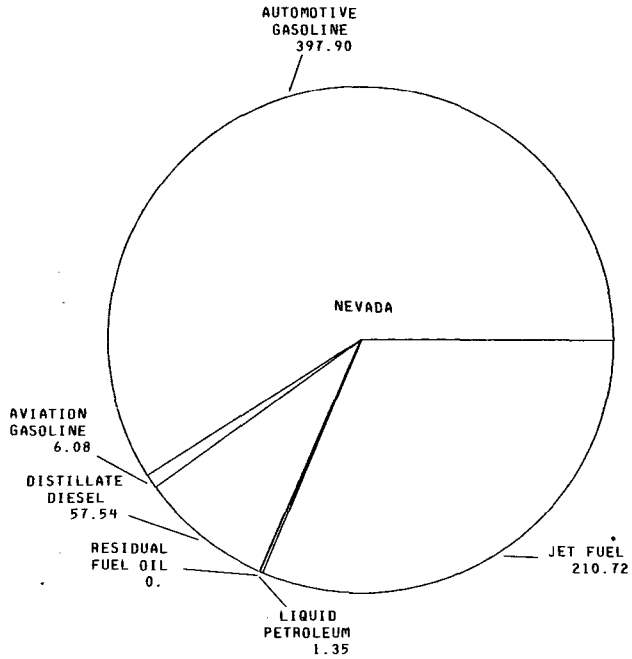
FIGURE I-21 GROSS CONSUMPTION OF ENERGY BY SECTOR, 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978









Units: 10^6 Gallons

FIGURE I-22 CONSUMPTION OF PETROLEUM FUELS FOR TRANSPORTATION, 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

TABLE I-24
FUEL AND ELECTRICITY PURCHASED
BY MANUFACTURES IN CALIFORNIA, 1974

CODE		DISTILLATE FUEL OIL (1000 BARRELS)	RESIDUAL FUEL OIL (1000 BARRELS	COAL AND LIGNITE (1000 TONS)	COKE AND BREEZE (1000 TONS)	NATURAL GAS (BILLION CU FT)	ELECTRIC ENERGY (MILLION KWH)
20	FOOD AND KINDRED PRODUCTS	226.4	49.4	0.0	(D)	65.2	3,581.2
22	TEXTILE MILL PRODUCTS	12.1	(D)	0.0	0.0	4.4	214.7
23	APPAREL, OTHER TEXTILE PRODUCTS	(D)	(D)	0.0	0.0	1.2	479.9
24	LUMBER AND WOOD PRODUCTS	504.2	171.8	0.0	0.0	5.7	1,709.7
25	FURNITURE AND FIXTURES	3.6	0.0	0.0	0.0	1.5	450.2
26	PAPER AND ALLIED PRODUCTS	(D)	79.9	(D)	0.0	23.0	2,328.4
27	PRINTING AND PUBLISHING	(D)	0.0	0.0	0.0	3.1	746.1
28	CHEMICALS AND ALLIED PRODUCTS	73.9	10.9	(D)	0.0	35.1	3,222.7
29	PETROLEUM AND COAL PRODUCTS	182.3	(D)	0.0	0.0	133.3	5,203.6
30	RUBBER, MISC PLASTIC PRODUCTS	26.8	(I)	0.0	0.0	6.1	1,464.2
31	LEATHER, LEATHER PRODUCTS	0.0	0.0	0.0	0.0	(D)	38.8
32	STONE, CLAY, GLASS PRODUCTS	200.9	322.3	(D)	(D)	81.1	2,551.1
33	PRIMARY METAL INDUSTRY	845.5	(I)	(D)	(D)	35.4	3,109.0
34	FABRICATED METAL PRODUCTS	22.6	(I)	0.0	0.0	16.2	2,132.7
35	MACHINERY, EXCEPT ELECTRIC	23.4	(I)	0.0	(D)	4.0	1,518.6
36	ELECTRIC AND ELECTRONIC EQUIP	7.9	(I)	0.0	0.0	4.8	2,764.4
37	TRANSPORTATION EQUIPMENT	140.1	(I)	0.0	0.0	13.2	3,631.2
38	INSTRUMENTS, RELATED PRODUCTS	(D)	0.0	0.0	0.0	1.1	495.3
39	MISC MANUFACTURING INDUSTRIES	(D)	0.0	0.0	0.0	1.4	273.0
	TOTAL MANUFACTURING	1,822.5	1,832.6	53.7	56.6	435.2	36,359.1

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES 1974, FUELS AND ELECTRIC ENERGY CONSUMED

NOTES - (D) WITHHELD TO AVOID DISCLOSING DATA FOR INDIVIDUAL COMPANIES
(S) WITHHELD BECAUSE THE ESTIMATE DID NOT MEET PUBLICATION STANDARDS, EITHER ON THE BASIS OF ASSOCIATED STANDARD ERROR OF ESTIMATE, OR ON THE BASIS OF A CONSISTENCY REVIEW.
(Z) REPRESENTS LESS THAN HALF THE UNIT OF MEASURE
(I) INCLUDED IN DISTILLATE FUEL OIL

THE ANNUAL SURVEY EXCLUDES FUELS THAT ARE SELF-GENERATED OR ARE USED AS A CHEMICAL FEEDSTOCK. THUS THE QUANTITY OF COKE COVERED BY THE ANNUAL SURVEY REPRESENTS ONLY A SMALL FRACTION OF THE COKE CONSUMED IN MANUFACTURING SINCE MOST METALLURGICAL COKE IS PRODUCED AND CONSUMED IN THE SAME ESTABLISHMENT.

TABLE I-25
FUEL AND ELECTRICITY PURCHASED
BY MANUFACTURES IN HAWAII, 1974

CODE	DISTILLATE FUEL OIL (1000 BARRELS)	RESIDUAL FUEL OIL (1000 BARRELS	COAL AND LIGNITE (1000 TONS)	COKE AND BREEZE (1000 TONS)	NATURAL GAS (BILLION CU FT)	ELECTRIC ENERGY (MILLION KWH)
20 FOOD AND KINDRED PRODUCTS	205.8	433.1	0.0	0.0	0.0	528.1
24 LUMBER AND WOOD PRODUCTS	2.6	(I)	0.0	0.0	(D)	4.3
26 PAPER AND ALLIED PRODUCTS	0.0	3.0	0.0	0.0	0.0	2.0
32 STONE, CLAY, GLASS PRODUCTS	76.6	(I)	0.0	0.0	0.0	53.1
34 FABRICATED METAL PRODUCTS	0.0	0.0	0.0	0.0	(D)	7.7
TOTAL MANUFACTURING	308.6	447.8	0.0	0.0	0.7	732.5

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES 1974, FUELS AND ELECTRIC ENERGY CONSUMED

NOTES - (D) WITHHELD TO AVOID DISCLOSING DATA FOR INDIVIDUAL COMPANIES
(S) WITHHELD BECAUSE THE ESTIMATE DID NOT MEET PUBLICATION STANDARDS, EITHER ON THE BASIS OF ASSOCIATED STANDARD ERROR OF ESTIMATE, OR ON THE BASIS OF A CONSISTENCY REVIEW.
(Z) REPRESENTS LESS THAN HALF THE UNIT OF MEASURE
(I) INCLUDED IN DISTILLATE FUEL OIL

THE ANNUAL SURVEY EXCLUDES FUELS THAT ARE SELF-GENERATED OR ARE USED AS A CHEMICAL FEEDSTOCK. THUS THE QUANTITY OF COKE COVERED BY THE ANNUAL SURVEY REPRESENTS ONLY A SMALL FRACTION OF THE COKE CONSUMED IN MANUFACTURING SINCE MOST METALLURGICAL COKE IS PRODUCED AND CONSUMED IN THE SAME ESTABLISHMENT.

TABLE I-26
FUEL AND ELECTRICITY PURCHASED
BY MANUFACTURES IN NEVADA, 1974

CODE	DISTILLATE FUEL OIL (1000 BARRELS)	RESIDUAL FUEL OIL (1000 BARRELS	COAL AND LIGNITE (1000 TONS)	COKE AND BREEZE (1000 TONS)	NATURAL GAS (BILLION CU FT)	ELECTRIC ENERGY (MILLION KWH)
20 FOOD AND KINDRED PRODUCTS	4.4	(I)	0.0	0.0	0.3	42.9
27 PRINTING AND PUBLISHING	(D)	(D)	0.0	0.0	(Z)	15.6
32 STONE, CLAY, GLASS PRODUCTS	105.7	(I)	0.0	0.0	4.9	143.6
33 PRIMARY METAL INDUSTRY	(D)	(D)	(D)	0.0	(D)	(D)
35 MACHINERY, EXCEPT ELECTRIC	0.0	0.0	0.0	0.0	0.1	7.3
39 MISC MANUFACTURING INDUSTRIES	0.0	0.0	0.0	0.0	(Z)	(D)
TOTAL MANUFACTURING	332.2	(I)	(D)	0.0	10.0	1,179.9

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES 1974, FUELS AND ELECTRIC ENERGY CONSUMED

NOTES - (D) WITHHELD TO AVOID DISCLOSING DATA FOR INDIVIDUAL COMPANIES
(S) WITHHELD BECAUSE THE ESTIMATE DID NOT MEET PUBLICATION STANDARDS, EITHER ON THE BASIS OF ASSOCIATED STANDARD ERROR OF ESTIMATE, OR ON THE BASIS OF A CONSISTENCY REVIEW.
(Z) REPRESENTS LESS THAN HALF THE UNIT OF MEASURE
(I) INCLUDED IN DISTILLATE FUEL OIL

THE ANNUAL SURVEY EXCLUDES FUELS THAT ARE SELF-GENERATED OR ARE USED AS A CHEMICAL FEEDSTOCK. THUS THE QUANTITY OF COKE COVERED BY THE ANNUAL SURVEY REPRESENTS ONLY A SMALL FRACTION OF THE COKE CONSUMED IN MANUFACTURING SINCE MOST METALLURGICAL COKE IS PRODUCED AND CONSUMED IN THE SAME ESTABLISHMENT.

TABLE I-27
MOTOR VEHICLE REGISTRATION AND MILEAGE, 1975
[IN THOUSANDS OF VEHICLES, EXCEPT
MILEAGE IN BILLIONS OF VEHICLE MILES]

REGION	MOTOR VEHICLE REGISTRATION				TOTAL MILEAGE
	AUTO-MOBILES	BUSES	TRUCKS	MOTOR-CYCLES	
CALIFORNIA	11,226.3	20.9	2,643.4	668.5	132.6
HAWAII	394.6	2.3	65.1	6.0	4.1
NEVADA	345.6	1.0	117.2	17.8	4.4
REGION TOTAL	11,966.6	24.3	2,825.6	692.2	141.2
UNITED STATES	106,717.2	462.2	25,780.6	4,967.0	1,330.1
PERCENT OF US	11.2	5.2	11.0	13.9	10.6

SOURCE - U.S. FEDERAL HIGHWAY ADMINISTRATION, HIGHWAY STATISTICS, 1975

TABLE I-28
EMPLOYMENT IN TRANSPORTATION, 1975
[NUMBER OF EMPLOYEES]

SIC CODE	SECTOR	CALI-FORNIA	HAWAII	NEVADA	UNITED STATES
41	LOCAL AND INTERURBAN PASSENGER TRANSIT	32,592	2,867	3,072	307,866
42	TRUCKING AND WAREHOUSING	94,413	2,644	1,650	1,039,800
44	WATER TRANSPORTATION	21,526	1,533	AA	184,418
45	TRANSPORTATION BY AIR	58,533	3,969	1,359	350,055
46	PIPELINES, EXCEPT NATURAL GAS	744	0	0	19,396
47	TRANSPORTATION SERVICES	135,394	2,733	438	135,729
	TOTAL TRANSPORTATION	343,202	13,746	6,600	2,037,264

SOURCE - U.S. BUREAU OF THE CENSUS, COUNTY BUSINESS PATTERNS, 1975

NOTES - DOES NOT INCLUDE ADMINISTRATIVE AND AUXILLIARY ESTABLISHMENTS
AA = 20 - 99 EMPLOYEES

I-C-2 REGIONAL CONSUMPTION IN RELATION TO NATIONAL CONSUMPTION

GRAPHIC AND TABULAR DATA ARE SHOWN IN THIS SECTION TO ILLUSTRATE THE DIFFERENCES AMONG THE THREE STATES AND THE UNITED STATES IN THE PER CAPITA CONSUMPTION OF ENERGY DURING 1975. THESE DIFFERENCES SHOW UP IN BOTH THE CONSUMPTION BY FUEL AND BY SECTOR. FOR REASONS OF CONSISTENCY, ALL THE DATA ARE TAKEN FROM THE ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM.

TABLE I-29
PER CAPITA ENERGY CONSUMPTION BY SECTOR, 1975
[IN MILLION BTU PER PERSON]

REGION	RESI-DENTIAL	COMMER-CIAL	INDUS-TRIAL	ELECTRIC UTILITIES	TRANSPOR-TATION
CALIFORNIA	39.1	26.3	69.9	60.4	90.2
HAWAII	9.3	8.8	31.7	67.7	145.1
NEVADA	42.1	56.2	40.3	255.5	145.7
REGION TOTAL	38.0	26.4	67.7	65.7	93.8
UNITED STATES	46.4	34.9	101.5	97.1	84.2

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978

NOTES - BASED ON ESTIMATED MIDYEAR POPULATION. THE LARGE PER CAPITA CONSUMPTION OF ENERGY BY THE ELECTRIC UTILITY SECTOR IN NEVADA IS DUE TO LARGE EXPORTS OF ELECTRICITY.

TABLE I-30
PER CAPITA ENERGY CONSUMPTION BY FUEL, 1975
[IN MILLION BTU PER PERSON]

REGION	PETROLEUM PRODUCTS	NATURAL GAS	COAL	ELEC-TRICITY	TOTAL ENERGY
CALIFORNIA	124.3	91.0	2.6	23.1	262.6
HAWAII	232.1	0.0	0.0	21.0	241.5
NEVADA	177.6	107.1	169.7	43.9	495.7
REGION TOTAL	129.8	88.0	6.8	23.6	267.9
UNITED STATES	130.5	95.3	61.7	27.7	336.0

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY, [DOE/EIA-0031/2 UC-13], FEB 1978

NOTES - BASED ON ESTIMATED MIDYEAR POPULATION. THE LARGE PER CAPITA CONSUMPTION OF COAL IN NEVADA IS DUE TO THE USE OF COAL IN ELECTRIC POWER PLANTS WHICH EXPORT MUCH OF THEIR ELECTRICITY.

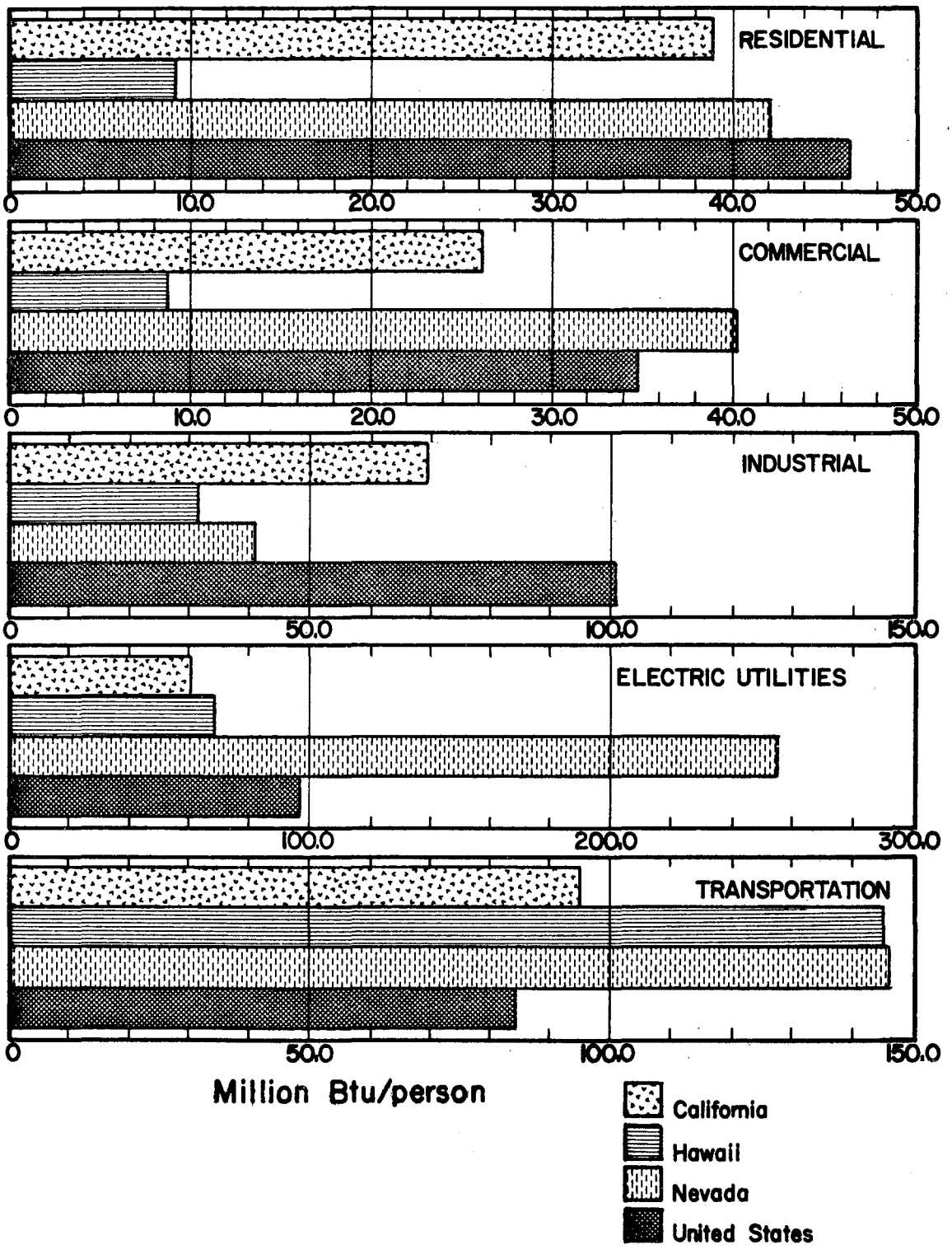


FIGURE I-23 PER CAPITA ENERGY CONSUMPTION BY SECTOR, 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

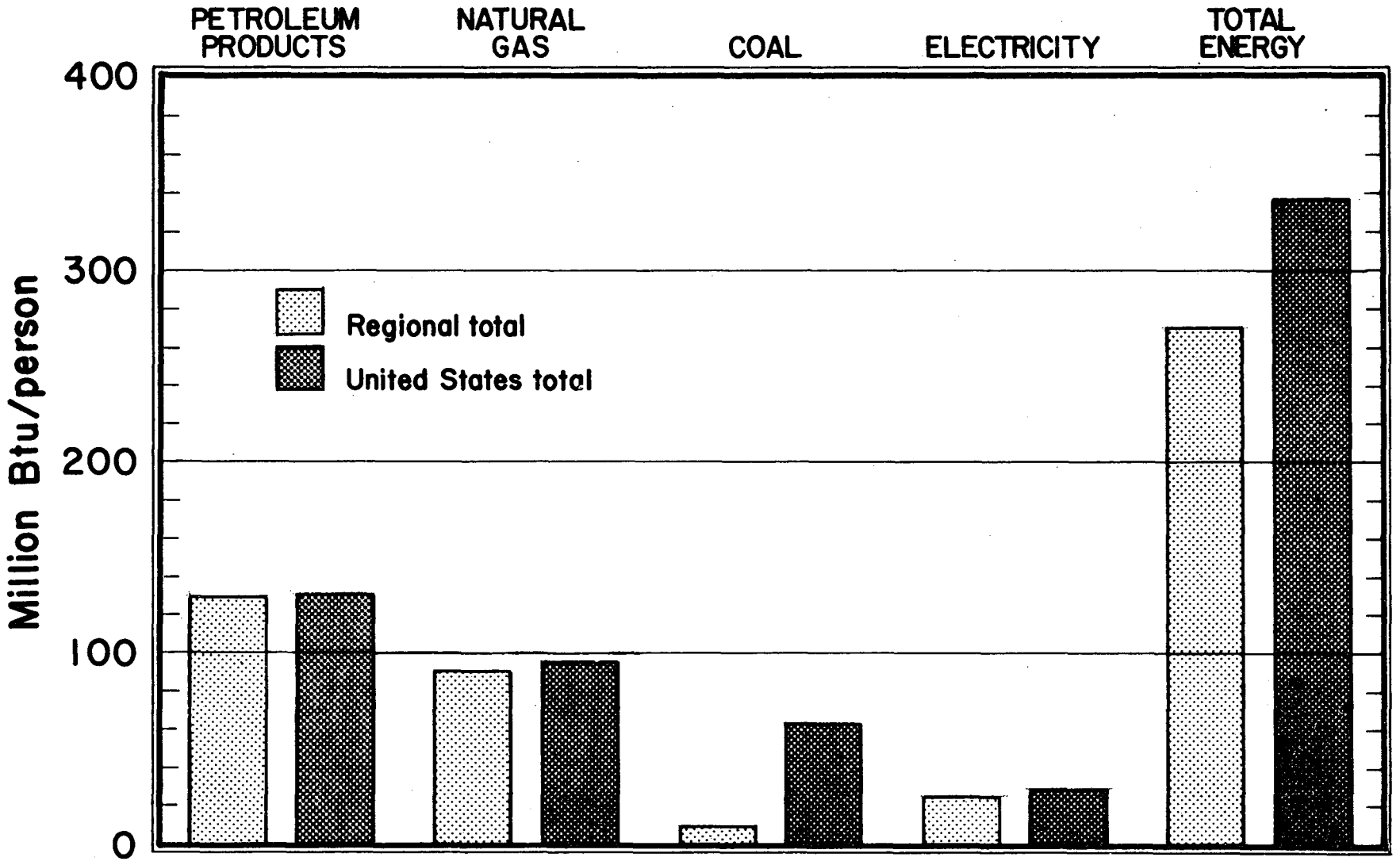


FIGURE I-24 PER CAPITA ENERGY CONSUMPTION BY FUEL, 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

I-C-3 CONSUMPTION TRENDS

ENERGY CONSUMPTION TRENDS FOR THE YEARS 1970 TO 1975 ARE PRESENTED IN THIS SECTION BY FUEL AND SECTOR. ALL DATA ARE DERIVED FROM THE ENERGY INFORMATION ADMINISTRATION, FEDERAL ENERGY DATA SYSTEM.

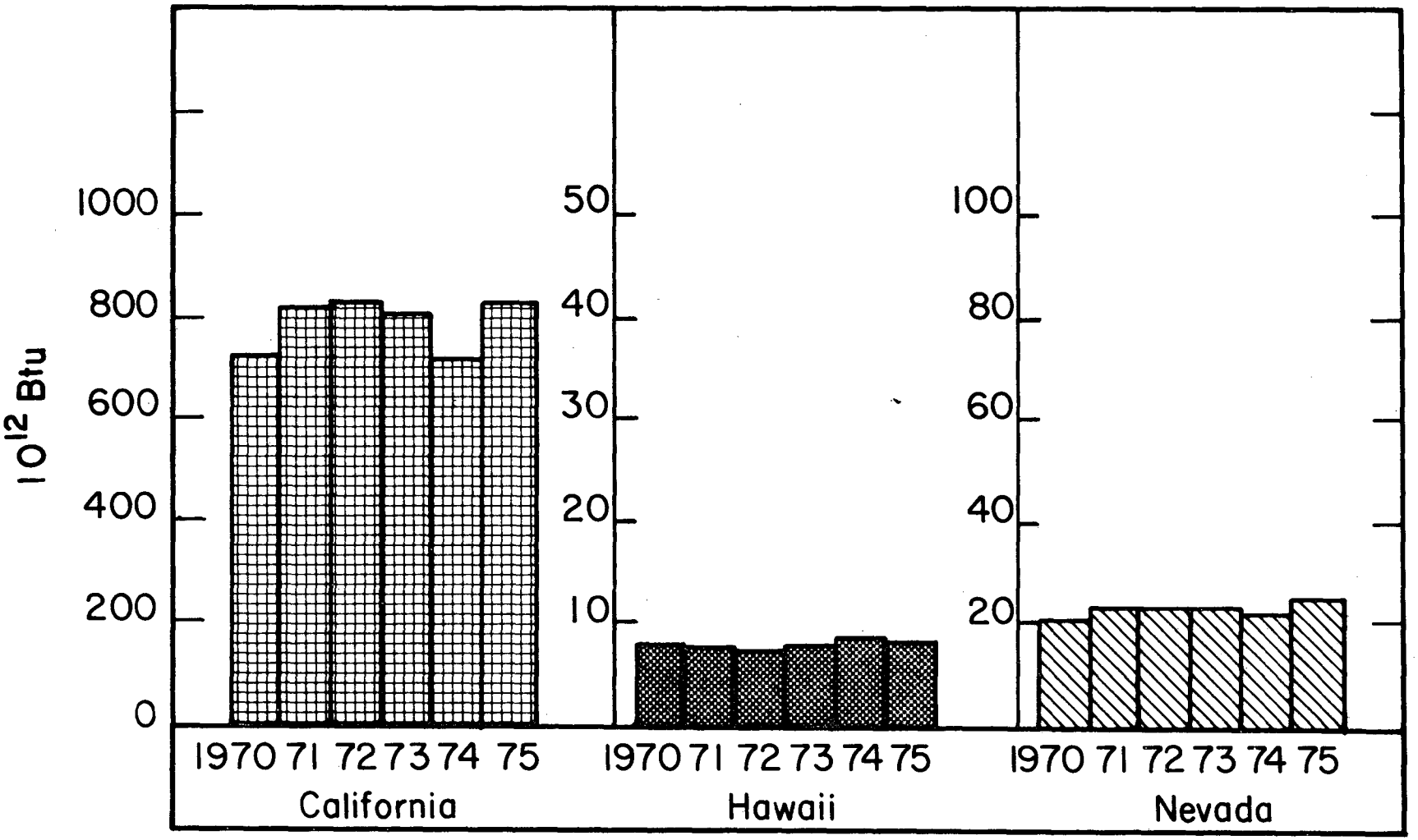


FIGURE I-25 RESIDENTIAL ENERGY CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

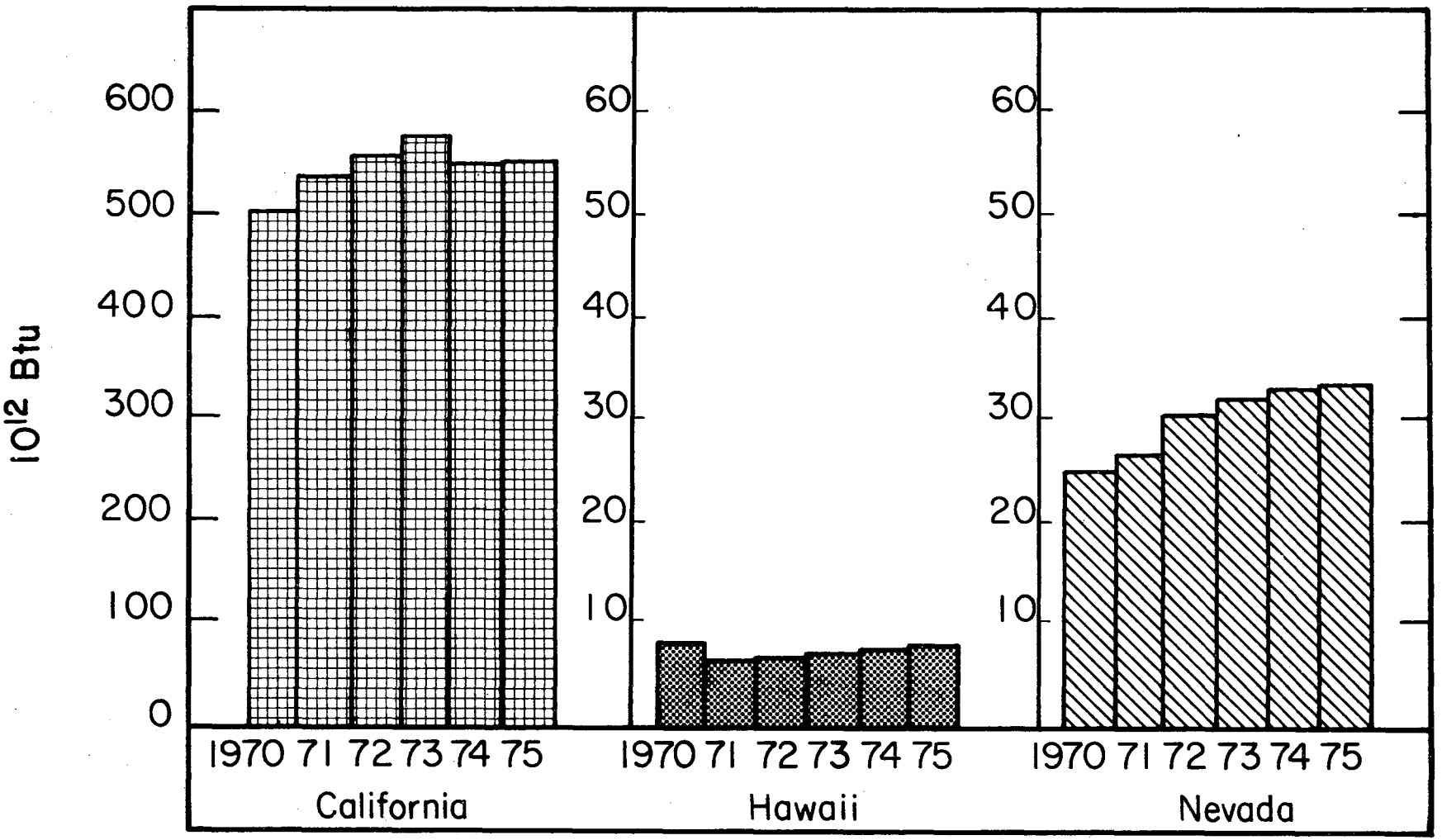


FIGURE I-26 COMMERCIAL ENERGY CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

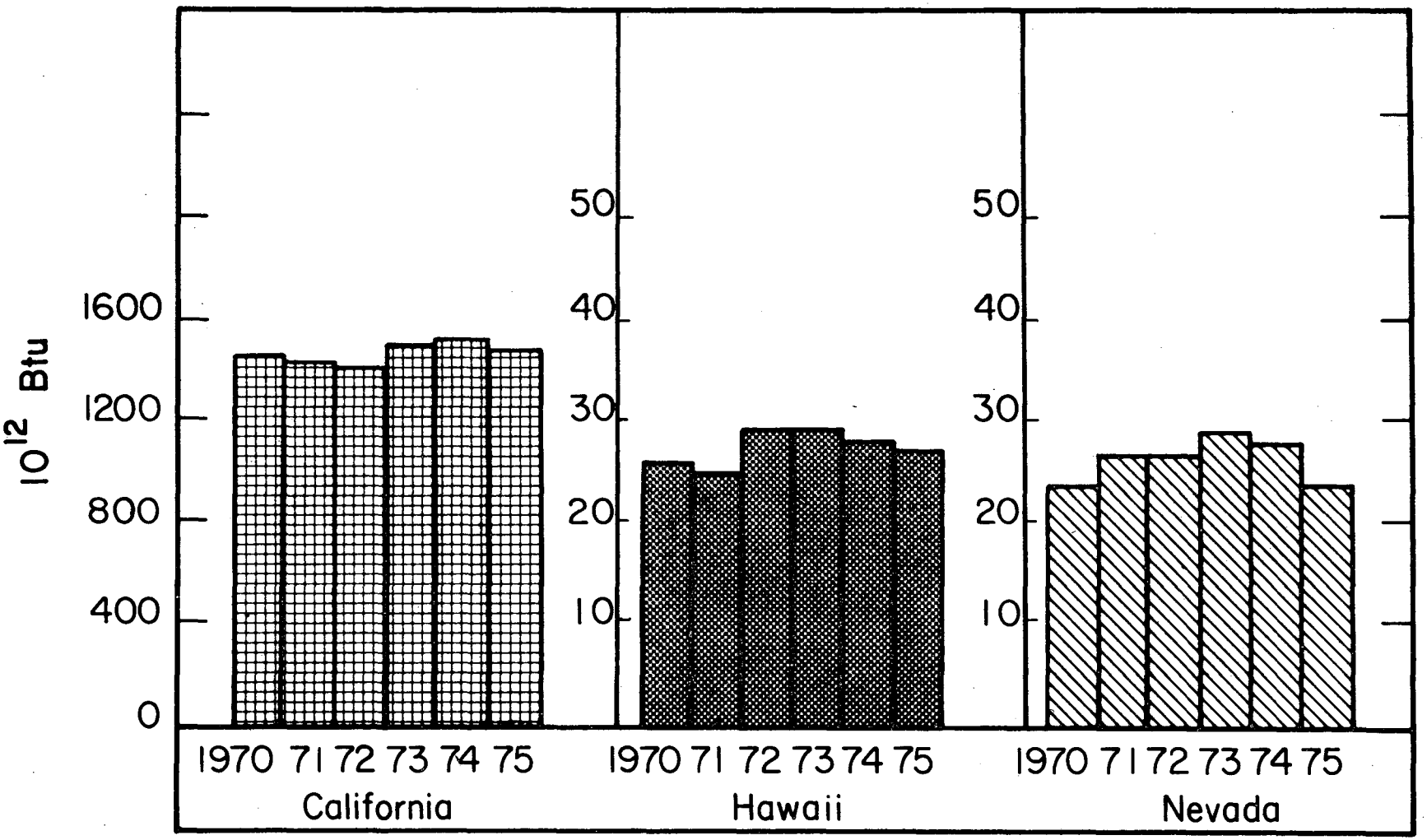


FIGURE I-27 INDUSTRIAL ENERGY CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

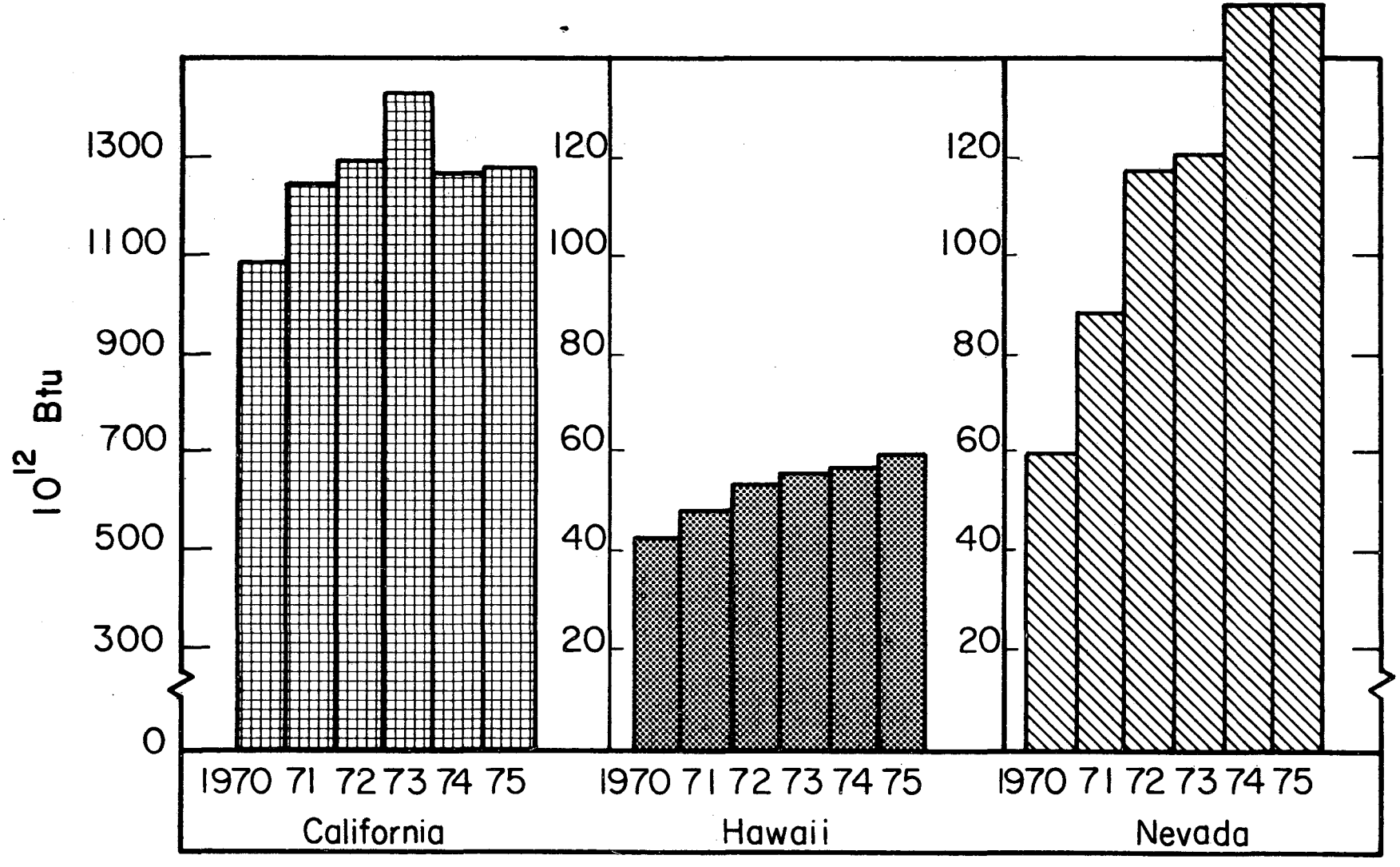


FIGURE I-28 ELECTRIC UTILITY ENERGY CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

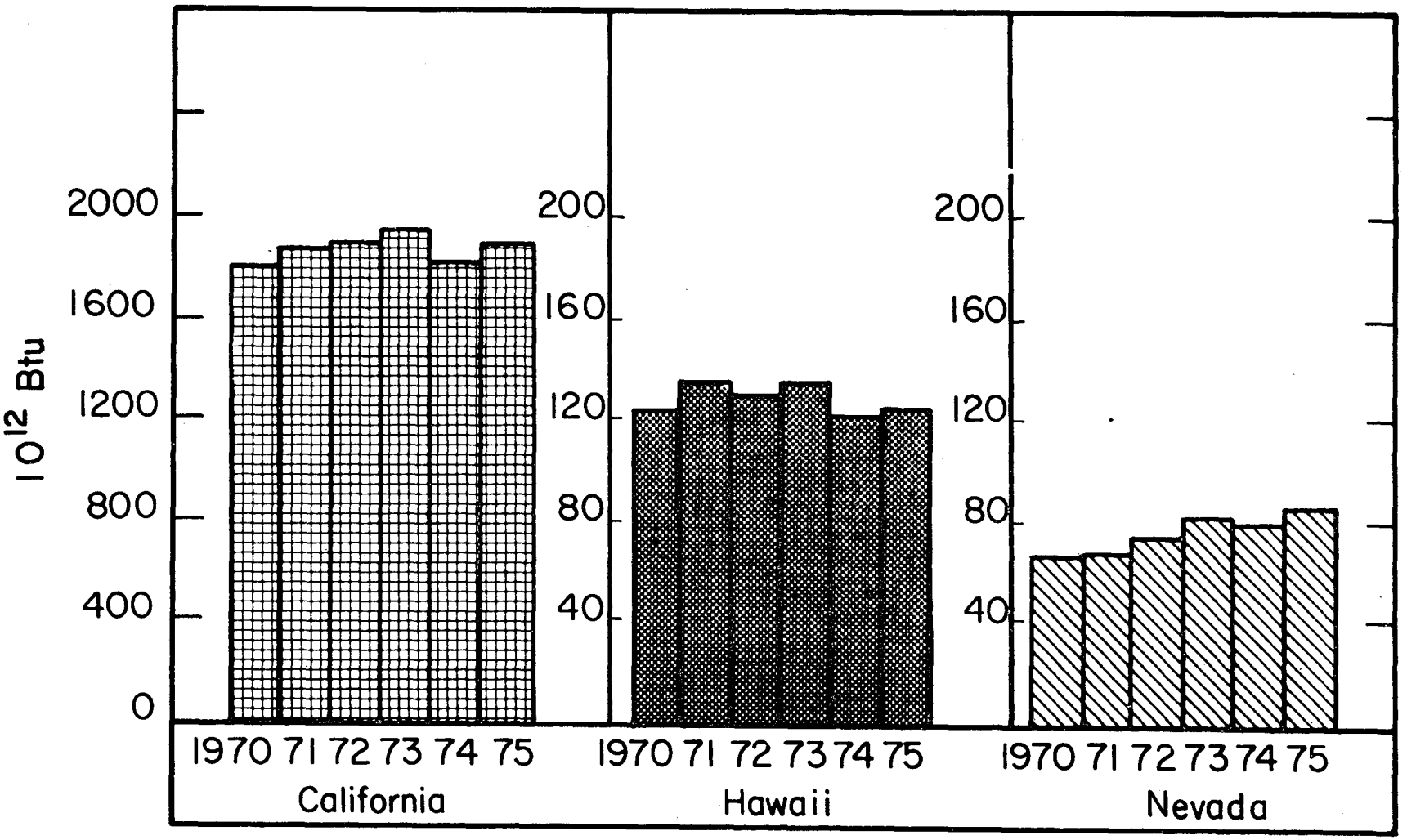


FIGURE I-29 TRANSPORTATION ENERGY CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

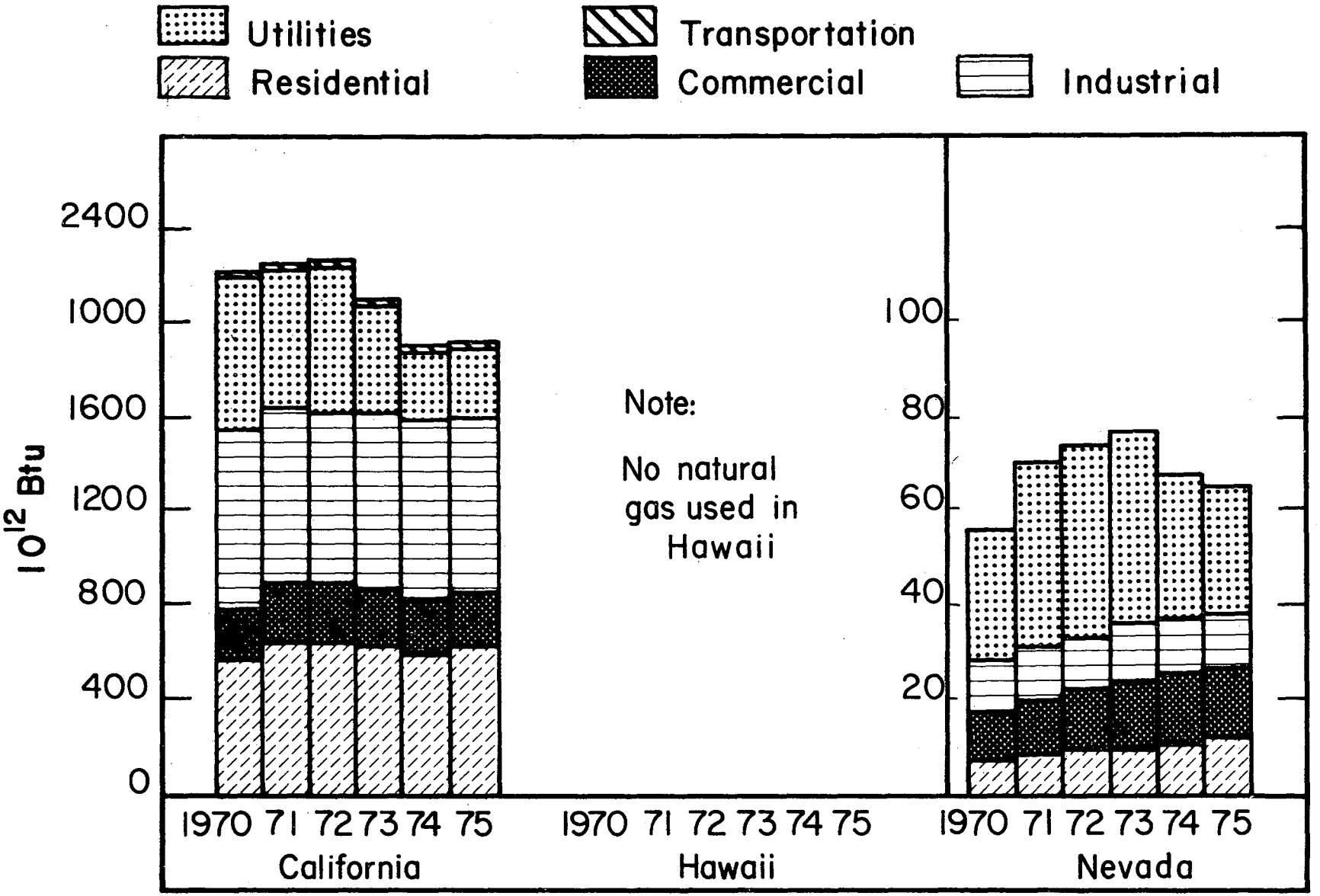


FIGURE T-30 NATURAL GAS CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

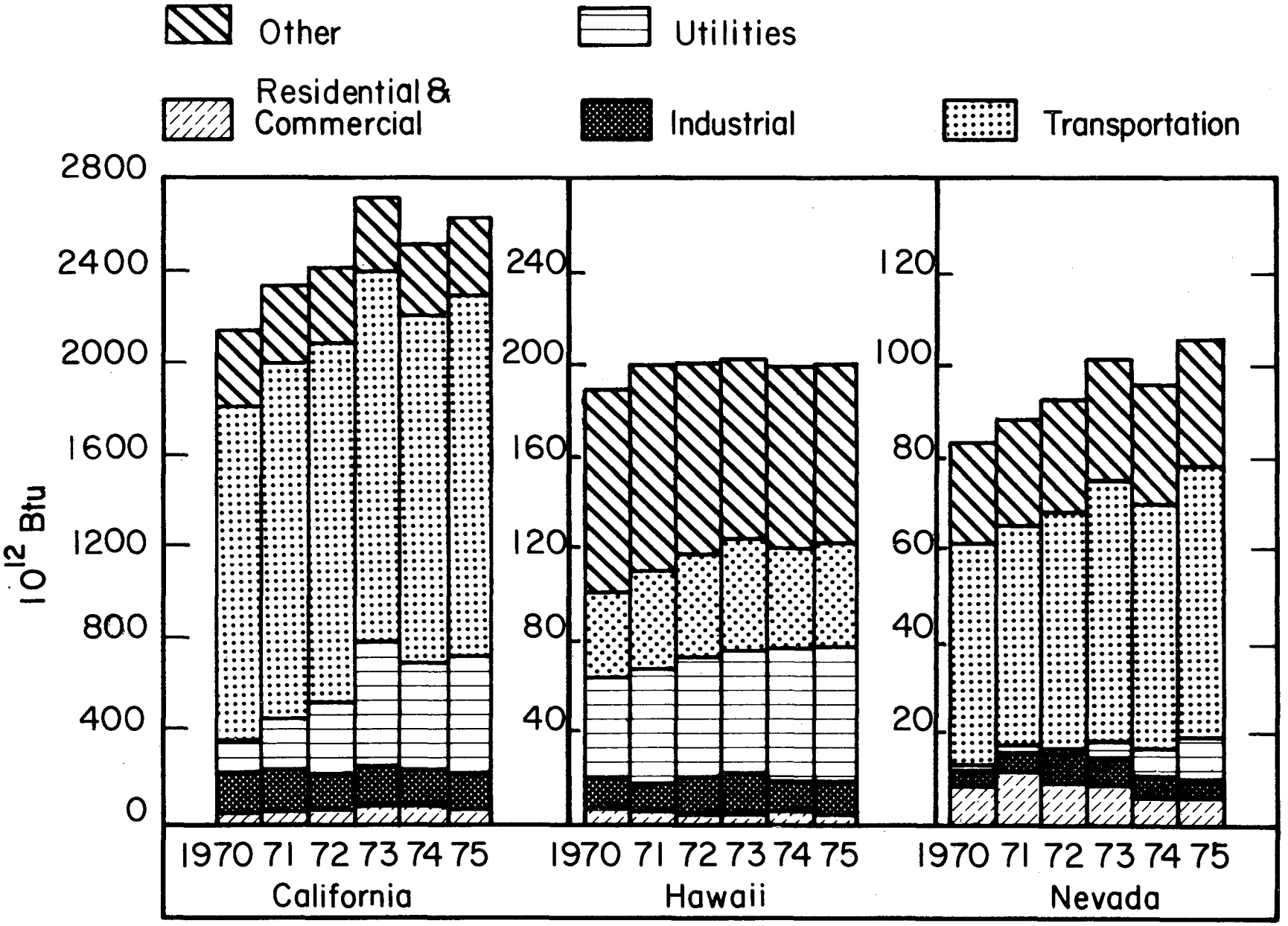


FIGURE I-31 PETROLEUM PRODUCTS CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

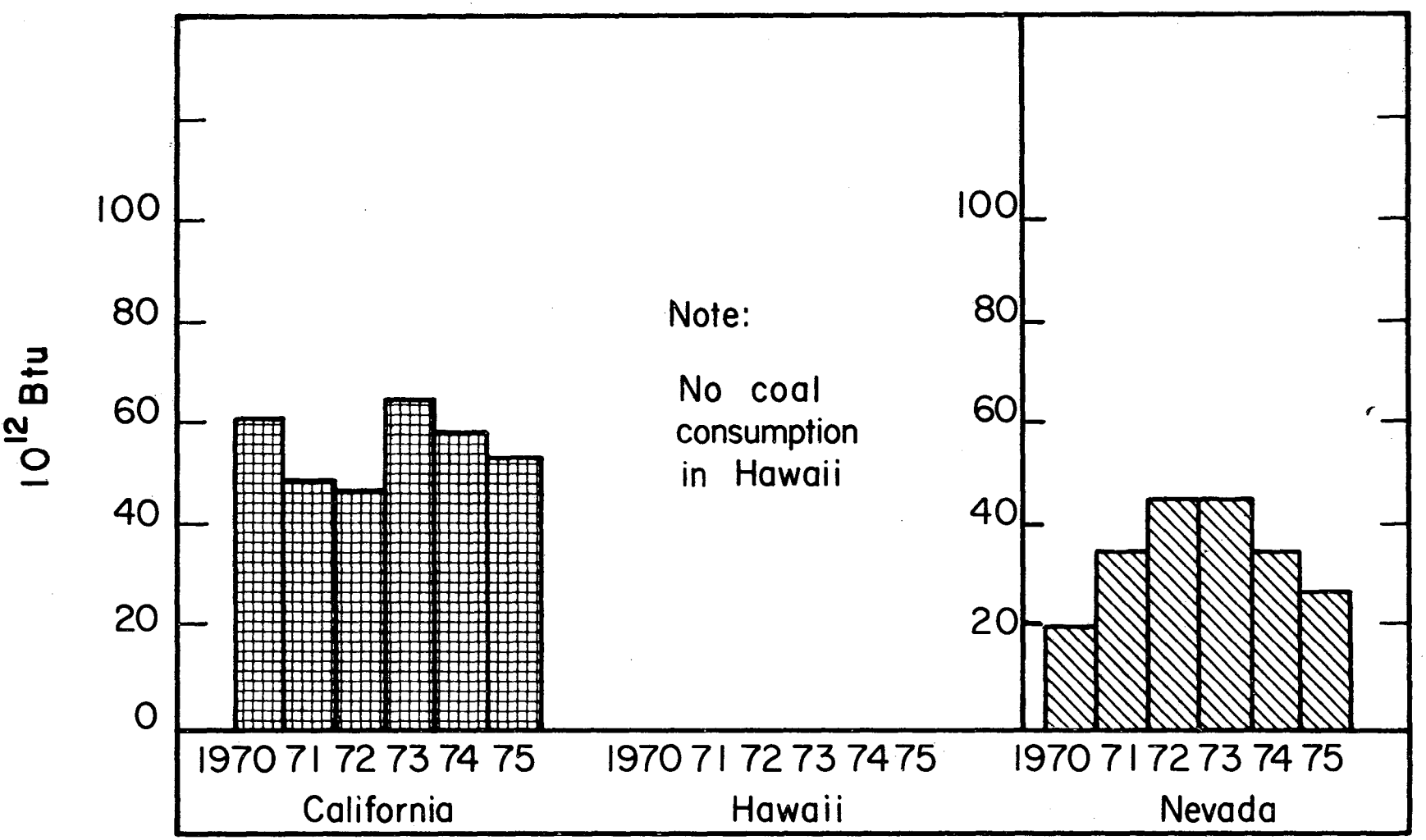


FIGURE I-32 COAL CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

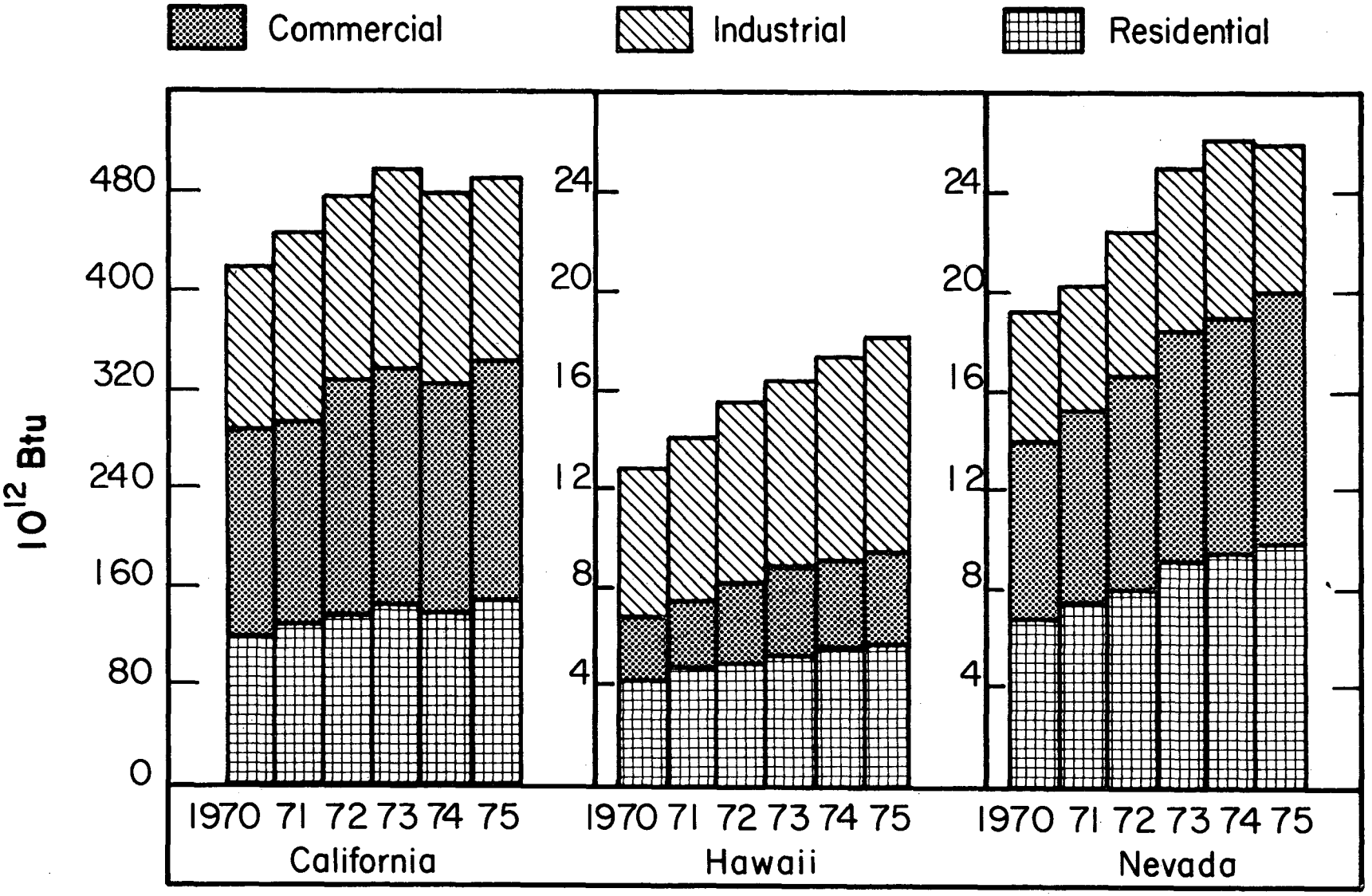


FIGURE I-33 ELECTRICITY CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

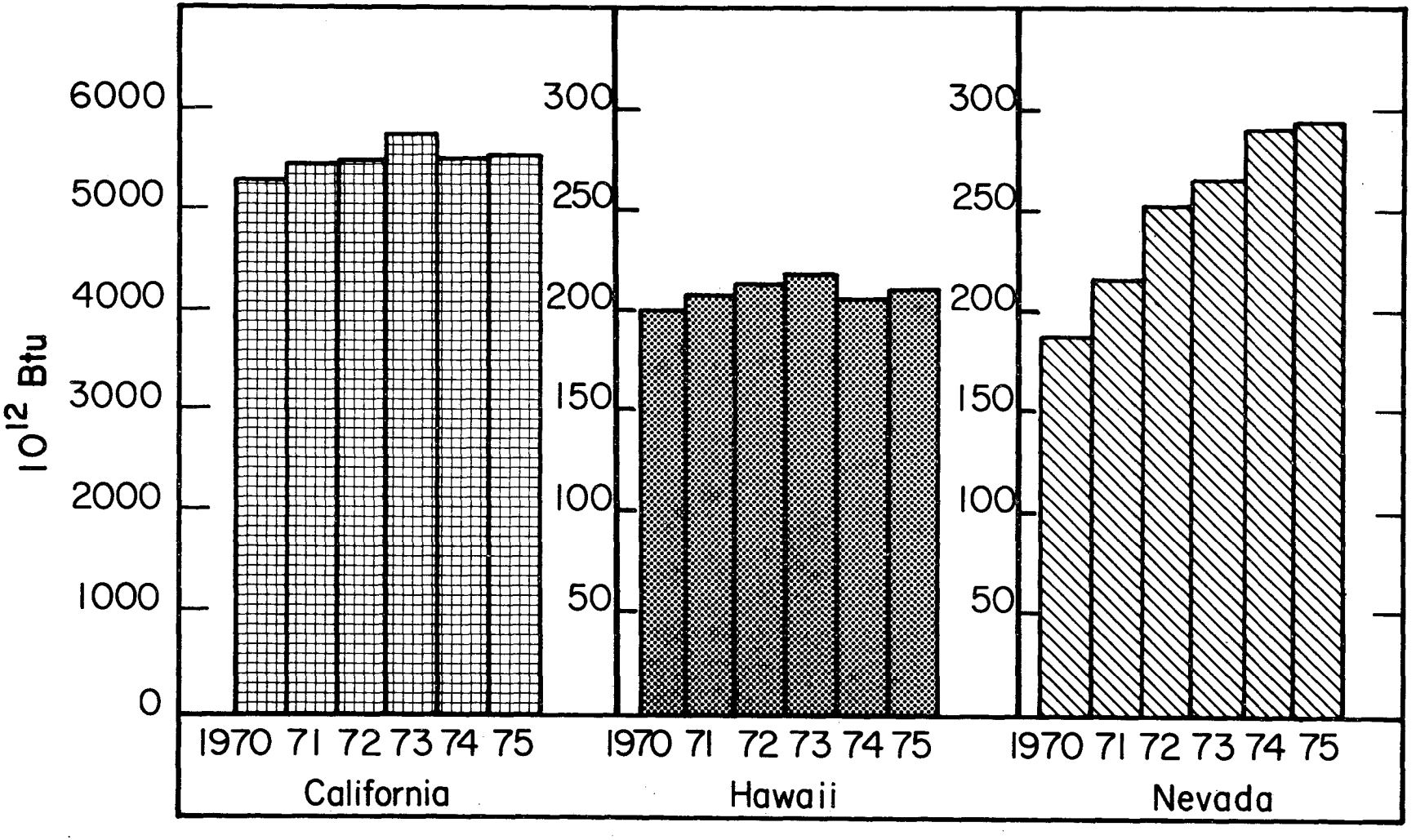


FIGURE 1-34 GROSS ENERGY CONSUMPTION TRENDS, 1970 - 1975

SOURCE: U. S. ENERGY INFORMATION AGENCY, FEDERAL ENERGY DATA SYSTEM (FEDS), STATISTICAL SUMMARY DOE/EIA-0031/2 UC-13, FEBRUARY 1978

I-C-4 ENERGY STORAGE

THIS SECTION PRESENTS TABULAR DATA ON THE STORAGE OF CRUDE PETROLEUM, NATURAL GAS AND NATURAL GAS LIQUIDS. THE DATA, WHICH ARE FOR THE END OF 1975, ARE TAKEN FROM THE ENERGY INFORMATION ADMINISTRATION.

TABLE I-31
STORAGE OF CRUDE PETROLEUM, NATURAL GAS
AND NATURAL GAS LIQUIDS, 1975
[NATURAL GAS IN MILLION CUBIC FEET,
PETROLEUM AND NGL IN THOUSANDS OF BARRELS]

REGION	CRUDE PETROLEUM	NATURAL GAS		NATURAL GAS LIQUIDS
		STORED	CAPACITY	
CALIFORNIA	24,217	202,157	424,494	104,578
HAWAII	0	0	0	0
NEVADA	0	0	0	0
REGION TOTAL	24,217	202,157	424,494	104,578
UNITED STATES	289,296	4,276,984	6,649,539	1,034,838
PERCENT OF US	8.4	4.7	6.4	10.1

SOURCE - U.S. ENERGY INFORMATION ADMINISTRATION, ENERGY DATA REPORTS, CRUDE PETROLEUM, PETROLEUM PRODUCTS AND NATURAL GAS LIQUIDS U.S. BUREAU OF MINES, MINERALS YEARBOOK, 1975

NOTES - STORAGE AS OF DEC 31, 1975 EXCEPT FOR CRUDE PETROLEUM WHICH IS AS OF JAN 31, 1976. ACCORDING TO THE DOE OFFICE IN HAWAII, THE STOCKS OF CRUDE OIL IN THE STATE AS OF THIS DATE TOTALED 3,351,000 BARRELS.

I-D REGIONAL ENERGY BALANCE

I-D-1 DIFFERENTIAL ENERGY PRICES

THIS SECTION PRESENTS DATA ON AVERAGE FUEL AND ENERGY PRICES DURING 1975. THE DATA ARE IN TERMS OF PHYSICAL AND ENERGY UNITS. THEY ARE FROM THE FEDERAL ENERGY ADMINISTRATION.

TABLE I-32
FUEL AND ENERGY PRICES, 1975

FUEL OR ENERGY TYPE	CALIFORNIA	HAWAII	NEVADA	UNITED STATES
GASOLINE				
SERVICE STATION				
(CENTS/GALLON)	58.67	57.03	59.03	57.22
DISTILLATE OIL				
RESIDENTIAL				
($/MILL. BTU)	3.01	2.98	2.87	2.81
(CENTS/GALLON)	41.77	41.37	39.78	39.01
COMMERCIAL				
($/MILL. BTU)	2.75	2.72	2.62	2.60
(CENTS/GALLON)	38.13	37.77	36.32	36.02
INDUSTRIAL				
($/MILL. BTU)	2.75	2.72	2.62	2.59
(CENTS/GALLON)	38.13	37.77	36.32	36.02
RESIDUAL OIL				
COMMERCIAL				
($/MILL. BTU)	2.64	2.61	2.59	2.26
($/BARREL)	16.58	16.42	16.30	14.23
INDUSTRIAL				
($/MILL. BTU)	2.63	2.61	2.50	2.25
($/BARREL)	16.56	16.41	15.74	14.17
KEROSENE				
RESIDENTIAL				
($/MILL. BTU)	3.00	2.97	2.86	2.95
(CENTS/GALLON)	40.52	40.14	38.60	39.77
COMMERCIAL				
($/MILL. BTU)	2.73	2.71	2.60	2.73
(CENTS/GALLON)	36.89	36.54	35.13	36.84
INDUSTRIAL				
($/MILL. BTU)	2.73	2.71	2.60	2.72
(CENTS/GALLON)	36.89	36.54	35.13	36.75
LIQUID PETROLEUM GAS				
RESIDENTIAL				
($/MILL. BTU)	2.80	2.78	2.67	2.51
(CENTS/GALLON)	26.77	26.51	25.49	24.01
INDUSTRIAL				
($/MILL. BTU)	2.56	2.53	2.44	2.33
(CENTS/GALLON)	24.44	24.21	23.28	22.20

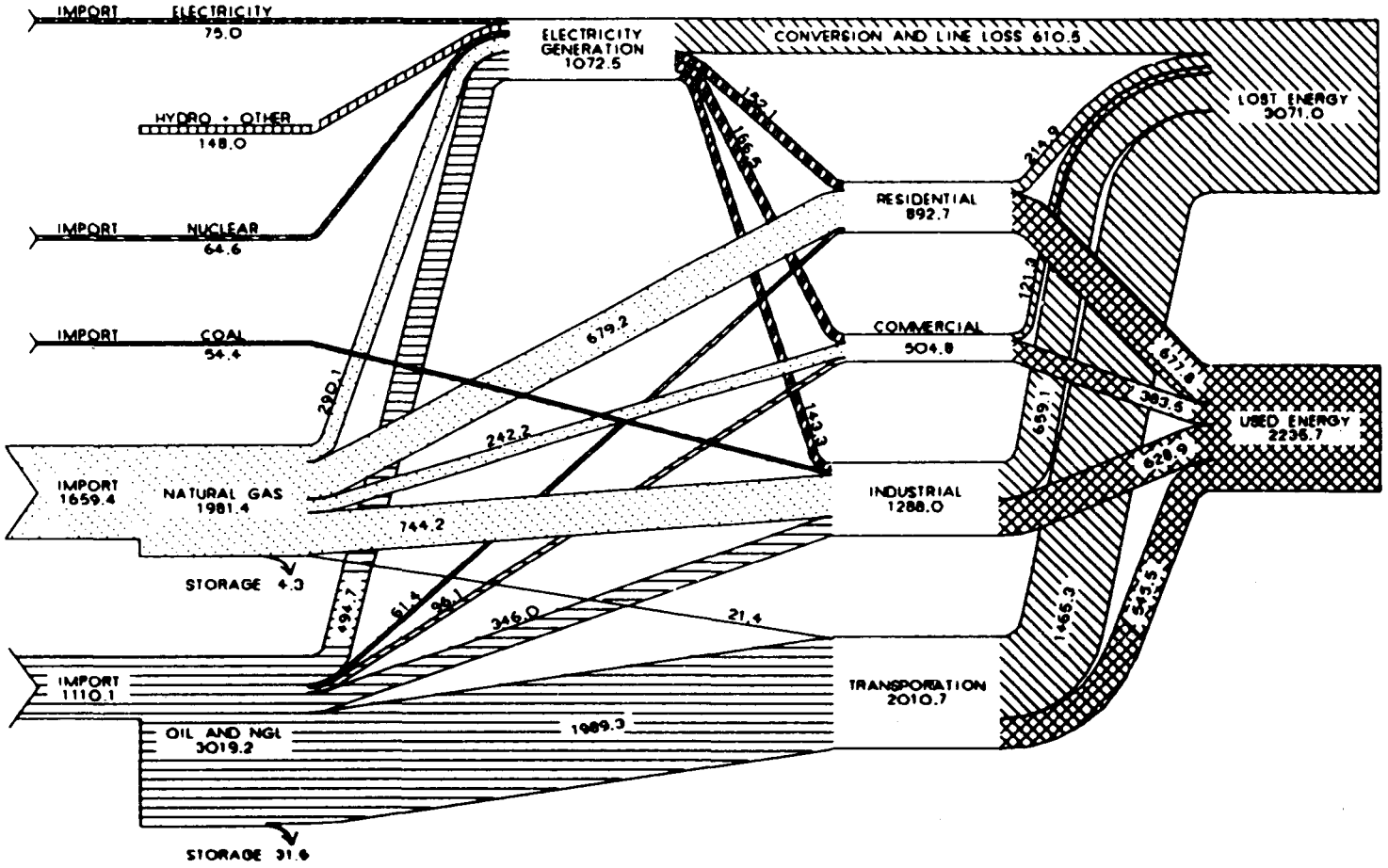
FUEL AND ENERGY PRICES, 1975

FUEL OR ENERGY TYPE	CALIFORNIA	HAWAII	NEVADA	UNITED STATES
NATURAL GAS				
RESIDENTIAL				
($/MILL. BTU)	1.53	---	1.89	1.69
($/1000 CU FT)	1.57	---	1.95	1.71
COMMERCIAL				
($/MILL. BTU)	1.25	---	1.50	1.31
($/1000 CU FT)	1.29	---	1.50	1.35
INDUSTRIAL				
($/MILL. BTU)	1.00	---	1.10	0.85
($/1000 CU FT)	1.04	---	1.13	0.88
ELECTRICITY				
RESIDENTIAL				
($/MILL. BTU)	9.78	13.35	6.90	9.40
($/1000 KWH)	33.35	45.55	23.55	32.08
COMMERCIAL				
($/MILL. BTU)	8.07	15.26	7.40	9.25
($/1000 KWH)	27.54	52.07	25.26	31.56
INDUSTRIAL				
($/MILL. BTU)	6.22	9.14	3.93	5.63
($/1000 KWH)	21.22	31.19	13.39	19.21

SOURCE - U.S. FEDERAL ENERGY ADMINISTRATION, CONSUMPTION STUDIES DIVISION

I-D-2 ENERGY IMPORTED AND EXPORTED

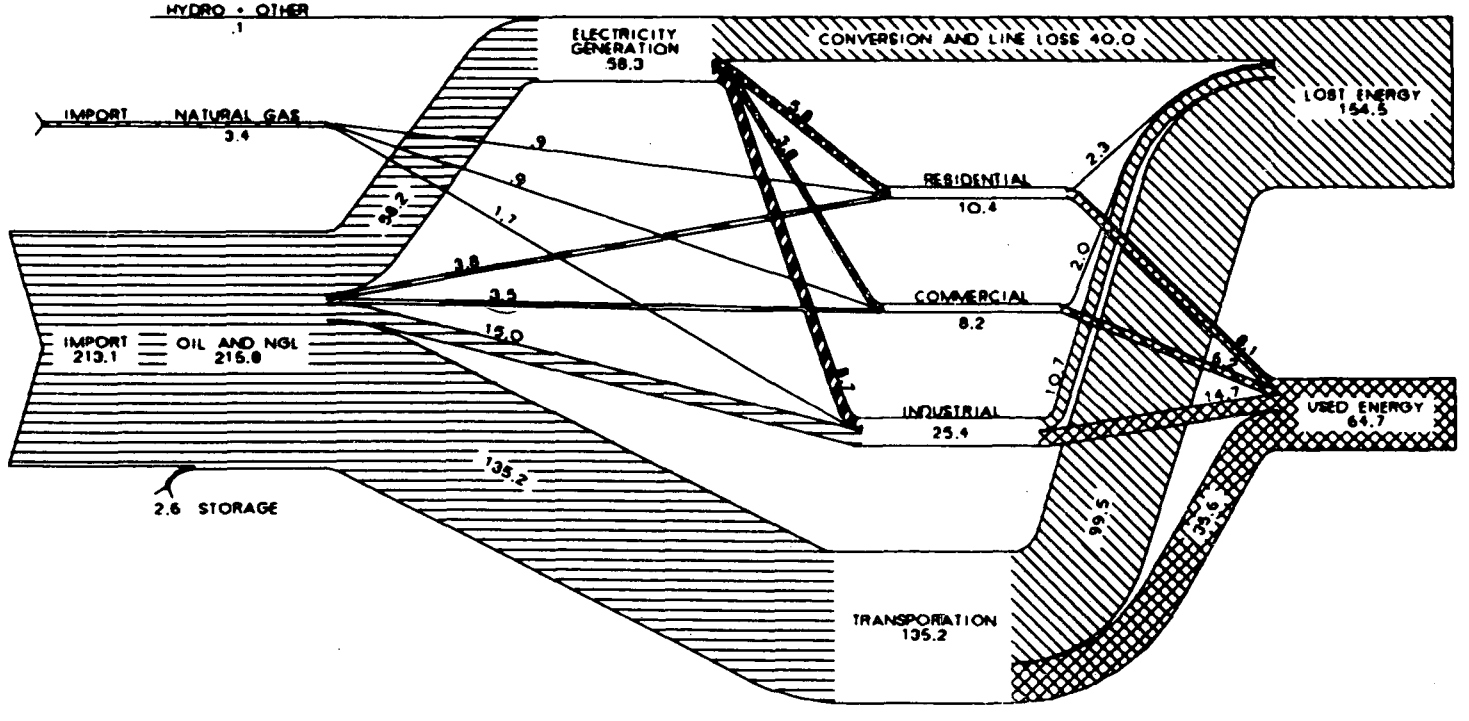
THE DATA PRESENTED IN THIS SECTION SHOW THE ENERGY BALANCES OF THE THREE STATES IN THIS REGION. THE ORIGINS AND DESTINATIONS OF FUEL AND ELECTRICITY SHIPMENTS ARE GIVEN. THE DATA ARE FROM A VARIETY OF SOURCES AND ARE NOT NECESSARILY CONSISTENT WITH EACH OTHER OR WITH DATA IN OTHER SECTIONS OF THIS BOOK.



Energy Flows in 10^{12} BTUs

FIGURE I-35 ENERGY FLOW PATTERNS FOR CALIFORNIA, 1975

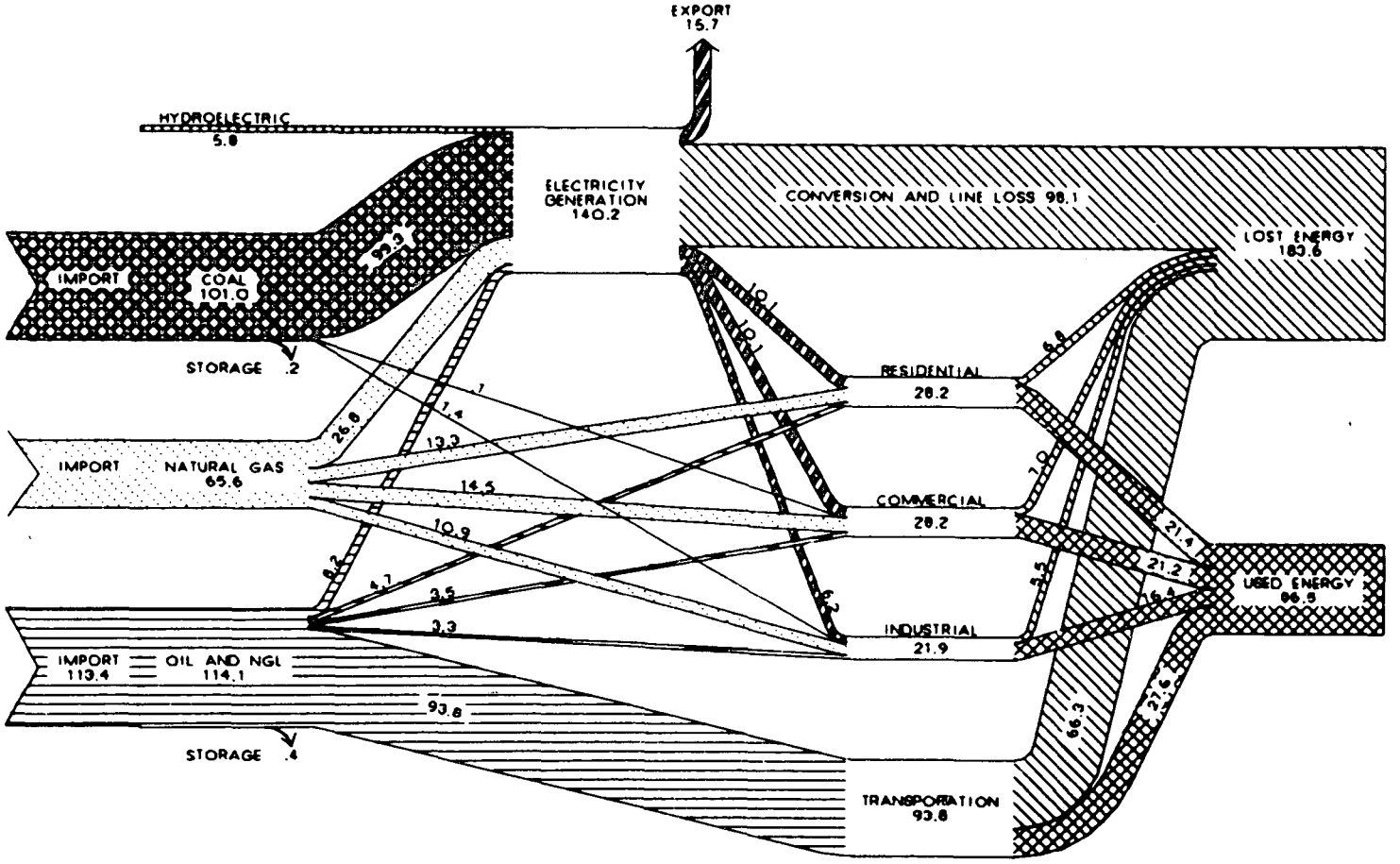
SOURCE: KIDMAN, R. B., ET AL., ENERGY FLOW PATTERNS FOR 1975
LASL REPORT LA-6770, JUNE 1977



Energy Flows in 10^{12} BTUs

FIGURE I-36 ENERGY FLOW PATTERNS FOR HAWAII, 1975

SOURCE: KIDMAN, R. B., ET AL., ENERGY FLOW PATTERNS FOR 1975
LASL REPORT LA-6770, JUNE 1977



Energy Flows in 10^{12} BTUs

FIGURE I-37 ENERGY FLOW PATTERNS FOR NEVADA, 1975

SOURCE: KIDMAN, R. B., ET AL., ENERGY FLOW PATTERNS FOR 1975
LASL REPORT LA-6770, JUNE 1977

TABLE I-33
NET INTERSTATE PIPELINE MOVEMENTS OF NATURAL GAS, 1974
[IN BILLIONS OF CUBIC FEET AT 14.73 PSIA]

REGION	NET RECEIPTS FROM		NET DELIVERIES TO		
	STATE	QUANTITY	STATE	QUANTITY	NET FLOW
CALIFORNIA	ARIZONA	1,252.3	---	0.0	1,598.3
	OREGON	346.0			
HAWAII	---	0.0	---	0.0	0.0
NEVADA	ARIZONA	35.5	---	0.0	64.6
	IDAHO	29.1			
REGION TOTAL	---	1,662.9	---	0.0	1,662.9

SOURCE - U.S. BUREAU OF MINES, MINERALS YEARBOOK, VOL 1, 1974

TABLE I-34
IMPORTS OF CRUDE OIL AND PETROLEUM PRODUCTS BY TANKER, 1974
[IN MILLIONS OF BARRELS]

DESTINATION	CRUDE PETROLEUM		PETROLEUM PRODUCTS	
	ORIGIN	QUANTITY	ORIGIN	QUANTITY
CALIFORNIA	ALASKA	47.5	TEXAS	5.7
	VIRGIN ISLANDS	1.8	VIRGIN ISLANDS	1.4
	FOREIGN	168.2	FOREIGN	34.8
HAWAII	ALASKA	0.1	LOUISIANA	1.7
	VIRGIN ISLANDS	0.5	VIRGIN ISLANDS	1.2
	FOREIGN	13.7	FOREIGN	14.2
REGION TOTAL	---	231.8	---	59.0

SOURCE - CONGRESSIONAL RESEARCH SERVICE PUB 95-15, NATIONAL ENERGY TRANSPORTATION, VOL I, 1974

NOTES - IMPORTS FROM THE VIRGIN ISLANDS INCLUDE THOSE FROM PUERTO RICO.

TABLE I-35
NET INTERSTATE MOVEMENTS OF COAL, 1974
[IN THOUSANDS OF TONS]

REGION	NET RECEIPTS FROM DISTRICT	NET RECEIPTS FROM QUANTITY	NET DELIVERIES TO DISTRICT	NET DELIVERIES TO QUANTITY	NET FLOW
CALIFORNIA	15	1			
	17	1,218			
	20	965			
	TOTAL	2,184	TOTAL	0	2,184
HAWAII	TOTAL	0	TOTAL	0	0
NEVADA	18	3,933			
	19	1			
	20	641			
	TOTAL	4,575	TOTAL	0	4,575
REGION TOTAL	---	6,759	---	0	6,759

SOURCE - U.S. BUREAU OF MINES, BITUMINOUS COAL AND LIGNITE DISTRIBUTION, CALANDER YEAR 1974

NOTES - THESE COAL MOVEMENTS ARE ALL BY RAIL. THE COAL MINING DISTRICTS ARE LOCATED IN THE FOLLOWING STATES
15 - MISSOURI AND NEBRASKA 17 - COLORADO
18 - ARIZONA AND NEW MEXICO 19 - WYOMING AND IDAHO
20 - UTAH

TABLE I-36
INTERSTATE DELIVERIES OF ELECTRICITY, 1974
[IN MILLIONS OF KILOWATT-HOURS]

REGION	RECEIPTS FROM STATE	RECEIPTS FROM QUANTITY	DELIVERIES TO STATE	DELIVERIES TO QUANTITY	NET FLOW
CALIFORNIA	NEVADA	13,361	NEVADA	1,453	11,908
	OREGON	20,298	OREGON	153	20,145
	ARIZONA	26	ARIZONA	25	1
HAWAII	---	0	---	0	0
NEVADA	ARIZONA	569	ARIZONA	98	471
	CALIF	1,453	CALIF	13,361	-11,908
	UTAH	187	UTAH	0	187
REGION TOTAL	---	21,080	---	276	20,804

SOURCE - CONGRESSIONAL RESEARCH SERVICE PUB 95-15, NATIONAL ENERGY TRANSPORTATION, VOL I, 1974

INTERSTATE SHIPMENTS OF URANIUM

DURING 1975 THE ONLY FORM THAT URANIUM WAS SHIPPED INTO THE REGION WAS AS REACTOR FUEL FOR THE SAN ONOFRE NUCLEAR POWER STATION IN CALIFORNIA. THE SHIPMENT WAS FROM COLUMBIA, S.C. AND CONTAINED A TOTAL ENERGY CONTENT OF 14.45 BILLION BTU.

THERE WAS ALSO A SHIPMENT OF IRRADIATED FUEL FROM THE SAN ONOFRE PLANT TO THE REPROCESSING FACILITY AT MORRIS, IL. THIS SHIPMENT HAD AN ENERGY CONTENT OF 2.85 BILLION BTU.

I-D-3 ENERGY DISTRIBUTION SYSTEM

THE MAPS DISPLAYED IN THIS SECTION SHOW THE MAJOR FLOWS OF ENERGY INTO AND OUT OF THE REGION DURING 1974. THE WIDTHS OF THE ARROWS ON THESE MAPS AND THEIR LEGENDS DO NOT CORRESPOND EXACTLY DUE TO VARIATIONS IN REDUCTION FACTORS. THEY SHOULD ONLY BE USED AS GUIDES AND NOT AS PRECISE REPRESENTATIONS OF THE AMOUNTS OF ENERGY FLOWS. DATA ON THE TRANSPORTATION NETWORK GIVING RAILROAD, HIGHWAY, PIPELINE AND TRANSMISSION LINE MILEAGES ARE TABULATED AND THE IMPORTANT ROUTES ARE MAPPED. THE SERVICE AREAS OF THE ELECTRIC AND GAS UTILITIES IN CALIFORNIA ARE ALSO SHOWN. THE ENERGY FLOW AND DISTRIBUTION SYSTEM MAPS ARE TAKEN FROM A CONGRESSIONAL RESEARCH SERVICE REPORT ON ENERGY TRANSPORTATION.

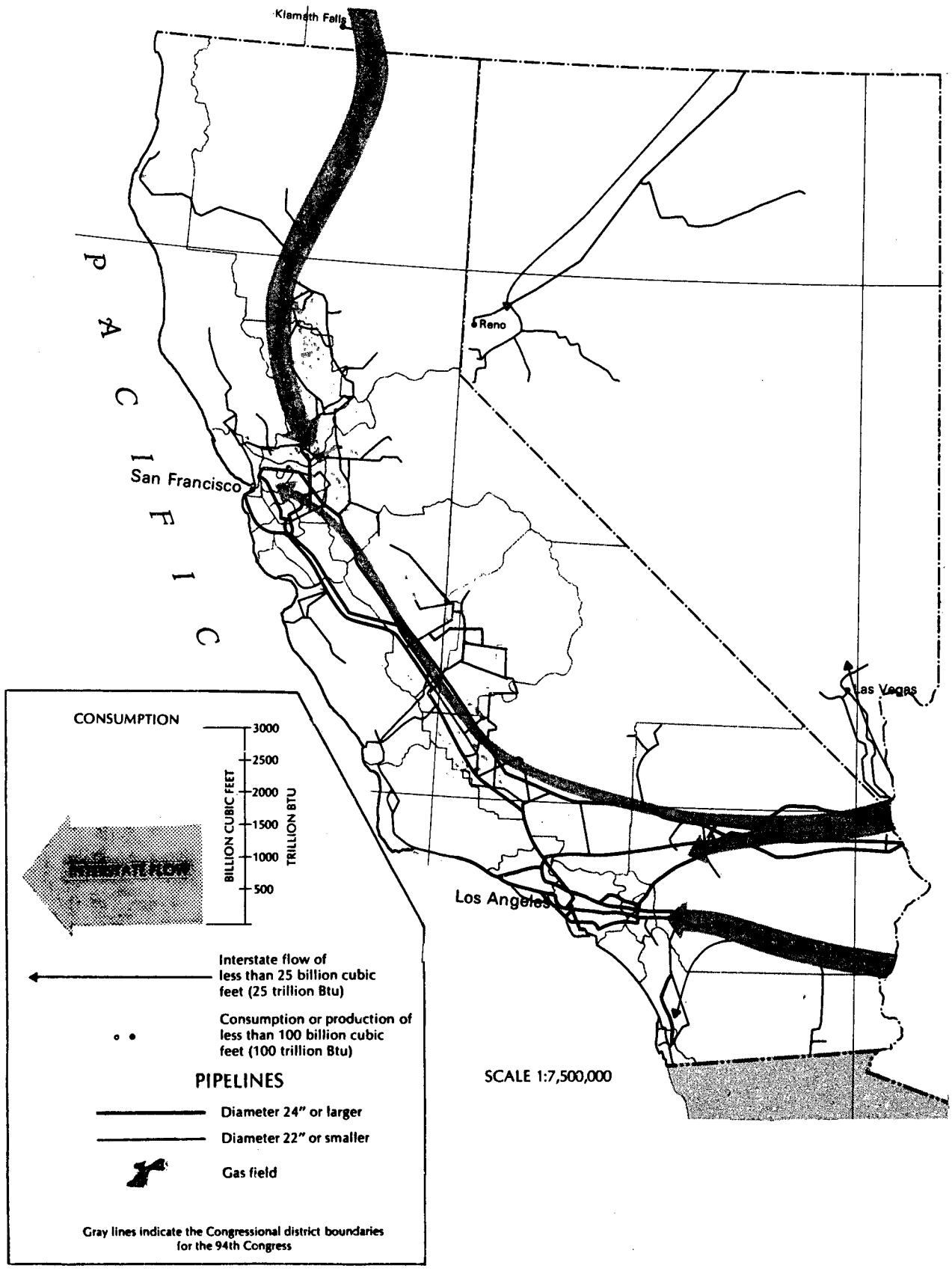


FIGURE I-38 TRANSPORTATION OF NATURAL GAS BY PIPELINE, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

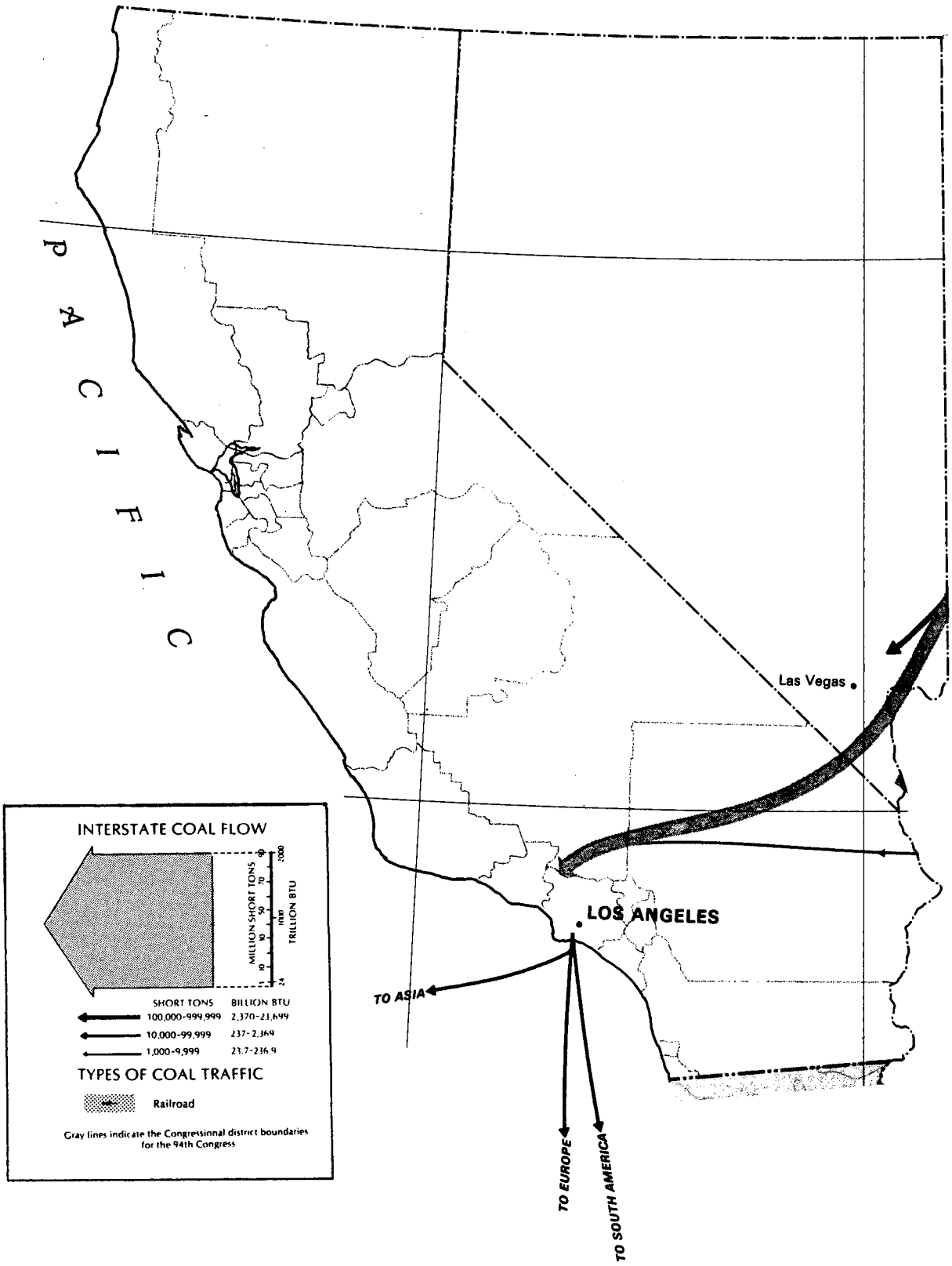


FIGURE I-39 TRANSPORTATION OF COAL BY ALL MODES, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

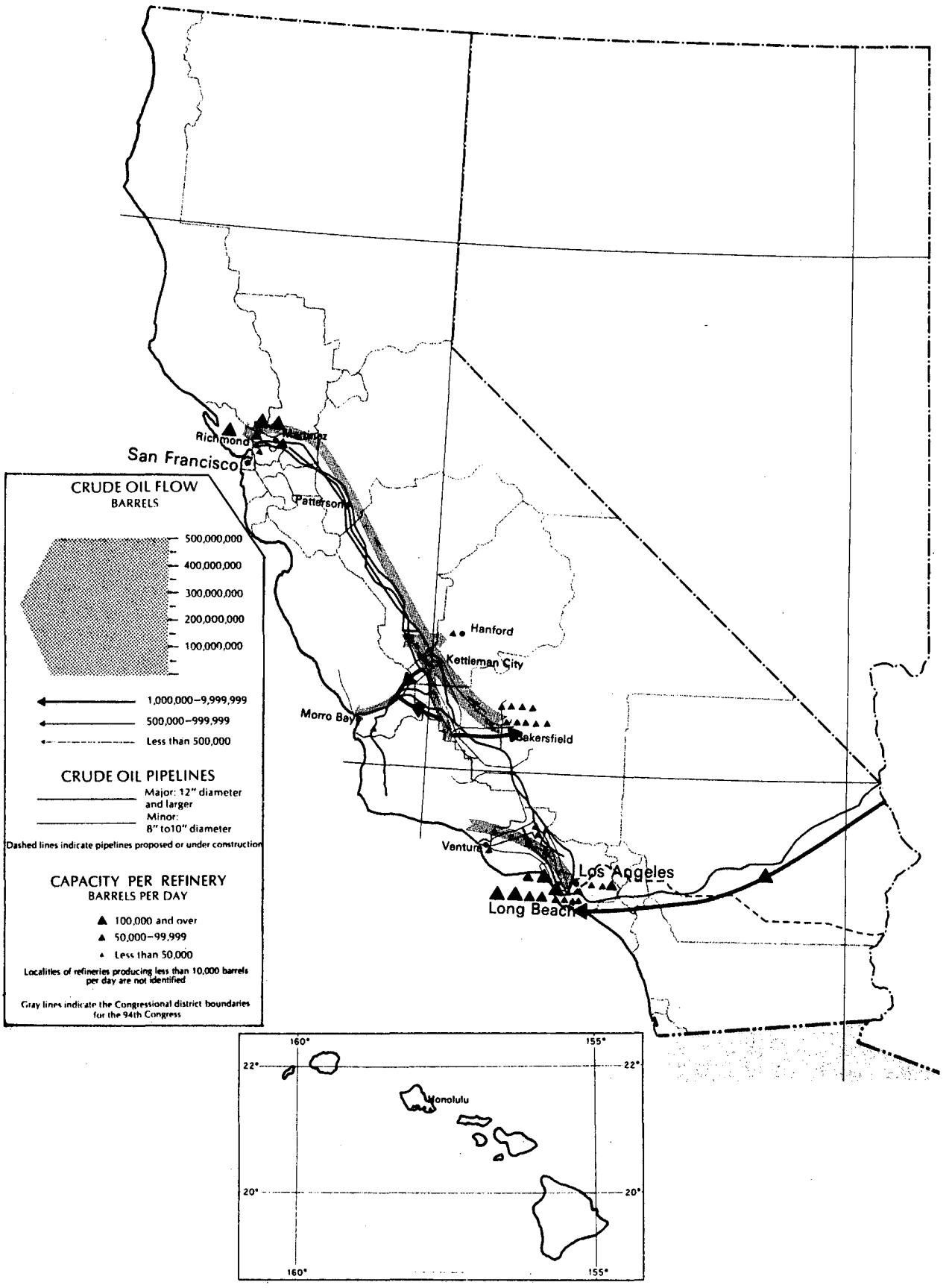


FIGURE I-40 TRANSPORTATION OF CRUDE OIL BY PIPELINE, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

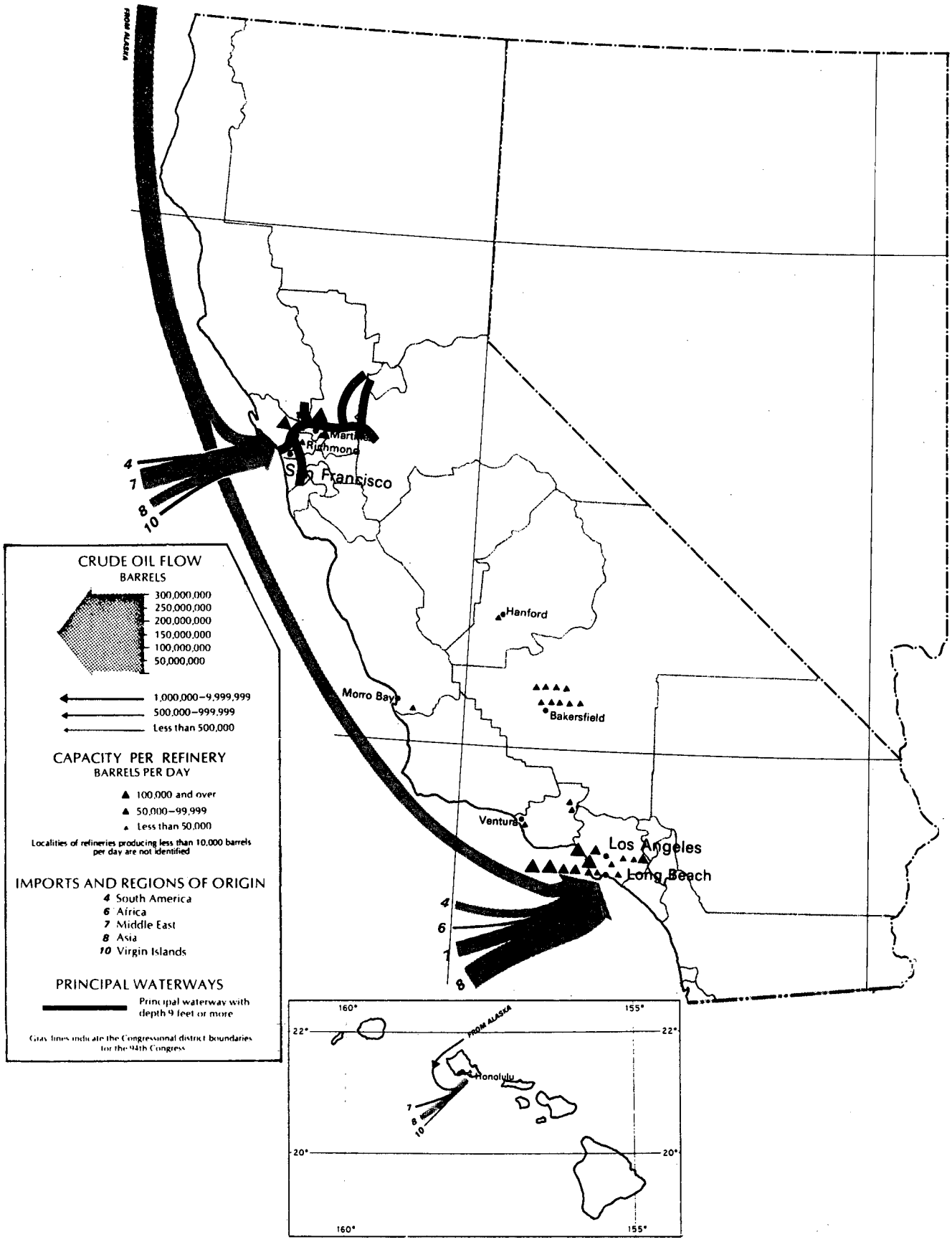


FIGURE I-41 TRANSPORTATION OF CRUDE OIL BY WATER, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

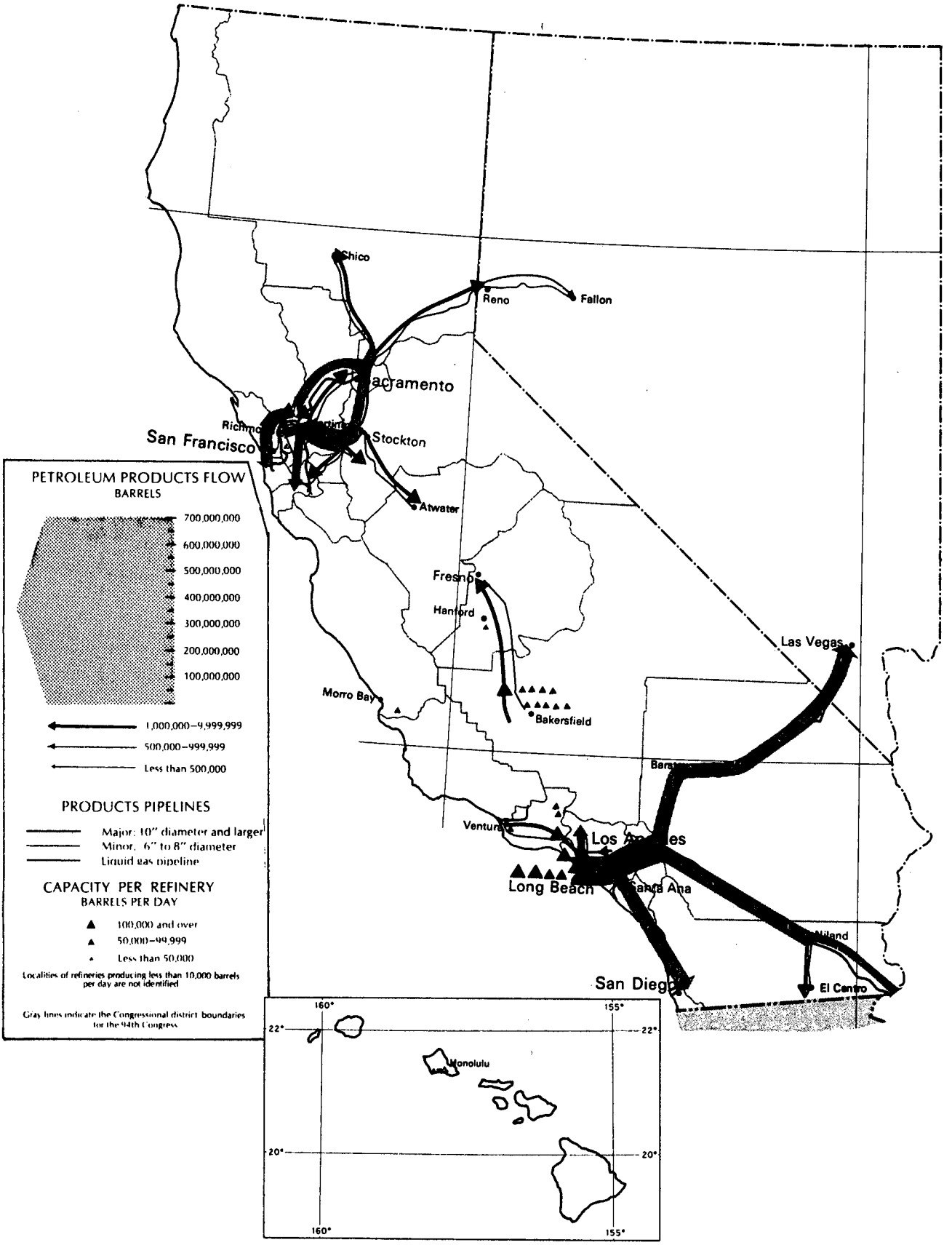


FIGURE I-42 TRANSPORTATION OF PETROLEUM PRODUCTS BY PIPELINE, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

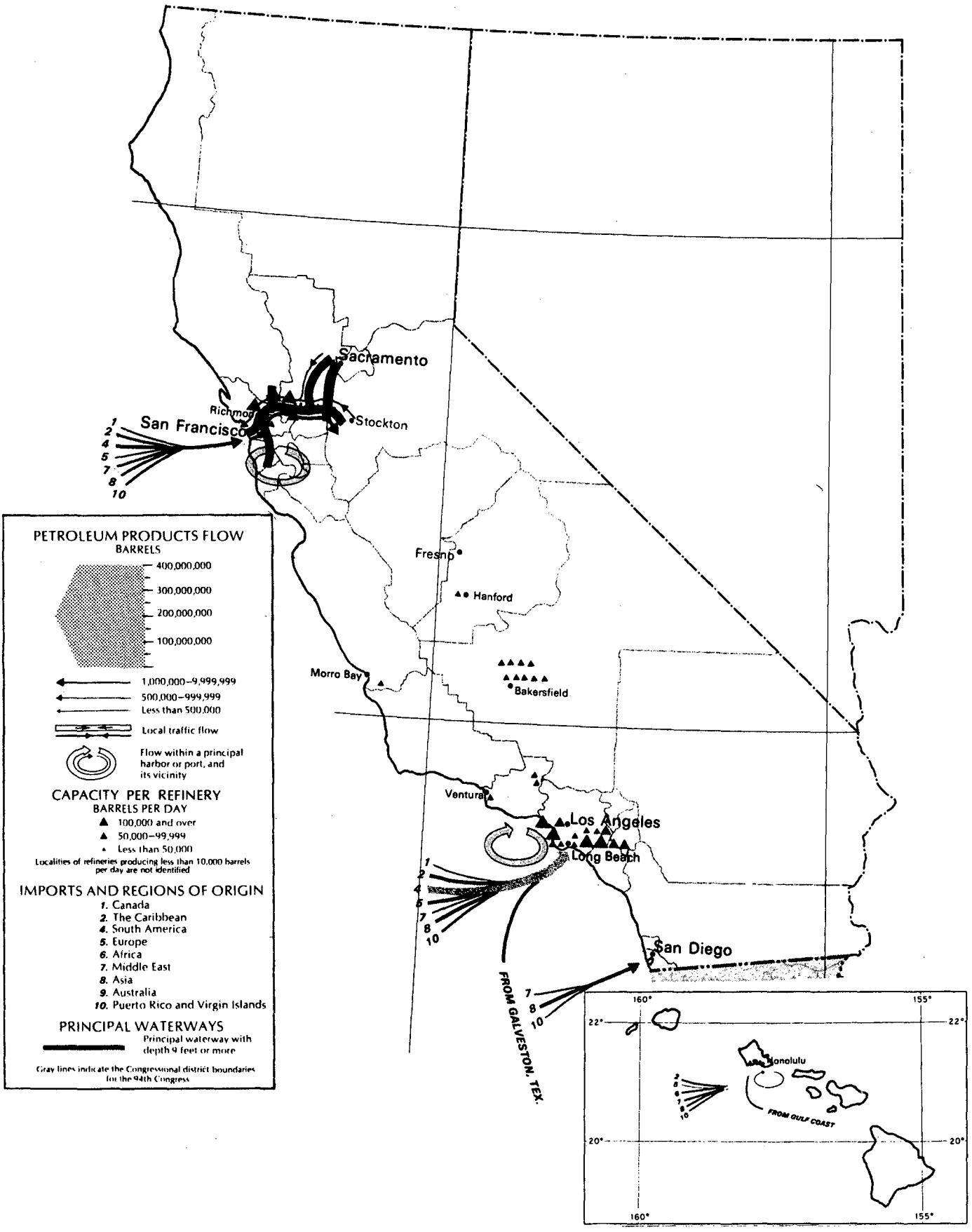


FIGURE I-43 TRANSPORTATION OF PETROLEUM PRODUCTS BY WATER, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

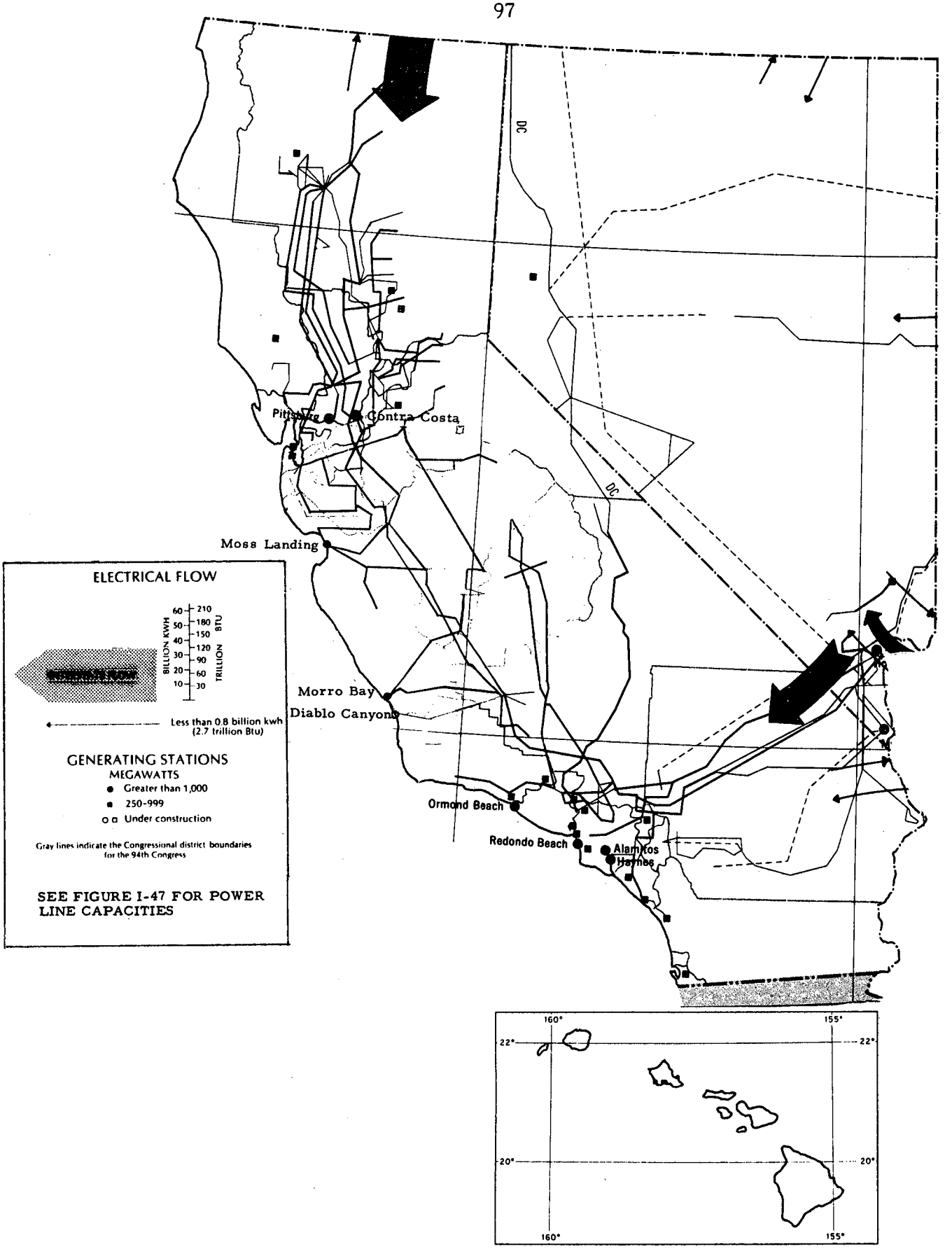


FIGURE I-44 INTERSTATE TRANSMISSION OF ELECTRICITY, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

TABLE I-37
RAILROAD AND HIGHWAY MILEAGE, 1975
[IN THOUSANDS OF MILES]

REGION	RAILROAD	HIGHWAY TOTAL	HIGHWAY MUNICIPAL	HIGHWAY RURAL
CALIFORNIA	7.3	171.1	47.9	123.2
HAWAII	0.0	3.8	1.1	2.7
NEVADA	1.6	49.7	2.0	47.8
REGION TOTAL	8.9	224.6	51.0	173.7
UNITED STATES	199.4	3,838.1	639.6	3,198.6
PERCENT OF US	4.4	5.9	8.0	5.4

SOURCE - U.S. FEDERAL HIGHWAY ADMINISTRATION, HIGHWAY STATISTICS, 1975
U.S. INTERSTATE COMMERCE COMMISSION

NOTES - RAILWAY MILEAGE FOR LINE-HAUL RAILROADS ONLY

TABLE I-38
PETROLEUM PIPELINE MILEAGE OPERATED, 1975

REGION	CRUDE OIL TRUNK LINES	CRUDE OIL GATHERING LINES	PRODUCTS LINES	OTHER	TOTAL
CALIFORNIA	275	0	1,390	14	1,679
HAWAII	0	0	0	0	0
NEVADA	0	0	135	0	135
REGION TOTAL	275	0	1,525	14	1,814
UNITED STATES	54,658	42,582	66,620	8,820	172,680
PERCENT OF US	0.5	0.0	2.3	0.1	1.1

SOURCE - U.S. INTERSTATE COMMERCE COMMISSION, TRANSPORT STATISTICS IN THE UNITED STATES, 1975

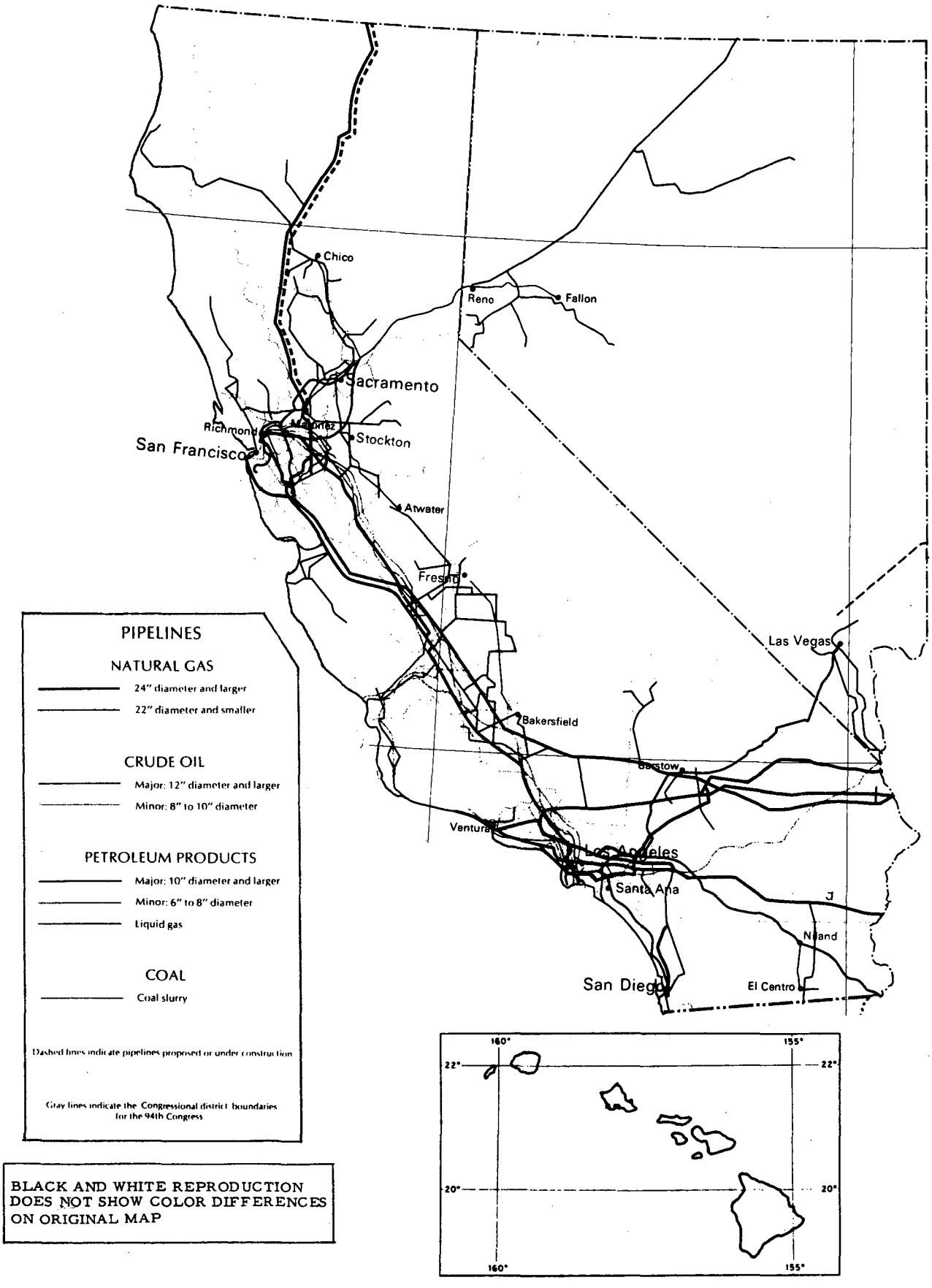
NOTES - OTHER INCLUDES MILEAGE IN UNDIVIDED INTERESTS AND MILEAGE OWNED BY OTHERS, BUT EXCLUDES MILES OPERATED BY OTHERS. INCLUDES TRUNK LINES AND GATHERING LINES.

TABLE I-39
CIRCUIT MILES OF HIGH VOLTAGE TRANSMISSION LINES, 1976

REGION	1976	1975	1974
CALIFORNIA	37,199	37,127	36,935
HAWAII	1,371	1,418	1,342
NEVADA	5,131	5,080	4,821
REGION TOTAL	43,701	43,625	43,098
UNITED STATES	520,635	513,925	504,890
PERCENT OF US	8.4	8.5	8.5

SOURCE - EDISON ELECTRIC INSTITUTE, STATISTICAL YEARBOOK OF THE ELECTRIC UTILITY INDUSTRY, 1976

NOTES - INCLUDES ELECTRICAL TRANSMISSION LINES OF 22,000 VOLTS AND ABOVE



BLACK AND WHITE REPRODUCTION DOES NOT SHOW COLOR DIFFERENCES ON ORIGINAL MAP

FIGURE I-45 PETROLEUM AND NATURAL GAS PIPELINE ROUTES, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

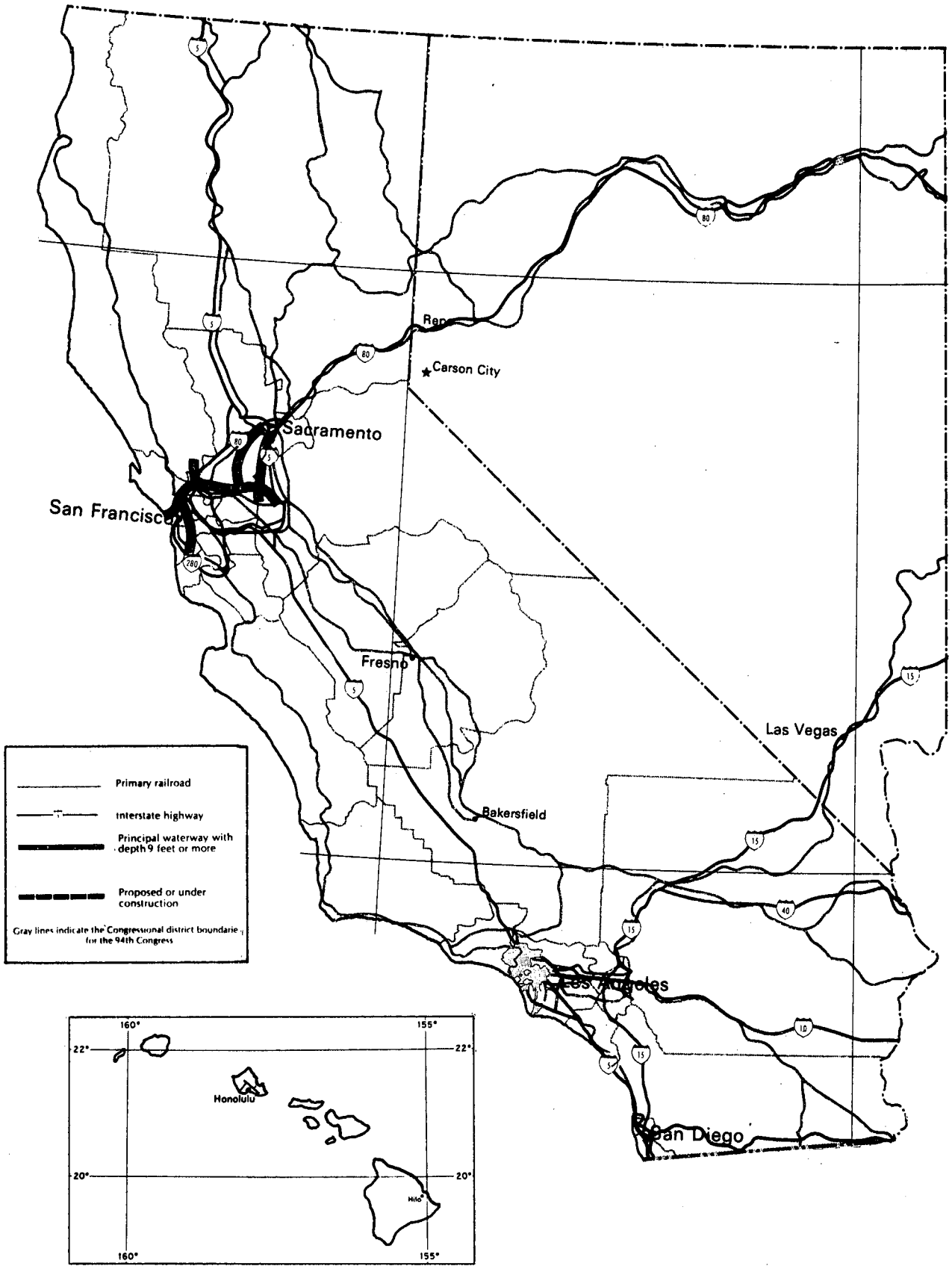


FIGURE I-46 MAJOR RAIL, HIGHWAY AND WATER TRANSPORTATION ROUTES, 1974

SOURCE: U. S. GEOLOGICAL SURVEY, MAP PREPARED FOR THE CONGRESSIONAL RESEARCH SERVICE, NATIONAL ENERGY TRANSPORTATION PUBLICATION 95-15, 1974

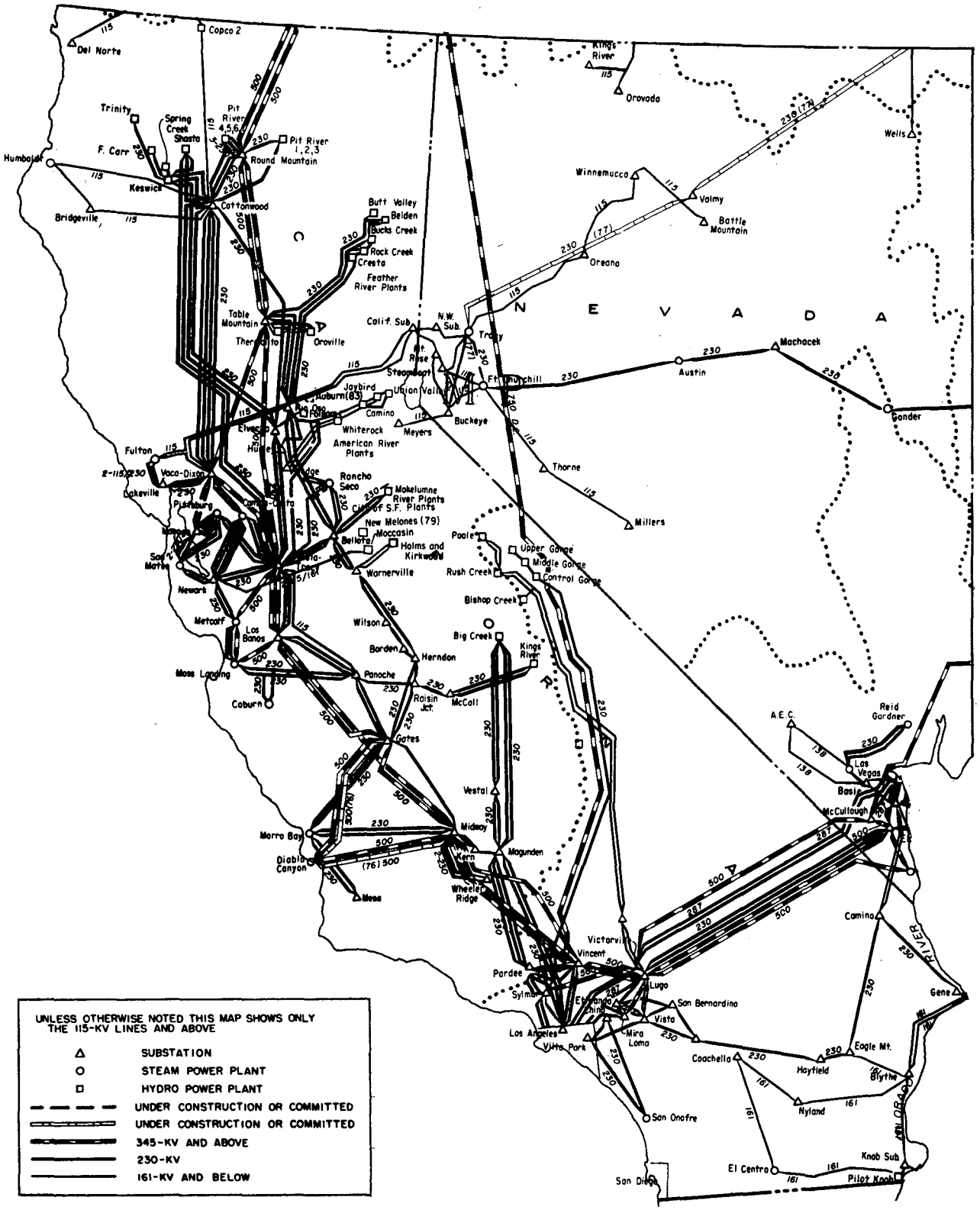


FIGURE I-47 MAJOR TRANSMISSION LINES

SOURCE: U. S. BUREAU OF RECLAMATION, PRINCIPAL POWER FACILITIES--WESTERN UNITED STATES 1975

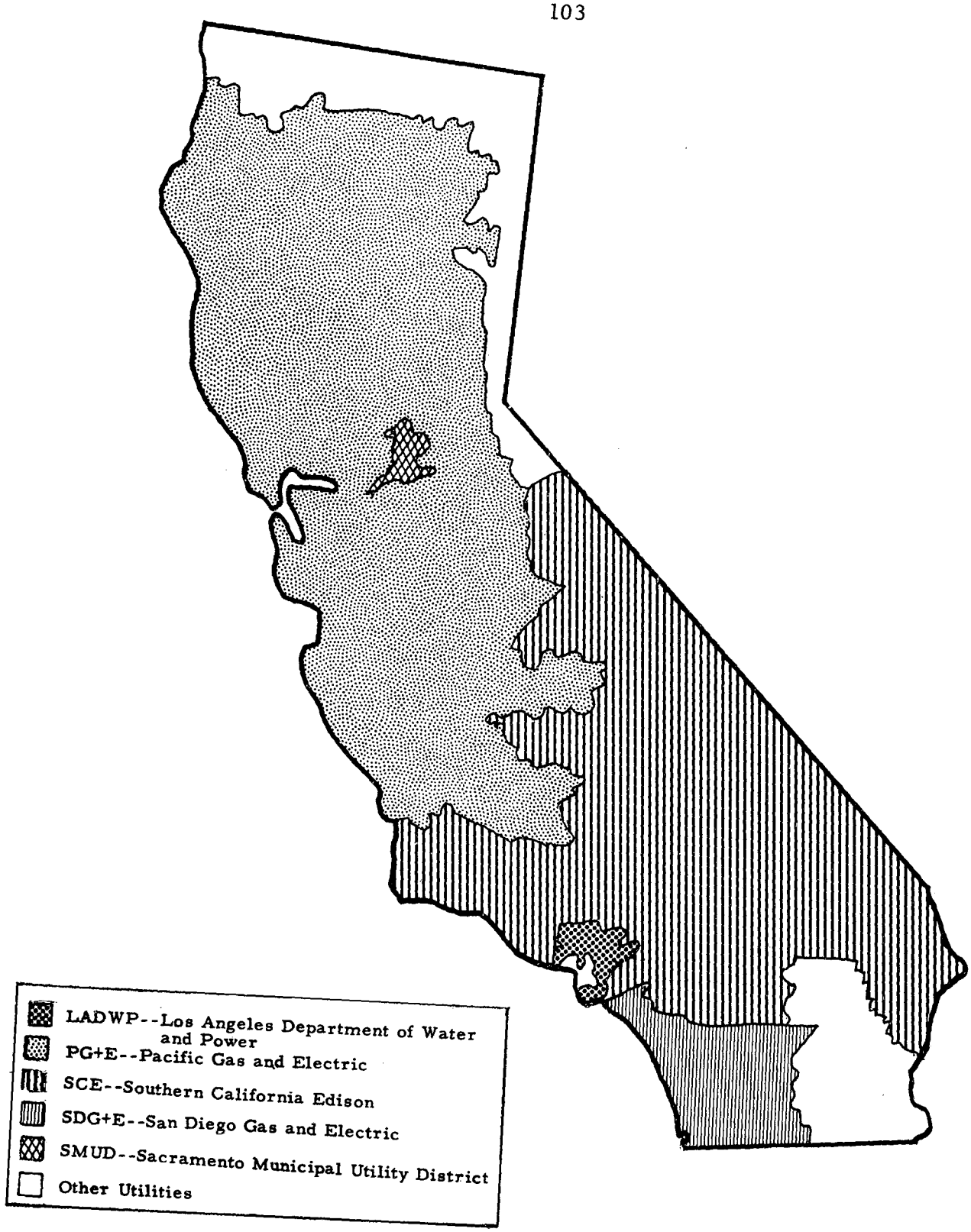


FIGURE I-48 ELECTRIC UTILITY SERVICE AREAS IN CALIFORNIA

SOURCE: CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION, "ENERGY WATCH " VOLUME 1 #4, JULY 1978

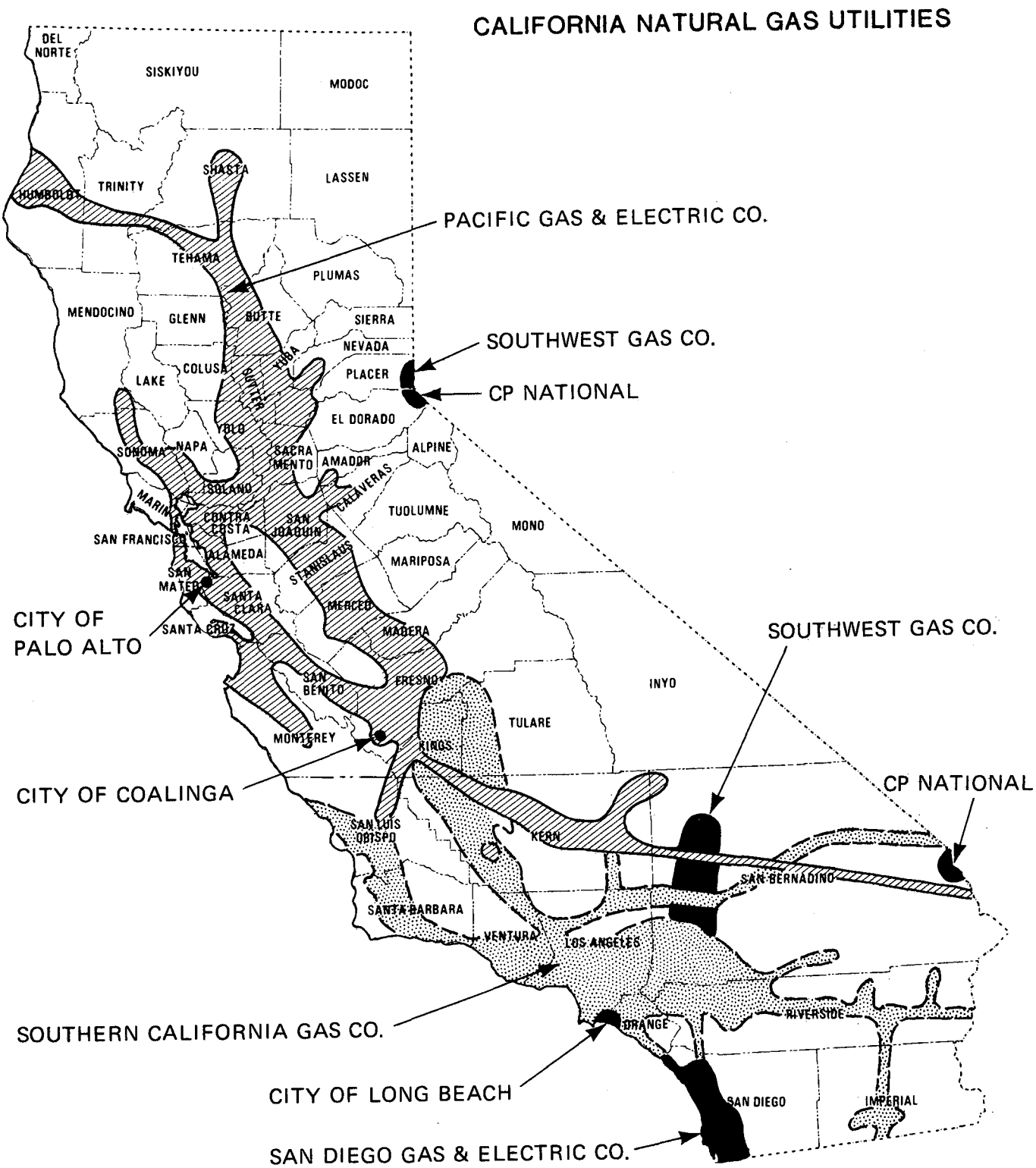


FIGURE I-49 GAS UTILITY SERVICE AREAS IN CALIFORNIA

SOURCE: CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION, QUARTERLY FUEL AND ENERGY SUMMARY, VOLUME 3 #2, 1977

REGIONAL DATA AVAILABILITY MATRIX

Section	Resolution of Included Data	Resolution of Additional Data
I-B-1 Natural Gas		
Production	Annually by state, 1970-75 1975 by county (map)	Annually by PAD; monthly by state; annually by state; California - annually by field and county; Nevada - annually by well, field and county
I-B-2 Natural Gas Liquids		
Production and Capacity	Annually by state, 1970-75	Annually by PAD and product; monthly by state and product
I-B-3 Petroleum		
Crude oil production	Annually by state 1970-75 1975 by county (map)	California - annually by field and county; Nevada - annually and monthly by field and county
Petroleum refinery capacity	1975 by state and county (map)	Annually by state; 1977 by refinery
Petroleum products production	1974 by state	1977 by PAD, refinery district, state and refinery
I-B-4 Oil shale		
Production	None	None
I-B-5 Coal		
Production	None	None
I-B-6 Uranium		
Production	None	None
I-B-7 Electricity		
Capacity and generation	By state and fuel, 1975 and 1977	Annually; by state and fuel; annually by utility; monthly by unit and fuel, 1970-
Fuel consumption	None	Annually and monthly by state; monthly by boiler 1970- ; California - monthly by utility, 1975-
I-B-8 Geothermal		
Locations of activity	Maps	Data on individual wells in California and Nevada
Generation	1977 (included in Section I-B-7)	California - quarterly
I-B-9 Solar		
Insolation	Map	By state and county
I-B-10 Wind Energy		
Wind energy	Map	Hourly data on wind speed for selected locations

REGIONAL DATA AVAILABILITY MATRIX (Continued)

Section	Resolution of Included Data	Resolution of Additional Data
I-B-11 Wood		
Potential as fuel	California - statewide Hawaii - by company	California - by county (includes agricultural wastes)
I-B-12 Waste		
Potential as fuel	Proposed plants Hawaii - by island (agricultural)	Hawaii- potential by island and city
I-B-13 OTEC and Pumped storage		
OTEC	None	None
Pumped storage capacity	By plant	Annual generation by plant
I-C-1 Energy Consumption		
By sector and fuel	1975 by state	1972 by fuel and county; California - electricity and gas by utility; Hawaii - electricity by island
In manufacturing	1974 by 2-digit SIC code	1971 and 1974 by county and 3- and 4-digit SIC code
In transportation	1975 by state and fuel	Hawaii - 1961 to 1975 by island
I-C-3 Consumption Trends		
By sector and fuel	1970-1975 by state	1960-1975 by state; 1950-1975 Hawaii by island; 1975- California by quarter; California - by utility 4-digit SIC code and county 1976 (natural gas only)
I-C-4 Energy Storage		
Stocks	1975 by state	Annual by state
I-D-1 Energy Prices		
Prices	1975 by fuel and state	1960-1975 by fuel and state; 1977-1978 electricity rates by utility and customer class
I-D-2 Imports and Exports		
Energy balance	1975 by state	None
Interstate flows	1974 by state and fuel	Annual by state or district to 1974
Energy distribution system	1974 maps 1975 mileage by state	None; Annual by state

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Chapter II

PERSPECTIVE AND DATA ON ENVIRONMENTAL QUALITY

II PERSPECTIVE AND DATA ON ENVIRONMENTAL QUALITY

II-A REGIONAL OVERVIEW

II-A-I Regional Overview

This chapter contains statistical and mapped data on water quantity and quality; air quality and climatological factors; solid waste; land characteristics, use, and ownership; flora and fauna; and socio-economic and health indicators. This introductory material provides a broad overview of the states' environmental characteristics, and some of their current and future environmentally related problems.

Water

In a state of California's physical size, population, and dependence on agriculture, the availability and quality of water are of paramount importance. A key to understanding the water supply situation in the state is the recognition of the seasonal variability of precipitation and geographic distribution of demand. These inequities have led to major efforts at redistribution through such projects as the State Water Project, the Central Valley Project, diversion of water from the lower Colorado River, and the construction of the variety of dams, reservoirs, and canals throughout the state. In addition, this supply variability has manifested itself through alternate periods of severe flooding (especially in the northern portion of the state) and serious drought (e.g., 1976-1977 drought). One should also underscore the importance of agricultural activities, chiefly irrigation, in the state's water picture. Roughly 85 percent of California's total water use is attributable to this sector. This, in turn, has created problems with soil and water salinity increase, as well as potentially severe overdrafting of groundwater reserves. These agriculturally related problems are of critical importance to the state and its future water quantity and quality.

Nevada's water situation is characterized by an almost entirely indigenous water system, with the exception of water taken from the Colorado River in the south. As with California, agriculture is the dominant mode of water usage, but unlike California absolute rather than simply spatial and temporal availability of water within the state is a significant problem. Demand for increased supply, especially in the more urbanized areas, will be of critical importance in the future. Although potentially large groundwater reserves exist, their ultimate availability is speculative. California and Nevada, as well as other neighboring states, are dependent on the Colorado River for much of their water. It is expected that problems of Colorado River water quantity and quality will tax the river's physical limits with concomitant effects on the two states.

Hawaii relies on very limited aquifers for its water supply. The combined demands of agriculture and domestic use, together with a five-year drought period, have created critical water supply situations in part of the State. On Oahu, the most populous island, demand is expected to exceed the safe recharge level before the turn of the century. Water quality in the islands is generally good, and efforts at cleaning up ocean discharge have resulted in improvements in coastal water quality. However, with respect to groundwater, which provides nearly 45 percent of the total state supply, the aquifers are highly susceptible to salt water and waste water intrusion under conditions of overdrafting. As with the other two states, agricultural irrigation is the chief use of water in the state.

Air and Climate

California's air quality situation is improving on the whole. In spite of this, a non-attainment status for particulates, oxidants, and several other major pollutants is characteristic of large portions

of the state, and it is expected that non-attainment problems will continue for some time to come. Substantial portions of the state have been designated as Class I Prevention of Significant Deterioration areas. These factors will be important in siting energy facilities which emit large amounts of pollutants.

Nevada, while experiencing non-attainment for some pollutants in certain portions of the state, notably the Las Vegas and Carson City-Reno-Sparks urban areas, is in a relatively more favorable status than California.

Hawaii's situation with respect to air quality is generally excellent except for some areas in and around the city of Honolulu.

Climatic factors in the three states vary through a wide range. California, with its proximity to the ocean, has large areas of moist, cool, marine-type climate juxtaposed against more inland areas of low rainfall and major temperature fluctuations. This contrast is largely due to the varied topography and the large north-south extent of the state. Nevada, with its inland location, is more removed from the moderating effects of the ocean and is therefore subject to greater temperature ranges as well as having the lowest mean rainfall of any state. Finally, Hawaii is unique among the states in that its semi-tropical location gives it a relatively invariant temperature. Its topography and wind patterns produce rainfall extremes ranging from a few inches to hundreds of inches per year.

Solid Waste

The solid waste situation in California is of significant magnitude due to the sheer number of people residing in the state and the lack of suitable disposal sites. It is expected that solid waste pressures will increase in the future as current disposal sites are filled.

However, a number of resource recovery and recycling efforts have been instituted and are likely to be expanded in the future.

For Nevada, the most salient solid waste characteristic is the existence of two low-level radioactive waste disposal facilities within its border. One commercial disposal site is located at Beatty in Nye county and other disposal grounds are found on the Nevada Test Site. Hawaii's solid waste situation is typical except that a shortage of adequate landfill sites is expected to arise in the medium- to long-term. The state is unique in that a large portion of its energy is provided by agricultural wastes, notably sugar cane residue.

Land

California has an extremely varied topography. Features include a long coastline, fertile inland valleys, extensive deserts and wetlands, and high mountainous areas. The varied topography leads to a diversity of land use patterns with urban areas along the coast, agriculture further inland and forestland in the northern mountains. Recreation areas are found throughout the state. A major land use problem is the encroachment of urban areas into prime agricultural land. A second problem, which is an important consideration for power plant siting, is the relatively high level of seismic risk throughout much of the state.

The federal government owns or controls approximately 45 percent of the land area in California. Much of this land is in national forests, parks, wilderness areas, military reservations, and desert areas under the jurisdiction of the Bureau of Land Management.

Nevada is even more under the purview of the federal government with more than 80 percent of its land federally controlled. It is expected that most urban growth and land development will continue to be concentrated in the Las Vegas and Carson City-Reno-Sparks areas.

Hawaii consists of a chain of volcanic islands. The fertile volcanic soil, temperate climate and abundant rainfall make certain parts of the islands ideal for growing such crops a sugar cane and pineapples. Here too there is a land use conflict between the growing urban areas and agriculture. Furthermore there is pressure to keep many areas in an undisturbed state to continue attracting tourists. These considerations may preclude the siting of energy facilities.

Biota

Because of its diverse topography and climate California contains a variety of habitats. These include shorelines, estuaries, wetlands, soft- and hardwood forests, deserts, scrub growth and alpine regimes. With the large growth in population and the extensive development of land for agriculture and other uses, many of these habitats have shrunk or disappeared entirely. As a result 35 species of animals residing in the state have been classified by the federal government as endangered or threatened.

The ecosystem of Nevada is much less varied. Most of the state is arid or semi-arid range land. Twelve of Nevada's species of animals have been classified as endangered by the federal government.

The Hawaiian islands contain a series of more or less isolated ecosystems. This leads to a large number of species with limited ranges. About 95 percent of native Hawaiian plants and animals occur nowhere else in the world. Thus the ecosystem is exceedingly vulnerable to disruption by introduced species. Hawaii has vast numbers of plant and animal species that have been classified as threatened or endangered, far more than any other state in the union. Protecting all of these species is an important consideration in the state's future.

Socio-Economic and Health

The states of California, Hawaii and Nevada, while comprising less than eight percent of the nation's land area, contain more than ten percent of its population. California and Hawaii have mean population densities twice the national average, whereas Nevada's density is barely eight percent of the nation's. Moreover, the population distribution is far from uniform, with large concentrations along portions of the California coast and on the island of Oahu in Hawaii. The populations of these two states are also characterized by ethnic diversity (Hawaii is less than half white). The region has shown a high rate of population increase (27 percent during the 1960's) with a strong in-migration component.

The California economy is made up of a variety of light, high technology and service-oriented industries. The major sectors are agriculture, transportation equipment, instruments, and communications. (California leads the nation in value-added in agriculture.) Hawaii and Nevada have more narrow economic bases. In both states tourism provides a large portion of the employment and income. Agriculture is also of major importance in Hawaii. Unemployment rates in the three states have tended to run about one prcentage point higher than the national average, while at the same time median family income is one to two thousand dollars per year higher.

The housing stock of the region is, as would be expected from the large amount of in-migration, relatively new as compared to the remainder of the United States. Moreover, the length of residence in both owner and renter occupied dwellings is substantially shorter than the national average.

Morbility and mortality in the region are not substantially different from the rest of the country. Hawaii has the distinction of being the state with the longest life expectancy.

II-A-2. Data Quality and Availability

The information presented in this chapter is taken from a wider and more varied range of publications than that of the other chapters. Therefore, consistency within this chapter varies substantially. Furthermore, statewide statistics on environmental factors (e.g., air quality, flood potential, etc.) often fail to reflect the diversity of such factors within a given state. National sources of information on the State of Hawaii are at times lacking and have, where possible, been supplemented by state or local data.

Water

The lengths of coastlines, area of water bodies, etc., that are presented here may not agree with other public sources due to the wide range of methods employed in their determination. The maps provided on seasons of highest and lowest stream flows for various sections of the region are intended merely as general area-wide approximations and should not be applied to specific streams, rivers or drainage basins.

The data on water comsumption by end use are taken from a U.S.G.S. circular in which they are presented on a statewide basis. This permits intercomparisons among states and end uses, but does not permit detailed planning or assessments at a hydrological basin level. The maps of water quality provided by the Council on Environmental Quality show annual averages of pollutant levels by NASQAN accounting unit. These correspond to subbasin regions defined by the Water Resources Council. The data plotted are means of the water quality data taken from individual monitoring stations within a subbasin, and weighted by stream flow.

Air

The table on air pollutant attainment status by air basin and country as well as the data presented on precipitation and temperature by state climatic divisions are aggregations of individual station measures and may not accurately reflect either the diversity within a region or the characteristics of a specific location. In the same vein, the maps of annual sea level air pressure, mean annual flood potential, and mixing heights, and wind speed are attempts to annualize phenomena that occur with characteristics times of a few hours to several weeks. Consequently they are of limited applicability on the local level. Maps of evapotranspiration for Hawaii and drought potential for the region have been excluded because of the lack of adequate source data.

The maps of air quality were constructed by CEQ from data extracted from the SAROAD data bank. The daily maximum concentration of each pollutant for all monitoring stations were aggregated by AQCR. The 1975 annual mean value represents the mean of all these raw data measurements recorded within that AQCR. Arithmetic means were calculated for all pollutants with the exception of TSP, for which the geometric means was used.

Solid Waste

Amounts of characteristics of municipal solid waste for the three states are not readily available in any conveniently aggregated form. The information presented is derived from calculated average values.

Land

The wetland information provided is taken from a 1956 survey of the Nation's wetlands, since no more recent federal survey is currently available. The map of seismic risk was originally intended as a general guide to nuclear power center siting and is generalized in the extreme.

The data presented on land ownership and use is very difficult to obtain in any consistent format. Due to differences in categorization of land use and types, incomplete information on current land status, and wide ranges in the data of various land use surveys, comparisons between tables and with other published sources will yield substantial variations. As an example, the tabular and mapped information from the 1967 Conservation Needs Inventory, which was performed by the Soil Conservation Service, employs a unique system of land classification and does not reflect recent changes in both land ownership and use.

Biota

The tabular information presented on endangered, rare and threatened species is as current as possible. However, given the vast number of species of endangered plants in Hawaii, more than 1000, no complete list by individual species could be included.

Socio-Economic and Health

The socio-economic data presented in this section are derived almost exclusively from the U. S. Bureau of the Census. Any information regarding specific data quality coverage, or reliability should be obtained from the specific publications cited. This information is also summarized in Appendix III of the 1977 Statistical Abstract of the United States.

The maps of mortality by county are derived from data for 1968-1972 compiled by the National Center for Health Statistics. The rates are compiled by race and sex making it difficult to combine the data to get an overall mortality rate. Only data for white males are presented.

II-B. WATER QUALITY AND QUANTITY

II-B-1 SURFACE WATER

THIS SECTION PRESENTS DATA ON THE AVAILABILITY OF SURFACE WATER. TABULAR AND GRAPHICAL DATA ARE GIVEN ON THE SOURCES OF SURFACE WATER, THE QUANTITY OF WATER AVAILABLE, PATTERNS OF WATER CONSUMPTION, NON-AVAILABLE FLOWS, AND THE LEVELS OF WATER POLLUTION. THE SECTION BEGINS WITH A DESCRIPTION OF THE MAJOR RIVERS AND TRIBUTARIES, THE LAKES AND RESERVOIRS, AND THE SHORELINE AND COASTLINE OF THE REGION. QUANTITATIVE DATA ARE PRESENTED ON FLOWS OF MAJOR STREAMS AND ANNUAL RUNOFF. MAPS SHOWING THE EFFECTS OF THE 1975-76 DROUGHT ON STREAM FLOW ARE INCLUDED. THE WATER CONSUMPTION DATA ARE GIVEN BY MAJOR USE SECTOR INCLUDING POWER PLANT COOLING AND HYDROELECTRIC GENERATION. SEVERAL MAPS ARE INCLUDED THAT HIGHLIGHT AREAS OF INADEQUATE WATER SUPPLY AND COMPETITION FOR WATER. WATER QUALITY DATA ARE MAPPED FOR EIGHT POLLUTANTS BY WATER RESOURCES COUNCIL AGGREGATED SUBREGION (ASR). DATA ON OTHER WATER POLLUTANTS ARE ALSO TABULATED.

DATA FOR THIS SECTION COME FROM A VARIETY OF SOURCES. MANY OF THE MAPS ARE TAKEN FROM THE WATER ATLAS OF THE U.S. WATER CONSUMPTION DATA ARE FROM THE U.S. GEOLOGICAL SURVEY AND THE OAK RIDGE NATIONAL LABORATORY. THE COUNCIL ON ENVIRONMENTAL QUALITY SUPPLIED MUCH OF THE WATER QUALITY DATA. ANOTHER SOURCE OF MAPS WAS THE REPORT OF THE 1977 NATIONAL CONFERENCE ON WATER, WHICH WAS PUBLISHED BY THE NATIONAL WATER RESOURCES COUNCIL.

TABLE II-1
WATER AREA AND LENGTH OF COASTLINE

REGION	WATER AREA (SQ KM)	COAST -LINE (KM)	TIDAL SHORE -LINE (KM)
CALIFORNIA	6,040	1,352	5,514
HAWAII	65	1,207	1,693
NEVADA	1,686	0	0
REGION TOTAL	7,791	2,559	7,207
UNITED STATES	202,712	19,924	142,610
PERCENT OF US	3.8	12.8	5.1

SOURCE - U.S. BUREAU OF THE CENSUS, AREA MEASUREMENT REPORTS; U.S. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, COASTLINE OF THE UNITED STATES. TAKEN FROM THE STATISTICAL ABSTRACT OF THE U.S., 1977.

NOTES - WATER AREA INCLUDES PERMANENT INLAND WATER SURFACE SUCH AS LAKES, RESERVOIRS, PONDS, STREAMS, SLOUGHS, ESTUARIES, CANALS, SOUNDS AND DEEPLY INDENTED EMBAYMENTS.

COASTLINE FIGURES ARE LENGTHS OF THE GENERAL OUTLINE OF THE COAST.

TABLE II-2
MAJOR RIVERS

RIVER	STATES	SOURCE	OUTFLOW	LENGTH (MILES)	DRAINAGE AREA (SQ MI)
COLORADO	NEVADA AND CALIFORNIA	COLORADO	GULF OF MEXICO	1,360	242,900
SACRAMENTO	CALIFORNIA	SISKIYOU CO.	SUISUN BAY	377	27,100
SAN JOAQUIN	CALIFORNIA	MADERA CO.	SUISUN BAY	350	

SOURCE - 1978 WORLD ALMANAC AND BOOK OF FACTS AND U.S. GEOLOGICAL SURVEY CIRCULAR 686, LARGE RIVERS OF THE UNITED STATES, 1974

TABLE II-3
POPULATION AND AREA OF RIVER BASINS, 1975
[POPULATION IN THOUSANDS, AREA IN THOUSANDS OF ACRES]

ASR	RIVER BASIN	POPULATION	TOTAL AREA
1502	LOWER COLORADO (1)	474	40,192
1603	HUMBOLDT AND TONOPAH	43	46,784
1604	CENTRAL LAHONTON	196	11,520
1801	NORTH COASTAL (2)	266	15,040
1802	SACRAMENTO BASIN	1,313	20,224
1803	SAN JOAQUIN	1,714	20,864
1804	SAN FRANCISCO BAY	4,988	4,416
1805	CENTRAL COASTAL	800	7,168
1806	SOUTH COASTAL - COLORADO DESERT	12,056	27,200
1807	SOUTH LAHONTON	23	8,832
2001	HAWAII COUNTY	75	2,584
2002	MAUI COUNTY	54	752
2003	HONOLULU COUNTY	704	391
2004	KAUAI COUNTY	32	401

SOURCE - LUKENS AND PECHAN, WATER POLLUTION CONTROL, PRAEGER, 1977
STATE OF HAWAII DATA BOOK, 1977

NOTES -
(1) INCLUDES COCONINO, MOHAVE AND YUMA COUNTIES IN ARIZONA.
(2) INCLUDES KLAMATH COUNTY IN OREGON.

TABLE II-4
SURFACE WATER FLOW BY ASR
[IN MILLIONS OF GALLONS PER DAY]

ASR	RIVER BASIN	MEAN FLOW	95 % FLOW	CRITICAL FLOW		1975 CONSUMP-TION
				FLOW	MONTH	
1502	LOWER COLORADO (1)	10,609	1,810	15,104	JUL	1,883
1603	HUMBOLDT AND TONOPAH	1,607	665	4,328	JUL	3,738
1604	CENTRAL LAHONTON	1,500	30	1,879	AUG	1,868
1801	NORTH COASTAL (2)	27,911	1,620	3,087	AUG	1,482
1802	SACRAMENTO BASIN	18,551	4,130	9,408	SEP	7,132
1803	SAN JOAQUIN	23,936	290	10,858	SEP	17,912
1804	SAN FRANCISCO BAY	3,110	87	1,001	SEP	933
1805	CENTRAL COASTAL	1,376	35	184	OCT	348
1806	SOUTH COASTAL - COLORADO DESERT	-876	5	2,961	OCT	3,941
1807	SOUTH LAHONTON	203	363	378	OCT	77

SOURCE - ORNL REPORT TM-6098, NATIONWIDE ASSESSMENT OF WATER QUALITY IMPACTS OF THE NEP, VOL I, 1977

NOTES - CRITICAL FLOW IS THE APPROXIMATE TOTAL SURFACE SUPPLY DURING CRITICAL MONTH.
(1) INCLUDES COCONINO, MOHAVE AND YUMA COUNTIES IN ARIZONA.
(2) INCLUDES KLAMATH COUNTY IN OREGON.

DATA ARE NOT AVAILABLE FOR HAWAII.

95 % FLOW INDICATES WATER FLOW THAT CAN BE EXPECTED AT LEAST 95 PERCENT OF THE YEAR.

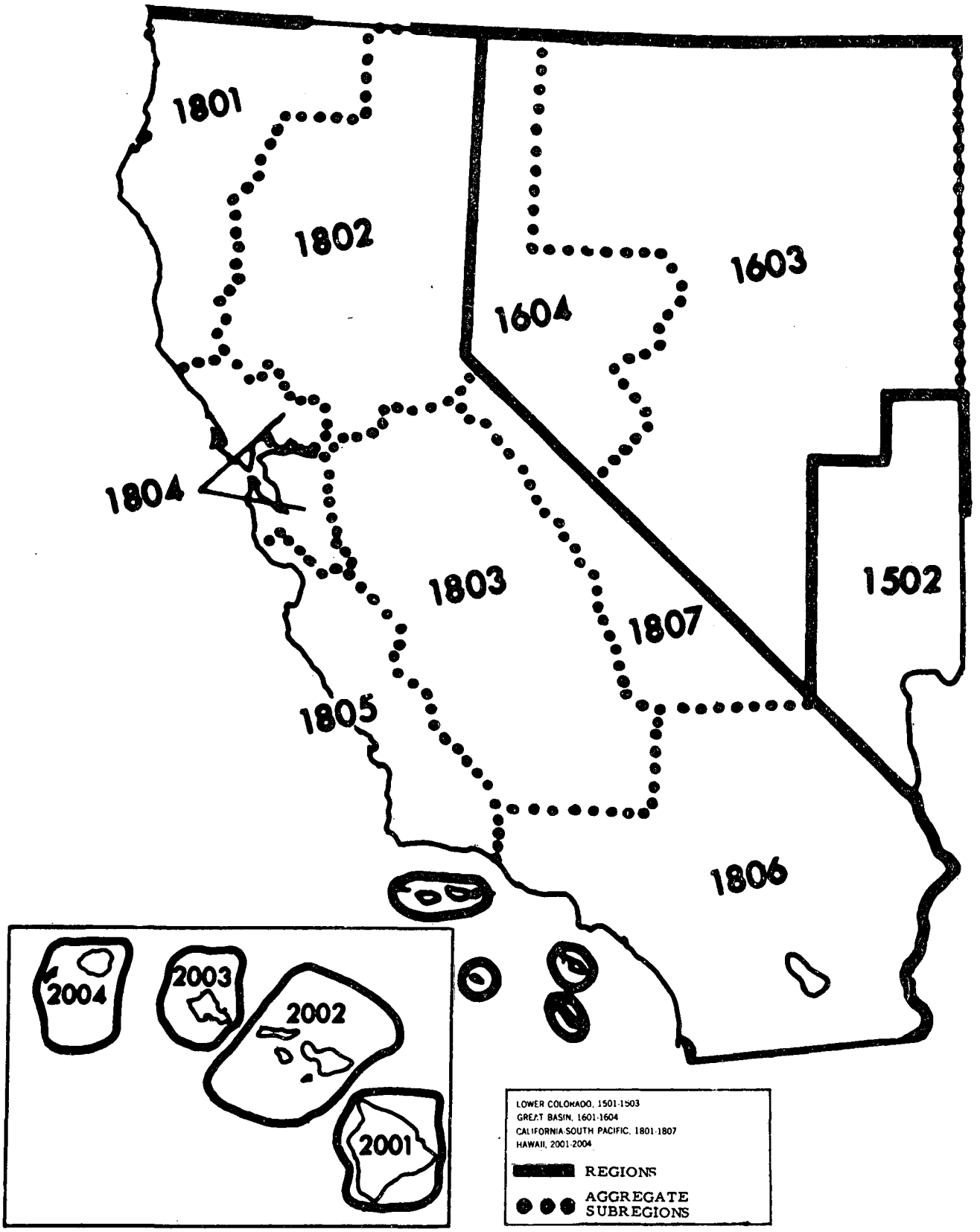


FIGURE II-1 WATER RESOURCE COUNCIL AGGREGATED SUBREGIONS

SOURCE: U. S. FOREST SERVICE, THE NATION'S RENEWABLE RESOURCES-AN ASSESSMENT 1975 FOREST RESOURCE REPORT #21, JUNE 1977

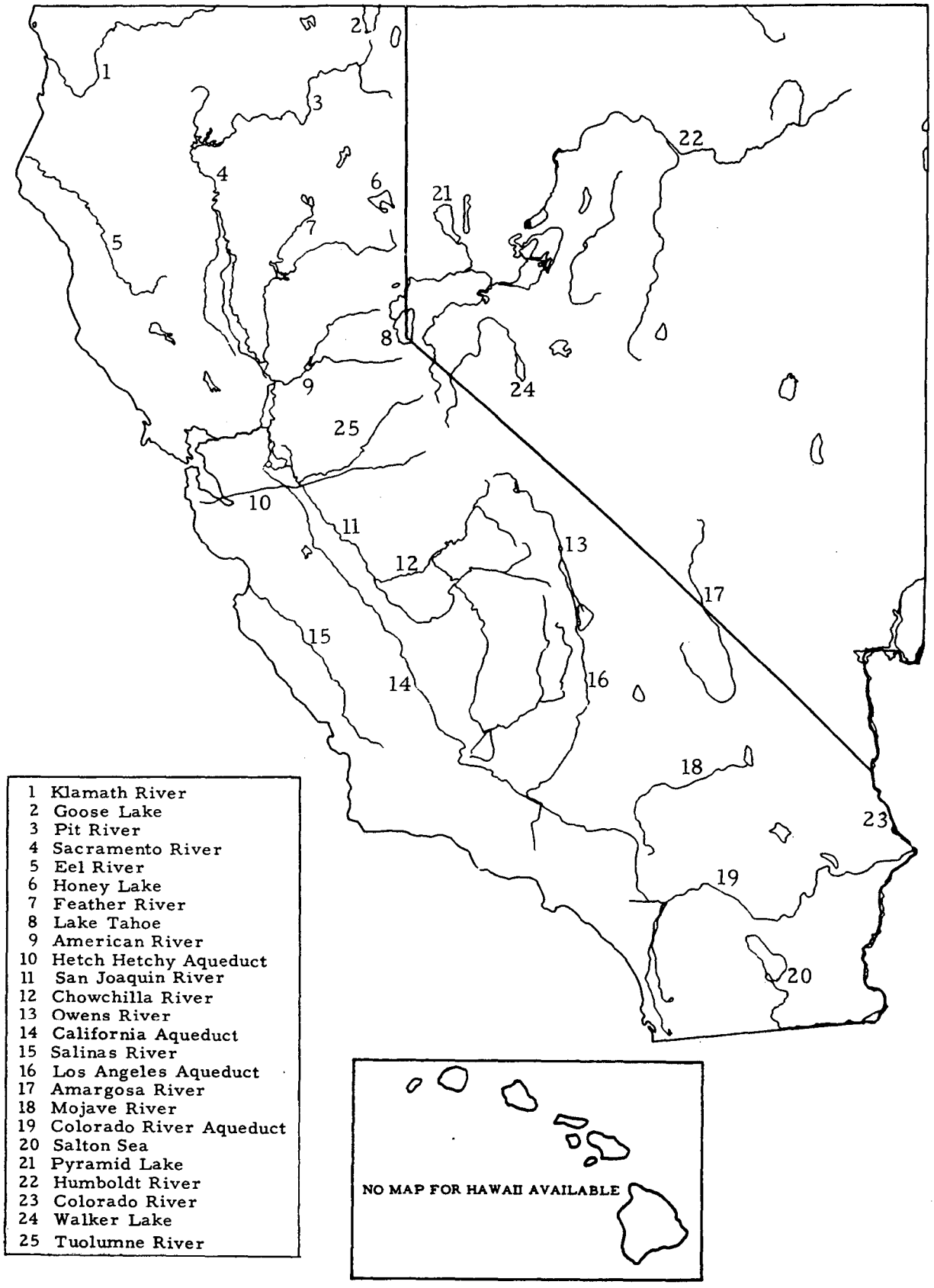


FIGURE II-2 MAJOR RIVERS, LAKES AND RESERVOIRS

SOURCE: CARTE MAP PRODUCED BY THE LAWRENCE BERKELEY LABORATORY

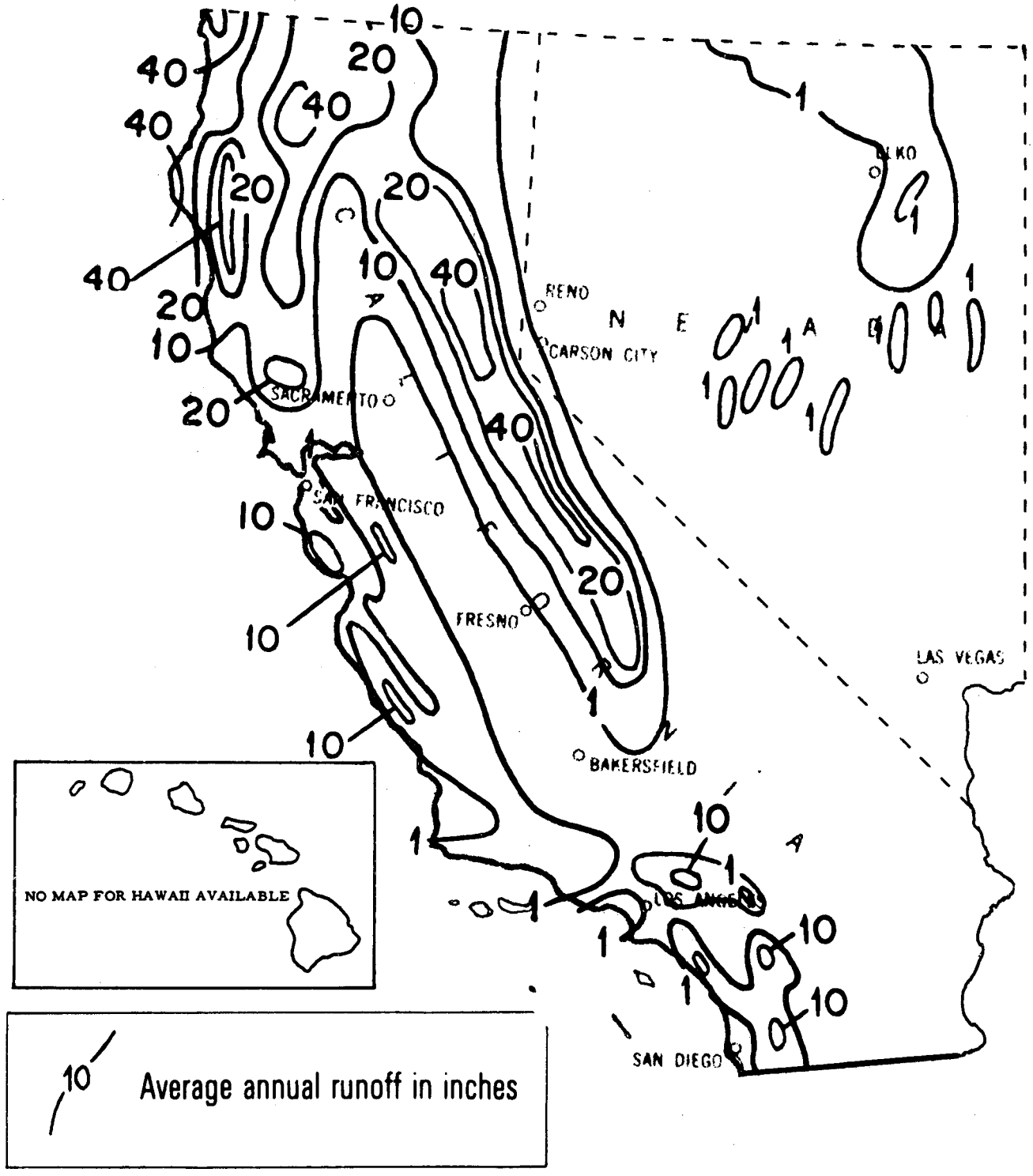


FIGURE II-3 ANNUAL AVERAGE SURFACE WATER RUNOFF

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

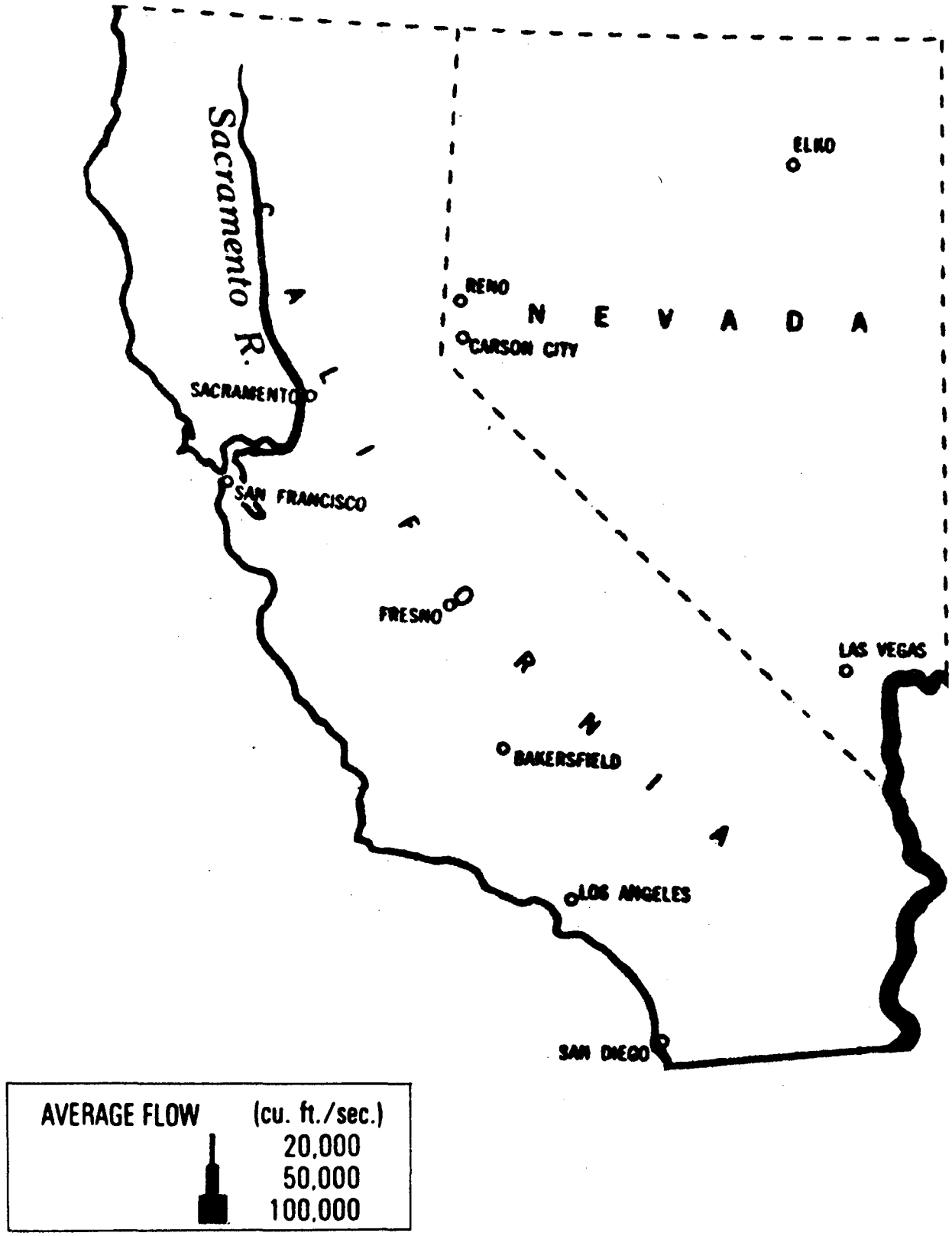


FIGURE II-4 FLOWS OF PRINCIPAL STREAMS IN CALIFORNIA AND NEVADA

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

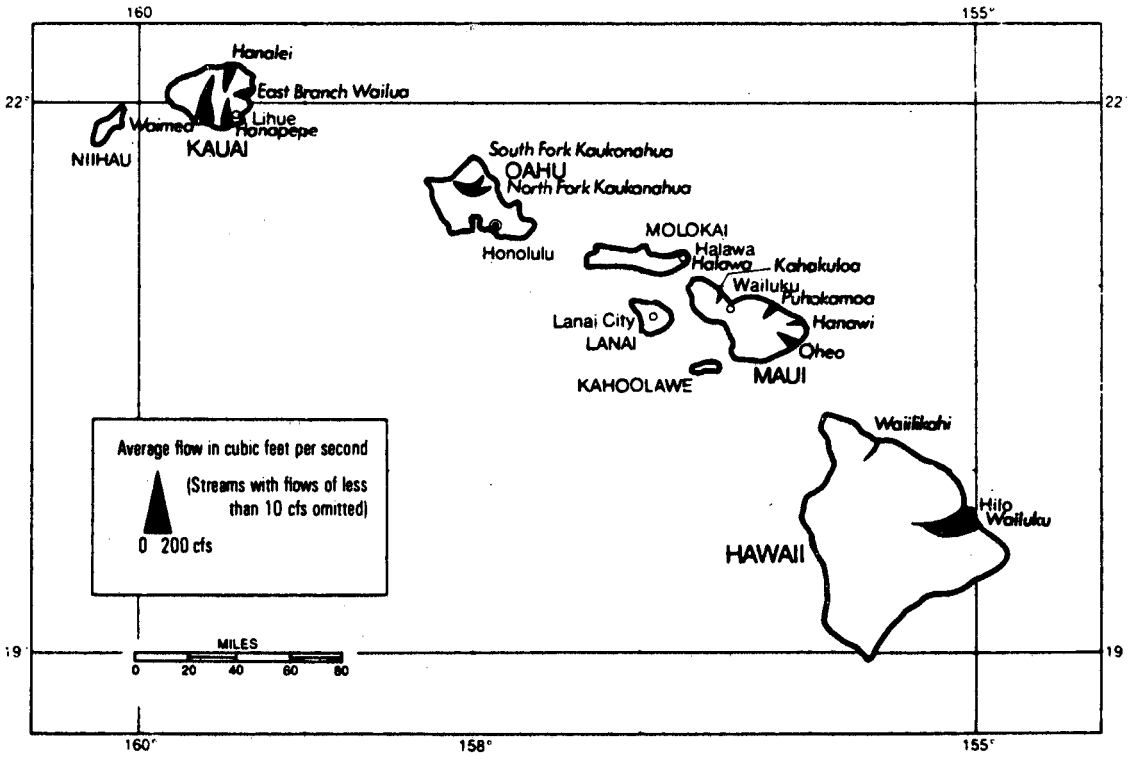


FIGURE II-5 FLOWS OF PRINCIPAL STREAMS IN HAWAII

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

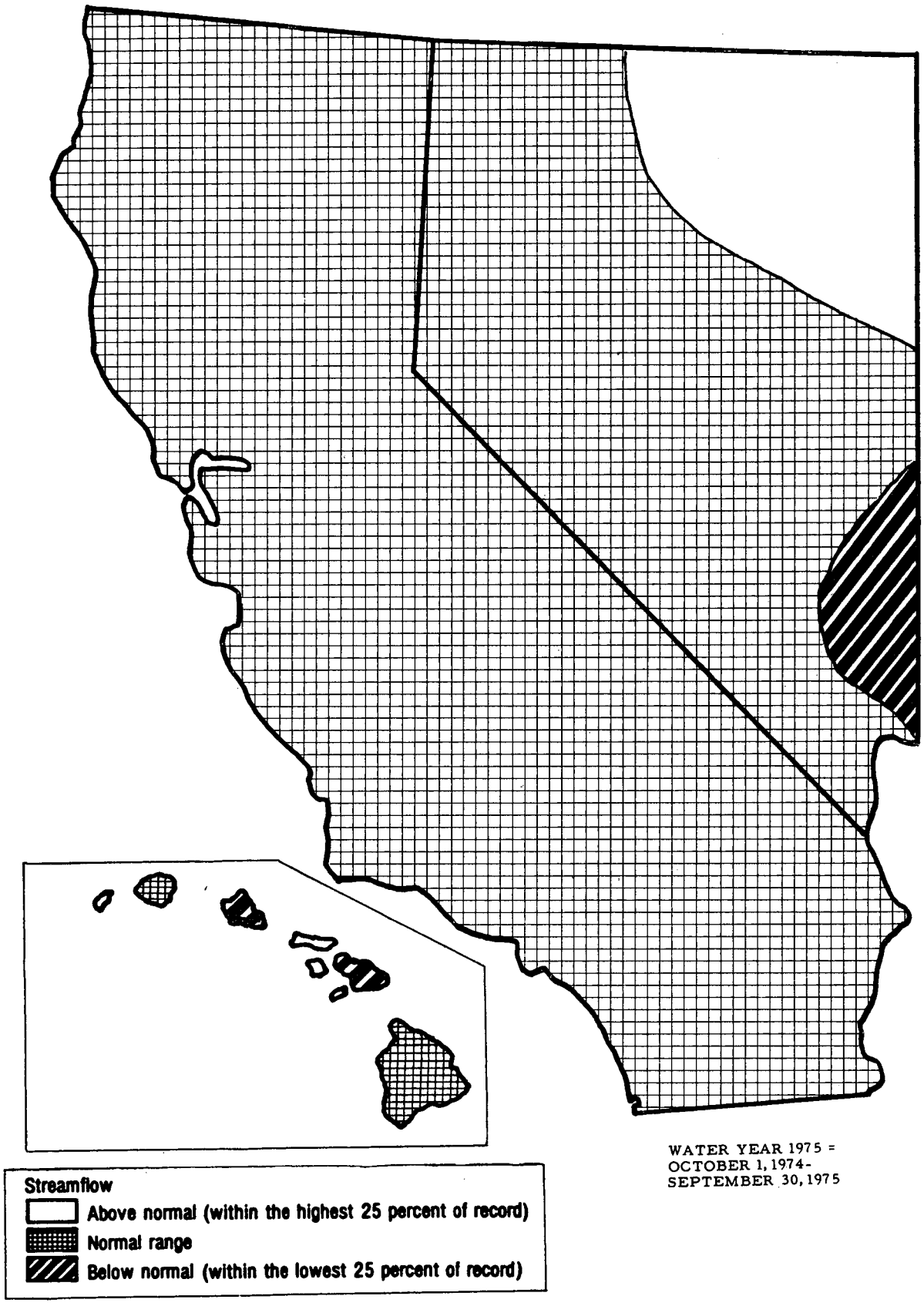


FIGURE II-6 STREAM FLOW DURING WATER YEAR 1975

SOURCE: COUNCIL ON ENVIRONMENTAL QUALITY, 8TH ANNUAL REPORT--ENVIRONMENT QUALITY 1977, 1977

FIGURE II-7 STREAM FLOW DURING WATER YEAR 1976

SOURCE: COUNCIL ON ENVIRONMENTAL QUALITY, 8TH ANNUAL REPORT--ENVIRONMENT QUALITY 1977, 1977

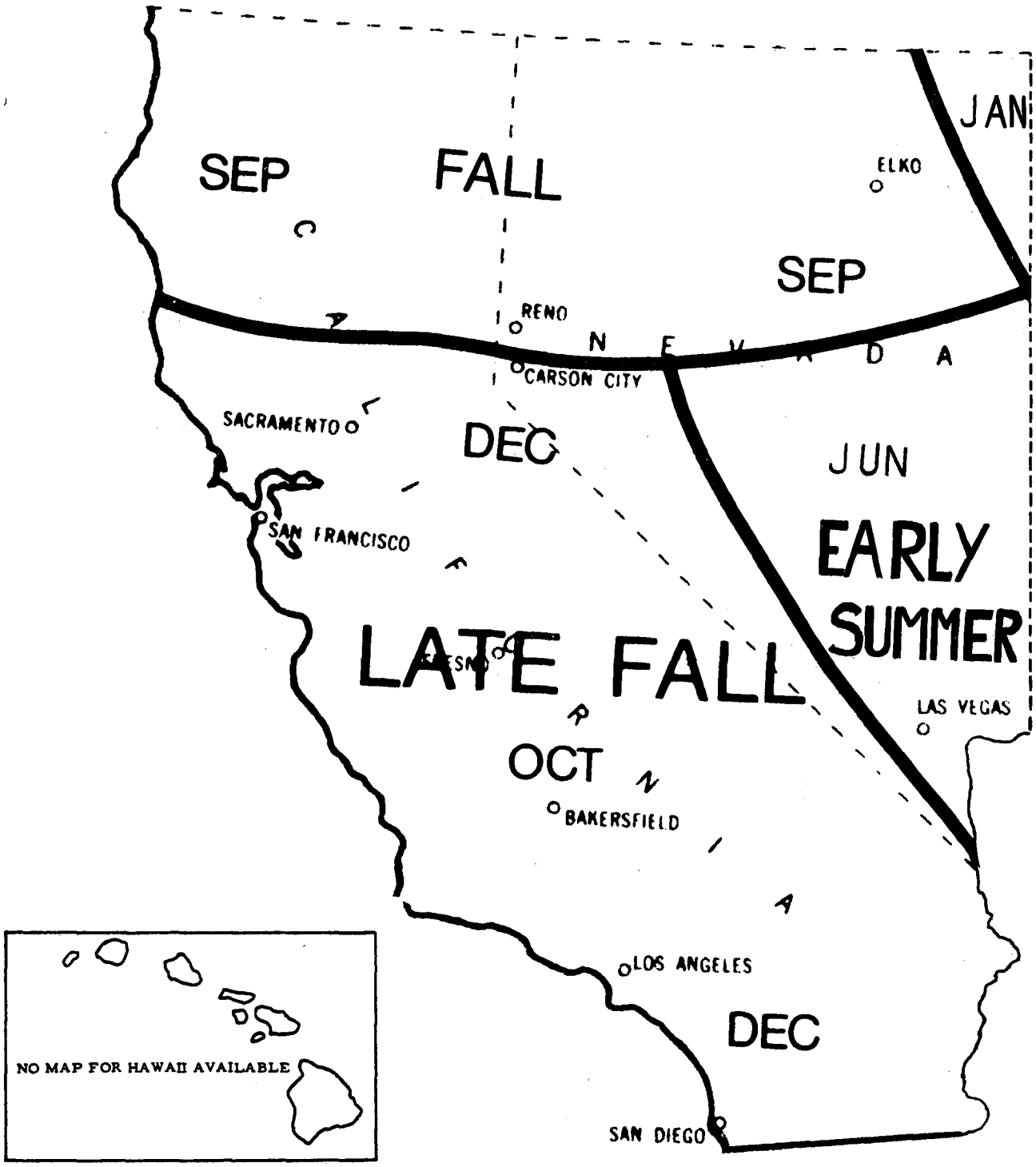


FIGURE II-8 SEASONS OF LOWEST STREAM FLOW

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

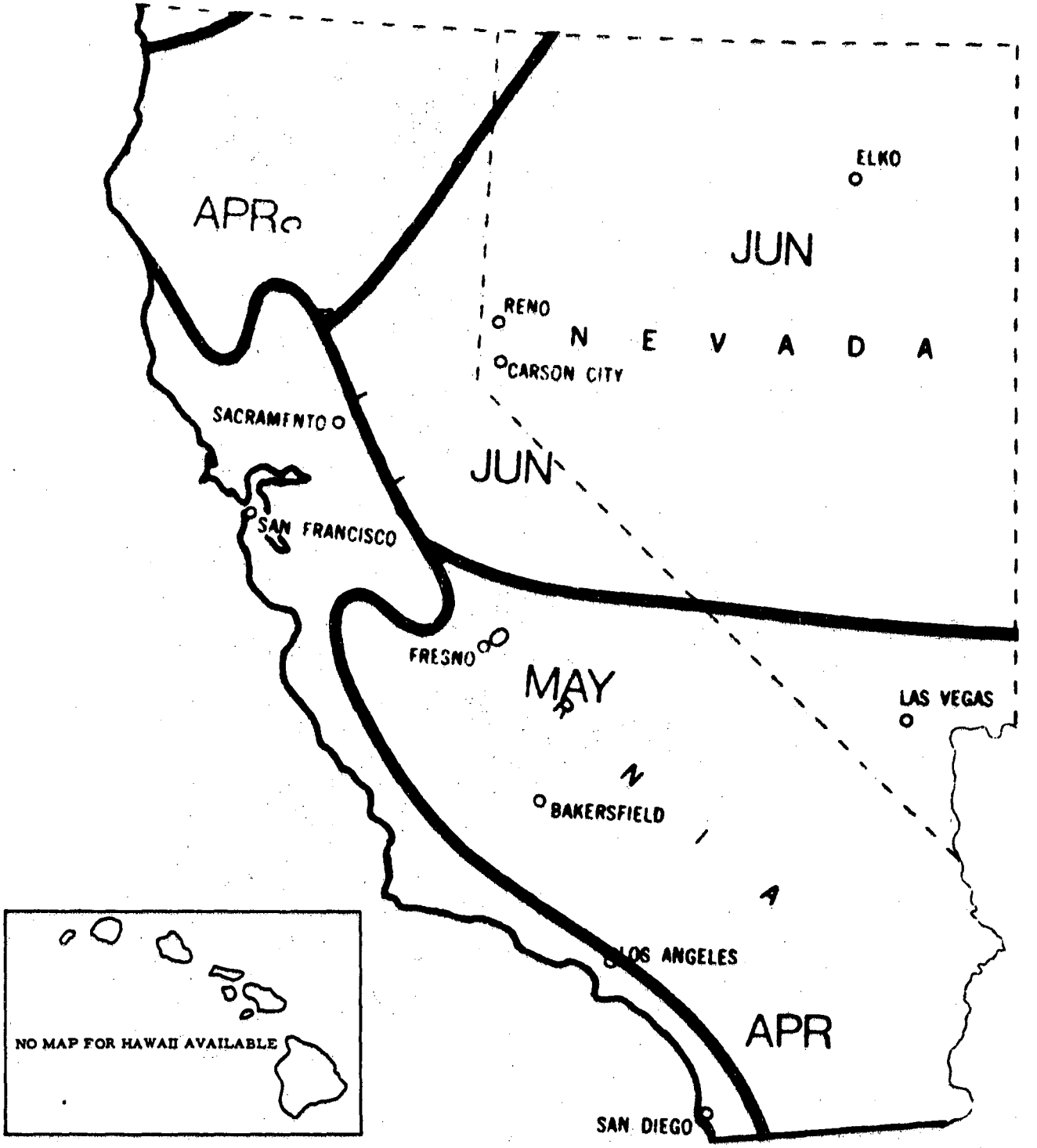


FIGURE II-9 SEASONS OF HIGHEST STREAM FLOW

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

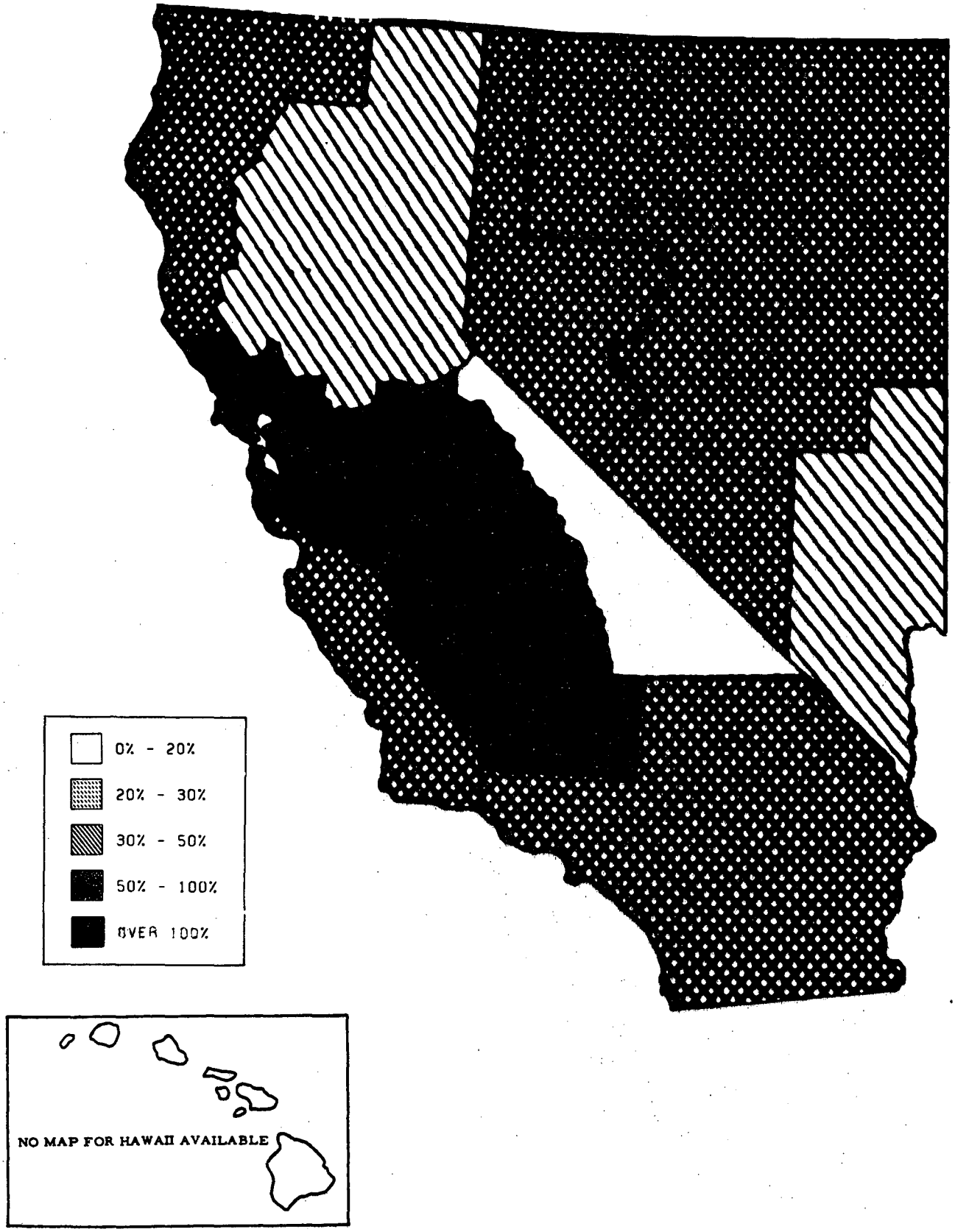


FIGURE II-10 CONSUMPTION BY ALL SECTORS AS A PERCENT OF APPROXIMATE TOTAL SURFACE SUPPLY

SOURCE: DOBSON, JEROME E., ET AL., A NATIONWIDE ASSESSMENT OF WATER QUALITY IMPACTS OF THE NATIONAL ENERGY PLAN, VOLUME 1 ORNL/TM 6098, 1978

TABLE II-5
WATER USED FOR PUBLIC SUPPLIES, 1975
[IN MILLIONS OF GALLONS PER DAY, EXCEPT PER CAPITA
IN GALLONS PER DAY AND POPULATION IN THOUSANDS]

	POPULATION SERVED			WATER WITHDRAWAL				WATER DELIVERED		
REGION	GROUND WATER	SURFACE WATER	TOTAL	GROUND WATER	SURFACE WATER	TOTAL	PER CAPITA	INDUSTRIAL COMMERCIAL	DOMESTIC AND LOSSES	FRESHWATER CONSUMED
CALIFORNIA	8,540	11,300	19,900	1,700	2,000	3,700	185	720	3,000	1,500
HAWAII	767	42	808	170	11	180	228	36	150	55
NEVADA	256	290	545	72	100	170	321	59	120	52
REGION TOTAL	9,560	11,600	21,300	1,900	2,100	4,050	191	815	3,270	1,600
UNITED STATES	64,700	110,000	175,000	11,000	19,000	29,000	168	9,100	20,000	6,700
PERCENT OF US	14.8	10.6	12.1	17.6	11.1	14.0	---	9.0	16.4	24.0

SOURCE - U.S. GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE U.S., CIRCULAR 765, 1977

NOTES - FIGURES MAY NOT ADD DUE TO ROUNDING

TABLE II-6
WATER WITHDRAWAL AND CONSUMPTION FOR RURAL USE, 1975
[IN MILLIONS OF GALLONS PER DAY]

	DOMESTIC WITHDRAWAL				LIVESTOCK WITHDRAWAL			
REGION	GROUND WATER	SURFACE WATER	TOTAL	FRESHWATER CONSUMED	GROUND WATER	SURFACE WATER	TOTAL	FRESHWATER CONSUMED
CALIFORNIA	120.0	8.6	120.0	74.0	42.0	59.0	100.0	54.0
HAWAII	0.3	0.0	0.3	0.3	5.6	0.1	5.7	5.2
NEVADA	7.9	0.5	8.4	5.0	3.9	8.0	12.0	8.8
REGION TOTAL	128.2	9.1	128.7	79.3	51.5	67.1	117.7	68.0
UNITED STATES	2,700	130	2,800	1,400	1,200	890	2,100	2,000
PERCENT OF US	4.7	7.0	4.6	5.6	4.3	7.5	5.6	3.4

SOURCE - U.S. GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE U.S., CIRCULAR 765, 1977

NOTES - FIGURES MAY NOT ADD DUE TO ROUNDING

TABLE II-7
WATER WITHDRAWN FOR IRRIGATION, 1975
[IN MILLIONS OF GALLONS PER DAY,
EXCEPT ACREAGE IN THOUSANDS OF ACRES]

REGION	ACREAGE IRRIGATED	GROUND WATER	SURFACE WATER	RECLAIMED SEWAGE	TOTAL	FRESHWATER CONSUMED	CONVEYENCE LOSSES
CALIFORNIA	9,000	17,000	18,000	160	35,000	21,000	5,300
HAWAII	140	430	520	0	950	500	450
NEVADA	860	530	2,600	3	3,100	1,500	720
REGION TOTAL	10,000	18,000	21,100	163	39,000	23,000	6,500
UNITED STATES	54,000	57,000	84,000	360	140,000	80,000	23,000
PERCENT OF US	18.5	31.5	25.1	45.4	27.9	28.7	28.1

SOURCE - U.S. GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE U.S., CIRCULAR 765, 1977

NOTES - FIGURES MAY NOT ADD DUE TO ROUNDING

TABLE II-8
WATER USED FOR ELECTRICITY GENERATION, 1975
[IN MILLIONS OF GALLONS PER DAY]

		THERMO-ELECTRIC POWER					
		WATER WITHDRAWAL				WATER CONSUMED	
REGION	HYDRO-ELECTRIC POWER	FRESH GROUND WATER	FRESH SURFACE WATER	SALINE SURFACE WATER	TOTAL FRESH WATER	FRESH	SALINE
CALIFORNIA	81,000	380	1,100	9,200	1,500	32	60
HAWAII	200	142	32	980	170	0	0
NEVADA	4,600	8	87	0	95	22	0
REGION TOTAL	85,800	530	1220	10,200	1,800	54	60
UNITED STATES	3,300,000	1,400	130,000	64,000	130,000	1,900	260
PERCENT OF US	2.6	37.8	0.9	15.9	1.4	2.8	23.1

SOURCE - U.S. GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE U.S., CIRCULAR 765, 1977

NOTES - FIGURES MAY NOT ADD DUE TO ROUNDING

TABLE II-9
INDUSTRIAL WATER USE, 1975
[IN MILLIONS OF GALLONS PER DAY]

REGION	WATER WITHDRAWAL							WATER CONSUMED	
	FRESH GROUND WATER	SALINE GROUND WATER	FRESH SURFACE WATER	SALINE SURFACE WATER	RECLAIMED SEWAGE	TOTAL FRESH WATER	TOTAL SALINE WATER	FRESH	SALINE
CALIFORNIA	390	240	41	500	1.7	430	740	170	36
HAWAII	97	15	94	0	0.0	190	15	4	0
NEVADA	55	13	58	0	7.7	120	13	49	11
REGION TOTAL	542	268	193	500	9.4	740	768	223	47
UNITED STATES	9,600	90	29,000	5,400	170	38,000	6,400	4,200	490
PERCENT OF US	5.6	27.3	0.7	9.3	5.5	1.9	12.0	5.2	9.6

SOURCE - U.S. GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE U.S., CIRCULAR 765, 1977

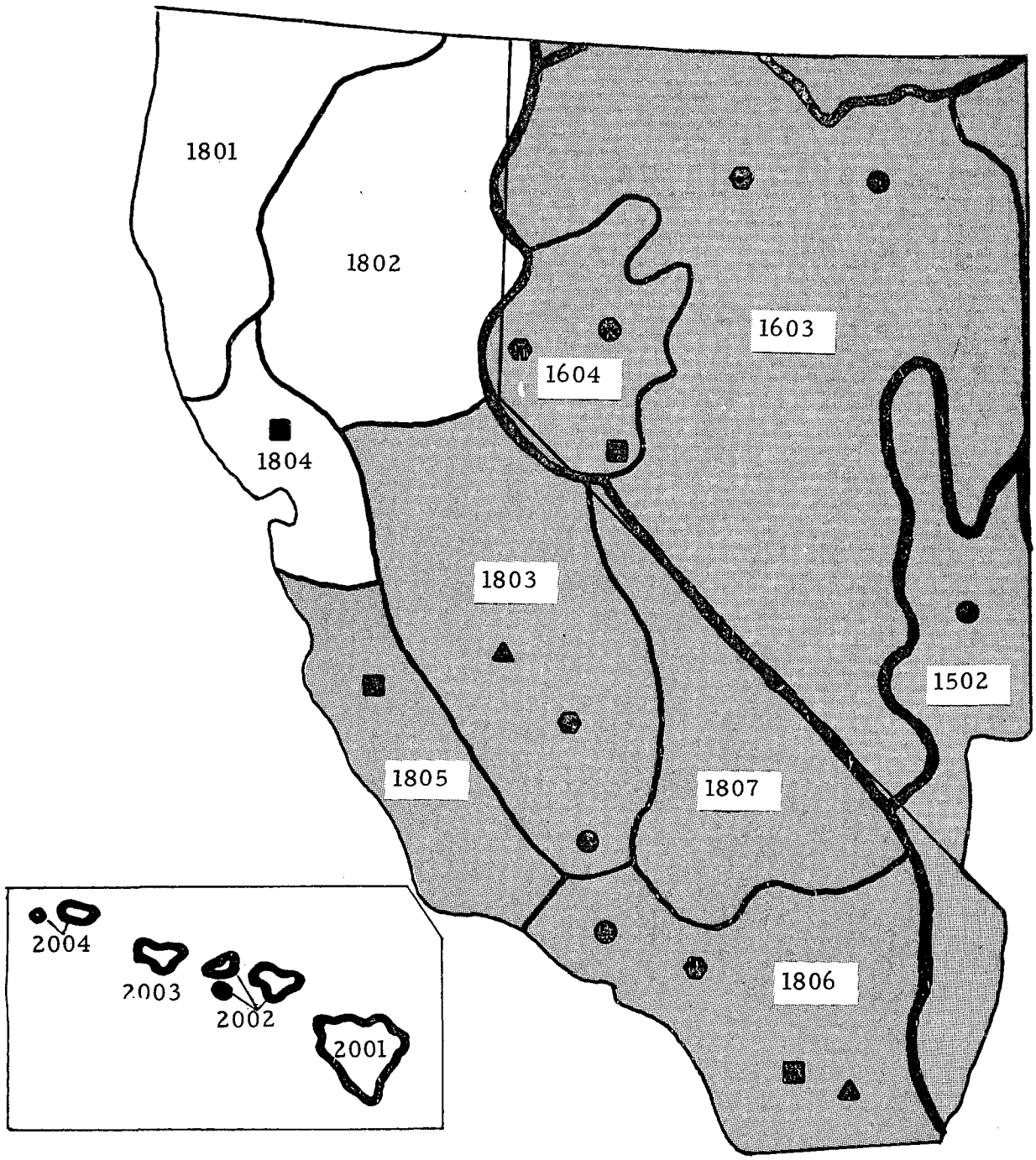
NOTES - FIGURES MAY NOT ADD DUE TO ROUNDING

TABLE II-10
SUMMARY OF WATER WITHDRAWAL AND CONSUMPTION, 1975
[IN MILLIONS OF GALLONS PER DAY,
EXCEPT PER CAPITA IN GALLONS PER DAY]

REGION	TOTAL GROUND WATER WITHDRAWN	TOTAL SURFACE WATER WITHDRAWN	TOTAL RECLAIMED SEWAGE	TOTAL FRESH WATER WITHDRAWN	TOTAL SALINE WATER WITHDRAWN	TOTAL FRESH WATER CONSUMED	PER CAPITA FRESH WATER CONSUMED
CALIFORNIA	19,000	31,000	160	41,000	9,900	23,000	1,900
HAWAII	870	1,600	0	1,500	990	560	1,900
NEVADA	690	2,800	11	3,500	13	1,600	5,800
REGION TOTAL	20,600	35,400	170	46,000	10,900	25,200	2,500
UNITED STATES	83,000	330,000	530	350,000	70,000	96,000	1,600
PERCENT OF US	24.8	10.7	32.3	13.1	15.6	26.2	---

SOURCE - U.S. GEOLOGICAL SURVEY, ESTIMATED USE OF WATER IN THE U.S., CIRCULAR 765, 1977

NOTES - FIGURES MAY NOT ADD DUE TO ROUNDING. DOES NOT INCLUDE WITHRAWALS FOR HYDROELECTRIC POWER.



Areas with Greatest Total Impact

Areas that have inadequate water supplies to support current and projected offstream energy, food and fiber, municipal and industrial uses.

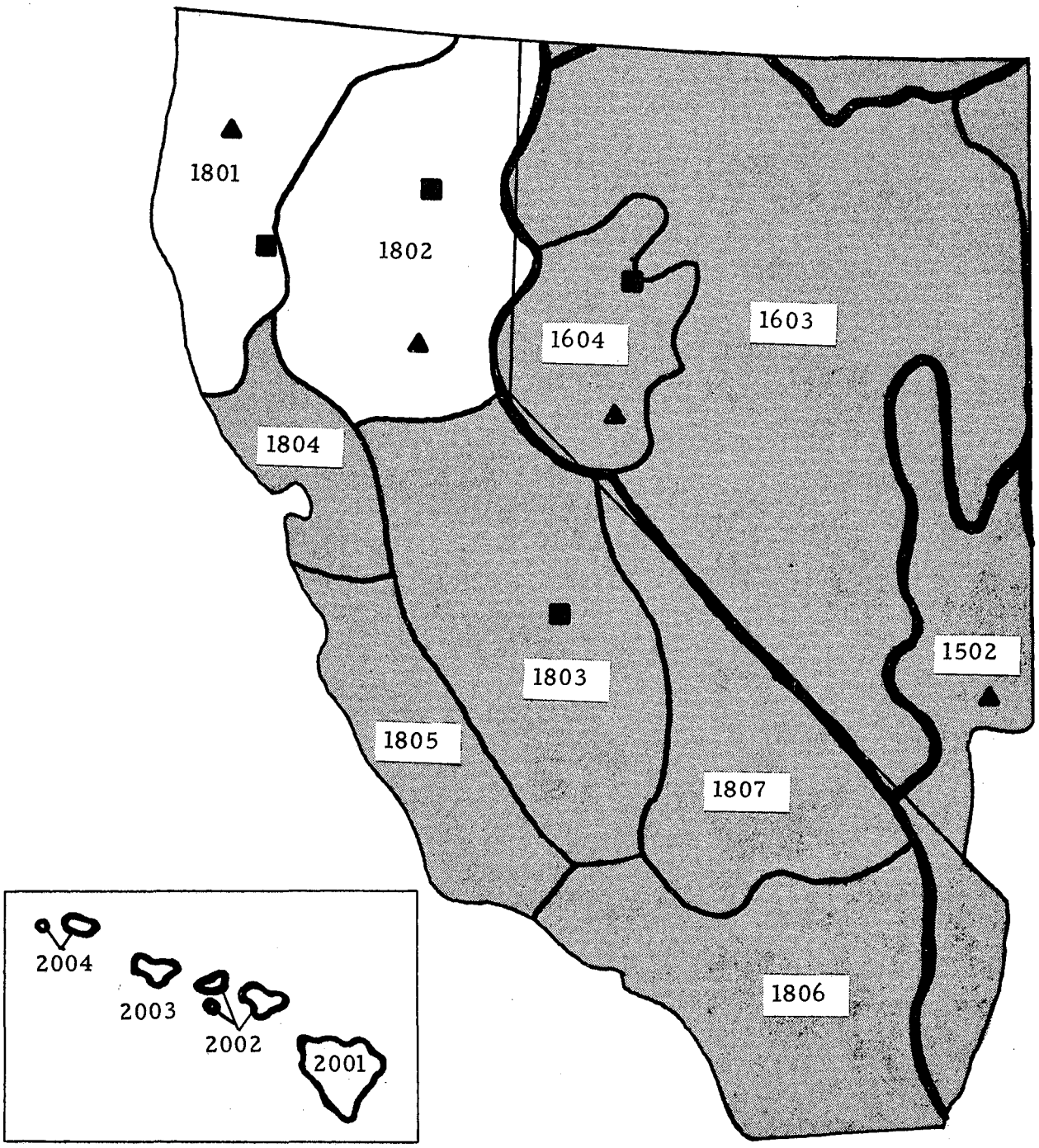
Location of Specific Impacts*

- Inadequate water to support offstream energy resource development.
- Inadequate water to support irrigation for food and fiber production.
- Inadequate water to support present offstream industry.
- Inadequate water to support offstream municipal and rural domestic uses.

*Identified by State/Regional study teams.

FIGURE II-11 INADEQUATE WATER SUPPLY FOR OFFSTREAM USES

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977



Areas with Greatest Total Impact

Areas that have inadequate water supplies to support current navigation, hydropower, recreation, and fish and wildlife.

Location of Specific Impacts*

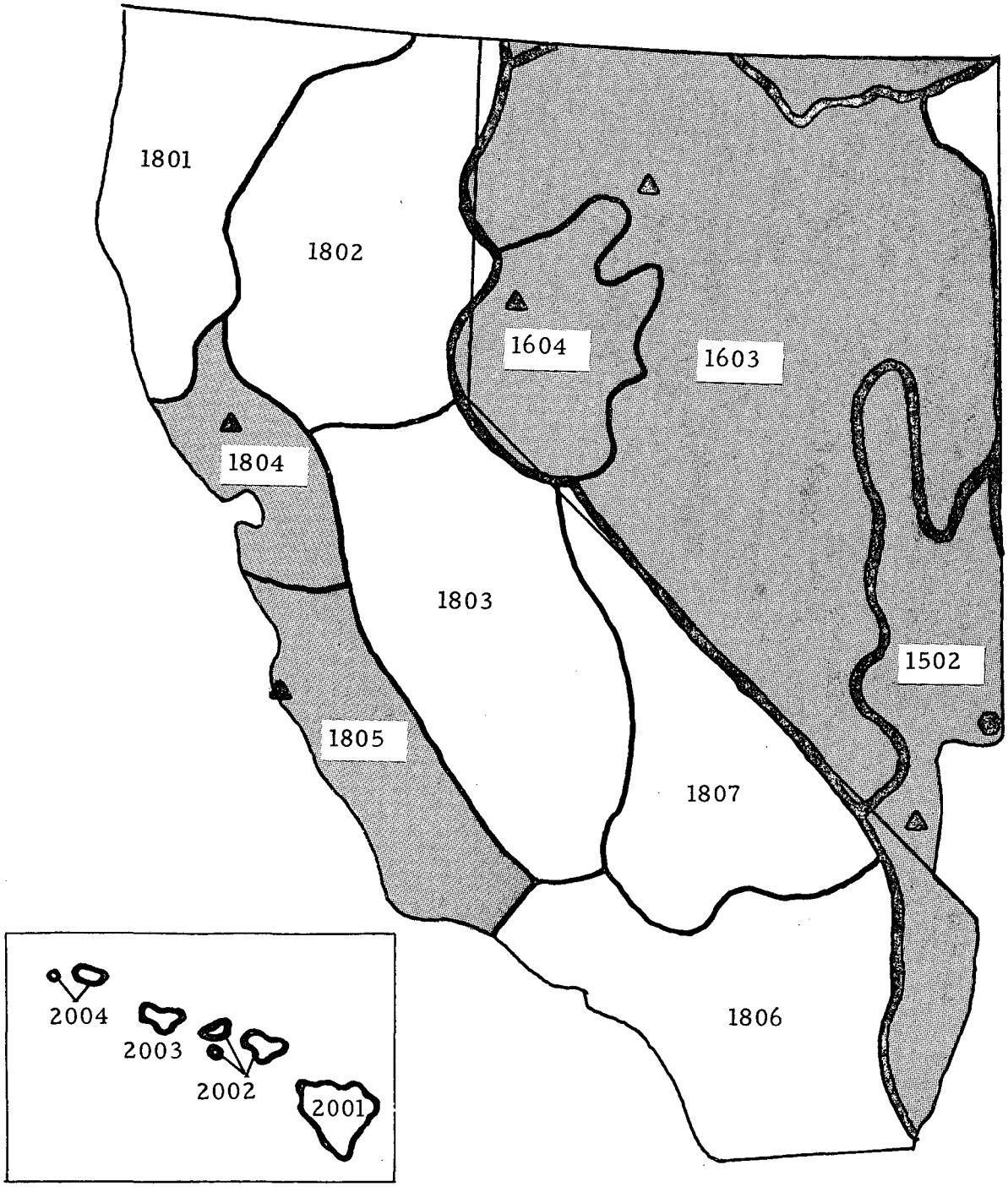
▲ Inadequate flows to support instream recreation.

■ Inadequate flows to support fish and wildlife.

*Identified by State/Regional study teams.

FIGURE II-12 INADEQUATE WATER SUPPLY FOR INSTREAM USES

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977



Areas with Greatest Total Impact

Areas in which increasing competition exists between offstream and instream uses.

Location of Specific Impacts*

- Conflicts among offstream users for municipal, industrial, electrical and irrigation purposes.
- Critical conflicts between instream and offstream users.

*Identified by State/Regional study teams.

FIGURE II-13 OFFSTREAM - INSTREAM COMPETITION FOR WATER

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977

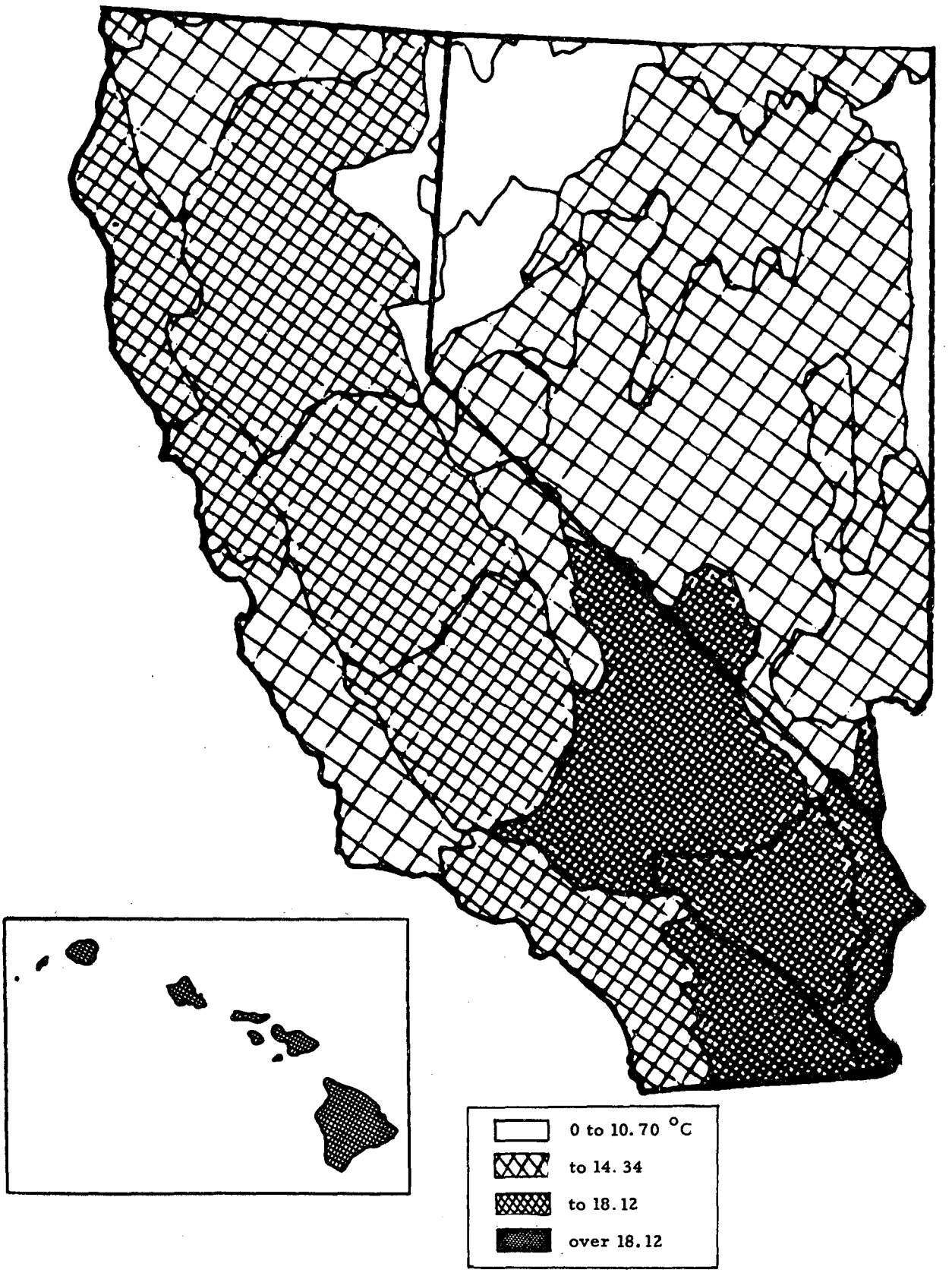


FIGURE II-14 WATER QUALITY, 1975 - TEMPERATURE

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

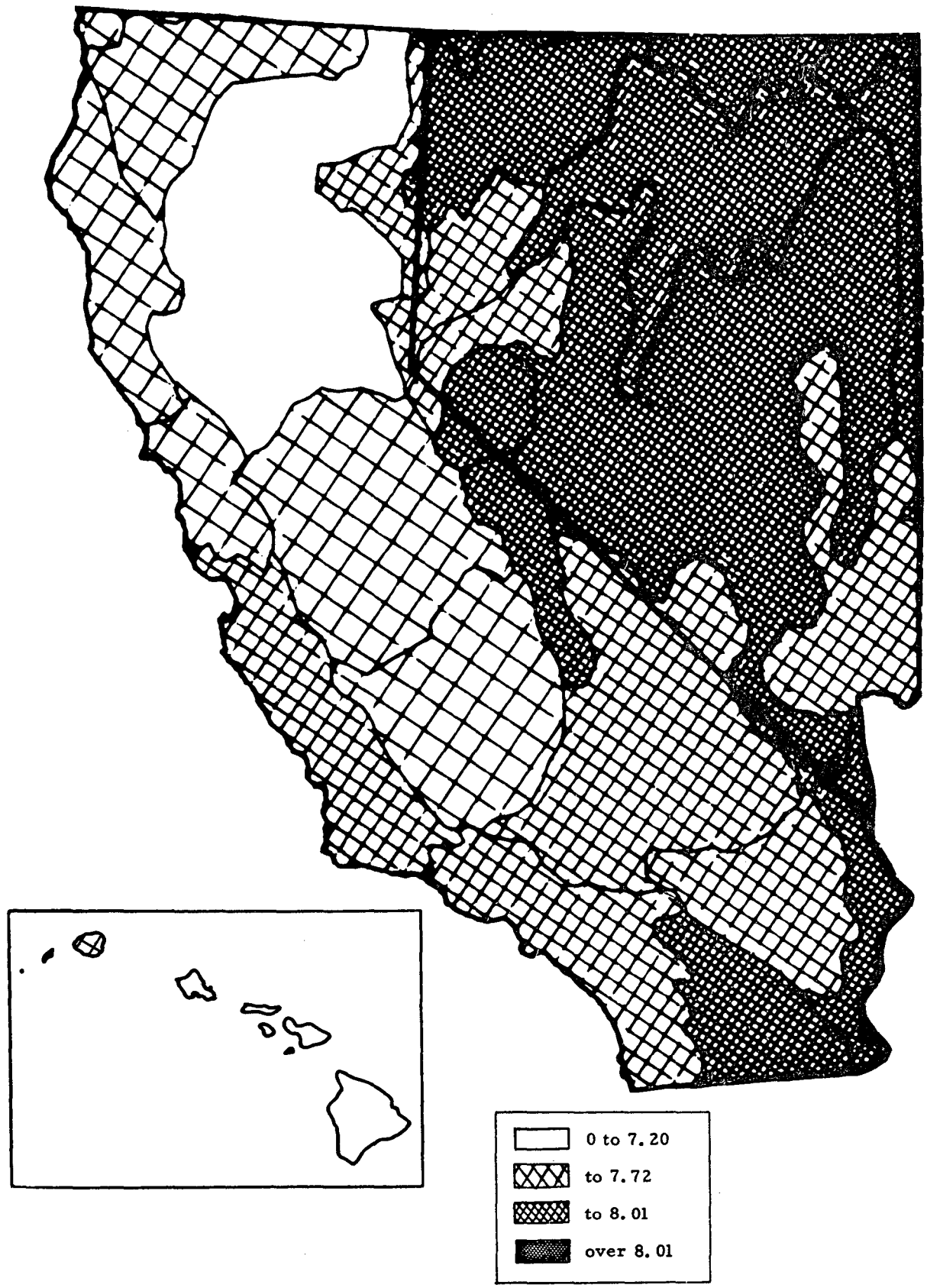


FIGURE II-15 WATER QUALITY, 1975 - PH

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

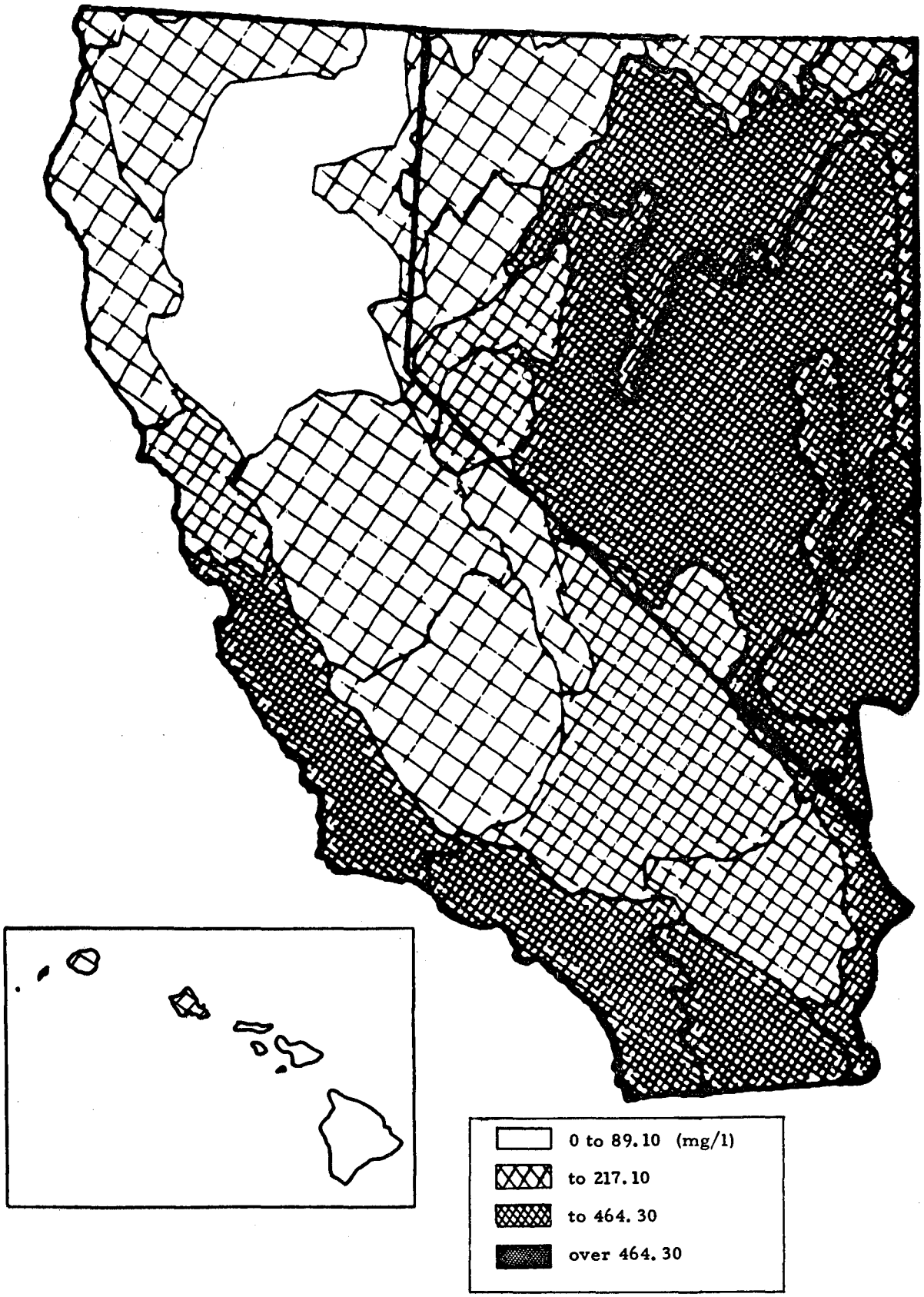


FIGURE II-16 WATER QUALITY, 1975 - DISSOLVED SOLIDS

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

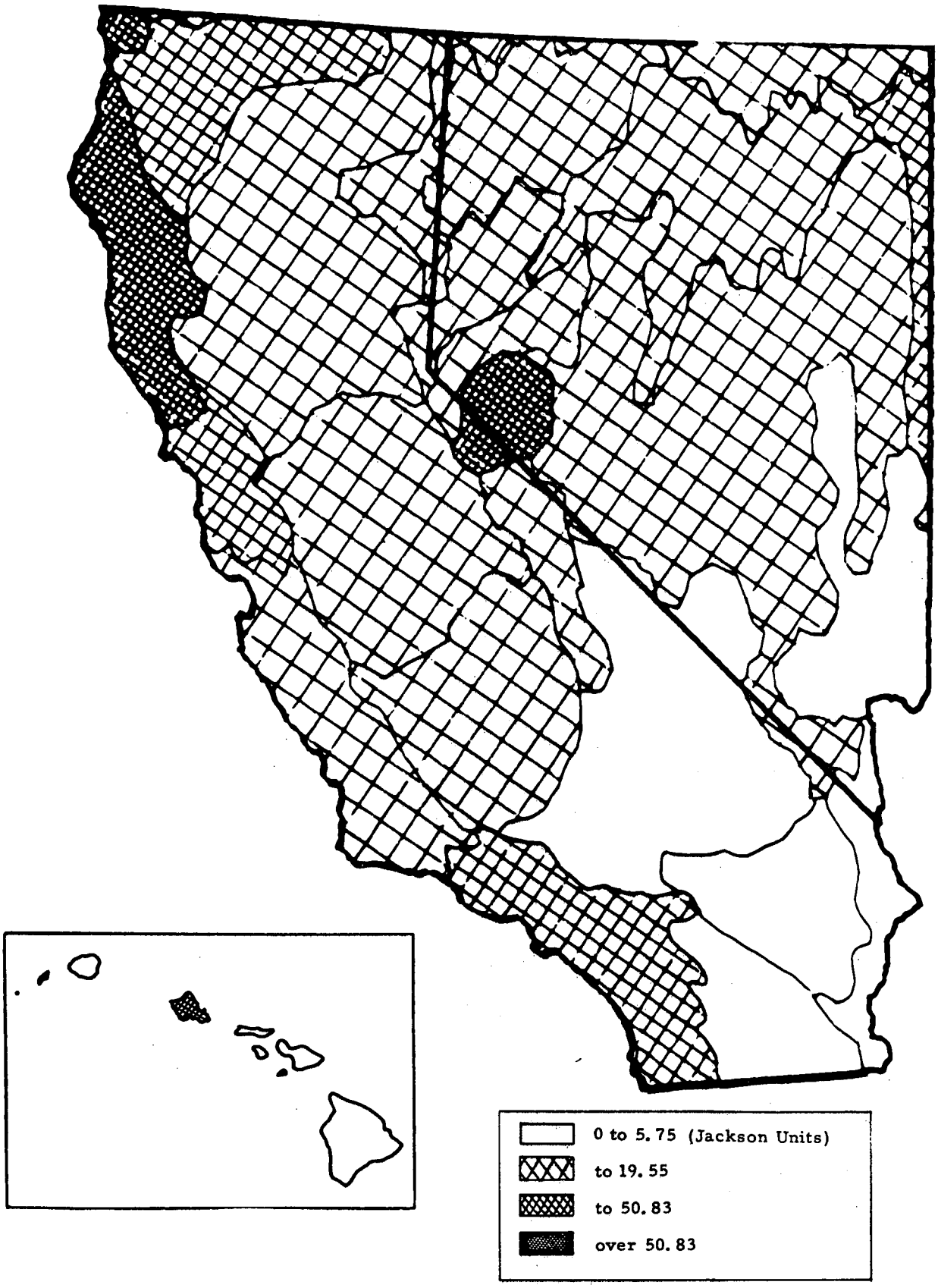


FIGURE II-17 WATER QUALITY, 1975 - TURBIDITY

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

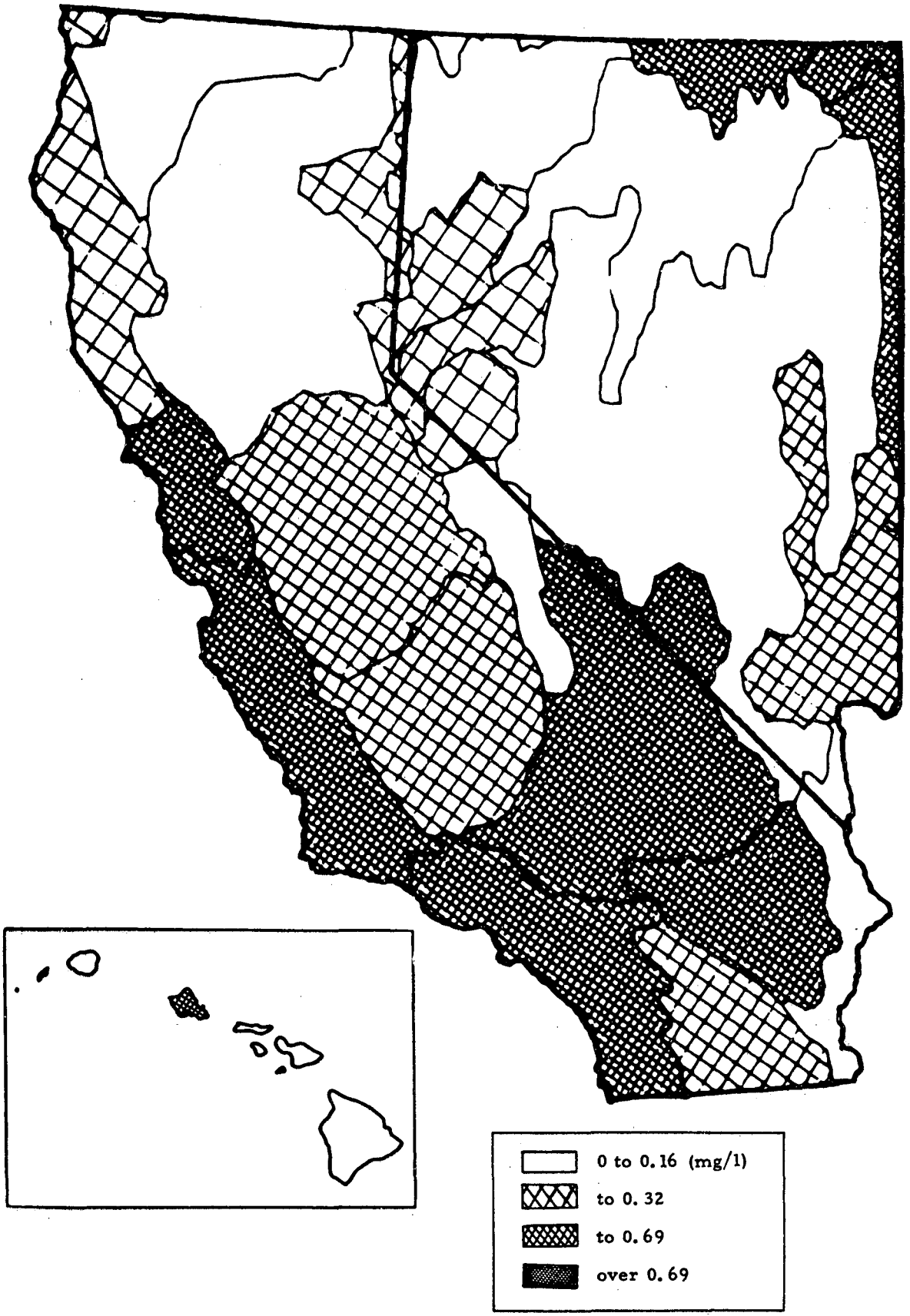


FIGURE II-18 WATER QUALITY, 1975 - TOTAL INORGANIC NITROGEN

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

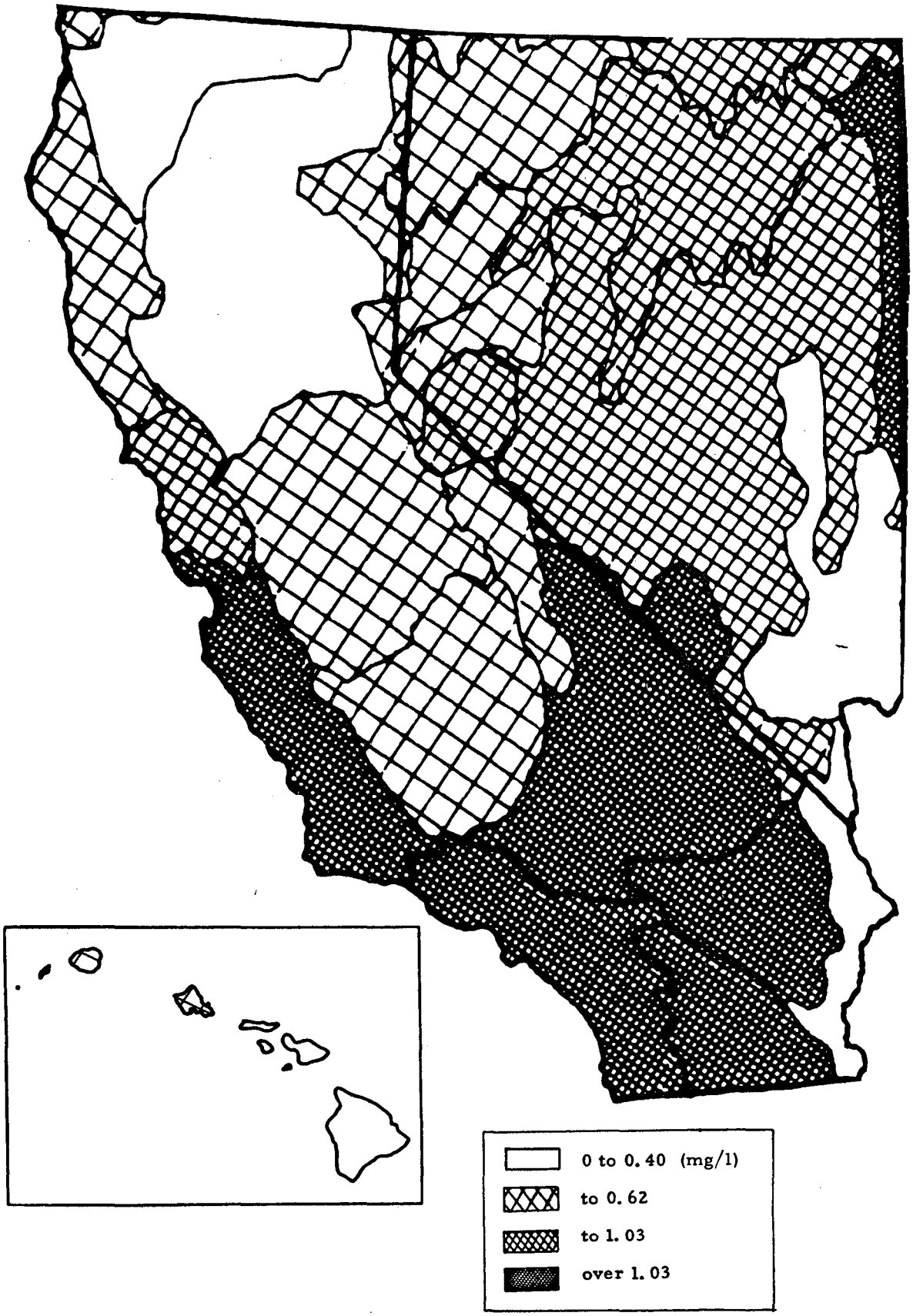


FIGURE II-19 WATER QUALITY, 1975 - TOTAL ORGANIC NITROGEN

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

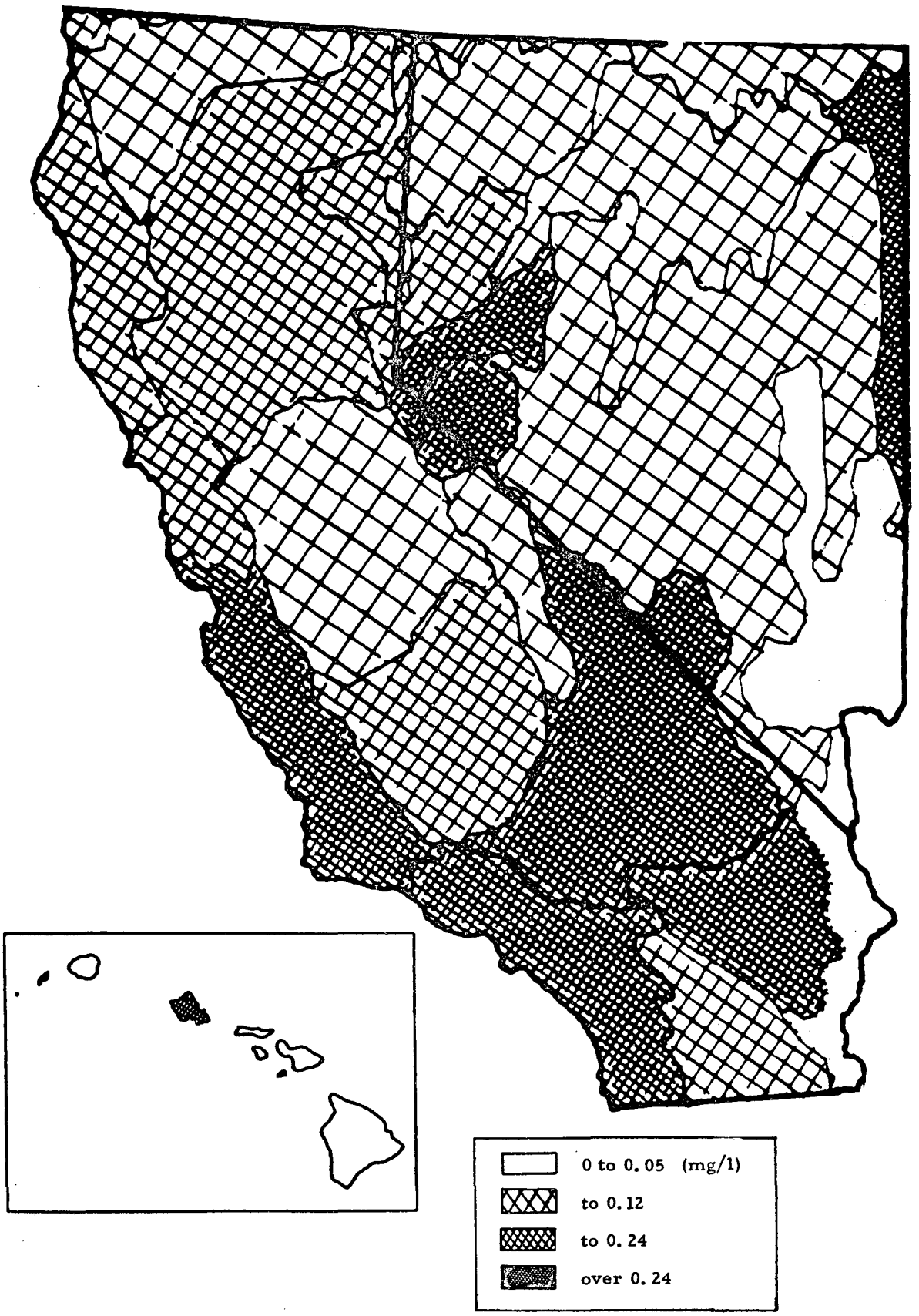


FIGURE II-20 WATER QUALITY, 1975 - TOTAL PHOSPHORUS

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

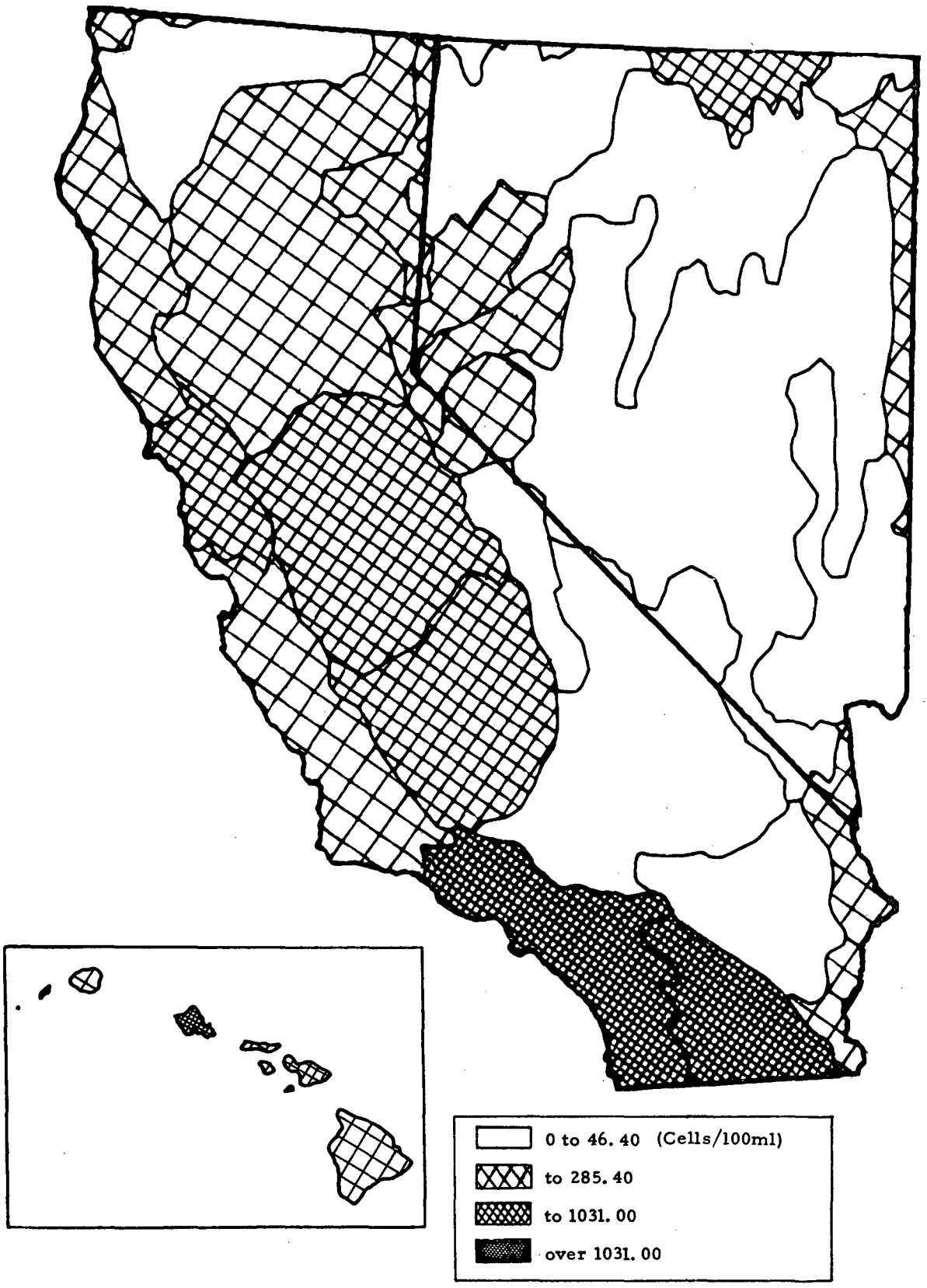


FIGURE II-21 WATER QUALITY, 1975 - FECAL COLIFORM BACTERIA

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), 1975

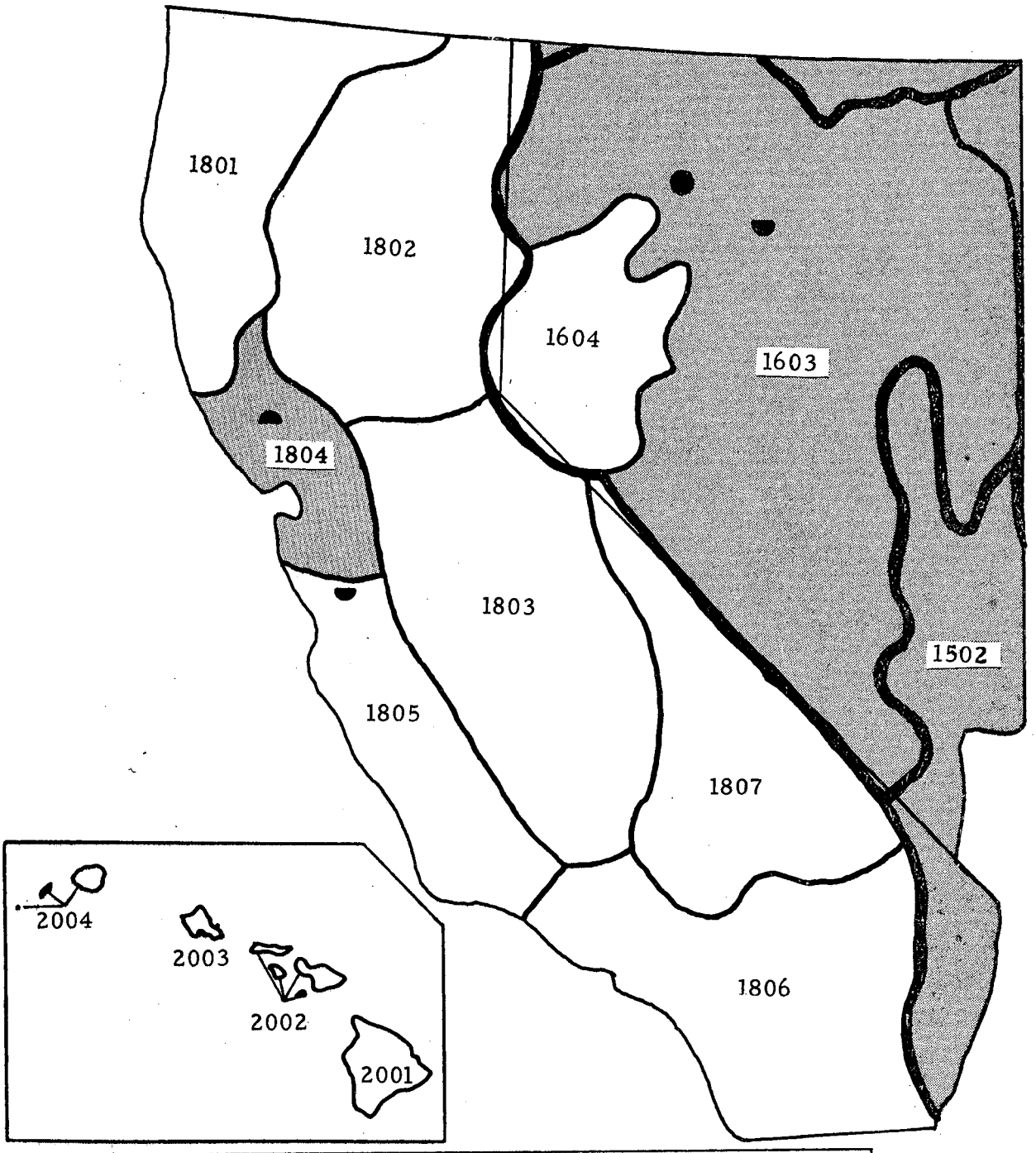


FIGURE II-22 TOXIC AND HAZARDOUS SUBSTANCES IN WATER SUPPLIES

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977

TABLE II-11
STREAM QUALITY, 1975
[ANNUAL AVERAGE VALUES IN MICROGRAMS PER LITER,
EXCEPT TOTAL RESIDUE IN MILLIGRAMS PER LITER]

NASQAN ACCOUNTING UNIT	TOTAL RESIDUE	TOTAL COBALT	TOTAL IRON	TOTAL LEAD	TOTAL CARBON
150100	712.92	37.50	82.50	100.00	3.35
150301	864.53	37.50	419.85	120.51	4.65
160203	1360.64	50.00	1147.26	118.31	8.27
160300	1459.77	48.59	930.02	100.00	6.33
160401	590.75	50.00	712.50	100.00	10.50
160402	166.00	50.00	2295.00	100.00	4.13
160501	109.45	50.00	1039.59	82.34	3.30
160502	332.75	25.00	352.50	100.00	4.32
160503	275.00	50.00	10655.98	100.00	11.40
160600	583.13	49.82	712.11	100.00	10.40
170402	285.25	50.00	607.50	100.00	4.22
170501	295.54	38.80	1913.78	100.00	4.60
180101	141.89	50.00	3729.99	100.00	4.57
180102	95.50	50.00	2197.50	100.00	3.53
180200	80.50	50.00	6375.00	100.00	4.13
180300	217.83	50.00	1882.68	100.00	5.56
180400	203.94	50.18	1763.22	100.00	5.31
180500	350.00	50.00	3105.00	100.00	7.90
180600	503.00	183.33	1220.00	166.67	168.00
180700	602.91	45.34	3895.63	90.68	12.59
180800	109.45	50.00	1039.59	82.34	3.30
180901	179.00	37.50	950.00	100.00	5.20
180902	354.06	50.00	730.00	100.00	6.97
181001	354.06	50.00	730.00	100.00	6.97
181002	1114.08	47.55	346.00	102.87	6.86
200100	33.31	50.00	197.50	125.00	2.48
200200	58.08	50.00	140.00	100.00	2.50
200500	40.25	40.00	264.00	100.00	3.65
200600	249.10	50.00	2578.55	75.21	3.40
200700	112.00	50.00	356.00	100.00	3.76

SOURCE - U.S. GEOLOGICAL SURVEY, NASQAN DATA BASE
DATA PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY

NOTES - SEE FIGURE II-23 FOR BOUNDARIES OF THE NASQAN ACCOUNTING UNITS.

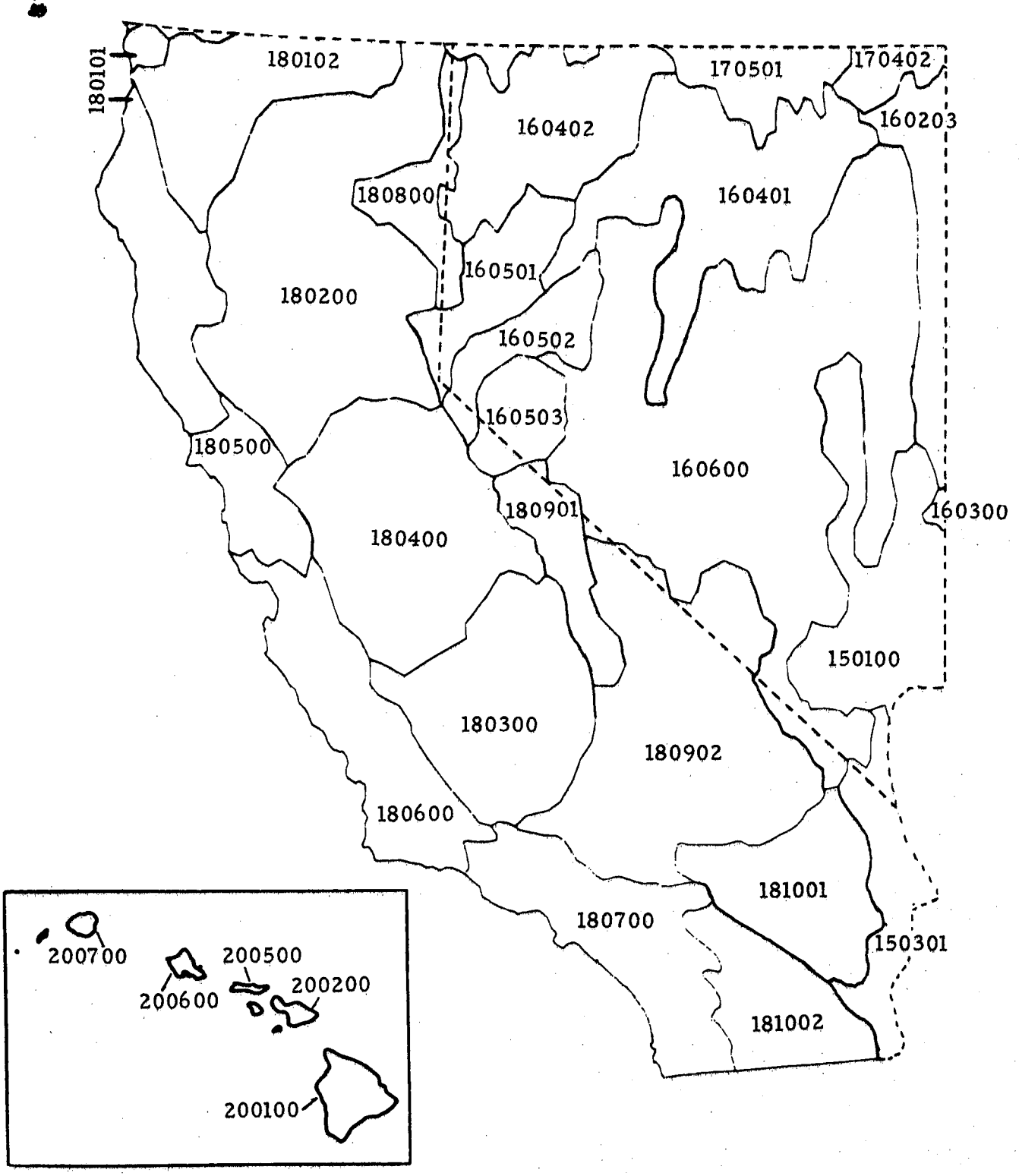


FIGURE II-23 NASQAN ACCOUNTING UNITS

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM THE NATIONAL STREAM QUALITY ACCOUNTING SYSTEM (NASQAN), 1975

II-B-2 GROUNDWATER

THIS SECTION CONTAINS DATA ON THE QUANTITY AND QUALITY OF GROUNDWATER IN THE THREE STATE REGION. THESE DATA ARE PRESENTED AS MAPS OF THE LOCATION OF GROUNDWATER AREAS, PLACES WHERE GROUNDWATER IS DEPLETED, AND AREAS OF HARD OR CONTAMINATED GROUNDWATER. DATA ON GROUNDWATER CONSUMPTION MAY BE FOUND IN THE PREVIOUS SECTION.

THE MAPS IN THIS SECTION ARE TAKEN FROM THE WATER ATLAS OF THE U.S. AND FROM THE WRC 1977 NATIONAL CONFERENCE ON WATER.

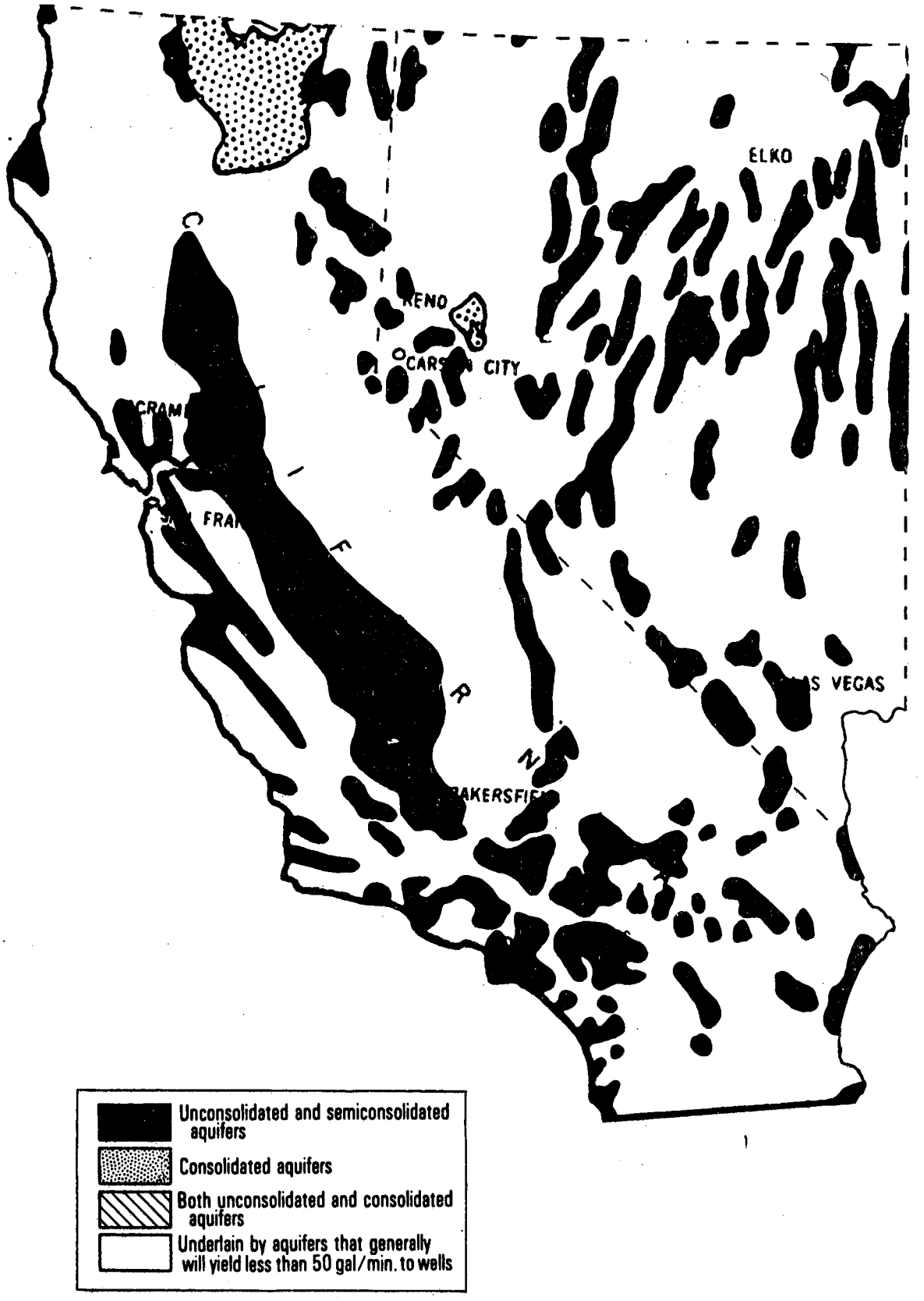


FIGURE II-24 GROUNDWATER AREAS IN CALIFORNIA AND NEVADA

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

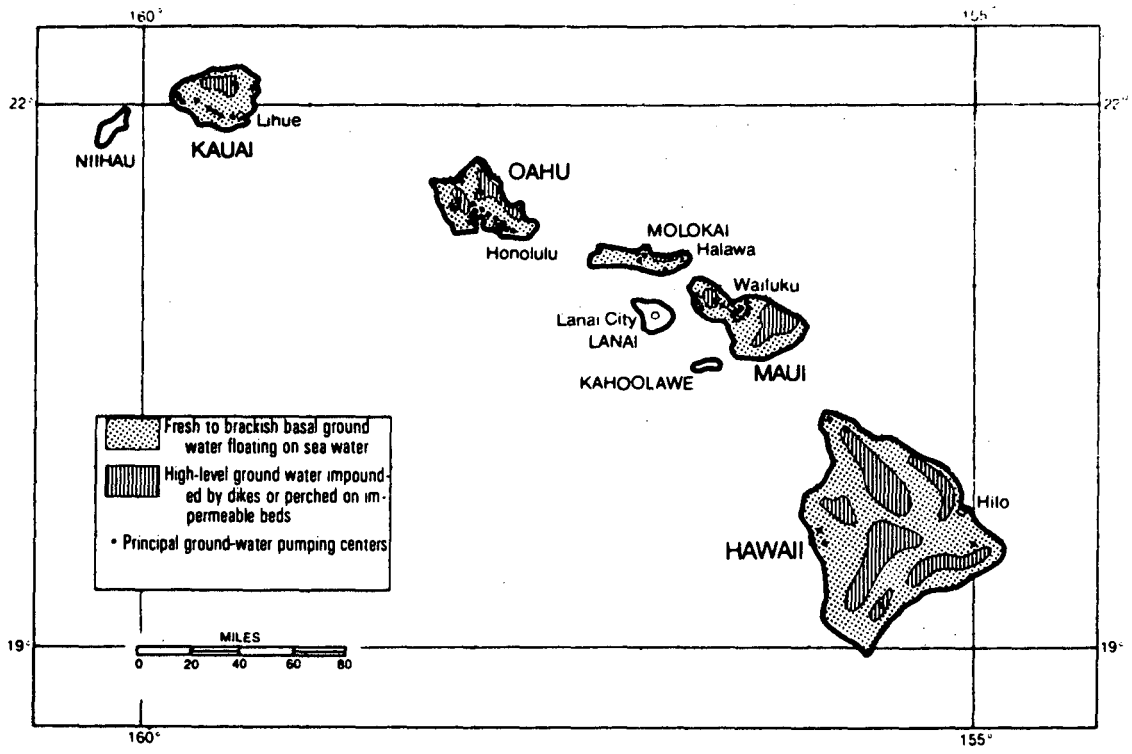


FIGURE II-25 GROUNDWATER AREAS IN HAWAII

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

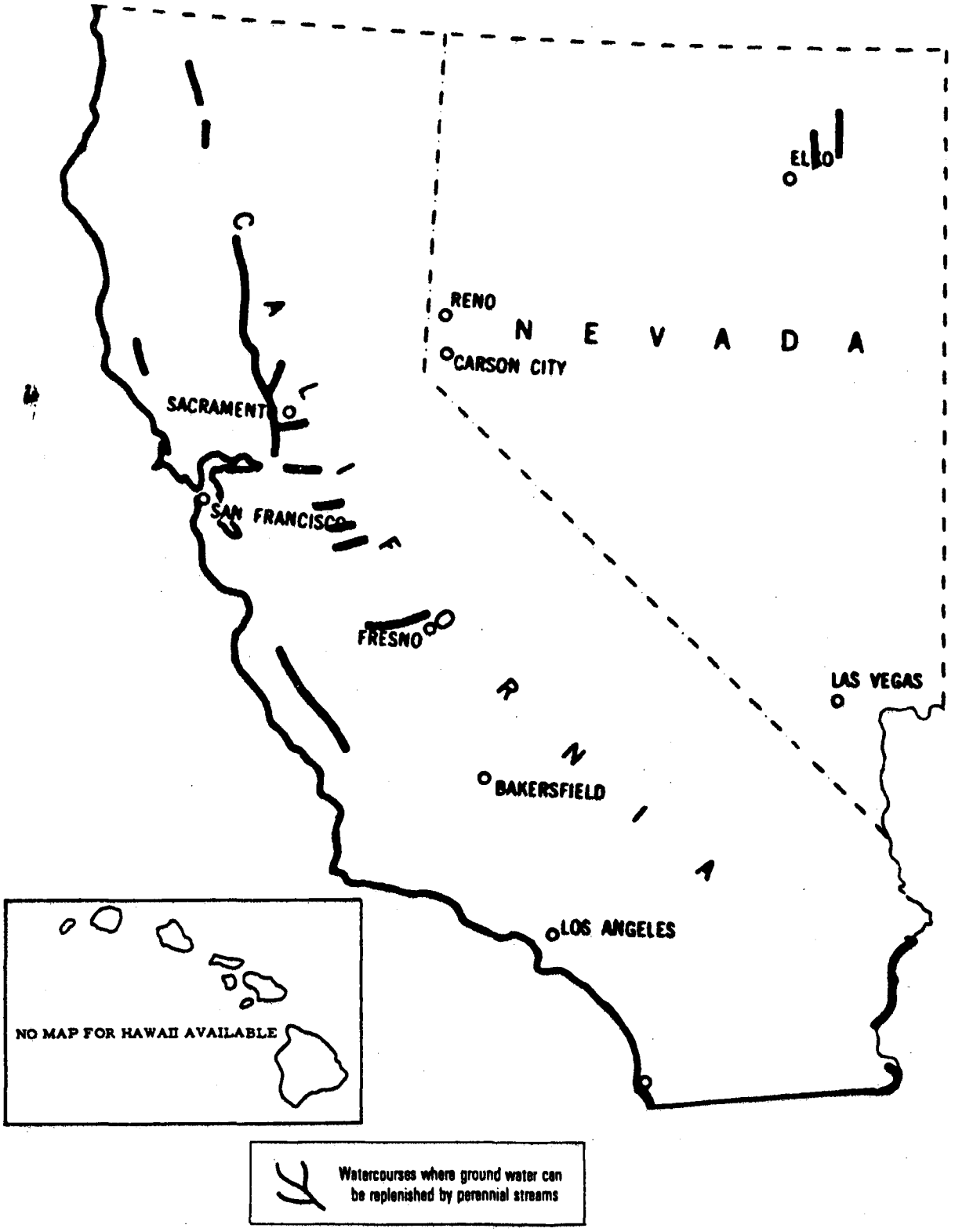
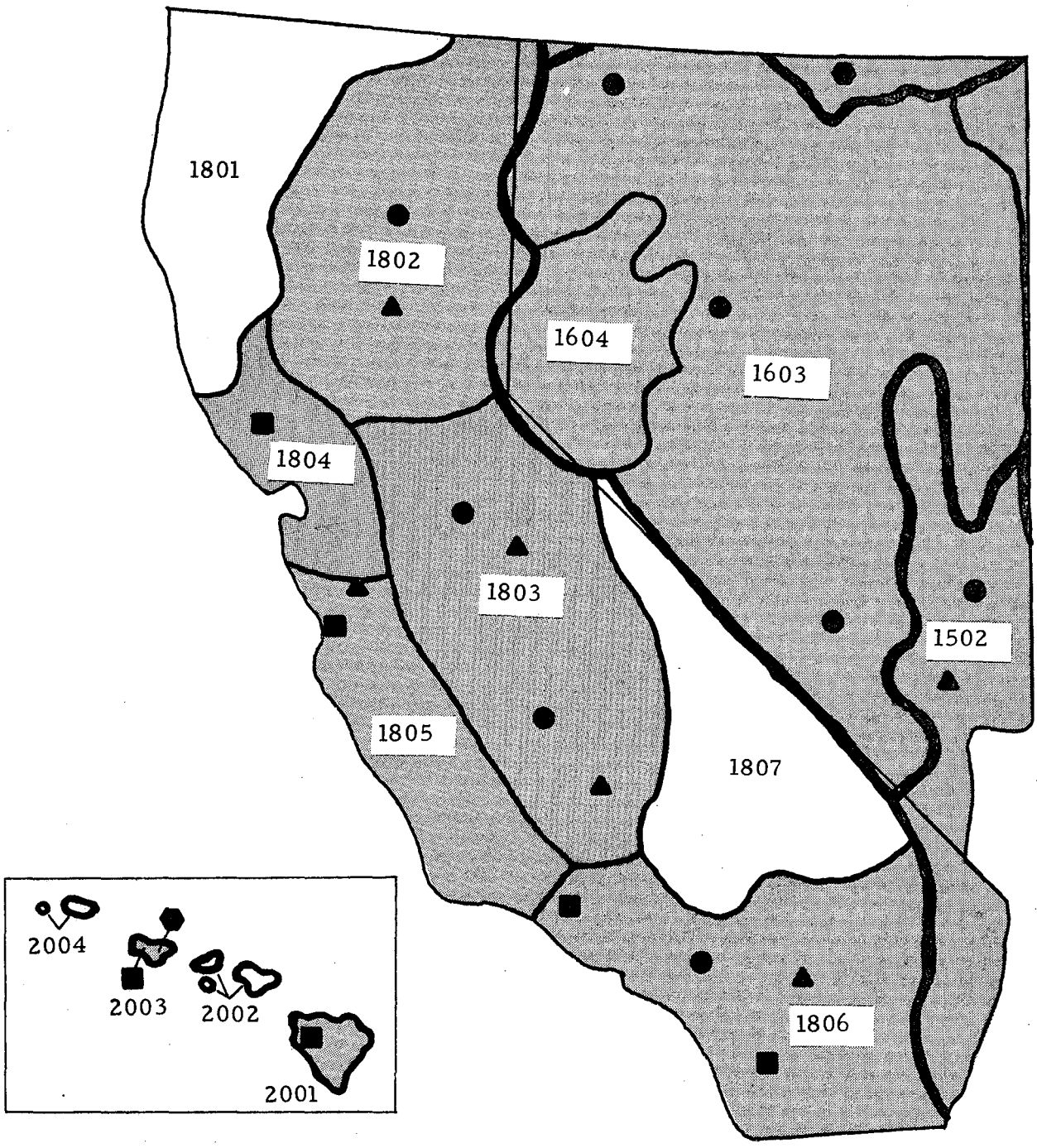


FIGURE II-26 GROUNDWATER CONFINED TO NARROW AQUIFERS RELATED TO RIVER VALLEYS

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973



Areas with Greatest Total Impact

Areas that have groundwater depletion.

Location of Specific Impacts*

- Mining of groundwater that exhausts the water source.
- Withdrawal that diminishes spring and stream flow.
- Withdrawal that causes subsidence and fissures.
- Withdrawal that causes salt water intrusion into fresh water aquifers.

*Identified by State/Regional study teams.

FIGURE II-27 GROUNDWATER DEPLETION

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977

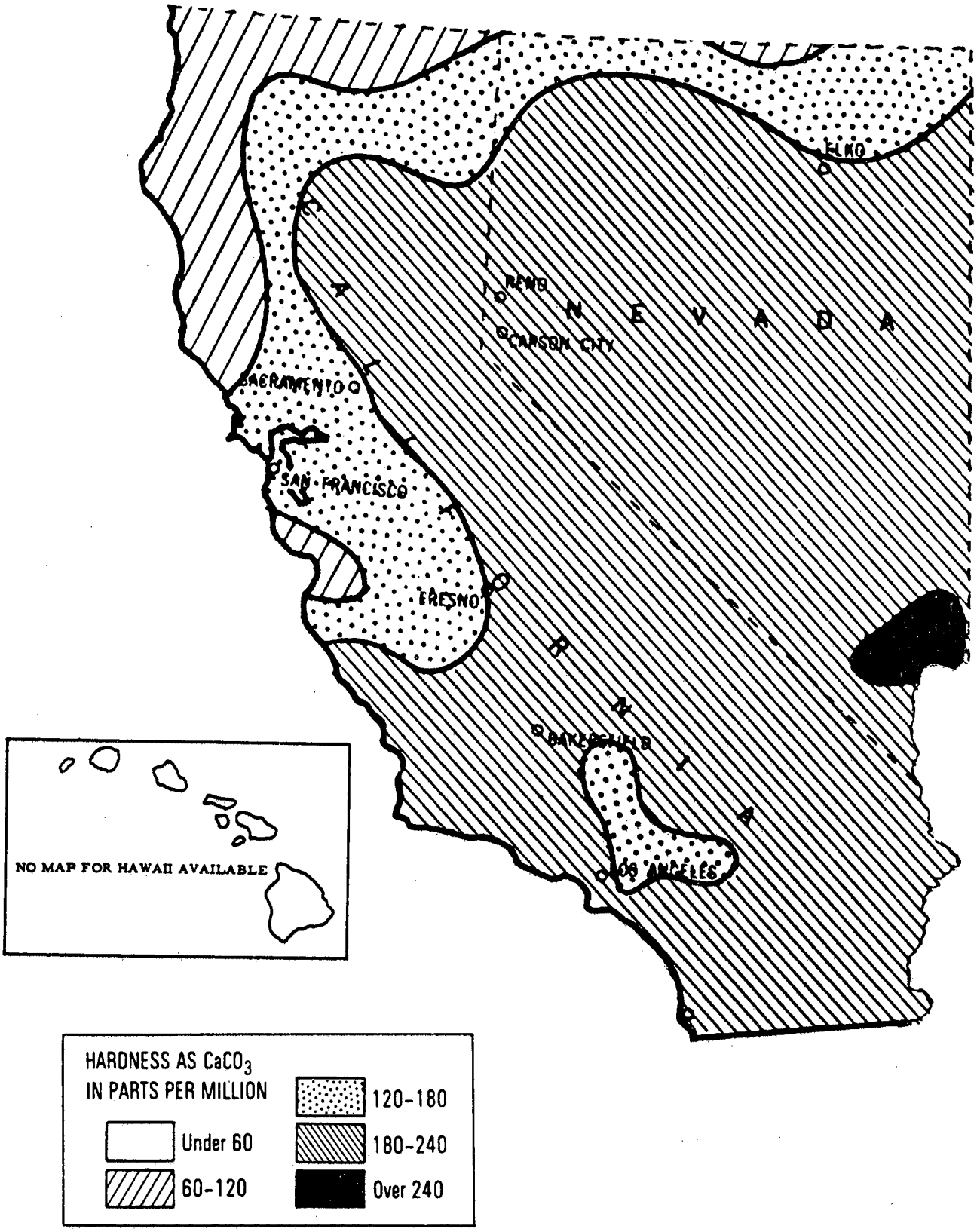
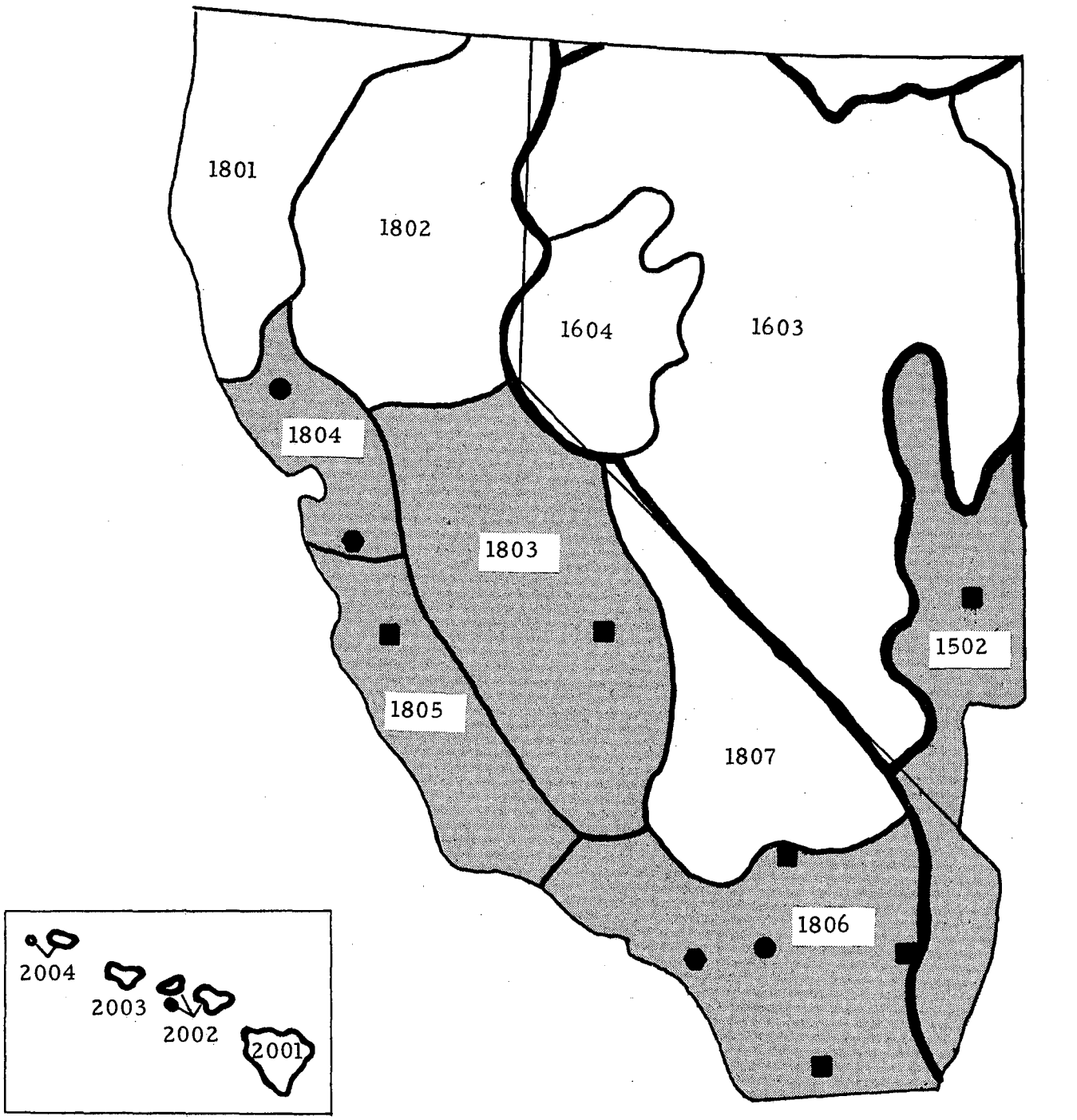


FIGURE II-28 GROUNDWATER HARDNESS

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973



Areas with Greatest Total Impact

Areas that have groundwater contamination

Location of Specific Impacts*

- Contamination resulting from toxic industrial wastes.
- Contamination resulting from leaching of municipal and industrial wastes, and waste runoff through oil and gas fields, and other excavations.
- Salt and other chemical contamination of aquifers from irrigation and other agricultural activities.

*Identified by State/Regional study teams.

FIGURE II-29 GROUNDWATER CONTAMINATION

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977

II-B-3 WATER MANAGEMENT

THIS SECTION CONSISTS OF A MAP AND A TABLE GIVING THE SIZES AND LOCATIONS OF WATER MANAGEMENT FACILITIES. THE MAP IS TAKEN FROM THE WATER ATLAS OF THE U.S. AND THE TABLE FROM THE CALIFORNIA STATISTICAL ABSTRACT AND A STATE OF NEVADA WATER STUDY.

TABLE II-12
MAJOR RESERVOIRS AND DAMS, 1977

	DAM	STREAM	ASR	HEIGHT (FEET)	CAPACITY (1000 AC-FT)	USE
1	DAVIS	COLORADO RIVER	1502		1,820	MULTI-PURPOSE
2	HOOVER	COLORADO RIVER	1502	726	31,047	MULTI-PURPOSE
3	LAHONTON RESERVOIR	CARSON-TRUCKEE RIVER	1605		274	IRRIGATION
4	TRINITY	TRINITY RIVER	1801	465	2,448	MULTI-PURPOSE
5	AUBURN	MIDDLE FORK AMERICAN RIVER	1802	690	2,330	MULTI-PURPOSE
6	CLEAR LAKE	LOST RIVER	1802	39	527	FLOOD CONTROL, STORAGE
7	CLEAR LAKE IMPOUNDMENT	CACHE RIVER	1802	38	420	STORAGE
8	FOLSOM	AMERICAN RIVER	1802	280	1,010	MULTI-PURPOSE
9	INDIAN VALLEY	NORTH FORK CACHE CREEK	1802	220	300	FLOOD CONTROL, STORAGE
10	LAKE ALMANDOR	NORTH FORK FEATHER RIVER	1802	130	1,308	DIVERSION, STORAGE
11	LOWER HELL HOLE	RUBICON RIVER	1802	410	208	DIVERSION, STORAGE
12	NEW BULLARDS BAR	NORTH YUBA RIVER	1802	635	969	STORAGE
13	OROVILLE	FEATHER RIVER	1802	770	3,484	MULTI-PURPOSE
14	SHASTA	SACRAMENTO RIVER	1802	487	4,500	MULTI-PURPOSE
15	STAMPEDE	LITTLE TRUCKEE RIVER	1802	233	225	STORAGE
16	UNION VALLEY	SILVER CREEK	1802	453	271	STORAGE
17	WHISKEYTOWN	CLEAR CREEK	1802	278	241	MULTI-PURPOSE
18	BUENA VISTA	KERN RIVER	1803	20	205	STORAGE
19	CAMANCHE	MOKELUMNE RIVER	1803	171	432	MULTI-PURPOSE
20	CHERRY VALLEY	CHERRY CREEK	1803	315	268	DIVERSION, STORAGE
21	DON PEDRO	TUOLUMNE RIVER	1803	568	2,030	DIVERSION, FLOOD CONTROL, STORAGE
22	FRIANT	SAN JOAQUIN RIVER	1803	296	521	FLOOD CONTROL, STORAGE
23	ISABELLA	KERN RIVER	1803	171	431	FLOOD CONTROL, STORAGE
24	NEW EXCHEQUER	MERCED RIVER	1803	479	1,026	STORAGE
25	NEW MELONES	STANISLAUS RIVER	1803	625	2,400	MULTI-PURPOSE
26	NEW HOGAN	CALAVERAS RIVER	1803	195	320	MULTI-PURPOSE
27	PARDEE	MOKELUMNE RIVER	1803	345	210	DIVERSION, STORAGE
28	PINE FLAT	KINGS RIVER	1803	430	1,000	MULTI-PURPOSE
29	OSHAUGHNESSY	TUOLUMNE RIVER	1803	312	360	STORAGE
30	SAN LUIS	SAN LUIS CREEK	1803	313	2,040	STORAGE

MAJOR RESERVOIRS AND DAMS, 1977

	DAM	STREAM	ASR	HEIGHT (FEET)	CAPACITY (1000 AC-FT)	USE
31	MONTICELLO	PUTAH CREEK	1804	271	1,600	MULTI-PURPOSE
32	WARM SPRINGS	DRY CREEK	1804	319	381	FLOOD CONTROL, STORAGE
33	BRADBURY	SANTA YNEZ RIVER	1805	197	205	MULTI-PURPOSE
34	NACIMIENTO	NACIMIENTO RIVER	1805	210	350	FLOOD CONTROL, STORAGE
35	SAN ANTONIO	SAN ANTONIO RIVER	1805	201	348	FLOOD CONTROL, STORAGE
36	TWITCHELL	CUYAMA RIVER	1805	216	240	MULTI-PURPOSE
37	PARKER	COLORADO RIVER	1806	85	648	FLOOD CONTROL, STORAGE
38	PRADO	SANTA ANA RIVER	1806	106	223	FLOOD CONTROL
39	CASITAS	COYOTE CREEK	1806	285	451	MULTI-PURPOSE
40	CASTAIC	CASTAIC RIVER	1806	340	350	STORAGE
41	HENSHAW	SAN LUIS REY RIVER	1808	123	204	STORAGE

SOURCE - CALIFORNIA STATISTICAL ABSTRACT, 1977; WATER FOR NEVADA, VOL 3, 1971

NOTES - RESERVOIRS WITH CAPACITY GREATER THAN 200,000 ACRE-FEET
MULTI-PURPOSE USES INCLUDE MUNICIPAL WATER SUPPLY, IRRIGATION, RECREATION AND POWER GENERATION.

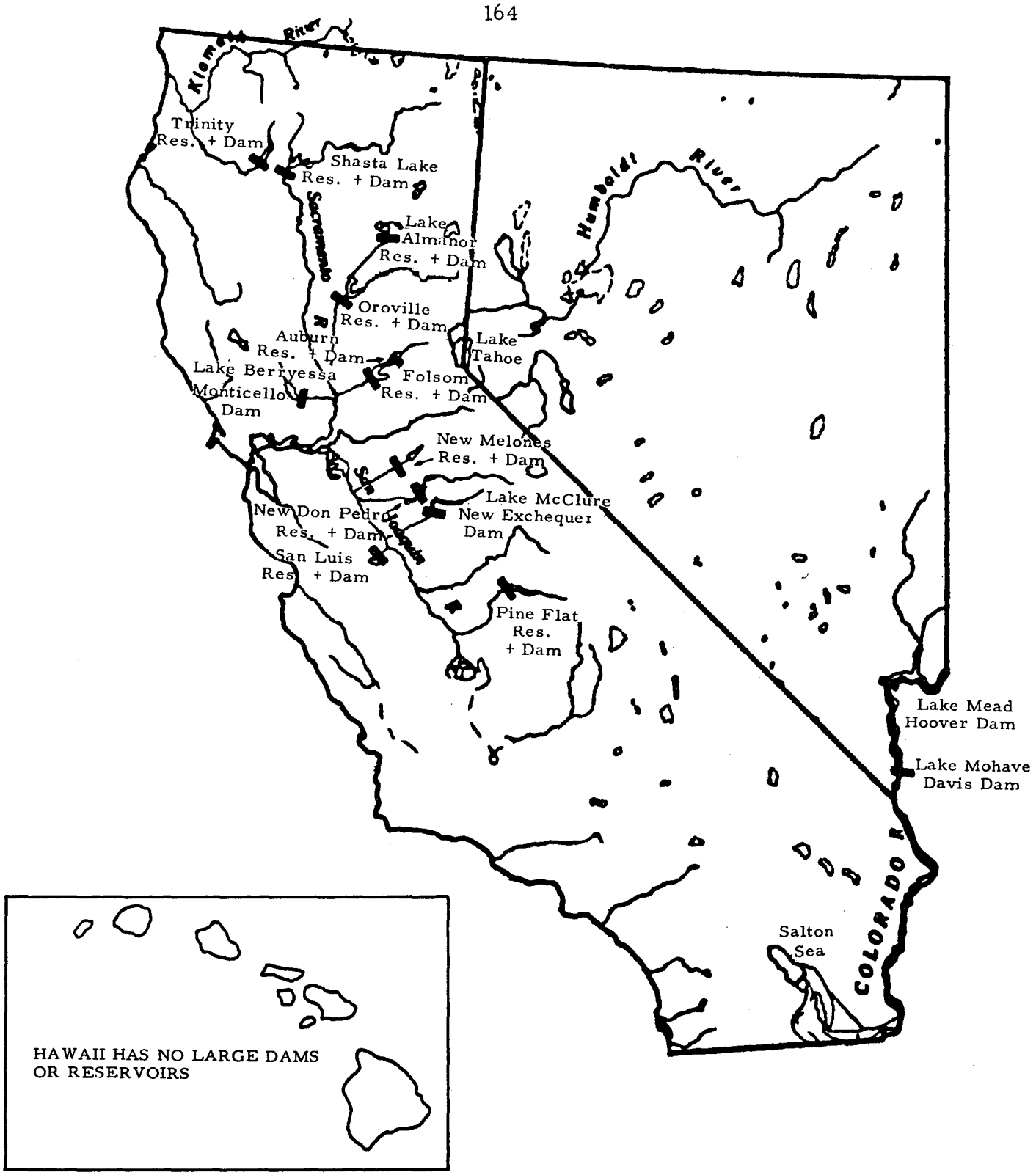


FIGURE 11-30 MAJOR DAMS AND RESERVOIRS

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

II-C AIR QUALITY AND CLIMATIC FACTORS

II-C-1 AIR QUALITY STATUS

STATISTICS RELATING TO THE QUALITY OF THE AIR IN THE THREE STATE REGION ARE PRESENTED IN THIS SECTION. FIRST, THERE ARE MAPS SHOWING THE DISTRIBUTION OF FIVE POLLUTANTS DURING 1975. THIS IS FOLLOWED BY A SET OF MAPS SHOWING POLLUTANT EMISSIONS. THE DATA ARE SHOWN BY AIR QUALITY CONTROL REGION (AQCR). THE BOUNDARIES OF THE AQCRS ARE MAPPED, AS ARE THOSE OF AIR BASINS AND AQMAS IN CALIFORNIA. NEXT, DATA ARE GIVEN ON PREVENTION OF SIGNIFICANT DETERIORATION AREAS AND ON THE ATTAINMENT STATUS OF AIR BASINS.

THE MAPS OF AIR QUALITY ARE FROM THE EPA SAROAD DATA BASE AND WERE PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY. MAPS OF EMISSIONS AND ATTAINMENT STATUS ARE TAKEN FROM DEPARTMENT OF ENERGY PUBLICATIONS. DATA ON ATTAINMENT STATUS ARE FROM THE FEDERAL REGISTER.

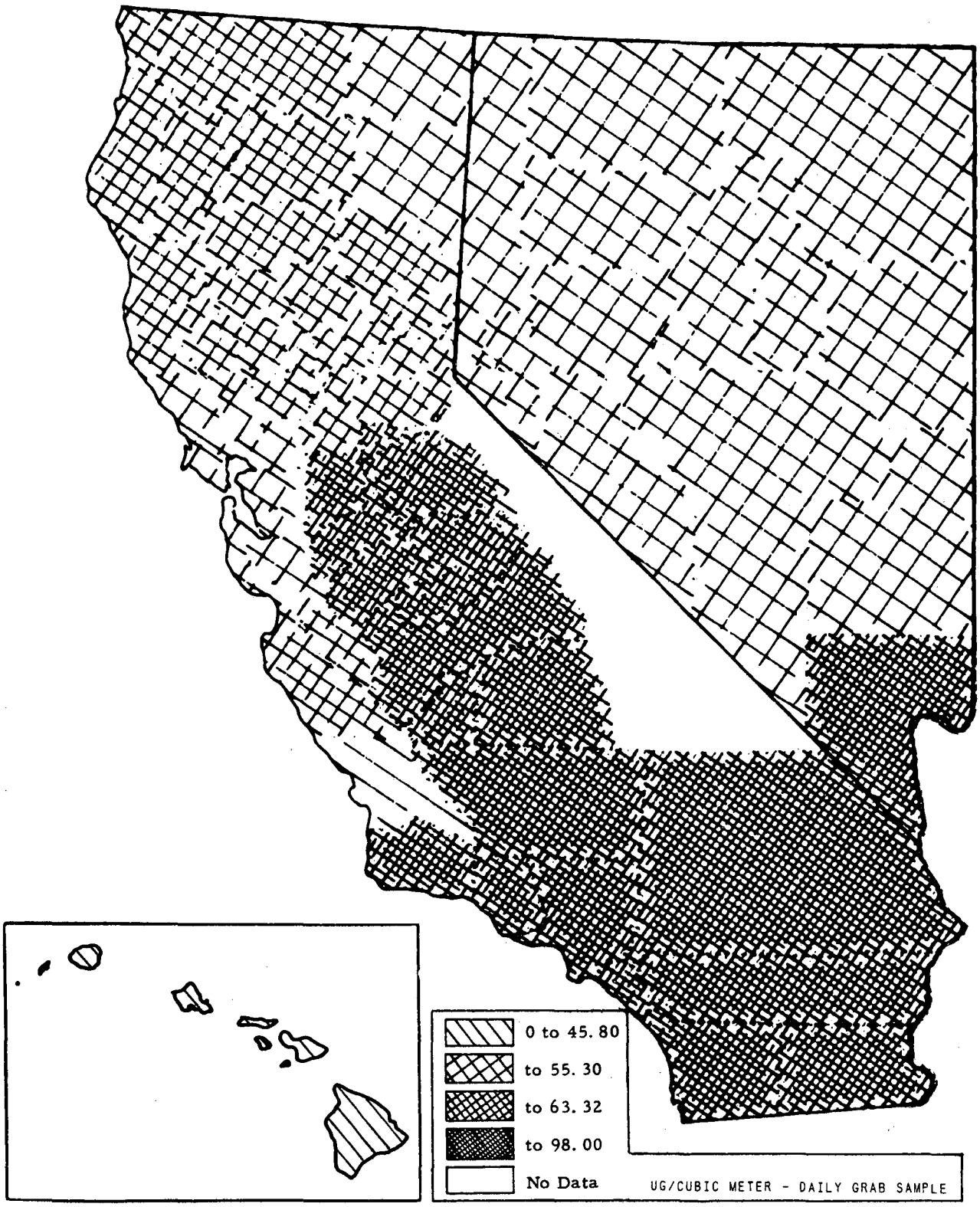


FIGURE II-31 AIR QUALITY, 1975 - TOTAL SUSPENDED PARTICULATES

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM STORAGE AND RETRIEVAL OF AEROMETRIC DATA (SAROAD)

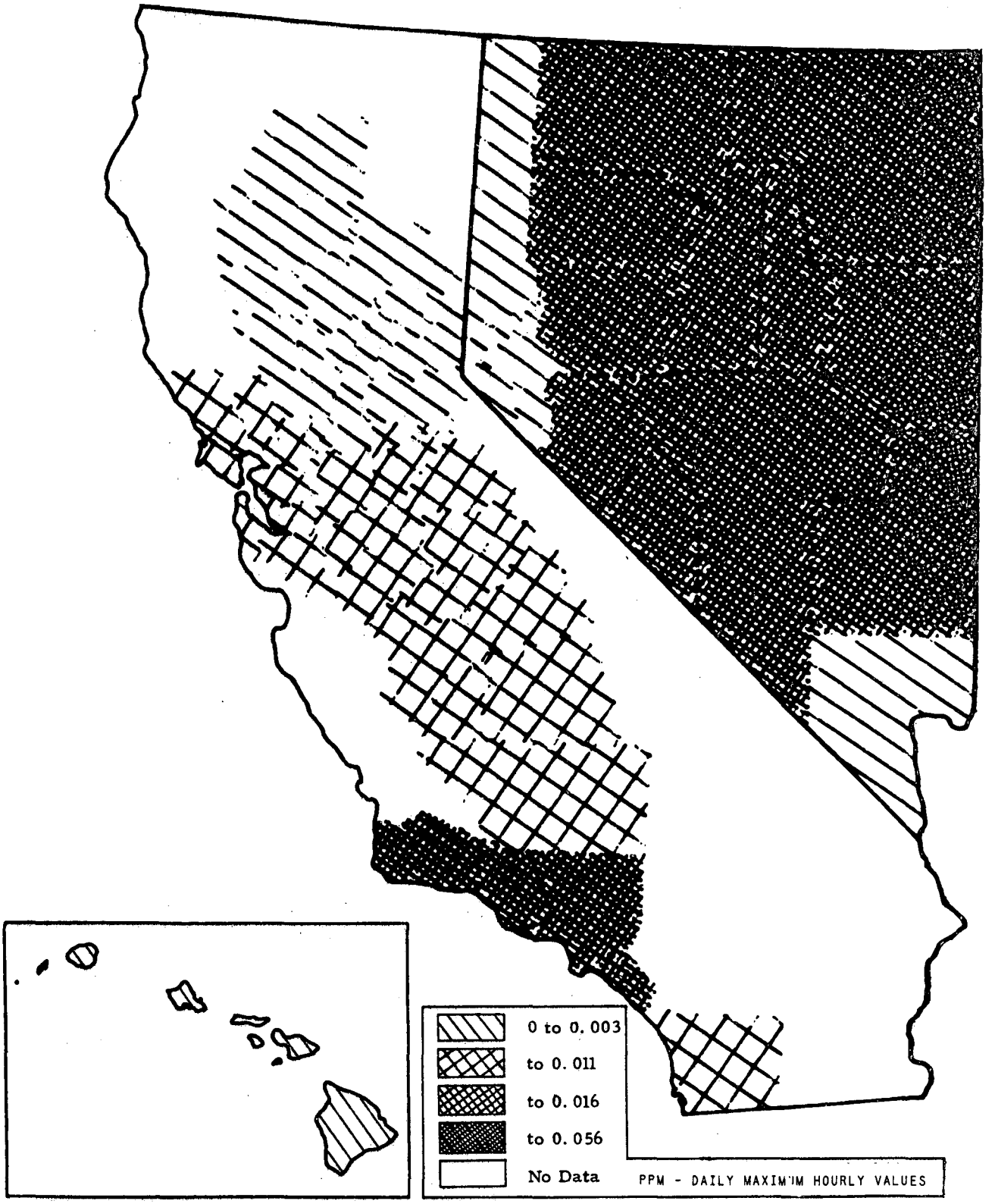


FIGURE II-32 AIR QUALITY, 1975 - SULFUR DIOXIDE

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM STORAGE AND RETRIEVAL OF AEROMETRIC DATA (SAROAD)

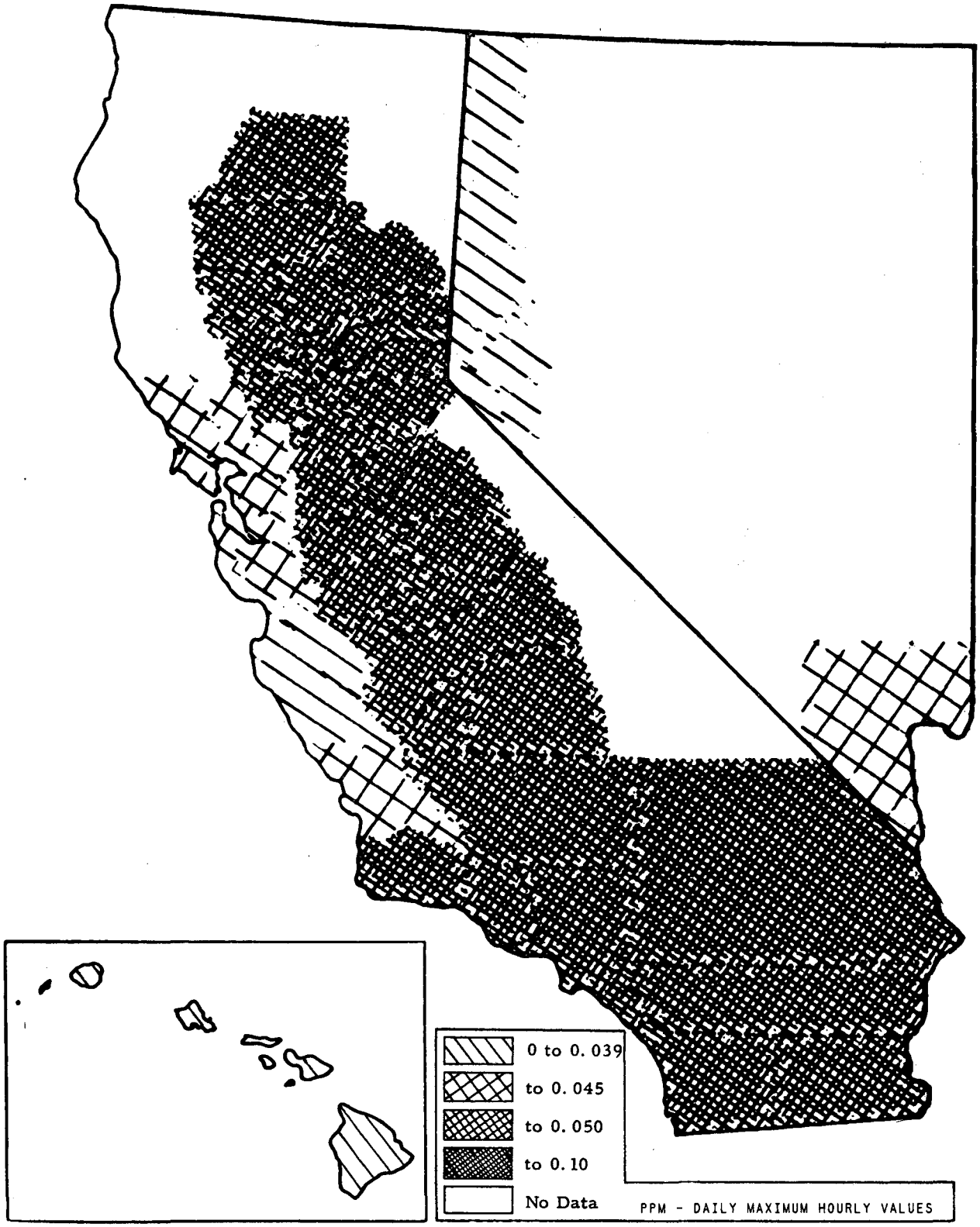


FIGURE II-33 AIR QUALITY, 1975 - OZONE

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM STORAGE AND RETRIEVAL OF AEROMETRIC DATA (SAROAD)

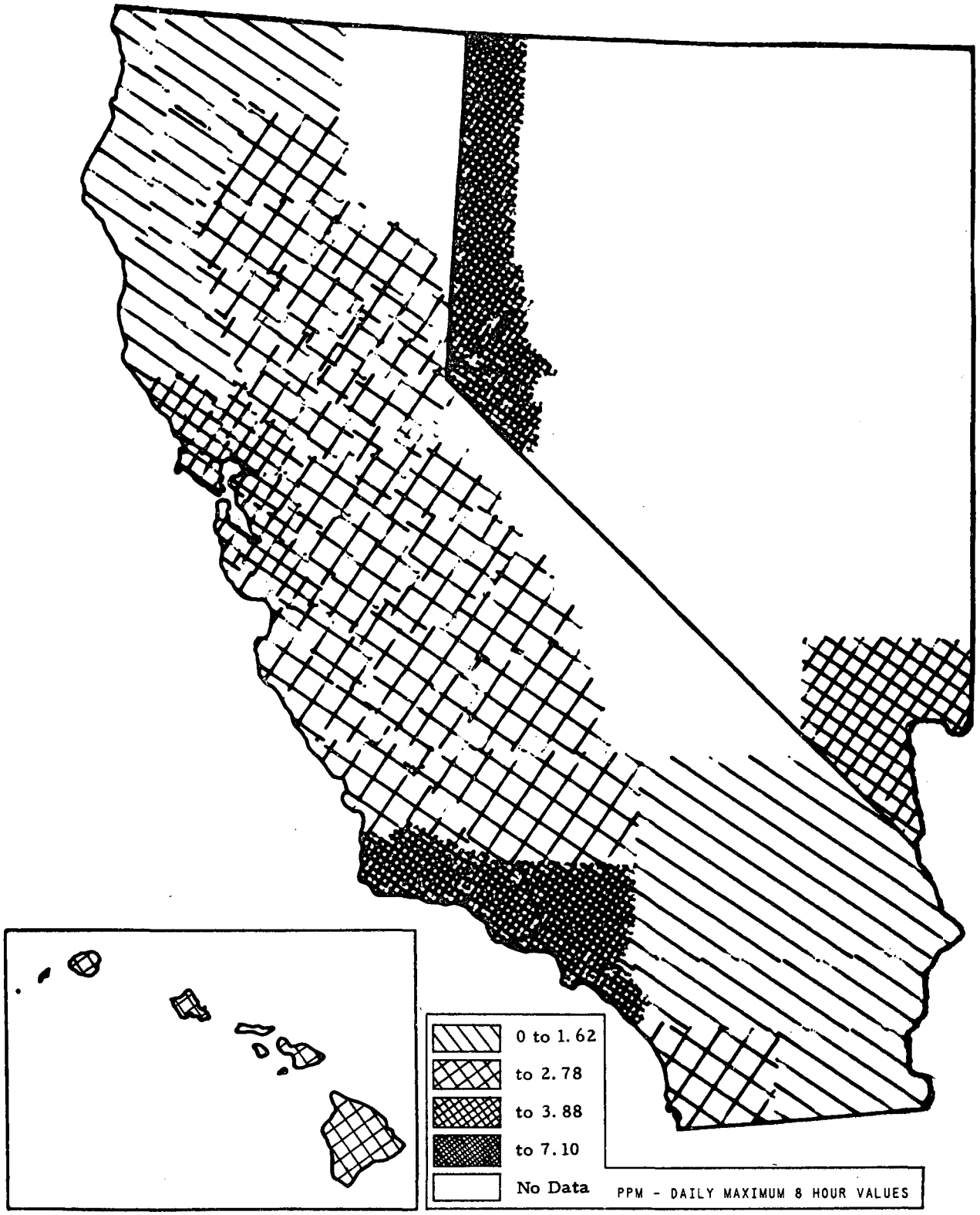


FIGURE II-34 AIR QUALITY, 1975 - CARBON MONOXIDE

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM STORAGE AND RETRIEVAL OF AEROMETRIC DATA (SAROAD)

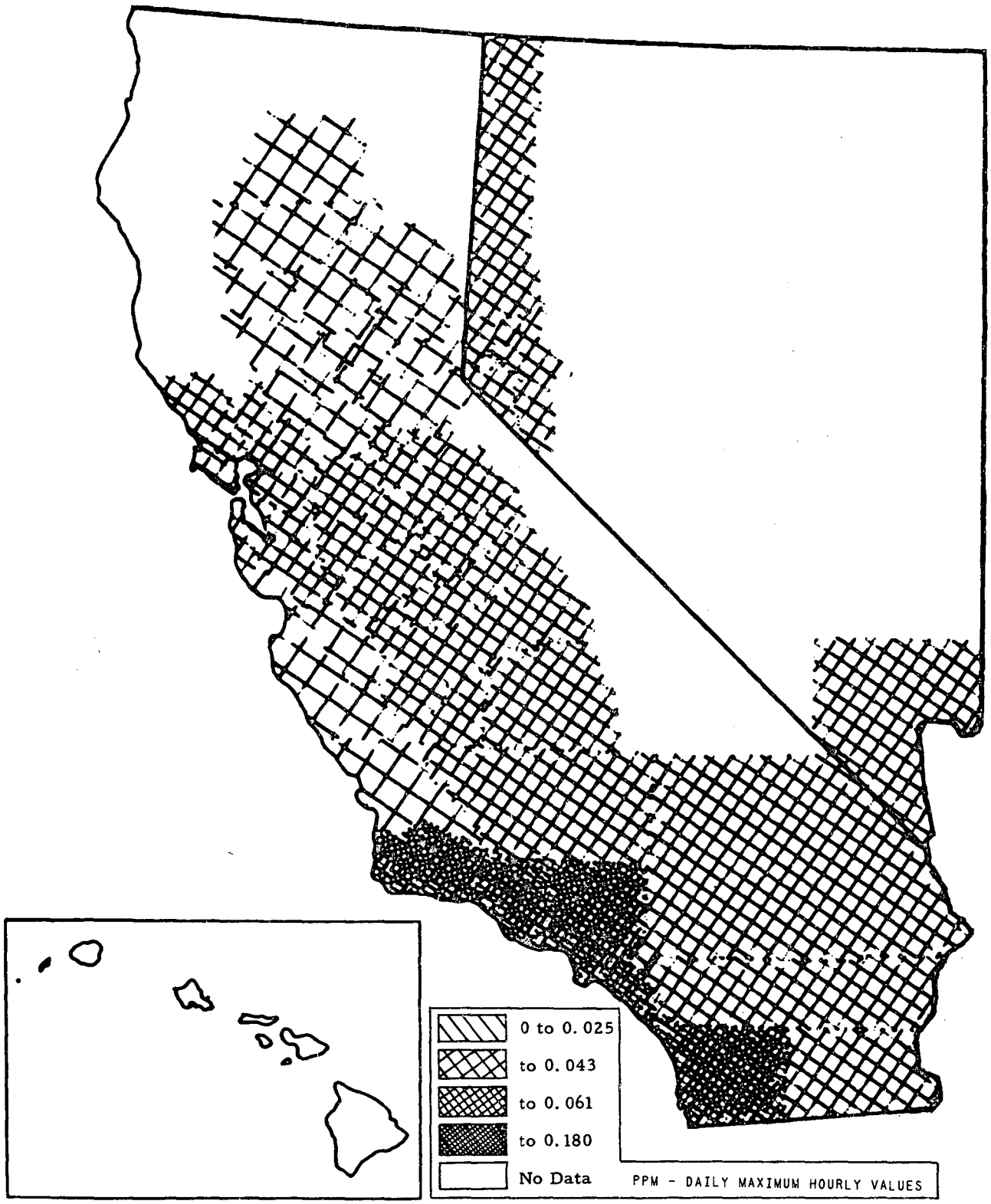


FIGURE II-35 AIR QUALITY, 1975 - NITROGEN DIOXIDE

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM STORAGE AND RETRIEVAL OF AEROMETRIC DATA (SAROAD)

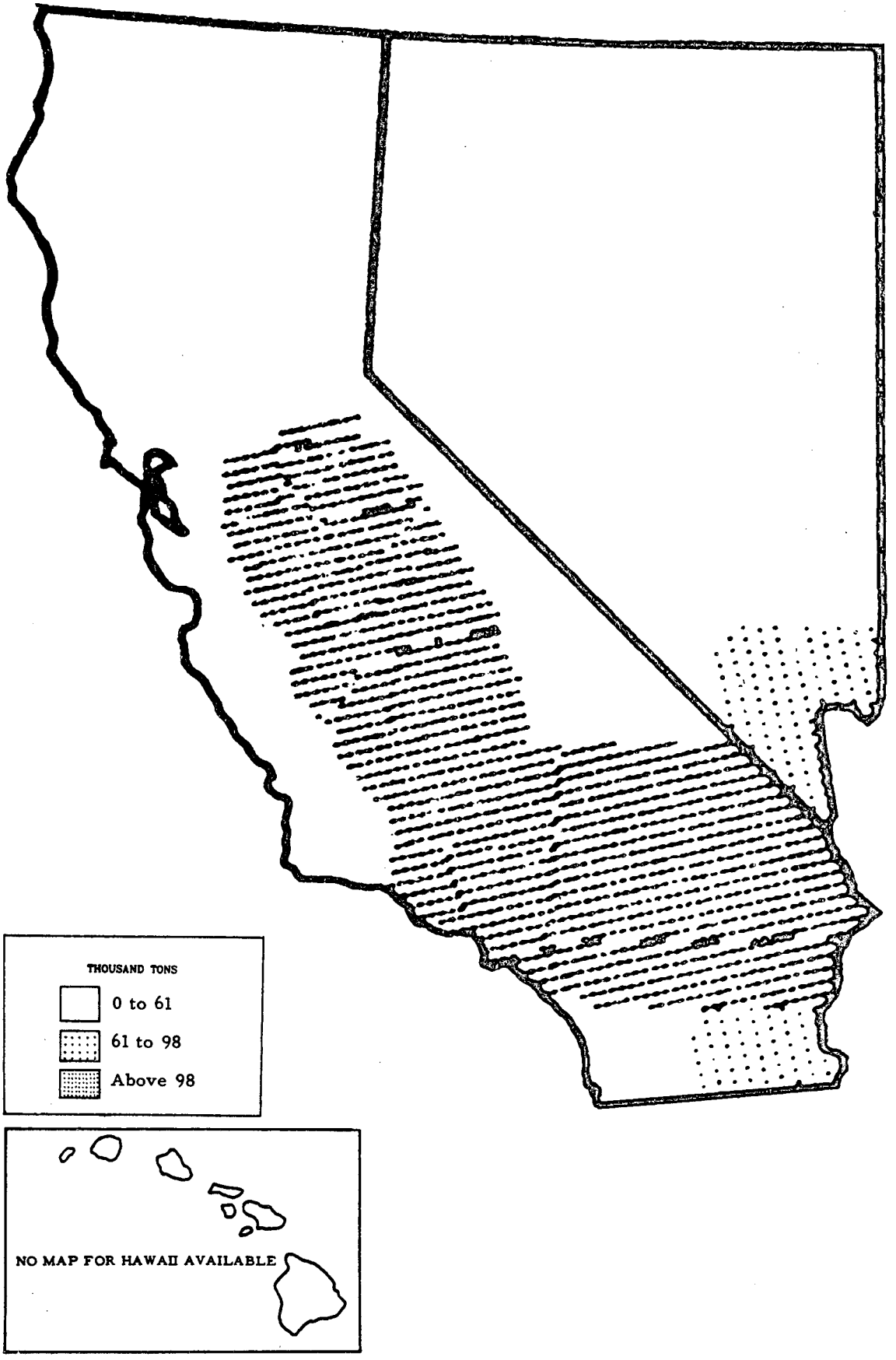


FIGURE II-36 EMISSIONS BY AQCR, 1975 - TOTAL SUSPENDED PARTICULATES

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS
DOE/PE-0001 UC-11, DECEMBER 1977

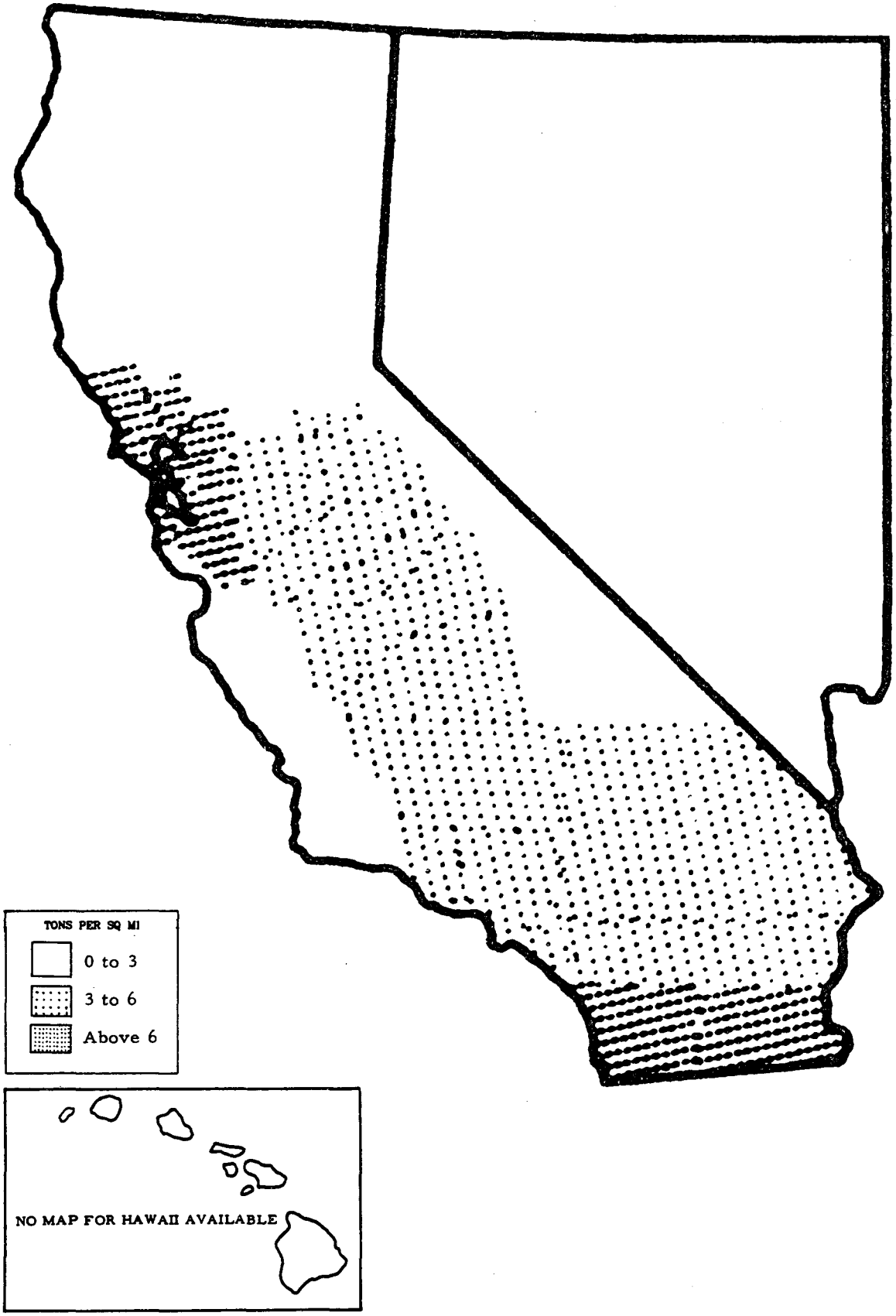
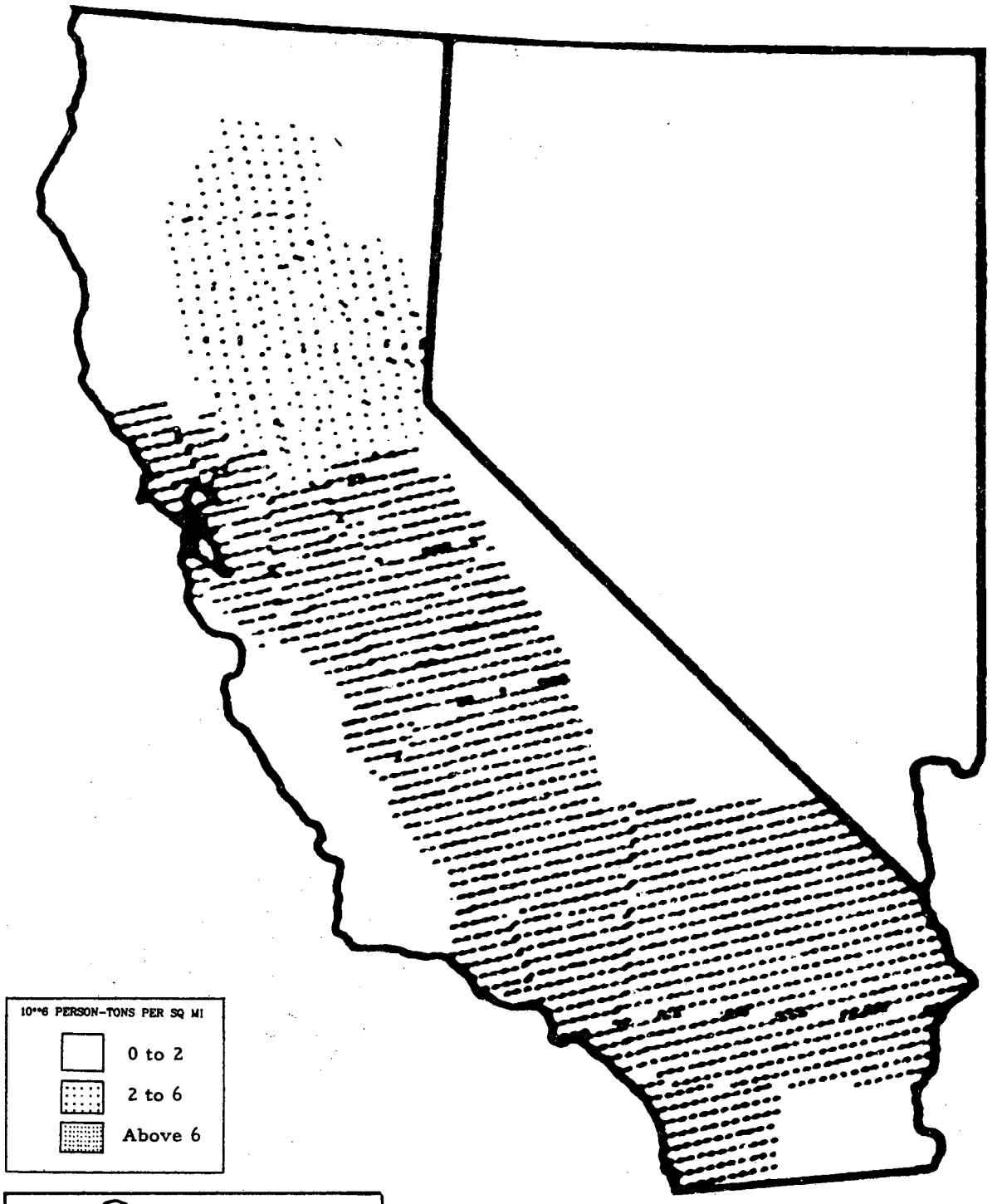


FIGURE II-37 EMISSION DENSITY BY AQCR, 1975 - TOTAL SUSPENDED PARTICULATES

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS DOE/PE-0001 UC-11, DECEMBER 1977



The exposure index for each AQCR is the product of the population of the AQCR in millions times the emission density in tons per square mile.

FIGURE II-38 EXPOSURE INDEX BY AQCR, 1975 - TOTAL SUSPENDED PARTICULATES

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS DOE/PE-0001 UC-11, DECEMBER 1977

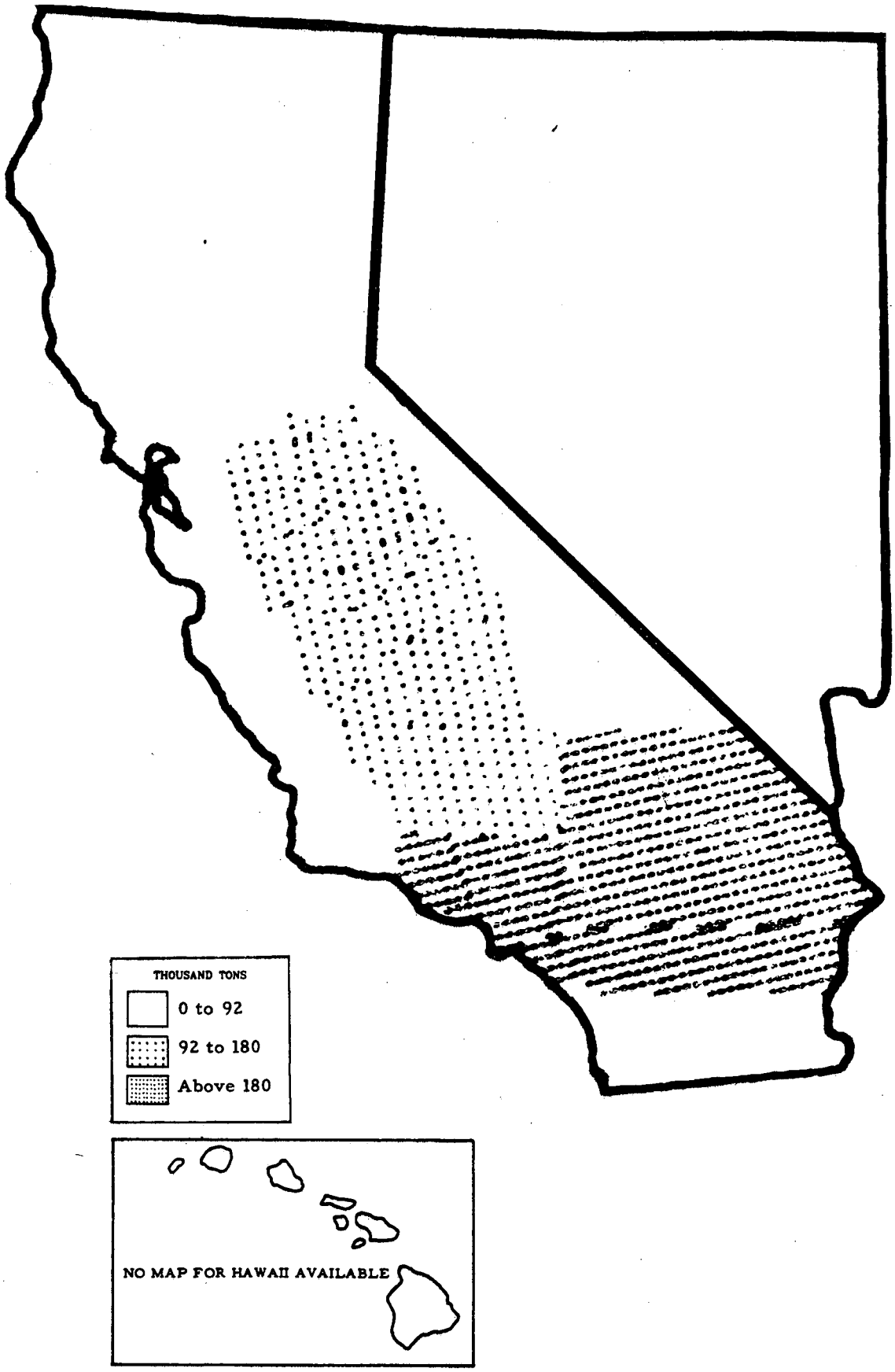


FIGURE II-39 EMISSIONS BY AQCR, 1975 - SULFUR DIOXIDE

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS
DOE/PE-0001 UC-11, DECEMBER 1977

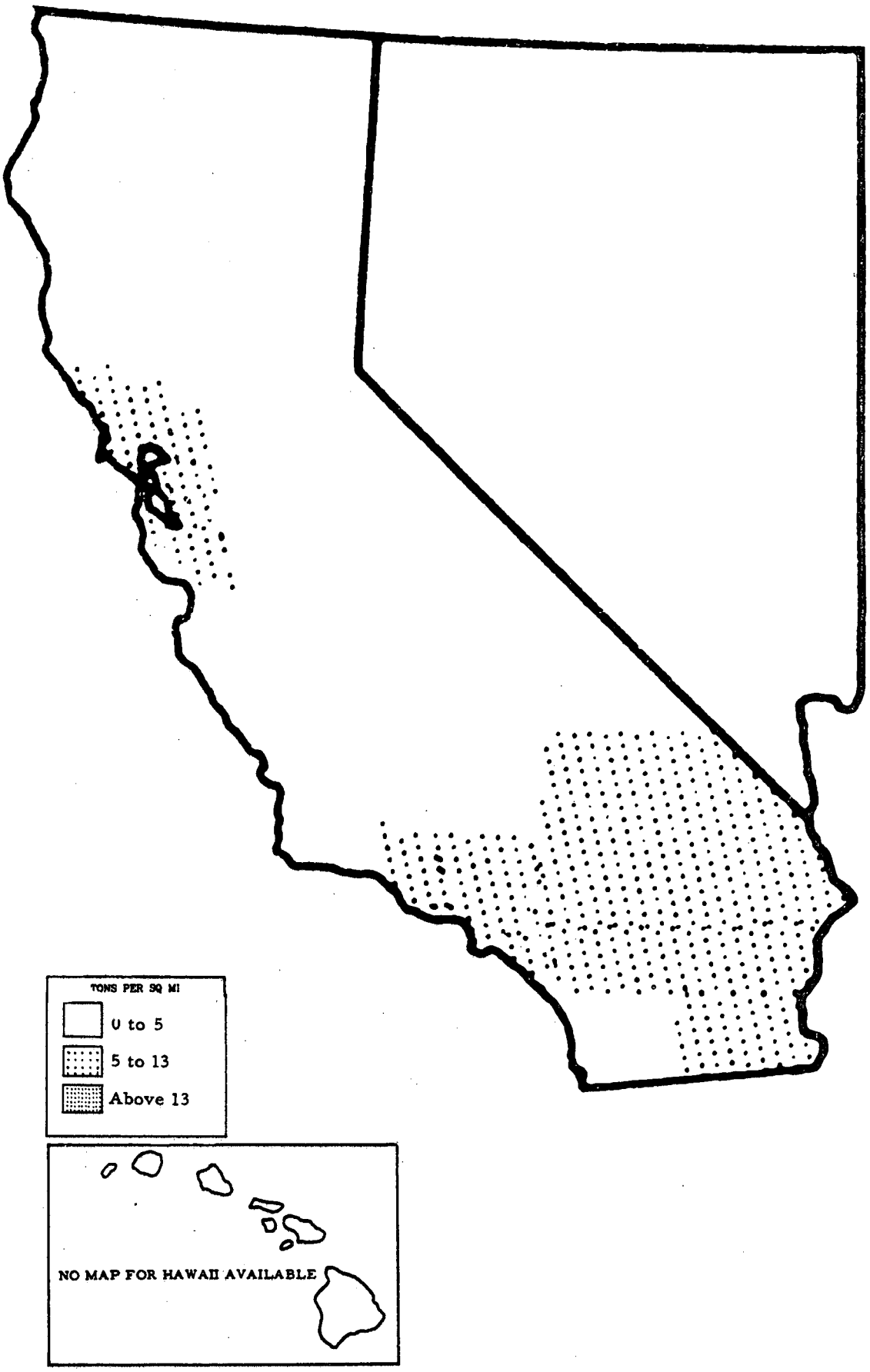
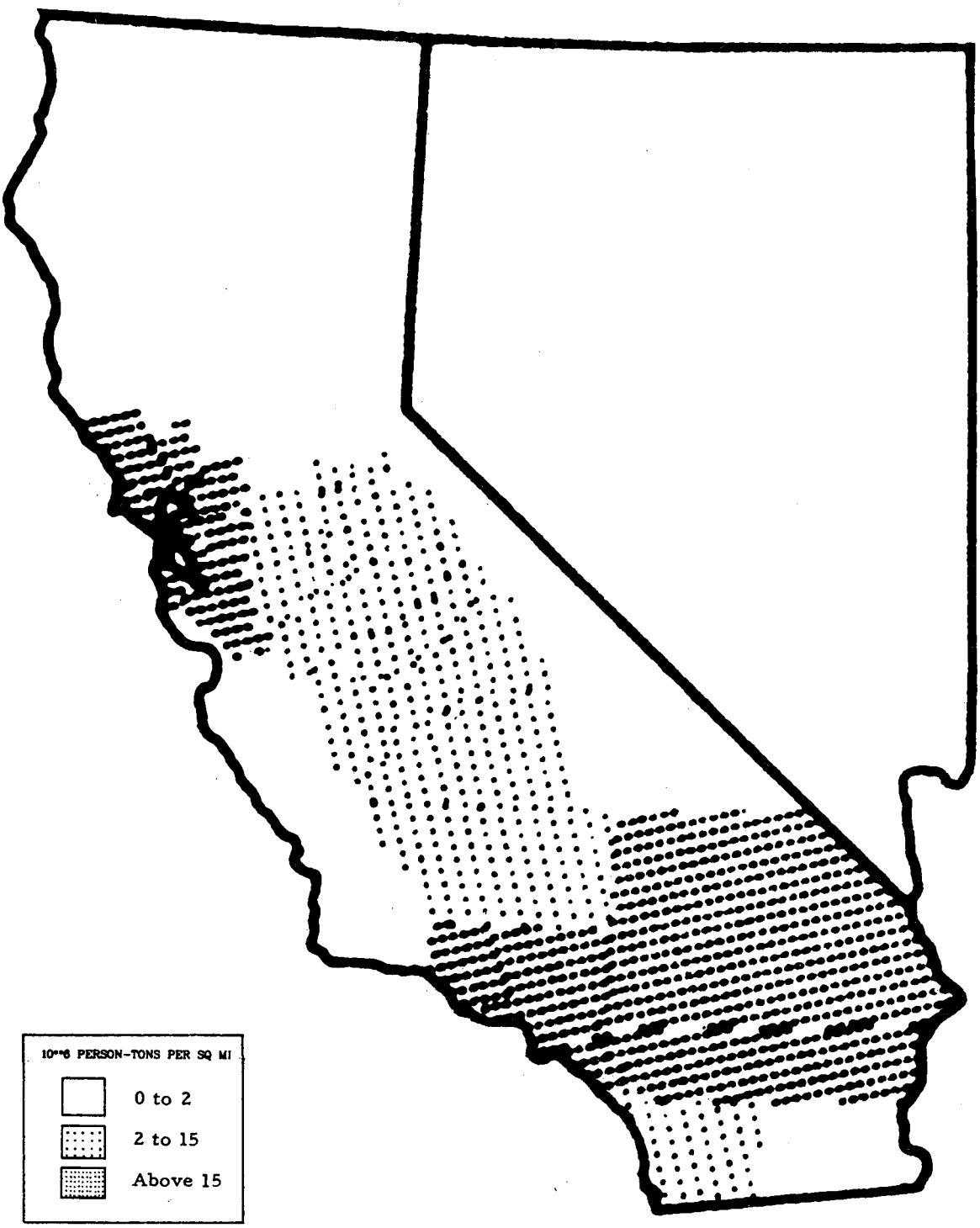


FIGURE II-40 EMISSION DENSITY BY AQCR, 1975 - SULFUR DIOXIDE

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS DOE/PE-0001 UC-11, DECEMBER 1977



The exposure index for each AQCR is the product of the population of that AQCR in millions times the emission density in tons per square mile.

FIGURE II-41 EXPOSURE INDEX BY AQCR, 1975 - SULFUR DIOXIDE

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS
DOE/PE-0001 UC-11, DECEMBER 1977

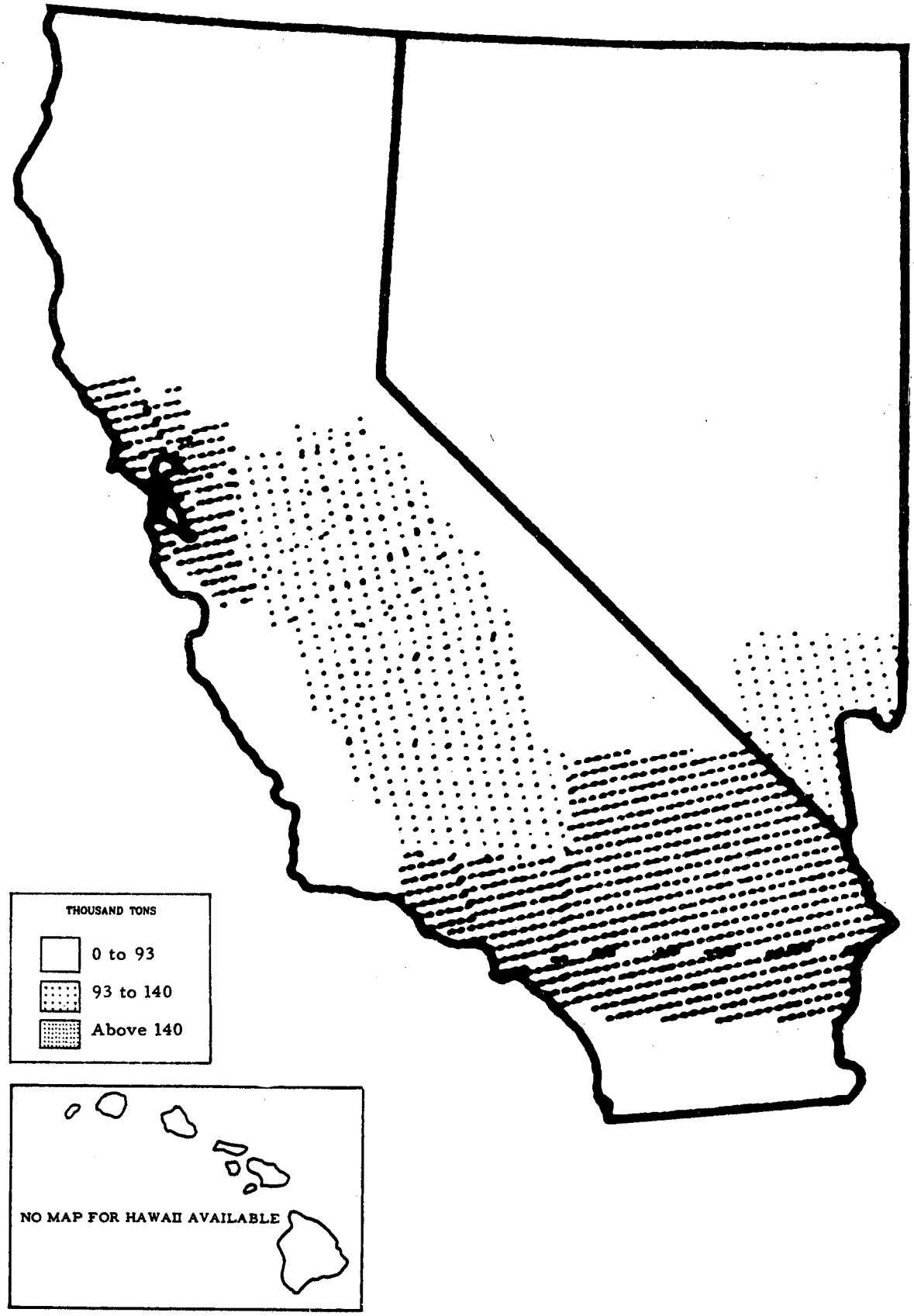


FIGURE II-42 EMISSIONS BY AQCR, 1975 - NITROGEN DIOXIDE

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS DOE/PE-0001 UC-11, DECEMBER 1977

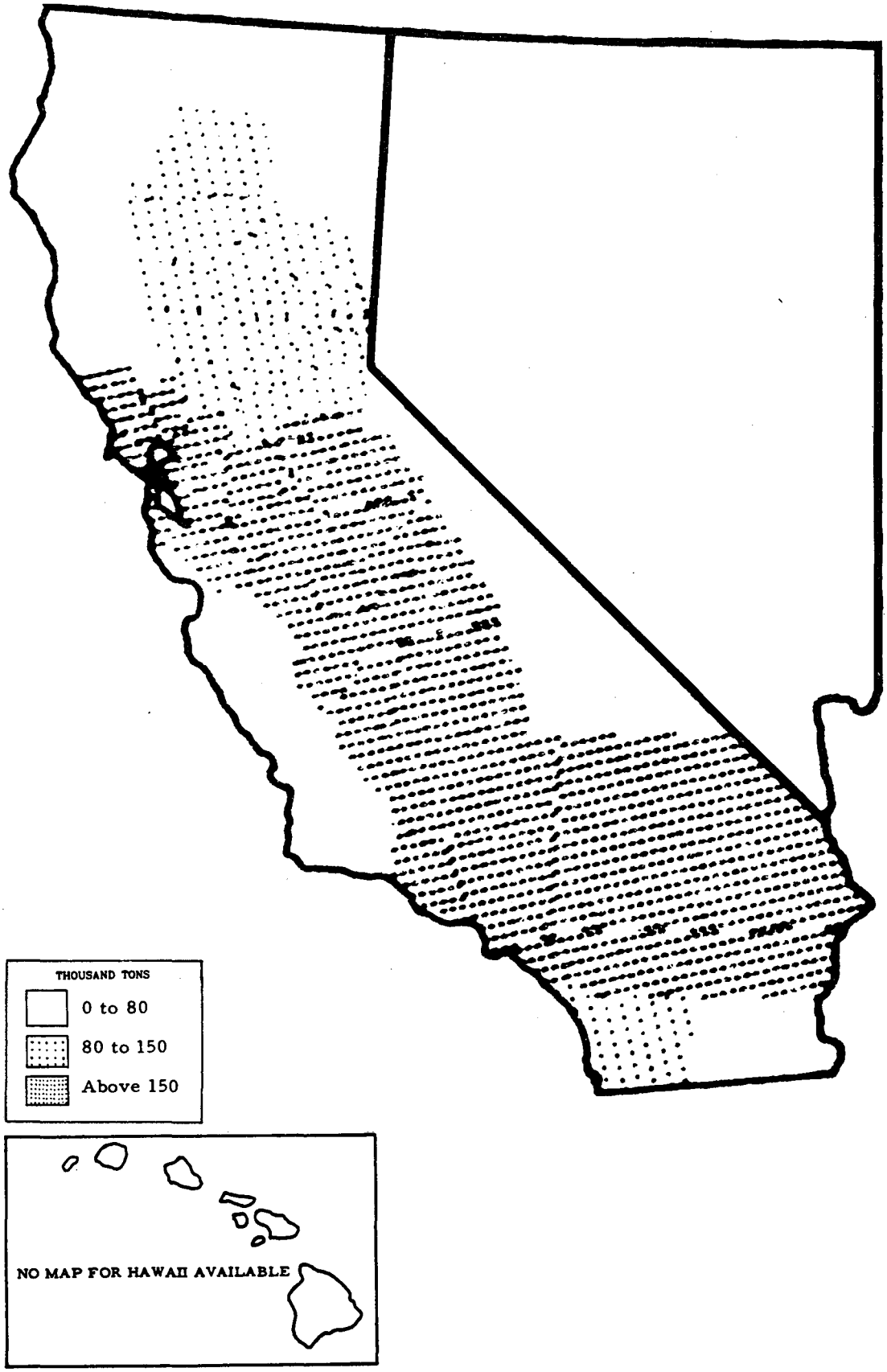


FIGURE II-43 EMISSIONS BY AQCR, 1975 - HYDROCARBONS

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS DOE/PE-0001 UC-11, DECEMBER 1977

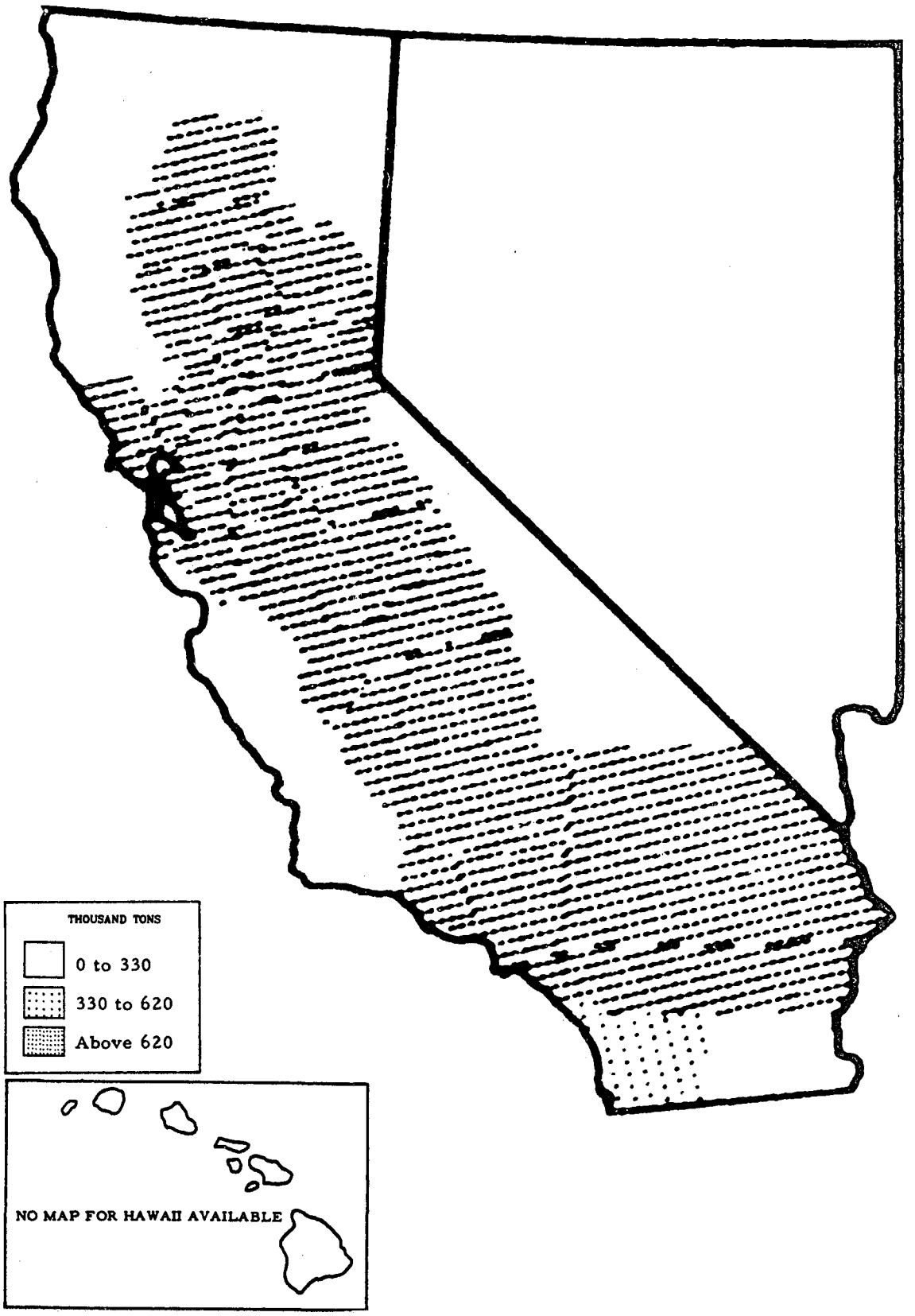


FIGURE II-44 EMISSIONS BY AQCR, 1975 - CARBON MONOXIDE

SOURCE: U. S. DEPARTMENT OF ENERGY, 1985 AIR POLLUTION EMISSIONS
DOE/PE-0001 UC-11, DECEMBER 1977

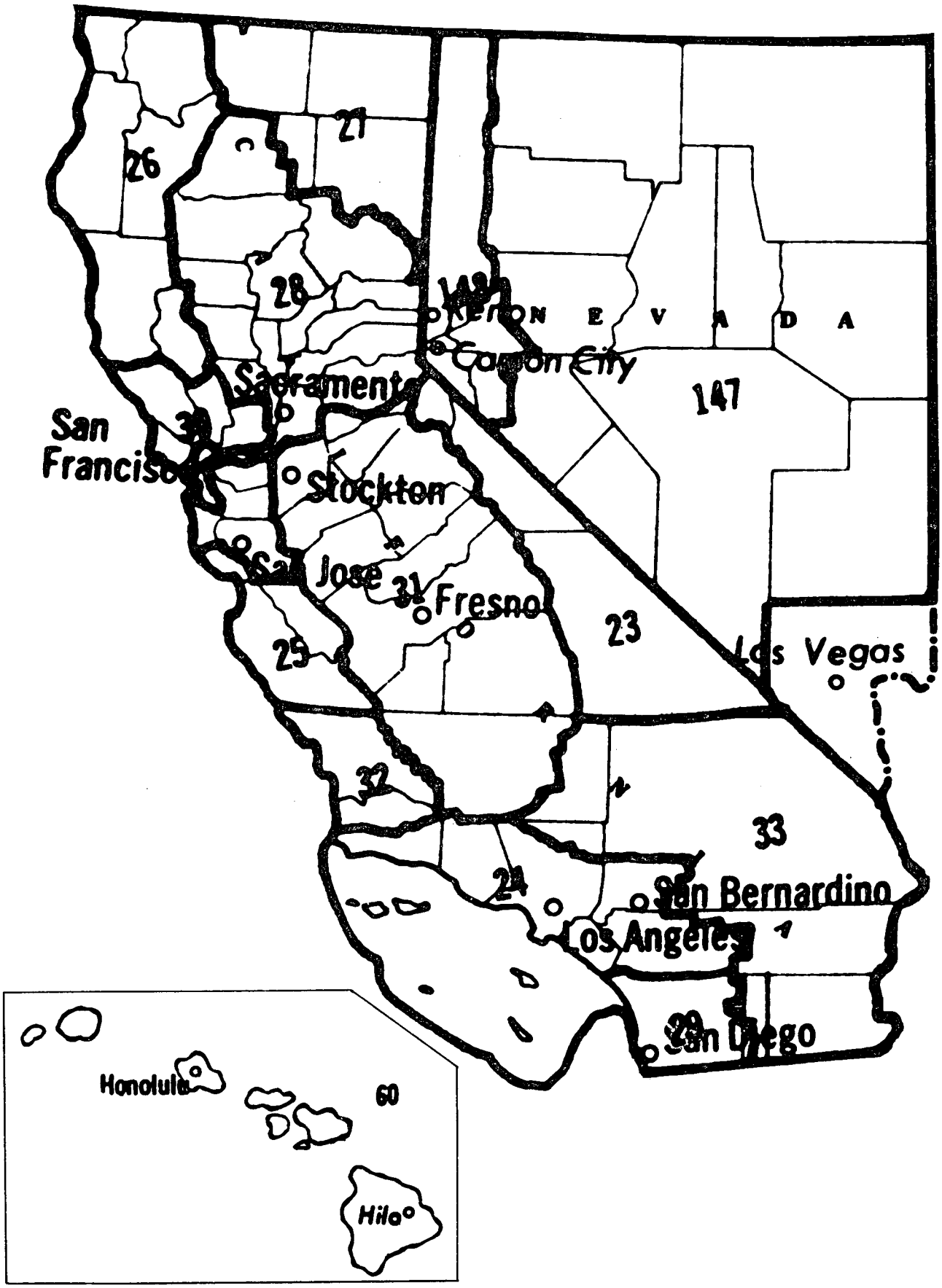


FIGURE II-45 AIR QUALITY CONTROL REGIONS

SOURCE: U. S. ENVIRONMENTAL PROTECTION AGENCY--OFFICE OF AIR AND SOLID WASTE MANAGEMENT, NATIONAL SUMMARY OF STATE IMPLEMENTATION PLAN REVIEWS, VOLUME 2 EPA 450/3-75-0530, 1975

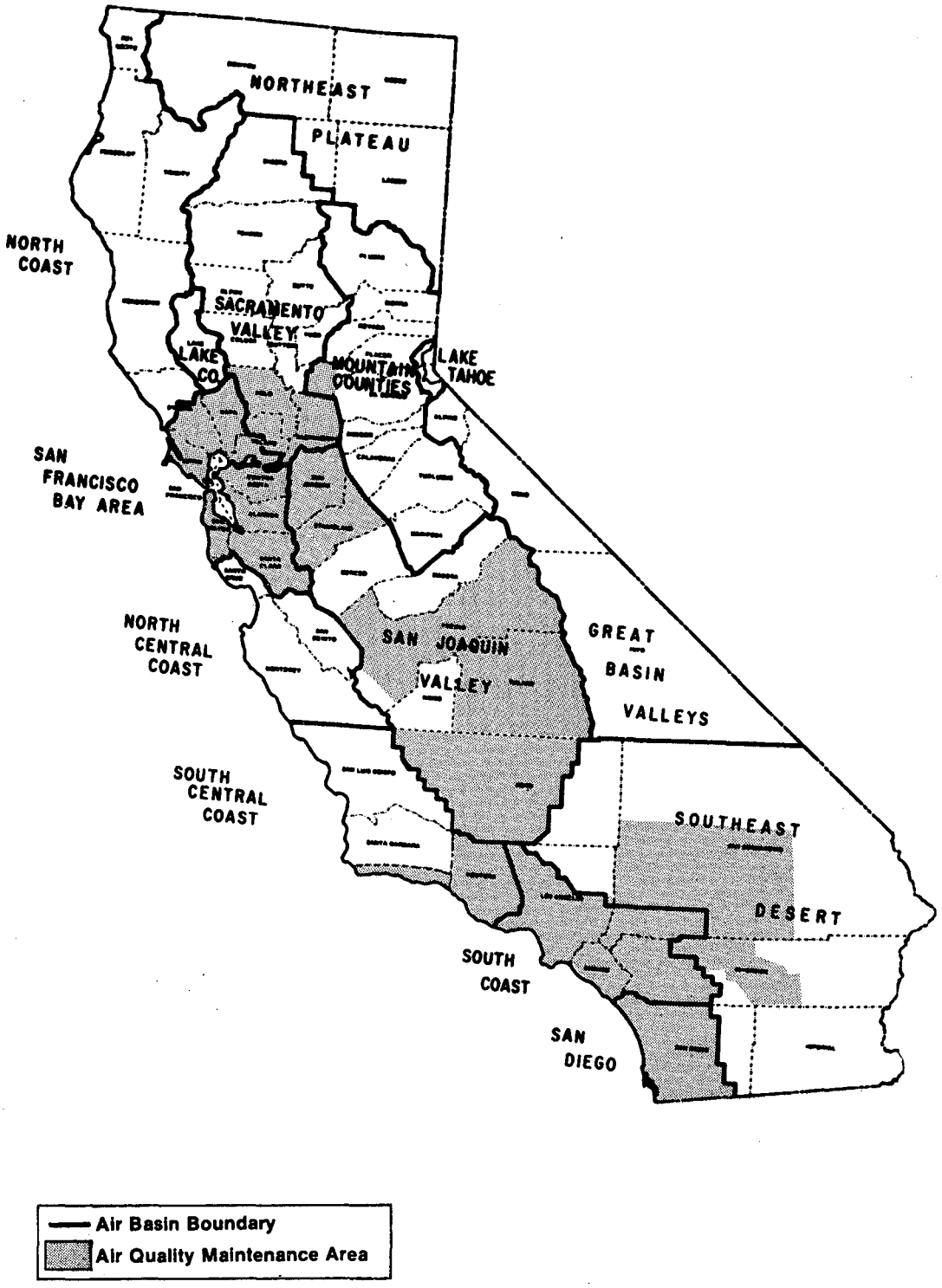


FIGURE II-46 AIR BASINS AND AQMAS IN CALIFORNIA

SOURCE: CALIFORNIA ENERGY RESOURCE DEVELOPMENT AND CONSERVATION COMMISSION, 1977 BIENNIAL REPORT, VOLUME 7, 1977

TABLE II-13
PREVENTION OF SIGNIFICANT DETERIORATION - CLASS I AREAS
[AREA IN ACRES]

	NAME	AREA	AQCR
	CALIFORNIA		
1	AGUA TIBIA WILDERNESS AREA	15,934	29
2	CARIBOU WILDERNESS AREA	19,080	27, 28
3	CUCAMONGA WILDERNESS AREA	9,022	24
4	DESOLATION WILDERNESS AREA	63,469	28
5	DOME LAND WILDERNESS AREA	62,206	31
6	EMIGRANT WILDERNESS AREA	104,311	31
7	HOOVER WILDERNESS AREA	47,916	23
8	JOHN MUIR WILDERNESS AREA	484,673	23, 31
9	JOSHUA TREE WILDERNESS AREA	429,690	33
10	KAISER WILDERNESS AREA	22,500	31
11	KINGS CANYON NATIONAL PARK	459,994	31
12	LASSEN VOLCANIC NATIONAL PARK	105,800	27, 28
13	LAVA BEDS WILDERNESS AREA	28,640	27
14	MINARETS WILDERNESS AREA	109,484	23, 31
15	MARBLE MOUNTAIN WILDERNESS AREA	213,743	26
16	MOKELUMNE WILDERNESS AREA	50,400	23, 31
17	PINNACLES WILDERNESS AREA	12,952	25
18	POINT REYES WILDERNESS AREA	25,370	30
19	REDWOOD NATIONAL PARK	27,792	26
20	SAN GABRIEL WILDERNESS AREA	36,137	24
21	SAN GORGONIO WILDERNESS AREA	34,644	24
22	SAN JACINTO WILDERNESS AREA	20,564	24, 34
23	SAN RAFAEL WILDERNESS AREA	142,722	24, 32
24	SEQUOIA NATIONAL PARK	386,642	31
25	SOUTH WARNER WILDERNESS AREA	68,507	27
26	THOUSAND LAKES WILDERNESS AREA	15,695	27
27	VENTANA WILDERNESS AREA	95,152	25
28	YOLLA BOLLY MIDDLE EEL WILDERNESS AREA	109,091	26, 28
29	YOSEMITE NATIONAL PARK	759,172	31
	HAWAII		
1	HALEAKALA NATIONAL PARK	27,208	60
2	HAWAII VOLCANOES NATIONAL PARK	217,029	60
	NEVADA		
1	JARBIDGE WILDERNESS AREA	64,667	

SOURCE - FEDERAL REGISTER, VOL 43, NO 38, FEB 24, 1978

NOTES - ALL OTHER AREAS ARE DESIGNATED CLASS II.

TABLE II-14
ATTAINMENT STATUS OF AIR BASINS, 1978

	DESIGNATED AIR BASIN	PARTIC-ULATES	SULFUR DIOXIDE	OXIDANTS	CARBON MONOXIDE	NITROGEN DIOXIDE
	CALIFORNIA					
1	GREAT BASIN VALLEYS AIR BASIN	3	3	3 OR 4	3 OR 4	3 OR 4
2	METROPOLITAN LOS ANGELES AIR BASIN					
3	NORTH CENTRAL COAST AIR BASIN			1		
	--MONTEREY COUNTY	1	3		3 OR 4	3 OR 4
	--SAN BENITO COUNTY	4	3		3 OR 4	3 OR 4
	--SANTA CRUZ COUNTY	4	3		3 OR 4	3 OR 4
4	NORTH COAST AIR BASIN			3 OR 4	3 OR 4	3 OR 4
	--DEL NORTE COUNTY	4	3			
	--HUMBOLDT COUNTY	1	3			
	--MENDOCINO COUNTY	1	3			
	--SONOMA COUNTY (PART)	2	3			
	--TRINITY COUNTY	4	3			
5	NORTHEAST PLATEAU AIR BASIN	3	3	3 OR 4	3 OR 4	3 OR 4
6	SACRAMENTO VALLEY AIR BASIN		3			
	--SACRAMENTO COUNTY	2			1	3 OR 4
	--SOLANO COUNTY (PART)	2			3 OR 4	3 OR 4
	--YOLO COUNTY	1			3 OR 4	3 OR 4
	--BUTTE COUNTY	1			1	3 OR 4
	--COLUSA COUNTY	2			3 OR 4	3 OR 4
	--GLENN COUNTY	3			3 OR 4	3 OR 4
	--SHASTA COUNTY (PART)	2			3 OR 4	3 OR 4
	--SUTTER COUNTY	1			1	3 OR 4
	--TEHAMA COUNTY	2			3 OR 4	3 OR 4
	--YUBA COUNTY	2			3 OR 4	3 OR 4
	--SACRAMENTO VALLEY (METRO AQMA)			1		
	--SACRAMENTO VALLEY (NON AQMA)			1		
7	SAN DIEGO AIR BASIN					
	--WEST SAN DIEGO COUNTY	1	4	1	1	1
	--EAST SAN DIEGO COUNTY	3	4	1	3 OR 4	3 OR 4
8	SAN FRANCISCO BAY AREA AIR BASIN		4	1	1	3 OR 4
	--BASIN WIDE	2				
	--ALAMEDA COUNTY	1				

ATTAINMENT STATUS OF AIR BASINS, 1978

	DESIGNATED AIR BASIN	PARTIC-ULATES	SULFUR DIOXIDE	OXIDANTS	CARBON MONOXIDE	NITROGEN DIOXIDE
9	SAN JOAQUIN VALLEY AIR BASIN	1		1		
	--FRESNO COUNTY		3		1	3 OR 4
	--KERN COUNTY		1		1	3 OR 4
	--KINGS COUNTY		3		3 OR 4	3 OR 4
	--MADERA COUNTY		3		3 OR 4	3 OR 4
	--MERCED COUNTY		3		3 OR 4	3 OR 4
	--SAN JOAQUIN COUNTY		3		1	3 OR 4
	--STANISLAUS COUNTY		3		1	3 OR 4
	--TULARE COUNTY		3		1	3 OR 4
10	SOUTH CENTRAL COAST AIR BASIN					
	--SALINAS VALLEY (EL POMAR ESTRELLA PLANNING AREA)	2				
	--NON SALINAS VALLEY	3				
	--SANTA BARBARA (AQMA)	2	3	1	1	3 OR 4
	--SANTA BARBARA (NON AQMA)	1 OR 3	3	1	3 OR 4	3 OR 4
	--VENTURA COUNTY	1 OR 3	4	1	3 OR 4	3 OR 4
	--CHANNEL ISLANDS	3	3	1	3 OR 4	3 OR 4
	--SAN LUIS OBISPO COUNTY		3	1	3 OR 4	3 OR 4
11	SOUTH COAST AIR BASIN	1		1	1	1
	--LOS ANGELES COUNTY (PART)		1			
	--ORANGE COUNTY		4			
	--RIVERSIDE COUNTY (PART)		4			
	--SAN BERNADINO COUNTY	4				
12	SOUTHEAST DESERT AIR BASIN		3			
	--KERN COUNTY (SOUTH EAST DESERT PORTION)	3		3 OR 4	3 OR 4	3 OR 4
	--IMPERIAL COUNTY	3	4	1	3 OR 4	3 OR 4
	--LOS ANGELES COUNTY (PART)	1		1	3 OR 4	3 OR 4
	--RIVERSIDE COUNTY (PART)	1		1	3 OR 4	3 OR 4
	--SAN BERNARDINO COUNTY (PART)	1	1	3 OR 4	3 OR 4	
	--RIVERSIDE COUNTY (NON AQMA PART)	3		3 OR 4	3 OR 4	3 OR 4
	--SAN BERNARDINO COUNTY (NON AQMA PART)	3		3 OR 4	3 OR 4	3 OR 4
13	TAHOE AIR BASIN	4	4	1	1	3 OR 4

ATTAINMENT STATUS OF AIR BASINS, 1978

	DESIGNATED AIR BASIN	PARTIC-ULATES	SULFUR DIOXIDE	OXIDANTS	CARBON MONOXIDE	NITROGEN DIOXIDE
14	MOUNTAIN COUNTY AIR BASIN		3			
	--PLACER COUNTY (AQMA)	2		1	3 OR 4	3 OR 4
	--PLACER COUNTY (NON AQMA AND LAKE TAHOE)	4		3 OR 4	3 OR 4	3 OR 4
	--AMADOR COUNTY	4		3 OR 4	3 OR 4	3 OR 4
	--CALAVERAS COUNTY	3		3 OR 4	3 OR 4	3 OR 4
	--EL DORADO COUNTY (EXCLUDING TAHOE AIR BASIN)	4		3 OR 4	3 OR 4	3 OR 4
	--MARIPOSA COUNTY	3		1		
	--NEVADA COUNTY	3		3 OR 4	3 OR 4	3 OR 4
	--PLAMAS COUNTY	4		3 OR 4	3 OR 4	3 OR 4
	--SIERRA COUNTY	4		3 OR 4	3 OR4	3 OR 4
	--TUOLUMNE COUNTY	2		3 OR 4	3 OR 4	3 OR4
	--LAKE COUNTY AIR BASIN	4	3	3 OR 4	3 OR 4	3 OR 4
	HAWAII					
	HAWAII			3 OR 4	3 OR 4	3 OR 4
	--MAUI ISLAND	3	3			
	--HAWAII ISLAND	3	3			
	--REST OF THE STATE	4	4			
	NEVADA					
	LAS VEGAS VALLEY	1		1	1	
	CARSON DESERT	1				
	WINNEMUCCA SEGMENT	1				
	LOWER REESE VALLEY	2				
	GABBS VALLEY	1				
	FORNLEY AREA	1				
	TRUCKEE MEADOW	1		1	1	
	MASON VALLEY	1				
	SAN EMIDO DESERT	3				
	COLORADO RIVER VALLEY	3				
	STEPTOE VALLEY	3	1			
	CLOVERS AREA	2				
	LAKE TAHOE BASIN			1	1	
	EAGLE VALLEY			1		
	REST OF THE STATE	4	4	3 OR 4	3 OR 4	3 OR 4

SOURCE - FEDERAL REGISTER, VOL 43, NO 43, MAR 3, 1978

NOTES - 1 - DOES NOT MEET PRIMARY STANDARD 2 - DOES NOT MEET SECONDARY STANDARD
3 - CANNOT BE CLASSIFIED 4 - BETTER THAN NATIONAL STANDARD

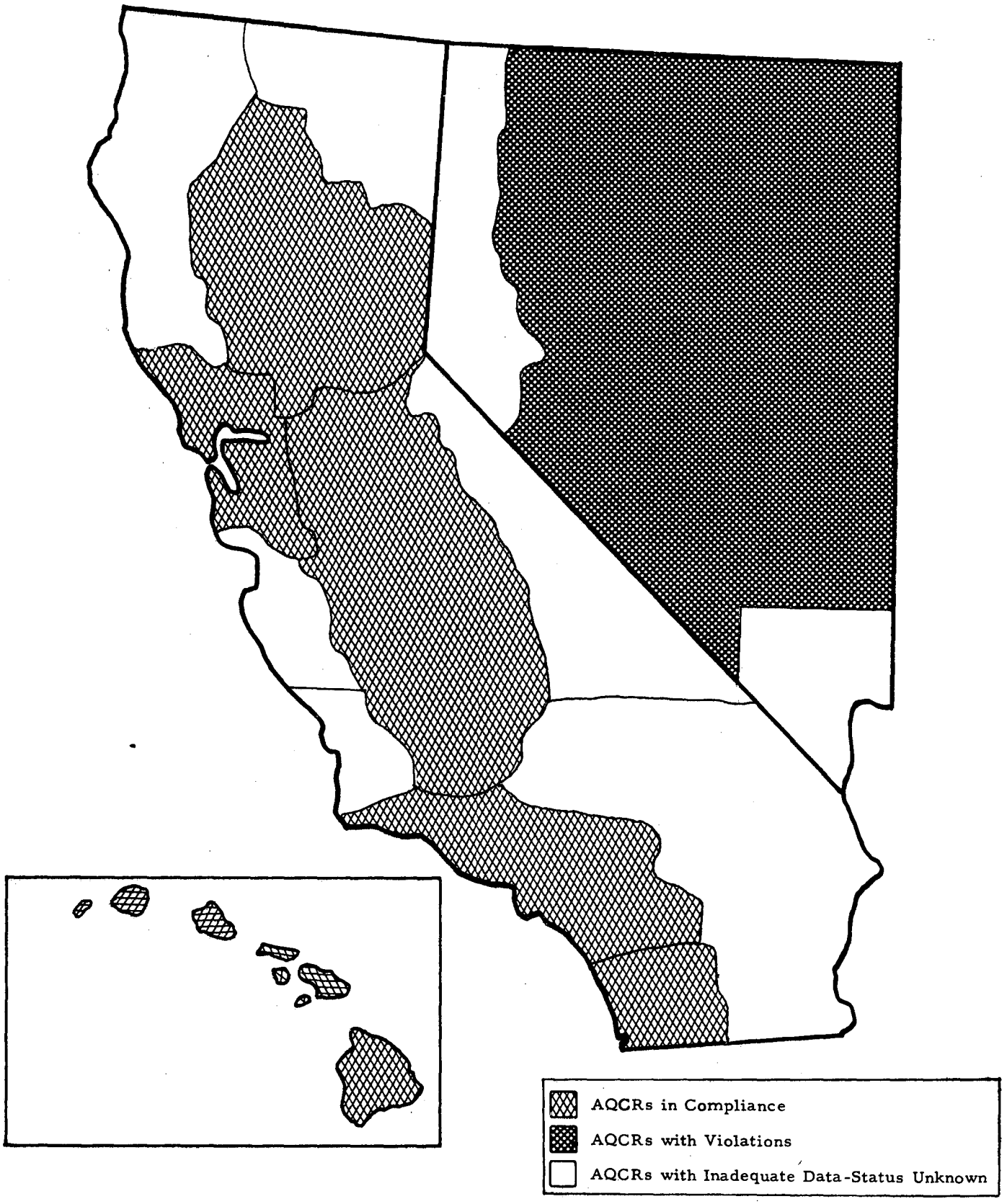


FIGURE II-47 ATTAINMENT STATUS FOR TOTAL SUSPENDED PARTICULATES, 1974

SOURCE: U. S. DEPARTMENT OF ENERGY, ENERGY AND ENVIRONMENT FACT BOOK, EPA 600-9-77-041, 1977

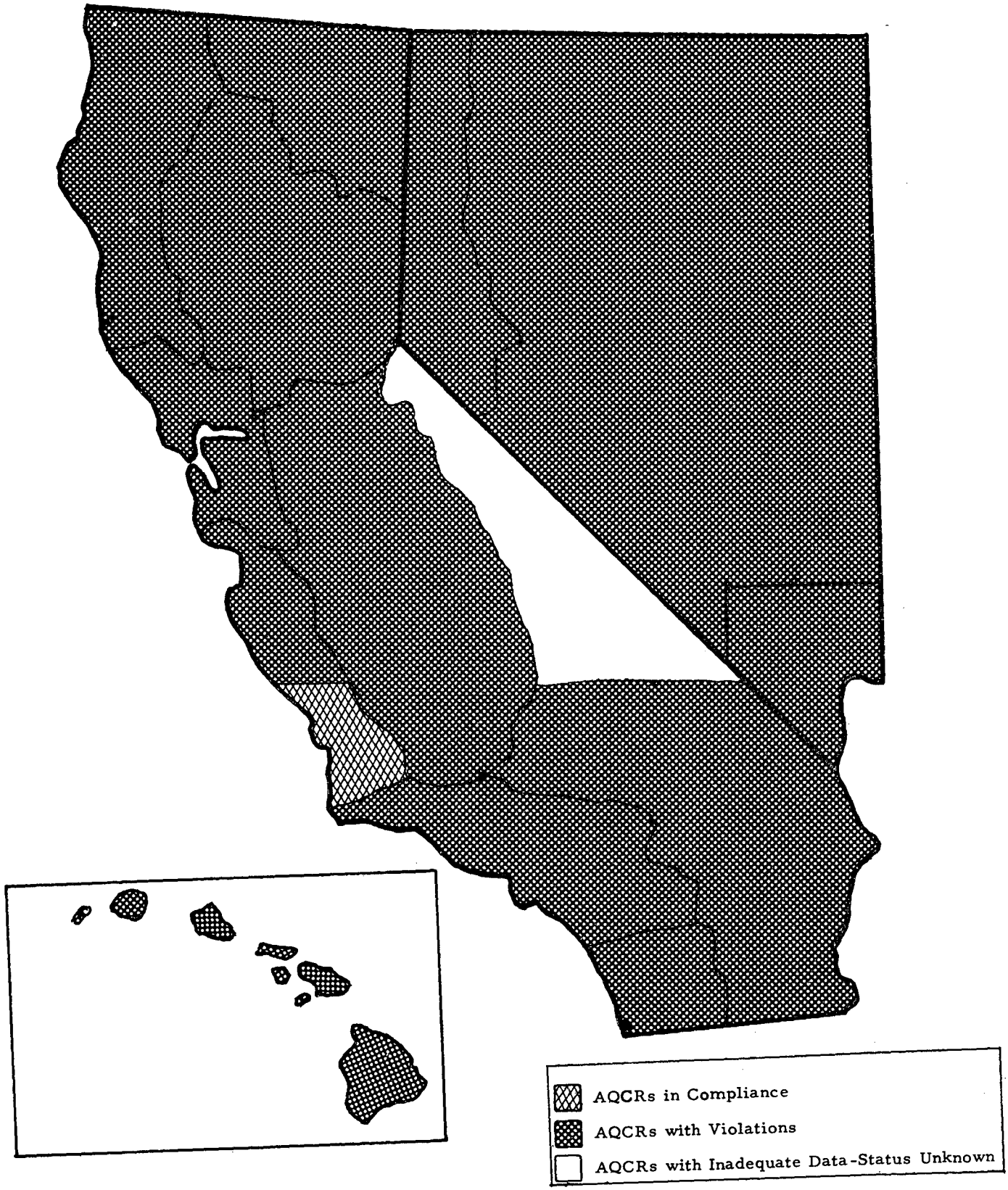


FIGURE II-48 ATTAINMENT STATUS FOR SULFUR DIOXIDE, 1974

SOURCE: U. S. DEPARTMENT OF ENERGY, ENERGY AND ENVIRONMENT FACT BOOK, EPA 600-9-77-041, 1977

II-C-2 NATURAL CLIMATIC FACTORS

THIS SECTION CONTAINS A DESCRIPTION OF THE CLIMATES OF THE REGION. TABULAR DATA ON PRECIPITATION AND TEMPERATURE ARE GIVEN BY STATE CLIMATIC DIVISION. THE RAINFALL AND SNOWFALL DISTRIBUTIONS ARE SHOWN AS MAPS. HEATING AND COOLING DEGREE-DAYS ARE ALSO TABULATED AND MAPPED. OTHER MAPS SHOW DATA ON EVAPOTRANSPIRATION, WIND DIRECTION AND VELOCITY, AIR PRESSURE, AND ADVERSE CLIMATIC FACTORS SUCH AS THUNDERSTORMS, HAIL, FOG, DROUGHT AND FLOODS. FINALLY, THERE ARE A SET OF MAPS OF MIXING HEIGHTS AND WIND SPEEDS FOR USE IN AIR POLLUTION ANALYSIS.

THE DATA IN THIS SECTION COME FROM A VARIETY OF SOURCES. DATA ON TEMPERATURE AND PRECIPITATION ARE FROM THE NOAA PUBLICATION, CLIMATOGRAPHY OF THE U.S. AND WERE PROVIDED BY OAK RIDGE NATIONAL LABORATORY. ADDITIONAL MAPS ARE FROM THE WATER ATLAS OF THE U.S., THE WEATHER ATLAS OF THE U.S. AND THE NATIONAL ATLAS. THE MAPS OF MIXING HEIGHTS AND WIND SPEEDS ARE FROM AN ENVIRONMENTAL PROTECTION AGENCY REPORT.

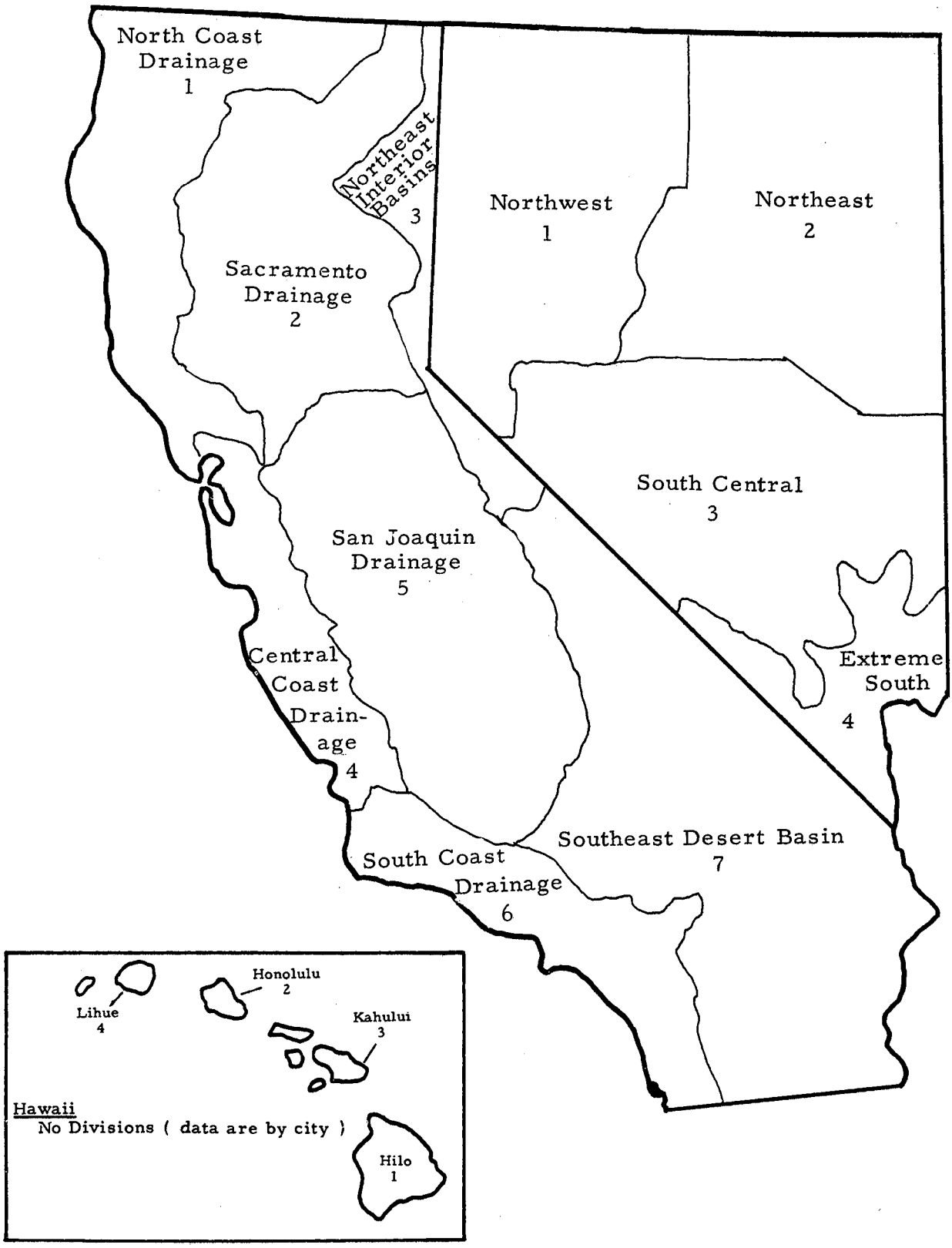


FIGURE II-49 STATE CLIMATIC DIVISIONS

SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION--ENVIRONMENTAL DATA SERVICE, CLIMATOGRAPHY OF THE UNITED STATES #81, 1973

TABLE II-15
AVERAGE, MAXIMUM AND MINIMUM MONTHLY PRECIPITATION
BY STATE CLIMATIC DIVISION
[IN INCHES]

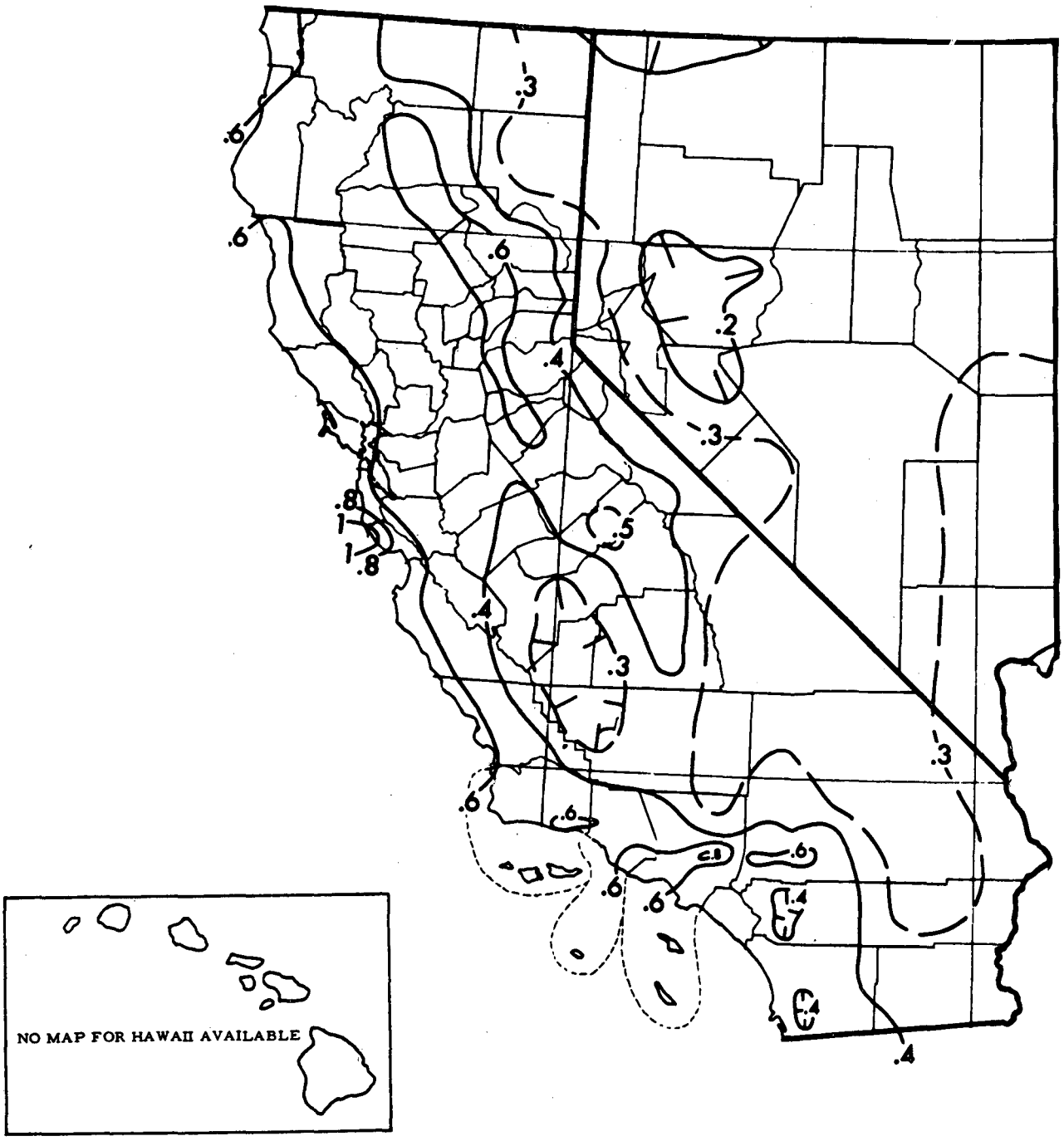
DIV	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
CALIFORNIA													
1 AVERAGE	8.5	5.8	4.7	2.8	1.5	0.7	0.1	0.4	0.5	2.9	5.6	7.9	41.4
MAXIMUM	17.8	17.1	7.8	8.0	4.2	2.1	0.9	2.0	2.6	10.3	12.6	18.9	57.4
MINIMUM	1.7	0.7	1.5	0.4	0.1	0.0	0.0	0.0	0.0	0.3	0.2	2.2	25.3
2 AVERAGE	6.9	5.4	4.5	3.1	1.6	0.7	0.1	0.2	0.4	2.3	4.8	6.6	36.5
MAXIMUM	15.9	13.3	8.9	9.2	4.7	2.0	0.5	1.7	2.8	12.6	11.2	20.1	51.6
MINIMUM	1.3	0.4	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	21.7
3 AVERAGE	3.8	2.8	2.2	1.4	1.1	0.8	0.4	0.4	0.4	1.4	2.5	3.7	20.9
MAXIMUM	11.6	8.7	6.0	4.5	2.5	2.0	1.5	2.1	1.6	6.3	6.2	14.3	29.9
MINIMUM	0.7	0.2	0.6	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.5	10.2
4 AVERAGE	4.3	3.3	2.8	1.8	0.5	0.1	0.0	0.0	0.2	1.0	2.4	3.9	20.3
MAXIMUM	10.4	8.6	7.4	5.7	2.9	0.7	0.2	0.2	2.5	5.1	6.2	13.4	35.1
MINIMUM	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	11.4
5 AVERAGE	3.5	3.0	2.8	2.1	0.7	0.2	0.0	0.1	0.2	0.8	2.4	3.4	19.3
MAXIMUM	11.6	9.1	7.0	6.3	2.8	0.6	0.2	0.5	1.9	2.7	6.3	11.5	29.4
MINIMUM	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	9.9
6 AVERAGE	3.1	2.9	2.5	1.6	0.3	0.1	0.1	0.1	0.2	0.5	2.0	2.5	15.9
MAXIMUM	12.8	9.4	8.9	5.8	1.5	0.3	0.4	1.0	2.3	2.4	9.6	7.4	34.2
MINIMUM	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9
7 AVERAGE	1.3	1.1	0.9	0.6	0.2	0.1	0.2	0.4	0.3	0.4	0.9	1.1	7.4
MAXIMUM	5.1	4.2	3.5	2.5	0.7	0.3	1.1	1.4	1.8	1.3	4.3	3.6	16.2
MINIMUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0

AVERAGE, MAXIMUM AND MINIMUM MONTHLY PRECIPITATION
BY STATE CLIMATIC DIVISION
[IN INCHES]

DIV	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
HAWAII													
1 AVERAGE	9.8	12.7	12.8	13.4	9.2	6.0	9.0	9.8	6.7	10.1	14.4	15.5	129.4
2 AVERAGE	4.5	2.7	3.3	1.6	0.9	0.4	0.5	0.7	0.7	1.5	3.4	3.4	23.7
3 AVERAGE	3.5	2.8	2.7	1.6	0.6	0.2	0.3	0.4	0.4	0.9	2.0	3.1	18.6
4 AVERAGE	6.6	3.6	4.9	3.4	2.3	1.4	2.1	1.9	2.0	4.4	6.0	5.6	44.2
NEVADA													
1 AVERAGE	1.2	1.0	0.8	0.6	0.8	0.8	0.3	0.3	0.3	0.6	0.9	1.1	8.7
MAXIMUM	3.8	3.3	1.9	1.3	1.9	1.9	1.2	1.6	0.8	1.5	2.1	3.9	13.4
MINIMUM	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.9
2 AVERAGE	1.0	0.9	1.0	1.1	1.3	1.3	0.5	0.6	0.5	0.8	1.0	1.1	11.1
MAXIMUM	2.2	2.0	2.2	2.5	3.4	3.6	1.3	2.1	1.8	2.4	2.2	2.8	16.4
MINIMUM	0.1	0.2	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	7.0
3 AVERAGE	0.6	0.7	0.6	0.7	0.5	0.4	0.7	0.6	0.4	0.5	0.6	0.6	7.0
MAXIMUM	2.7	2.4	1.7	2.3	2.1	1.8	1.6	2.1	1.7	2.0	2.2	2.6	12.8
MINIMUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1
4 AVERAGE	0.5	0.5	0.4	0.4	0.2	0.1	0.5	0.5	0.3	0.3	0.5	0.5	4.7
MAXIMUM	2.5	2.4	1.9	2.9	0.8	0.6	1.3	1.5	1.4	1.3	2.3	1.7	11.4
MINIMUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4

SOURCE - U.S. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, CLIMATOGRAPHY OF THE UNITED STATES, 1973 AND LOCAL CLIMATOLOGIC DATA, 1976

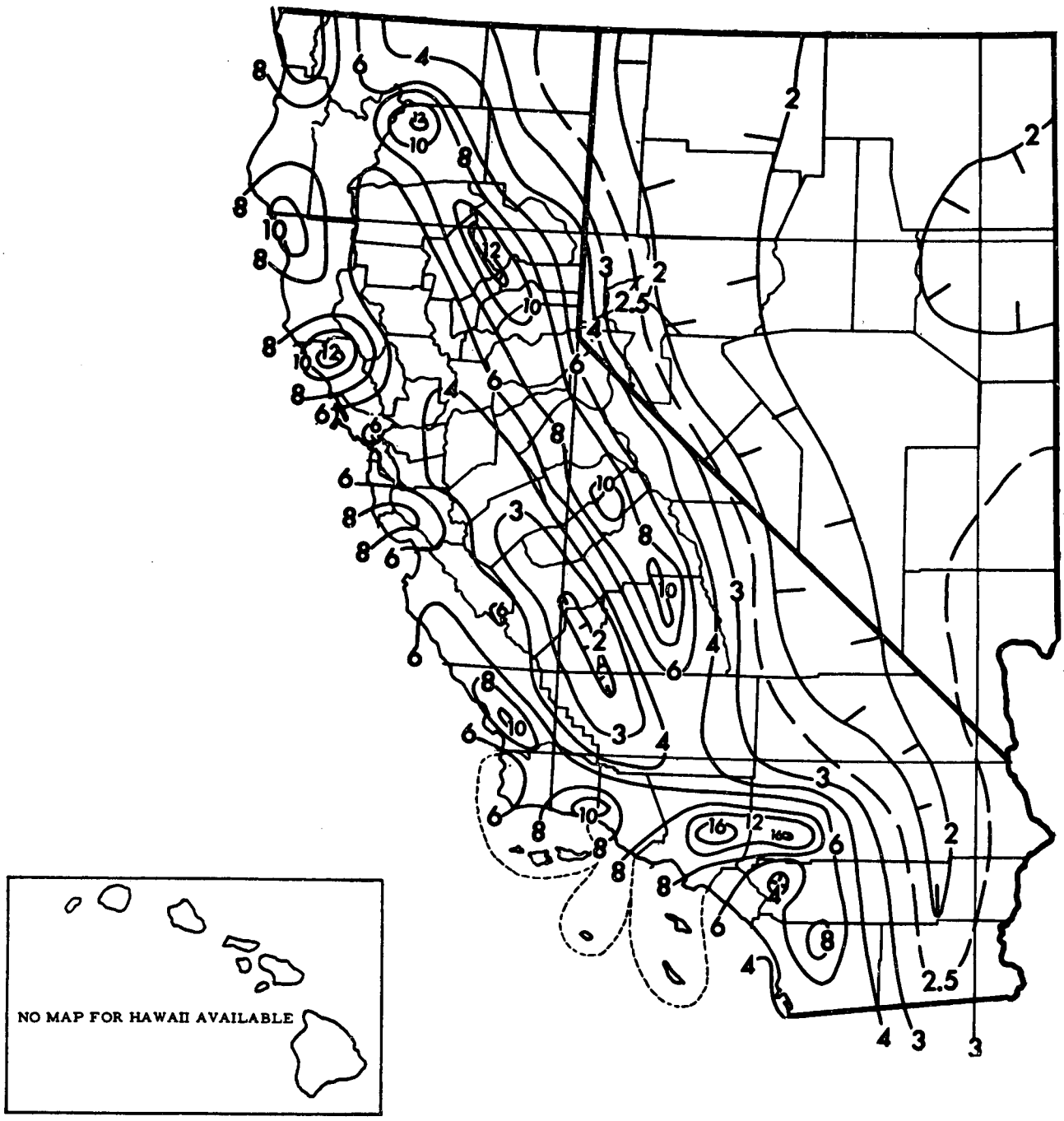
NOTES - THE HAWAII DATA CORRESPONDS TO THE FOLLOWING STATIONS
1 - HILO 2 - HONOLULU 3 - KAHULUI 4 - LIHUE



The one hour-one year rainfall maximum is defined as the greatest amount of rain or rain equivalent that will fall in a given area in one hour during a period of one year.

FIGURE II-50 MAXIMUM ONE HOUR - ONE YEAR RAINFALL

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, RAINFALL FREQUENCY ATLAS OF THE UNITED STATES TECHNICAL PAPER 40, MAY 1961



The 24 hour-50 year rainfall maximum is defined as the greatest amount of rain or rain equivalent that will fall in a given area in a 24 hour period over a 50 year time span.

FIGURE II-51 MAXIMUM 24 HOUR - 50 YEAR RAINFALL

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, RAINFALL FREQUENCY ATLAS OF THE UNITED STATES TECHNICAL PAPER 40, MAY 1961

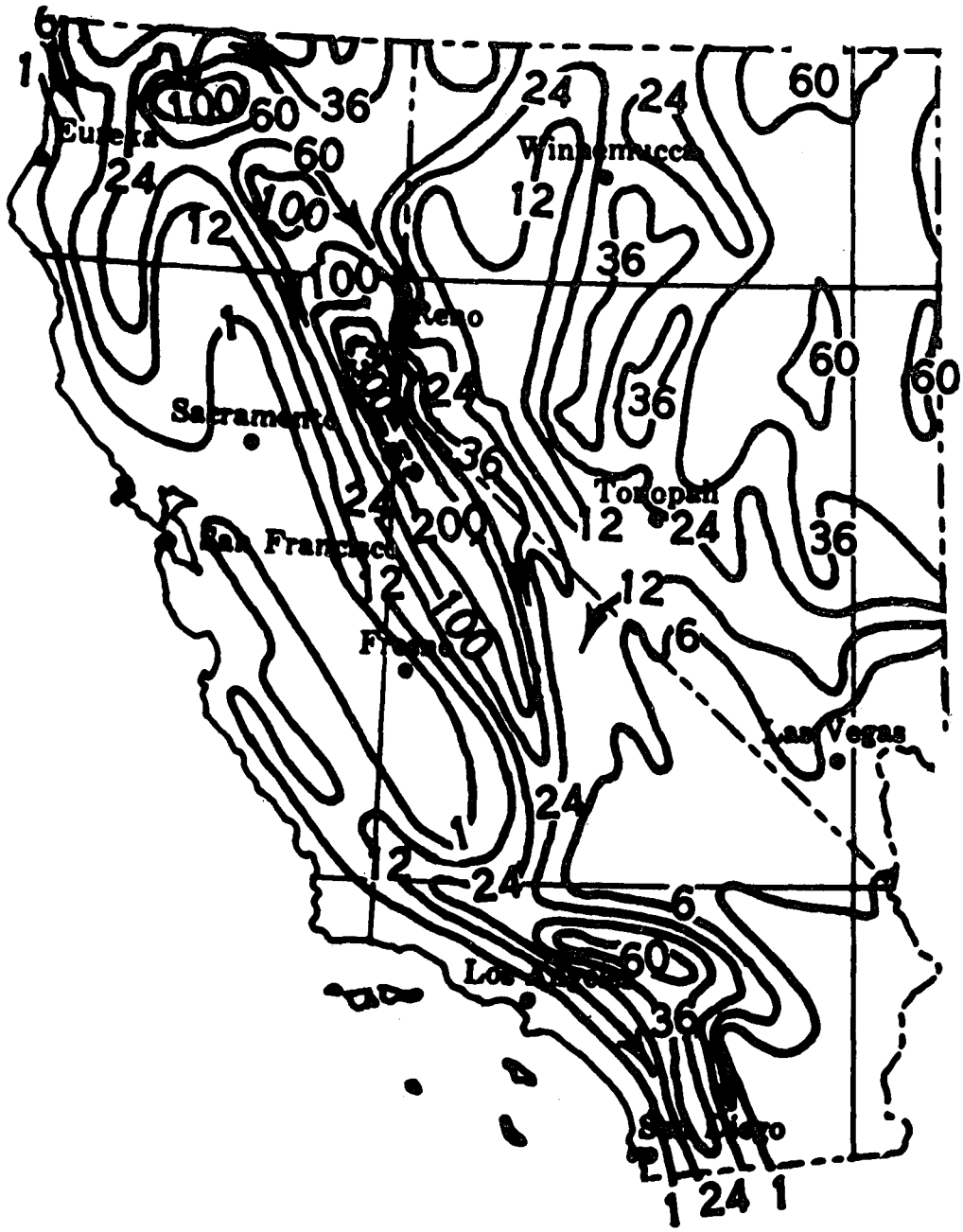


FIGURE II-52 MEAN ANNUAL TOTAL SNOWFALL

SOURCE: U. S. ENVIRONMENTAL DATA SERVICE, WEATHER ATLAS OF THE UNITED STATES, JUNE 1968 (REPRINTED 1975)

TABLE II-16
AVERAGE, MAXIMUM AND MINIMUM MONTHLY TEMPERATURE
BY STATE CLIMATIC DIVISION
[IN DEGREES FARENHEIT]

DIV	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
CALIFORNIA													
1 AVERAGE	42.4	46.1	48.2	52.1	57.2	62.3	66.7	66.1	63.6	56.8	49.2	43.7	54.5
MAXIMUM	46.9	52.2	52.6	55.9	61.0	65.7	68.9	69.5	67.0	59.6	52.5	49.0	56.7
MINIMUM	33.4	40.8	45.1	44.5	53.5	58.7	63.9	63.2	60.6	53.9	46.3	38.0	52.6
2 AVERAGE	39.9	43.5	46.4	52.3	59.1	66.2	72.8	71.0	67.1	58.1	48.0	41.5	55.5
MAXIMUM	45.2	50.6	50.7	57.7	64.8	72.1	75.9	76.8	70.2	62.9	52.3	48.0	57.4
MINIMUM	31.2	37.4	42.2	42.5	53.1	61.4	69.1	67.3	62.5	53.9	44.2	36.1	53.7
3 AVERAGE	28.3	31.8	35.7	42.7	50.1	57.2	65.2	63.6	57.5	48.1	37.7	30.6	45.7
MAXIMUM	36.0	41.1	40.2	48.1	55.8	63.1	68.6	67.6	62.2	54.5	43.3	37.6	47.6
MINIMUM	13.2	24.7	30.2	32.8	44.7	52.0	61.5	59.5	51.3	42.1	32.1	23.8	43.6
4 AVERAGE	47.9	50.6	52.3	55.3	58.9	62.8	65.6	65.6	65.3	60.8	54.3	49.2	57.4
MAXIMUM	52.2	56.3	56.2	59.4	61.9	66.4	68.4	69.0	68.9	64.1	58.7	53.8	59.5
MINIMUM	40.3	46.0	49.0	49.1	56.1	59.7	62.9	63.0	62.7	58.0	50.5	44.3	56.1
5 AVERAGE	43.4	47.2	50.5	56.3	62.9	69.8	76.8	75.0	70.7	61.8	51.5	44.5	59.2
MAXIMUM	48.0	54.1	55.0	62.0	67.7	76.4	80.2	80.2	73.3	66.4	56.5	50.1	61.2
MINIMUM	35.4	42.2	46.2	46.8	57.5	65.6	73.1	71.2	66.0	57.0	46.9	40.6	57.3
6 AVERAGE	51.1	52.5	53.9	57.4	61.3	65.5	71.4	71.8	69.7	63.9	57.4	52.5	60.7
MAXIMUM	55.7	58.2	59.4	62.2	65.0	69.7	75.1	76.2	73.2	68.6	62.2	57.5	62.9
MINIMUM	41.8	47.3	49.4	50.2	58.7	61.9	67.3	69.4	65.9	60.1	53.4	48.2	59.1
7 AVERAGE	46.1	49.9	54.1	61.4	69.0	76.9	84.5	83.0	77.2	66.4	54.4	47.2	64.2
MAXIMUM	52.4	57.0	58.2	67.9	74.5	82.1	88.1	86.6	81.0	72.8	60.9	54.7	66.9
MINIMUM	35.8	44.6	48.9	51.2	63.9	71.2	81.2	78.0	70.7	61.1	49.8	42.6	62.3

AVERAGE, MAXIMUM AND MINIMUM MONTHLY TEMPERATURE
BY STATE CLIMATIC DIVISION
[IN DEGREES FARENHEIT]

DIV	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
HAWAII													
1 AVERAGE	71.1	70.9	71.2	72.0	73.2	74.5	75.2	75.8	75.6	75.1	73.4	71.6	73.3
MAXIMUM	79.0	78.8	78.7	79.2	80.6	82.2	82.5	83.2	83.4	82.8	80.6	79.0	80.8
MINIMUM	63.2	63.0	63.6	64.8	65.7	66.8	67.8	68.4	67.8	67.3	66.1	64.2	65.7
2 AVERAGE	72.4	72.6	73.3	74.7	76.3	78.1	79.1	79.8	79.6	78.4	76.0	73.7	76.2
MAXIMUM	79.2	79.3	79.8	81.0	82.6	84.4	85.2	86.0	86.1	84.9	82.4	79.9	82.6
MINIMUM	65.6	65.8	66.7	68.4	69.9	71.7	72.9	73.6	73.0	71.9	69.6	67.5	69.7
3 AVERAGE	71.3	71.2	72.2	73.8	75.0	76.7	77.8	78.5	78.0	77.1	75.1	72.7	75.0
MAXIMUM	79.4	79.2	80.3	81.6	83.1	84.8	85.5	86.2	86.5	85.5	83.0	80.4	83.0
MINIMUM	63.2	63.2	64.0	65.9	66.8	68.5	70.1	70.8	69.5	68.7	67.1	64.9	66.9
4 AVERAGE	70.0	70.0	70.7	72.1	74.2	76.1	77.2	77.7	77.5	76.1	73.7	71.5	73.9
MAXIMUM	77.6	77.6	77.8	78.7	80.7	82.4	83.3	83.9	84.2	83.0	80.5	78.4	80.7
MINIMUM	62.3	62.3	63.5	65.5	67.6	69.8	71.7	71.5	70.7	69.1	66.9	64.6	67.1
NEVADA													
1 AVERAGE	30.4	35.8	39.7	47.1	55.2	62.6	71.5	69.1	61.5	51.0	39.5	32.5	49.7
MAXIMUM	39.8	43.0	44.1	51.9	61.3	68.9	74.7	74.5	65.4	56.0	44.7	38.4	51.5
MINIMUM	12.3	28.3	35.1	39.1	48.7	57.3	67.7	64.9	56.2	45.2	34.5	27.2	47.5
2 AVERAGE	25.0	29.5	34.1	42.6	51.1	58.5	68.1	65.8	57.2	46.9	35.1	27.3	45.1
MAXIMUM	35.8	37.7	39.6	49.2	56.8	64.9	71.6	69.4	60.7	51.9	42.6	34.9	47.2
MINIMUM	8.0	19.4	27.2	36.0	44.7	53.9	64.6	60.5	50.8	40.7	28.1	21.6	42.6
3 AVERAGE	31.1	35.9	40.3	48.6	57.3	65.4	73.6	71.5	63.9	52.9	40.6	32.8	51.2
MAXIMUM	39.7	43.4	45.4	54.2	62.5	71.3	77.7	76.0	67.0	58.5	48.0	39.7	53.3
MINIMUM	16.1	25.9	33.9	38.9	51.3	60.0	70.3	66.2	57.7	46.8	35.2	25.0	49.7
4 AVERAGE	43.0	47.6	52.7	61.2	69.8	78.1	85.4	83.5	76.5	65.0	51.8	44.2	63.2
MAXIMUM	47.9	54.6	57.7	66.8	74.4	83.6	88.4	87.4	79.7	69.9	58.2	50.4	64.9
MINIMUM	31.4	39.7	48.0	52.1	63.3	73.8	83.1	79.3	70.5	59.0	47.3	39.8	61.8

SOURCE - U.S. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, CLIMATOGRAPHY OF THE UNITED STATES, 1973 AND LOCAL CLIMATOLOGIC DATA, 1976

NOTES - THE HAWAII DATA CORRESPONDS TO THE FOLLOWING STATIONS
1 - HILO 2 - HONOLULU 3 - KAHULUI 4 - LIHUE

TABLE II-17
ANNUAL HEATING AND COOLING DEGREE-DAYS

STATION	HEATING DEGREE -DAYS	COOLING DEGREE -DAYS
CALIFORNIA		
BAKERSFIELD	2,185	2,179
BISHOP	4,313	1,037
BLUE CANYON	5,704	302
EUREKA	4,675	0
FRESNO	2,650	1,671
LONG BEACH	1,606	985
LOS ANGELES -AIRPORT	1,819	615
LOS ANGELES -CIVIC CENTER	1,245	1,185
MT. SHASTA	5,890	286
OAKLAND	2,803	198
RED BLUFF	2,688	1,904
SACRAMENTO	2,843	1,159
SANDBERG	4,427	800
SAN DIEGO	1,507	722
SAN FRANCISCO -AIRPORT	3,042	108
SAN FRANCISCO -CITY	3,080	39
SANTA MARIA	3,053	84
STOCKTON	2,806	1,259
HAWAII		
HILO	0	3,066
HONOLULU	0	4,221
KAHULUI	0	3,732
LIHUE	0	3,719
NEVADA		
ELKO	7,483	342
ELY	7,814	207
LAS VEGAS	2,601	2,946
RENO	6,022	329
WINNEMUCCA	6,629	497

SOURCE - U.S. NATIONAL OCEANIC AND ATMOSPERIC ADMINISTRATION, LOCAL CLIMATOLOGICAL DATA, 1976

NOTES - BASED ON STANDARD 30-YEAR PERIOD 1941 TO 1970
HEATING DEGREE-DAYS BASED ON 65 F
COOLING DEGREE-DAYS BASED ON 75 F

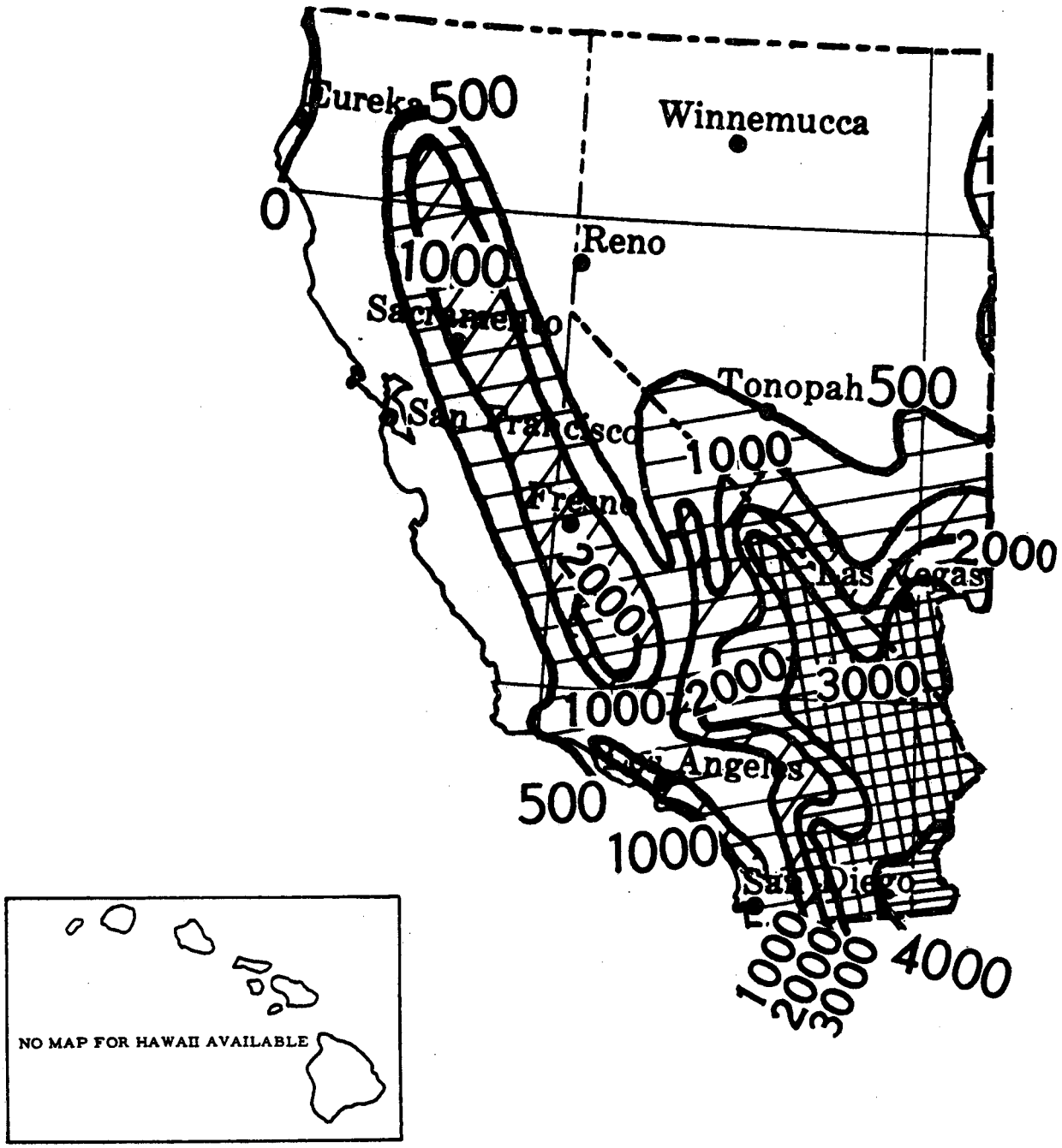


FIGURE II-53 MEAN ANNUAL COOLING DEGREE-DAYS

SOURCE: U. S. ENVIRONMENTAL DATA SERVICE, WEATHER ATLAS OF THE UNITED STATES, JUNE 1968 (REPRINTED 1975)

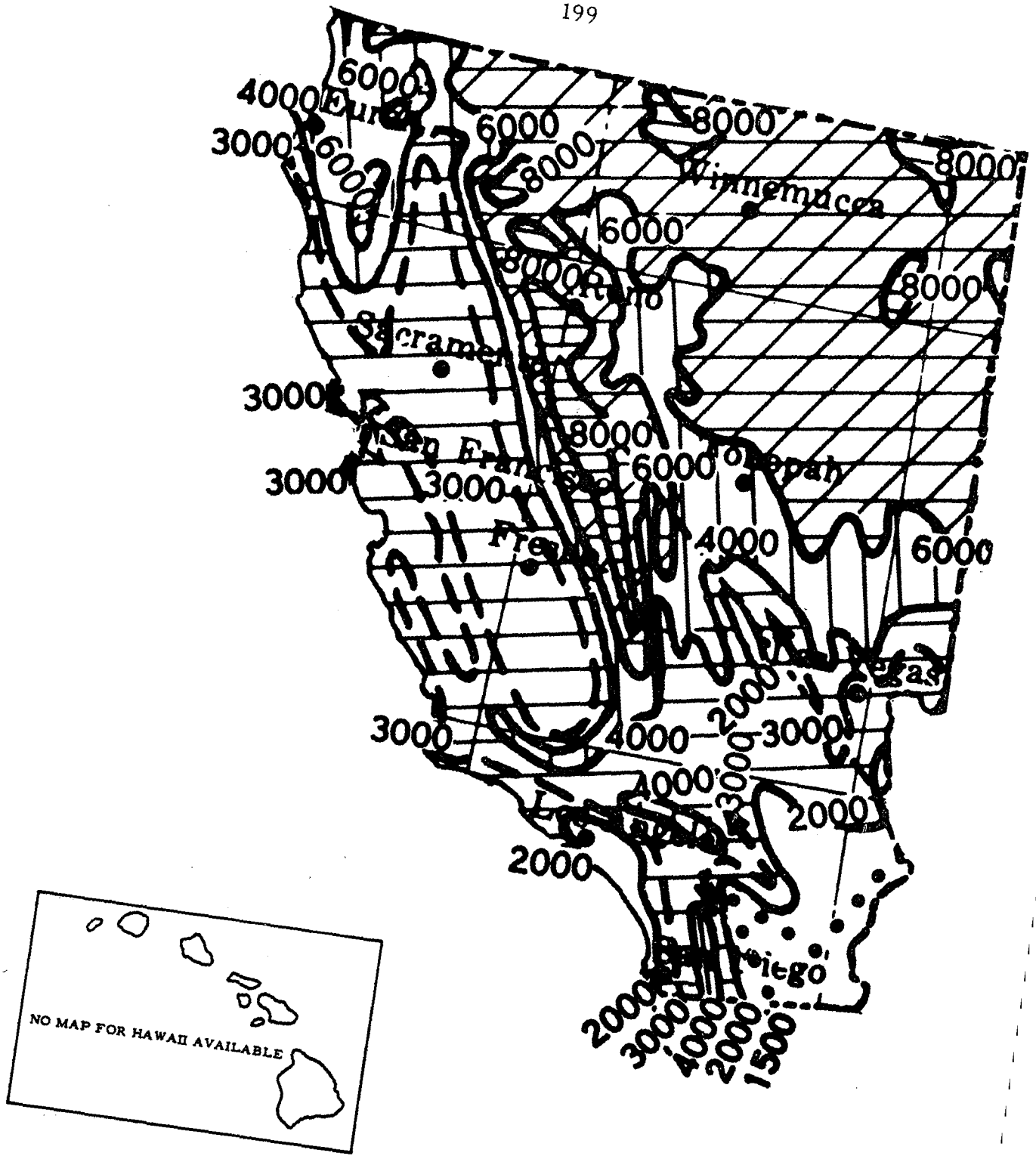


FIGURE II-54 MEAN ANNUAL HEATING DEGREE-DAYS

SOURCE: U. S. ENVIRONMENTAL DATA SERVICE, WEATHER ATLAS OF THE UNITED STATES, JUNE 1968 (REPRINTED 1975)

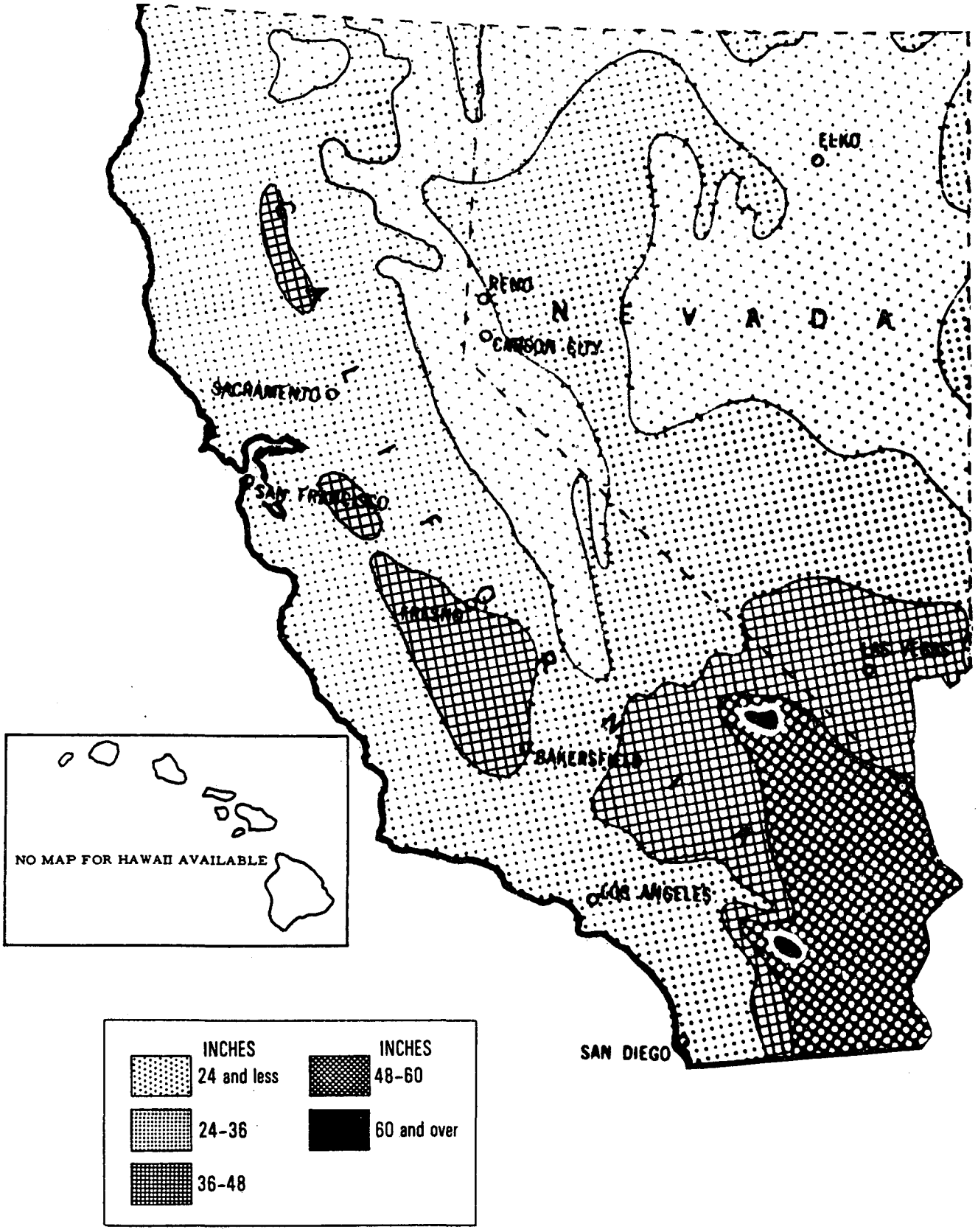


FIGURE II-55 ANNUAL AVERAGE POTENTIAL EVAPOTRANSPIRATION

SOURCE: GERAGHTY, J. J. ET AL., WATER ATLAS OF THE UNITED STATES, 1973

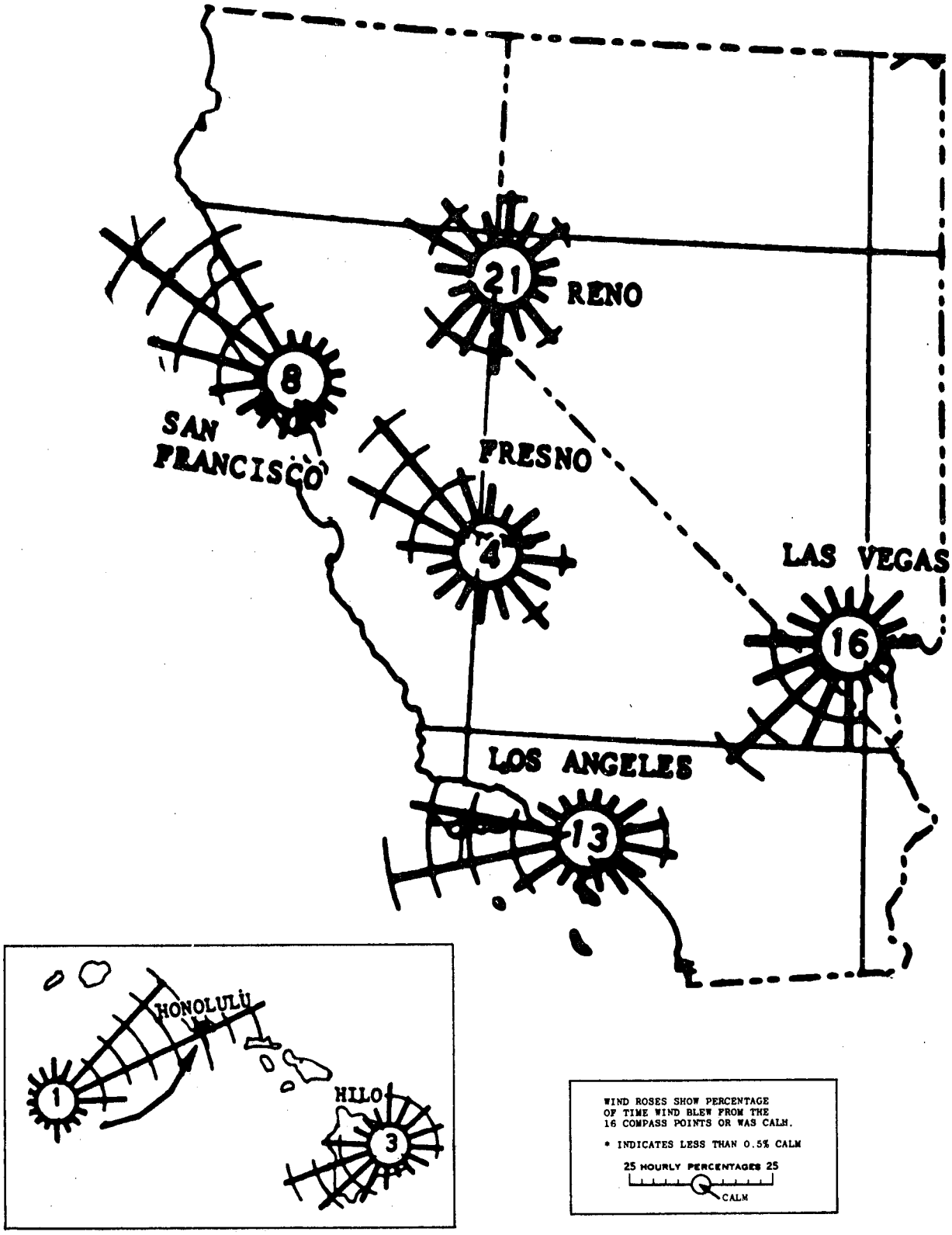


FIGURE II-56 ANNUAL SURFACE WIND ROSES

SOURCE: U. S. DEPARTMENT OF COMMERCE--ENVIRONMENTAL DATA SERVICE, CLIMATES OF THE UNITED STATES, 1973

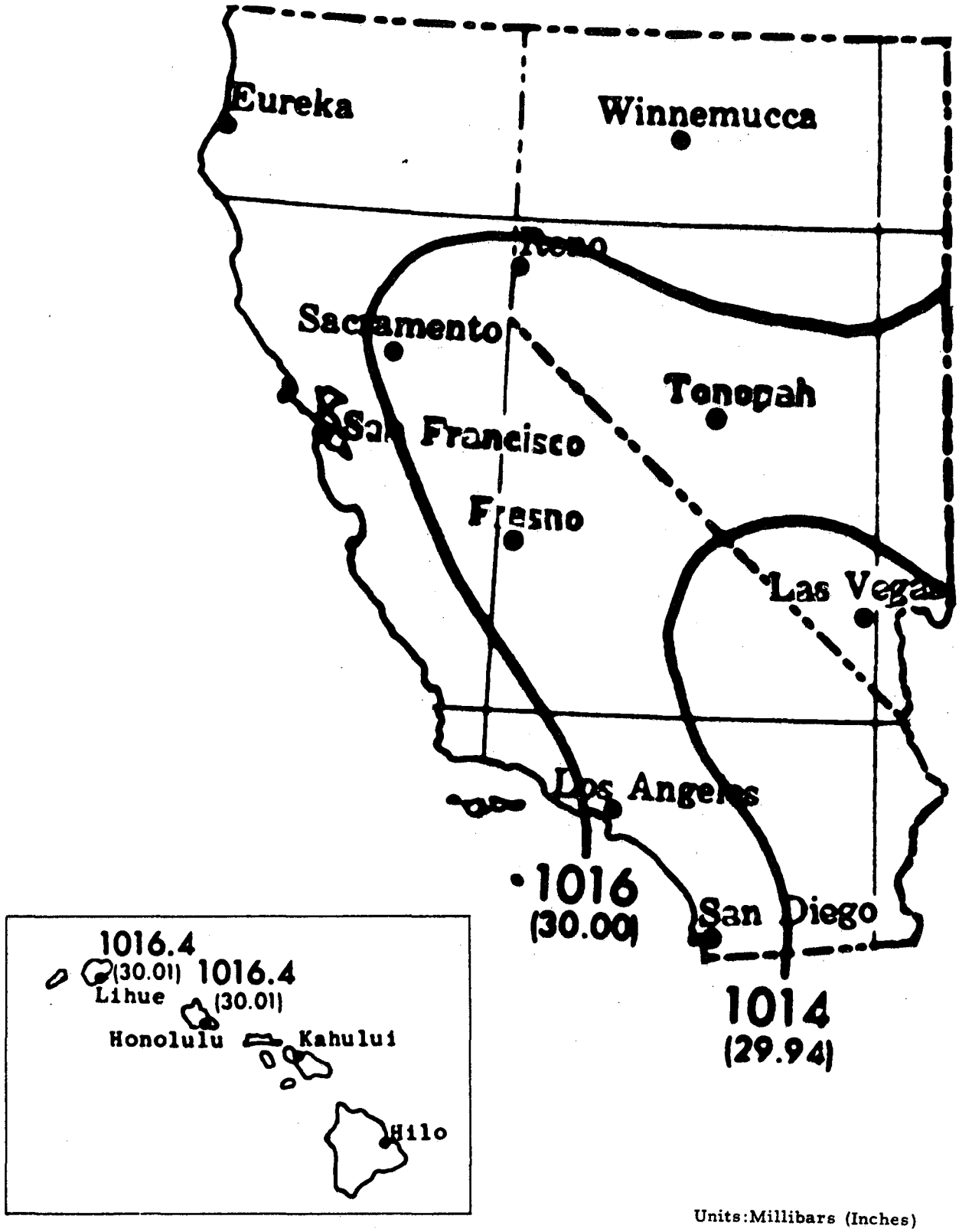


FIGURE II-57 NORMAL ANNUAL SEA LEVEL AIR PRESSURE

SOURCE: U. S. DEPARTMENT OF COMMERCE--ENVIRONMENTAL DATA SERVICE, CLIMATES OF THE UNITED STATES, 1973

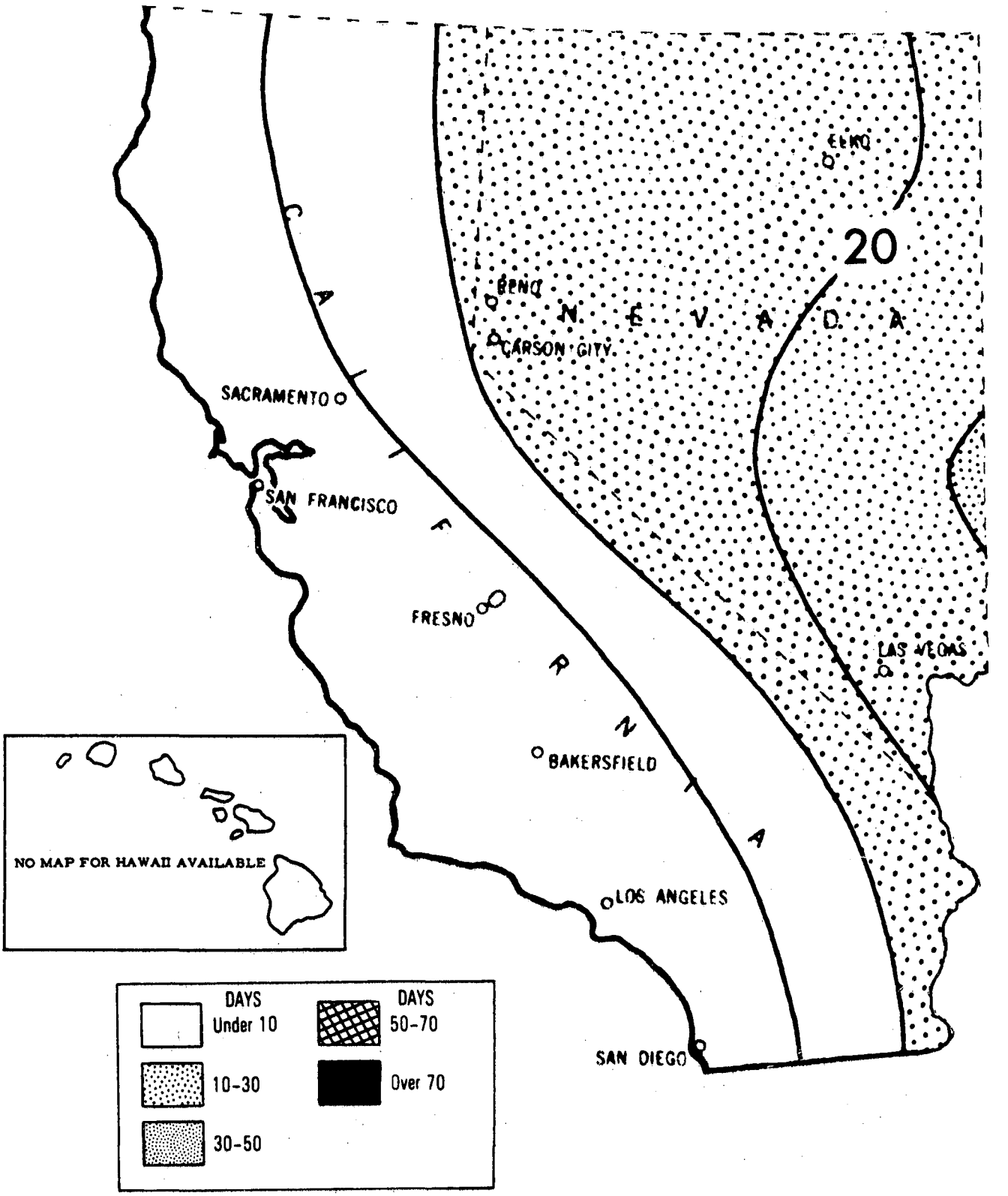


FIGURE II-58 MEAN ANNUAL NUMBER OF DAYS WITH THUNDERSTORMS

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

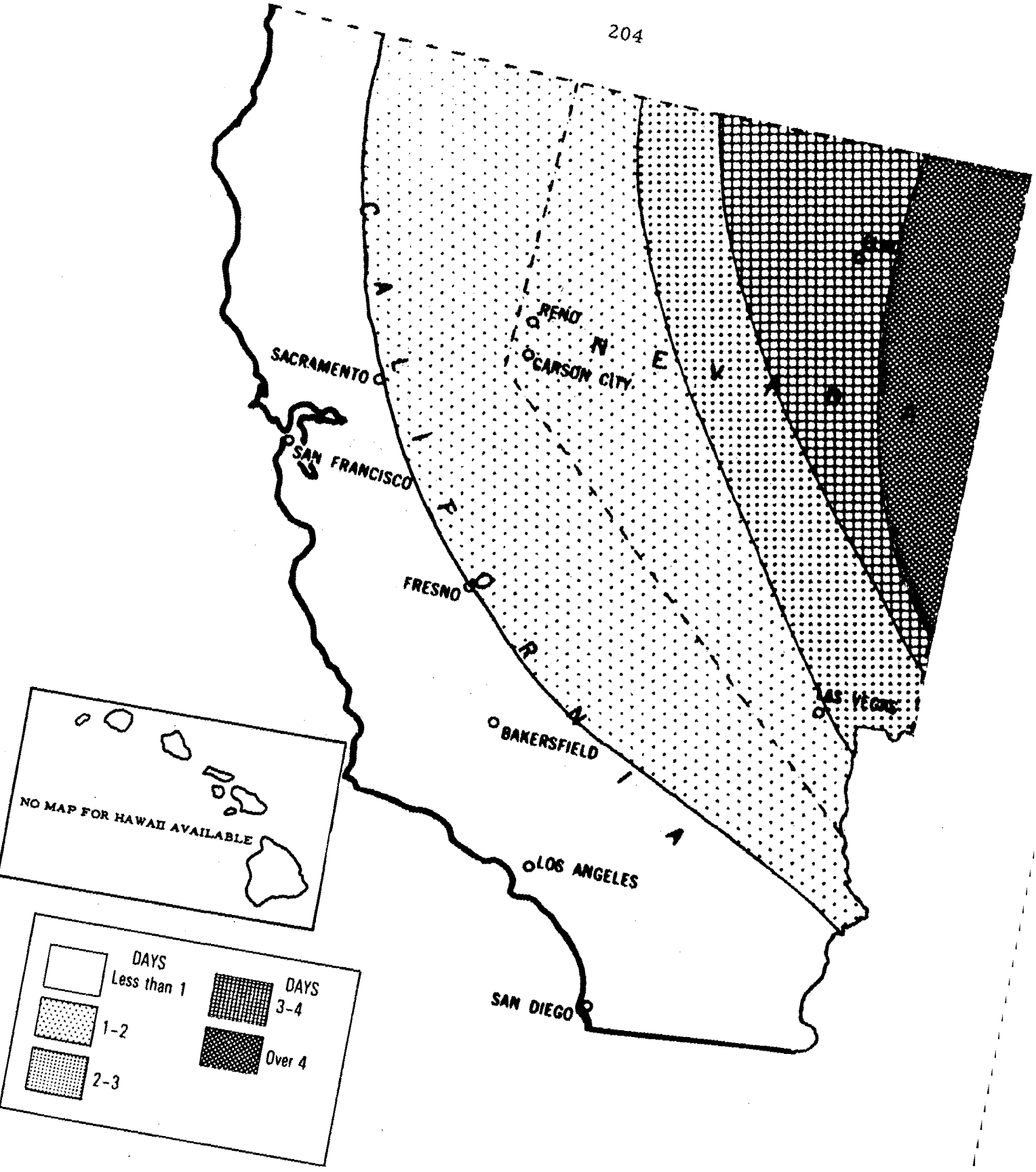


FIGURE II-59 MEAN ANNUAL NUMBER OF DAYS WITH HAIL

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

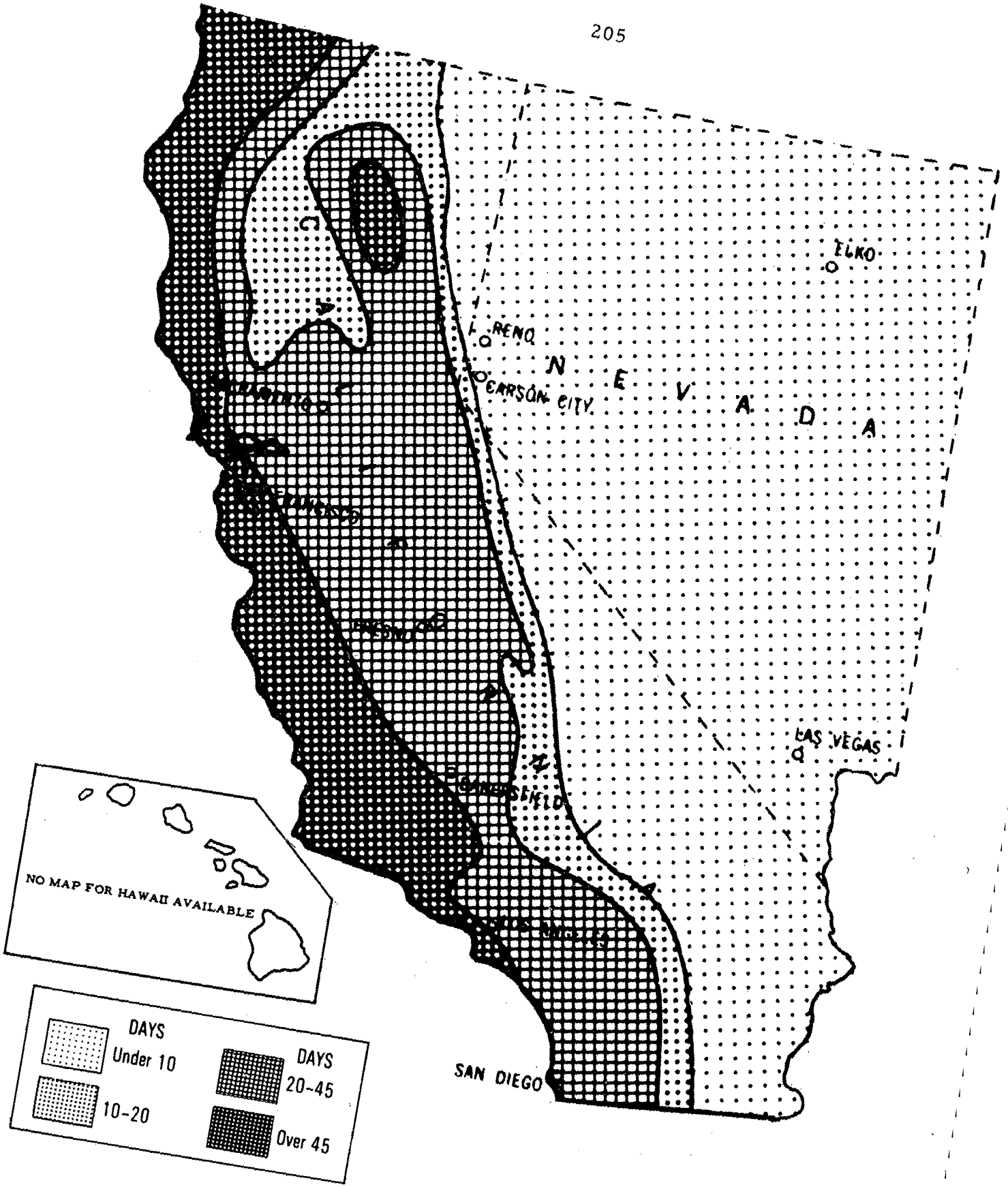
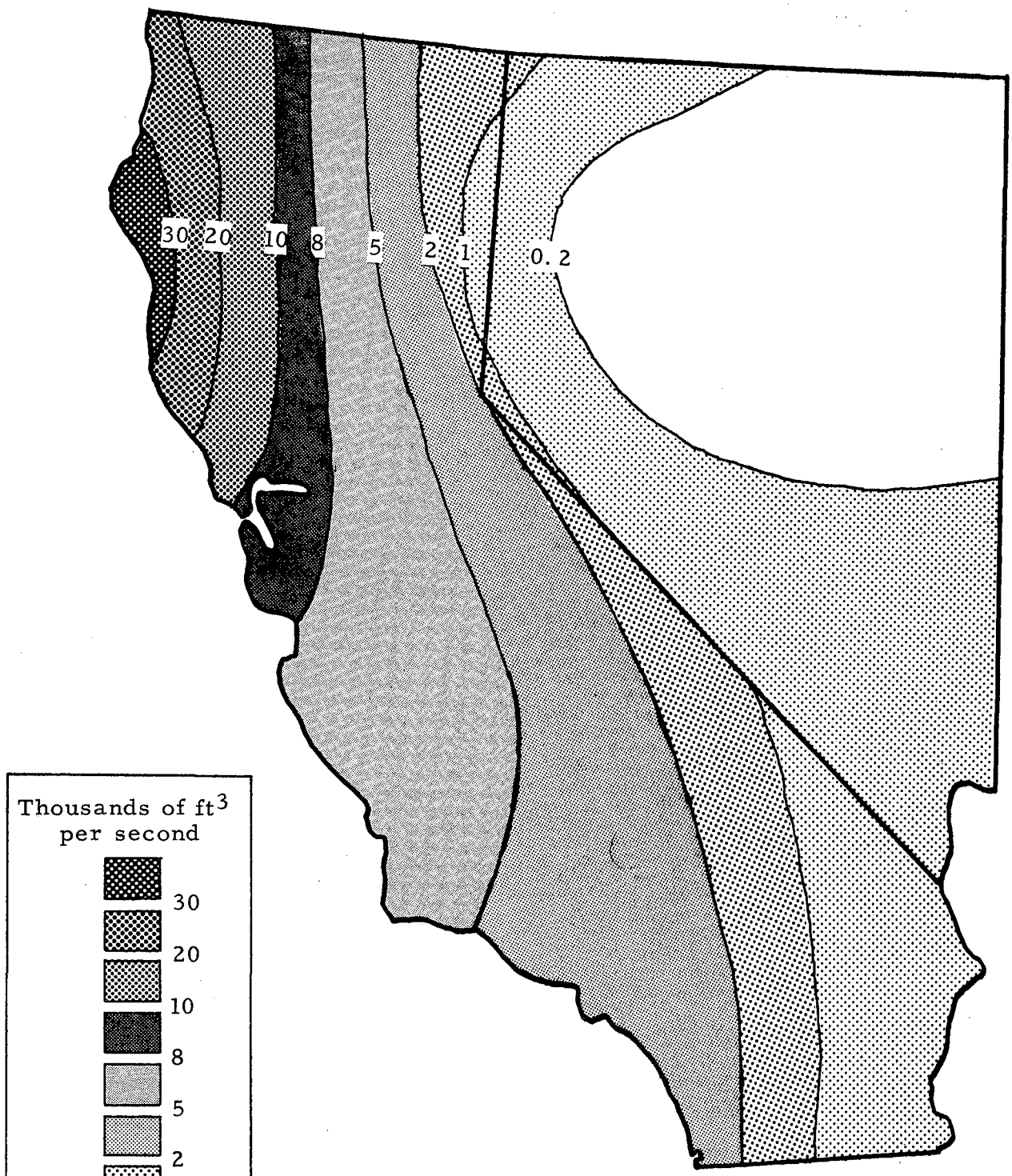


FIGURE II-60

MEAN ANNUAL NUMBER OF DAYS WITH FOG

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

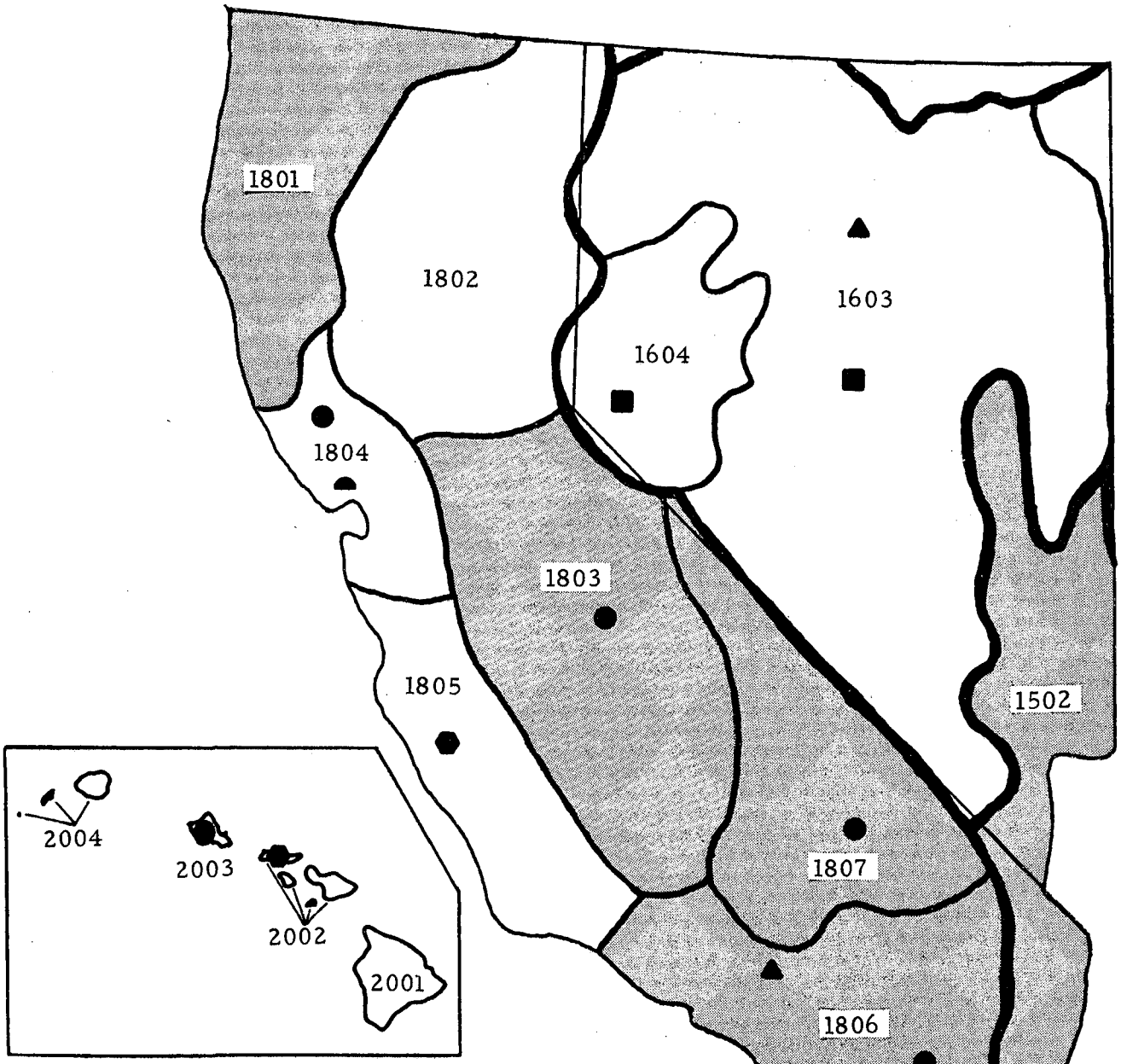


To be comparable, floods in different regions must be produced from drainage areas of the same size and must have the same frequency of occurrence. On the map, contours indicate the flood discharge, in thousands of cubic feet per second, that is to be expected from a 300-square-mile drainage basin during a mean annual flood. (To obtain approximate cubic meters-per-second from an 800-square-kilometer drainage basin, multiply contour number by 30). The mean annual flood is one which will be exceeded in about half the years.

The lines of equal flood potential are necessarily generalized and are intended only to show wide-scope variability. Flood potential is intimately related to topography, precipitation, and antecedent storage conditions, all of which may change aburptly within a short distance, especially in western United States. Because the local variability cannot be shown, the map should not be used to estimate the flood potential of a particular stream.

FIGURE II-61 MEAN ANNUAL FLOOD POTENTIAL

SOURCE: U. S. GEOLOGICAL SURVEY, NATIONAL ATLAS OF THE UNITED STATES, 1971



Areas with Greatest Total Impact

Areas that have serious agriculture, urban and other flooding.

Location and Specific Impacts.*

Flood plain encroachment, inappropriate agricultural management, inadequate design and siting of public use facilities, and other in situ shortfalls in flood plain management.

Urbanization and industrialization that induce increased flood damage from accelerated runoff.

▲ Inadequate upstream watershed management and safeguards of both structural and nonstructural systems.

Loss of flood control from inadequate upstream structural systems and conservation.

Flooding and coastal, beach, subsided, and other lowland areas caused by tides and storms.

*Identified by State/Regional study teams.

FIGURE II-62 FLOOD DAMAGES

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977

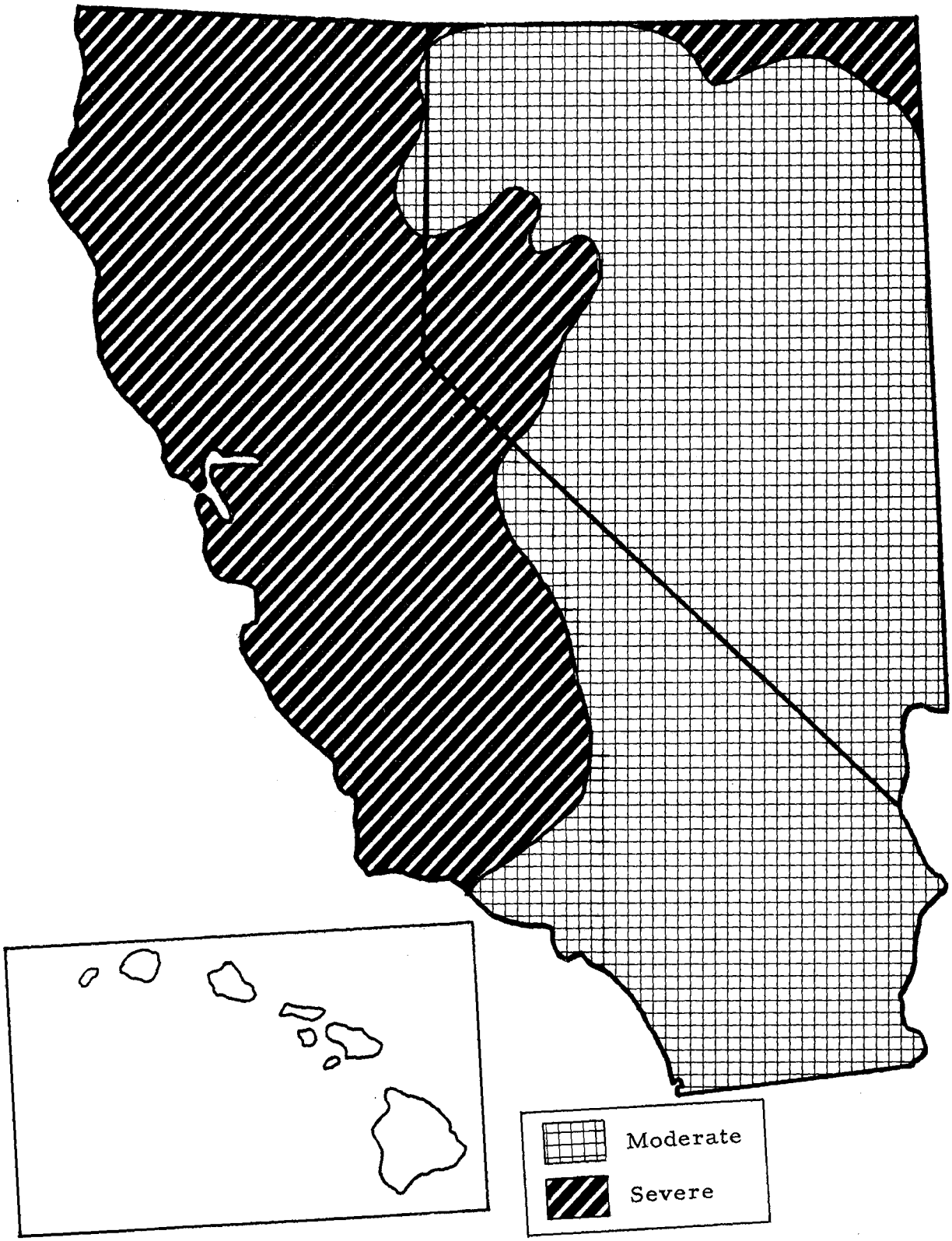
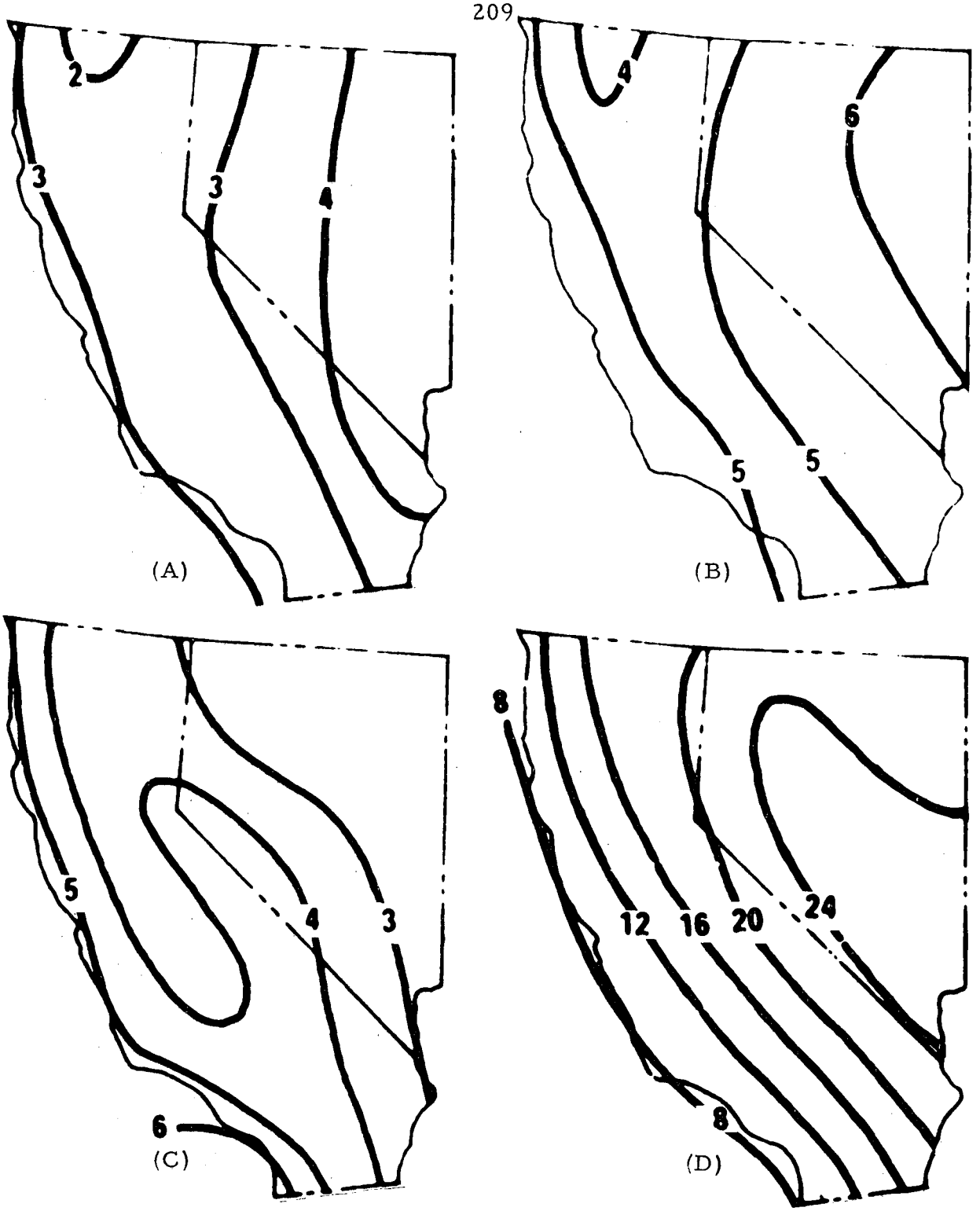


FIGURE II-63 DROUGHT AFFECTED AREAS, 1977

SOURCE: COUNCIL ON ENVIRONMENTAL QUALITY, 8TH ANNUAL REPORT--ENVIRONMENT QUALITY 1977, 1977



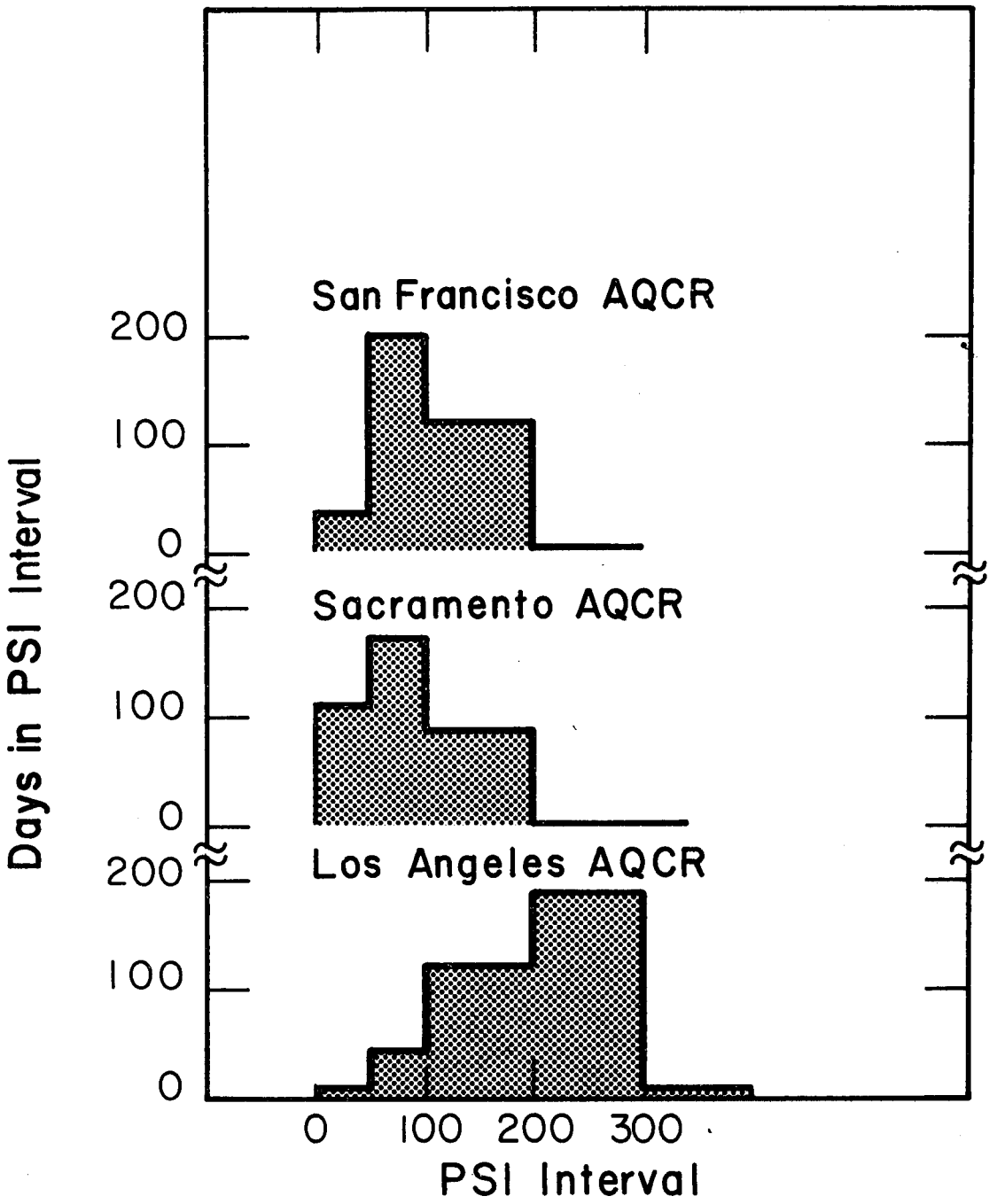
(A) Isopleths (m sec^{-1}) of mean annual wind speed averaged through the morning mixing layer; (B) Averaged through the afternoon mixing layer; (C) Isopleths (m x 10^2) of mean annual morning mixing heights; (D) Mean annual afternoon mixing heights.

FIGURE II-64 MIXING HEIGHTS AND WIND SPEEDS

SOURCE: U. S. ENVIRONMENTAL PROTECTION AGENCY--DIVISION OF METEOROLOGY, MIXING HEIGHTS, WIND SPEEDS AND POTENTIAL FOR URBAN AIR POLLUTION AP-101, 1975

II-C-3 MAN-INDUCED CLIMATIC FACTORS

THIS SECTION PRESENTS DATA ON TWO MAN-INDUCED CLIMATIC FACTORS, AIR POLLUTION AND ACID RAIN. AIR POLLUTION IS QUANTIFIED BY A POLLUTANT STANDARD INDEX DEVELOPED BY A FEDERAL INTER-AGENCY TASK FORCE. THE DATA ARE PRESENTED FOR THREE MAJOR URBAN AREAS IN CALIFORNIA. A MAP IS INCLUDED SHOWING THE DISTRIBUTION OF ACID RAIN. THE MAP IS FROM A NATIONAL ACADEMY OF SCIENCES REPORT.



Index value	Air quality level	Pollutant levels				
		TSP (24-hour) μg/m³	SO_2 (24-hour) μg/m³	CO (8-hour) μg/m³	O_3 (1-hour) μg/m³	NO_2 (1-hour) μg/m³
500	Significant harm	1,000	2,620	57.5	1,200	3,750
400	Emergency	875	2,100	46.0	1,000	3,000
300	Warning	825	1,600	34.0	800	2,260
200	Alert	375	800	17.0	[2] 400	1,130
100	NAAQS	260	365	10.0	160	([1])
50	50 percent of NAAQS	[3] 75	[3] 80	5.0	80	([1])
0		0	0	0	0	([1])

[1] No index values reported at concentrations below those specified by alert level criteria.
[2] 400 μg/m³ was used instead of the O_3 alert level of 200 μg/m³.
[3] Annual primary NAAQS.

FIGURE II-65 NUMBER OF DAYS WITH POLLUTANT STANDARD INDEX, 1975

SOURCE: COUNCIL ON ENVIRONMENTAL QUALITY, 8TH ANNUAL REPORT--ENVIRONMENT QUALITY 1977, 1977

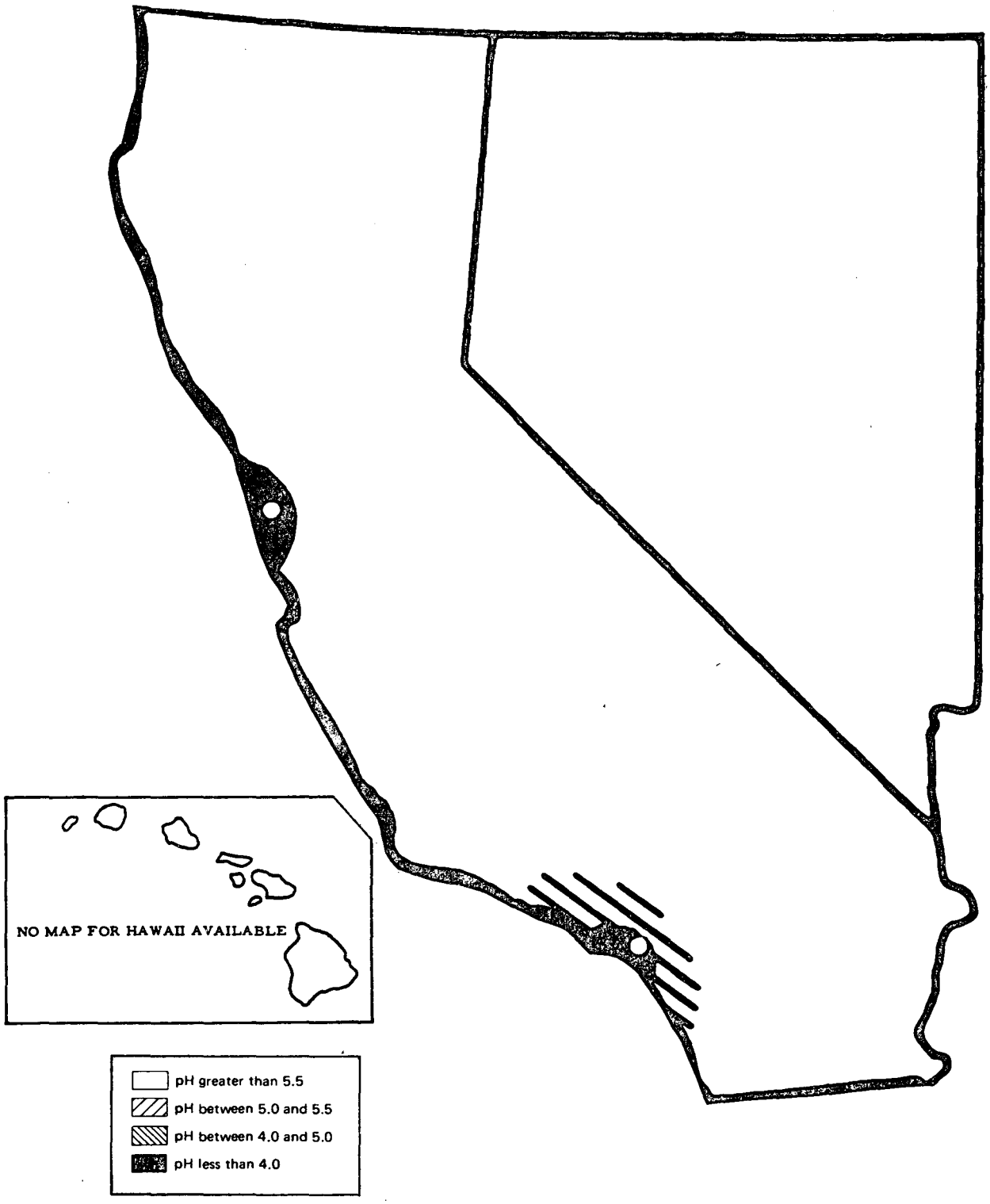


FIGURE II-66 ACIDITY OF RAINFALL IN CALIFORNIA AND NEVADA 1973

SOURCE: NATIONAL ACADEMY OF SCIENCES, MINERAL RESOURCES AND THE ENVIRONMENT, 1975

II-D SOLID WASTES

II-D-1 LEVEL AND SITE OF GENERATION AND DISPOSAL

FIVE TYPES OF SOLID WASTE ARE DISCUSSED IN THIS SECTION - FLY ASH, RADIOACTIVE WASTES, COAL PREPARATION AND OIL SHALE WASTES, HAZARDOUS WASTES, AND MUNICIPAL SOLID WASTE. MORE DATA ON MUNICIPAL SOLID WASTE FOR ENERGY GENERATION IS GIVEN IN CHAPTER I. THIS SECTION CONTAINS MAPS SHOWING THE LOCATION OF HAZARDOUS WASTE RECLAMATION AND MANAGEMENT FACILITIES. THESE MAPS ARE FROM AN EPA REPORT ON HAZARDOUS WASTE MANAGEMENT.

FLY ASH

THE ONLY COAL-FIRED POWER PLANTS IN THIS REGION ARE LOCATED IN NEVADA. DURING 1976 THEY CONSUMED 4,994,000 TONS OF COAL. THE LATEST YEAR FOR WHICH WE HAVE DATA ON SOLID WASTE PRODUCTION IS 1972 WHEN A TOTAL OF 421,000 TONS WAS COLLECTED.

RADIOACTIVE WASTES

THERE ARE TWO LOW-LEVEL RADIOACTIVE WASTE DISPOSAL SITES IN NEVADA. A COMMERCIAL DISPOSAL SITE AT BEATTY IN NYE COUNTY IS OWNED BY NUCLEAR ENGINEERING CO. AS OF 1 JAN 1974 IT HAD A TOTAL OF 1.97 MILLION CUBIC FEET OF LOW-LEVEL WASTE ORIGINALLY CONTAINING 85,500 CURIES BURIED THERE. AT THE DEPARTMENT OF ENERGYS NEVADA TEST SITE THERE ARE 0.27 MILLION CUBIC FEET OF LOW-LEVEL WASTES STORED.

COAL PREPARATION AND OIL SHALE WASTES

THERE ARE NO WASTES OF THIS TYPE GENERATED IN THE REGION

HAZARDOUS WASTES

THE LOCATIONS OF THE HAZARDOUS WASTE MANAGEMENT FACILITIES ARE SHOWN ON THE FOLLOWING PAGES. IN CALIFORNIA THE CAPACITIES FOR PROCESSING HAZARDOUS WASTES DURING 1974 WERE (IN THOUSAND GALLONS PER DAY) 57 FOR CHEMICAL TREATMENT, 14 FOR INCINERATION, 639 FOR SECURE LAND FILL, AND 400 FOR RESOURCE RECOVERY.

MUNICIPAL SOLID WASTE

ESTIMATES OF THE AMOUNT OF MUNICIPAL SOLID WASTE GENERATED ARE BASED ON THE ASSUMPTION THAT THE PER CAPITA PRODUCTION IS FOUR POUNDS PER DAY. THIS WOULD AMOUNT TO ABOUT 42,000 TONS PER DAY IN CALIFORNIA, 1,700 IN HAWAII AND 1,200 IN NEVADA. EXISTING, PLANNED AND PROPOSED PROJECTS FOR UTILIZING MUNICIPAL SOLID WASTE FOR PRODUCING ENERGY ARE SUMMARIZED IN SECTION I-B-12.

TABLE II-18
RESOURCE RECOVERY AND ENERGY CONVERSION PRACTICES

	CALIFORNIA	HAWAII	NEVADA
COMMUNITIES PRACTICING RECOVERY OF MUNICIPAL SOLID WASTE	155	4	0
COMMUNITIES PRACTICING VOLUNTARY SEPARATION OR SORTING	150	0	0
MAJOR SEPARATION OF WASTE FOR RESOURCE RECOVERY (TONS PER DAY)	3,000	380	NA
PROCESSED AS FUEL (TONS PER DAY)	0	1,900	0

SOURCE - WASTE AGE, 1977 SURVEY OF RESOURCE RECOVERY AND ENERGY CONSERVATION PRACTICES

NOTES - THE 1,900 TONS PER DAY PROCEESED IN HAWAII IS AGRICULTURAL RATHER THAN MUNICIPAL WASTE. THE ENERGY INVENTORY FOR HAWAIIAN SUGAR FACTORIES, 1975 REPORTS THAT ABOUT 7,500 WET TONS PER DAY OR ABOUT 4,000 TONS PER DAY OF DRY AGRICULTURAL WASTES (BAGASSE + CANE TRASH) ARE PROCESSED FOR FUEL.

TABLE II-19
SOLID WASTE LAND FILL SITES
[TONNAGE IN THOUSANDS OF TONS PER YEAR]

	NUMBER OF SITES					
REGION	ALL SITES	< 10 TPD	< 100 TPD	< 300 TPD	< 700 TPD	ANNUAL TONNAGE
CALIFORNIA	430	275	80	35	40	12,805
HAWAII	30	17	9	2	2	798
NEVADA	120	118	1	0	1	515

SOURCE - U.S. ENVIRONMENTAL PROTECTION AGENCY, DRAFT ENVIRONMENTAL IMPACT STATEMENT, CRITERIA FOR CLASSIFICATION OF SOLID WASTE DISPOSAL FACILITIES, APRIL 1978

NOTES - TPD = TONS PER DAY

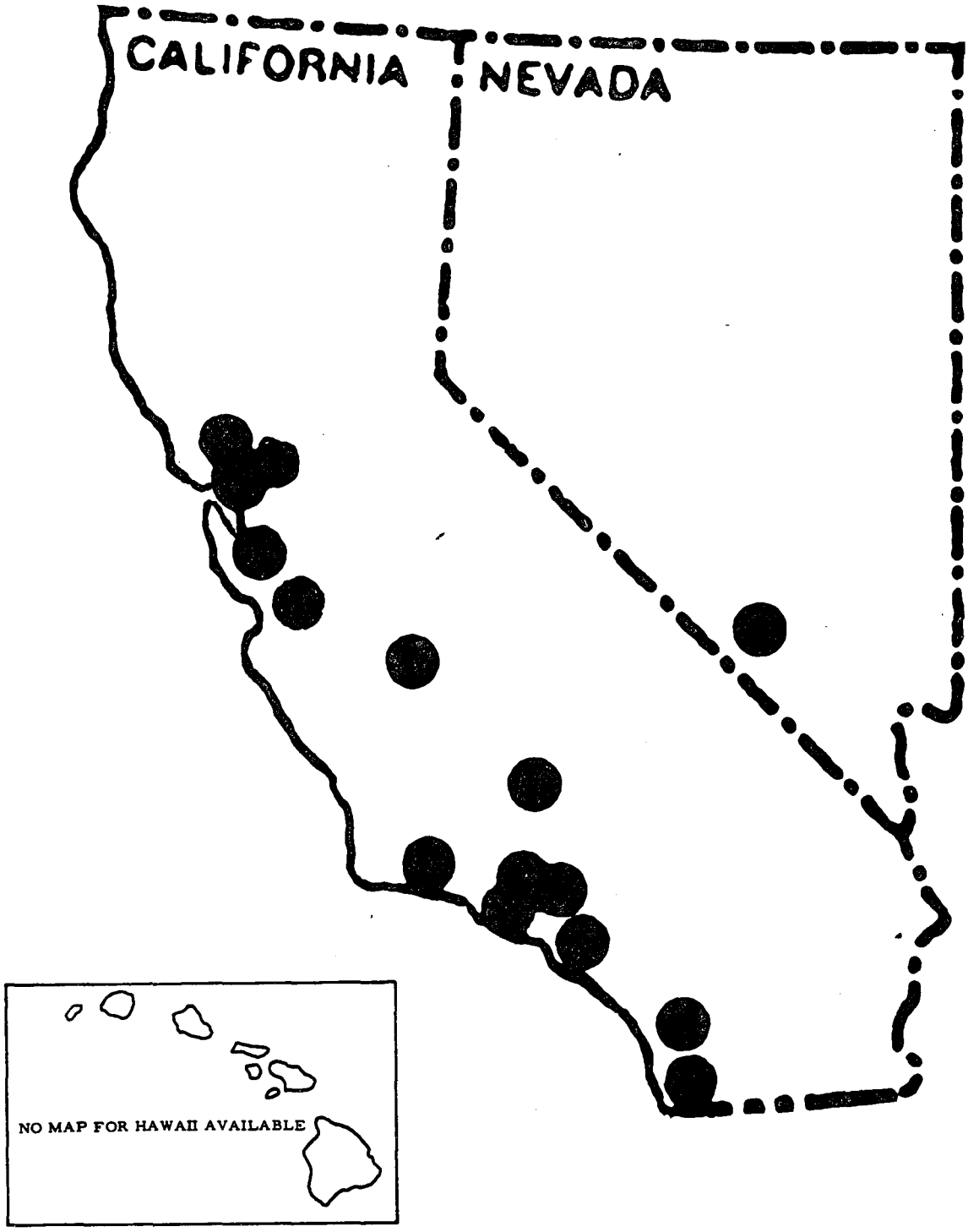


FIGURE II-67 HAZARDOUS WASTE MANAGEMENT FACILITIES, 1977

SOURCE: U. S. ENVIRONMENTAL PROTECTION AGENCY, HAZARDOUS WASTE MANAGEMENT FACILITIES IN THE UNITED STATES, 1977

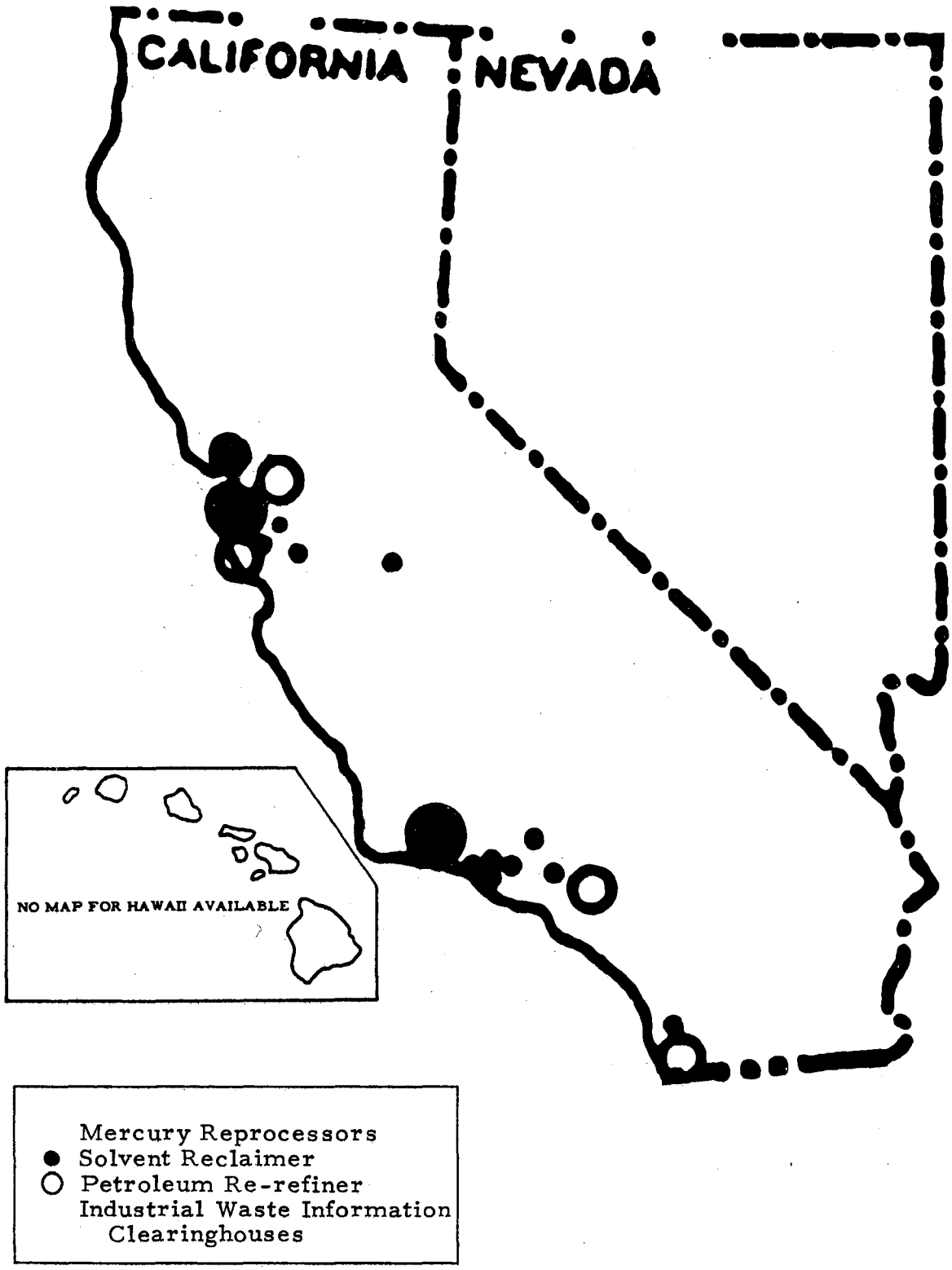


FIGURE II-68 HAZARDOUS WASTE RECLAMATION FACILITIES, 1977

SOURCE: U. S. ENVIRONMENTAL PROTECTION AGENCY, HAZARDOUS WASTE MANAGEMENT FACILITIES IN THE UNITED STATES, 1977

II-E LAND

II-E-1 NATURAL LANDSCAPE

DATA IN THIS SECTION ARE IN THE FORM OF MAPS SHOWING THE PRINCIPAL FEATURES OF THE NATURAL LANDSCAPE OF THE REGION. THEY INCLUDE SHADED RELIEF MAPS, MAPS OF SOIL TYPES AND GEOLOGICAL FEATURES, AND MAPS OF THE LOCATION AND EXTENT OF WETLANDS. THERE IS ALSO A MAP SHOWING REGIONS OF HIGH SEISMIC RISK.

MOST OF THESE MAPS ARE TAKEN FROM THE NATIONAL ATLAS. THE WETLANDS MAP IS FROM THE WATER ATLAS OF THE U.S., WHILE THE SEISMIC RISK MAP IS FROM A NUCLEAR REGULATORY COMMISSION REPORT.

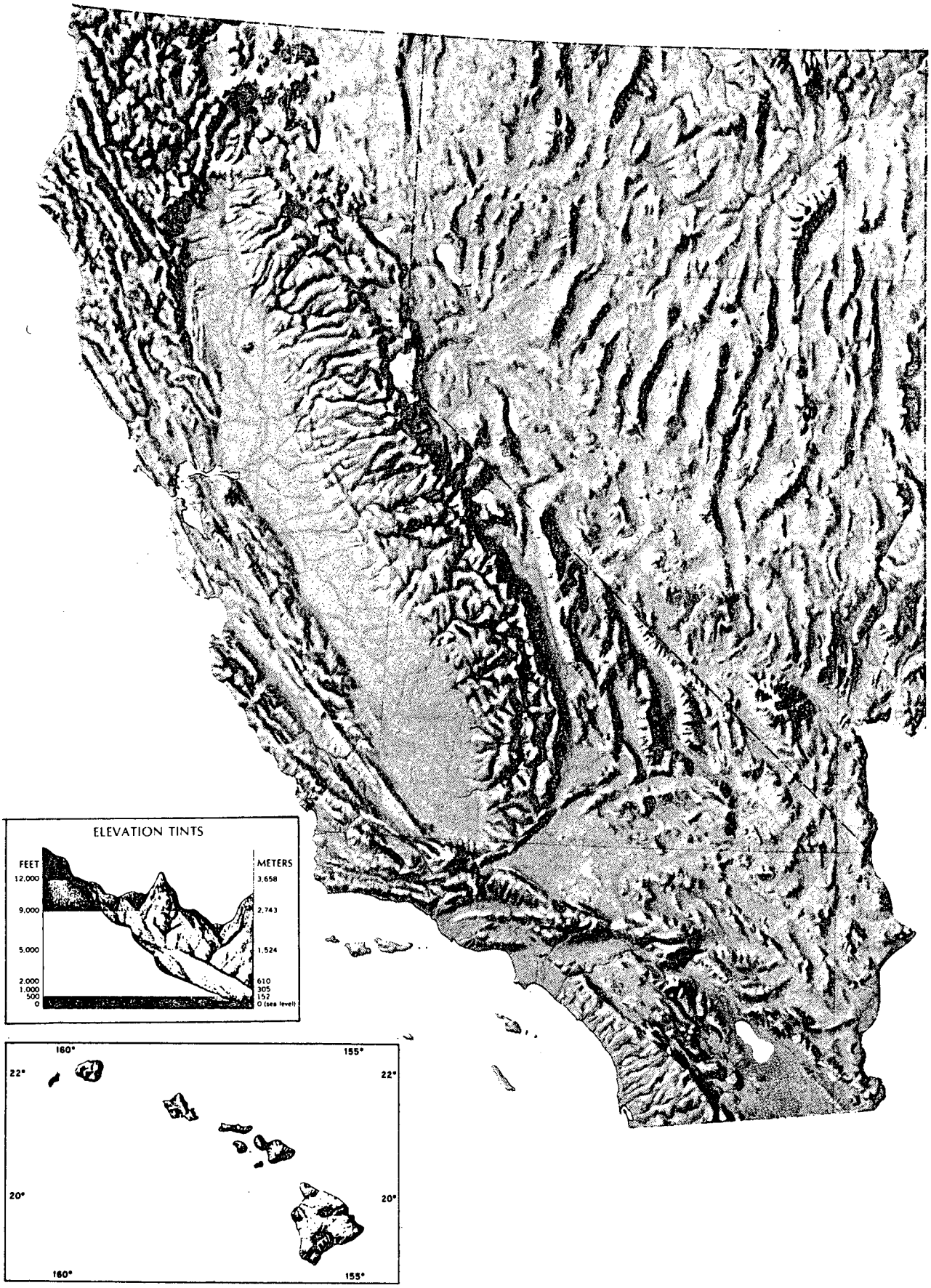


FIGURE II-69 SHADED RELIEF

SOURCE: U. S. GEOLOGICAL SURVEY, NATIONAL ATLAS OF THE UNITED STATES, 1971

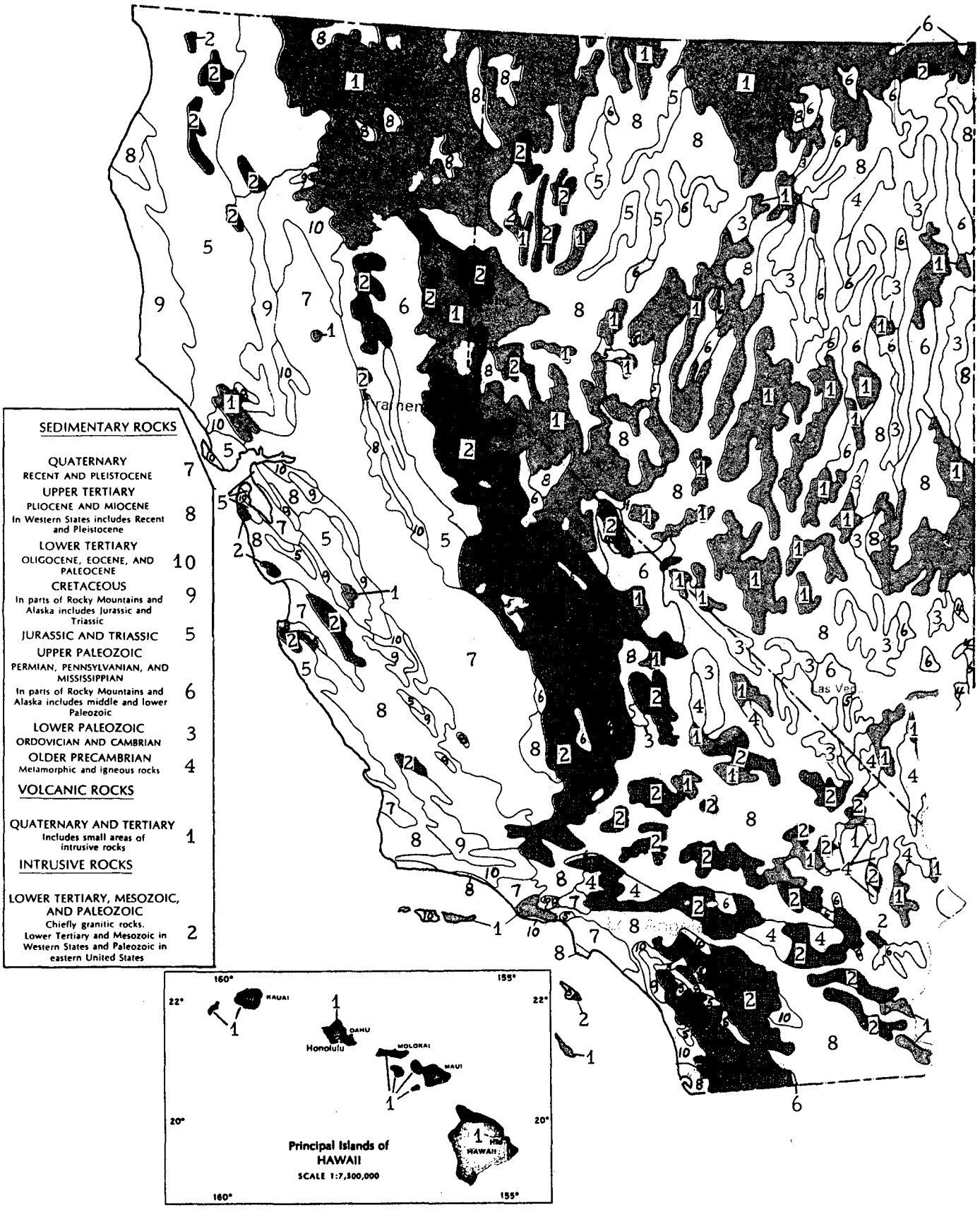


FIGURE II-70 GEOLOGY

SOURCE: U. S. GEOLOGICAL SURVEY, NATIONAL ATLAS OF THE UNITED STATES, 1971

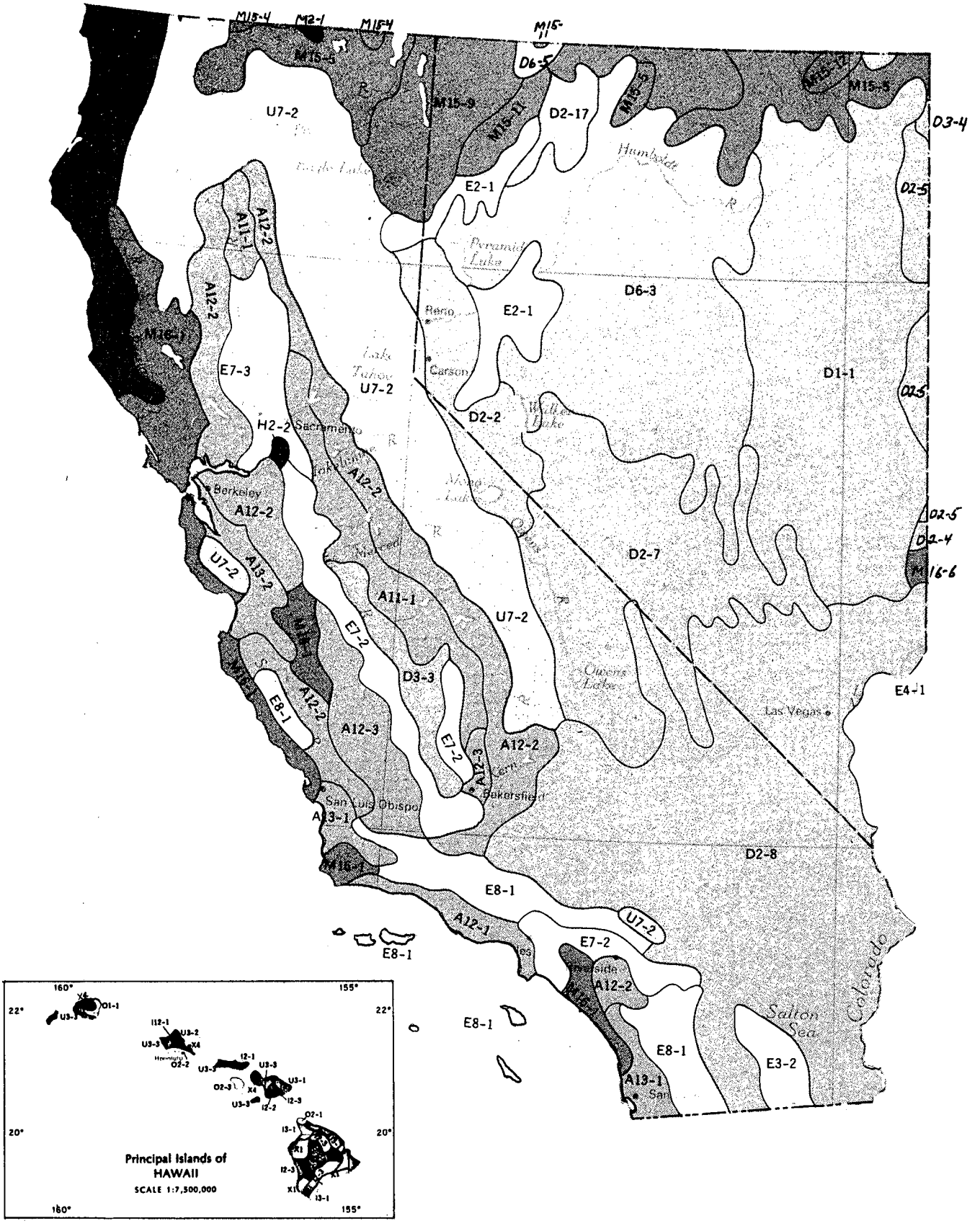


FIGURE II-71 DISTRIBUTION OF PRINCIPAL KINDS OF SOILS

SOURCE: U. S. GEOLOGICAL SURVEY, NATIONAL ATLAS OF THE UNITED STATES, 1971

The following arrangement is alphabetical by order and by taxa in a category. General soil definitions are given for the three categories used—namely, order, suborder, and great group. Present dominant land use is given for the suborder. Names of orders, the highest category, end in "sol," for example, "Alfisol." Names of suborders have two syllables, the final syllable being taken from the order name; for example "Aqualf" is a suborder of "Alfisol." Names of great groups have one or more syllables as a prefix to a suborder name; for example, "Albaqualf" is one of the great groups of the suborder "Aqualf." Names that correspond approximately to those used in the 1938 classification system and additional names commonly used since about 1950 are also given.

The map units are mostly associations of phases of great groups. Only the principal kinds of soil are named for each map unit. The most extensive is listed first and the least extensive, last. Other kinds of soil are present in each map unit but are not extensive enough to be listed as inclusions.

Classes used for the approximate slope of each map unit are:

Gently sloping-------Slope mainly less than 10 percent.
Moderately sloping---Slope mainly between 10 and 25 percent.
Steep----------Slope mainly steeper than 25 percent.

ALFISOLS

Soils that are medium to high in bases (base saturation at pH 8.2) and have gray to brown surface horizon and subsurface horizons of clay accumulation; usually moist but during the warm season of the year some are dry part of the time.

XERALFS.—Alfisols that are in climates with rainy winters but dry summers; during the warm season of the year these soils are continually dry for a long period; used for range, small grain and irrigated crops.

DURIXERALFS (formerly Noncalcic Brown soils with a hardpan).—Xeralfs that have a hardpan (duripan) that is cemented with silica.

A11-1—Durixeralfs plus Palexeralfs, gently sloping.

HAPLOXERALFS (formerly Noncalcic Brown soils).—Xeralfs that have a subsurface horizon of clay accumulation that is relatively thin or is brownish in color.

A12-1—Haploxeralfs plus Haplaquolls, Palexeralfs, and Xerorthents, gently sloping.

A12-2—Haploxeralfs plus Palexeralfs and Xerorthents (shallow), moderately sloping to steep.

A12-3—Haploxeralfs plus Xerorthents (shallow) and Chromoxererts, moderately sloping or steep.

PALEXERALFS (formerly Noncalcic Brown soils).—Xeralfs that have an indurated (petrocalcic) horizon cemented by carbonates or a horizon having one or both of the following: A thick reddish clay accumulation or a distribution that is clayey in the upper part and abruptly changes in texture into an overlying horizon.

A13-1—Palexeralfs plus Durixeralfs, gently sloping.

A13-2—Palexeralfs plus Xerorthents and Haplaquolls, gently sloping.

ARIDISOLS

Soils that have pedogenic horizons and are low in organic matter and are never moist as long as 3 consecutive months.

ARGIDS.—Aridisols that have a horizon in which clay has accumulated with or without alkali (sodium); used for mostly range and some irrigated crops.

DURARGIDS (formerly Desert, Red Desert, Sierozem and some Brown soils, all with hardpan).—Argids that have a hardpan (duripan) that is cemented with silica.

D1-1—Durargids plus Durorthids and Calciorthids, all gently sloping; also Haploxerolls and Argixerolls, steep.

HAPLARGIDS (formerly Sierozem, Desert, Red Desert and some Brown soils).—Argids that have a loamy horizon of clay accumulation with or without alkali (sodium).

D2-2—Haplargids plus Argixerolls, Durargids, and Haploxerolls, gently sloping to steep.

D2-4—Haplargids plus Calciorthids, Natrargids, and Camborthids, gently sloping.

D2-5—Haplargids plus Calciorthids, and Natrargids, all gently sloping; also Torriorthents (shallow) and Camborthids, both steep.

D2-7—Haplargids plus Paleorthids, Torriorthents, and Rock land, gently or moderately sloping.

D2-8—Haplargids plus Paleorthids, Torripsamments, Paleargids, and Calciorthids, gently sloping to steep.

NATRARGIDS (formerly Solonetz soils).—Argids that have a horizon of clay and alkali (sodium) accumulation.

D3-3—Natrargids plus Nadurargids, Haplaquolls, and Torriorthents, gently sloping.

D3-4—Natrargids plus Salorthids and Torriorthents, gently sloping.

CAMBORTHIDS (formerly Sierozems, Desert, and Red Desert soils).—Orthids that have horizons from which some materials have been removed or altered but have no accumulation of large amounts of calcium carbonate or gypsum.

D6-5—Camborthids plus Torriorthents and Torripsamments, gently sloping.

ENTISOLS

Soils that have no pedogenic horizons.

FLUVENTS (formerly Alluvial soils).—Entisols that have organic-matter content that decreases irregularly with depth; formed in loamy or clayey alluvial deposits; used for range or irrigated crops in dry regions and for general farming in humid regions.

TORRIFLUVENTS (formerly Alluvial soils).—Fluvents that are never moist as long as 3 consecutive months.

E2-1—Torrifluvents plus Natrargids, Salorthids, and Haplargids, gently or moderately sloping.

ORTHENTS.—Loamy or clayey Entisols that have a regular decrease in organic-matter content with depth; used for range or irrigated crops in dry regions and for general farming in humid regions.

TORRIORTHENTS (formerly Regosols).—Orthents that are never moist as long as 3 consecutive months.

E3-2—Torriorthents plus Torrifluvents and Salorthids, gently sloping.

TORRIORTHENTS (shallow; formerly Lithosols).—Torriorthents that are shallower than 20 inches to bedrock.

E4-1—Torriorthents (shallow) plus Haplargids and Badlands, moderately sloping or steep.

XERORTHENTS (formerly Regosols, Brown, or Alluvial soils).—Orthents that are in climates with rainy winters but dry summers; during the warm season of the year, they are continually dry for a long period.

E7-2—Xerorthents plus Durixeralfs, Haploxeralfs, Xerofluvents, and Palexeralfs, gently sloping.

E7-3—Xerorthents plus Haploxeralfs, Xerofluvents, and Haplaquolls, gently sloping.

XERORTHENTS (shallow; formerly Lithosols).—Xerorthents that are shallower than 20 inches to bedrock.

E8-1—Xerorthents (shallow) plus Haploxeralfs, both steep.

HISTOSOLS

Wet organic (peat and muck) soils; includes soils in which the decomposition of plant residues ranges from highly decomposed to not decomposed; formed in swamps and marshes; used for mostly woodland or lie idle, but some drained areas have truck crops. Histosols are classified here only according to stage of plant-residue decomposition.

Plant residues moderately decomposed or highly decomposed; formerly called peat or muck. Histosols of warm regions.

H2-2—Histosols (plant residues highly decomposed), gently sloping.

INCEPTISOLS

Soils that have weakly differentiated horizons; materials in the soil have been altered or removed but have not accumulated. These soils are usually moist, but during the warm season of the year some are dry part of the time.

ANDEPTS.—Inceptisols that either have formed in ashy (vitric pyroclastic) materials, have low bulk density and large amounts of amorphous materials, or both; used for woodland and range or pasture.

DYSTRANDEPTS (formerly Ando soils).—Andepts that have a thick dark-colored surface horizon that is low in bases or that have a light-colored surface horizon.

I2-1—Dystrandepts plus Andaquepts, gently sloping to steep.

I2-2—Dystrandepts plus Eutrandepts, moderately sloping to steep.

I2-3—Dystrandepts plus Hydrandepts and Rubble land, moderately sloping or steep.

EUTRANDEPTS (formerly Brown or Reddish Brown soils).—Andepts that have a thick dark-colored surface horizon that is high in bases.

I3-1—Eutrandepts plus Vitrandepts and Rubble land, moderately sloping or steep.

TROPEPTS (formerly Latosols).—Inceptisols of tropical climates; used for pineapple and irrigated sugarcane in Hawaii.

I12-1—Tropepts plus Ustox and Rock land, gently sloping to steep.

MOLLISOLS

Soils that have nearly black friable organic-rich surface horizons high in bases; formed mostly in subhumid and semiarid warm to cold climates.

AQUOLLS.–Seasonally wet Mollisols that have a thick nearly black surface horizon and gray subsurface horizons; used for pasture, and where drained, small grains, corn, and potatoes in the North-Central States, and rice and sugarcane in Texas.

HAPLAQUOLLS (formerly Humic-Gley soils). Aquolls that have horizons in which materials have been altered or removed but no clay or calcium carbonate has accumulated.

M2-1–Haplaquolls, gently sloping.

XEROLLS.–Mollisols that are in climates with rainy winters but dry summers; during the warm season of the year, these soils are continually dry for a long period; used for wheat, range, and irrigated crops.

ARGIXEROLLS (formerly Brunizems).–Xerolls that have a subsurface horizon of clay accumulation that is relatively thin or is brownish.

M15-4–Argixerolls plus Cryandepts and Haploxerolls, moderately sloping or steep.

M15-5–Argixerolls plus Haploxerolls, moderately sloping.

M15-9–Argixerolls plus Haploxerolls, Xererts, and Palexerolls, moderately sloping or steep.

M15-11–Argixerolls plus Xerorthents (shallow), Haploxerolls, and Rock land, steep.

M15-12–Argixerolls plus Xerorthents (shallow), Xeralfs, and Rock land, steep.

HAPLOXEROLLS (formerly Chestnut and Brown soils).–Xerolls that have a subsurface horizon high in bases but without large accumulations of clay, calcium carbonate, or gypsum.

M16-1–Haploxerolls plus Argixerolls, Chromoxererts, and Xerothents (shallow), steep.

M16-6–Haploxerolls plus Camborthids and Calciorthids (shallow), moderately sloping or steep.

OXISOLS

Soils that are mixtures principally of kaolin, hydrated oxides, and quartz and that are low in weatherable minerals; formed on gentle or moderate slopes at low or moderate elevations in tropical or subtropical climates.

ORTHOX (formerly Latosols).–Oxisols that are moist all or most of the time. They have moderate to low content of organic matter and are relatively low in bases; used for sugarcane, pineapple, and pasture in Hawaii. (These soils are not classified here below the level of suborder.)

01-1–Orthox plus Gibbsihumox, gently or moderately sloping.

USTOX (formerly Latosols).–Oxisols that are continually dry in some part of the soil for a long period during the year; used for pineapple, irrigated sugarcane, and pasture in Hawaii. (These soils are not classified here below the level of suborder.)

02-1–Ustox plus Andepts and Aquepts, gently sloping to steep.

02-2–Ustox plus Chromusterts, Tropepts, and Andepts, gently or moderately sloping.

02-3–Ustox plus Tropepts, Andepts, and Rock land, gently sloping to steep.

ULTISOLS

Soils that are low in bases and have subsurface horizons of clay accumulation; usually moist, but during the warm season of the year, some are dry part of the time.

HUMULTS.–Ultisols that have a high content of organic matter; formed in temperate or tropical climates that have high amounts of rainfall throughout the year; used for woodland and pasture where steep, small grain and truck and seed crops in Oregon and Washington, and pineapple and irrigated sugarcane in Hawaii where gently or moderately sloping.

HAPLOHUMULTS (formerly Reddish-Brown Lateritic soils).–Humults that either have a subsurface horizon of clay accumulation that is relatively thin, a subsurface horizon having appreciable weatherable minerals, or both; formed in temperate climates.

U2-2–Haplohumults plus Xerumbrepts and Haploxerolls, moderately sloping or steep.

TROPOHUMULTS (formerly Reddish-Brown Lateritic soils).–Humults that either have a horizon of clay accumulation that is relatively thin, a subsurface horizon having appreciable weatherable minerals, or both; formed in tropical climates.

U3-1–Tropohumults plus Dystrandepts and Rubble land, moderately sloping or steep.

U3-2–Tropohumults plus Tropepts, gently sloping to steep.

U3-3–Tropohumults plus Tropepts and Rock land, gently sloping to steep.

XERULTS.–Ultisols that are relatively low in organic matter in the subsurface horizons. They are in climates with rainy winters but dry summers; during the warm season of the year, these soils are continually dry for a long period; used for range and woodland.

HAPLOXERULTS (formerly Reddish-Brown Lateritic and some Red-Yellow Podzolic soils).–Xerults that either have a subsurface horizon of clay accumulation that is relatively thin, a subsurface horizon having appreciable weatherable minerals, or both.

U7-2–Haploxerults plus Xerumbrepts and Xerorthents, steep.

MISCELLANEOUS LAND TYPES.–Barren or nearly barren areas that are mainly rock, ice, or salt and some included soils. Mostly not used for crops but some in warm, moist climates have vegetation.

X1–Rock land plus Andepts, steep.

X2–Rock land plus Andepts and Stony land, steep.

X3–Rock land plus Cryandepts, Cryumbrepts, Cryaquepts, and Cryorthods (shallow), all moderately sloping or steep (includes icefields and glaciers).

X4–Rock land plus Rough broken land, Andepts, and Tropepts, steep.

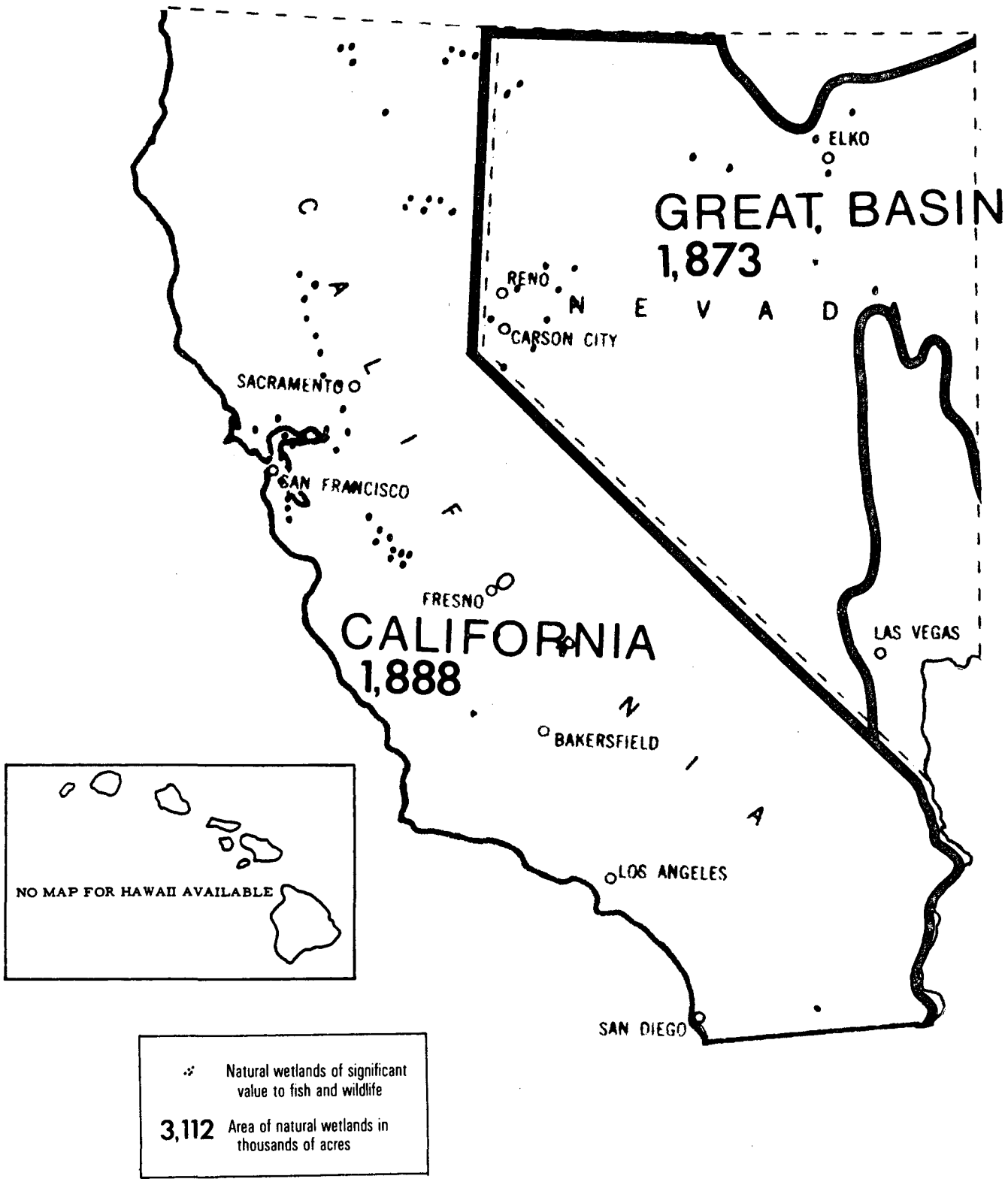


FIGURE II-72 WETLANDS, 1968

SOURCE: GERAGHTY, J. J., ET AL., WATER ATLAS OF THE UNITED STATES, 1973

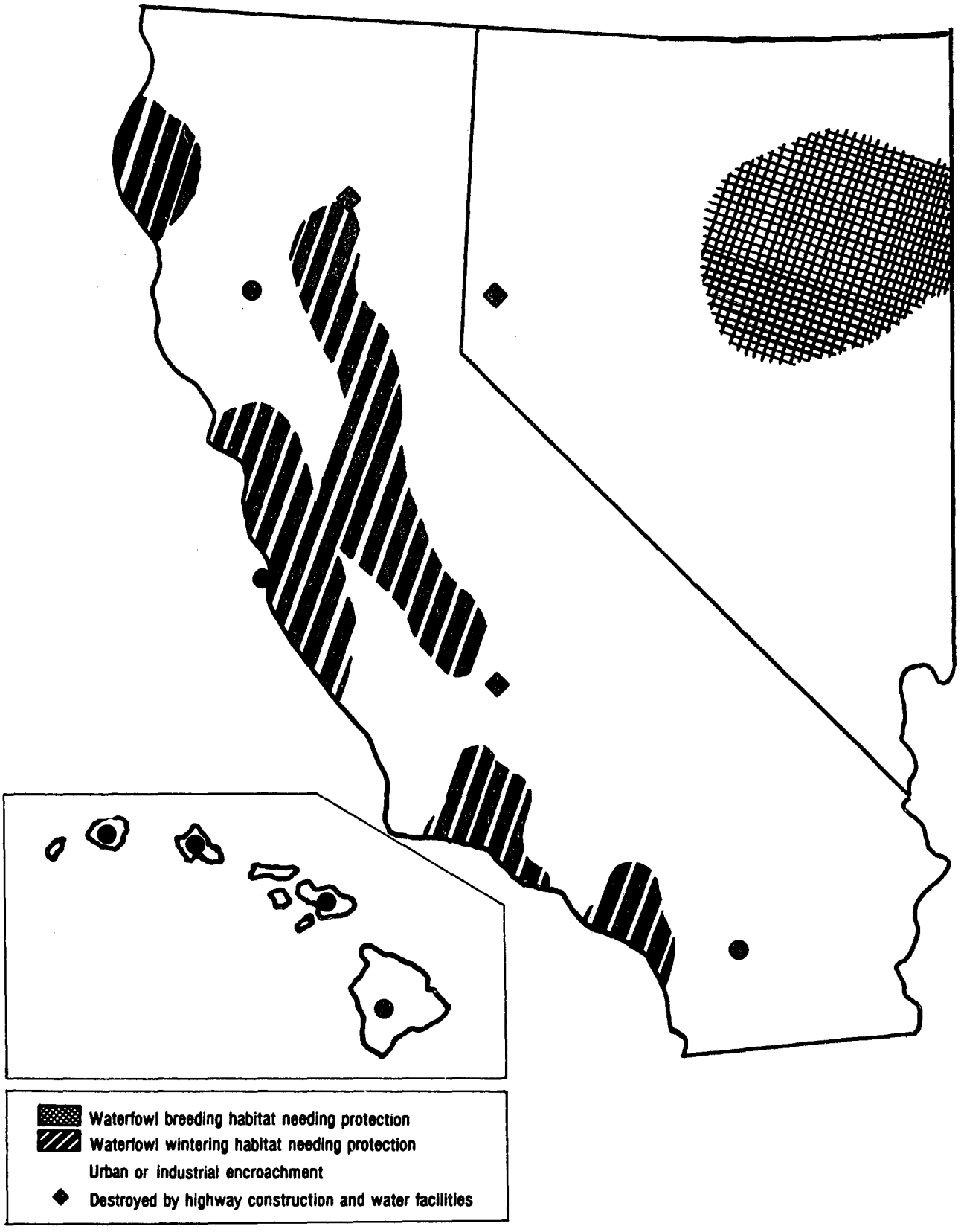


FIGURE II-73 WETLAND WILDLIFE HABITAT LOSS, 1955 - 1975

SOURCE: COUNCIL ON ENVIRONMENTAL QUALITY, 8TH ANNUAL REPORT--ENVIRONMENT QUALITY 1977, 1977

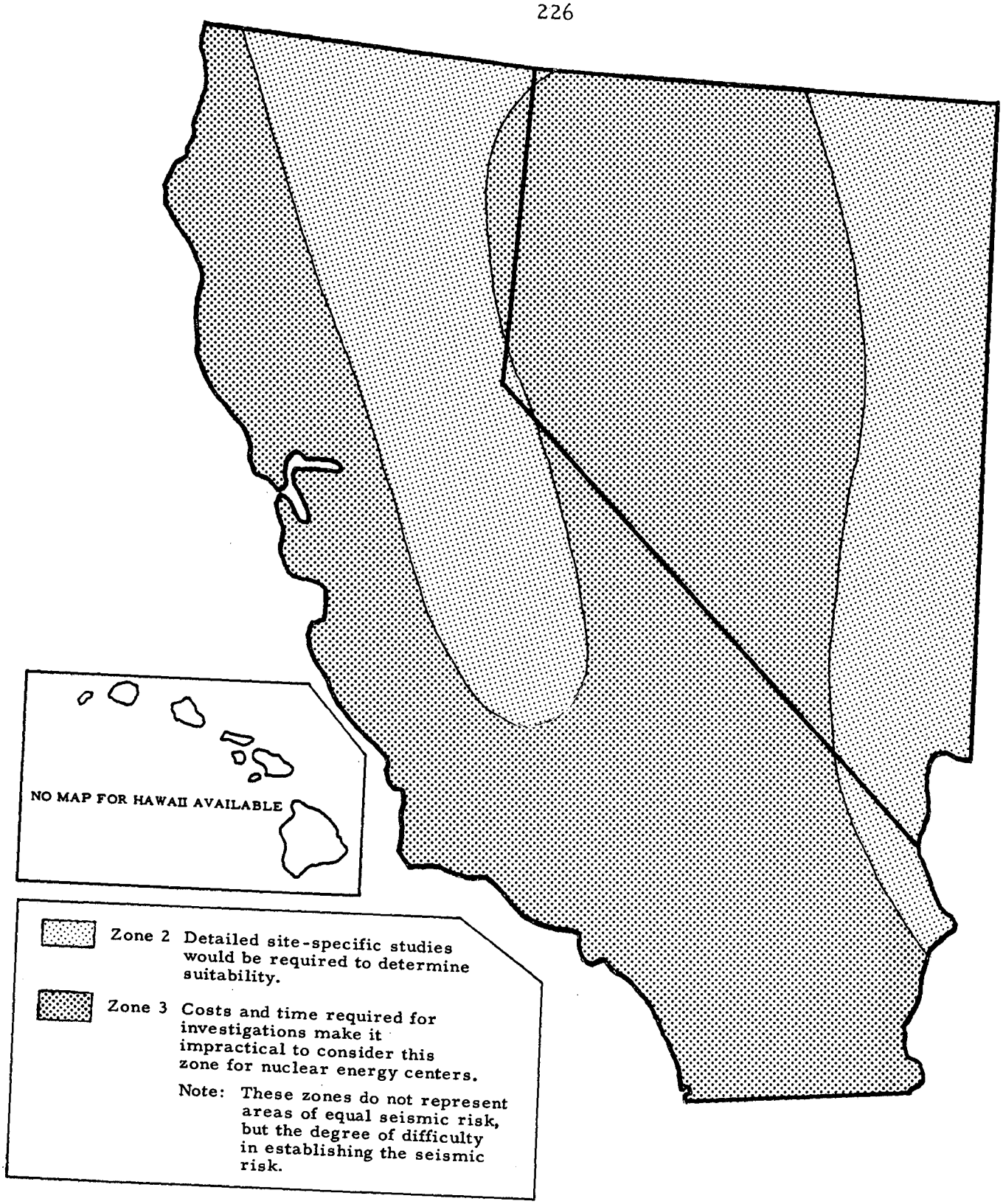


FIGURE II-74 AREAS OF RELATIVE SEISMIC SUITABILITY FOR NUCLEAR ENERGY CENTERS

SOURCE: U. S. NUCLEAR REGULATORY COMMISSION, NUCLEAR ENERGY SITE SURVEY 1975, VOLUME 5 NUREG 0001, JANUARY 1976

II-E-2 LAND USE

THIS SECTION PRESENTS DATA IN THE FORM OF MAPS AND TABLES ON MAJOR USES OF LAND IN THE REGION. DETAILED COUNTY LEVEL MAPS ARE INCLUDED SHOWING CROPLAND, FORESTLAND, PASTURE AND RANGELAND, AND LAND IN URBAN AREAS. THERE ARE ALSO TABLES ON FARM ACREAGE, LIVESTOCK AND CROP PRODUCTION.

THE MAPS OF LAND USE IN CALIFORNIA AND HAWAII ARE TAKEN FROM PRIVATE AND STATE PUBLICATIONS. THE COUNTY LEVEL MAPS WERE PROVIDED BY THE OAK RIDGE NATIONAL LABORATORY AND ARE DERIVED FROM DATA IN THE 1967 CONSERVATION NEEDS INVENTORY OF THE SOIL CONSERVATION SERVICE. OTHER LAND USE DATA ARE FROM THE DEPARTMENT OF AGRICULTURE, THE BUREAU OF THE CENSUS, AND STATE PUBLICATIONS.

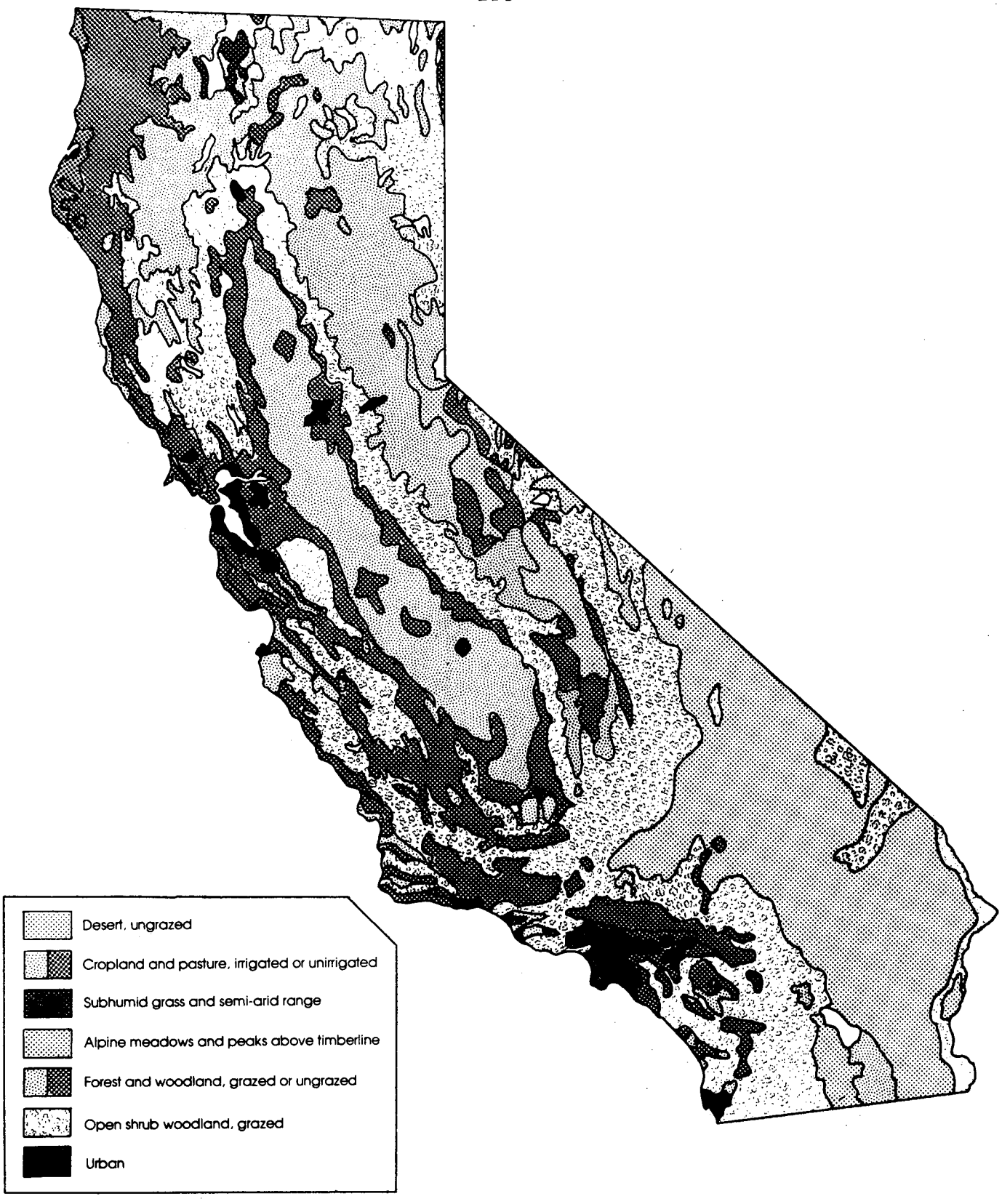
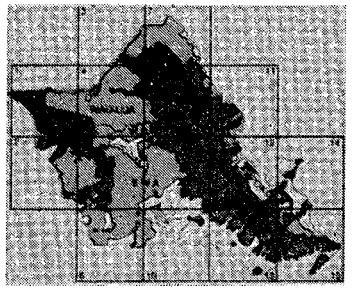
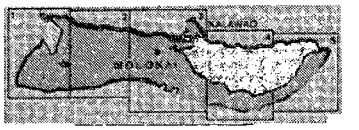


FIGURE II-75 LAND USE IN CALIFORNIA, 1971

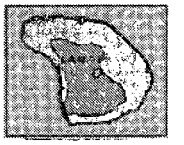
SOURCE: DURRENBERGER, ROBERT, CALIFORNIA PATTERNS ON THE LAND, 5TH EDITION, 1975



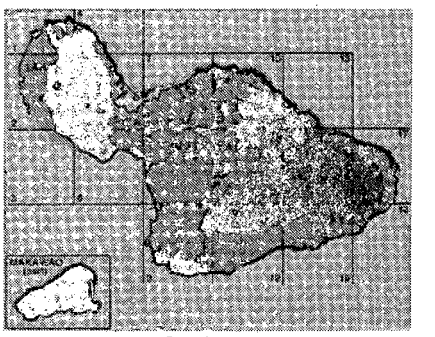
OAHU



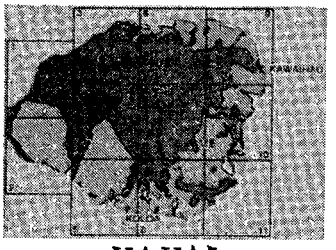
MOLOKAI



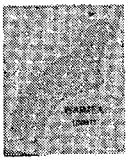
LANAI



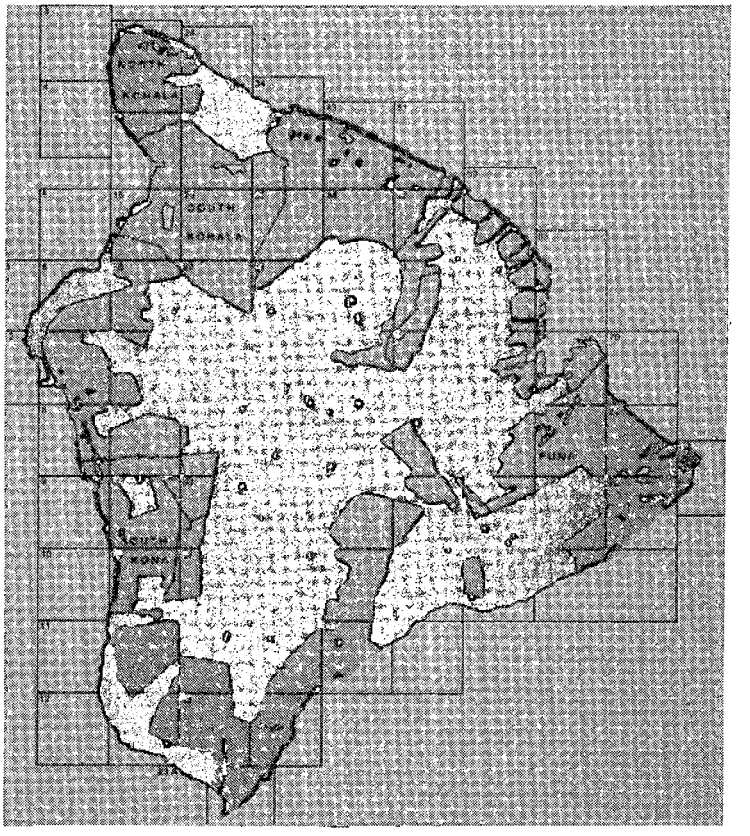
MAUI



KAUAI



WAIMEA



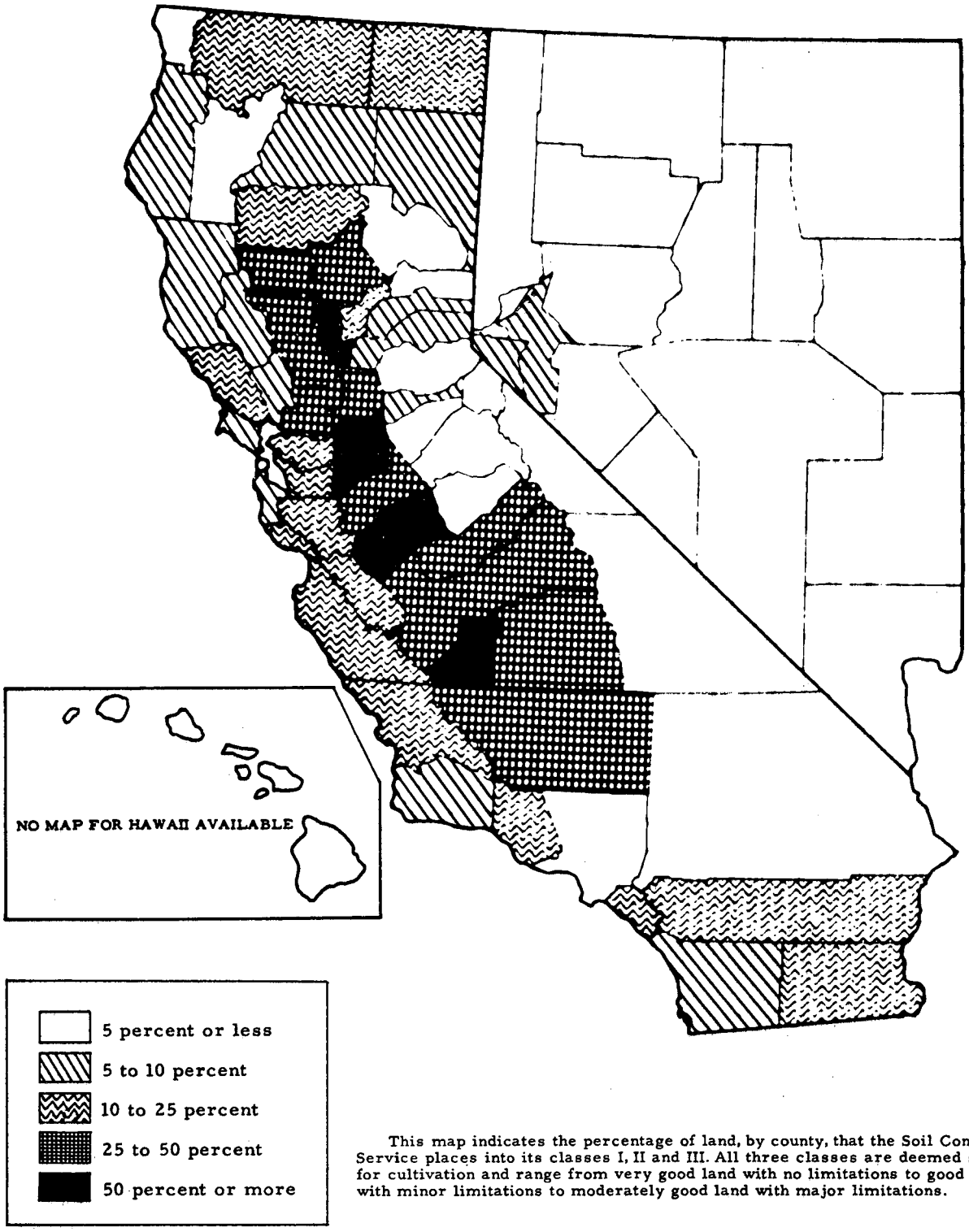
HAWAII

LAND USE DISTRICTS

- Urban District
- Rural District
- Agriculture District
- Conservation District
- District Boundary Map Index
- Hana Judicial District Boundary and Name

FIGURE II-76 LAND USE DISTRICTS IN HAWAII

SOURCE: UNIVERSITY OF HAWAII, DEPARTMENT OF GEOGRAPHY, ATLAS OF HAWAII, 3RD EDITION, 1973



This map indicates the percentage of land, by county, that the Soil Conservation Service places into its classes I, II and III. All three classes are deemed suitable for cultivation and range from very good land with no limitations to good land with minor limitations to moderately good land with major limitations.

FIGURE II-77 LAND OF CAPABILITY CLASS I, II AND III, 1967

SOURCE: PROVIDED BY THE OAK RIDGE NATIONAL LABORATORY FROM THE 1967 SOIL CONSERVATION SERVICE CONSERVATION NEEDS INVENTORY

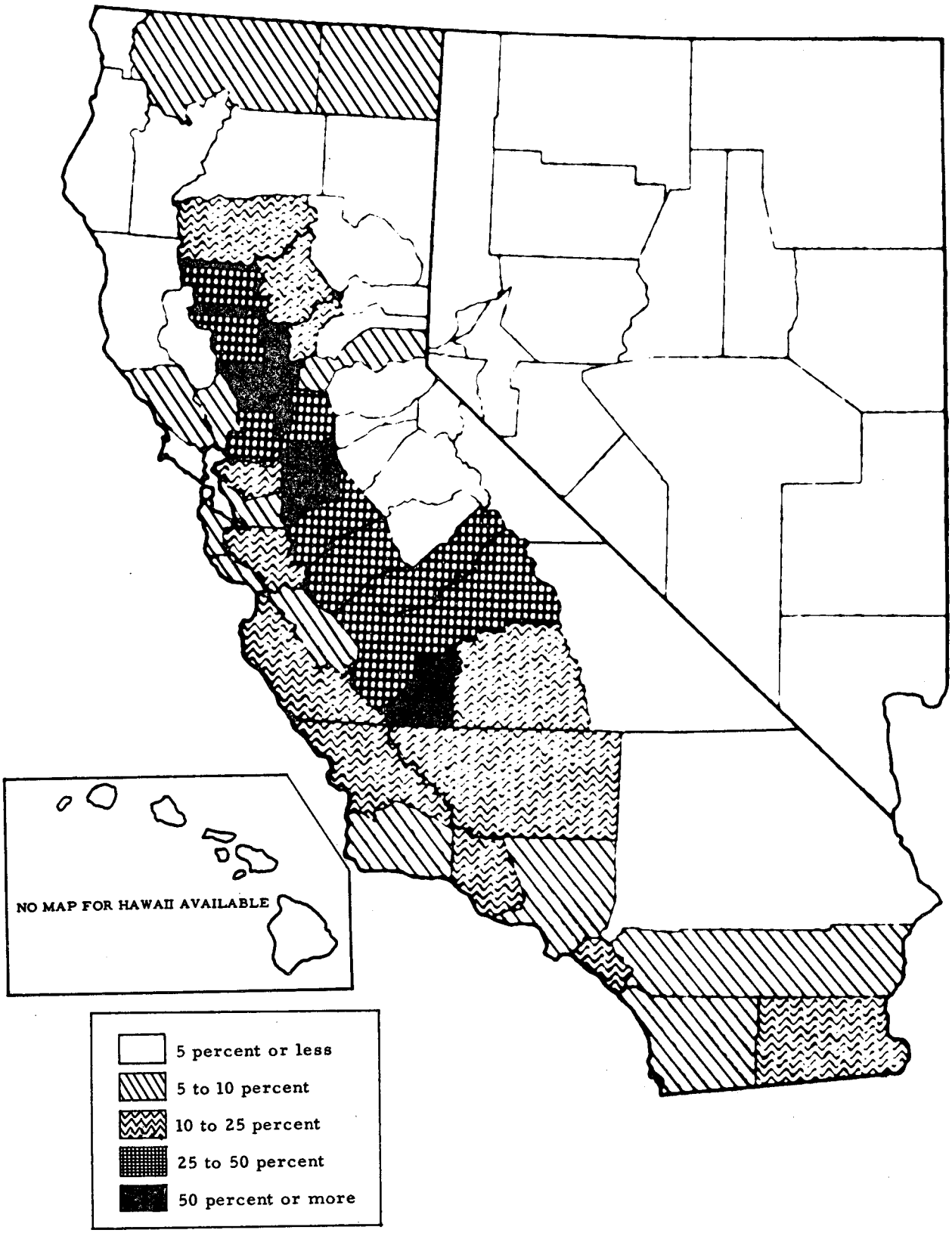


FIGURE II-78 CROPLAND, 1967

SOURCE: PROVIDED BY THE OAK RIDGE NATIONAL LABORATORY FROM THE 1967 SOIL CONSERVATION SERVICE CONSERVATION NEEDS INVENTORY

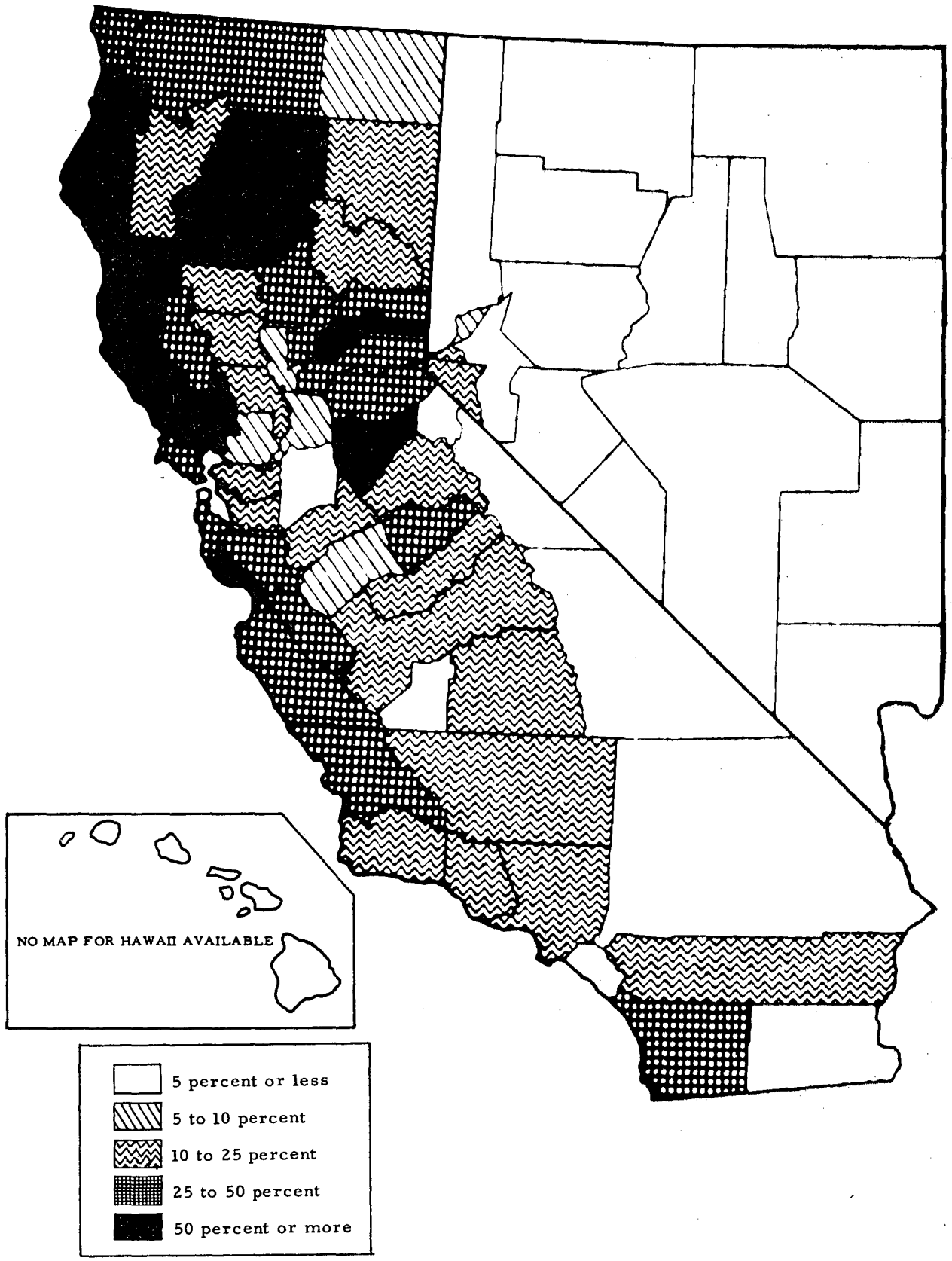


FIGURE II-79 FORESTLAND, 1967

SOURCE: PROVIDED BY THE OAK RIDGE NATIONAL LABORATORY FROM THE 1967 SOIL CONSERVATION SERVICE CONSERVATION NEEDS INVENTORY

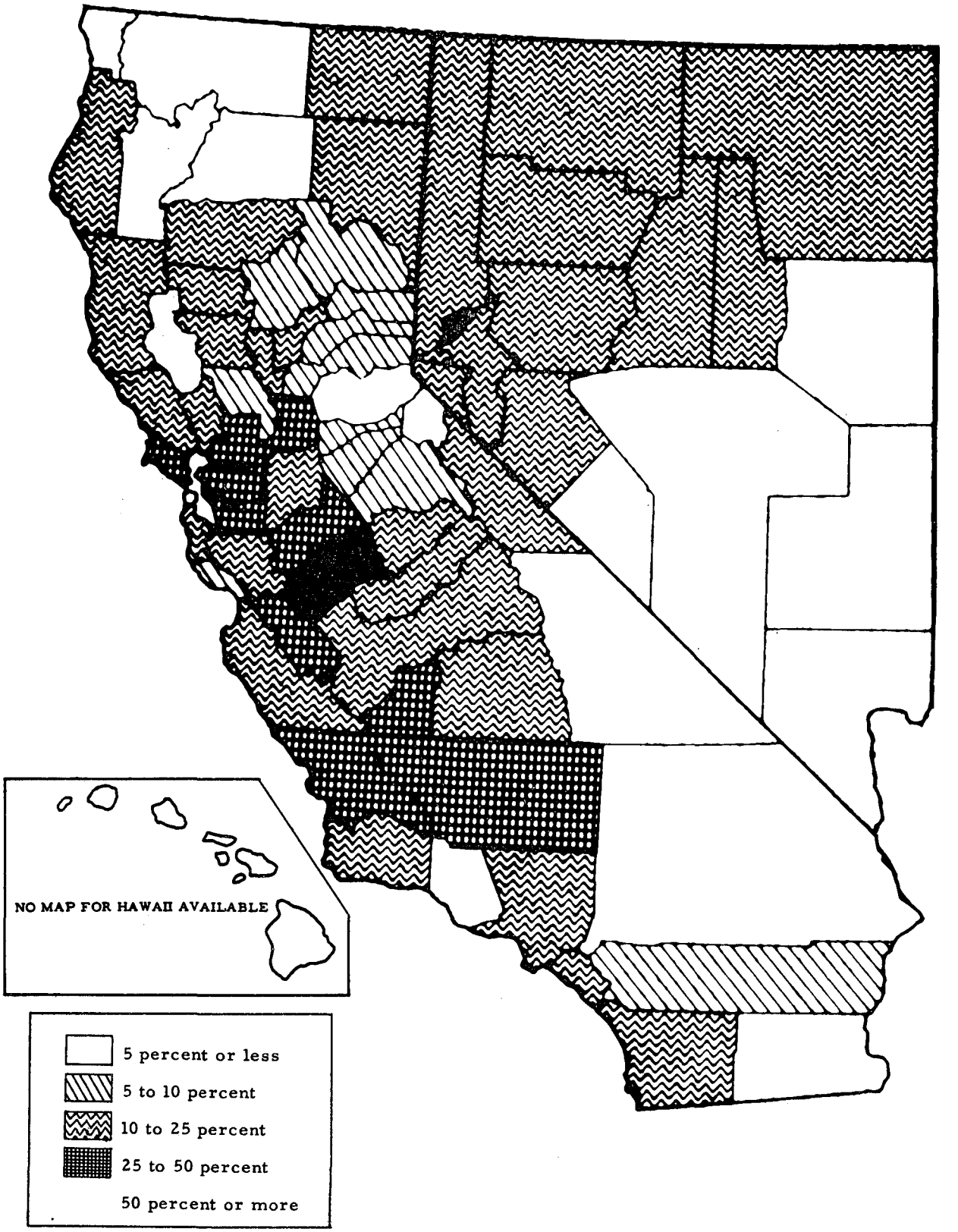


FIGURE II-80 PASTURE AND RANGELAND, 1967

SOURCE: PROVIDED BY THE OAK RIDGE NATIONAL LABORATORY FROM THE 1967 SOIL CONSERVATION SERVICE CONSERVATION NEEDS INVENTORY

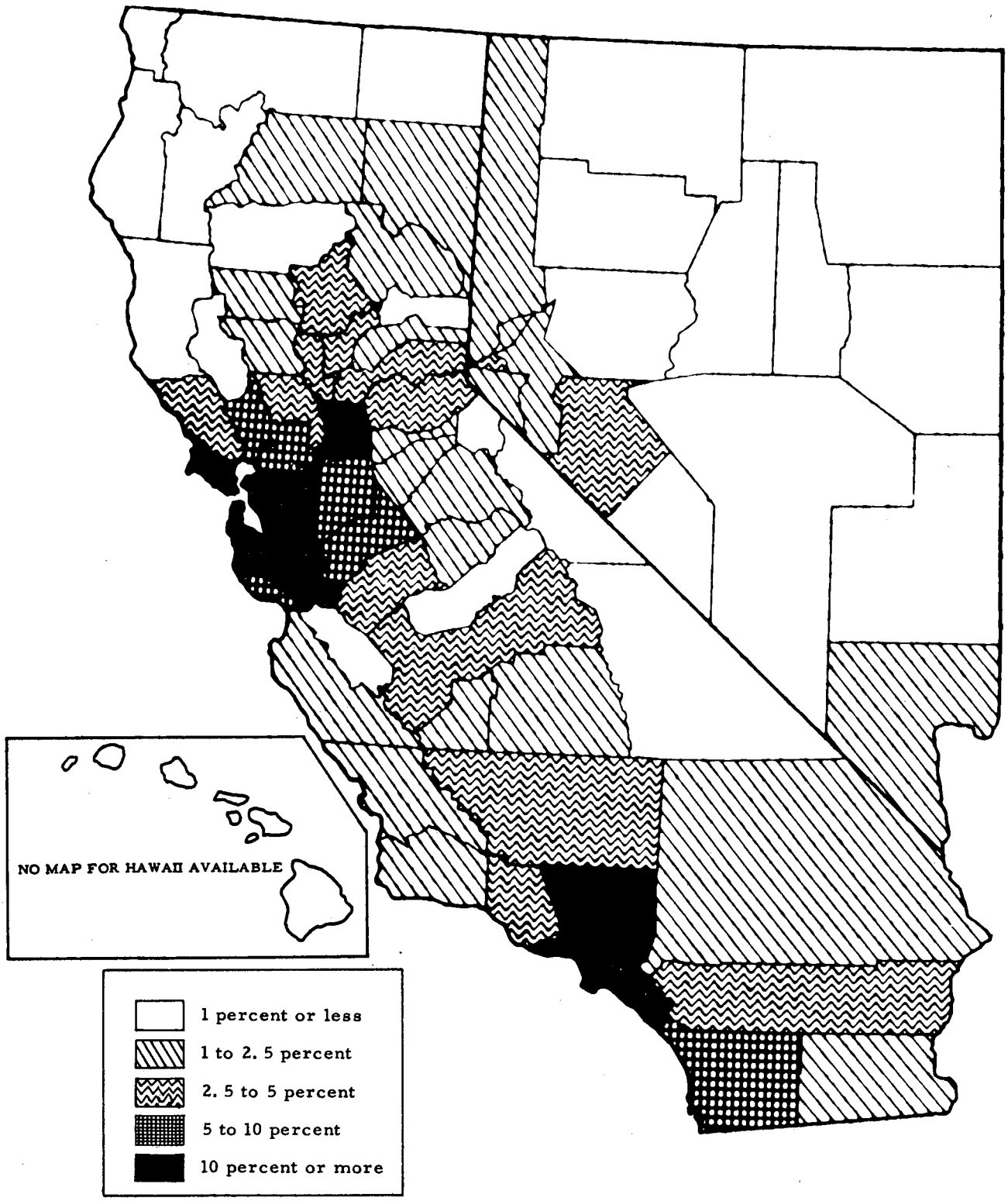
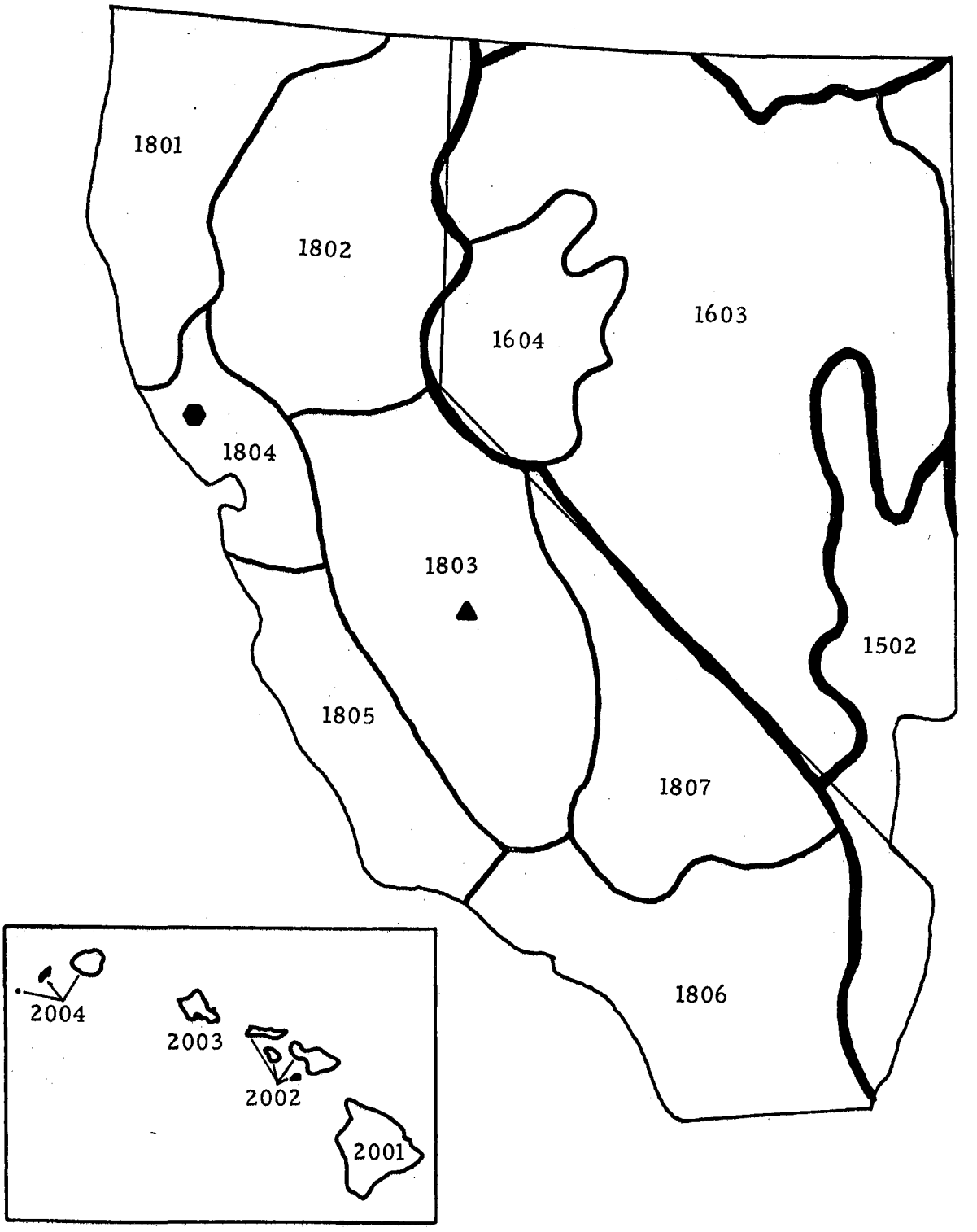


FIGURE II-81 URBAN LAND, 1967

SOURCE: PROVIDED BY THE OAK RIDGE NATIONAL LABORATORY FROM THE 1967 SOIL CONSERVATION SERVICE CONSERVATION NEEDS INVENTORY



Location of Specific Impacts*

⬢ Urban and residential areas with unresolved drainage problems.
▲ Irrigated areas with major drainage problems.

*Identified by State/Regional study teams.

FIGURE II-82 RESTRICTED LAND USE FROM WET SOILS

SOURCE: U. S. WATER RESOURCES COUNCIL, NATIONAL CONFERENCE ON WATER, 1977

TABLE II-20
MAJOR USES OF LAND, 1969
[IN THOUSANDS OF ACRES]

LAND USE	CALIFORNIA	HAWAII	NEVADA
CROPLAND	10,879	372	783
GRASSLAND, PASTURE AND RANGELAND	22,856	987	48,638
FORESTLAND	39,826	1,626	7,255
URBAN AREA	3,302	141	135
RURAL TRANSPORTATION	1,143	40	496
RURAL PARKS	7,019	225	927
WILDLIFE REFUGES	183	2	1,701
NATIONAL DEFENSE AND INDUSTRIAL	3,828	176	3,964
STATE INSTITUTIONAL	86	11	6
FARMSTEADS, FARM ROADS AND LANES	273	22	14
OTHER	10,676	510	6,409
APPROXIMATE TOTAL	100,071	4,112	70,328

SOURCE - U.S. DEPARTMENT OF AGRICULTURE, ECONOMIC RESEARCH SERVICE

NOTES - CROPLAND INCLUDES ONLY ACREAGE IN CROP ROTATION. FORESTLAND EXCLUDES RESERVED AREAS IN PARKS OR DUPLICATED IN OTHER CATEGORIES. OTHER INCLUDES MISCELLANEOUS AREAS WITH LOW VALUE AGRICULTURAL USE SUCH AS MARSHES, OPEN SWAMPS AND BARE ROCK AREAS.

TABLE II-21
AREA OF RANGELAND AND NON-COMMERCIAL FORESTS, 1970
[IN THOUSANDS OF ACRES]

TYPE OF LAND	CALIFORNIA	HAWAII	NEVADA
MOUNTAIN GRASSLANDS	4,293	0	7,436
DESERT GRASSLANDS	0	0	70
ANNUAL GRASSLANDS	6,700	0	0
MOUNTAIN MEADOWS	847	0	13
ALPINE	1,512	0	2
SAGE BRUSH	2,949	0	27,238
DESERT SHRUB	8,559	0	21,319
CHAPARRAL MOUNTAIN SHRUB	13,651	0	2,829
PINYON JUNIPER	1,819	0	4,518
TOTAL	40,330	0	63,425

SOURCE - U.S. FOREST SERVICE, THE NATIONS RENEWABLE RESOURCES, 1975

TABLE II-22
LAND IN FARMS, 1974
[IN THOUSANDS OF ACRES, EXCEPT PERCENT]

REGION	LAND IN FARMS	PERCENT IN FARMS	TOTAL CROPLAND	TOTAL WOODLAND	OTHER LAND
CALIFORNIA	33,385	33.4	10,630	1,522	21,234
HAWAII	2,119	51.5	353	201	1,566
NEVADA	10,814	15.4	753	34	10,026
REGION TOTAL	46,318	23.6	11,735	1,757	32,826
UNITED STATES	1,017,030	44.9	440,039	92,528	484,464
PERCENT OF US	4.6	---	2.7	1.9	6.8

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF AGRICULTURE, 1974

TABLE II-23
LIVESTOCK ON FARMS, 1975
[IN THOUSANDS]

REGION	ALL CATTLE	MILK COWS	SHEEP AND LAMBS	HOGS AND PIGS
CALIFORNIA	5,200	800	1,100	138
HAWAII	250	13	0	58
NEVADA	657	14	151	10
REGION TOTAL	6,107	827	1,251	206
UNITED STATES	131,826	11,121	14,152	49,602
PERCENT OF US	4.6	7.4	8.8	0.4

SOURCE - U.S. DEPARTMENT OF AGRICULTURE, STATISTICAL REPORTING SERVICE, ANNUAL LIVESTOCK SUMMARIES

TABLE II-24
PRODUCTION OF MAJOR CROPS, 1976
[IN THOUSANDS]

CROP	ACREAGE	VOLUME OF PRODUCTION	
CALIFORNIA			
ALMONDS	259	230	TONS
BARLEY	1,010	1,357	TONS
CORN	305	893	TONS
COTTON	1,120	1,644	TONS
GRAPE	583	3,620	TONS
HAY	1,630	7,554	TONS
RICE	420	1,169	TONS
SUGAR BEETS	312	8,892	TONS
TOMATOES	263	5,405	TONS
WHEAT	940	1,672	TONS
HAWAII			
COFFEE	2.4	8,040	LBS
FRUIT (EXCEPT PINEAPPLE)	5.0	36,087	LBS
MACADAMIA NUTS (IN SHELL)	10.3	8,726	LBS
PINEAPPLES	48.0	1,006	TONS
SUGAR CANE (UNPROCESSED)	221.6	10,970	TONS
VEGETABLES AND MELONS	3.6	56,707	LBS
NEVADA			
BARLEY	18	864	BUSHELS
HAY	460	939	TONS
OATS	10	144	BUSHELS
POTATOES	14	266	TONS
WHEAT	34	1,667	BUSHELS

SOURCE - CALIFORNIA STATISTICAL ABSTRACT, 1977; HAWAII DATA BOOK, 1977; U.S DEPARTMENT OF AGRICULTURE, CROP PRODUCTION 1977 ANNUAL SURVEY

NOTES - OTHER IMPORTANT CROPS IN CALIFORNIA INCLUDE LETTUCE, NURSERY PRODUCTS, FLOWERS AND FOLIAGE PLANTS, CITRUS FRUIT AND STRAWBERRIES.

TABLE II-25
ACREAGE OF MAJOR CROPS, 1974
[IN THOUSANDS OF ACRES]

REGION	CORN	WHEAT	COTTON	IRISH POTATOES	HAY	VEGE-TABLES	ORCHARDS	BERRIES
CALIFORNIA	354.2	792.9	1,150.3	60.4	1,145.1	740.4	1,169.8	11.8
HAWAII	1.2	0.0	0.0	0.2	2.3	2.6	16.0	0.0
NEVADA	2.8	28.2	1.7	7.6	470.7	0.6	0.3	0.0
REGION TOTAL	358.1	821.1	1,152.0	68.3	1,618.0	743.6	1,186.1	11.8
UNITED STATES	65,357	65,613	12,567	1,391	56,236	3,124	4,190	121
PERCENT OF US	0.5	1.3	9.2	4.9	3.5	23.8	42.6	9.8

SOURCE - U.S. BUREAU OF THE CENSUS, 1974 CENSUS OF AGRICULTURE

II-E-3 LAND OWNERSHIP

THE DATA ON LAND OWNERSHIP PRESENTED IN THIS SECTION ARE CLASSIFIED INTO FOUR MAJOR CATEGORIES - FEDERAL, STATE AND LOCAL, INDIAN LAND, AND PRIVATE LAND. UNDER FEDERAL LAND ARE INCLUDED MAPS OF NATIONAL PARKS, WILDERNESS AREAS, WILDLIFE REFUGES, AND WILD AND SCENIC RIVERS. ACREAGE OF FEDERALLY OWNED LAND IS TABULATED BY AGENCY. OTHER TABLES PRESENT DATA ON MANAGEMENT OF STATE LANDS, STATE PROTECTED WILDLIFE HABITATS, AND THE EXTENT OF INDIAN RESERVATIONS.

THE MAPS ARE TAKEN FROM A USDA REPORT ENTITLED THE NATIONS RENEWABLE RESOURCES. THE TABULAR DATA ARE FROM FEDERAL AND STATE SOURCES.

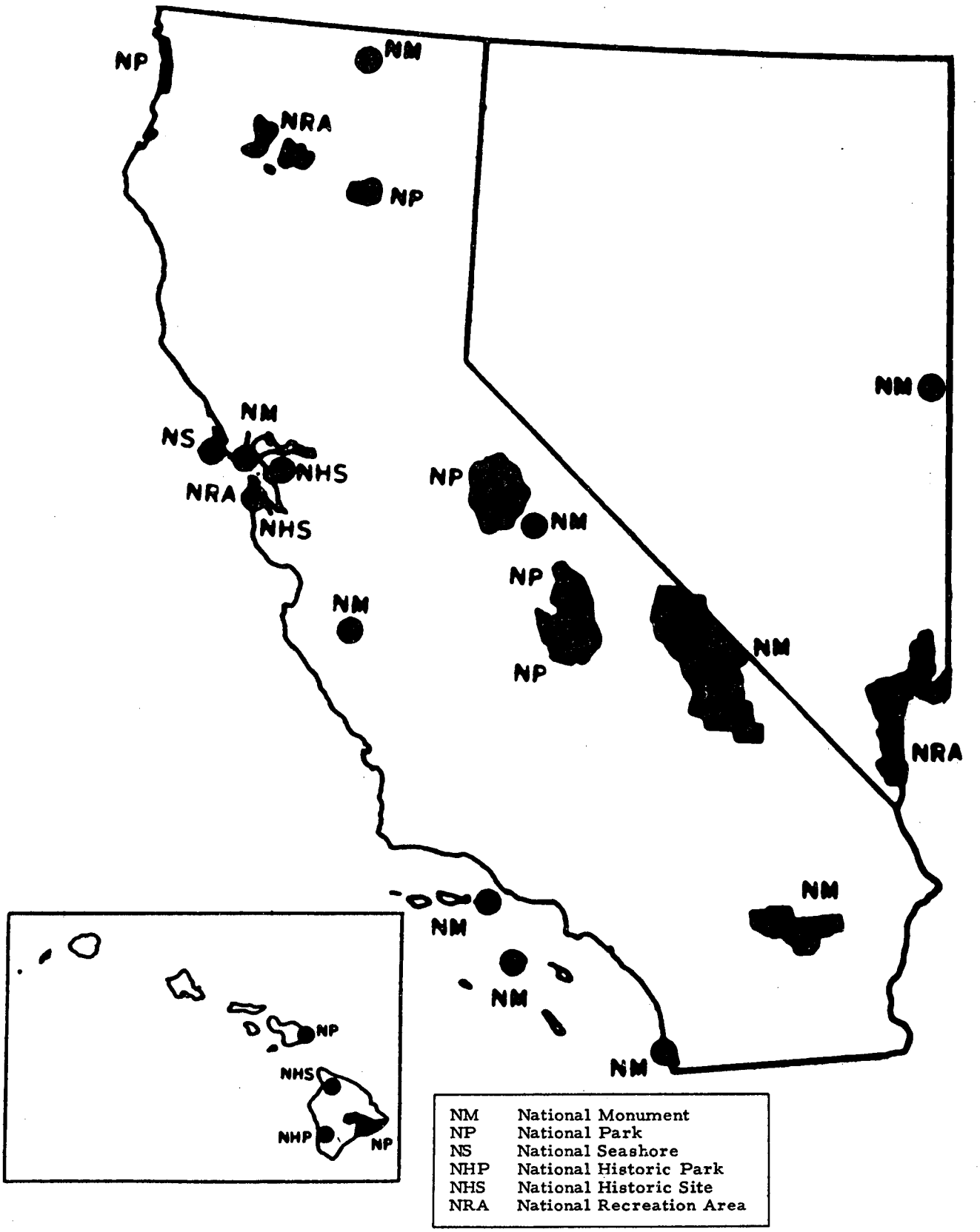


FIGURE II-83 NATIONAL PARK SYSTEM

SOURCE: U. S. FOREST SERVICE, THE NATION'S RENEWABLE RESOURCES--AN ASSESSMENT 1975 FOREST RESOURCE REPORT #21, JUNE 1977

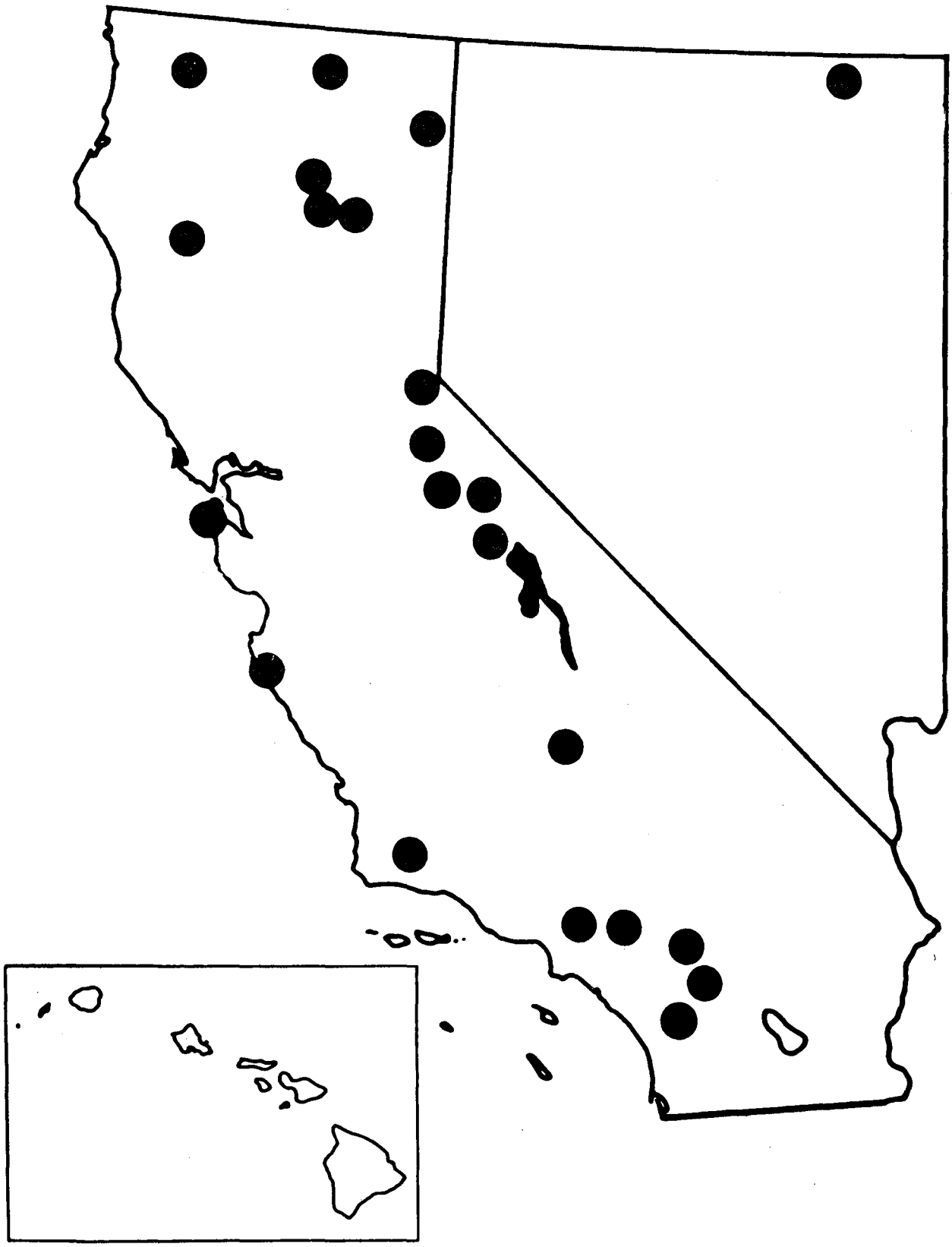


FIGURE II-84 PRESENT WILDERNESS SYSTEM, 1975

SOURCE: U. S. FOREST SERVICE, THE NATION'S RENEWABLE RESOURCES--AN ASSESSMENT 1975 FOREST RESOURCE REPORT #21, JUNE 1977

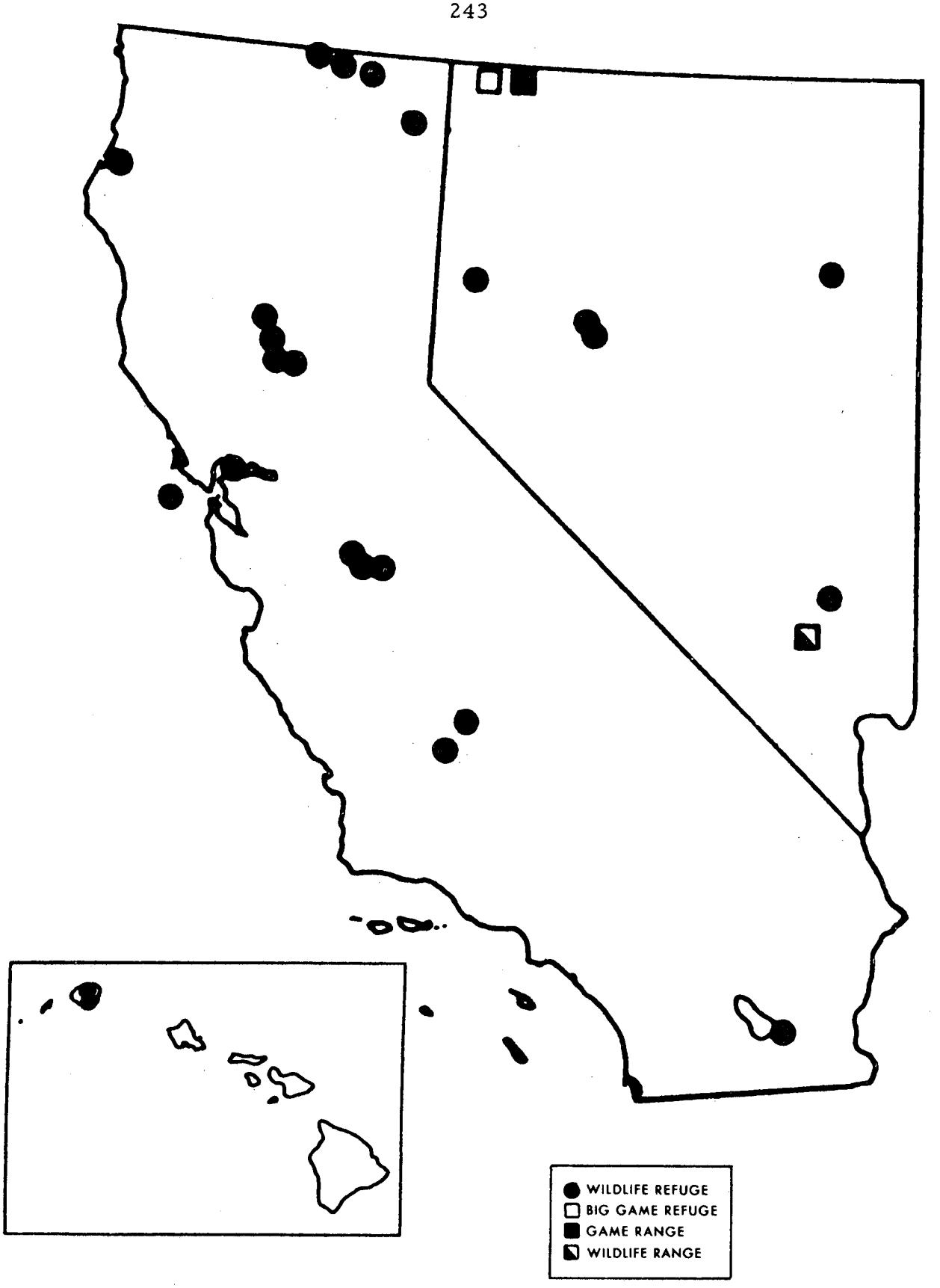


FIGURE II-85 NATIONAL WILDLIFE REFUGES, 1974

SOURCE: U. S. FOREST SERVICE, THE NATION'S RENEWABLE RESOURCES--AN ASSESSMENT 1975 FOREST RESOURCE REPORT #21, JUNE 1977

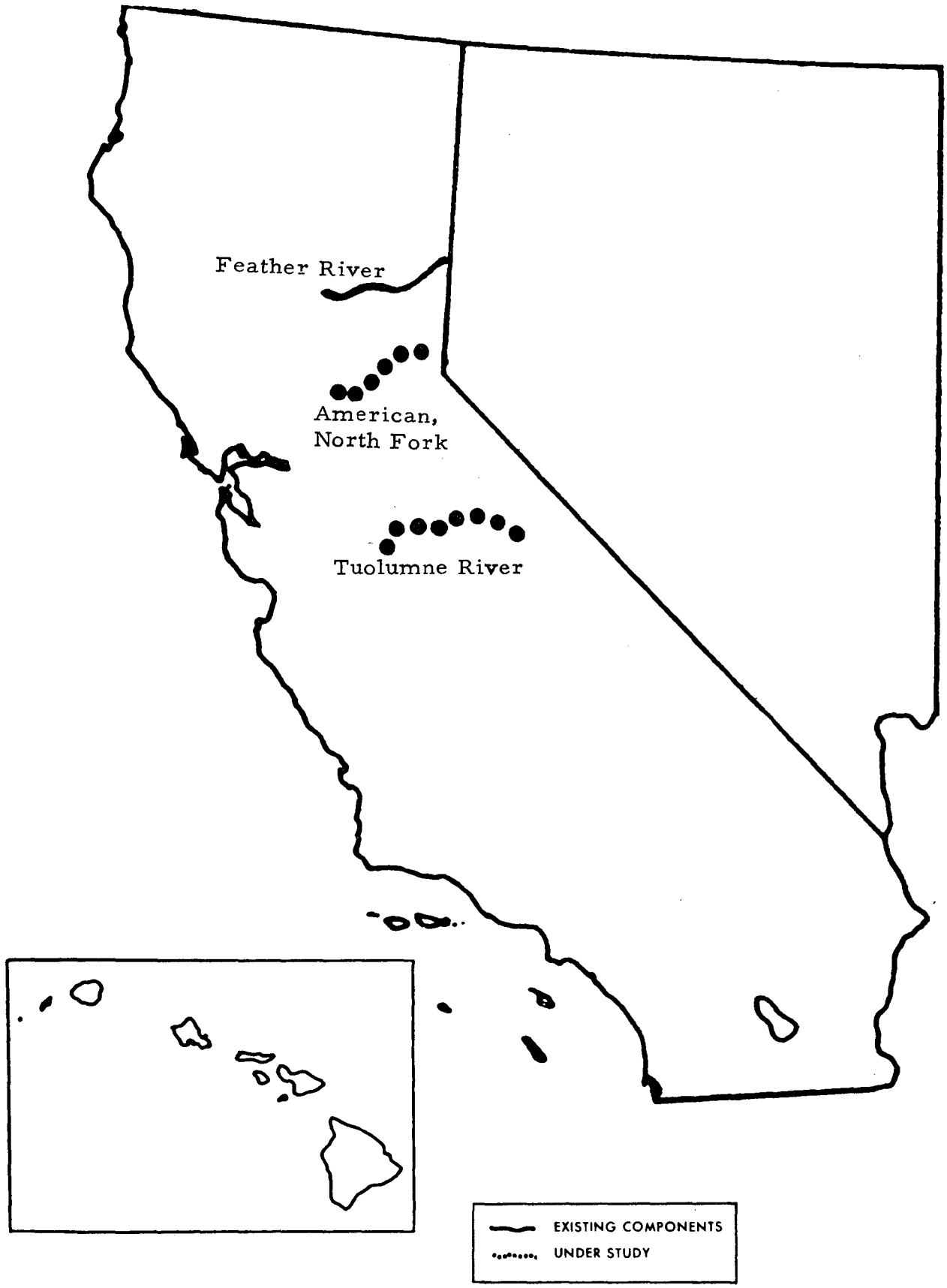


FIGURE II-86 NATIONAL WILD AND SCENIC RIVER SYSTEM, 1975

SOURCE: U. S. FOREST SERVICE, THE NATION'S RENEWABLE RESOURCES--AN ASSESSMENT 1975 FOREST RESOURCE REPORT #21, JUNE 1977

TABLE II-26
FEDERALLY OWNED LAND AS OF 30 JUL 1975
[IN THOUSANDS OF ACRES]

FEDERAL AGENCY	CALIFORNIA	HAWAII	NEVADA
DEPARTMENT OF AGRICULTURE	20,234.8	0.0	5,112.6
FOREST SERVICE	20,234.8	0.0	0.0
ATOMIC ENERGY COMMISSION	7.7	0.0	819.6
DEPARTMENT OF COMMERCE	(Z)	0.2	0.0
FEDERAL COMMUNICATIONS COMMISSION	0.1	(Z)	0.0
GENERAL SERVICES ADMINISTRATION	1.5	(Z)	(Z)
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE	(Z)	(Z)	0.0
DEPARTMENT OF THE INTERIOR	21,025.2	241.5	51,768.3
FISH AND WILDLIFE SERVICE	68.9	3.1	2,202.0
BUREAU OF LAND MANAGEMENT	15,577.9	0.0	48,375.7
NATIONAL PARK SERVICE	4,258.1	238.4	262.3
BUREAU OF RECLAMATION	1,120.0	0.0	920.3
DEPARTMENT OF DEFENSE	3,997.6	161.7	3,117.8
AIR FORCE	471.3	5.3	2,896.9
ARMY	1,005.7	107.0	8.3
NAVY	2,395.7	49.4	212.0
CORPS OF ENGINEERS	124.9	(Z)	0.7
DEPARTMENT OF TRANSPORTATION	5.5	1.9	2.0
OTHER	5.3	0.1	0.1
TOTAL	45,277.8	405.5	60,820.4
PERCENT OF STATE AREA	45.2	9.9	86.5

SOURCE - U.S. BUREAU OF LAND MANAGEMENT, PUBLIC LAND STATISTICS, 1976

NOTES - (Z) LESS THAN 50 ACRES

TABLE II-27
NATIONAL PARKS AND AFFILIATED AREAS, 1977
[AREA IN ACRES]

	NAME OF AREA	AREA
	CALIFORNIA	
1	CABRILLO NATIONAL MONUMENT	144
2	CHANNEL ISLANDS NATIONAL MONUMENT	18,388
3	DEATH VALLEY NATIONAL MONUMENT	1,938,135
4	DEVILS POSTPILE NATIONAL MONUMENT	798
5	FORT POINT NATIONAL HISTORICAL SITE	29
6	GOLDEN GATE NATIONAL RECREATION AREA	34,938
7	JOHN MUIR NATIONAL HISTORICAL SITE	9
8	JOSHUA TREE NATIONAL MONUMENT	559,960
9	KINGS CANYON NATIONAL PARK	460,136
10	LASSEN VOLCANIC NATIONAL PARK	106,372
11	LAVA BEDS NATIONAL MONUMENT	46,821
12	MUIR WOODS NATIONAL MONUMENT	554
13	PINNACLES NATIONAL MONUMENT	16,216
14	POINT REYES NATIONAL SEASHORE	65,300
15	REDWOOD NATIONAL PARK	62,211
16	SEQUOIA NATIONAL PARK	386,823
17	WHISKEYTOWN-SHASTA-TRINITY NATIONAL RECREATION AREA	42,497
18	YOSEMITE NATIONAL PARK	760,917
	HAWAII	
1	CITY OF REFUGE NATIONAL HISTORICAL PARK	182
2	HALEAKALA NATIONAL PARK	28,072
3	HAWAII VOLCANOES NATIONAL PARK	229,177
4	PUULOHOLA HEIAU NATIONAL HISTORIC SITE	77
	NEVADA	
1	DEATH VALLEY NATIONAL MONUMENT	110,813
2	LAKE MEAD NATIONAL RECREATION AREA	1,496,601
3	LEHMAN CAVES NATIONAL MONUMENT	640

SOURCE - U.S. NATIONAL PARK SERVICE, INDEX OF THE NATIONAL PARK SYSTEM AND AFFILIATED AREAS AS OF JUNE 30, 1977

NOTES - AREA INCLUDES BOTH FEDERAL AND NON-FEDERAL LANDS.
DEATH VALLEY NATIONAL MONUMENT HAS A TOTAL AREA OF 2,048,948 ACRES IN CALIFORNIA AND NEVADA.

TABLE II-28
MANAGEMENT OF STATE LAND, 1977
[AREA IN THOUSANDS OF ACRES]

REGION	TOTAL	PARKS	FORESTS	FISH AND WILDLIFE	OTHER
CALIFORNIA	1,117	916	75	126	0
HAWAII	1,659	15	808	836	0
NEVADA	169	121	0	48	0
REGION TOTAL	2,945	1,051	884	1,010	0
UNITED STATES	78,004	5,528	26,503	9,142	36,831
PERCENT OF US	3.8	19.0	3.3	11.0	0.0

SOURCE - U.S. FOREST SERVICE, LAND MANAGEMENT PLANNING UNIT (UNPUBLISHED)

NOTES - FOREST LAND INCLUDES MULTIPLE USE LAND

TABLE II-29
STATE PROTECTED WILDLIFE HABITAT, 1975
[IN THOUSANDS OF ACRES]

REGION	AREAS MANAGED FOR WILDLIFE	FORESTS AND PARKS	NATURAL AREAS	TOTAL WILDLIFE HABITAT
CALIFORNIA	130	0	1	131
HAWAII	484	309	12	806
NEVADA	43	0	0	43
REGION TOTAL	657	309	13	980

SOURCE - PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY

TABLE II-30
FEDERAL AND STATE INDIAN RESERVATIONS, 1972
[AREA IN THOUSANDS OF ACRES]

REGION	NO. OF RESER-VATIONS	TRIBALLY OWNED ACREAGE	ALLOTTED ACREAGE	NO. OF TRIBES	NO. OF PERSONS
CALIFORNIA	76	387.0	67.4	7	6,903
HAWAII	0	0.0	0.0	0	0
NEVADA	23	1,133.5	32.7	3	4,784

SOURCE - WORLD ALMANAC AND BOOK OF FACTS, 1978, NEWSPAPER ENTERPRISE ASSOCIATION INC.

NOTES - ACREAGE DATA ARE APPROXIMATIONS. MOST TRIBALLY OWNED LAND LISTED HERE IS OWNED BY TRIBAL ORGANIZATIONS, BUT SOME OF IT IS HELD IN TRUST BY THE GOVERNMENT AND SOME IS LEASED TO OR OCCUPIED BY NON-INDIANS. GOVERNMENT OWNED LAND, EVEN THAT HELD FOR THE EXCLUSIVE USE OF INDIANS, AND NON-INDIAN LAND FORMALLY INCLUDED IN RESERVATIONS IS NOT COUNTED HERE.

ALLOTTED LAND WAS THE LAND HELD BY INDIAN INDIVIDUALS OR FAMILIES. IT IS NOT CLEAR FROM THE DEPARTMENT OF COMMERCE DATA WHETHER ALL LAND LISTED AS ALLOTTED IS STILL HELD BY INDIANS.

MANY CALIFORNIA INDIANS ARE HISTORICALLY ASSOCIATED WITH GROUPS THAT SETTLED NEAR SPANISH MISSIONS WHERE MUCH OF THE TRADITIONAL CULTURE WAS DESTROYED. MANY OF THESE BANDS, HOWEVER, STILL RETAIN SOME OF THEIR LANGUAGE AND CUSTOMS. EXCLUDING THE BANDS, THERE ARE 22 TRIBES REPRESENTED ON CALIFORNIA RESERVATIONS.

TABLE II-31
PUBLIC AND PRIVATE LAND
[IN THOUSANDS OF ACRES]

REGION	FEDERAL	STATE	COUNTY	PRIVATE	OTHER
CALIFORNIA	44,048	2,505	759	51,779	2,472
HAWAII	297	1,400	2	2,347	0
NEVADA	60,407	404	192	8,798	990
REGION TOTAL	104,752	4,309	953	62,924	3,462
PERCENT OF AREA	59.4	2.4	0.5	35.7	2.0

SOURCE - CALIFORNIA STATE LANDS COMMISSION, PUBLIC LAND OWNERSHIP IN CALIFORNIA, 1977; HAWAII DATA BOOK, 1977; NEVADA COUNTY DATA FILES, 1975

NOTES - DATA ARE FOR THE FOLLOWING YEARS - CALIFORNIA 1977, HAWAII 1971-74, NEVADA 1966. OTHER INCLUDES MUNICIPAL AND INDIAN LANDS.

II-F BIOTA

II-F-1 FLORA

THE TABLES IN THIS SECTION DESCRIBE THE PLANT LIFE IN THE REGION. THE DATA ON FORESTS INCLUDE ACREAGE, GROWING STOCK AND SAWTIMBER. ENDANGERED SPECIES OF PLANTS ARE TABULATED BY PLANT FAMILY. MAPS ARE ALSO PRESENTED SHOWING THE DISTRIBUTION OF FORESTS AND OTHER VEGETATION IN THE REGION.

THE DATA ON FORESTS ARE FROM THE U.S. FOREST SERVICE AND STATE OF HAWAII PUBLICATIONS. DATA ON ENDANGERED PLANTS ARE FROM THE FEDERAL REGISTER. THE MAPS COME FROM THE NATIONAL ATLAS, EXCEPT FOR THE SEPARATELY PUBLISHED MAP OF BAILEY ECOREGIONS.

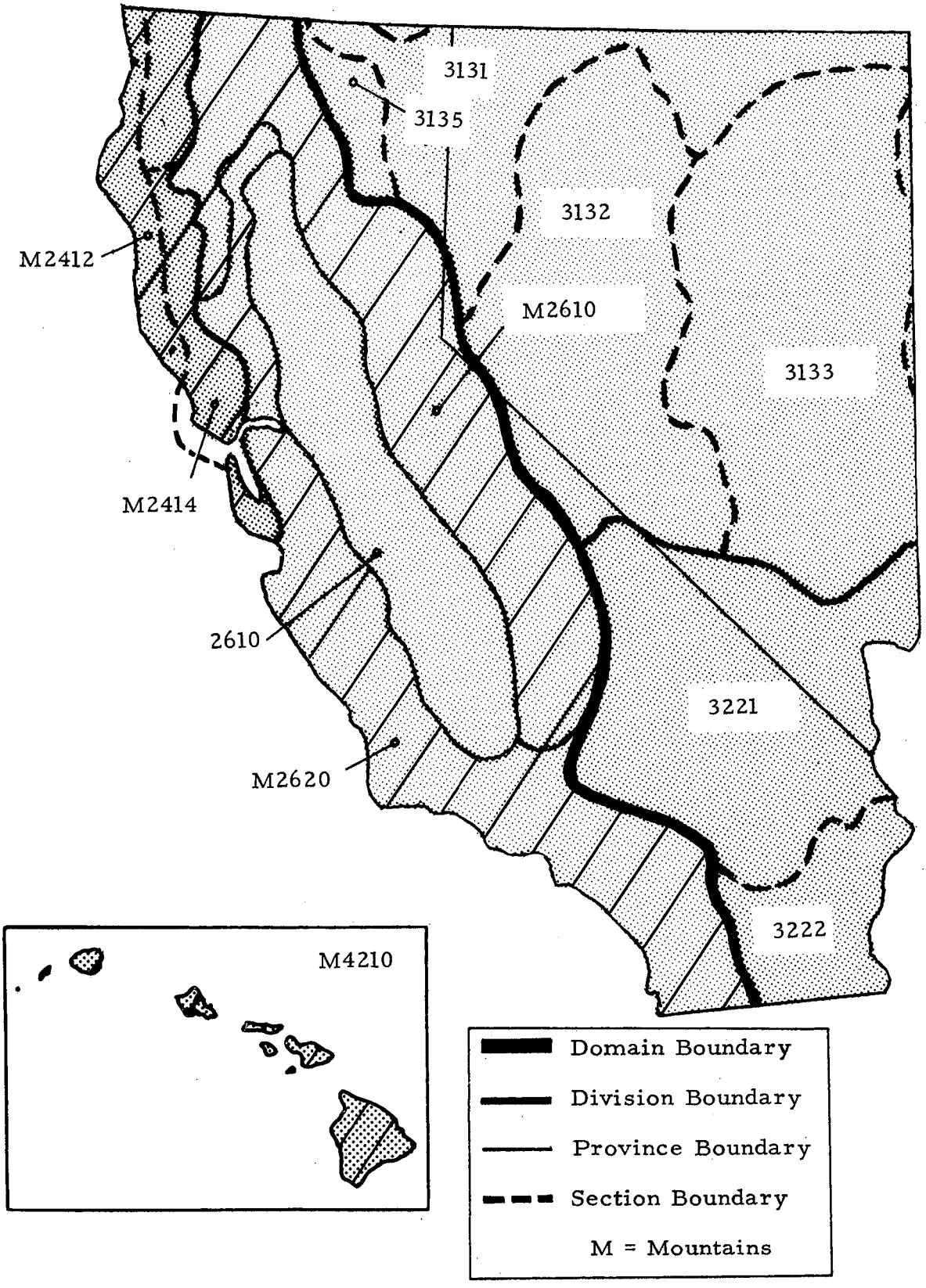


FIGURE 11-87 BAILY ECOREGIONS

SOURCE: U.S. FOREST SERVICE, ECOREGIONS OF THE UNITED STATES, 1976

DOMAIN	DIVISION	LOWLAND ECOREGIONS		HIGHLAND ECOREGIONS*	
		PROVINCE	SECTION	PROVINCE	SECTION
2000 HUMID TEMPERATE	2400 MARITIME			M2410 PACIFIC FOREST	M2412 REDWOOD FOREST M2414 CALIFORNIA MIXED EVERGREEN FOREST
	2600 MEDITERRANEAN (DRY - SUMMER SUBTROPICAL)	2610 CALIFORNIA GRASSLAND		M2610 SIERRAN FOREST M2620 CALIFORNIA CHAPARRAL	
3000 DRY	3100 STEPPE	3130 INTERMOUNTAIN SAGEBRUSH	3131 SAGEBRUSH - WHEATGRASS 3132 LAHONTAN SALTBUSH-GREASEWOOD 3133 GREAT BASIN SAGEBRUSH 3135 PONDEROSA SHRUB FOREST		
	3200 DESERT	3220 AMERICAN DESERT (MOJAVE-COLORADO-SONORAN)	3221 CREOSOTE BUSH 3222 CREOSOTE BUSH - BUR SAGE		
4000 HUMID TROPICAL	4200 RAINFOREST			M4210 HAWAIIAN ISLANDS	

*Key to letter symbol: M - mountains

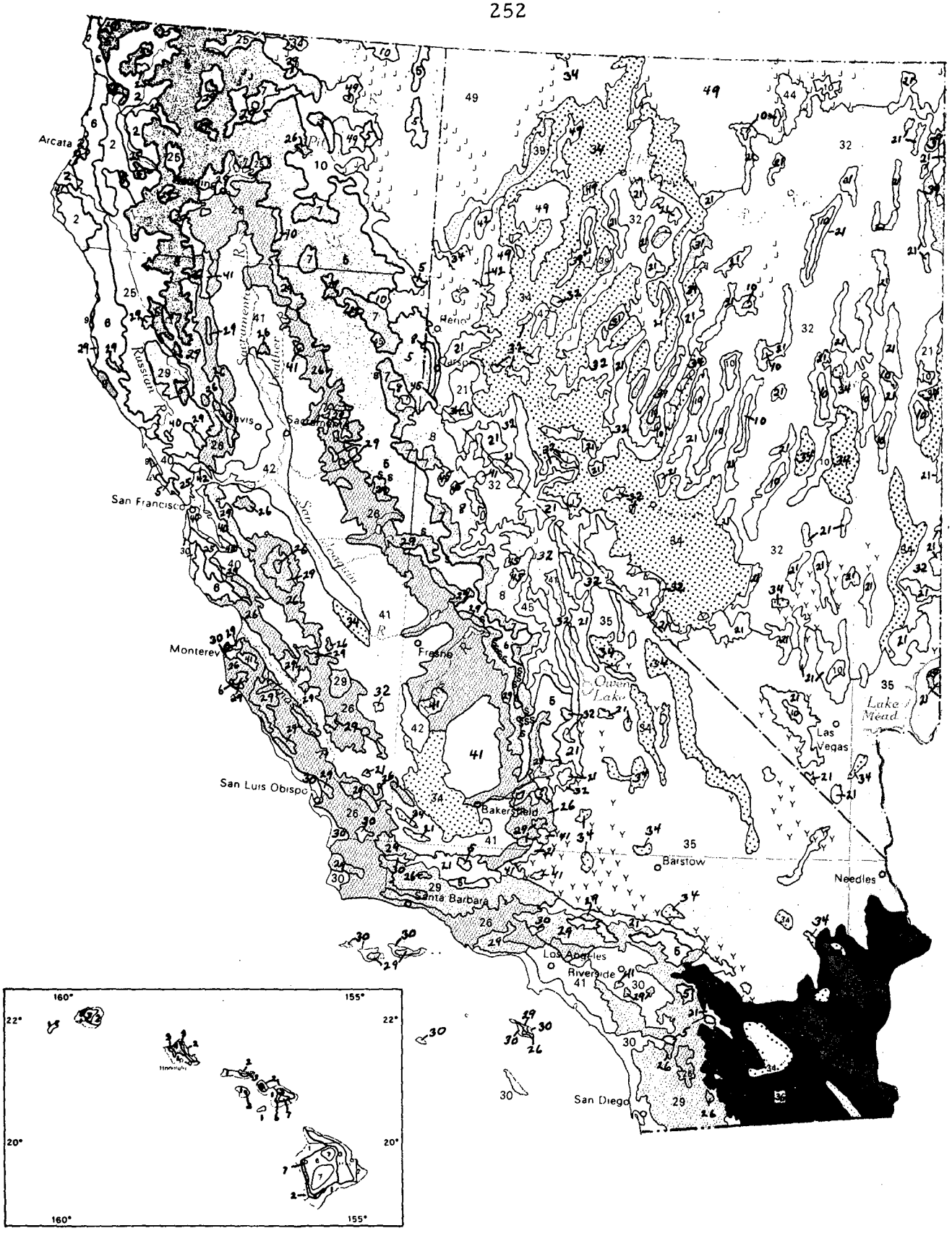


FIGURE II-88 POTENTIAL NATURAL VEGETATION

SOURCE: U. S. GEOLOGICAL SURVEY, NATIONAL ATLAS OF THE UNITED STATES, 1971

WESTERN FORESTS

NEEDLELEAF FORESTS

2 Cedar-hemlock-Douglas fir forest
(Thuja-Tsuga-Pseudotsuga)

5 Mixed conifer forest
(Abies-Pinus-Pseudotsuga)

6 Redwood forest
(Sequoia-Pseudotsuga)

7 Red fir forest
(Abies)

8 Lodgepole pine-subalpine forest
(Pinus-Tsuga)

9 Pine-cypress forest
(Pinus-Cupressus)

10 Western ponderosa forest
(Pinus)

21 Juniper-pinyon woodland
(Juniperus-Pinus)

BROADLEAF AND NEEDLELEAF FORESTS

25 California mixed evergreen forest
(Quercus-Arbutus-Pseudotsuga)

26 California oakwoods
(Quercus)

WESTERN SHRUB AND GRASSLAND

SHRUB

29 Chaparral
(Adenostoma-Arctostaphylos-Ceanothus)

30 Coastal sagebrush
(Salvia-Eriogonum)

31 Mountain mahogany-oak scrub
(Cercocarpus-Quercus)

32 Great Basin sagebrush
(Artemisia)

34 Saltbush-greasewood
(Atriplex-Sarcobatus)

35 Creosote bush
(Larrea)

36 Creosote bush-bur sage
(Larrea-Franseria)

39 Desert: vegetation largely absent

GRASSLAND

40 Fescue-oatgrass
(Festuca-Danthonia)

41 California steppe
(Stipa)

42 Tule marshes
(Scirpus-Typha)

45 Alpine meadows and barren
(Agrostis, Carex, Festuca, Poa)

SHRUB AND GRASSLAND COMBINATIONS

49 Sagebrush steppe
(Artemisia-Agropyron)

POTENTIAL NATURAL VEGETATION OF HAWAII

1 Sclerophyllous forest, shrubland, and grassland
(Heteropogon-Opuntia-Prosopis)

2 Guava mixed forest
(Aleurites-Hibiscus-Mangifera-Psidium-Schinus)

3 Ohia lehua forest
(Metrosideros-Cibotium)

4 Lama-manele forest
(Diospyros-Sapindus)

5 Koa forest
(Acacia)

6 Koa-mamani parkland
(Acacia-Deschampsia-Myoporum-Sophora)

7 Grassland, microphyllous shrubland, and barren
(Deschampsia-Styphelia-Vaccinium)

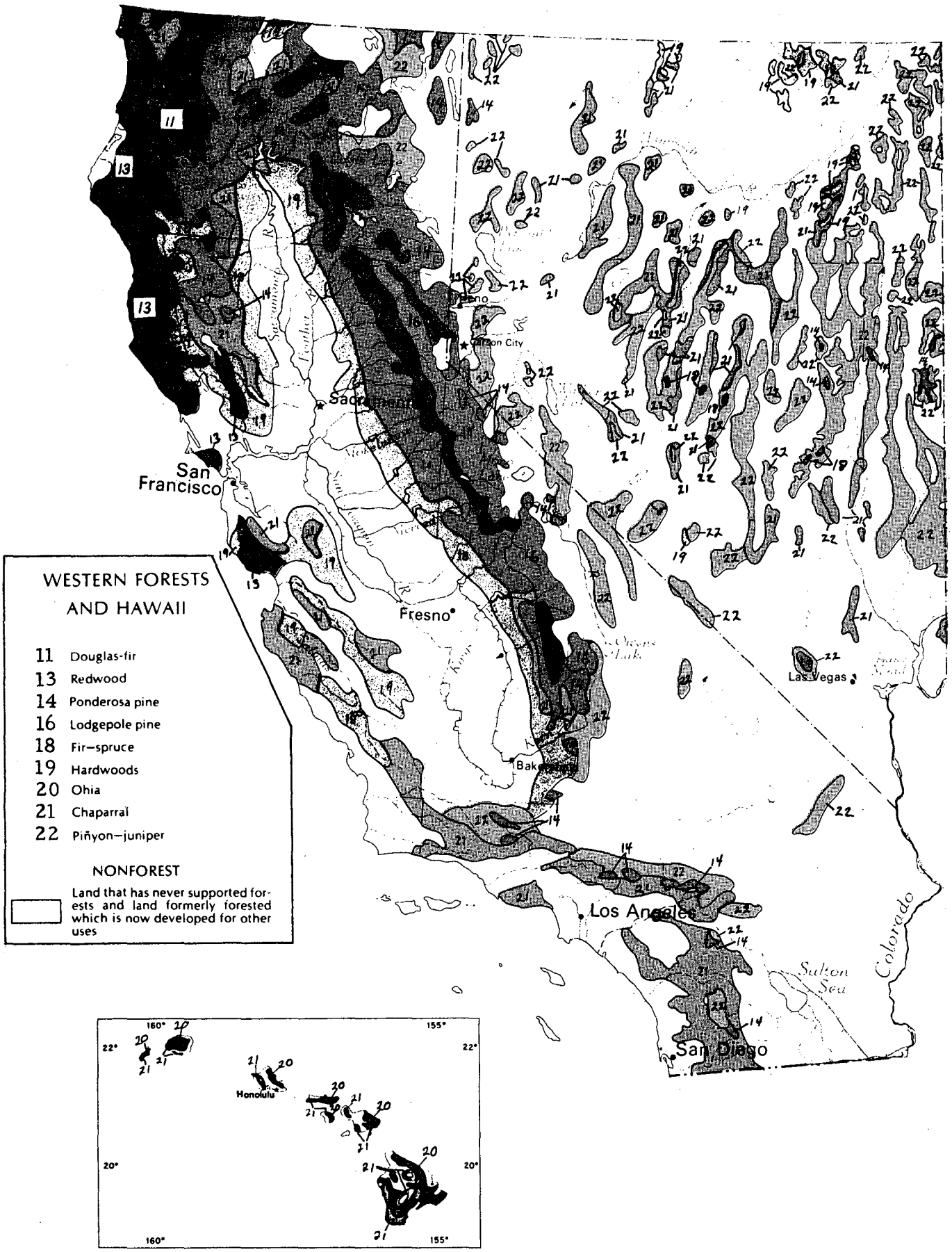


FIGURE II-89 FOREST TYPES

SOURCE: U. S. GEOLOGICAL SURVEY, NATIONAL ATLAS OF THE UNITED STATES, 1971

TABLE II-32
FOREST TYPES, 1970
[IN THOUSANDS OF ACRES]

TYPE OF FOREST	ACREAGE
CALIFORNIA	
DOUGLAS FIR	3,552
PONDEROSA PINE	7,748
WESTERN WHITE PINE	26
FIR - SPRUCE	3,489
HEMLOCK - SITKA SPRUCE	35
LODGEPOLE PINE	426
REDWOOD	923
HARDWOODS	10,009
TOTAL	16,208
HAWAII	
OHIA	174
OHIA - KOA	426
KOA	19
MONKEY POD	2
KUKUL	6
OTHER	13
SHRUB TYPES	261
TOTAL	902
NEVADA	
DOUGLAS FIR	21
PONDEROSA PINE	103
WESTERN WHITE PINE	168
FIR - SPRUCE	143
HEMLOCK - SITKA SPRUCE	61
LODGEPOLE PINE	13
HARDWOODS	29
TOTAL	538

SOURCE - U.S. FOREST SERVICE, THE NATIONS RENEWABLE RESOURCES, 1975; HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES, FORESTRY POTENTIAL FOR HAWAII, 1976

TABLE II-33
GROWING STOCK ON COMMERCIAL TIMBERLAND, 1970
[IN MILLIONS OF CUBIC FEET].

REGION	NET ANNUAL GROWTH	ANNUAL REMOVALS	NET VOLUME		
			TOTAL	SOFTWOOD	HARDWOOD
CALIFORNIA	630	927	54,251	51,152	3,099
HAWAII	0	2	239	4	235
NEVADA	2	0	250	237	13
REGION TOTAL	632	929	54,740	51,393	3,347
UNITED STATES	18,568	14,033	648,879	431,874	217,005
PERCENT OF US	3.4	6.6	8.4	11.9	1.5

SOURCE - U.S. FOREST SERVICE, THE OUTLOOK FOR TIMBER IN THE UNITED STATES, 1973

NOTES - GROWING STOCK INCLUDES ALL LIVE SAWTIMBER TREES, POLETIMBER TREES, SAPLINGS AND SEEDLINGS MEETING SPECIFIED STANDARDS OF VIGOR.

TABLE II-34
SAWTIMBER ON COMMERCIAL TIMBERLAND, 1970
[IN MILLIONS OF CUBIC FEET].

REGION	NET ANNUAL GROWTH	ANNUAL REMOVALS	NET VOLUME		
			TOTAL	SOFTWOOD	HARDWOOD
CALIFORNIA	2,422	5,637	277,554	271,653	5,901
HAWAII	0	11	853	18	835
NEVADA	10	0	1,344	1,320	24
REGION TOTAL	2,432	5,648	297,751	272,991	6,760
UNITED STATES	59,919	62,770	2,420,767	1,905,289	515,478
PERCENT OF US	4.1	9.0	11.6	14.3	1.3

SOURCE - U.S. FOREST SERVICE, THE OUTLOOK FOR TIMBER IN THE UNITED STATES, 1973

NOTES - SAWTIMBER COMPRISES ALL LIVE TREES OF COMMERCIAL SPECIES WHICH CONTAIN AT LEAST ONE SAW LOG OF MINIMUM SPECIFIED SIZE.

TABLE II-35
ENDANGERED SPECIES OF PLANTS

	PLANT FAMILY		NUMBER OF SPECIES OR SUBSPECIES		
	COMMON NAME	SCIENTIFIC NAME	CA	HI	NV
1	ADDERS TONGUE	OPHIOGLOSSACEAE	0	2	0
2	AMARANTH	AMARANTHACEAE	3	30	0
3	ASTER	ASTERACEAE	32	119	2
4	BARBERRY	BERBERDACEAE	2	0	0
5	BELLFLOWER	CAMPANULACEAE	5	69	0
6	BORAGE	BORAGINACEAE	3	0	1
7	BROOMRAPE	OROBANCHACEAE	1	0	0
8	BUCKWHEAT	POLYGONACEAE	27	0	4
9	BUTTERCUP	RANUNCULACEAE	3	0	0
10	CACTUS	CACTACEAE	3	0	0
11	CAPER	CAPPARIDACEAE	0	2	0
12	CHOCOLATE	STERCULIACEAE	1	1	0
13	CLUB MOSS	LYCOPODIACEAE	0	1	0
14	COFFEEBERRY	RHAMNACEAE	4	17	0
15	DOGBANE	APOCYNACEAE	0	7	0
16	ELODEA	HYDROCHARITACEAE	1	0	1
17	EVENING PRIMROSE	ONAGACEAE	9	0	2
18	FERN	POLYPODIACEAE	0	9	0
19	FLAGELLARIA	FLAGELLARIACEAE	0	1	0
20	FLAX	LINACEAE	3	37	1
21	FOUR O CLOCK	NYCTAGINACEAE	1	0	0
22	FUMITORY	FUMIARIACEAE	0	2	0
23	GENTAIN	GENTAINACEAE	1	0	3
24	GERANIUM	GERANIACEAE	0	6	0
25	GESNERIA	GESNERIACEAE	0	89	0
26	GINSENG	ARALIACEAE	0	43	0
27	GOODENIA	GOODENIACEAE	0	3	0
28	GOOSEFOOT	CHENOPODIACEAE	2	0	0
29	GOURD	CUCURBITACEAE	0	1	0
30	GRASS	POACEAE	20	12	0
31	HEATH	ERICACEAE	3	0	0
32	IRIS	IRIDACEAE	1	0	0
33	LAUREL	LAURACEAE	0	1	0
34	LENNOA	LENNOACEAE	1	0	0
35	LILY	LILIACEAE	19	5	0
36	MADDER	RUBIACEAE	10	109	0
37	MALLOW	MALVACEAE	7	26	0
38	MARSILEA	MARSILEACEAE	0	1	0
39	MEADOW FOAM	LIMNANTHACEAE	3	0	0
40	MEZEREUM	THYMELAEACEAE	0	5	0

ENDANGERED SPECIES OF PLANTS

	PLANT FAMILY		NUMBER OF SPECIES OR SUBSPECIES		
	COMMON NAME	SCIENTIFIC NAME	CA	HI	NV
41	MILKWEED	ASCLEPIADIACEAE	0	0	1
42	MINT	LAMIACEAE	12	58	0
43	MORNING GLORY	CONVOLVOLACEAE	2	47	0
44	MUSTARD	BRASSICACEAE	10	6	3
45	MYRSINE	MYRSINACEAE	5	0	0
46	MYRTLE	MYRTACEAE	0	2	0
47	NETTLE	URTICACEAE	0	15	0
48	NIGHTSHADE	SOLANACEAE	2	14	0
49	ORCHID	ORCHIDACEAE	1	0	1
50	PALM	ARECEAE	0	10	0
51	PARSLEY	APIACEAE	3	3	1
52	PEA	FABACEAE	21	33	11
53	PEPPER	PIPERACEAE	0	8	0
54	PHLOX	POLEMONICEAE	1	0	0
55	PINK	CARYOPHYLLACEAE	3	16	0
56	PITTOSPORUM	PITTOSPORACEAE	0	16	0
57	PLANTAIN	PLANTAGINACEAE	0	3	0
58	POPPY	PAPAVEVACEAE	1	1	1
59	PORTULACA	PORTULACACEAE	1	2	1
60	PRIMROSE	PRIMOLACEAE	0	3	2
61	ROSE	ROSACEAE	5	1	2
62	SANDALWOOD	SANTALACEAE	0	5	0
63	SOAPBERRY	SAPINDACEAE	0	12	0
64	SAPOTE	SAPOTACEAE	0	2	0
65	SAXIFRAGE	SAXIFRAGACEAE	2	0	0
66	SNAPDRAGON	SCROPHULARIACEAE	22	0	6
67	TEA	THEACEAE	0	1	0
68	VIOLET	VIOLACEAE	0	20	0
69	WALNUT	JUGLANDACEAE	1	1	0
70	WATERLEAF	HYDROPHYLLACEAE	3	1	1
71	WATERMILFOIL	HALORAGOCEAE	3	1	1

SOURCE - FEDERAL REGISTER, VOL 41, NO 117, JUNE 16, 1976

II-F-2 FAUNA

THIS SECTION CONTAINS DATA ON ENDANGERED, THREATENED, RARE, AND PROTECTED SPECIES OF ANIMALS. THE DISTRIBUTION OF THESE SPECIES BY COUNTY ARE SHOWN ON A SERIES OF MAPS. DATA ARE ALSO PRESENTED ON COMMERCIAL FISH LANDINGS AND ON BIG GAME ANIMALS.

THE DATA ON ENDANGERED ANIMAL SPECIES ARE FROM THE FEDERAL REGISTER AND FROM STATE SOURCES. THE MAPS, WHICH ARE BASED ON THE FEDERAL DATA, WERE PROVIDED BY THE BROOKHAVEN NATIONAL LABORATORY. THE DATA ON FISH LANDINGS AND BIG GAME ARE FROM FEDERAL SOURCES.

TABLE II-36
ENDANGERED, THREATENED, RARE AND PROTECTED SPECIES OF ANIMALS

	COMMON NAME	SCIENTIFIC NAME	RANGE	STATUS US	CA	HI	NV
	MAMMALS						
1	BAT, HAWAIIAN HOARY	LASIURUS CINERUS SEMOTUS	HAWAII	E		E	
2	BAT, SPOTTED	EUDERMA MACULATUM	NEVADA				R
3	BEAVER, MOUNTAIN	APLODONTIA RUFA	NEVADA				P
4	CAT, RING-TAILED	BASSARISCUS ASTUTUS	CALIFORNIA		P		
5	FOX, ISLAND	UROCYON LITTORALIS	CALIFORNIA		R		
6	FOX, SAN JOAQUIN KIT	VUPLES MACROTIS MUTICA	CALIFORNIA	E	R		
7	MOUSE, SALT MARSH HARVEST	REITHRODONTOMYS RAVIVENTRIS	CALIFORNIA	E	E		
8	OTTER, SOUTHERN SEA	ENHYDRA LUTRIS NEREIS	CALIFORNIA		P		
9	PIKA	OCHOTONA PRINCEPS	NEVADA				P
10	RAT, FRESNO KANGAROO	DIPODOMYS NITRATOIDES EXILIS	CALIFORNIA		R		
11	RAT, MORRO BAY KANGAROO	DIPODOMYS HEERMANNI MORROENSIS	CALIFORNIA	E	E		
12	RAT, STEPHENS KANGAROO	DIPODOMYS STEPHENSI	CALIFORNIA		R		
13	SEAL, GUADALUPE FUR	ARCTOCEPHALUS TOWNSENDI	CALIFORNIA		P		
14	SEAL, HAWAIIAN	MONACHUS SCHAUINSLAND	HAWAII			E	
15	SEAL, NORTHERN ELEPHANT	MIROUNGA ANGUSTIROSTRSIS	CALIFORNIA		P		
16	SHEEP, BIGHORN	OVIS CANADENSIS	CALIFORNIA		P		
17	SHEEP, CALIFORNIA BIGHORN	OVIS CANADENSIS CALIFORNIANA	CALIFORNIA		R		
18	SHEEP, PENISULAR BIGHORN	OVIS CANADENSIS CREMNOBATES	CALIFORNIA		R		
19	SQUIRREL, DOUGLAS	TAMIASCIURUS SPP.	NEVADA				P
20	SQUIRREL, FLYING	GLAUCOMYS SPP.	NEVADA				P
21	SQUIRREL, GRAY	SCIURUS SPP.	NEVADA				P
22	SQUIRREL, MOHAVE GROUND	CITELLUS MOHAVENSIS	CALIFORNIA		R		
23	WOLF,GREY	CANIS LUPUS	CALIFORNIA, NEVADA	E			
24	WOLVERINE	GULO LUSCUS	CALIFORNIA		P		

ENDANGERED, THREATENED, RARE AND PROTECTED SPECIES OF ANIMALS

	COMMON NAME	SCIENTIFIC NAME	RANGE	STATUS			
				US	CA	HI	NV
	BIRDS						
1	AKEPA, HAWAII (HONEY CREEPER)	LOXOPS COCCINEA COCCINEA	HAWAII	E		E	
2	AKEPA, MAUI (HONEY CREEPER-AKEPUIE)	LOXOPS COCCINEA OCHRACEA	HAWAII	E		E	
3	AKIALOA, KAUAI (HONEY CREEPER)	HEMIGNATHYS PROCERUS	HAWAII	E		E	
4	AKIAPOLAAU (HONEY CREEPER)	HEMIGNATHOS WILSONI	HAWAII	E		E	
5	CONDOR, CALIFORNIA	GYMNOGYPS CALIFORNIANUS	CALIFORNIA	E	E		
6	COOT, HAWAIIAN	FULICA AMERICANA ALAI	HAWAII	E		E	
7	CRANE, GREATER SANDHILL	GRUS CANADENSIS TABIDA	CALIFORNIA		P		
8	CRANE, WHOOPING	GRUS AMERICANA	CANADA, USA	E			
9	CREEPER, HAWAII (HONEY CREEPER)	LOXOPS MACULATA MANA	HAWAII	E		E	
10	CREEPER, MOLAKAI (KAKAWAHIE-HONEY CREEPER)	LOXOPS MACULATA FLAMMEA	HAWAII	E		E	
11	CREEPER, OAHU (ALAUWAHIO HONEY CREEPER)	LOXOPS MACULATA MACULATA	HAWAII	E		E	
12	CROW, HAWAIIAN (ALALA)	CORVUS TROPICUS	HAWAII	E		E	
13	CUCKOO, CALIFORNIA YELLOW-BILLED	COCCYZUS AMERICANUS OCCIDENTALIS	CALIFORNIA		R		
14	DUCK, HAWAIIAN (KOLOA)	ANAS WYVILLIANA	HAWAII	E		E	
15	DUCK, LAYSAN	ANAS LAYSANENSIS	HAWAII	E		E	
16	EAGLE, BALD	HALIAEETUS LEUCOCEPHALUS	CALIFORNIA, NEVADA	E			P
17	EAGLE, GOLDEN	AQUILA CHRYSAETOS	CALIFORNIA, NEVADA		P		P
18	EAGLE, SOUTHERN BALD	HALIAEETUS LEUCOCEPHALUS LEUCOCEPHALUS	USA (SOUTH OF 40TH PARALLEL)	E	E		P
19	FALCON,ARTIC PEREGRINE	FALCO PEREGRINUS TUNDRIUS	NEVADA	E			
20	FALCON, AMERICAN PEREGRINE	FALCO PEREGRINUS ANATUM	CANADA, USA, MEXICO	E	E		
21	FALCON, PIGEON HAWK	FALCO COLUMBARIUS	NEVADA				P
22	FALCON, PRAIRIE	FALCO MEXICANUS	NEVADA				P
23	FALCON, SPARROW HAWK	FALCO SPARVERIUS	NEVADA				P
24	FINCHES, LAYSAN AND NIHOA (HONEY CREEPERS)	PSITTIROSTRA CANTANS	HAWAII	E		E	

ENDANGERED, THREATENED, RARE AND PROTECTED SPECIES OF ANIMALS

	COMMON NAME	SCIENTIFIC NAME	RANGE	STATUS US	CA	HI	NV
25	GALLINULA, HAWAIIAN	GALLINULA CHLOROPUS SANDVICENSIS	HAWAII	E		E	
26	GOOSE, ALEUTIAN CANADA	BRANTA CANADENSIS LEUCOPAREIA	WESTERN USA, JAPAN	E			
27	GOOSE, HAWAIIAN (NENE)	BRANTA SANDVICENSIS	HAWAII	E		E	
28	HAWK, COOPERS	ACCIPITER COOPERII	NEVADA				P
29	HAWK, FERRUGINOUS	BUTEO REGALIS	NEVADA				P
30	HAWK, GOSHAWK	ACCIPITER GENTILIA	NEVADA				P
31	HAWK, HARRIS	PARABUTEO UNICINCTUS	NEVADA				P
32	HAWK, HAWAIIAN (IO)	BUTEO SOLITARIUS	HAWAII	E		E	
33	HAWK, MARSH	CIRCUS CYANEUS	NEVADA				P
34	HAWK, RED-TAILED	BUTEO JAMAICENSIS	NEVADA				P
35	HAWK, ROUGH-LEGGED	BUTEO LAGOPUS	NEVADA				P
36	HAWK, SHARP-SHINNED	ACCIPITER STRIATUS	NEVADA				P
37	HAWK, SWAINSONS	BUTEO SWAINSONI	NEVADA				P
38	HONEY CREEPER, CRESTED (AKOHEKOHE)	PALMERIA DOLEI	HAWAII	E		E	
39	IBIS, WHITE-FACED GLOSSY	PLEGADIS CHIHI	NEVADA				P
40	IIWI	VESTIURIA COCCINEA	HAWAII			E	
41	KINGFISHER	MEGACERYLE ALCYON	NEVADA				P
42	KITE, WHITE-TAILED	ELANUS LEUCURUS	CALIFORNIA		P		
43	MILLERBIRD, NIHOA (WARBLER)	ACROCEPHALUS FAMILIARIS KINGI	HAWAII	E		E	
44	NIGHTHAWK	CHORDEILES SPP.	NEVADA				P
45	NUKUPUUS, KAUAI AND MAUI (HONEY CREEPER)	HEMIGNATHUS LUCIDUS	HAWAII	E		E	
46	OO, KAUAI (OO AA) (HONEY CREEPER)	MOHO BRACEATUS	HAWAII	E		E	
47	OSPREY	PANDION HALIAETUS	NEVADA				P
48	OU (HONEY CREEPER)	PSITTIROSTRA PSITTACEA	HAWAII	E		E	
49	OWL, BARN	TYTO ALBA	NEVADA				P
50	OWL, BURROWING	SPEOTYTO CUNICULARIA	NEVADA				P
51	OWL, GREAT HORNED	BUBO BIRGINIANUS	NEVADA				P
52	OWL, HAWAIIAN	ASIO FLAMMEUS SANDWICHENSIS	HAWAII			E	
53	OWL, LONG-EARED	ASIO OTUS	NEVADA				P
54	OWL, SHORT-EARED	ASIO FLAMMEUS	NEVADA				P
54	PALILA (HONEY CREEPER)	PSITTIROSTRA BAILLEUI	HAWAII	E		E	
56	PARROTBILL, MAUI (HONEY CREEPER)	PSEUDONESTOR XANTHROPHRYS	HAWAII	E		E	

ENDANGERED, THREATENED, RARE AND PROTECTED SPECIES OF ANIMALS

	COMMON NAME	SCIENTIFIC NAME	RANGE	STATUS US	CA	HI	NV
57	PELICAN, CALIFORNIA BROWN	PELECANUS OCCIDENTALIS CALIFORNICUS	CALIFORNIA, NEVADA		E		P
58	PELICAN, WHITE	PELECANUS ERYTHRORHYNCHOS	NEVADA				P
59	PETREL, HAWAIIAN DARK-RUMPED	PTERODROMA PHAEOPYGIA SANDWICHENSIS	HAWAII	E		E	
60	PETREL, HAWAIIAN STORM	OCEANODROMA CASTRO CRYPTOLEUCURA			E		
61	POO-ULI	MELAMPROSOPS PHAEOSOMA	HAWAII	E		E	
62	RAIL, CALIFORNIA BLACK	LATERALLUS JAMAICENSIS COTURNICULUS	CALIFORNIA		P		
63	RAIL, CALIFORNIA CLAPPER	RALLUS LONGIROSTRIS OBSOLETUS	CALIFORNIA	E	E		
64	RAIL, LIGHT-FOOTED CLAPPER	RALLUS LONGIROSTRIS LEVIPES	CALIFORNIA	E	E		
65	RAIL, YUMA CLAPPER	RALLUS LONGIROSTRIS YUMANENSIS	MEXICO, CALIFORNIA, ARIZONA	E	E		
66	ROAD RUNNER	GEOCOCCYX CALIFORNIANUS	NEVADA				P
67	SHEARWATER, NEWELLS MANX	PUFFINUS PUFFINUS NEWELLI	HAWAII	T		E	
68	SHRIKE, LOGGERHEAD SAN CLEMENTE	LANIUS LUDOVICIANUS MEARNS	CALIFORNIA	E			
69	SPARROW, BELDINGS SAVANNAH	PASSERCULUS SANDWICHENSIS BELDINGI	CALIFORNIA		E		
70	SPARROW, SAGE SAN CLEMENTE	AMPHISPIZA BELLI CLEMENTE	CALIFORNIA	T			
71	SPARROW, SANTA BARBARA SONG	MEOLSPIZA MELODIA GRAMINEA	CALIFORNIA	E			
72	STILT, HAWAIIAN	HIMANTOPUS HIMANTOPUS KNUDSENI	HAWAII	E		E	
73	SWAN, TRUMPTER	CYGNUS BUCCINATOR	CALIFORNIA		P		
74	TERN, CALIFORNIA LEAST	STERNA ALBIFRONS BROWNI	CALIFORNIA	E	E		
75	TERN, WHITE	GYGIS ALBA	HAWAII			E	
76	THRUSH, LARGE KAUAI	PHAEURNIS OBSCURUS MYADESTINA	HAWAII	E		E	
77	THRUSH, MOLAKAI (OLOMAU)	PHAEORNIS OBSCURUS RUTHA	HAWAII	E		E	
78	THRUSH, SMALL KAUAI (PUAIOHI)	PHAEORNIS PALMERI	HAWAII	E		E	
79	VULTURE, TURKEY	CATHARTES AURA	NEVADA				P

ENDANGERED, THREATENED, RARE AND PROTECTED SPECIES OF ANIMALS

	COMMON NAME	SCIENTIFIC NAME	RANGE	STATUS US	CA	HI	NV
	REPTILES						
1	BOA, SOUTHERN RUBBER	CHARINA BOTTAE UMBRATICA	CALIFORNIA		R		
2	GILA MONSTER	HELODERMA SUSPECTUM	NEVADA				R
3	LIZARD, BLUNT-NOSED LEOPARD	CROTAPHYTUS SILUS	CALIFORNIA	E	E		
4	LIZARD, NIGHT ISLAND	KLAUBERINA RIVERSIANA	CALIFORNIA	T			
5	RACER, ALAMEDA STRIPED	MASTICOPHIS LATERALIS EURYXANTHUS	CALIFORNIA		R		
6	SNAKE, GIANT GARTER	THAMNOPHIS COUCHI GIGAS	CALIFORNIA		R		
7	SNAKE, SAN FRANCISCO GARTER	THAMNOPHIS SIRTALIS TETRATAENIS	CALIFORNIA	E	E		
8	TORTOISE, DESERT	GOPHERUS AGASSIZI	NEVADA				R
	AMPHIBIANS						
1	SALAMANDER, DESERT SLENDER	BATRACHOSEPS ARIDUS	CALIFORNIA	E	E		
2	SALAMANDER, KERN CANYON SLENDER	BATRACHOSEPS SIMATUS	CALIFORNIA		R		
3	SALAMANDER, LIMESTONE	HYDROMANTES BRUNUS	CALIFORNIA		P		
4	SALAMANDER, SANTA CRUZ LONG-TOED	AMBYSTOMA MARCODACTYLUM CROCEUM	CALIFORNIA	E	E		
5	SALAMANDER, SHASTA	HYDROMANTES SHASTAE	CALIFORNIA		R		
6	SALAMANDER, SISKIYOU MOUNTAIN	PLETHODON STORMI	CALIFORNIA		R		
7	SALAMANDER, TEHACHAPI SLENDER	BATRACHOSEPS STEBBINSI	CALIFORNIA		R		
8	TOAD, BLACK	BUFO BOREAS EXSUL	CALIFORNIA		P		

ENDANGERED, THREATENED, RARE AND PROTECTED SPECIES OF ANIMALS

	COMMON NAME	SCIENTIFIC NAME	RANGE	STATUS US	CA	HI	NV
	FISH						
1	BONYTAIL, COLORADO	GILA ROBUSTA ELEGANS	NEVADA				R
2	BONYTAIL, PAHRANAGAT	GILA ROBUSTA JORDONI	NEVADA	E			E
3	CHUB, BONYTAIL	GILA ELEGANS	CALIFORNIA		E		
4	CHUB, MOHAVE	GILA (=SIPHATELES) MOHAVENSIS	CALIFORNIA	E	E		
5	CHUB, OWENS TUI	GILA BICOLOR SNYDERI	CALIFORNIA		E		
6	CHUB, THICKTAIL	GILA CRASSICAUDA	CALIFORNIA		E		
7	CUI-UI	CHASMISTES CUJUS	NEVADA	E			E
8	DACE, DESERT	EREMICHTHYS ACROS	NEVADA				R
9	DACE, MOAPA	MOAPA CORIACEA	NEVADA	E			E
10	DACE, STEPTOE	RELICTUS SOLITARIUS	NEVADA				R
11	KILLIFISH, PAHRUMP	EMPETRICHYTHYS LATOS	NEVADA	E			E
12	PUPFISH, COTTONBALL MARSH	CYPRINODON MILLERI	CALIFORNIA		R		
13	PUPFISH, DEVILS HOLE	CYPRINODON DIABOLIS	NEVADA	E			E
14	PUPFISH, OWENS RIVER	CYPRINODON RADIOSUS	CALIFORNIA	E	E		
15	PUPFISH, TECOPA	CYPRINODON NEVADENSIS CALIDAE	CALIFORNIA	E	E		R
16	PUPFISH, WARM SPRINGS	CYPRINODON NEVADENSIS PECTORALIS	NEVADA	E			R
17	SCULPIN, ROUGH	COTTUS ASPERRIMUS	CALIFORNIA		R		
18	SPINEDACE, BIG SPRING	LEPIDOMEDA MOLLISPINIS PRATENSIS	NEVADA				P
19	SPINEDACE, VIRGIN RIVER	LEPIDOMEDA MOLLISPINIS MOLLISPINIS	NEVADA				R
20	SPINEDACE, WHITE RIVER	LEPIDOMEDA ALBIVALLIS	NEVADA				R
21	SPRINGFISH, RAILROAD VALLEY	CRENICHTHYS NEVADAE	NEVADA				R
22	SPRINGFISH, WHITE RIVER	CRENICHTHYS BAILEYI	NEVADA				R
23	SQUAWFISH, COLORADO RIVER	PTYCHOCHEILUS LUCIUS	CALIFORNIA, WESTERN USA	E	E		E
24	STICKLEBACK, UNARMORED THREE-SPINE	GASTEROSTERUS ACULEATUS WILLIAMSONI	CALIFORNIA	E	E		

ENDANGERED, THREATENED, RARE AND PROTECTED SPECIES OF ANIMALS

	COMMON NAME	SCIENTIFIC NAME	RANGE	STATUS US	CA	HI	NV
25	SUCKER, HUMPBACK	XYRAUCHEN TEXANUS	CALIFORNIA, NEVADA		E		R
26	SUCKER, LOST RIVER	CATOSTOMUS LUXATUS	CALIFORNIA		E		
27	SUCKER, MODOC	CATOSTOMUS MICROPS	CALIFORNIA		R		
29	SUCKER, SHORTNOSE	CHASMISTES BREVIROSTRIS	CALIFORNIA		E		
30	SUCKER, WHITE RIVER	PANTOSTEUS INTERMEDIS	NEVADA				R
31	TROUT, GOLDEN LITTLE KERN	SALMO AGUABONITA WHITEI	CALIFORNIA	T			
32	TROUT, LAHONTAN CUTTHROAT	SALMO CLARKI HENSHAWI	CALIFORNIA, NEVADA	T			
33	TROUT, PAIUTE CUTTHROAT	SALMO CLARKI SELENIRIS	CALIFORNIA	T			
34	TROUT, UTAH CUTTHROAT	SALMO CLARKI UTAH	NEVADA				E
35	WOUNDFIN	PLAGOPTERUS ARGENTISSIMUS	NEVADA, ARIZONA, UTAH	E			R
	INSECTS						
1	BUTTERFLY, EL SEGUNDO BLUE	SHIJIMIAEOIDES BATTOIDES ALLYNI	CALIFORNIA	E			
2	BUTTERFLY, LANGES METALMARK	APODEMIA MORMO LANGEI	CALIFORNIA	E			
3	BUTTERFLY, LOTIS BLUE	LYCAEIDES ARGYROGNOMON LOTIS	CALIFORNIA	E			
4	BUTTERFLY, MISSION BLUE	ICARICIA ICARIOIDES MISSIONENSIS	CALIFORNIA	E			
5	BUTTERFLY, SAN BRUNO ELFIN	CALLOPHRYS MOSSII BAYENSIS	CALIFORNIA	E			
6	BUTTERFLY, SMITHS BLUE	SHIJIMAEOIDES ENOPTES SMITHI	CALIFORNIA	E			

SOURCE - FEDERAL REGISTER VOL 41, NO 208, OCT 1976, WITH UPDATES
CALIFORNIA FISH AND GAME CODE
HAWAII DIVISION OF FISH AND GAME
NEVADA BOARD OF FISH AND GAME

NOTES -
E - ENDANGERED P - PROTECTED R - RARE
T - THREATENED

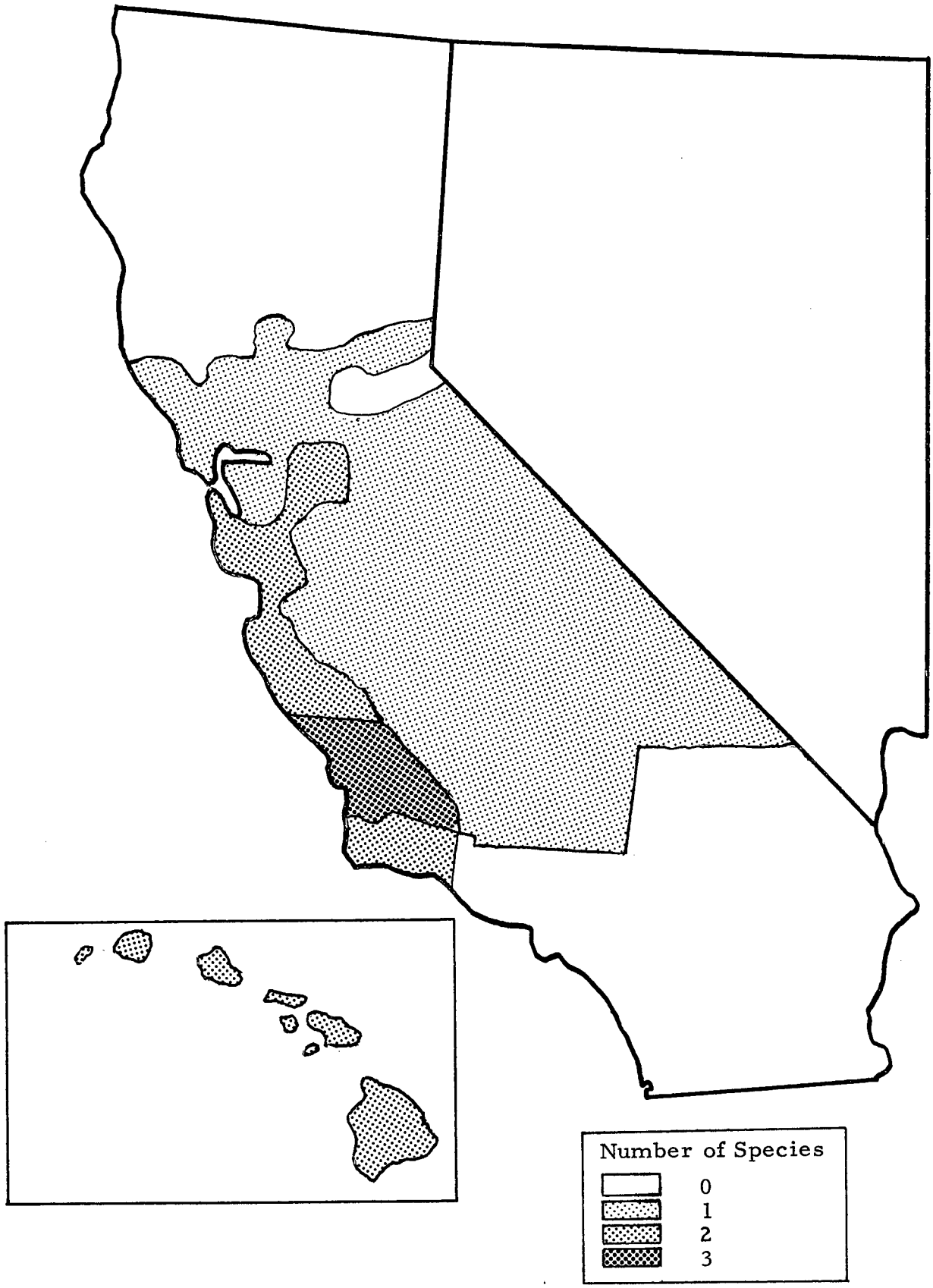


FIGURE II-90 ENDANGERED MAMMALS BY COUNTY, 1978

SOURCE: SHREEVE, DANIEL, ET AL., THE ENDANGERED SPECIES ACT AND ENERGY FACILITY PLANNING: COMPLIANCE AND CONFLICT BNL 50841 UC-13, MAY 1978

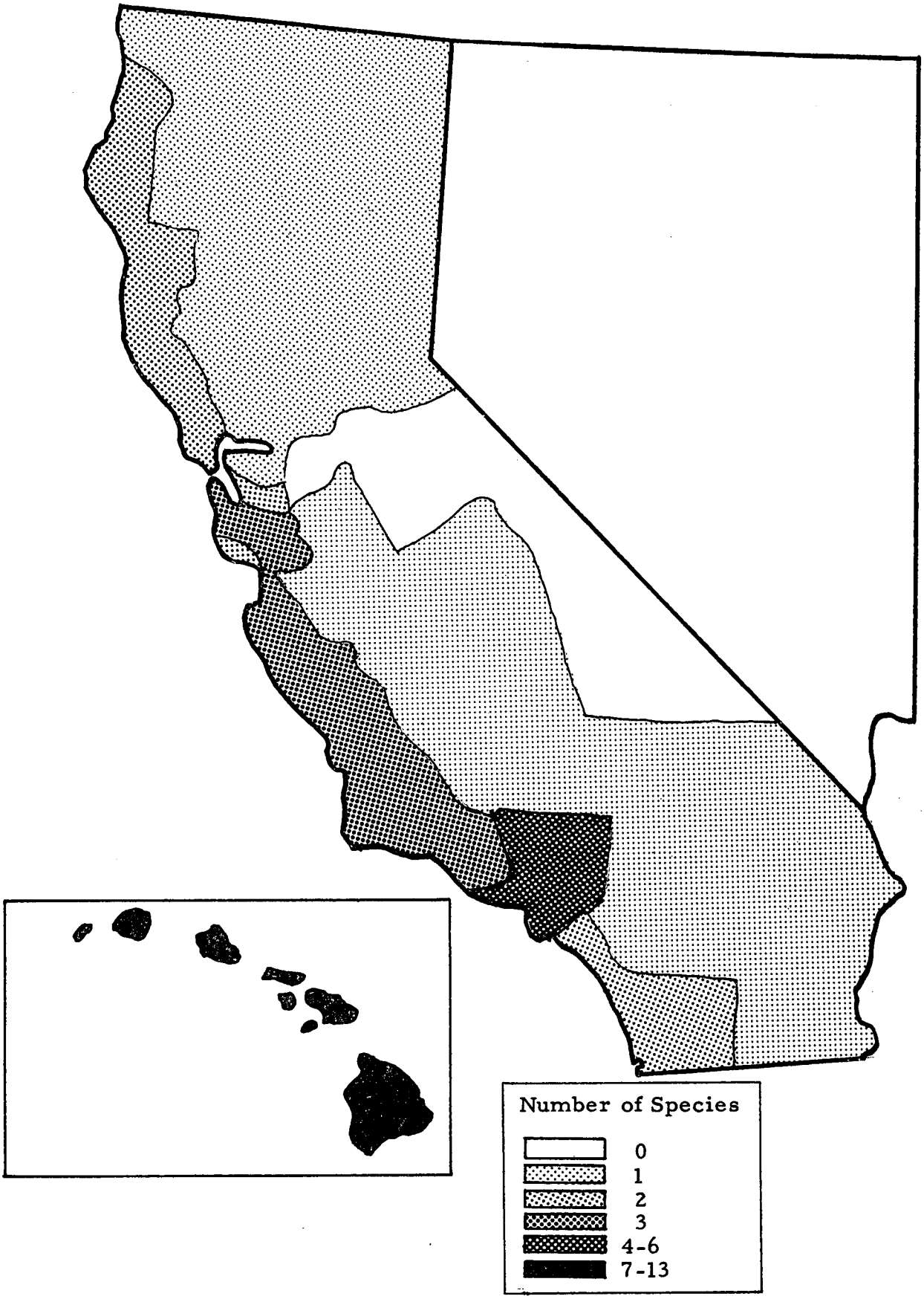


FIGURE II-91 ENDANGERED BIRDS BY COUNTY, 1978

SOURCE: SHREEVE, DANIEL, ET AL., THE ENDANGERED SPECIES ACT AND ENERGY FACILITY PLANNING: COMPLIANCE AND CONFLICT BNL 50841 UC-13, MAY 1978

FIGURE II-92 ENDANGERED REPTILES BY COUNTY, 1978

SOURCE: SHREEVE, DANIEL, ET AL., THE ENDANGERED SPECIES ACT AND ENERGY FACILITY PLANNING: COMPLIANCE AND CONFLICT BNL 50841 UC-13, MAY 1978

FIGURE II-93 ENDANGERED AMPHIBIANS BY COUNTY, 1978

SOURCE: SHREEVE, DANIEL, ET AL., THE ENDANGERED SPECIES ACT AND ENERGY FACILITY PLANNING: COMPLIANCE AND CONFLICT BNL 50841 UC-13, MAY 1978

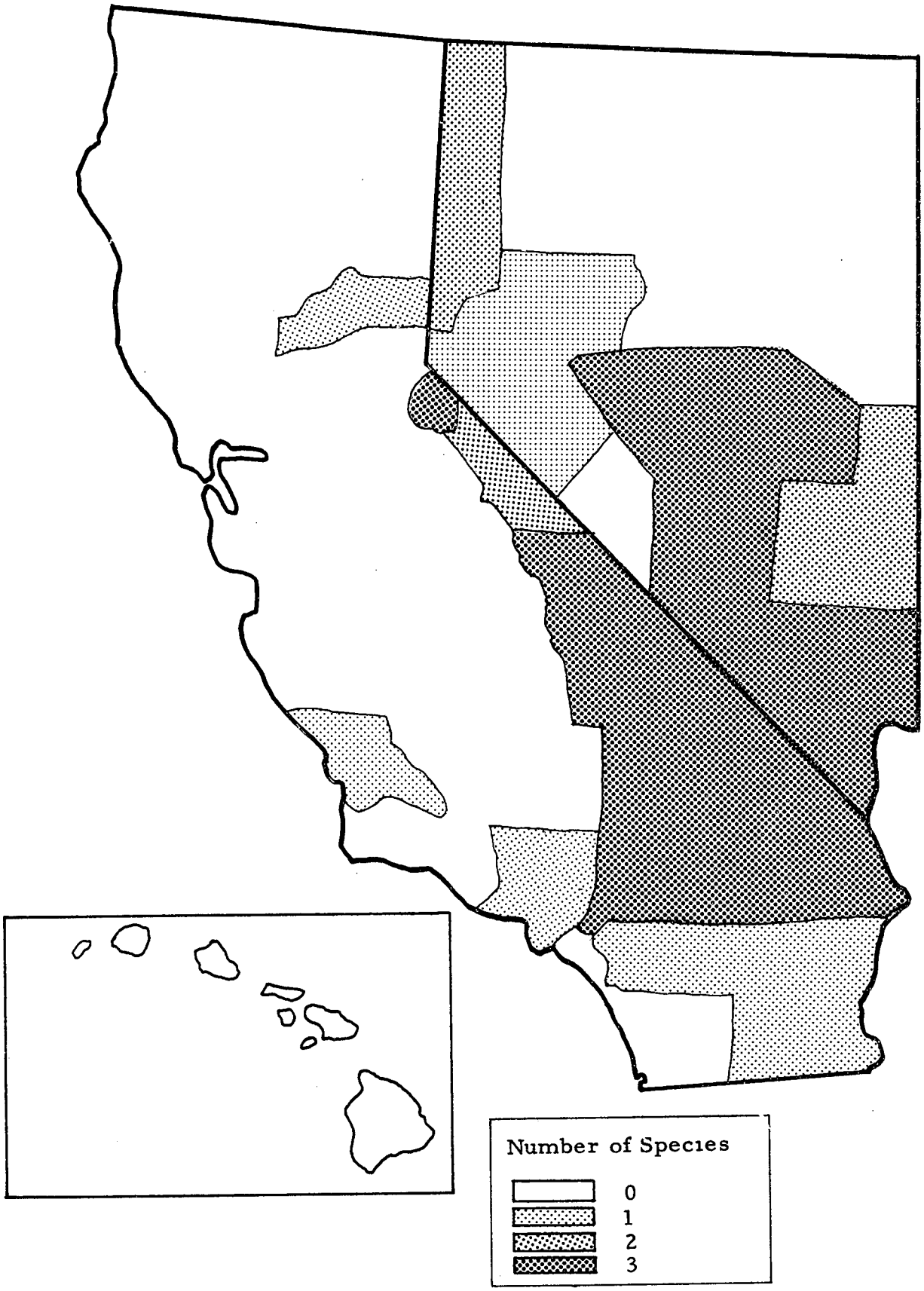


FIGURE II-94 ENDANGERED FISHES BY COUNTY, 1978

SOURCE: SHREEVE, DANIEL, ET AL., THE ENDANGERED SPECIES ACT AND ENERGY FACILITY PLANNING: COMPLIANCE AND CONFLICT BNL 50841 UC-13, MAY 1978

TABLE II-37
COMMERCIAL FISH LANDINGS, 1976 AND 1977

REGION	1976 AMOUNT (1000 POUNDS)	1976 VALUE (1000 DOLLARS)	1977 AMOUNT (1000 POUNDS)	1977 VALUE (1000 DOLLARS)
CALIFORNIA	896,858	185,647	874,376	194,957
HAWAII	11,871	7,486	15,279	9,412
NEVADA	NA	NA	NA	NA
UNITED STATES	5,350,400	1,352,700	5,198,100	1,515,100

SOURCE - U.S. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, FISHERIES OF THE UNITED STATES, 1977

NOTES - STATISTICS ON LANDINGS ARE SHOWN AS ROUND (LIVE) WEIGHT FOR ALL ITEMS EXCEPT UNIVALVE AND BIVALVE MOLLUSKS WHICH ARE SHOWN AS WEIGHT OF MEAT EXCLUDING THE SHELL. DATA ARE PRELIMINARY.

TABLE II-38
BIG GAME ANIMALS USING PUBLIC LANDS, 1975

GAME ANIMAL	CALIFORNIA	HAWAII	NEVADA	WESTERN STATES
ANTELOPE	5,130	0	3,800	192,248
BARBARY SHEEP	0	0	0	340
BEAR	540	0	0	74,283
BIG HORN SHEEP	1,110	0	3,300	39,521
DEER	132,960	0	107,650	1,131,000
ELK	593	0	500	95,563
TOTAL	140,333	0	115,250	2,108,539

SOURCE - U.S. BUREAU OF RECLAMATION, PUBLIC LAND STATISTICS, 1976

NOTES - THESE SPECIES OF ANIMALS ARE FOUND PRIMARILY IN THE ELEVEN WESTERN STATES OF ALASKA, ARIZONA, CALIFORNIA, COLORADO, IDAHO, MONTANA, NEVADA, NEW MEXICO, OREGON, UTAH AND WYOMING. DATA ARE ESTIMATES.

II-G SOCIO-ECONOMIC

II-G-1 POPULATION

THIS SECTION PRESENTS DETAILED DEMOGRAPHIC DATA FOR THE THREE STATES IN THE REGION. SOME ADDITIONAL DATA ARE PRESENTED FOR COUNTIES IN HAWAII. A SERIES OF TABLES SHOW THE POPULATION, POPULATION DENSITY, AND THE COMPONENTS OF POPULATION CHANGE. THE POPULATION COMPOSITION IS IS SHOWN BY AGE, SEX AND RACE. THE DATA IS FROM THE 1970 CENSUS AND THE CURRENT POPULATION REPORTS PUBLISHED BY THE CENSUS BUREAU. ADDITIONAL HAWAII DATA ARE FROM THE HAWAII DATA BOOK, 1977.

TABLE II-39
POPULATION 1960 - 1975

REGION	POPULATION (1000) 1960	1970	1975	AVERAGE ANNUAL PERCENT CHANGE 1960-70	1970-75
CALIFORNIA	15,870	20,007	21,185	2.3	1.1
HAWAII	642	774	865	1.9	2.2
NEVADA	291	493	592	5.4	3.7
REGION TOTAL	16,803	21,274	22,642	2.4	1.3
UNITED STATES	179,979	203,806	213,121	1.3	0.9
PERCENT OF US	9.3	10.4	10.6		

SOURCE - U.S. BUREAU OF THE CENSUS, CURRENT POPULATION REPORTS

NOTES - THE ESTIMATED 1975 POPULATION OF THE COUNTIES IN HAWAII WAS HONOLULU - 705,400; HAWAII - 75,300; KAUAI - 32,700; MAUI - 55,000.

TABLE II-40
POPULATION DENSITY AND URBANIZATION, 1970

REGION	POPULATION (1000)	LAND AREA (SQ KM)	DENSITY	PERCENT URBAN
CALIFORNIA	19,953	404,975	49.2	90.9
HAWAII	769	16,641	46.2	83.1
NEVADA	489	284,613	1.7	80.9
REGION TOTAL	21,211	707,229	30.0	90.4
UNITED STATES	203,212	9,160,454	22.2	73.5
PERCENT OF US	10.4	7.7		

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF POPULATION, 1970

NOTES - POPULATION DOES NOT INCLUDE ARMED FORCES
THE POPULATION DENSITY IN PERSONS PER SQUARE KILOMETER OF THE COUNTIES IN HAWAII IN 1970 WAS
HONOLULU - 435.8; HAWAII - 6.5; KAUAI - 21.4; MAUI - 17.8.

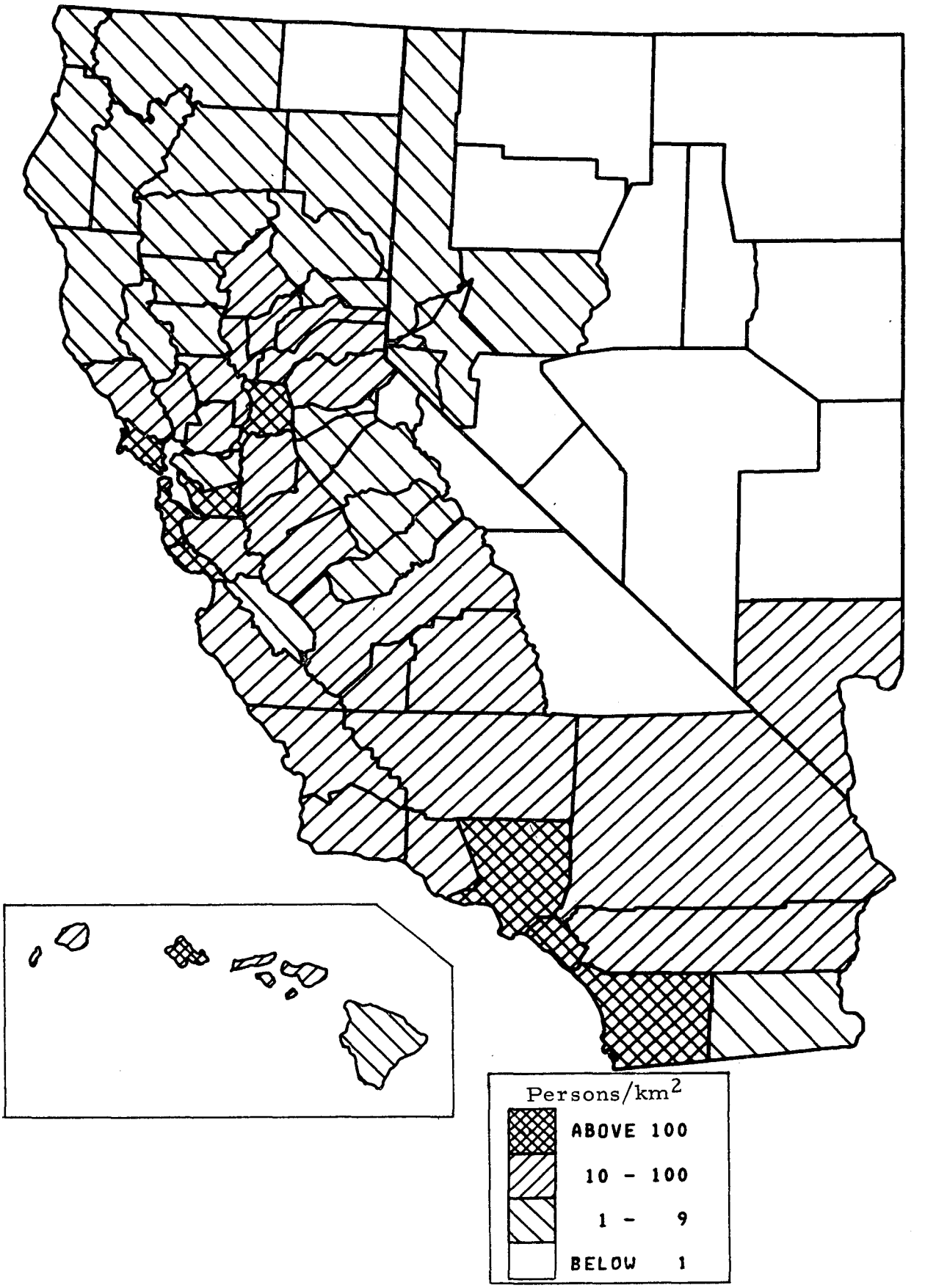


FIGURE II-95 POPULATION DENSITY, 1975

SOURCE: CARTE MAP PRODUCED BY THE LAWRENCE BERKELEY LABORATORY

TABLE II-41
POPULATION BY RACE AND SEX, 1970
[IN THOUSANDS, EXCEPT PERCENT]

REGION	WHITE	BLACK	OTHER	MALE	FEMALE
CALIFORNIA	17,871	1,404	695	9,817	10,183
HAWAII	301	8	461	399	369
NEVADA	449	28	12	248	241
REGION TOTAL	18,621	1,440	1,168	10,464	10,746
UNITED STATES	178,158	22,589	2,558	98,912	104,300
PERCENT OF US	10.5	6.4	45.7	10.6	10.3

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF POPULATION, 1970

NOTE - A MORE DETAILED BREAKDOWN OF THE HAWAIIAN POPULATION BY RACE IS AS FOLLOWS

WHITE	301,429	HAWAIIAN	71,274	CHINESE	52,375
FILIPINO	95,354	JAPANESE	217,669	INDIAN	1,216
KOREAN	9,625	BLACK	7,517	OTHERS	12,100

TABLE II-42
POPULATION BY AGE, 1976
[IN THOUSANDS, EXCEPT PERCENT]

REGION	UNDER 5	5-13	14-17	18-20	21-44	45-64	65 AND OVER
CALIFORNIA	1,488	3,170	1,634	1,279	7,430	4,397	2,121
HAWAII	74	139	70	62	310	171	60
NEVADA	46	96	49	35	208	129	47
REGION TOTAL	1,608	3,405	1,753	1,376	7,948	4,697	2,228
UNITED STATES	15,339	32,955	16,896	12,641	70,194	43,700	22,934

SOURCE - U.S. BUREAU OF THE CENSUS, POPULATION ESTIMATES AND PROJECTIONS, SERIES P-25, 1977

NOTES - PRELIMINARY, AS OF JULY 1

TABLE II-43
COMPONENTS OF POPULATION CHANGE 1960 - 1970
[IN THOUSANDS, EXCEPT PERCENT]

REGION	NET INCREASE		COMPONENTS OF CHANGE		
	NUMBER	PERCENT	BIRTHS	DEATHS	NET MIGRATION
CALIFORNIA	4,236	27.0	3,634	1,511	2,113
HAWAII	137	21.7	164	37	11
NEVADA	203	71.3	91	31	144
REGION TOTAL	4,576	27.2	3,889	1,579	2,268
UNITED STATES	23,912	13.3	39,033	18,192	3,070
PERCENT OF US	19.1		10.0	8.7	

SOURCE - U.S. BUREAU OF THE CENSUS, CURRENT POPULATION REPORTS

TABLE II-44
COMPONENTS OF POPULATION CHANGE 1970 - 1975
[IN THOUSANDS, EXCEPT PERCENT]

REGION	NET INCREASE		COMPONENTS OF CHANGE		
	NUMBER	PERCENT	BIRTHS	DEATHS	NET MIGRATION
CALIFORNIA	1,214	6.1	1,675	893	431
HAWAII	95	12.3	82	22	34
NEVADA	103	21.1	47	22	78
REGION TOTAL	1,412	6.6	1,805	937	543
UNITED STATES	9,817	4.8	17,490	10,200	2,527
PERCENT OF US	14.4		10.3	9.2	

SOURCE - U.S. BUREAU OF THE CENSUS, CURRENT POPULATION REPORTS

II-G-2 EMPLOYMENT AND INCOME

DATA ON THE REGIONAL ECONOMY ARE PRESENTED IN THIS SECTION. DATA ON EMPLOYMENT ARE GIVEN BY BROAD INDUSTRIAL CATEGORY AND IN DETAIL BY TWO-DIGIT SIC CODE FOR MANUFACTURING. FARM EMPLOYMENT AND INCOME DATA ARE ALSO TABULATED. FOR MANUFACTURING, DATA ON VALUE ADDED, VALUE OF SHIPMENTS, AND CAPITAL EXPENDITURES ARE PRESENTED BY TWO-DIGIT SIC CODE. DATA ON THE LABOR FORCE AND UNEMPLOYMENT RATES ARE TABULATED. INCOME DISTRIBUTIONS OF PERSONS AND FAMILIES ARE GIVEN. FINALLY, THERE ARE A SERIES OF TABLES SHOWING DATA ON PUBLIC ASSISTANCE SUCH AS UNEMPLOYMENT INSURANCE, SOCIAL SECURITY, MEDICARE AND MEDICAID, WELFARE, AND FOOD STAMPS.

THE DATA IN THIS SECTION COME FROM A VARIETY OF FEDERAL SOURCES. DATA ON MANUFACTURING ARE TAKEN FROM THE CENSUS OF MANUFACTURES AND THE ANNUAL SURVEY OF MANUFACTURES. FARM INCOME AND EMPLOYMENT COME FROM DEPARTMENT OF AGRICULTURE PUBLICATIONS. FAMILY AND PERSONAL INCOME DISTRIBUTIONS COME FROM THE 1970 CENSUS.

TABLE II-45
EMPLOYMENT IN NONAGRICULTURAL ESTABLISHMENTS, 1975
[IN THOUSANDS OF EMPLOYEES]

REGION	TOTAL	MANU-FACTURING	WHOLE-SALE AND RETAIL TRADE	GOVERN-MENT	SERVICES	TRANSPOR TATION PUBLIC UTILITIES	FINANCE INSURANCE AND REAL ESTATE	CONTRACT CON-STRUCTION	MINING
CALIFORNIA	7,815	1,585	1,777	1,646	1,574	465	453	284	32
HAWAII	339	24	84	82	72	25	23	28	(1)
NEVADA	264	12	51	46	110	17	11	12	4
REGION TOTAL	8,418	1,621	1,912	1,774	1,756	507	487	324	36
UNITED STATES	76,985	18,347	16,947	14,773	13,995	4,498	4,223	3,457	745
PERCENT OF US	10.9	8.8	11.3	12.0	12.5	11.3	11.5	9.4	4.8
THE CORRESPONDING DATA (IN PERSONS EMPLOYED) FOR THE COUNTIES OF HAWAII ARE -									
OAHU	286,350	17,380	71,970	70,810	59,560	21,380	21,090	24,160	(1)
HAWAII	23,900	3,060	6,000	5,340	5,670	1,580	820	1,430	(1)
KAUAI	10,870	1,350	2,370	2,360	2,460	1,170	390	770	(1)
MAUI	18,000	2,130	4,070	3,470	4,290	1,230	990	1,820	(1)

SOURCE - U.S. BUREAU OF LABOR STATISTICS, EMPLOYMENT AND EARNINGS, 1977. TAKEN FROM THE STATISTICAL ABSTRACT OF THE U.S., 1977.
COUNTY DATA IS FROM THE HAWAII DATA BOOK, 1976

NOTES - (1) MINING COMBINED WITH SERVICES

TABLE II-46
NEW CAPITAL EXPENDITURES, VALUE ADDED AND VALUE OF SHIPMENTS
BY MANUFACTURES IN CALIFORNIA, 1975
[IN MILLIONS OF DOLLARS]

CODE		VALUE ADDED	VALUE OF SHIPMENTS	CAPITAL EXPEN-DITURES
20	FOOD AND KINDRED PRODUCTS	5,501.1	17,881.0	363.6
22	TEXTILE MILL PRODUCTS	222.9	600.7	21.9
23	APPAREL, OTHER TEXTILE PRODUCTS	1,244.6	2627.5	29.2
24	LUMBER AND WOOD PRODUCTS	1,103.2	2,664.5	93.3
25	FURNITURE AND FIXTURES	722.7	1,367.1	18.3
26	PAPER AND ALLIED PRODUCTS	1,128.3	2,701.6	137.8
27	PRINTING AND PUBLISHING	2,035.0	3,202.9	87.8
28	CHEMICALS AND ALLIED PRODUCTS	2,298.0	4,646.3	198.2
29	PETROLEUM AND COAL PRODUCTS	1,423.0	8,501.2	367.4
30	RUBBER, MISC PLASTIC PRODUCTS	1,170.3	2,234.4	70.0
32	STONE, CLAY, GLASS PRODUCTS	1,303.3	2,365.4	111.5
33	PRIMARY METAL INDUSTRY	1,304.9	3,137.8	93.0
34	FABRICATED METAL PRODUCTS	3054.1	6012.6	163.5
35	MACHINERY, EXCEPT ELECTRIC	3,852.9	6,897.9	285.6
36	ELECTRIC AND ELECTRONIC EQUIP	4,462.6	7,169.0	(D)
37	TRANSPORTATION EQUIPMENT	7,292.9	14,001.2	223.7
38	INSTRUMENTS, RELATED PRODUCTS	7,286.6	12,101.1	88.9
39	MISC MANUFACTURING INDUSTRIES	542.4	1,440.0	13.1
	TOTAL MANUFACTURING	40,082.4	89,415.1	2,572.8

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES, 1975

NOTES - (D) WITHHELD TO AVOID DISCLOSING FIGURES FOR INDIVIDUAL COMPANIES

TABLE II-47
NEW CAPITAL EXPENDITURES, VALUE ADDED AND VALUE OF SHIPMENTS
BY MANUFACTURES IN HAWAII, 1975
[IN MILLIONS OF DOLLARS]

CODE		VALUE ADDED	VALUE OF SHIPMENTS	CAPITAL EXPENDITURES
20	FOOD AND KINDRED PRODUCTS	442.3	843.3	31.8
23	APPAREL, OTHER TEXTILE PRODUCTS	25.5	50.8	0.4
24	LUMBER AND WOOD PRODUCTS	10.8	18.6	2.2
25	FURNITURE AND FIXTURES	16.5	21.2	0.1
27	PRINTING AND PUBLISHING	79.6	115.5	2.1
31	LEATHER, LEATHER PRODUCTS	0.7	1.3	0.0
32	STONE, CLAY, GLASS PRODUCTS	49.7	127.7	2.7
39	MISC MANUFACTURING INDUSTRIES	7.3	16.7	0.2
	TOTAL MANUFACTURING	685.4	1,800.3	51.5

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES, 1975

TABLE II-48
NEW CAPITAL EXPENDITURES, VALUE ADDED AND VALUE OF SHIPMENTS
BY MANUFACTURES IN NEVADA, 1975
[IN MILLIONS OF DOLLARS]

CODE		VALUE ADDED	VALUE OF SHIPMENTS	CAPITAL EXPENDITURES
20	FOOD AND KINDRED PRODUCTS	40.9	124.4	1.4
23	APPAREL, OTHER TEXTILE PRODUCTS	0.6	1.4	0.0
24	LUMBER AND WOOD PRODUCTS	4.8	9.7	0.3
27	PRINTING AND PUBLISHING	36.1	51.2	1.7
28	CHEMICALS AND ALLIED PRODUCTS	41.6	85.9	4.8
30	RUBBER, MISC PLASTIC PRODUCTS	2.8	8.0	0.4
32	STONE, CLAY, GLASS PRODUCTS	51.9	104.4	13.1
34	FABRICATED METAL PRODUCTS	17.2	30.0	0.9
35	MACHINERY, EXCEPT ELECTRIC	12.1	20.8	0.3
36	ELECTRIC AND ELECTRONIC EQUIP	19.4	37.2	0.7
37	TRANSPORTATION EQUIPMENT	3.2	6.6	0.1
39	MISC MANUFACTURING INDUSTRIES	20.4	27.6	0.6
	TOTAL MANUFACTURING	313.0	134.4	28.5

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES, 1975

TABLE II-49
EMPLOYMENT BY MANUFACTURES IN CALIFORNIA, 1967, 1972 AND 1975
[IN THOUSANDS]

CODE		1967	1972	1975
20	FOOD AND KINDRED PRODUCTS	159.8	156.1	156.6
22	TEXTILE MILL PRODUCTS	8.2	12.2	11.8
23	APPAREL, OTHER TEXTILE PRODUCTS	67.0	82.4	81.1
24	LUMBER AND WOOD PRODUCTS	(NA)	62.3	53.7
25	FURNITURE AND FIXTURES	33.6	43.2	41.2
26	PAPER AND ALLIED PRODUCTS	32.0	34.3	35.4
27	PRINTING AND PUBLISHING	82.7	88.0	89.9
28	CHEMICALS AND ALLIED PRODUCTS	42.0	45.2	52.4
29	PETROLEUM AND COAL PRODUCTS	16.4	16.2	16.4
30	RUBBER, MISC PLASTIC PRODUCTS	(NA)	51.1	48.7
31	LEATHER, LEATHER PRODUCTS	FF	FF	---
32	STONE, CLAY, GLASS PRODUCTS	43.4	50.3	47.5
33	PRIMARY METAL INDUSTRY	58.8	49.9	48.1
34	FABRICATED METAL PRODUCTS	(NA)	120.2	116.9
35	MACHINERY, EXCEPT ELECTRIC	123.1	134.9	159.1
36	ELECTRIC AND ELECTRONIC EQUIP	(NA)	176.7	185.0
37	TRANSPORTATION EQUIPMENT	(NA)	268.4	245.7
38	INSTRUMENTS, RELATED PRODUCTS	(NA)	48.1	56.7
39	MISC MANUFACTURING INDUSTRIES	30.9	34.7	28.9
	TOTAL MANUFACTURING	1,583.5	1,544.3	1,558.1

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES, 1975 AND 1972 CENSUS OF MANUFACTURES

NOTES - GENERAL STATISTICS FOR SOME PRODUCTION AREAS ARE WITHHELD TO AVOID DISCLOSING FIGURES FOR INDIVIDUAL COMPANIES. FOR SUCH AREAS WITH OVER 150 EMPLOYEES THE EMPLOYMENT SIZE RANGE IS INDICATED AS FOLLOWS

AA - 150 TO 249 CC - 500 TO 999 FF - 2500 OR MORE
BB - 250 TO 488 DD - 1000 TO 2499

(NA) - NOT AVAILABLE

TABLE II-50
EMPLOYMENT BY MANUFACTURES IN HAWAII, 1967, 1972 AND 1975
[IN THOUSANDS]

CODE		1967	1972	1975
20	FOOD AND KINDRED PRODUCTS	14.2	11.9	11.6
23	APPAREL, OTHER TEXTILE PRODUCTS	2.5	3.3	3.1
24	LUMBER AND WOOD PRODUCTS	(NA)	0.9	0.7
25	FURNITURE AND FIXTURES	CC	0.7	0.7
26	PAPER AND ALLIED PRODUCTS	AA	AA	(NA)
27	PRINTING AND PUBLISHING	2.0	2.5	2.7
28	CHEMICALS AND ALLIED PRODUCTS	BB	BB	(NA)
29	PETROLEUM AND COAL PRODUCTS	BB	BB	(NA)
30	RUBBER, MISC PLASTIC PRODUCTS	(NA)	AA	(NA)
32	STONE, CLAY, GLASS PRODUCTS	1.1	1.1	1.6
33	PRIMARY METAL INDUSTRY	AA	AA	(NA)
34	FABRICATED METAL PRODUCTS	(NA)	CC	(NA)
35	MACHINERY, EXCEPT ELECTRIC	0.5	0.4	(NA)
37	TRANSPORTATION EQUIPMENT	(NA)	0.2	(NA)
39	MISC MANUFACTURING INDUSTRIES	0.5	0.8	0.7
	TOTAL MANUFACTURING	25.4	25.0	23.7

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES, 1975 AND 1972 CENSUS OF MANUFACTURES

NOTES - GENERAL STATISTICS FOR SOME PRODUCTION AREAS ARE WITHHELD TO AVOID DISCLOSING FIGURES FOR INDIVIDUAL COMPANIES. FOR SUCH AREAS WITH OVER 150 EMPLOYEES THE EMPLOYMENT SIZE RANGE IS INDICATED AS FOLLOWS

AA - 150 TO 249 CC - 500 TO 999 FF - 2500 OR MORE
BB - 250 TO 488 DD - 1000 TO 2499

(NA) - NOT AVAILABLE

TABLE II-51
EMPLOYMENT BY MANUFACTURES IN NEVADA, 1967, 1972 AND 1975
[IN THOUSANDS]

CODE		1967	1972	1975
20	FOOD AND KINDRED PRODUCTS	1.0	1.4	1.4
24	LUMBER AND WOOD PRODUCTS	(NA)	0.3	0.4
25	FURNITURE AND FIXTURES	0.2	0.2	(NA)
27	PRINTING AND PUBLISHING	1.3	1.5	1.7
28	CHEMICALS AND ALLIED PRODUCTS	0.7	0.8	0.9
32	STONE, CLAY, GLASS PRODUCTS	1.0	1.4	1.5
33	PRIMARY METAL INDUSTRY	EE	EE	(NA)
34	FABRICATED METAL PRODUCTS	(NA)	0.5	0.6
35	MACHINERY, EXCEPT ELECTRIC	0.2	0.6	0.6
36	ELECTRIC AND ELECTRONIC EQUIP	(NA)	0.8	0.6
38	INSTRUMENTS, RELATED PRODUCTS	(NA)	BB	(NA)
39	MISC MANUFACTURING INDUSTRIES	(NA)	0.4	1.0
	TOTAL MANUFACTURING	7.0	10.0	11.3

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF MANUFACTURES, 1975 AND 1972 CENSUS OF MANUFACTURES

NOTES - GENERAL STATISTICS FOR SOME PRODUCTION AREAS ARE WITHHELD TO AVOID DISCLOSING FIGURES FOR INDIVIDUAL COMPANIES. FOR SUCH AREAS WITH OVER 150 EMPLOYEES THE EMPLOYMENT SIZE RANGE IS INDICATED AS FOLLOWS

AA - 150 TO 249 CC - 500 TO 999 FF - 2500 OR MORE
BB - 250 TO 488 DD - 1000 TO 2499

(NA) - NOT AVAILABLE

TABLE II-52
FARM EMPLOYMENT, 1975
[IN THOUSANDS]

REGION	TOTAL WORKERS	FAMILY WORKERS	HIRED WORKERS
CALIFORNIA	316.0	71.0	245.0
HAWAII	NA	NA	NA
NEVADA	5.1	2.8	2.3
REGION TOTAL	NA	NA	NA
UNITED STATES	4,357.1	3,033.5	1,323.6

SOURCE - U.S DEPARTMENT OF AGRICULTURE, AGRICULTURAL STATISTICS, 1976

NOTES - DATA FOR HAWAII IS NOT AVAILABLE

TABLE II-53
GROSS FARM INCOME, 1976
[IN MILLIONS OF DOLLARS]

REGION	MARKET RECEIPTS	GOVERN -MENT PAYMENTS	NON- MONEY INCOME	OTHER FARM INCOME	TOTAL INCOME
CALIFORNIA	9,101.9	13.0	258.5	132.8	9,506.2
HAWAII	323.3	0.4	13.8	14.3	351.8
NEVADA	149.8	1.3	12.5	2.8	166.3
REGION TOTAL	9,575.0	14.7	284.8	149.9	10,024.3
UNITED STATES	94,326.0	734.0	7,221.0	1,362.0	103,643.0
PERCENT OF US	10.2	2.0	3.9	11.0	9.7

SOURCE - U.S. DEPARTMENT OF AGRICULTURE, ECONOMIC RESEARCH SERVICE, STATE FARM INCOME STATISTICS, STATISTICAL BULLETIN 576, JUL 1977

TABLE II-54
LABOR FORCE BY MAJOR OCCUPATION, 1970
[IN THOUSANDS]

OCCUPATION	CALIFORNIA	HAWAII	NEVADA	TOTAL
PROFESSIONAL, TECHNICAL AND KINDRED WORKERS	1,283	43	26	1,353
NON-FARM MANAGERS AND ADMINISTRATORS	685	24	19	728
SALES WORKERS	562	19	11	592
CLERICAL AND KINDRED WORKERS	1,478	51	32	1,560
CRAFTSMEN AND KINDRED WORKERS	972	42	25	1,038
NON-TRANSPORT OPERATIVES	804	21	10	835
TRANSPORT EQUIPMENT OPERATIVES	251	10	7	267
NON-FARM LABORERS	326	14	7	347
FARMERS AND FARM MANAGERS	48	1	2	51
FARM LABORERS AND SUPERVISORS	124	7	2	133
NON-HOUSEHOLD SERVICE WORKERS	855	39	44	938
PRIVATE HOUSEHOLD WORKERS	95	2	2	99
OCCUPATION NOT REPORTED	519	24	25	567
TOTAL WORKERS	8,002	296	211	8,508

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF POPULATION, 1970

NOTES - THE CIVILIAN LABOR FORCE BY COUNTY IN HAWAII IN 1970 WAS HONOLULU - 250,570; HAWAII - 27,400; KAUAI - 13,200; MAUI - 19,980.

TABLE II-55
UNEMPLOYMENT AND UNEMPLOYMENT RATES, 1976
[IN THOUSANDS OF PERSONS, EXCEPT PERCENT]

REGION	NUMBER	UNEMPLOYMENT RATE (PERCENT)				
		TOTAL	MALE	FEMALE	WHITE	NON-WHITE
CALIFORNIA	889	9.2	8.7	9.8	8.5	14.0
HAWAII	39	9.8	11.4	7.9	13.4	8.5
NEVADA	27	9.0	8.1	10.4	NA	NA
REGION TOTAL	955	9.2	8.8	9.8	NA	NA
UNITED STATES	7,288	7.7	7.1	8.6	7.0	12.8
PERCENT OF US	13.1					

SOURCE - U.S. BUREAU OF LABOR STATISTICS, HANDBOOK OF LABOR STATISTICS

NOTES - PERSONS 16 YEARS OLD OR OLDER
UNEMPLOYMENT RATES FOR THE COUNTIES OF HAWAII IN 1976 WERE HONOLULU - 9.4; HAWAII - 11.2; KAUAI - 9.8; MAUI - 11.4.

TABLE II-56
PER CAPITA AND MEDIAN FAMILY INCOME, 1969
PERSONS BELOW POVERTY LEVEL, 1975
[NUMBER IN THOUSANDS]

REGION	MEDIAN FAMILY INCOME	PER CAPITA INCOME	BELOW POVERTY LEVEL	
			PERSONS	PERCENT
CALIFORNIA	$10,729	$3,614	2,192	10.4
HAWAII	11,552	3,373	67	7.9
NEVADA	10,687	3,554	53	8.8
UNITED STATES	9,586	3,119	23,991	11.4

SOURCE - U.S. BUREAU OF THE CENSUS, U.S CENSUS OF POPULATION, 1970 AND SURVEY OF INCOME AND EDUCATION

NOTES - MEDIAN FAMILY INCOME IN HAWAII BY COUNTY IN 1969 WAS HONOLULU - $12,035; HAWAII - $9,750; KAUAI - $9,946; MAUI - $9,643.

TABLE II-57
INCOME OF PERSONS BY INCOME CLASS, 1969
[IN THOUSANDS OF PEOPLE]

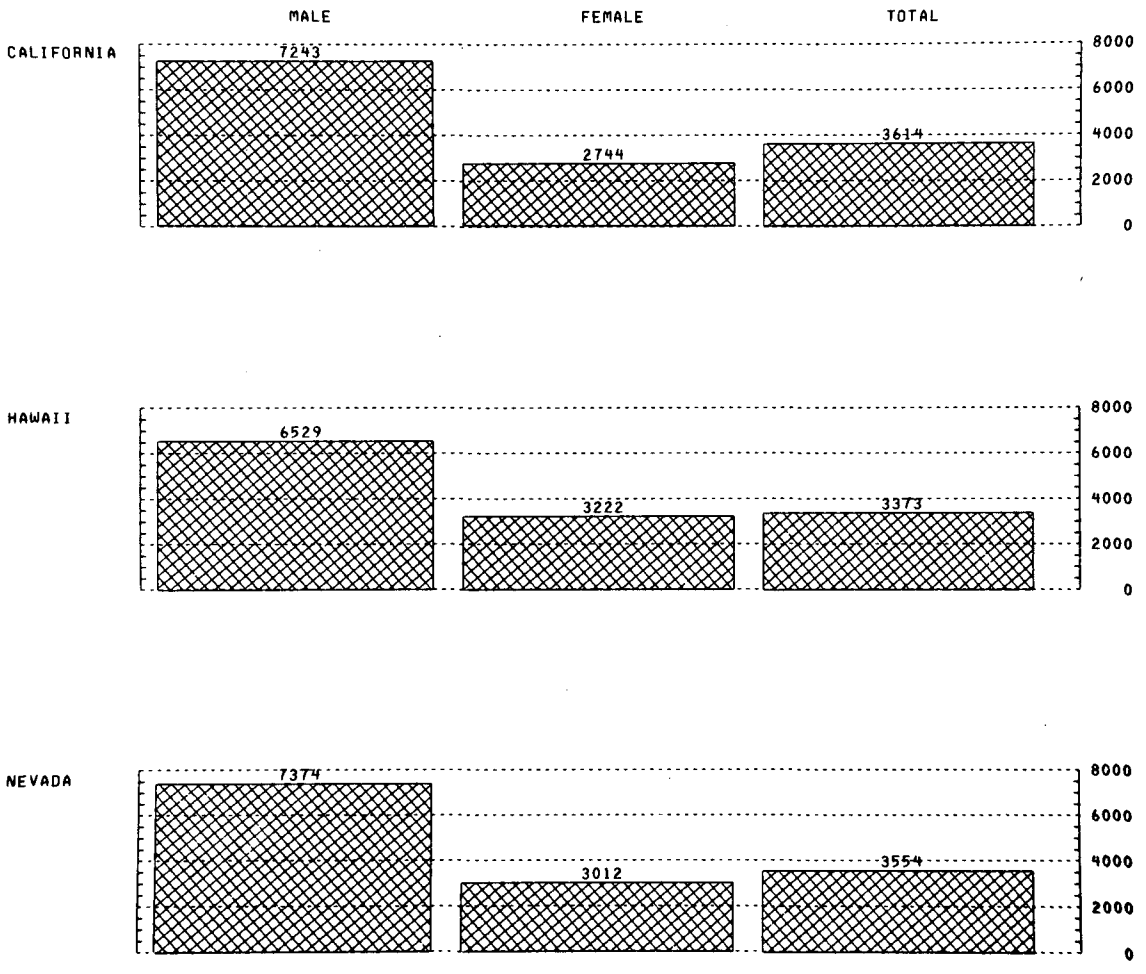
INCOME CLASS	MALE	FEMALE	TOTAL
CALIFORNIA			
0 - 4,999	2,389.0	3,554.0	5,943.3
5,000 - 9,999	2,042.3	1,186.7	3,229.0
10,000 - 14,999	1,312.2	184.0	1,496.2
15,000 - 24,999	547.4	44.9	592.3
25,000 +	202.9	18.1	221.0
MEDIAN INCOME	$7,243	$2,744	$3,614
HAWAII			
0 - 4,999	101.6	118.7	220.3
5,000 - 9,999	88.2	42.7	130.9
10,000 - 14,999	45.3	6.5	51.8
15,000 - 24,999	18.4	1.5	19.9
25,000 +	6.1	0.6	6.7
MEDIAN INCOME	$6,529	$3,222	$3,373
NEVADA			
0 - 4,999	55.2	77.7	132.9
5,000 - 9,999	58.1	27.8	85.9
10,000 - 14,999	34.2	3.5	37.7
15,000 - 24,999	13.1	0.7	13.8
25,000 +	4.1	0.4	4.5
MEDIAN INCOME	$7,374	$3,012	$3,554

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF POPULATION, 1970

TABLE II-58
INCOME OF FAMILIES BY INCOME CLASS, 1969
[IN THOUSANDS OF FAMILIES]

INCOME CLASS	TOTAL	WHITE	NON-WHITE	URBAN	NON-FARM RURAL	FARM RURAL
CALIFORNIA						
0 - 4,999	841.7	716.0	125.6	734.9	96.4	10.3
5,000 - 9,999	1,426.1	1,267.3	158.8	1,277.0	134.4	12.2
10,000 - 14,999	1,399.0	1,289.4	109.6	1,287.7	100.2	11.2
15,000 - 24,999	1,029.4	966.2	63.2	962.5	58.5	8.4
25,000 +	305.1	293.5	11.5	284.0	17.1	3.8
MEDIAN INCOME	$10,732	$10,969	$8,339	$10,899	$8,922	$9,683
HAWAII						
0 - 4,999	22.8	10.7	9.8	17.8	4.7	0.3
5,000 - 9,999	47.7	21.7	26.0	37.1	10.2	0.4
10,000 - 14,999	44.7	16.0	28.7	37.7	6.7	0.3
15,000 - 24,999	42.3	14.7	27.5	37.7	4.2	0.2
25,000 +	13.3	5.2	8.1	12.1	1.1	0.2
MEDIAN INCOME	$11,554	$10,508	$12,175	$12,056	$9,194	$10,248
NEVADA						
0 - 4,999	18.4	15.9	2.5	14.0	3.6	0.4
5,000 - 9,999	38.0	34.9	3.1	29.9	7.5	0.6
10,000 - 14,999	36.5	34.9	1.6	29.6	6.6	0.3
15,000 - 24,999	24.9	24.3	0.6	21.0	3.6	0.3
25,000 +	6.3	6.3	0.1	5.2	0.9	0.2
MEDIAN INCOME	$10,692	$10,942	$7,051	$10,878	$10,023	$8,921

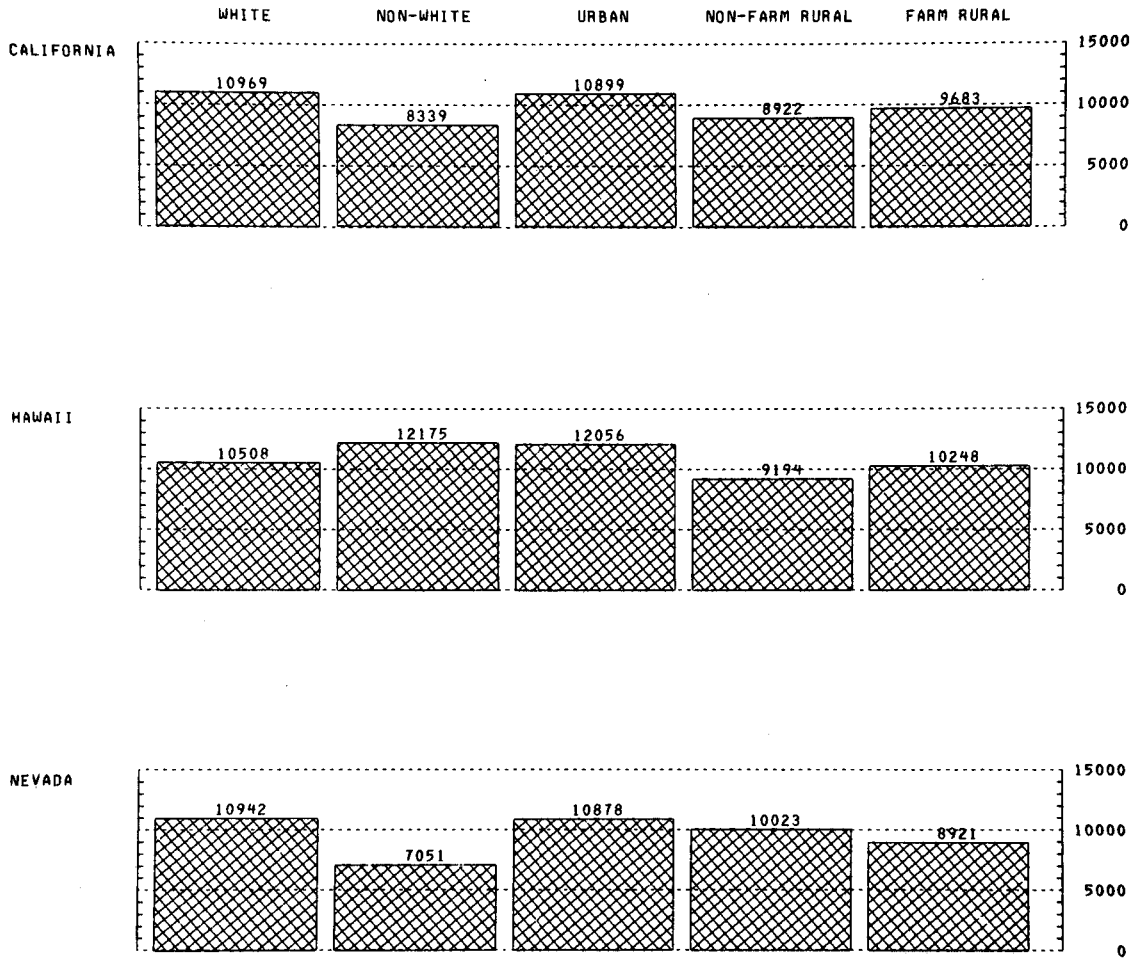
SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF POPULATION, 1970



Units:Current Dollars

FIGURE II-96 MEDIAN INCOME OF PERSONS, 1969

SOURCE: U. S. BUREAU OF THE CENSUS, CENSUS OF POPULATION, 1970



Units:Current Dollars

FIGURE II-97 MEDIAN FAMILY INCOME, 1969

SOURCE: U. S. BUREAU OF THE CENSUS, CENSUS OF POPULATION, 1970

TABLE II-59
UNEMPLOYMENT INSURANCE, 1976
[IN THOUSANDS, EXCEPT BENEFITS IN MILLIONS]

REGION	INITIAL CLAIMS	AVERAGE WEEKS COMPENSATED	WEEKLY BENEFICIARIES	BENEFITS
CALIFORNIA	2,598	17,405	335	$2,003
HAWAII	68	846	16	105
NEVADA	113	569	11	68
REGION TOTAL	2,779	18,820	362	2,176
UNITED STATES	20,705	135,000	2,596	16,015
PERCENT OF US	13.4	13.9	13.9	13.6

SOURCE - U.S. EMPLOYMENT AND TRAINING ADMINISTRATION, UNEMPLOYMENT INSURANCE STATISTICS

NOTES - PRELIMINARY DATA

TABLE II-60
SOCIAL SECURITY (OASDHI) BENEFITS, 1976
[IN THOUSANDS, EXCEPT PAYMENTS IN MILLIONS]

REGION	NUMBER OF BENEFITS			BENEFIT PAYMENTS
	RETIRED WORKERS	SURVIVORS	DISABILITY INSURANCE	
CALIFORNIA	1,867.5	598.6	441.8	$6,630.0
HAWAII	64.4	19.0	10.5	196.6
NEVADA	43.3	15.4	10.7	157.3
REGION TOTAL	1,977.1	633.0	463.0	6,983.9
UNITED STATES	20,496.1	7,446.3	4,532.8	71,362.7
PERCENT OF US	9.6	8.5	10.2	9.8

SOURCE - US. SOCIAL SECURITY ADMINISTRATION, SOCIAL SECURITY BULLETIN. TAKEN FROM THE STATISTICAL ABSTRACT OF THE U.S., 1977

NOTES - INCLUDES SPECIAL BENEFITS

TABLE II-61
HOSPITAL AND MEDICAL INSURANCE UNDER SOCIAL SECURITY, 1975
[ENROLLMENT IN THOUSANDS, PAYMENTS IN MILLIONS]

REGION	HOSPITAL		MEDICAL	
	ENROLLMENT	BENEFIT PAYMENTS	ENROLLMENT	BENEFIT PAYMENTS
CALIFORNIA	2,221	$1,247	2,199	$578
HAWAII	61	27	61	17
NEVADA	49	35	47	10
REGION TOTAL	2,331	1,309	2,307	605
UNITED STATES	24,640	11,335	23,905	4,225
PERCENT OF US	9.5	11.5	9.7	14.3

SOURCE - U.S. SOCIAL SECURITY ADMINISTRATION, HEALTH INSURANCE STATISTICS. TAKEN FROM THE STATISTICAL ABSTRACT OF THE U.S., 1977

TABLE II-62
OUTLAYS FOR THE FIVE LARGEST WELFARE PROGRAMS, 1976
[MONTHLY BENEFITS PER RECIPIENT]

REGION	MEDICAID	A F D C	S S I	FOOD STAMPS	GENERAL ASSIST-ANCE
CALIFORNIA	$112	$85	$167	$22	$103
HAWAII	100	104	128	28	119
NEVADA	190	55	107	29	0
UNITED STATES	134	73	116	24	103

SOURCE - HAVEMAN, J AND DEMKOVICH, L, MAKING SOME SENSE OUT OF THE WELFARE MESS, NATIONAL JOURNAL, VOL 9, NO 2, JAN 1977 (COPYRIGHT). TAKEN FROM THE STATISTICAL ABSTRACT OF THE U.S., 1977

NOTES - COVERS OUTLAYS BY FEDERAL, STATE AND LOCAL GOVERNMENTS
A F D C - AID TO FAMILIES WITH DEPENDENT CHILDREN
S S I - SUPPLEMENTAL SECURITY INCOME

II-G-3 HOUSING

THE DATA ON HOUSING PRESENTED IN THIS SECTION DESCRIBE THE AGE OF THE HOUSING STOCK, THE NUMBER OF NEW UNITS AUTHORIZED, AND DETAILS OF OWNERSHIP AND OCCUPANCY. THE DATA ARE FROM THE 1970 CENSUS OF HOUSING AND THE ANNUAL HOUSING SURVEY.

TABLE II-63
AGE BREAKDOWN OF HOUSING STOCK, 1970
[IN THOUSANDS OF UNITS]

REGION	TOTAL	0 - 4 YEARS	5 - 9 YEARS	10-19 YEARS	20-29 YEARS	30 + YEARS
CALIFORNIA	6,977	945	1,241	2,031	1,106	1,653
HAWAII	216	46	40	53	30	46
NEVADA	172	32	55	43	18	24
REGION TOTAL	7,364	1,023	1,336	2,127	1,154	1,723
UNITED STATES	67,699	8,874	8,802	14,499	8,786	27,458
PERCENT OF US	10.9	11.5	16.5	14.7	13.1	6.3

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF HOUSING, 1970

TABLE II-64
NEW HOUSING UNITS AUTHORIZED, 1975
[IN NUMBER OF UNITS]

REGION	TOTAL	PUBLIC	PRIVATE
CALIFORNIA	131,248	586	130,662
HAWAII	12,240	1,578	10,662
NEVADA	7,187	0	7,187
REGION TOTAL	150,675	2,164	148,511
UNITED STATES	949,234	10,075	939,159
PERCENT OF US	15.9	21.5	15.8

SOURCE - U.S. BUREAU OF THE CENSUS, ANNUAL SURVEY OF HOUSING, 1975

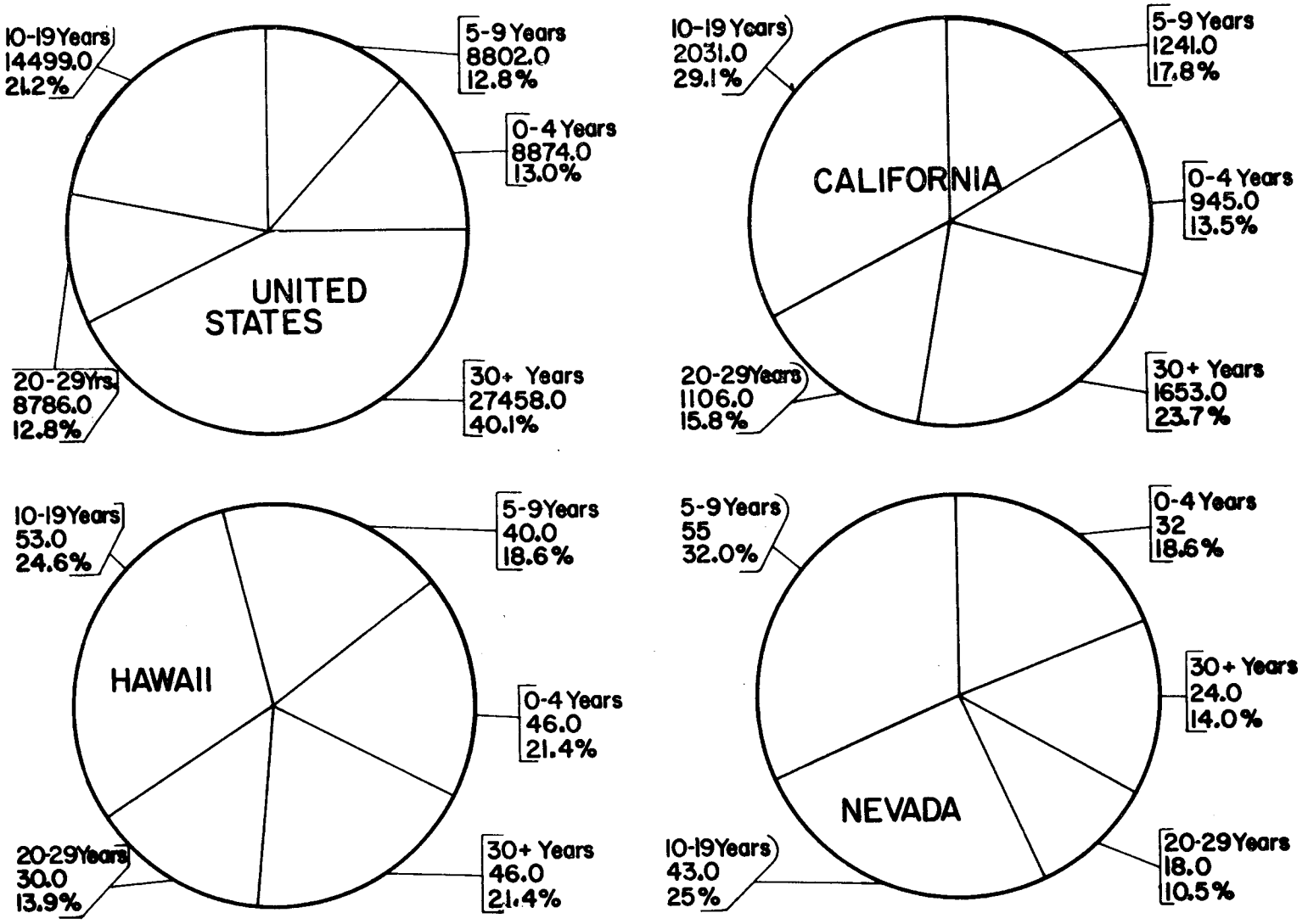


FIGURE II-98 AGE BREAKDOWN OF HOUSING STOCK, 1970

SOURCE: U. S. BUREAU OF THE CENSUS, CENSUS OF HOUSING, 1970

TABLE II-65
LENGTH OF RESIDENCE, 1970
[IN THOUSANDS OF UNITS]

REGION	0 - 4 YEARS	5 - 9 YEARS	10-19 YEARS	20 + YEARS
CALIFORNIA				
OWNER OCCUPIED	1,520	832	838	421
RENTER OCCUPIED	2,470	288	144	57
HAWAII				
OWNER OCCUPIED	37	20	24	14
RENTER OCCUPIED	84	11	7	5
NEVADA				
OWNER OCCUPIED	51	22	14	6
RENTER OCCUPIED	60	4	2	1
REGION TOTAL				
OWNER OCCUPIED	1,608	874	876	441
RENTER OCCUPIED	2,614	303	153	63
UNITED STATES				
OWNER OCCUPIED	14,387	7,729	9,675	8,094
RENTER OCCUPIED	17,482	2,845	1,854	1,379
PERCENT OF US				
OWNER OCCUPIED	11.1	11.3	9.1	5.4
RENTER OCCUPIED	15.0	10.7	8.3	4.6

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF HOUSING, 1970

TABLE II-66
OCCUPANCY OF HOUSING UNITS, 1970
[IN THOUSANDS OF UNITS]

REGION	YEAR ROUND UNITS	OCCUPIED UNITS	OWNER OCCUPIED	RENTER OCCUPIED
CALIFORNIA	6,977	6,574	3,612	2,960
HAWAII	216	203	95	108
NEVADA	172	160	94	66
REGION TOTAL	7,364	6,937	3,800	3,134
UNITED STATES	67,657	63,450	39,855	23,560
PERCENT OF US	10.8	10.9	9.5	13.3

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF HOUSING, 1970

TABLE II-67
POPULATION PER OCCUPIED HOUSING UNIT, 1970
[IN PERSONS PER UNIT]

REGION	OWNER OCCUPIED	RENTER OCCUPIED	MEDIAN NUMBER OF ROOMS
CALIFORNIA	3.3	2.5	4.7
HAWAII	4.0	3.3	4.6
NEVADA	3.3	2.6	4.6
REGION	3.3	2.5	4.7
UNITED STATES	3.3	2.8	5.0

SOURCE - U.S. BUREAU OF THE CENSUS, CENSUS OF HOUSING, 1970

II-G-4 HEALTH

DATA ON MORTALITY AND MORBIDITY IN THE REGION ARE PRESENTED IN THIS SECTION. MAPS SHOWING MORTALITY RATES FOR SIX CATEGORIES OF DISEASES ARE INCLUDED. THE DATA ARE FROM PUBLICATIONS OF THE CENTER FOR HEALTH STATISTICS. THE MAPS WERE PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY.

TABLE II-68
DEATH RATES FOR THE TEN LEADING CAUSES OF DEATH, 1975
[RATES PER 100,000 ESTIMATED MIDYEAR POPULATION]

REGION	DISEASES OF THE HEART	MALIG-NANT NEO-PLASMS	CEREBRO-VASCULAR DISEASES	ACCI-DENTS	INFLU-ENZA AND PNEU-MONIA	DIABETES MELLITUS	CIRRHOSIS OF THE LIVER	ARTERIO-SCLE-ROSIS	SUICIDE	DISEASES OF EARLY INFANCY
CALIFORNIA	289.7	163.0	85.5	51.6	22.0	10.8	20.9	12.0	18.2	9.5
HAWAII	162.0	107.2	45.8	29.2	17.5	15.1	7.3	1.6	8.7	11.8
NEVADA	232.9	147.6	81.8	60.0	20.1	10.3	22.6	8.8	27.2	13.9
UNITED STATES	336.2	171.7	91.1	48.4	26.1	16.5	14.8	13.6	12.7	12.5

SOURCE - U.S. NATIONAL CENTER FOR HEALTH STATISTICS, VITAL STATISTICS OF THE UNITED STATES, 1975

TABLE II-69
CANCER MORTALITY RATES, 1975
[RATES PER 100,000 ESTIMATED MIDYEAR POPULATION]

REGION	TOTAL MALIGNANT NEOPLASMS	OF THE DIGESTIVE ORGANS	OF THE RESPIRATORY SYSTEM	OF THE BREAST	OF THE GENITAL ORGANS	OF THE URINARY ORGANS	LEUKEMIA	OTHER CANCERS
CALIFORNIA	163.0	43.0	39.7	15.0	18.5	7.1	6.9	32.7
HAWAII	107.2	36.3	24.5	7.2	8.1	5.3	3.5	22.3
NEVADA	147.6	33.6	42.2	12.2	14.9	7.8	4.9	32.1
REGION TOTAL	160.4	42.5	39.2	14.6	18.0	7.1	6.7	32.2
UNITED STATES	171.7	46.8	40.7	15.2	20.2	7.8	6.9	34.1

SOURCE - U.S. NATIONAL CENTER FOR HEALTH STATISTICS, VITAL STATISTICS OF THE UNITED STATES, 1975

TABLE II-70
REPORTED CASES OF NOTIFIABLE DISEASES, 1976
[RATE PER 100,000 ESTIMATED MIDYEAR POPULATION]

DISEASE	CALIFORNIA	HAWAII	NEVADA	UNITED STATES
AMEBIASIS	3.6	2.7	---	1.4
ASEPTIC MENINGITIS	3.4	7.4	2.0	1.6
BRUCELLOSIS	0.1	---	---	0.1
CHICKEN POX	8.0	118.0	12.6	85.7
DIPHTHERIA	0.0	0.1	---	0.1
HEPATITIS	46.4	27.1	26.4	30.0
MALARIA	0.7	0.1	0.2	0.2
MEASLES	11.0	1.2	14.6	19.2
MENINGO-COCCAL INFECTIONS	0.7	0.7	0.2	0.7
MUMPS	8.8	5.5	19.5	17.9
PERTUSSIS	0.3	0.2	---	0.5
RHEUMATIC FEVER, ACUTE	0.1	---	---	0.9
RUBELLA	4.2	2.5	3.3	5.8
SALMONELLOSIS (NOT TYPHOID)	9.9	52.8	5.4	10.7
SHIGELLOSIS	21.3	20.5	3.0	6.1
TETANOUS	0.0	---	---	0.0
TRICHINOSIS	0.0	---	---	0.1
TULAREMIA	0.0	---	---	0.1
TYPHOID FEVER	0.6	0.8	---	0.2
TYPHUS FEVER	0.0	---	---	0.4
TUBERCULOSIS	16.8	75.0	6.9	15.0

SOURCE - U.S. PUBLIC HEALTH SERVICE, CENTER FOR DISEASE CONTROL, REPORTED MORBIDITY AND MORTALITY IN THE UNITED STATES, 1976

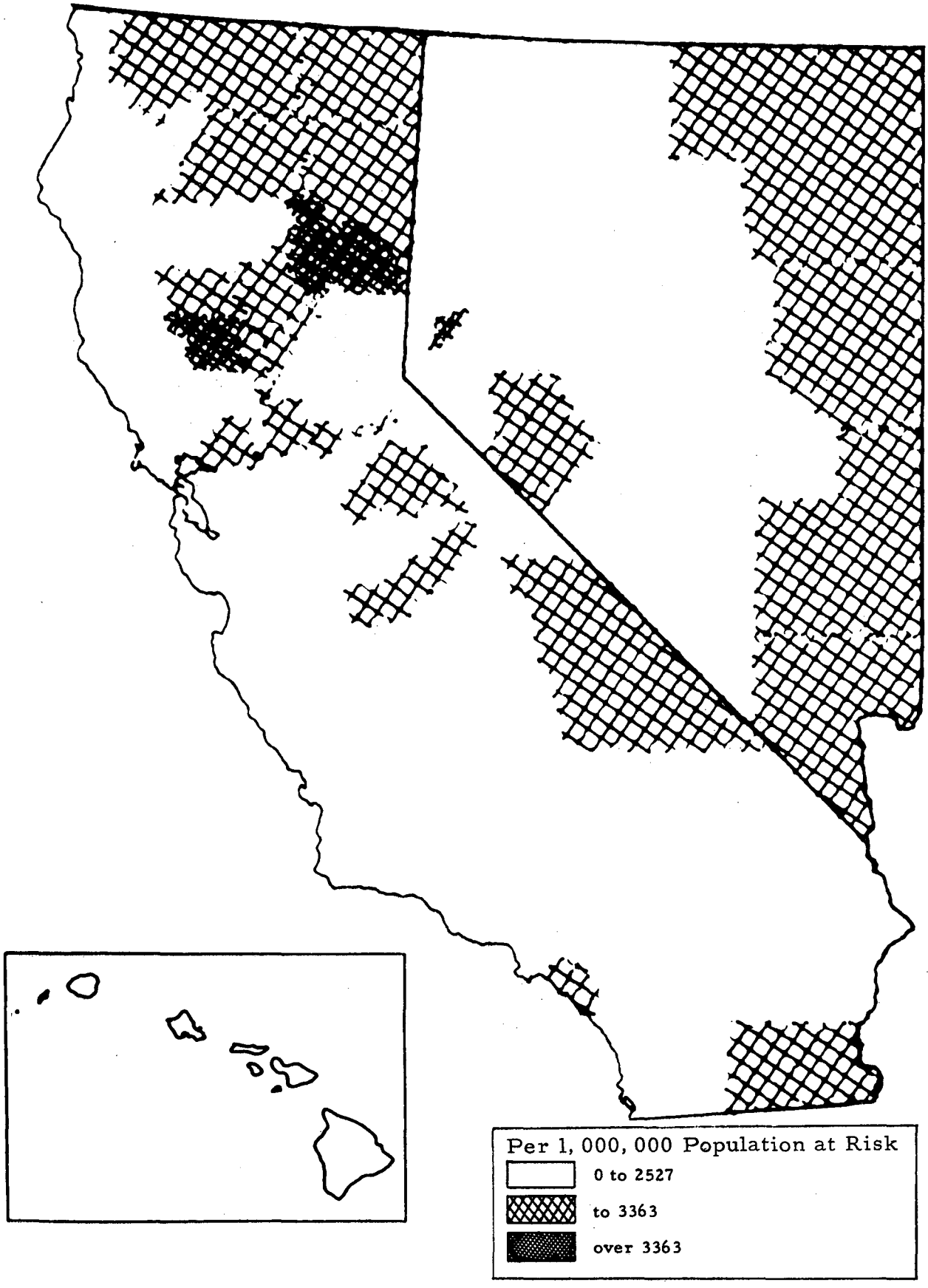


FIGURE II-99 AGE-ADJUSTED MORTALITY FROM ACUTE ISCHEMIC HEART DISEASE WHITE MALES 1968 - 1972

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM U. S. HEALTH, EDUCATION AND WELFARE DATA

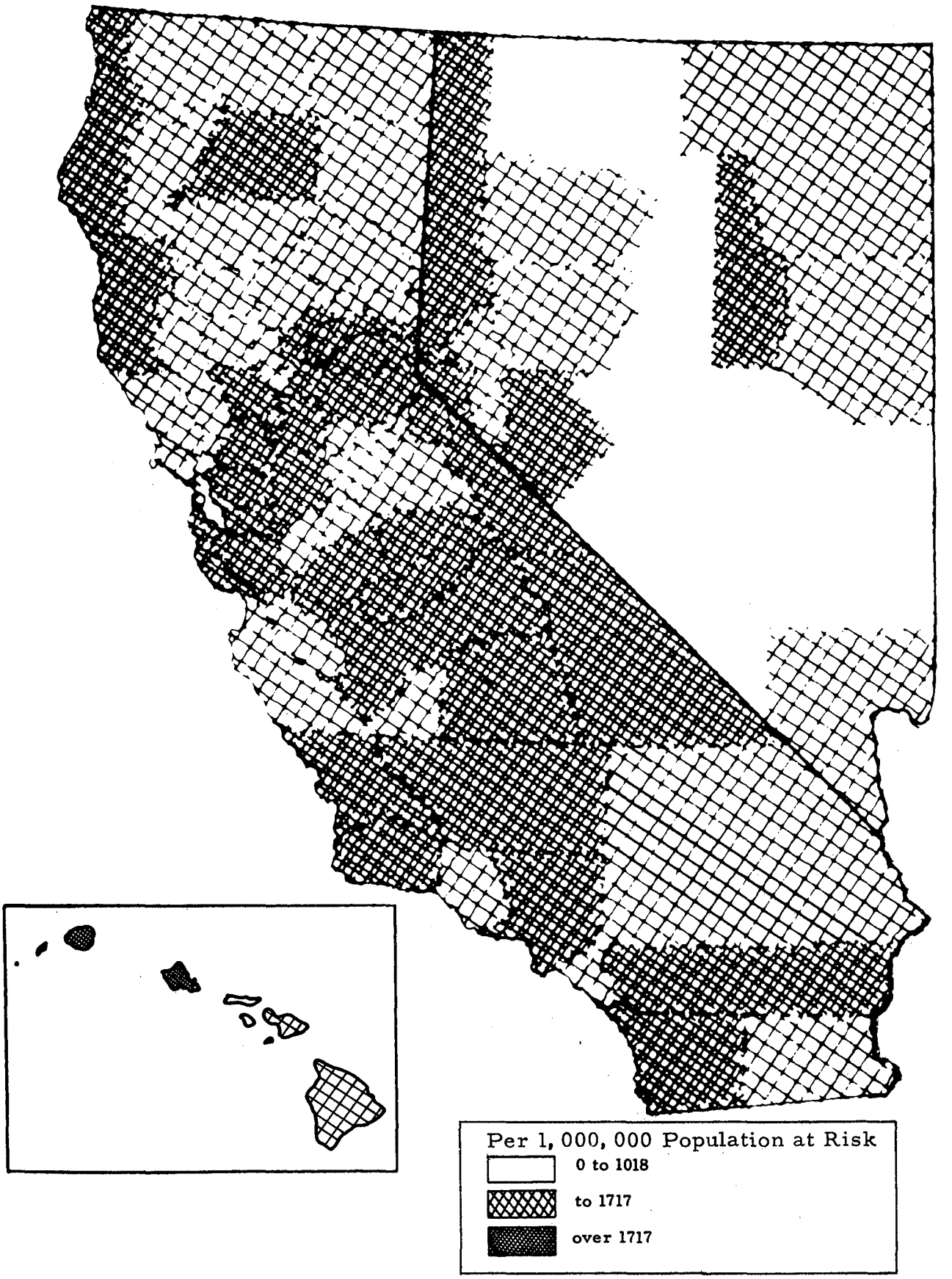


FIGURE II-100 AGE-ADJUSTED MORTALITY FROM CHRONIC ISCHEMIC HEART DISEASE WHITE MALES 1968 - 1972

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM U. S. HEALTH, EDUCATION AND WELFARE DATA

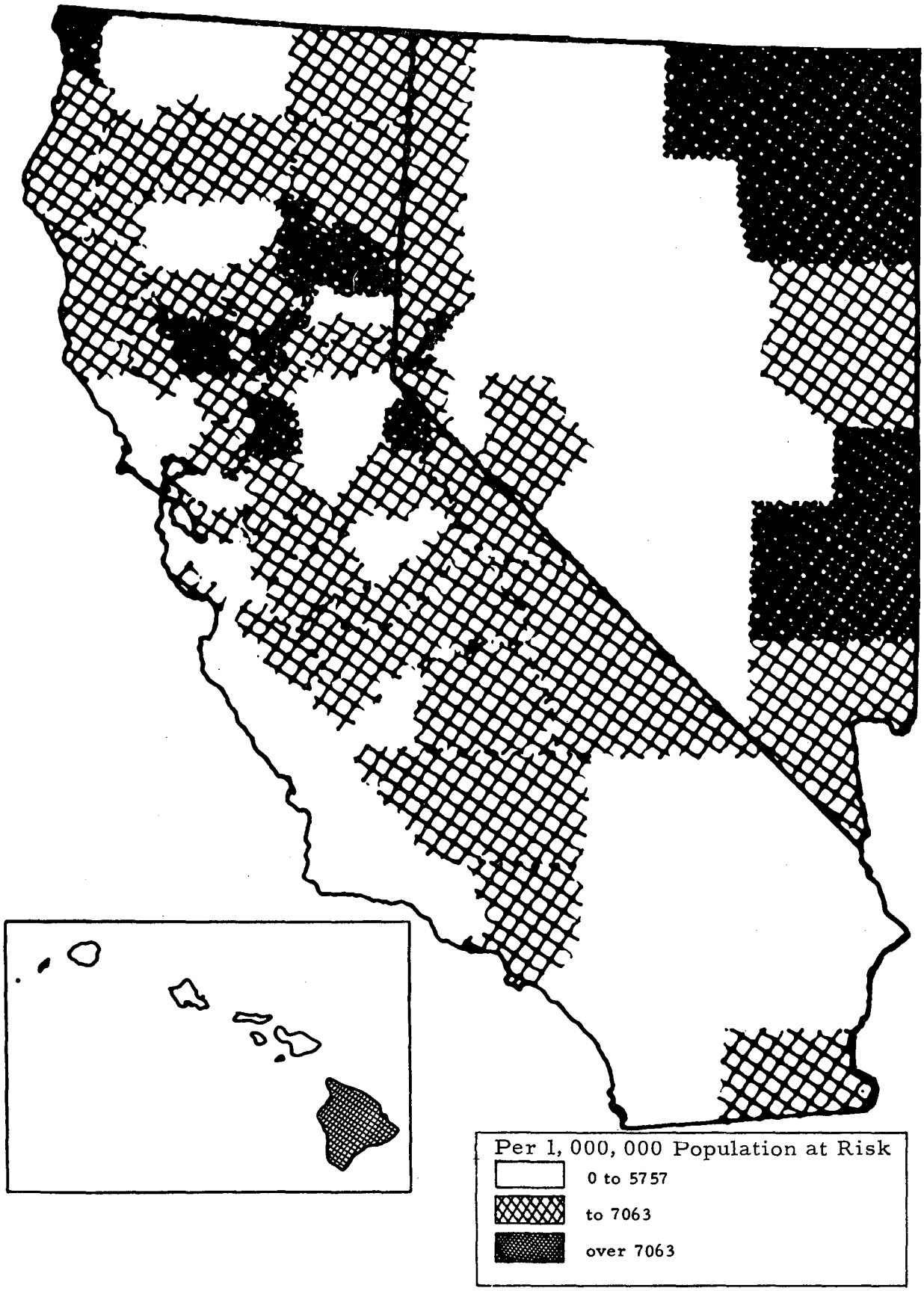


FIGURE II-101 AGE-ADJUSTED MORTALITY FROM MAJOR CARDIOVASCULAR DISEASE WHITE MALES 1968 - 1972

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM U. S. HEALTH, EDUCATION AND WELFARE DATA

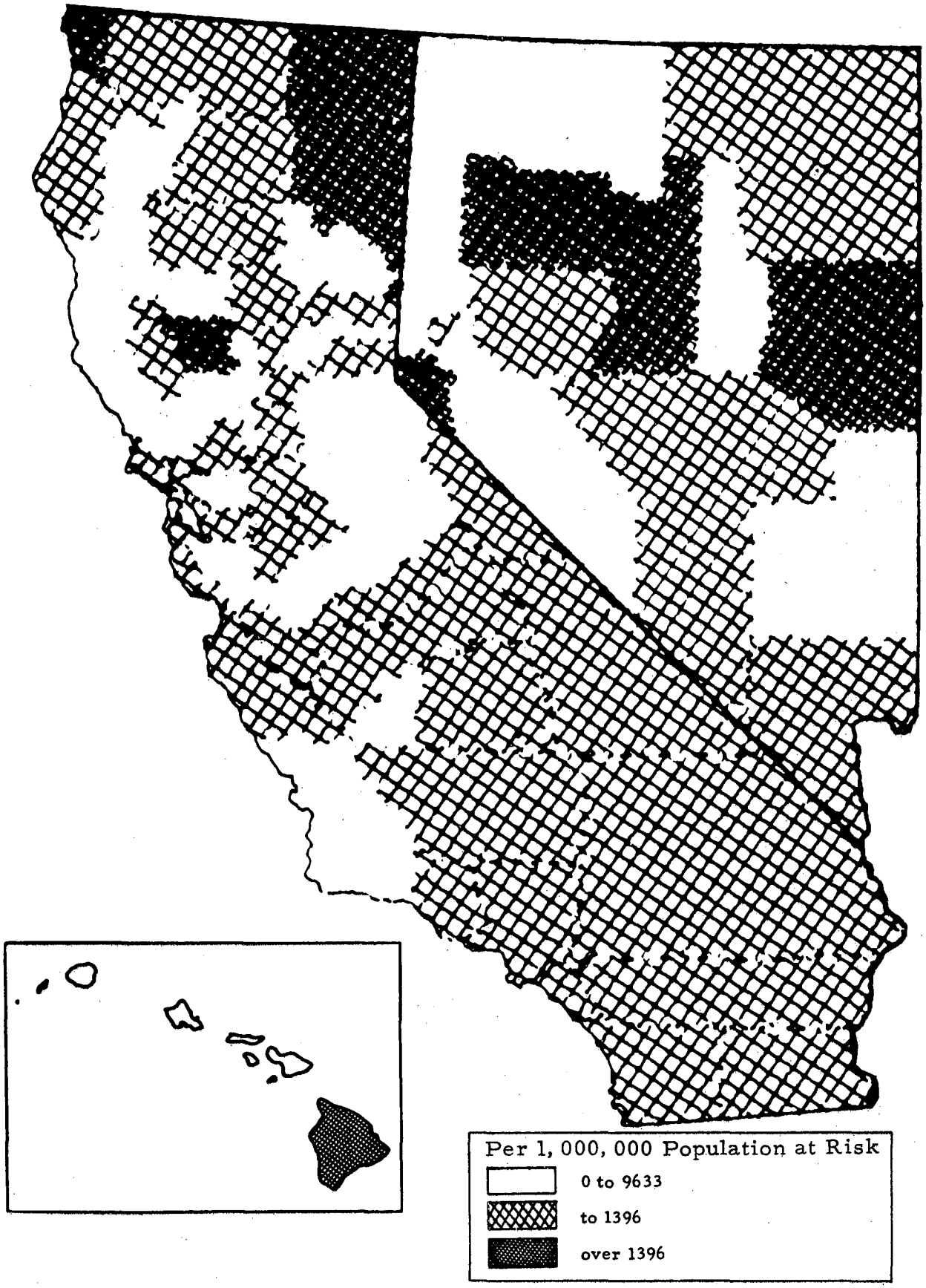


FIGURE II-102 AGE-ADJUSTED MORTALITY FROM CEREBROVASCULAR DISEASE WHITE MALES 1968 - 1972

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM U. S. HEALTH, EDUCATION AND WELFARE DATA

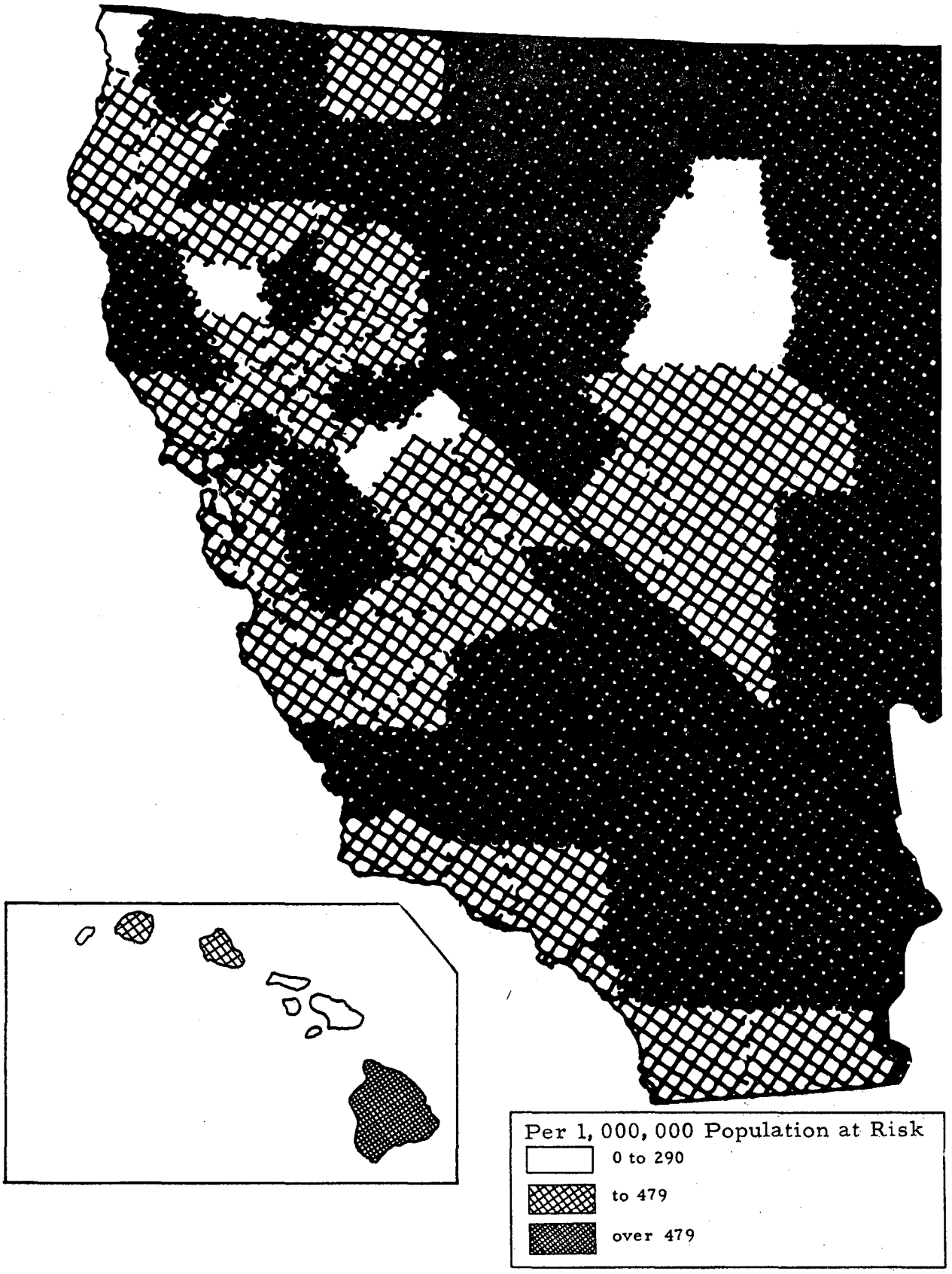


FIGURE II-103 AGE-ADJUSTED MORTALITY FROM CHRONIC RESPIRATORY DISEASE WHITE MALES 1968 - 1972

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM U. S. HEALTH, EDUCATION AND WELFARE DATA

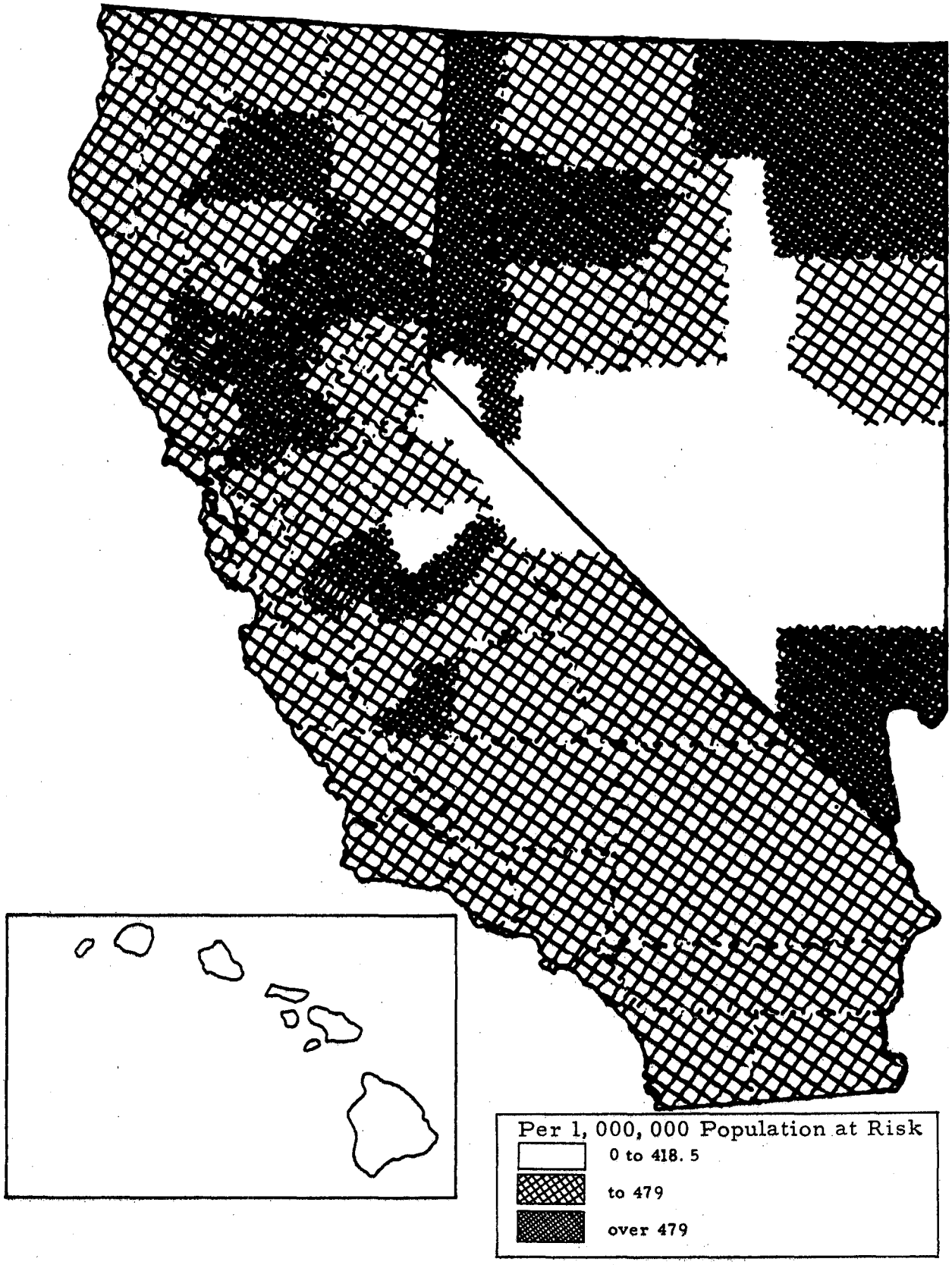


FIGURE II-104 AGE-ADJUSTED MORTALITY FROM RESPIRATORY CANCER WHITE MALES 1968 - 1972

SOURCE: PROVIDED BY THE COUNCIL ON ENVIRONMENTAL QUALITY FROM U. S. HEALTH, EDUCATION AND WELFARE DATA

REGIONAL DATA AVAILABILITY MATRIX

Section	Resolution of Included Data	Resolution of Additional Data
II-B-1 Surface Water		
Stream flow	Major streams annual average	Daily by gauging station
Consumption	1975 by state and consuming sector	By ASR and sector (partial coverage); California by 4-digit SIC code in manufacturing 1970
Quality	1975 by ASR and pollutant	Daily by gauging station
II-B-2 Groundwater		
Availability	By state and ASR (maps)	None
Quality	By ASR (maps)	None
II-B-3 Water Management		
Dams & Reservoirs	Size and location by river and ASR	Daily operating records for USBR and California DWR facilities
II-C-1 Air Quality		
Air quality	1975 by AQCR and pollutant	Annually by monitoring station, 1974-1976; daily through 1972 by NASN station; California - quarterly by basin
Emissions	1975 by AQCR and pollutant	California - monthly by power plant boiler
II-C-2 Natural Climate Factors		
Temperature, precipitation, wind, heating and cooling degree-days, etc.	Monthly by state climate division or weather station	Hourly data for selected weather stations; by county Jan., Jul., and annual averages
II-C-3 Man-induced Climate Factors		
Pollution standard index	Selected basins - annual	Daily by air basin
Acid rain	Map of pH	None
II-D-1 Solid Wastes		
Municipal wastes	Statewide averages	By municipality
Hazardous wastes	Location of facilities (maps)	None
II-E-1 Natural Landscape		
Shaded relief	Regional map	Detailed topological maps
II-E-2 Land Use		
Land use	1967 by county (maps)	California - one mile grid by 15 land use types
Crop production and acreage	1976 by state	1974, 1969 by county; annually by state

REGIONAL DATA AVAILABILITY MATRIX (Continued)

Section	Resolution of Included Data	Resolution of Additional Data
II-E-3 Land Ownership		
Federal, state, indian and public lands	Regional maps, state data for selected years	None
II-F-1 Flora		
Endangered plants	Number of species by state	None
II-F-2 Fauna		
Endangered animals	List of species by state; number of species by county (maps)	Maps of range of species
II-G-1 Population		
Population characteristics	1975 by state; Hawaii by county	1970 by county, census tract, block groups and enumeration district; 1970-1976 estimates by county for total population and components of population change
II-G-2 Employment and Income		
Employment	1967, 1972, 1975 manufacturing by 2-digit SIC code and state; 1975 farm employment by state	1962-1973 by county and 4-digit SIC code. 1958-1972 by state and SMSA and by 2-digit SIC code; California - monthly by SMSA; farm employment annually by state; 1974 by county
Labor force	1970 by state	1970 by county census tract, block group and enumeration district; 1975 by prime sponsor
Unemployment	1976 by state	California - monthly by SMSA; Hawaii - annually by county
Income	1969 by state	1929-1974 by county
Capital Expenditures, Value Added and Value of Shipments	1975 by state and 2-digit SIC code for manufacturing	1972 by county and 4-digit SIC code for manufacturing and mining
II-G-3 Housing		
Housing characteristics	1970 by state	1970 by county, census tract, block group and enumeration district for California; selected data by county for other states
II-G-4 Health		
Mortality	1975 by state and disease 1968-1972 by county (maps)	1968-1972 by cause of death, race and sex, and county; 1950-1969 cancer mortality; weekly by state
Morbidity	1972 by state	Annually and weekly by state

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Chapter III
PERSPECTIVE ON REGIONAL INSTITUTIONS

III PERSPECTIVE ON REGIONAL INSTITUTIONS

III-A REGIONAL OVERVIEW

III-A-1. Regional Overview

This chapter describes the institutions and summarizes the legislation, regulations, and standards which are pertinent to the siting, construction and operation of energy facilities. We identify the major state agencies involved and describe how they interact with each other and the federal government. In this discussion we examine possible constraints and conflicts with emphasis on siting and environmental impacts.

California

The principal state agencies that have regulatory and site approval authority for thermal electric power plants in California are the Energy Resources Conservation and Development Commission (ERCDC), the Public Utilities Commission (PUC), the Coastal Commission, the air Resources Board (ARB) and the State Water Resources Control Board (SWRCB).

The ERCDC has the exclusive state level authority to approve sites and certify thermal electric power plants. This authority is exercised in lieu of any permit or certificate required by any other state, local or regional agency and federal agencies to the extent permitted by federal law. The ERCDC must determine the need for new plants by comparing a utility's proposal with a Commission forecast of demand. Specific proposals must be reviewed for environmental impacts and for alternatives to the proposed plant. It is not clear at present whether the ERCDC or ARB has final permit authority with respect to state and federal air quality regulations. A more detailed discussion of the structure and function of the Energy Commission is presented in an Appendix.

Prior to the creation of the ERCDC, the Public Utilities Commission had issued certificates of public convenience and necessity that were required before a plant could be built. Those provisions of the Public Utility Code remain on the books, but with the preemption by the ERCDC, the PUC's primary function is to regulate public utility rates. The PUC is requested to provide the Energy Commission with comments or the design, operation, and location of proposed facilities as well as the economic, financial, rate, system reliability, and service implications of the facility. A certificate of public convenience and necessity is still required from the PUC. However, the certificate may not be granted prior to the Energy Commission's certification.

The Coastal Commission, which originated in a statewide initiative concerning coastal preservation, administers the state programs under the federal Coastal Zone Management Act. It is a key factor in siting facilities that significantly affect the coastal zone. By state law, the Coastal Commission is required to designate areas within the coastal zone that are not suitable for siting energy facilities. For power plants proposed in non-designated coastal areas the Commission is to participate in the ERCDC siting process.

The Air Resources Board and the Water Resources Control Board administer the state and federal air and water pollution regulations, as well as the California Environmental Quality Act. The ARB has played a crucial role in siting proposals for non-nuclear facilities because of pollutant non-attainment status of portions of the state. There are also local Air Pollution Control Districts that administer the state and federal regulations and have the power to create stricter regulations.

In 1976 in response to a pending vote on the highly restrictive Nuclear Safeguards Initiative the Legislature passed several bills concerned with nuclear safety. Part of this legislation required

the ERCDC to present to the Legislature findings on whether there exists a proven means of disposing high-level radioactive wastes before a nuclear power plant could be sited. In the case of the proposed Sundesert nuclear facility, the Commission found that there was no proven method for waste disposal and recommended that the power plant not be exempted. Subsequently the Legislature failed to provide an exemption for the Sundesert plant. Before this, nuclear power plants had been a major element of the utilities' projected growth in electrical capacity. Because of the uncertainties with the future of nuclear power and with the cost and long-term availability of fuel oil, the state's utilities plan to introduce coal as a fuel for in-state base-load electrical generation in the late 1980's and expect to continue to rely on new oil-fired capacity in the near term. Coal as a fuel source may conflict with the ARB and the air quality standards of the state. This results in a squeeze between the air quality regulations and the coal conversion sections of the National Energy Act.

Water for plant cooling is an important consideration in California because of constraints on coastal sites and a shortage of fresh water. Along the coast where there is an abundant supply of ocean water for once-through cooling, there are, however, significant seismic hazards, air quality problems and coastal preservation considerations. The coastal air quality problems are created by the typically onshore wind patterns that collect pollutants from the primary population centers in front of the coastal mountains. As concerns possible inland power plant sites, the WRCB has set the lowest priority on fresh water use for power plant cooling. Although in theory the ERCDC can overrule WRCB findings, the setting of priorities indicates the relative importance of competing uses for water in California.

The single most significant piece of environmental legislation so far enacted in the State of California is the California Environmental Quality Act (CEQA) of 1970, as amended through 1974. The basic structure

of CEQA, in very large measure inspired by and modeled after the National Environmental Policy Act (NEPA) of 1969, consists of a declaration of legislative findings and policy and two operative chapters requiring the preparation of state and local environmental impact reports (EIR).

The key feature of the law is section 21100, which provides that all state agencies, boards, and commissions shall prepare, or cause to be prepared by contract, and certify the completion of an environmental impact report on any project they propose to carry out or approve which may have a significant effect on the environment. Such a report shall include a detailed statement setting forth the following:

(a) The environmental impact of the proposed action.
(b) Any adverse environmental effects which cannot be avoided if the proposal is implemented.
(c) Mitigation measures proposed to minimize the impact.
(d) Alternatives to the proposed action.
(e) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.
(f) Any irreversible environmental changes which could be involved in the proposed action should it be implemented.
(g) The growth-inducing impact of the proposed action.

The Act requires certain other actions such as state comment on federal environmental impact statements.

Note: Portions of the above were taken from the California Environmental Quality Act--An Innovation in State and Local Decision Making, Thaddeus C. Trazyna and Authur W. Jokela, California, 1974.

Hawaii

Hawaii does not have a state level siting authority for thermal electric power plants; local zoning is the major siting determinant. Other agencies of importance for seting are the Department of Health (DOH) and the Department of Planning and Economic Development (DPED), which includes the Coastal Zone Management Program (CZMP), the State Land Use Commission (LUC), the State Energy Office (SEO) and the Center for Science, Policy and Technology Assessment (CSPTA).

The DOH regulates and administers the state and federal air and water pollution acts. The Coastal Zone Management Program is a state program funded and initiated by the Federal Coastal Zone Management Act. Under the program permits must be obtained for thermal discharge sources that significantly affect the coastal zone.

The State Land Use Commission has classified the lands of the state into four categories. Special permits are required from the Commission for certain unusual and seasonal uses of lands within agricultural and rural categories.

Hawaii's Department of Planning and Economic Development, which had already in existence divisions working in trade and commerce, was asked by the governor in 1974 to set up an office for oil allocation. The director of DPED drew on his experienced staff for support, and he and they were natural choices to assume energy responsibilities when the Legislature created the position of "Energy Resources Coordinator" by Act 237 which became effective on July 1, 1974. (The Act became Chapter 196 in the Hawaii Revised Statutes.)

That legislation, in the Legislative Reference Bureau's definition, "Establishes the position of Energy Resources Coordinator in the office of the governor to coordinate programs to effectuate the conservation of fuel, to provide for the equitable distribution of the fuel, to

formulate plans for the development and alternate use of energy resources; and specifically requires the coordinator to formulate plans and criteria to measure the accomplishment of objectives and financial requirements for the optimum development of Hawaii's energy resources, conduct systematic analyses of energy resource programs and make recommendations to the governor and to the legislature, formulate proposals for conserving energy and fuel, assist public and private agencies in implementing energy conservation and related measures, coordinate the State's energy conservation and allocate programs, contract for services, consult with various bodies, conduct public education programs, review proposed state actions, and prepare an annual report."

In his dual role as DPED director and State Energy Resources Coordinator, Hideto Kono looks to two portions of his Department of Planning and Economic Development for actions in the energy field. The two DPED organizations responsible for energy policy are the State Energy Office and the State Center for Science Policy and Technology Assessment. Manager of the State Energy Office is Alfred S. Harris; manager of the Center for Science Policy and Technology Assessment is Eugene M. Grabbe.

In this way of operating the DPED Director-Energy Resources Coordinator has at his command both the human resources and the administrative vantage point to deal with energy concerns, to balance energy considerations against development objectives and to take into account the State's total planning process. The department can identify trade-offs early in the planning process, before their resolutions acquire increased difficulty.

The State Energy Office, to perform its job of energy management and conservation planning and programming:

- Administers the set-asides to help energy users who experience difficulty in obtaining fuels;
- Helps consumers obtain allocation adjustments;
- Devises contingency plans to cope with shortages;
- Forecasts supply and demand, production and consumption;
- Develops and implements conservation programs;
- Educates the public in efficient use of resources; and
- Monitors and coordinates the State's positions on federal legislation and policy.

The Center for Science Policy and Technology Assessment has been involved in energy assessment, planning and policy formulation since its formation in 1971. The Center, in providing assistance in short-term assessments and in formulating long-term plans for research, development and demonstration:

- Advises on State funding of alternate energy research and development projects;
- Organizes and promotes conferences, seminars and meetings concerning alternate energy and economic development;
- Publishes and disseminates alternate energy information;
- Provides liaison among the University of Hawaii, federal and other agencies, industry, other States and national laboratories in alternate energy research and development programs.

The Hawaii Natural Energy Institute (HNEI) was formed in 1974 to foster the development of alternate energy in Hawaii, serving as the focal point for energy research at the University of Hawaii. Since 1975 funding for HNEI has chaneled through DPED.

The Natural Energy Laboratory of Hawaii (NELH) was established by the 1974 State Legislature as a facility at Ke-Ahole Point (on

the southern most island of the chain, Hawaii), a location ideal for ocean- and land-based ocean thermal energy conversion, solar research, aquaculture and other energy projects.

Hawaii's state policy has been to support five renewable energy programs and to seek federal funding to accelerate program progress. The five areas of investigation are solar, biomass, geothermal, OTEC (ocean thermal energy conversion), and wind.

Hawaii is almost totally dependent on oil for electricity generation. It is exempted from coal conversion requirements of the National Energy Act. The state policy is to move toward energy self-sufficiency through the use of indigenous and renewable resources.

Note: A portion of the material on Hawaii was extracted from The Energy Users Report, No. 247, May 4, 1978, by permission of the Bureau of National Affairs, Inc., Washington, D.C., Copyright 1978.

Nevada

The state of Nevada initiated a comprehensive program of energy resource management and development in 1977 with the creation of the State Department of Energy. It was the aim of the legislature to consolidate responsibility for managing and conserving energy resources within one department, authorized to coordinate research and development relating to energy resources in Nevada. While this goal was realized in principle in the 1977 statute (N.R.S. Chap. 523), routine administration of Nevada's energy resources remains scattered throughout various state agencies and jurisdictional conflicts over specific resources seem probable in the future.

The principal energy-related agencies are the Public Service Commission (PSC), the State Environmental Commission (SEC), the Division

of Environmental Protection (DEP), the Nevada Department of Energy (NDOE), the Division of Water Resources, and the State Radiation Control Agency (SRCA). Construction permits for electric generating plants and their associated facilities must be obtained from the PSC. Issuance of a permit is based upon a finding of need, the nature of the probable environmental impact, and conformance with applicable state and local laws and regulations.

The SEC is the air and water regulation promulgation arm of the state. The DEP administers the water and air pollution regulations created by the federal government and by the SEC.

The NDOE is a research and planning agency. It forecasts state energy demand for 5-10-20 year periods, establishes a state energy conservation plan, and reports to the governor and the Legislature on the status of energy in Nevada.

The Health Division of the Department of Human Resources is designated as the State Radiation Control Agency. The SRCA regulates nuclear materials to the extent not preempted by the federal government.

Nevada is severely water constrained; it has the lowest average rainfall of any of the states. There is some groundwater available for power plant cooling, but the extent of this resource is unknown. The State Engineer, who is the administrative head of the Department of Water Resources, approves or disapproves changes in water use in the state.

Both the State Engineer and the PSC have the power to limit the amount of electricity that can be exported from a proposed new power plant in Nevada. The State Engineer may disapprove the use of water by such a plant. The PSC may condition its approval of a certificate to construct the proposed plant upon the applicant making available for in-state use and amount of energy equal to or less than the amount exported. These powers have yet to be used.

Conflicts with coal conversion sections of the National Energy Act should be minimal as all of the planned generating facilities for Nevada are coal-fired.

III-A-2. Data Quality and Availability

Institutional Structure

The listing of federal, regional, state, and local agencies compiled in this chapter includes only those agencies whose duties substantively pertain to energy or environmental activities in the regions. It does not include all agencies that may potentially be involved in energy or environmental affairs. In addition, the short descriptions provided are not meant to be an exhaustive description of all of the responsibilities or activities of a given agency, but rather are included as a guide to their energy and environmental activities. The addresses and phone numbers are as up to date as possible, but specific agency contacts (i.e., agency heads) have not been indicated due to problems of information collection and agency staff turnover.

Environmental and Energy Laws and Regulations

This section is designed to provide a broad overview of energy and environment laws for California, Hawaii and Nevada; it is not meant to be an exhaustive analysis of all relevant legal material. Limitations of time and space have prevented the inclusion of any court decisions (notwithstanding their legal significance). Most of the laws and regulations that are included have been taken from secondary sources rather than from comprehensive examinations of state statutes or codes. Because of the ephemeral nature of state appropriations and expenditures on energy and environmental activities, such information has not been included.

III-B INSTITUTIONAL STRUCTURE

III-B-1 FEDERAL AGENCIES AND ORGANIZATIONS

THIS SECTION PRESENTS A TABLE OF THE FEDERAL AGENCIES INVOLVED IN ENERGY AND ENVIRONMENTAL POLICY FORMULATION, ADMINISTRATION, REGULATION, ENFORCEMENT AND MANAGEMENT. THE FIRST PART OF THE TABLE GIVES THEIR WASHINGTON OFFICES AND DESCRIBES THEIR FUNCTION. THE REGIONAL OFFICES ARE LISTED IN THE SECOND PART OF THE TABLE.

TABLE III-1
FEDERAL AGENCIES AND ORGANIZATIONS

WASHINGTON OFFICES

OFFICE OF THE SECRETARY U.S. DEPARTMENT OF ENERGY 1600 PENNSYLVANIA AVENUE, N.W. WASHINGTON, D.C. 20006	MANAGES ALL ENERGY FUNCTIONS OF FEDERAL GOVERNMENT; PROVIDES FOR DEVELOPMENT OF NATIONAL ENERGY POLICY; CARRIES OUT ENERGY RESEARCH AND DEVELOPMENT; ESTABLISHES CENTRAL DATA COLLECTION AND ANALYSIS PROGRAM, AND IN A NATIONAL EMERGENCY REGULATES ENERGY PRICES.
FEDERAL ENERGY REGULATORY COMMISSION 825 N. CAPITOL STREET, N.E. WASHINGTON, D.C. 20426	CONTROLS RATES FOR NATURAL GAS AND WHOLESALE ELECTRICITY; REGULATES MERGERS AND SECURITIES ACQUISITIONS UNDER THE FEDERAL POWER AND NATURAL GAS ACTS; REGULATES TRANSPORTATION RATES FOR OIL PIPELINES.
ECONOMIC REGULATORY ADMINISTRATION FEDERAL BUILDING 12TH AND PENNSYLVANIA AVENUE, N.W. WASHINGTON, D.C. 20461	ADMINISTERS POLICIES OF THE DEPARTMENT AND FERC AS DEEMED APPROPRIATE BY THE SECRETARY OF DOE.
NUCLEAR REGULATORY COMMISSION WASHINGTON, D.C. 20555	REGULATES ALL COMMERCIAL USES OF NUCLEAR ENERGY TO PROTECT THE HEALTH AND SAFETY OF THE PUBLIC AND THE ENVIRONMENT.
ENVIRONMENTAL PROTECTION AGENCY 401 M STREET, S.W. WASHINGTON, D.C. 20460	SETS AND ENFORCES ENVIRONMENTAL STANDARDS FOR AIR AND WATER POLLUTION, SOLID WASTES MANAGEMENT, PESTICIDES, TOXIC SUBSTANCES, RADIATION, AND NOISE. CONDUCTS RESEARCH ON THE CAUSES, EFFECTS, AND CONTROL OF ENVIRONMENTAL PROBLEMS. ASSISTS STATE AND LOCAL GOVERNMENTS.
DEPARTMENT OF THE INTERIOR INTERIOR BUILDING 18TH AND C STREETS, N.W. WASHINGTON, D.C. 20240	OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT WILL ADMINISTER FEDERAL SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977.
BUREAU OF LAND MANAGEMENT INTERIOR BUILDING 18TH AND C STREETS, N.W. WASHINGTON, D.C. 20240	ADMINISTERS PUBLIC LANDS WHICH ARE LOCATED PRIMARILY IN THE WESTERN STATES. THESE LANDS ARE MANAGED FOR MULTIPLE USES INCLUDING OUTDOOR RECREATION, FISH AND WILDLIFE PRODUCTION, LIVESTOCK GRAZING, TIMBER, INDUSTRIAL DEVELOPMENT, WATERSHED PROTECTION, AND MINERAL PRODUCTION INCLUDING THAT ON THE OUTER CONTINENTAL SHELF.
BUREAU OF RECLAMATION INTERIOR BUILDING 18TH AND C STREETS, N.W. WASHINGTON, D.C. 20240	ADMINISTERS FEDERAL WATER RESOURCE DEVELOPMENT PROGRAM IN WESTERN STATES TO PROVIDE FISH AND WILDLIFE PROTECTION AND RECREATIONAL OPPORTUNITIES; WATER FOR FARM IRRIGATION, MUNICIPAL, AND INDUSTRIAL USE; HYDROELECTRIC POWER; FLOOD CONTROL; AND OTHER NATURAL RESOURCE CONSERVATION BENEFITS.
U.S. FISH AND WILDLIFE SERVICE INTERIOR BUILDING 18TH AND C STREETS, N.W. WASHINGTON, D.C. 20240	AIDS IN CONSERVATION OF THE NATIONS MIGRATORY BIRDS, CERTAIN MAMMALS AND SPORT FISHES.

DEPARTMENT OF ENERGY
SAN FRANCISCO OPERATIONS OFFICE
1333 BROADWAY
OAKLAND, CALIFORNIA 94612
415-273-7881

DEPARTMENT OF ENERGY
HAWAII LIASON OFFICE
PJKK FEDERAL BLDG
335 SOUTH MERCHANT STREET
HONOLULU, HAWAII 96813
808-546-2184

DEPARTMENT OF ENERGY
NEVADA FIELD OFFICE
350 SOUTH CENTER
RENO, NEVADA 89501
702-784-5403

DEPARTMENT OF ENERGY
FEDERAL ENERGY REGULATORY COMMISSION
555 BATTERY
SAN FRANCISCO, CALIFORNIA 94111
415-556-3581

DEPARTMENT OF ENERGY
REGION IX OFFICE
525 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94105
415-556-8828

DEPARTMENT OF ENERGY
PACIFIC AREA SUPPORT OFFICE
HICKHAM AIR FORCE BASE
P.O. BOX 29939
HONOLULU, HAWAII 96820
808-422-9211

DEPARTMENT OF ENERGY
ECONOMIC REGULATORY ADMINISTRATION
1333 BROADWAY
OAKLAND, CALIFORNIA 94612
415-273-4237

DEPARTMENT OF ENERGY
ENERGY INFORMATION ADMINISTRATION
555 BATTERY
SAN FRANCISCO, CALIFORNIA 94111
415-556-3581

NUCLEAR REGULATORY COMMISSION
1990 NORTH CALIFORNIA BLVD.
WALNUT CREEK, CALIFORNIA 94596
415-486-3141

U.S. ENVIRONMENTAL PROTECTION AGENCY,
REGIONAL ADMINISTRATOR
215 FREMONT STREET
SAN FRANCISCO, CALIFORNIA 94105
415-556-2320

U.S. ENVIRONMENTAL PROTECTION AGENCY,
REGION IX
100 CALIFORNIA STREET
SAN FRANCISCO, CALIFORNIA 94111
415-556-3232

U.S. ENVIRONMENTAL PROTECTION AGENCY,
REGION IX
PACIFIC ISLAND CONTACT OFFICE
PJKK FEDERAL BLDG, RM 1302
335 SOUTH MERCHANT STREET
HONOLULU, HAWAII 96813
808-546-8910

U.S. ENVIRONMENTAL PROTECTION AGENCY,
REGION IX
944 EAST HARMON
LAS VEGAS, NEVADA 89109
702-736-2969

DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
FEDERAL OFFICE BLDG. RM E-2841
2800 COTTAGE WAY
SACRAMENTO, CALIFORNIA 95825
916-484-4217

DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT
FEDERAL BUILDING, RM 3008
300 BOOTH STREET
RENO, NEVADA 89509
702-784-5452

DEPARTMENT OF INTERIOR
PACIFIC OUTER CONTINENTAL SHELF OFFICE
300 NORTH LOS ANGELES STREET
ROOM 7127
LOS ANGELES, CALIFORNIA 90012
213-688-7234

U.S. ARMY CORPS OF ENGINEERS
PACIFIC OCEAN DIVISION
FORT SHAFTER BLDG. 230
APO SAN FRANCISCO, CALIFORNIA
808-438-1500 (HAWAII)

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814
916-440-2232

U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT
211 MAIN STREET
SAN FRANCISCO, CALIFORNIA 94105
415-556-3660

SOIL CONSERVATION SERVICE
RM 4316 PJKK FEDERAL BLDG
335 SOUTH MERCHANT STREET
HONOLULU, HAWAII 96813
808-546-3165

FOREST SERVICE
INSTITUTE OF PACIFIC ISLANDS FORESTRY
808-548-7410

NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION
ENVIRONMENTAL RESEARCH LABORATORY
2525 CORREA ROAD
HONOLULU, HAWAII 96822
808-948-8083

DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH
ADMINISTRATION
RM 5122, PJKK FEDERAL BLDG
335 SOUTH MERCHANT STREET
HONOLULU, HAWAII 96813
808-546-3157

DEPARTMENT OF TRANSPORTATION
MARINE SAFETY OFFICE
OIL POLLUTION REPORTS
P.O. BOX 3160
HONOLULU, HAWAII 96820
808-546-7146

NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION
2601 E. PLUM LANE
RENO, NEVADA 89502
702-784-5402

BUREAU OF MINES
1605 EVANS AVE.
RENO, NEVADA 89512
702-784-5391

BUREAU OF MINES
705 NORTH PLAZA
CARSON CITY, NEVADA 89701
702-882-9380

BUREAU OF RECLAMATION
705 NORTH PLAZA
CARSON CITY, NEVADA 89701
702-882-3436

III-B-2 REGIONAL AND INTERSTATE ORGANIZATIONS

THIS SECTION LISTS THE REGIONAL AND INTERSTATE ORGANIZATIONS THAT ARE INVOLVED WITH ENERGY OR THE ENVIRONMENT IN THE REGION. THE FUNCTIONS OF THESE ORGANIZATIONS ARE BRIEFLY DESCRIBED.

TABLE III-2
REGIONAL AND INTERSTATE ORGANIZATIONS

WESTERN INTERSTATE NUCLEAR BOARD P.O. BOX 15038 LAKEWOOD, COLORADO 80215 303-238-8383	CREATED BY AN INTERSTATE COMPACT AMONG TWELVE WESTERN STATES TO FOSTER THE SOUND AND ORDERLY UTILIZATION OF NUCLEAR ENERGY IN FURTHERING REGIONAL DEVELOPMENT, PUBLIC HEALTH AND SAFETY, AND ENVIRONMENTAL QUALITY. CALIFORNIA AND NEVADA ARE MEMBERS.
WESTERN INTERSTATE ENERGY BOARD SUITE 2500 3333 QUEBEC STREET DENVER, COLORADO 80207 303-837-5851	A 16 MEMBER ADVISORY COMMITTE TO THE WESTERN INTERSTATE NUCLEAR BOARD. INCLUDES CALIFORNIA, HAWAII AND NEVADA.
WESTERN SYSTEMS COORDINATING COUNCIL UNIVERSITY OF UTAH RESEARCH PARK 540 ARAPEEN DRIVE, SUITE 203 SALT LAKE CITY, UTAH 84108 801-582-0353	THE GOAL OF THE COUNCIL IS TO ENHANCE THE RELIABILITY OF AND PREVENT BLACKOUTS WITHIN THE BULK POWER SYSTEM IN FOURTEEN WESTERN STATES AND BRITISH COLUMBIA THROUGH COORDINATED OPERATION OF ELECTRICITY GENERATION AND INTER-CONNECTED TRANSMISSION FACILITIES. THE COUNCIL IS COMPRISED OF FOUR GENERAL LOAD AREAS - NORTHWEST POWER POOL (INCLUDES THE NORTHEASTERN HALF OF NEVADA); ROCKY MOUNTAIN POWER AREA; NEW MEXICO POWER POOL; AND PACIFIC SOUTHWEST POWER AREA (INCLUDES CALIFORNIA AND THE SOUTHWEST HALF OF NEVADA).
FOUR CORNERS REGIONAL COMMISSION MAIN COMMERCE BLDG. RM 1898-C WASHINGTON, D.C. 20006 202-377-5534	INCLUDES ARIZONA, COLORADO, NEVADA, NEW MEXICO AND UTAH
INTERNATIONAL BOUNDARY AND WATER COMMISSION	JOINT USA AND MEXICO COMMISSION. OVERSEES APPORTIONMENT OF COLORADO RIVER WATER RIGHTS, SALINITY CONTROLS, AND COORDINATES FLOOD CONTROL FACILITIES ON THE TIAJUANA RIVER.
TAHOE REGIONAL PLANNING AGENCY	RESPONSIBLE FOR PLANNING IN THE LAKE TAHOE BASIN. FORMED IN 1970, THE REGION COVERS PARTS OF PLACER AND EL DORADO COUNTIES IN CALIFORNIA, AND WASHOE, CARSON CITY AND DOUGLAS COUNTIES IN NEVADA.

PACIFIC MARINE FISHERIES COMMISSION JOHN P. HARVILLE, EXEC. DIR. 528 S.W. MILL STREET PORTLAND, OREGON 97201 503-229-5840	MEMBER STATES ARE ALASKA, CALIFORNIA, IDAHO, OREGON, AND WASHINGTON.
PACIFIC FISHERY MANAGEMENT COUNCIL C/O SOUTHWEST REGION NATIONAL MARINE FISHERIES SERVICE 300 SOUTH FERRY STREET TERMINAL ISLAND, CALIFORNIA 90731	THE COUNCIL WAS CREATED IN 1976 TO MANAGE AND CONSERVE FISHERIES WITHIN THE NEW 200 MILE MARINE FISHERY ZONE. MEMBERS REPRESENT THE U.S. GOVERNMENT AND THE STATE GOVERNMENTS OF WASHINGTON, OREGON, IDAHO, AND CALIFORNIA. FISHING INDUSTRY, LABOR AND SPORTS INTERESTS ARE ALSO REPRESENTED.
PACIFIC SOUTHWEST INTER-AGENCY COMMITTEE C/O DEPT. OF WATER RESOURCES 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814	COORDINATES FEDERAL AND STATE WATER RESOURCES AND RELATED ACTIVITIES IN THE RIVER BASINS OF THE PACIFIC SOUTHWEST, INCLUDING CALIFORNIA.
CALIFORNIA-NEVADA INTERSTATE COMPACT 201 SOUTH HALL CARSON CITY, NEVADA 89701	COORDINATES THE DISTRIBUTION AND USE OF THE WATERS OF LAKE TAHOE, AND THE TRUCKEE, CARSON AND WALKER RIVERS AND THEIR TRIBUTARIES.
COLUMBIA BASIN INTERSTATE COMPACT 201 SOUTH HALL CARSON CITY, NEVADA 89701	MEMBERS ARE IDAHO, MONTANA, NEVADA, OREGON, WASHINGTON, AND THE UNITED STATES. THE COMPACT HAS THE POWER TO INVESTIGATE ISSUES FOR THE PURPOSE OF ENTERING INTO AGREEMENT RESPECTING THE DIVISION, DIVERSION, DISTRIBUTION, APPORTIONMENT AND USE OF THE WATERS OF THE COLUMBIA RIVER AND ITS TRIBUTARIES, INCLUDING THE SNAKE.
COLUMBIA INTERSTATE COMPACT 201 SOUTH HALL CARSON CITY, NEVADA 89701	SAME MEMBERS AS THE COLUMBIA BASIN INTERSTATE COMPACT. THE COMPACT HAS EXTENSIVE DUTIES RELATING TO THE STORAGE AND ALLOCATION OF COLUMBIA RIVER WATER AND POWER. OTHER REGULATORY DUTIES INCLUDE POLLUTION CONTROL, FISH AND WILDLIFE PROGRAMS AND RECREATIONAL MANAGEMENT.

III-B-3 STATE AND METROPOLITAN BODIES

THIS SECTION LISTS THE STATE AND LOCAL INSTITUTIONS THAT INFLUENCE DECISION MAKING WITH RESPECT TO ENERGY OR ENVIRONMENTAL CONSIDERATIONS. THE FORMAT IS THE SAME AS THE PREVIOUS SECTION.

TABLE III-3
STATE ENERGY AND ENVIRONMENTAL AGENCIES IN CALIFORNIA

ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION (ERCDC) 1111 HOWE AVENUE SACRAMENTO, CALIFORNIA 95825 916-322-3690	SEE ENERGY LEGISLATION SUMMARY FOR DESCRIPTION OF ERCDC DUTIES
OFFICE OF PLANNING AND RESEARCH 1400 TENTH STREET SACRAMENTO, CALIFORNIA 95818 916-322-2318	DEVELOPMENT OF ENVIRONMENTAL AND RELATED LAND USE GOALS AND POLICIES; EVALUATION OF STATE PLANS AND PROGRAMS, AND ADMINISTRATION OF FEDERAL GRANTS-IN-AID TO ENSURE CONSISTENCY WITH STATEWIDE ENVIRONMENTAL GOALS AND POLICIES.
SECRETARY FOR RESOURCES 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-5656	
DEPARTMENT OF FORESTRY 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-9920	RESPONSIBLE FOR THE PROTECTION AND CONSERVATION OF PRIVATELY AND STATE OWNED FOREST, BRUSH AND GRASSLANDS. ACTIVITIES INCLUDE FIRE PROTECTION, REFORESTATION, TIMBER MANAGEMENT, AND A VARIETY OF OTHER RESOURCE RELATED ACTIONS.
DIVISION OF MINES AND GEOLOGY 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-5716	COLLECTS, DEVELOPS AND DISSEMINATES INFORMATION ABOUT THE GEOLOGY OF CALIFORNIA.
DIVISION OF OIL AND GAS 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-9686	REGULATES ALL IN-STATE OIL, GAS AND GEOTHERMAL WELLS. ALSO PUBLISHES MONTHLY AND ANNUAL REPORTS ON THESE WELLS.
DEPARTMENT OF FISH AND GAME 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-3531	ADMINISTERS AND ENFORCES THE STATE FISH AND GAME CODE. ACTIVITIES INCLUDE MANAGEMENT OF INLAND AND MARINE FISHERIES, WILDLIFE PROTECTION, AND ENVIRONMENTAL DATA COLLECTION.

STATE ENERGY AND ENVIRONMENTAL AGENCIES IN CALIFORNIA

CALIFORNIA COASTAL COMMISSION 631 HOWARD STREET SAN FRANCISCO, CALIFORNIA 94105 415-391-6800	REGULATES DEVELOPMENT WITHIN THE STATES COASTAL WATERS AND ON LAND WITHIN 1,000 YARDS OF THE COAST. ALSO ADMINISTERS STATE PROGRAMS UNDER THE FEDERAL COASTAL ZONE MANAGEMENT ACT.
NAVIGATION AND OCEAN DEVELOPMENT 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-2615	CONDUCTS PROGRAMS OF BOATING SAFETY AND REGULATIONS. ALSO WORKS WITH THE ARMY CORPS OF ENGINEERS AND LOCAL AGENCIES IN BEACH EROSION CONTROL PROJECTS.
STATE AIR RESOURCES BOARD 1102 Q STREET SACRAMENTO, CALIFORNIA 95814 916-322-2990	OVERALL RESPONSIBILITY FOR AIR POLLUTION CONTROL IN CALIFORNIA AND SPECIFIC RESPONSIBILITY FOR CONTROLLING POLLUTION FROM MOTOR VEHICLES. LOCAL AIR POLLUTION CONTROL DISTRICTS ARE CONCERNED PRIMARILY WITH STATIONARY POLLUTION SOURCES.
STATE RECLAMATION BOARD 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-9454	IMPLEMENTS FEDERAL FLOOD CONTROL IN THE CENTRAL VALLEY. OVERSEES CONTROL OF CENTRAL VALLEY STREAMS AND LOCAL RECLAMATION WORKS.
SOLID WASTE MANAGEMENT BOARD 1709 11TH STREET SACRAMENTO, CALIFORNIA 95814 916-322-3330	SETS MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL. ASSISTS AND MONITORS COUNTY IMPLEMENTATION OF SOLID WASTE MANAGEMENT PLANS.
STATE LANDS COMMISSION 1807 13TH STREET SACRAMENTO, CALIFORNIA 95814 916-322-4105	JURSDICTION OVER AND MANAGEMENT RESPONSIBILITY FOR STATE-OWNED SOVEREIGN AND CONGRESSIONAL GRANT LANDS. HANDLES RELATED LAND LEASES, EXCHANGES AND TRANSACTIONS; CONDUCTS OIL, GAS, GEOTHERMAL AND OTHER MINERAL LEASING PROGRAMS. RELATED ACTIVITIES INVOLVE BOUNDARIES AND OWNERSHIP DETERMINATION, GRANTED LANDS ADMINISTRATION AND MAINTAINING LAND INFORMATION SYSTEMS.

STATE ENERGY AND ENVIRONMENTAL AGENCIES IN CALIFORNIA

ENERGY AND MINERAL RESOURCES DEVELOPMENT 100 OCEANGATE, SUITE 300 LONG BEACH, CALIFORNIA 90802 213-590-5205	RESPONSIBLE FOR THE DEVELOPMENT OF ENERGY AND MINERAL RESOURCES ON STATE LANDS. ISSUES LEASES FOR THE DEVELOPMENT OF THESE RESOURCES.
GEOTHERMAL RESOURCES BOARD 1416 NINTH STREET ROOM 1335 SACRAMENTO, CALIFORNIA 95814 916-322-1080	COORDINATES GEOTHERMAL ACTIVITIES FOR THE STATE. ACTIVITIES INCLUDE MAINTAINING AN INVENTORY OF GEOTHERMAL RESOURCES, APPEAL OF GEOTHERMAL PERMITS FROM THE DIVISION OF OIL AND GAS, AND IMPLEMENTATION OF THE RECOMMENDATIONS OF THE STATE TASK FORCE ON GEOTHERMAL RESOURCES.
PUBLIC UTILITIES COMMISSION 350 MCALLISTER SAN FRANCISCO, CALIFORNIA 94102 415-557-0350	REGULATES PRIVATELY OWNED UTILITIES AND TRANSPORTATION COMPANIES INCLUDING NATURAL GAS, ELECTRICITY, WATER, TELEPHONE, RAILROAD, BUS AND PIPELINE RATES.
STATE DEPARTMENT OF INDUSTRIAL RELATIONS OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION 1006 FOURTH STREET SACRAMENTO, CALIFORNIA 95814 916-322-2220	CONCERNED WITH WORKPLACE CONDITIONS LARGELY THROUGH THE AGENCY OF THE CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH PROGRAM.
DEPARTMENT OF HEALTH RADIOLOGIC HEALTH SECTION 714 P STREET SACRAMENTO, CALIFORNIA 95814 916-322-2073	ASSURES THAT THE RISKS ASSOCIATED WITH THE BENEFICIAL USES OF IONIZING RADIATION ARE KEPT AS LOW AS REASONABLY PRACTICABLE, WITHIN ACCEPTED STANDARDS AND THAT UNNECCESSARY AND UNPRODUCTIVE MAN-MADE RADIATION EXPOSURE ARE REDUCED OR ELIMINATED. THIS ASSURANCE IS OBTAINED THROUGH A SYSTEM OF SPECIFIC LICENSING AND REGISTRATION, COMPLIANCE INSPECTION, ENVIRONMENTAL MONITORING AND X-RAY OPERATOR CERTIFICATION.

DEPARTMENT OF WATER RESOURCES 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-9248	FORMULATES PLANS FOR WATER RESOURCE CONTROL, CONSERVATION, PROTECTION, ENHANCEMENT AND UTILIZATION. THE DEPARTMENT IS AUTHORIZED TO CONSTRUCT AND OPERATE POWER GENERATING FACILITIES AS PART OF THE STATE WATER RESOURCES DEVELOPMENT SYSTEM. THIS INCLUDES HYDOELECTRIC AND OTHER TYPES OF GENERATING FACILITIES SUCH AS STEAM ELECTRIC TO PROVIDE POWER FOR PUMPING.
STATE WATER RESOURCES CONTROL BOARD 1416 NINTH STREET SACRAMENTO, CALIFORNIA 95814 916-445-9434	CONCERNED WITH STATE WATER RIGHTS, WATER QUALITY AND WATER PLANNING AND RESEARCH. ADMINISTERS STATE RESPONSIBILITIES UNDER THE 1972 FEDERAL WATER POLLUTION CONTROL ACT.

TABLE III-4
STATE ENERGY AND ENVIRONMENTAL AGENCIES IN HAWAII

STATE DEPARTMENT OF HEALTH ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION P.O. BOX 3378 HONOLULU, HAWAII 96801 808-548-6455	CONCERNED WITH ENFORCEMENT OF RULES AND REGULATIONS RELATED TO THE MAINTENANCE OF SANITARY AND HEALTHFUL ENVIRONMENTS.
LAND AND NATURAL RESOURCES DEPARTMENT 1151 PUNCHBOWL HONOLULU, HAWAII 96813	
FISH AND GAME DIVISION 808-548-4002	FUNCTIONS INCLUDE ENFORCEMENT OF FISH AND GAME LAWS AND REGULATIONS, INTRODUCTION AND CONTROL OF SPECIES, AND ADMINISTRATION OF PROGRAMS FOR THE UTILIZATION OF FISH AND WILDLIFE FOR RECREATIONAL AND COMMERCIAL USE.
FORESTRY DIVISION 808-548-5929	CONCERNED WITH STATEWIDE FOREST MANAGEMENT AND UTILIZATION INCLUDING PROGRAMS OF REFORESTATION, EROSION CONTROL, AND WATERSHED PROTECTION. IN ADDITION, IT ENFORCES FOREST LAWS AND REGULATIONS, AND IN SOME INSTANCES, HARVESTS AND MARKETS TIMBER.
LAND MANAGEMENT DIVISION 808-548-7517	RESPONSIBLE FOR THE MANAGEMENT OF HAWAII PUBLIC LANDS. INVOLVED WITH THE INVENTORY AND DISPOSITION OF PUBLIC LANDS.
STATE PARKS AND OUTDOOR RECREATION RESOURCES MANAGEMENT 808-548-7456	RESPONSIBLE FOR THE DEVELOPMENT AND OPERATION OF STATE PARKS AND THE OUTDOOR RECREATION PROGRAM.
WATER AND LAND DEVELOPMENT DIVISION 808-548-7539	PROVIDES FOR THE DEVELOPMENT OF WATER, LAND AND MINERAL RESOURCES. FUNCTIONS INCLUDE ENGINEERING SERVICES FOR THE LAND AND RESOURCES DEPARTMENT, FLOOD CONTROL AND GROUNDWATER CONTROL.

STATE ENERGY AND ENVIRONMENTAL AGENCIES IN HAWAII

LAND USE COMMISSION 190 SOUTH KING, SUITE 1795 HONOLULU, HAWAII 96813 808-548-4611	RESPONSIBLE FOR THE DISTRICTING OF THE STATES LAND INTO MAJOR USE CLASSES (URBAN, RURAL, AGRICULTURAL AND CONSERVATION), AND ADOPTION AND ADMINISTRATION OF LAND USE REGULATIONS.
PUBLIC UTILITIES COMMISSION 1164 BISHOP HONOLULU, HAWAII 96813 808-548-3990	PROVIDED WITH SUPERVISORY AND REGULATORY POWERS OVER ALL INVESTOR-OWNED PUBLIC UTILITIES IN HAWAII. INCLUDED ARE TRANSPORTATION, TELEPHONE AND TELEGRAPH, AND ELECTRIC AND WATER COMPANIES.
ENVIRONMENTAL QUALITY COMMISSION OFFICE OF ENVIRONMENTAL QUALITY CONTROL 550 HALEKAUWILA STREET ROOM 301 HONOLULU, HAWAII 96813 808-548-6915	RESPONSIBLE FOR THE ADMINISTRATION OF STATE ENVIRONMENTAL IMPACT STATEMENT REQUIREMENTS.
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT KAMAMALU BLDG 250 SOUTH KING HONOLULU, HAWAII 96813	THE DIRECTOR IS THE STATE ENERGY RESOURCES COORDINATOR
CENTER FOR SCIENCE POLICY AND TECHNOLOGY ASSESSMENT 808-548-4195	THE CENTER IS INVOLVED IN ASSESMENTS, PLANNING AND POLICY FORMULATION FOR THE STATE. IT ASSISTS IN POLICY RESEARCH BY ADVISING ON FUNDING OF ALTERNATIVE ENERGY RESEARCH AND DEVELOPMENT PROJECTS; ORGANIZING AND PROMOTING CONFERENCES, SEMINARS AND MEETINGS CONCERNING ENERGY AND ECONOMIC DEVELOPMENT; PUBLISHING AND DISSEMINATING INFORMATION ON ALTERNATIVE SOURCES OF ENERGY; AND SERVING AS A LIASON AMONG FEDERAL AND STATE AGENCIES, THE UNIVERSITY OF HAWAII, INDUSTRY, OTHER STATES AND NATIONAL LABORATORIES.
STATE ENERGY OFFICE 808-548-4080	FORECASTS SUPPLY, DEMAND, PRODUCTION AND CONSUMPTION OF ENERGY IN THE STATE. DEVISES AND ADMINISTERS CONTINGENCY PLANS TO COPE WITH ENERGY SHORTAGES. DEVELOPS AND IMPLEMENTS CONSERVATION PROGRAMS. MONITORS AND COORDINATES THE STATES POSITION ON FEDERAL LEGISLATION AND POLICY.

PLANNING DIVISION 808-548-3016	PLANS, CONDUCTS AND COORDINATES COMPREHENSIVE PLANNING PROGRAMS FOR THE STATE. ADVISES LOCAL GOVERNMENTS ON TECHNICAL PLANNING ACTIVITIES, CONDUCTS DATA ANALYSIS, AND IN GENERAL, IS RESPONSIBLE FOR STATE LONG-RANGE PLANNING.
RESEARCH AND ECONOMIC ANALYSIS 808-548-3036	INVOLVED IN SOCIAL, DEMOGRAPHIC AND ECONOMIC RESEARCH AND ANALYSIS.
HAWAII NATURAL ENERGY INSTITUTE UNIVERSITY OF HAWAII HONOLULU, HAWAII 96822 808-948-8111	SERVES AS A FOCAL POINT FOR ENERGY RESEARCH AT THE UNIVERSITY OF HAWAII. IT WAS FORMED TO FOSTER RESEARCH ON ALTERNATIVE ENERGY SOURCES FOR HAWAII. IT IS FUNDED THROUGH THE THE DEPARTMENT PF PLANNING AND ECONOMIC DEVELOPMENT.
NATURAL ENERGY LABORATORY OF HAWAII 2540 DOLE STREET 402 VARSITY BUILDING HONOLULU, HAWAII 96822 808-329-5001	CARRIES ON A PROGRAM OF RESEARCH ON SOLAR, BIOMASS, GEOTHERMAL, OTEC, AND WIND ENERGY.
ENVIRONMENTAL CENTER UNIVERSITY OF HAWAII 2550 CAMPUS ROAD HONOLULU, HAWAII 96822	FUNCTIONS TO STIMULATE, EXPAND AND COORDINATE UNIVERSITY OF HAWAII EFFORTS IN THE AREA OF ECOLOGY.

TABLE III-5
STATE ENERGY AND ENVIRONMENTAL AGENCIES IN NEVADA

CONSERVATION AND NATURAL RESOURCE DEPARTMENT 201 SOUTH FALL CARSON CITY, NEVADA 89701	
DIVISION OF CONSERVATION DISTRICTS 702-885-5414	PROVIDES STAFF SUPPORT FOR THE STATE CONSERVATION COMMISSION. WORKS TO COORDINATE FUNCTIONS OF THE THIRTY CONSERVATION DISTRICTS THROUGHOUT THE STATE. THE CONSERVATION COMMISSION IS APPOINTED BY THE GOVERNOR AND IS RESPONSIBLE FOR THE CONSERVATION OF NATURAL RESOURCES.
DIVISION OF ENVIRONMENTAL PROTECTION 702-885-4670	ADMINISTRATIVE ARM OF THE ENVIRONMENTAL PROTECTION COMMISSION CHARGED WITH ENFORCEMENT OF RULES RELATED TO AIR, WATER AND SOLID WASTE. THE ENVIRONMENTAL PROTECTION COMMISSION IS A QUASI-INDEPENDENT BODY CHARGED WITH THE RESPONSIBILITY FOR PROMULGATING STATE REGULATIONS ON AIR, WATER AND SOLID WASTE CONTROL AND QUALITY.
FORESTRY DIVISION 702-885-4350	CHARGED WITH THE PROTECTION AND MANAGEMENT OF THE PUBLICLY AND PRIVATELY OWNED FOREST RESOURCES IN THE STATE (EXCLUDING FEDERALLY OWNED AND CONTROLLED LANDS). ACTIVITIES INCLUDE COOPERATIVE FOREST MANAGEMENT, FOREST AND WATERSHED REHABILITATION, AND DISEASE AND INSECT CONTROL IN TREES.
PARKS DIVISION 702-885-4384	CONCERNED WITH THE PLANNING, DESIGN, OPERATION AND MAINTENANCE OF THE STATES PARKS. ALSO RESPONSIBLE FOR ADMINISTRATION OF THE FEDERAL LAND AND WATER CONSERVATION FUND.
STATE LAND DIVISION OF LAND USE PLANNING 702-885-4363	PART OF THE DIVISION OF STATE LANDS CHARGED WITH TECHNICAL PLANNING ASSISTANCE TO LOCAL GOVERNMENTS, INVENTORYING OF CRITICAL ENVIRONMENTAL AREAS, AND MONITORING THE ACTIVITIES OF FEDERAL LAND AGENCIES OPERATING WITHIN THE STATE.
WATER RESOURCES DIVISION STATE ENGINEER 702-885-4380	THE STATE ENGINEER, AS DIRECTOR OF THE DIVISION OF WATER RESOURCES, MAY ACT ALONE WITH RESPECT TO DISCRETIONARY ALLOCATION OF ALL RIVER WATER WITHIN NEVADA, EXCEPT FOR THE COLORADO. IN ADDITION THE STATE ENGINEERS OFFICE HAS REGULATORY CONTROL OVER GEOTHERMAL RESOURCES IN THE STATE. THE STATE ENGINEER ALSO HAS THE POWER TO PROHIBIT A CHANGE IN USE OF WATER FOR A NEW POWER PLANT THAT WOULD EXPORT SOME OF ITS ELECTRICITY.

FISH AND GAME, STATE OFFICE 1100 VALLEY ROAD RENO, NEVADA 89502 702-784-6214	ADMINISTERS AND ENFORCES THE RULES AND REGULATIONS OF THE STATE FISH AND GAME COMMISSION RELATED TO WILDLIFE. IN ADDITION IT IS CHARGED WITH PRESERVATION, PROTECTION AND MANAGEMENT OF ALL WILDLIFE IN THE STATE.
INSPECTOR OF MINES 515 EAST MUSSER CARSON CITY, NEVADA 89701 702-885-5243	CHARGED WITH THE ENFORCEMENT OF STATE HEALTH AND SAFETY REGULATIONS IN NEVADA MINES. ALSO CONDUCTS COURSES ON FIRST AID, MINE SAFETY, ETC.
LIQUIFIED PETROLEUM GAS BOARD 1501 NORTH CARSON CARSON CITY, NEVADA 89701 702-885-4890	HAS TOTAL JURISDICTION OVER PROPANE USE IN THE STATE. PRIMARY RESPONSIBILITY IS PROPANE SAFETY WITH SECONDARY RESOPNSIBILITIES FOR HANDLERS OF PROPANE AND FIRE FIGHTING UNITS, AND INVESTIGATION OF ANY PROPANE RELATED ACCIDENTS.
DEPARTMENT OF ENERGY 1050 E. WILLIAMS CARSON CITY, NEVADA 89701 702-885-5157	SERVES AS A RESEARCH AND COORDINATION CENTER FOR STATE ENERGY POLICY. THE DEPARTMENT CONSISTS OF THE DIRECTOR, THE DIVISION OF COLORADO RIVER RESOURCES, THE DIVISION OF ENERGY CONSERVATION AND PLANNING, AND THE DIVISION OF ENERGY CONSERVATION AND PLANNING. RESEARCH CONDUCTED BY THE AGENCY INCLUDES IDENTIFICATION AND FORECASTING OF ENERGY TRENDS, DEVELOPING A STATE ENERGY CONSERVATION PLAN, RECOMMENDING METHODS FOR IMPROVING EFFICIENCY IN THE UTILIZATION OF ENERGY RESOURCES, AND CREATING INCENTIVES FOR THE DEVELOPMENT OF ANY EXISTING AND ALTERNATIVE ENERGY RESOURCES.
PUBLIC SERVICES COMMISSION 505 EAST KING CARSON CITY, NEVADA 89701 702-885-4180	ISSUES PERMITS FOR POWER PLANT CONSTRUCTION AND REGULATES WATER AND POWER RATES. THE PSC MAY DENY A CONSTRUCTION PERMIT FOR OR LIMIT THE AMOUNT OF POWER TO BE EXPORTED FROM A PROPOSED NEW POWER PLANT.
DIVISION OF COLORADO RIVER RESOURCES P.O. BOX 19090 LAS VEGAS, NEVADA 89119 702-733-7755	THE DCRR POSESSES JOINT AUTHORITY WITH THE STATE ENGINEER OVER SALES, LEASES OR CONTRACTS FOR USE OF COLORADO RIVER WATER. DCRR CAN ENTER INTO CONTRACTS TO CONSTRUCT, OPERATE AND MAINTAIN WATER RECLAMATION FACILITIES AND ACT AS A UTILITY IN PURCHASING AND SELLING AGREEMENTS WITH NEVADA WATER AND POWER USERS AND OUT-OF-STATE UTILITIES.
NEVADA BUREAU OF MINES AND GEOLOGY UNIVERSITY OF NEVADA RENO NEVADA 89507 702-784-6691	ACTS AS THE GEOLOGICAL RESEARCH AND PUBLIC INFORMATION AGENCY. ITS ACTIVITIES INCLUDE GEOLOGICAL MAPPING OF THE STATE, MAPPING OF MINERAL DEPOSITS, AND DISSEMINATION OF GEOLOGICAL INFORMATION.

TABLE III-6
LOCAL ENVIRONMENTAL AGENCIES IN CALIFORNIA

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION 30 VAN NESS AVENUE SAN FRANCISCO, CALIFORNIA 94102 415-557-3686	WORKS TO PROVIDE A MANAGEMENT PROGRAM DESIGNED TO CONSERVE THE ENVIRONMENTAL, ECONOMIC, SOCIAL AND AESTHETIC VALUES OF THE SAN FRANCISCO BAY THROUGH CAREFULLY CONSIDERED AND DEMOCRATICALLY DETERMINED CONTROL MEASURES. COMPOSED OF 27 REPRESENTATIVES OF THE PUBLIC AND LOCAL, STATE, AND FEDERAL GOVERNMENT AGENCIES. THE COMMISSION WAS FORMED IN 1965.

III-C REGIONAL, STATE AND LOCAL LAWS, STANDARDS, AND REGULATIONS

III-C-1 ENVIRONMENTAL LAWS AND REGULATIONS

THIS SECTION SUMMARIZES THE ENVIRONMENTAL LAWS AND REGULATIONS FOR EACH OF THE THREE STATES. THE LAWS AND REGULATIONS ARE DISCUSSED UNDER TEN CATEGORIES - GENERAL ENVIRONMENT, AIR POLLUTION, WATER POLLUTION, SOLID WASTE, LAND USE , RADIATION, ENDANGERED SPECIES, PESTICIDES, NOISE, AND HAZARDOUS SUBSTANCES. THIS SUMMARY IS TAKEN, FOR THE MOST PART, WITH PERMISSION FROM A REPORT OF THE ENVIRONMENTAL INFORMATION CENTER, INC. NEW YORK, N.Y. ENTITLED STATE LAWS AND REGULATIONS, 1977. IT IS SUPPLEMENTED BY DATA FROM STATE SOURCES.

TABLE III-7
STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

CALIFORNIA

GENERAL ENVIRONMENT

LAWS

1 ENVIRONMENTAL QUALITY ACT OF 1970, PUBLIC RESOURCES CODE, DIV. 13, AS AMENDED THROUGH 1974.
2 POLLUTION CONTROL FINANCING AUTHORITY ACT, CHAPTER 957, DIV. 27, CHAPTERS 1 AND 2, EFFECTIVE 1975.

AIR POLLUTION

LAWS

1 AIR POLLUTION CONTROL LAWS, HEALTH AND SAFETY CODE, DIVISION 26, 1977 EDITION.
2 MANDATORY VEHICLE EMISSION INSPECTING AND TESTING PROGRAM, CHAPTER 20.4, SECTIONS 9889.50 THROUGH 9889.61, AS AMENDED THROUGH 1975.
3 MOTOR VEHICLE CODE AIR POLLUTION PROVISIONS, CHAPTER 957, SECTIONS 20 THROUGH 36, AS AMENDED THROUGH 1975.

REGULATIONS

1 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 1, AIR BASINS AND AIR QUALITY STANDARDS, AS AMENDED THROUGH 1976.
1.1 AMENDMENTS TO AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 1, SECTIONS 60103 TO 60106, AND 70101 AND 70200, AIR BASINS AND AIR QUALITY STANDARDS, AS AMENDED JULY 17, 1976.
2 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 2, AGRICULTURAL BURNING GUIDELINES, AS AMENDED DEC. 25, 1976.
3 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 3, SUBVENTIONS, AS AMENDED MARCH 26, 1977.
4 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 4, AIR POLLUTION RECORDS, AS AMENDED THROUGH 1976.
5 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 5, EMISSION DATA, SAMPLING, AND CREDENTIALS FOR ENTRY, AS AMENDED THROUGH 1976.
6 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 6, ABRASIVE BLASTING, AS AMENDED MARCH 13, 1976.

7 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 7, EMERGENCY MEETINGS, AS AMENDED THROUGH 1976.

7.1 AMENDMENTS TO AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 7, SECTIONS 93002 AND 93003, AS AMENDED MAY 14, 1977.

8 AIR POLLUTION CONTROL REGS., TITLE 17, PART III, CHAPTER 1, SUBCHAPTER 8, COMPLIANCE WITH NONVEHICULAR EMISSION STANDARDS, AS AMENDED MAY 14, 1977.

9 EXHAUST AND FUEL EVAPORATIVE EMISSION STANDARDS AND TEST PROCEDURES FOR USED MOTOR VEHICLES UNDER 6001 POUNDS, AIR RESOURCES BOARD, AS AMENDED MARCH 13, 1974.

10 EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1975 AND SUBSEQUENT MODEL GASOLINE-POWERED VEHICLES UNDER 6000 POUNDS, AIR RESOURCES BOARD, EFFECTIVE JUNE 21, 1973.

11 MOTOR VEHICLE EMISSIONS REGS., TITLE 13, CHAPTER 3, SUBCHAPTER 1, MOTOR VEHICLE POLLUTION CONTROL DEVICES, AS AMENDED THROUGH APRIL 9, 1977.

12 MOTOR VEHICLE EMISSIONS REGS., TITLE 13, CHAPTER 3, SUBCHAPTER 2, ENFORCEMENT OF VEHICLE EMISSIONS STANDARDS AND SURVEILLANCE TESTING, AS AMENDED APRIL 2, 1977.

13 MOTOR VEHICLE EMISSIONS REGS., TITLE 13, CHAPTER 3, SUBCHAPTER 3, HIGHWAY AND MANDATORY INSPECTION EMISSION STANDARDS, AS AMENDED MARCH 19, 1977.

14 MOTOR VEHICLE EMISSIONS REGS., TITLE 13, CHAPTER 3, SUBCHAPTER 4, CRITERIA FOR THE EVALUATION OF MOTOR VEHICLE POLLUTION CONTROL DEVICES AND FUEL ADDITIVES, AS AMENDED MARCH 19, 1977.

15 MOTOR VEHICLE EMISSIONS REGS., TITLE 13, CHAPTER 3, SUBCHAPTER 5, STANDARDS FOR MOTOR VEHICLE FUELS, AS AMENDED MARCH 19, 1977.

16 MOTOR VEHICLE EMISSIONS REGS., TITLE 13, CHAPTER 3, SUBCHAPTER 6, CERTIFICATION OF EXHAUST EMISSION CONTROL DEVICES, AS AMENDED MARCH 19, 1977.

17 CRITERIA AND TEST PROCEDURES FOR CERTIFICATION OF AUXILIARY GASOLINE FUEL TANKS, AIR RESOURCES BOARD, ADOPTED JULY 27, 1976.

18 EXHAUST EMISSION CRITERIA AND TEST PROCEDURES FOR NON-MANDATORY EMISSION CONTROL DEVICES, AIR RESOURCES BOARD, ADOPTED FEB. 13, 1974.

19 TEST PROCEDURES FOR GASOLINE AND DIESEL VEHICLE FUEL ADDITIVES, AIR RESOURCES BOARD, AS AMENDED DEC. 11, 1974.

20 NEW VEHICLE COMPLIANCE TEST PROCEDURES, AIR RESOURCES BOARD, ADOPTED JUNE 24, 1976.

21 TEST PROCEDURES FOR GASOLINE VAPOR RECOVERY SYSTEMS AT SERVICE STATIONS, AIR RESOURCES BOARD, AS AMENDED MARCH 30, 1976.

22 CERTIFICATION PROCEDURES FOR GASOLINE VAPOR RECOVERY SYSTEMS AT SERVICE STATIONS, AIR RESOURCES BOARD, ADOPTED MARCH 30, 1976.

23 CERTIFICATION AND TEST PROCEDURES FOR VAPOR RECOVERY SYSTEMS AT GASOLINE TERMINALS, AIR RESOURCES BOARD, ADOPTED APRIL 18, 1977.

24 CERTIFICATION AND TEST PROCEDURES FOR VAPOR RECOVERY SYSTEMS OF GASOLINE DELIVERY TANKS, AIR RESOURCES BOARD, ADOPTED APRIL 18, 1977.

25 CERTIFICATION AND TEST PROCEDURES FOR VAPOR RECOVERY SYSTEMS AT GASOLINE BULK PLANTS, AIR RESOURCES BOARD, ADOPTED APRIL 18, 1977.

26 EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1980 AND SUBSEQUENT MODEL PASSENGER CARS, LIGHT DUTY TRUCKS, AND MEDIUM DUTY VEHICLES, AIR RESOURCES BOARD, AS AMENDED DEC. 14, 1976.

27 EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1975 THROUGH 1979 MODEL PASSENGER CARS, LIGHT DUTY TRUCKS, AND MEDIUM DUTY VEHICLES, AIR RESOURCES BOARD, AS AMENDED NOV. 23, 1976.

28 EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1979 AND SUBSEQUENT MODEL YEAR HEAVY DUTY ENGINES AND VEHICLES, ADOPTED OCT. 5, 1976.

29 EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1975 TO 1978 MODEL YEAR GASOLINE FUELED HEAVY DUTY ENGINES AND VEHICLES, AIR RESOURCES BOARD, AS AMENDED OCT. 5, 1976.

30 EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1975 TO 1978 MODEL YEAR DIESEL FUELED HEAVY DUTY ENGINES AND VEHICLES, AIR RESOURCES BOARD, AS AMENDED OCT. 5, 1976.

31 EVAPORATIVE EMISSION STANDARDS AND TEST PROCEDURES FOR 1978 AND SUBSEQUENT MODEL GASOLINE POWERED MOTOR VEHICLES EXCEPT MOTORCYCLES, AIR RESOURCES BOARD, AS AMENDED NOV. 23, 1976.

32 FUEL EVAPORATIVE EMISSION STANDARD AND TEST PROCEDURE FOR 1977 AND SUBSEQUENT MODEL GASOLINE POWERED PASSENGER CARS AND LIGHT DUTY TRUCKS, AIR RESOURCES BOARD, AS AMENDED MAY 14, 1976.

33 FUEL EVAPORATIVE EMISSION STANDARDS FOR 1973 AND SUBSEQUENT MODEL GASOLINE POWERED VEHICLES OVER 6000 POUNDS, AIR RESOURCES BOARD, ADOPTED JUNE 16, 1971.

34 ASSEMBLY-LINE TEST PROCEDURES FOR 1977 MODEL YEAR GASOLINE POWERED PASSENGER CARS AND LIGHT DUTY TRUCKS, AIR RESOURCES BOARD, AS AMENDED JULY 27, 1976.

35 ASSEMBLY-LINE TEST PROCEDURES FOR 1976 MODEL YEAR GASOLINE POWERED PASSENGER CARS AND LIGHT DUTY TRUCKS, AIR RESOURCES BOARD, AS AMENDED FEB. 20, 1976.

36 ASSEMBLY-LINE TEST PROCEDURES FOR 1978 PASSENGER CARS, LIGHT DUTY TRUCKS, AND MEDIUM DUTY VEHICLES, AIR RESOURCES BOARD, ADOPTED JAN. 25, 1977.

STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

WATER POLLUTION

LAWS

1 THE PORTER-COLOGNE WATER QUALITY CONTROL ACT AND RELATED WATER CODE SECTIONS, MARCH 1972.

REGULATIONS

1 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 6, REVIEW BY STATE BOARD OF ACTION OR FAILURE TO ACT BY REGIONAL BOARD, AS AMENDED THROUGH 1975.

2 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 7, CLEAN WATER GRANT PROGRAM, AS AMENDED THROUGH 1975.

2.1 AMENDMENTS TO WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 7, ARTICLES 1 TO 6, AND 9 TO 11, CLEAN WATER GRANT PROGRAM, AS AMENDED THROUGH JAN. 29, 1977.

3 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 8, OTHER FEDERAL GRANT PROGRAMS, AS AMENDED THROUGH 1974.

4 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 9, WASTE DISCHARGE REPORTS AND REQUIREMENTS, AS AMENDED THROUGH 1975.

4.1 AMENDMENTS TO WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 9, ARTICLES 1,4,5, WASTE DISCHARGE REPORTS AND REQUIREMENTS, AS AMENDED THROUGH DEC. 11, 1976.

5 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 9.1, ENFORCEMENT PROCEDURES, AS AMENDED THROUGH 1973.

5.1 AMENDMENTS TO WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 9.1, ARTICLES 2 TO 6, ENFORCEMENT PROCEDURES, AS AMENDED THROUGH MAY 14, 1977.

6 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 10, LICENSING AND REGULATION OF USE OF OIL SPILL CLEANUP AGENTS, AS AMENDED THROUGH 1971.

7 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 11, CERTIFICATION OF CONFORMANCE WITH WATER QUALITY STANDARDS, AS AMENDED THROUGH 1976.

8 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 12, CERTIFICATION UNDER SECTION 169 OF THE INTERNAL REVENUE CODE OF 1954, AS AMENDED THROUGH 1972.

9 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 13, REGISTRATION AND REG. OF LIQUID WASTE HAULERS, AS AMENDED THROUGH 1975.

10 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 14, CLASSIFICATION OF WASTEWATER TREATMENT PLANTS AND OPERATOR CERTIFICATION, AS AMENDED THROUGH 1975.

11 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 15, WASTE DISPOSAL TO LAND, AS AMENDED THROUGH 1973.

12 WATER REGS., TITLE 23, CHAPTER 3, SUBCHAPTER 17, REGS. FOR IMPLEMENTATION OF THE ENVIRONMENTAL QUALITY ACT OF 1970, AS AMENDED THROUGH 1976.

STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

SOLID WASTE

LAWS

1 BEVERAGE CONTAINER LAW, DIVISION 20, CHAPTER 3, SECTIONS 24380 THROUGH 24384, HEALTH AND SAFETY CODE, ADOPTED AUG. 1975.

2 SOLID WASTE MANAGEMENT AND RESOURCE RECOVERY ACT OF 1972, TITLE 7.3, AS AMENDED THROUGH 1974.

REGULATIONS

1 MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL, CHAPTER 3, ARTICLE 8, SECTIONS 17801 THROUGH 17824, ADOPTED JUNE 1975.

LAND USE

LAWS

1 COASTAL ZONE CONSERVATION ACT OF 1972, SECTION 1, DIV. 18.

2 ESTABLISHMENT OF OFFICE OF PLANNING AND RESEARCH, CHAPTER 1.5, EFFECTIVE JAN. 1977.

REGULATIONS

NONE

RADIATION

LAWS

1 RADIATION CONTROL LAW, HEALTH AND SAFETY CODE, CHAPTER 7.6, AS AMENDED THROUGH 1971.

REGULATIONS

1 RADIATION CONTROL REGS., TITLE 17, CHAPTER 5, SUBCHAPTER 4, AS AMENDED THROUGH APRIL 1974.

1.1 AMENDMENTS TO RADIATION CONTROL REGS., TITLE 17, CHAPTER 5, SUBCHAPTER 4, GROUPS 1,2,4, AND 5, AS AMENDED THROUGH JAN. 24, 1976.

ENDANGERED SPECIES

LAWS

1 ENDANGERED SPECIES ACT OF 1970.

2 FISH AND GAME CODE, ARTICLE 1, SECTIONS 900-903, 3511, 4700, 5050 AND 5152.

REGULATIONS

NONE

STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

PESTICIDES

LAWS
NONE

REGULATIONS

1 ECONOMIC POISONS, TITLE 3, CHAPTER 4, SUBCHAPTER 1, GROUP 2, ARTICLES 1 TO 18, AS AMENDED MARCH 1977.
2 RESTRICTED HERBICIDES, TITLE 3, CHAPTER 4, SUBCHAPTER 1, GROUP 2, ARTICLE 20, AS AMENDED JULY 1976.
3 RESTRICTED MATERIALS, TITLE 3, CHAPTER 4, SUBCHAPTER 1, GROUP 2, ARTICLE 21, AS AMENDED JULY 1976.
4 SALE, USE, AND POSSESSION OF SODIUM FLUOROACETATE, TITLE 3, CHAPTER 4, SUBCHAPTER 1, GROUP 2, ARTICLE 22, AS AMENDED JULY 1976.
5 PEST CONTROL OPERATIONS, AGRICULTURAL PEST CONTROL ADVISERS, PESTICIDE DEALERS, FOOD AND AGRICULTURAL CODE, CHAPTERS 1 TO 7, REVISED AUG. 1975.
6 PRODUCE CARRYING SPRAY RESIDUE, FOOD AND AGRICULTURAL CODE, DIVISION 7, CHAPTER 1, REVISED JULY 1974.
7 ECONOMIC POISONS, FOOD AND AGRICULTURAL CODE, CHAPTER 2, REVISED JAN. 1977.
8 RESTRICTED MATERIALS, FOOD AND AGRICULTURAL CODE, CHAPTER 3, REVISED JAN. 1977.
9 TOLERANCES AND EXEMPTIONS FROM TOLERANCES FOR PESTICIDE CHEMICALS, TITLE 3, CHAPTER 4, SUBCHAPTER 1, GROUP 3, REVISED MARCH 1974.

NOISE

LAWS

1 A BILL TO ESTABLISH AN OFFICE OF NOISE CONTROL, S.B. 860, EFFECTIVE JAN. 1976.
2 NOISE CONTROL ACT OF 1973, DIV. 28, CHAPTERS 1 THROUGH 8.

REGULATIONS

1 NOISE REGS., DIV. II, SECTIONS 23130 THROUGH 38280, AS AMENDED THROUGH 1973.

HAZARDOUS SUBSTANCES

LAWS

1 HAZARDOUS WASTE LAW, CHAPTER 1236, ARTICLE 1 THROUGH 8, AS AMENDED THROUGH 1973.

REGULATIONS

2 HAZARDOUS WASTE REGS., TITLE 22, DIV. 4, CHAPTER 1, EFFECTIVE JULY 1974.

STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

HAWAII

GENERAL ENVIRONMENT

LAWS

1 ECOLOGY, ENVIRONMENT AND RECREATION ACT, ACT 100, SB 1382-72, APPROVED 1972.
2 ENVIRONMENTAL QUALITY LAW, REVISED STATUTES, CHAPTER 342, AS AMENDED THROUGH 1976.
3 ENVIRONMENTAL QUALITY COMM. LAW, REVISED STATUTES, CHAPTER 343, AS AMENDED THROUGH 1974.
4 ENVIRONMENTAL QUALITY CONTROL LAW, REVISED STATUTES, CHAPTER 341, AS AMENDED THROUGH 1974.
5 ENVIRONMENTAL POLICY ACT, REVISED STATUTES, CHAPTER 344, AS AMENDED THROUGH 1974.

REGULATIONS

1 ENVIRONMENTAL QUALITY COMMISSION, RULES OF PRACTICE AND PROCEDURE, EFFECTIVE JUNE 2, 1975.
2 ENVIRONMENTAL QUALITY COMMISSION, ENVIRONMENTAL IMPACT STATEMENT, REGS., AS AMENDED THROUGH 1977.

AIR POLLUTION

LAWS

FOR AIR LAWS, SEE ECOLOGY, ENVIRONMENT, AND RECREATION ACT, ACT 100, SB 1382-72, APPROVED 1972. ENVIRONMENTAL QUALITY LAW, REVISED STATUTES, CHAPTER 342, AS AMENDED THROUGH 1976. ENVIRONMENTAL QUALITY COMM. LAW, REVISED STATUTES, CHAPTER 343, AS AMENDED THROUGH 1974. ENVIRONMENTAL QUALITY CONTROL LAW, REVISED STATUTES, CHAPTER 341, AS AMENDED THROUGH 1974.

REGULATIONS

1 AIR POLLUTION CONTROL, PUBLIC HEALTH REGS., CHAPTER 43, EFFECTIVE 1973.
2 AMBIENT AIR QUALITY STANDARDS, PUBLIC HEALTH REGS., CHAPTER 42, AS AMENDED 1972.

WATER POLLUTION

LAWS

FOR WATER LAWS, SEE ECOLOGY, ENVIRONMENT, AND RECREATION ACT, ACT 100, SB 1382-72, APPROVED 1972. ENVIRONMENTAL QUALITY LAW, REVISED STATUTES, CHAPTER 342, AS AMENDED THROUGH 1976. ENVIRONMENTAL QUALITY COMM. LAW, REVISED STATUTES, CHAPTER 343, AS AMENDED THROUGH 1974. ENVIRONMENTAL QUALITY CONTROL LAW, REVISED STATUTES, CHAPTER 341, AS AMENDED THROUGH 1974.

REGULATIONS

1 DEPT. OF HEALTH, APPLICATION FOR PERMIT FOR WASTE DISCHARGE.
2 WATER POLLUTION CONTROL, PUBLIC HEALTH REGS., CHAPTER 37, AS AMENDED THROUGH 1975.
3 WATER QUALITY STANDARDS, PUBLIC HEALTH REGS., CHAPTER 37-A, EFFECTIVE 1974.
4 CONSERVATION STANDARDS, PUBLIC HEALTH REGS., CHAPTER 37-B, EFFECTIVE 1974.

SOLID WASTE

LAWS

FOR SOLID WASTE LAWS, SEE ECOLOGY, ENVIRONMENT AND RECREATION ACT, ACT 100, SB 1382-72, APPROVED 1972. ENVIRONMENTAL QUALITY LAW, REVISED STATUTES, CHAPTER 342, AS AMENDED THROUGH 1976. ENVIRONMENTAL QUALITY COMM. LAW, REVISED STATUTES, CHAPTER 343, AS AMENDED THROUGH 1974. ENVIRONMENTAL QUALITY CONTROL LAW, REVISED STATUTES, CHAPTER 341, AS AMENDED THROUGH 1974.

REGULATIONS

1 SEWAGE TREATMENT AND DISPOSAL SYSTEMS, PUBLIC HEALTH REGS., CHAPTER 38, EFFECTIVE 1973.
2 SOLID WASTE MANAGEMENT, PUBLIC HEALTH REGS., CHAPTER 46, EFFECTIVE 1974.

LAND USE

LAWS

1 LAND USE LAW, INCLUDING POWERS OF THE LAND USE COMMISSION, ACT 193 OF 1975 AND OTHERS, AS AMENDED THROUGH 1977. REVISED STATUTES, CHAPTERS 174, 181, 183, 184, 205, 205A AND 206.

RADIATION

LAWS

FOR RADIATION LAWS, SEE ECOLOGY, ENVIRONMENT, AND RECREATION ACT, ACT 100, SB 1382-72, APPROVED 1972. ENVIRONMENTAL QUALITY LAW, REVISED STATUTES, CHAPTER 342, AS AMENDED THROUGH 1976. ENVIRONMENTAL QUALITY COMM. LAW, REVISED STATUTES, CHAPTER 343, AS AMENDED THROUGH 1974. ENVIRONMENTAL QUALITY CONTROL LAW, REVISED STATUTES, CHAPTER 341, AS AMENDED THROUGH 1974.

REGULATIONS

1 RADIATION PROTECTION, PUBLIC HEALTH REGS., CHAPTER 33, EFFECTIVE 1960.

STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

ENDANGERED SPECIES

LAWS

1 REVISED STATUTES, CHAPTER 195D

REGULATIONS

1 CHAPTER 6 OF THE DIVISION OF FISH AND GAME RULES.

PESTICIDES

LAWS

1 HAWAII PESTICIDE LAW, REVISED STATUTES, CHAPTER 149A.

NOISE

LAWS

FOR NOISE LAWS, SEE ECOLOGY, ENVIRONMENT, AND RECREATION ACT, ACT 100, S.B. 1382-72, APPROVED 1972. ENVIRONMENTAL QUALITY LAW, REVISED STATUTES, CHAPTER 342, AS AMENDED THROUGH 1976. ENVIRONMENTAL QUALITY COMM. LAW, REVISED STATUTES, CHAPTER 343, AS AMENDED THROUGH 1974. ENVIRONMENTAL QUALITY CONTROL LAW, REVISED STATUTES, CHAPTER 341, AS AMENDED THROUGH 1974.

REGULATIONS

1 VEHICULAR NOISE CONTROL FOR OAHU, PUBLIC HEALTH REGS., CHAPTER 44A, EFFECTIVE 1972.

2 COMMUNITY NOISE CONTROL FOR OAHU, PUBLIC HEALTH REGS., CHAPTER 44B, EFFECTIVE APRIL 26, 1976, DEPT. OF HEALTH, APPLICATION FOR COMMUNITY NOISE PERMIT.

STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

NEVADA

AIR POLLUTION

LAWS

1 AIR POLLUTION CONTROL ACT, CHAPTER 445 SECTIONS 445.401 THROUGH 445.710, AS AMENDED THROUGH 1975.

1.1 REQUIREMENTS FOR THE REGULATION OF AIR POLLUTION SOURCES, S.B. NO. 106, 1977.

1.2 EMISSION CONTROL IN MOTOR VEHICLES, ASSEMBLY BILL NO. 464, 1977.

2 AN ACT RELATING TO AIR POLLUTION, CHAPTER 445, SECTIONS 1 THROUGH 44, AS AMENDED THROUGH 1975.

REGULATIONS

1 AIR QUALITY REGS., AS AMENDED THROUGH SEPT. 1975.

WATER POLLUTION

LAWS

1 WATER POLLUTION CONTROL LAW, CHAPTER 445, SECTIONS 445.015 THROUGH 445,354, AS AMENDED THROUGH 1975.

2 WATER CONSERVATION ACT, S.B. NO. 322, 1977.

3 WASTE OF WATER, ASSEMBLY BILL NO. 443, 1977.

4 ACT RELATING TO SUBDIVISIONS, ASSEMBLY BILL NO 445, 1977.

REGULATIONS

1 PROCEDURAL REGS. FOR ADMINISTRATION OF DISCHARGE PERMITS, ADOPTED JAN. 1975.

2 WATER POLLUTION CONTROL REGS., AS AMENDED THROUGH JAN. 1975.

SOLID WASTE

LAWS

1 SOLID WASTE DISPOSAL LAW, CHAPTER 444, SECTIONS 444.440 THROUGH 444.630, AS AMENDED 1971.

REGULATIONS

1 SOLID WASTE MANAGEMENT REGS., EFFECTIVE JAN. 1973.

STATE ENVIRONMENTAL LAWS AND REGULATIONS AS OF 1977

LAND USE

LAWS

1 ACT RELATING TO CAREY ACT LANDS, S.B. NO. 141, 1977.
2 LAND USE PLANNING ACT, S.B. NO. 212, 1977.
3 ACT RELATING TO OUTDOOR ADVERTISING, S.B. NO. 393, 1977.
4 PLANT PROTECTION ACT, ASSEMBLY BILL NO. 616, 1977.
5 ACT RELATING TO THE MARLETTE LAKE-HOBART RESERVOIR, ASSEMBLY BILL NO. 732, 1977.

RADIATION

LAWS

NONE

REGULATIONS

1 RULES AND REGS. FOR RADIATION CONTROL, PARTICLE ACCELERATORS, ADOPTED MARCY 1972.
2 RULES AND REGS. FOR RADIATION CONTROL RADIOACTIVE MATERIALS, ADOPTED MARCH 1972.
3 RULES AND REGS. FOR RADIATION CONTROL X-RAYS, ADOPTED MARCH 1972.

ENDANGERED SPECIES

LAWS

NONE

REGULATIONS

1 GENERAL REGULATION NO 1(8) OF THE BOARD OF FISH AND GAME COMMISSIONS.

PESTICIDES

LAWS

1 CUSTOM APPLICATION OF PESTICIDES LAW, CHAPTER 555, SECTIONS 555.262 THROUGH 555.500, AS AMENDED THROUGH 1976.
2 PESTICIDES ACT, DANGEROUS CAUSTIC OR CORROSIVE SUBSTANCES, CHAPTER 586, SECTIONS 586.010 THROUGH 586.460, 1973.

REGULATIONS

1 REGS. FOR THE ENFORCEMENT OF THE NEVADA PESTICIDES ACT, EFFECTIVE JULY 1956.
2 REGS. GOVERNING THE EXAMINATION, LICENSING AND OPERATIONS OF PEST CONTROL PERSONNEL, EFFECTIVE AUG. 1974.

SOURCE - ENVIRONMENTAL INFORMATION CENTER, NEW YORK, N.Y, STATE LAWS AND REGULATIONS, 1977, WITH UPDATES FROM STATE SOURCES

TABLE III-8
STATE LAND USE PROGRAMS

TYPE OF PROGRAM	CALIFORNIA	HAWAII	NEVADA
COMPREHENSIVE PERMIT SYSTEM (A)		YES	
COORDINATED INCREMENTAL (B)	YES	YES	YES
MANDATORY LOCAL PLANNING (C)			YES
COASTAL ZONE MANAGEMENT	YES	YES	
WETLANDS MANAGEMENT			
POWER PLANT SITING	YES	YES	YES
SURFACE MINING	YES	YES	
DESIGNATION OF CRITICAL AREAS		YES	YES
DIFFERENTIAL ASSESSMENT LAWS (D)	C	B	B
FLOODPLAIN MANAGEMENT	YES	YES	
STATEWIDE SHORELANDS ACT			

SOURCE - U.S. COUNCIL ON ENVIRONMENTAL QUALITY, SEVENTH ANNUAL REPORT, 1976

NOTES -

(A) STATE HAS AUTHORITY TO REQUIRE PERMITS FOR CERTAIN TYPES OF DEVELOPMENT.

(B) STATE ESTABLISHED MECHANISM TO COORDINATE LAND USE RELATED PROBLEMS.

(C) STATE REQUIRES LOCAL GOVERNMENTS TO ESTABLISH A MECHANISM FOR LAND USE PLANNING.

(D) STATE HAS ADOPTED A TAX MEASURE WHICH IS DESIGNED TO GIVE PROPERTY TAX RELIEF TO OWNERS OF AGRICULTURAL OR OPEN SPACE LANDS.

A - PREFERENTIAL ASSESSMENT PROGRAM
B - DEFERRED TAXATION
C - RESTRICTIVE AGREEMENTS.

TABLE III-9
SUMMARY OF SOLID WASTE PRACTICES

	CALIFORNIA	HAWAII	NEVADA
REVISION OF STATE SOLID WASTE LEGISLATION SINCE 1974	YES	NO	NO
SPECIAL COLLECTION FOR HAZARDOUS WASTES			
REQUIRED	YES	---	YES
BY STATE RULES AND REGS	YES	---	NO
SPECIAL PROCESSING OR DISPOSAL OF HAZARDOUS WASTES			
REQUIRED	YES	YES	YES
BY STATE RULES AND REGS	YES	YES	NO
CONTROL OF LIQUIDS, SEMI-SOLIDS, PASTES, AND SLUDGES REGULATED	YES	YES	YES
EFFECTIVE DATE	1970-73	JUL 1974	JAN 1973

SOURCE - WASTE AGE, FEB - APR 1977

III-C-2 ENERGY LEGISLATION

LAWS AND REGULATIONS CONCERNED WITH THE PRODUCTION, DISTRIBUTION OR USE OF ENERGY ARE SUMMARIZED IN THIS SECTION. THE SUMMARIES ARE PRESENTED SEPARATELY FOR EACH OF THE THREE STATES BECAUSE THEY ARE TAKEN FROM DIFFERENT SOURCES THAT HAD DIFFERENT FORMATS. THE EMPHASIS IN THIS SECTION IS ON THE PORTIONS OF THE STATE CODES THAT REFER TO THE AGENCIES INVOLVED WITH ENERGY OR THE ENVIRONMENT.

TABLE III-10
ENERGY LEGISLATION IN CALIFORNIA

ADMINISTRATION AND CONTROL OF STATE LANDS	
PUBLIC RESOURCES CODE SECTIONS 6001 - 6201	SECTIONS 6101-6201 ESTABLISH A STATE LANDS COMMISSION WITHIN THE DEPARTMENT OF CONSERVATION. THE COMMISSION HAS FULL AUTHORITY TO ADMINISTER, SELL, LEASE, OR DISPOSE OF LANDS OWNED BY THE STATE. THE COMMISSION ALSO POSSESSES THE POWER TO AUTHORIZE EXTRACTION OF MINERALS, OIL AND GAS FROM THESE PUBLIC LANDS. THE COMMISSION ALSO HAS JURISDICTION OVER UNGRANTED TIDELANDS AND SUBMERGED LANDS OWNED BY THE STATE.
PUBLIC RESOURCES CODE SECTION 6301.5	SECTION 6301.5 GRANTS TO THE COMMISSION THE AUTHORITY TO ACT IN BEHALF OF THE STATE OF CALIFORNIA PURSUANT TO THE FEDERAL OUTER CONTINENTAL SHELF LANDS ACT AND NEGOTIATE WITH THE SECRETARY OF THE INTERIOR AND THE CALIFORNIA ATTORNEY GENERAL WITH RESPECT TO OPERATIONS UNDER EXISTING MINERAL LEASES.
PUBLIC RESOURCES CODE SECTIONS 6401 - 6407	THESE SECTIONS RESERVE TO THE STATE ALL DEPOSITS OF OIL, GAS, COAL, OIL SHALE, PHOSPHATE, SODIUM, GOLD AND SILVER ON THE PUBLIC LANDS.
PUBLIC RESOURCES CODE SECTION 6801 ET SEQ.	OIL AND GAS AND MINERAL LEASES.
PUBLIC RESOURCES CODE SECTIONS 6902 - 6925	GEOTHERMAL RESOURCES - INCLUDES THE NATURAL HEAT OF THE EARTH IN WHATEVER FORM, WHETHER MINERALS OR OTHER PRODUCTS DERIVED FROM NATURALLY HEATED GASES, FLUIDS, ETC., EXCLUDING OIL, HYDROCARBON GAS, OR OTHER HYDROCARBON SUBSTANCES.
PUBLIC RESOURCES CODE SECTIONS 7501 - 7062	OIL AND GAS AND MINERAL LEASES BY PUBLIC AGENCIES.
ENERGY CONSERVATION AND DEVELOPMENT	
PUBLIC RESOURCES CODE SECTIONS 25200 - 25224	ESTABLISHES THE STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION AND PRESCRIBES POWERS AND DUTIES.
PUBLIC RESOURCES CODE SECTIONS 25300 - 25404	PLANNING AND FORECASTING - THESE SECTIONS PROVIDE THAT THE COMMISSION IS RESPONSIBLE FOR FORECASTING AND ASSESSING ENERGY DEMANDS AND SUPPLIES AND ALSO RESPONSIBLE FOR DESIGNATING CERTAIN METHODS BY WHICH TO CONSERVE ENERGY RESOURCES.

PUBLIC RESOURCE CODE SECTIONS 25500 - 25542	POWER FACILITY AND SITE CERTIFICATION - REQUIRES THAT POWER SITES AND FACILITIES, WITH A NUMBER OF EXCEPTIONS, MUST BE CERTIFIED BY THE COMMISSION. NUCLEAR THERMAL ELECTRIC SITES ARE SPECIFICALLY ADDRESSED IN SECTIONS 25524.1 THROUGH 25524.3.
PUBLIC RESOURCE CODE SECTIONS 25600 - 25604	RESEARCH AND DEVELOPMENT - REQUIRES THAT THE COMMISSION DEVELOP AND COORDINATE A PROGRAM OF RESEARCH AND DEVELOPMENT IN ENERGY SUPPLY, CONSUMPTION AND CONSERVATION.
PUBLIC RESOURCES CODE SECTIONS 25410 - 25426	RESIDENTIAL LOAN PROGRAM - AUTHORIZES THE COMMISSION TO CONDUCT A LOAN PROGRAM FOR FINANCING RESIDENTIAL ENERGY INSULATION, SOLAR HEATING AND COOLING, AND INFORMATIONAL PROGRAMS.
PUBLIC RESOURCES CODE SECTIONS 25480 - 25486	TRANSPORTATION - PROVIDES INCENTIVES FOR THE WIDE USE OF CARPOOLS AND PREFERENTIAL LANES FOR CARPOOL VEHICLES.
PUBLIC RESOURCE CODE SECTION 25600	ALTERNATIVE SYSTEMS - THIS SECTION IS AMENDED TO AUTHORIZE THE STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION (CERCDC) TO PARTICIPATE IN LARGE SCALE DEMONSTRATIONS OF ALTERNATIVE ENERGY SYSTEMS SITED IN CALIFORNIA IN COOPERATION WITH FEDERAL AGENCIES, REGIONAL COMPACTS, OTHER STATE GOVERNMENTS AND OTHER PARTICIPANTS IN ORDER TO ACCOMPLISH ITS ALREADY REQUIRED MANDATE TO DEVELOP AND COORDINATE A PROGRAM OF RESEARCH AND DEVELOPMENT IN ALTERNATIVE SOURCES OF ENERGY.

PUBLIC UTILITIES ACT

PUBLIC UTILITIES CODE SECTION 701	COMMISSION HAS AUTHORITY TO REGULATE GAS, ELECTRICITY, TELEPHONE, TELEGRAPH, WATER AND HEAT UTILITIES, PETROLEUM IRREGULAR ROUTE CARRIERS AND OTHERS.
PUBLIC UTILITIES CODE SECTION 729	LIFELINE RATES - EXISTING LAW REQUIRES THE PUBLIC UTILITIES COMMISSION TO DESIGNATE A LIFELINE VOLUME OF GAS AND QUANTITY OF ELECTRICITY NECESSARY TO SUPPLY MINIMUM ENERGY NEEDS OF AVERAGE RESIDENTIAL USERS AND REQUIRES GAS AND ELECTRICAL CORPORATIONS TO FILE A REVISED SCHEDULE OF RATES AND CHARGES PROVIDING A LIFELINE RATE. THIS AMENDMENT TO THAT LAW PROVIDES THAT WHERE THERE IS A MASTER METER AND THE END USE IS RESIDENTIAL, THERE SHALL BE A LIFELINE VOLUME AND QUANTITY APPORTIONED FOR EACH RESIDENTIAL UNIT.
PUBLIC UTILITIES COMMISSSION CASE NO. 9642, DEC 1973	CPUC BEGAN INVESTIGATIONS TO DETERMINE PROJECTED AVAILABILITY OF NATURAL GAS AND TO CONSIDER POSSIBLE REGULATORY ACTION TO DEAL WITH ANTICIPATED SHORTAGES, INCLUDING CONSIDERATION OF THE ENVIRONMENTAL CONSEQUENCES OF SUCH SHORTAGES.
PUBLIC UTILITIES COMMISSION DECISION NOS. 82305 AND 82358 CASE NO. 9581, JAN 1974	PUC ISSUED SECOND AND THIRD INTERIM ORDERS INCREASING VOLUNTARY CONSERVATION EFFORTS TO FIFTEEN PERCENT AND INITITATING MANDATORY CURTAILMENT FOR CERTAIN USES.
CALIFORNIA RESOURCES AGENCY GOVERNMENT CODE SECTION 12805	THIS AGENCY CONSISTS OF THE AIR RESOURCES BOARD, THE COLORADO RIVER BOARD, THE OFFICE OF NUCLEAR ENERGY, THE STATE WATER RESOURCES CONTROL BOARD AND EACH CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD AS WELL AS THE DEPARTMENTS OF FISH AND GAME, NAVIGATION AND OCEAN DEVELOPMENT, PARKS AND RECREATION AND WATER RESOURCES. THE POWERS OF THE AGENCY ARE DESCRIBED IN PUBLIC RESOURCES CODE SECTION 6217.

DEPARTMENT OF CONSERVATION

DIVISION OF MINES AND MINING PUBLIC RESOURCES CODE SECTION 2001	
DIVISION OF OIL AND GAS PUBLIC RESOURCES CODE SECTIONS 3106 - 3107	THE DIVISION IS HEADED BY THE OIL AND GAS SUPERVISIOR. THE SUPERVISIOR IS RESPONSIBLE FOR SUPERVISING THE DRILLING, OPERATION, MAINTENANCE AND ABANDONMENT OF WELLS IN ORDER TO PROTECT AND CONSERVE THE STATES NATURAL RESOURCES. DISTRICT DEPUTIES ARE RESPONSIBLE FOR COLLECTING INFORMATION REGARDING THE OIL AND GAS WELLS IN THE DISTRICT AND DETERMINING THE PRESENCE AND SOURCE OF WATER IN THE OIL SANDS.
DIVISION OF OIL AND GAS PUBLIC RESOURCES CODE SECTIONS 3200 - 3300	ARTICLE FOUR CONTAINS REQUIREMENTS TO BE FOLLOWED BY OWNERS AND OPERATORS OF WELLS. ARTICLE FIVE CONTAINS PROVISIONS PROHIBITING THE UNREASONABLE WASTE OF GAS, PROVIDES FOR PENALTIES FOR VIOLATION OF THIS ARTICLE, AND CONTAINS PROCEDURAL REQUIREMENTS FOR GRANTING RELIEF AGAINST A PARTY IN VIOLATION OF THE ARTICLE.
DIVISION OF OIL AND GAS PUBLIC RESOURCES CODE SECTIONS 3603 - 3690	CONTAIN PROVISIONS REGARDING MANAGEMENT AND OPERATION OF LANDS AS A UNIT FOR THE PRODUCTION OF OIL AND GAS AS A MEANS OF PREVENTING WASTE AND INCREASING THE USE OF THE SURFACE LAND FOR OTHER PURPOSES.
DIVISION OF OIL AND GAS PUBLIC RESOURCES CODE SECTIONS 3714.5 - 3728.5	CONTAIN PROVISIONS REGARDING GEOTHERMAL RESOURCES AND GRANTING THE STATE OIL AND GAS SUPERVISOR AUTHORITY TO SUPERVISE THE DRILLING, OPERATION, AND MAINTENANCE OF GEOTHERMAL RESOURCES WELLS.
SOLID WASTE MANAGEMENT AND RESOURCE RECOVERY GOVERNMENT CODE SECTION 66785	PROVIDES THAT THE MANAGEMENT BOARD IS RESPONSIBLE FOR ESTABLISHING GUIDELINES FOR INITIATING RESEARCH AND DEVELOPMENT TO DEVELOP ECONOMICALLY FEASIBLE AND SAFE SYSTEMS FOR COLLECTING, CONVERTING, RECYCLING WASTES. THIS RESEARCH IS TO INCLUDE SPECIAL STUDIES ON THE RECOVERY OF USEFUL ENERGY AND RESOURCES FROM SOLID WASTES.
ATOMIC ENERGY DEVELOPMENT LAW HEALTH AND SAFETY CODE SECTION 23710 - 23731	POWERS - THE SECRETARY OF THE RESOURCES AGENCY IS AUTHORIZED TO COORDINATE PROGRAMS, RULES AND REGULATIONS OF THE VARIOUS STATE AGENCIES RELATED TO ATOMIC ENERGY.
RADIATION CONTROL LAW HEALTH AND SAFETY CODE SECTIONS 25800 - 25663.1	

ENERGY LEGISLATION IN CALIFORNIA

CALIFORNIA COASTAL ACT OF 1976 PUBLIC RESOURCES CODE SECTION 30000 ET SEQ.	THESE SECTIONS REVISE EXISTING LAW AS TO THE JURISDICTION OF CERTIFYING SITES AND RELATED POWERPLANT FACILITIES TO BE LOCATED WITHIN THE COASTAL ZONE. THE LOCATING OF NEW OR EXPANDED COASTAL FACILITIES ARE DISCUSSED GENERALLY IN SEC. 30260. SITING POLICY FOR TANKER FACILITIES AND LIQUEFIED NATURAL GAS TERMINALS ARE DISCUSSED IN SEC. 30261. SITING POLICY FOR OIL AND GAS DEVELOPMENT, SEC. 30262. SITING POLICY FOR REFINERIES OR PETROCHEMICAL FACILITIES, SEC. 30263.
ENERGY INSULATION REGULATION HEALTH AND SAFETY CODE SECTION 19870 ET SEQ.	PROVIDES THAT THE COMMISSION OF HOUSING AND COMMUNITY DEVELOPMENT SHALL ADOPT RULES AND REGULATIONS ESTABLISHING MINIMUM STANDARDS OF ENERGY INSULATION FOR NEW HOTELS, MOTELS, APARTMENT HOUSES, HOMES, AND OTHER RESIDENTIAL DWELLINGS. FURTHER PROVIDES THAT THE DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT SHALL ESTABLISH MINIMUM ENERGY CONSERVATION STANDARDS FOR NEW NON-RESIDENTIAL BUILDINGS.
HOUSING-RESIDENTIAL-SOLAR ENERGY HEALTH AND SAFETY CODE SECTION 17959	AUTHORIZES ANY CITY OR COUNTY TO REQUIRE THAT NEW BUILDINGS SUBJECT TO THE STATE HOUSING LAW BE CONSTRUCTED IN A MANNER PERMITTING INSTALLATION OF SOLAR HEATING OR NOCTURNAL COOLING DEVICES.
VEHICLE CODE SECTION 22348 - DIVISION 11	UNDER THIS SECTION CALIFORNIA ESTABLISHED THE SPEED LIMIT AT 55 MILES PER HOUR AS A MEANS OF ALLEVIATING THE FUEL SHORTAGE.
TAXATION - PERSONAL INCOME - SOLAR ENERGY DEVICE REVENUE AND TAXATION CODE SECTIONS 17052.5 AND 23601	AUTHORIZES TAXPAYERS TO ELECT A TAX CREDIT AGAINST THE NET TAX EQUAL TO THE LESSER OF TEN PERCENT OR $1,000 OF THE ACQUISITION COST OF SOLAR ENERGY DEVICES ON PREMISES IN CALIFORNIA WHICH ARE OWNED OR CONTROLLED BY THE TAXPAYER AT THE TIME OF INSTALLATION, PAYMENT FOR WHICH IS MADE BY THE TAXPAYER DURING THE TAXABLE YEAR.

SOURCE - PRIMER ON ENVIRONMENTAL LAW IN CALIFORNIA, CALIFORNIA DEPARTMENT OF JUSTICE, ENVIRONMENTAL UNIT, DECEMBER 1976.

NOTES - CALIFORNIA ENERGY LEGISLATION DOES NOT EXIST AS A COLLECTED BODY OF STATUTES. INSTEAD, AS ENERGY RELATED LEGISLATION BECOMES PUBLIC LAW, STATUTES ARE LOCATED WITHIN THE CALIFORNIA CODES ON THE BASIS OF SPECIFIC NATURAL RESOURCE, ADMINISTRATIVE JURISDICTION, OR SIMPLY HISTORICAL PATTERNS OF ORGANIZATION. AN ATTEMPT HAS BEEN MADE TO PRESENT A REFERENCE LIST OF MAJOR PIECES OF CALIFORNIA ENERGY LEGISLATION, AS DISTINCT FROM LAWS REGARDING AIR, WATER, AND NOISE POLLUTION; ACCEPTABLE LEVELS OF PESTICIDE AND RADIATION; AND GENERAL LAND USE ISSUES. LEGISLATION ADDRESSED TO THE INTERCONNECTIONS BETWEEN ENERGY PRODUCTION/CONSUMPTION AND THESE OTHER AREAS IS HIGHLIGHTED, BUT THE DISCUSSION IS PRIMARILY DEVOTED TO THE ENERGY, AS OPPOSED TO THE ENVIRONMENTAL, ASPECT OF SUCH STATUTES OR CASE LAW.

TABLE III-11
ENERGY LEGISLATION IN HAWAII

SECTION	SUMMARY OF LEGISLATION
125C-1	PROVIDES THE GOVERNOR WITH EMERGENCY POWERS IN THE EVENT OF A SHORTAGE OF PETROLEUM PRODUCTS.
196-1	ESTABLISHES THE POSITION OF ENERGY RESOURCES COORDINATOR.
235-12	PROVIDES INCOME TAX CREDIT AND REAL PROPERTY TAX EXEMPTION FOR ENERGY CONSERVATION MEASURES. ALSO PROVIDES A TEN PERCENT INCOME TAX CREDIT FOR SOLAR ENERGY DEVICES.
246-34.7	PROVIDES A PROPERTY TAX EXEMPTION FOR ALTERNATIVE ENERGY IMPROVEMENTS THAT ADD TO THE VALUE OF REAL PROPERTY. THIS EXEMPTION IS AVAILABLE TO BOTH INDIVIDUAL AND CORPORATE TAX-PAYERS.
249-31	PLACES A ONE DOLLAR REGISTRATION FEE ON VEHICLES.
249-32	PROVIDES A STATE TAX ON VEHICLE ENGINE DISPLACEMENT.
249-33	IMPOSES AN ANNUAL STATE MOTOR VEHICLE WEIGHT TAX AND A DISTRIBUTOR LIQUID FUEL EXCISE TAX.
269-16	RELATES TO THE PUBLIC UTILITY COMMISSION RATE REGULATIONS INCLUDING PROVISIONS ON RATE HEARINGS, REBATES AND AUTHORIZATION OF ADJUSTMENTS.
269-29.2	EXEMPTS NON-FOSSIL FUEL ELECTRICITY GENERATING SOURCES FROM PUBLIC UTILITY COMMISSION REGULATIONS. ALSO PROVIDES PUC WITH POWERS TO INVESTIGATE THE AVAILABILITY OF SURPLUS NON-FOSSIL FUEL ELECTRICITY AND REQUIRE ELECTRIC UTILITIES TO BUY THE SURPLUS.
340A-2	DEFINES AND ESTABLISHES THE OWNERSHIP OF SOLID WASTE.
344-4	AMENDS THE STATE ENVIRONMENTAL POLICY TO REQUIRE ALL AGENCIES TO DEVELOP PROGRAMS FOR SOLID WASTE PREVENTION, RECYCLING AND ENERGY RECOVERY.
486E-3	REQUIRES MONTHLY REPORTS OF LIQUID FUEL SUPPLIES HELD BY DISTRIBUTORS.

SOURCE - HAWAII ENERGY RESOURCES COORDINATORS ANNUAL REPORT, 1975, 1976 AND 1977

NOTES - SECTIONS REFER TO THE HAWAII REVISED STATUTES

TABLE III-12
ENERGY LEGISLATION IN NEVADA

SECTION	SUBJECT OF LEGISLATION
232.010 ET SEQ	DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
445.152	DIVISION OF ENVIRONMENTAL PROTECTION
445.451 ET SEQ	ENVIRONMENTAL PROTECTION COMMISSION
523.011 ET SEQ	DEPARTMENT OF ENERGY
523.061 ET SEQ	ENERGY RESOURCES ADVISORY BOARD
532.010 ET SEQ	DIVISION OF WATER RESOURCES (STATE ENGINEER)
538.041	DIVISION OF COLORADO RIVER RESOURCES
703.010 ET SEQ	PUBLIC SERVICE COMMISSION

SOURCE - NEVADA REVISED STATUTES

TABLE III-13
PROVISIONS OF ENERGY FACILITY SITING LAWS

	CALIFORNIA	HAWAII	NEVADA
POWER PLANT SITING LAW	YES	YES	YES
ONE STOP PROVISION	YES	NO	YES
SITE CERTIFYING AUTHORITY	STATE ENERGY COMMISSION		PUBLIC SERVICE COMMISSION
COMPOSITION OF SITING PANEL	FIVE APPOINTED BY GOVERNOR		SIZE OF PSC
METHOD OF SITE ACQUISITION	EMINENT DOMAIN		PERMIT
APPLICATION FEE	$25,000 MAXIMUM		NONE
ANNUAL UTILITY FORECAST	5-10-20 YEAR PLAN		NONE

SOURCE - SOUTHERN STATES ENERGY BOARD, ENERGY FACILITY SITING IN THE UNITED STATES

NOTES - THERE IS NO ONE STOP SITING PROCESS IN HAWAII AND, CONSEQUENTLY, NO SINGLE SITING AGENCY. THE PUBLIC UTILITIES COMMISSION IS CHARGED WITH REGULATING CAPITAL EXPENDITURE FOR PLANTS. IN ADDITION, THE PUC REQUIRES THE FILING OF FIVE-YEAR ENERGY USE AND CAPITAL EXPENDITURE PLANS BY ELECTRIC UTILITIES. DEPENDING ON THE LOCATION OF A POWER PLANT, ADDITIONAL PERMITS OR OTHER MATERIAL MAY BE REQUIRED BY AGENCIES SUCH AS THE DEPARTMENT OF HEALTH OR THE STATE LAND USE COMMISSION.

III-C-3 ENVIRONMENTAL QUALITY STANDARDS

THIS SECTION CONSISTS OF A TABLE SHOWING THE FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS APPLICABLE TO THIS REGION. NOTE THAT IN CALIFORNIA LOCAL AIR QUALITY CONTROL BOARDS HAVE THE POWER TO PROMULGATE AND ENFORCE STRICTER STANDARDS. THE DATA INCLUDED IN THE TABLE ARE FROM FEDERAL AND STATE SOURCES.

TABLE III-14
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS, 1978

POLLUTANT	AVERAGING TIME	UNITS	FEDERAL STANDARDS		CALIFORNIA	HAWAII	NEVADA
			PRIMARY	SECONDARY			
PHOTOCHEMICAL OXIDANTS	1 HOUR	UG	160	SAME AS	(200)	100	(160)
		PPM	(0.08)	PRIMARY	0.10	(0.05)	0.08
CARBON MONOXIDE	12 HOUR	PPM	---	---	10	---	---
	8 HOUR	UG	10	SAME AS	---	5	(10)
		PPM	(9)	PRIMARY	---	(4.5)	9
	1 HOUR	UG	40	SAME AS	(46)	10	(40)
		PPM	(35)	PRIMARY	40	(9)	35
NITROGEN DIOXIDE	ANNUAL	UG	100	SAME AS	---	70	(100)
		PPM	(0.05)	PRIMARY	---	(0.035)	0.05
	24 HOUR	UG	---	---	---	150	---
	1 HOUR	PPM	---	---	0.25	---	---
SULFUR DIOXIDE	ANNUAL	UG	80	---	---	20	(50)
		PPM	(0.03)	---	---	(0.01)	0.02
	24 HOUR	UG	365	---	(105)	80	(250)
		PPM	(0.14)	---	0.04	(0.03)	0.10
	3 HOUR	UG	---	1300	---	400	(1300)
		PPM	---	(0.50)	---	(0.15)	0.50
	1 HOUR	PPM	---	---	0.5	---	---
SUSPENDED PARTICULATES	ANNUAL	UG	75	60	60	55	60
	24 HOUR	UG	260	150	100	100	150
SULFATES	24 HOUR	UG	---	---	25	---	---
LEAD	30 DAY	UG	---	---	1.5	---	---
HYDROGEN SULFIDE	1 HOUR	PPM	---	---	0.03	---	---
HYDROCARBONS (CORRECTED FOR METHANE)	3 HOUR (6-9 AM)	UG	160	SAME AS PRIMARY	---	100	160
ETHYLENE	8 HOUR	PPM	---	---	0.1	---	---
	1 HOUR	PPM	---	---	0.5	---	---

SOURCE - FEDERAL STANDARDS - ENVIRONMENTAL PROTECTION AGENCY CALIFORNIA STANDARDS - AIR RESOURCES BOARD
HAWAII STANDARDS - ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION NEVADA STANDARDS - ENVIRONMENTAL PROTECTION COMMISSION

FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS, 1978

NOTES - FEDERAL STANDARDS, OTHER THAN THOSE BASED ON ANNUAL AVERAGES OR GEOMETRIC MEANS, ARE NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR. CALIFORNIA STANDARDS ARE NOT TO BE EQUALLED OR EXCEEDED.

NATIONAL PRIMARY STANDARDS ARE THE LEVELS OF AIR QUALITY NECESSARY TO PROTECT PUBLIC HEALTH. NATIONAL SECONDARY STANDARDS ARE THE LEVELS OF AIR QUALITY NECESSARY TO PROTECT PUBLIC WELFARE FROM ANY KNOWN OR ANTICIPATED EFFECTS OF A POLLUTANT.

CONCENTRATIONS ARE EXPRESSED IN IN THE UNITS IN WHICH THEY WERE PROMULGATED. EQUIVALENT VALUES IN OTHER UNITS ARE BASED UPON A REFERENCE TEMPERATURE OF 25 DEGEES CELSIUS AND A REFERENCE PRESSURE OF 760 MM OF HG.

THE STANDARDS FOR SUSPENDED PARTICULATES ARE BASED ON ANNUAL GEOMETRIC MEANS. FOR ALL OTHER POLLUTANTS THEY ARE BASED ON ARITHMETIC MEANS.

IN NEVADA THERE ARE SEPARATE STANDARDS FOR CARBON MONOXIDE CONCENTRATIONS ABOVE 5000 FEET. THEY ARE 6 PPM FOR EIGHT HOURS AND 35 PPM FOR ONE HOUR. IN THE LAKE TAHOE BASIN THERE IS AN 8 HOUR STANDARD FOR CARBON MONOXIDE OF 6 PPM.

IN ADDITION TO THE STANDARDS FOR POLLUTANT CONCENTRATION, CALIFORNIA AND NEVADA HAVE VISIBILITY STANDARDS BASED ON ATMOSPHERIC OPACITY. THERE ARE SEPARATE VISIBILITY STANDARDS FOR THE LAKE TAHOE AIR BASIN.

UNITS ARE MICROGRAMS PER CUBIC METER (UG) OR PARTS PER MILLION BY VOLUME (PPM).

REGIONAL DATA AVAILABILITY MATRIX

Section	Resolution of Included Data	Resolution of Additional Data
III-B-1 Federal		
Federal agencies	By agency	None
III-B-2 Regional		
Regional agencies	By agency	None
III-B-3 State and Local		
State agencies	By agency and state	California and Hawaii - more detailed descriptions of structure and function of included and other agencies
III-C-1 Environmental law		
Laws and regulations	Summary of relevant laws and regulations by state	Complete text of statutes, rules, regulations and court decisions by state
III-C-2 Energy Legislation		
Laws and regulations	Summary of major legislation by state	Complete text of statutes, rules, regulations and court decisions by state
III-C-3 Standards		
Air quality standards	Federal and state standards	California - local air quality standards

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IV Appendices

IV-A THE CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

Introduction

Prior to the enactment of the legislation that created the Energy Resources Conservation and Development Commission (ERCDC), California state government had several relatively small agencies authorized to regulate or manage pieces of the state's energy policy. The largest of these, the Public Utilities Commission (PUC), has as its main concern the setting of customer rates for electricity, gas, and telephone services. A state Division of Oil and Gas is charged with regulation of oil, gas, and geothermal wells drilled within the boundaries of the state. A State Lands Commission has jurisdiction over wells drilled on state property through leases granted by the Lands Commission.

Despite the existence of these and other state agencies, California lacked rigorous state controls over siting of energy facilities such as power plants. It was forced to rely on the forecasts of utilities in attempting to predict future energy use patterns. Almost no research on energy conservation or development was funded by the state. In short, California had no state agency with comprehensive powers to assess the state's energy conservation and development needs and adopt policies and programs to meet those needs.

To address these problems, then Assemblyman Charles Warren (now chairman of the President's Council on Environmental Quality) and State Senator Alfred Alquist introduced the Energy Resources Conservation and Development Act. The bill, AB-1575, was signed into law on May 21, 1974, by then Governor Ronald Reagan as Chapter 276 of the Statutes of 1974.

Briefly, the Warren-Alquist Act:

- Established the five-member Energy Commission appointed by the Governor with the advice and consent of the State Senate.
- Provided for forecasting and assessment of energy demands and supplies and for conservation of energy resources by designated methods.
- Required that sites for power plants and related facilities be certified by the Energy Commission pursuant to certain procedures.
- Directed the Commission to develop and coordinate a program of research and development in energy supply, consumption, and conservation and the technology of siting energy facilities.
- Provided for the development of contingency plans to deal with shortages of electricity or fuel supplies.

The enabling law also included a somewhat unique provision for financing the Energy Commission's work. A surcharge is imposed on all electricity customers in the state based on their kilowatt hour usage and the proceeds from the surcharge constitute the budget of the Commission. For fiscal year 1978-79, the proposed surcharge is $0.00014, which will generate an estimated $20.9 million in revenue for the commission. Additional funds, totaling about $100,000, are derived from sales of Commission publications and filing fees required of utilities seeking certification for power plants.

Structure of the Commission

The Energy Commission is composed of five members. By law one member must have knowledge of energy supply or conversion systems, one must be an attorney with administrative law experience, one must have an environmental background, one must be an economist with experience in natural resource management, and one member must be from the public at large. The members serve staggered five year terms.

The Commission employs a staff of about 400 persons. The staff is organized into five divisions: conservation, energy assessment, alternatives implementation, energy facility siting, and administration. A general counsel is employed to advise the Commission and staff on legal matters.

Finally, the Commission staff includes a position unique in California state government: the public advisor. The public advisor's job is to ensure that the public is informed of what the Commission is doing and to make certain that all interested persons or groups have an opportunity to make their views known to the Commission. The advisor has a toll-free telephone number which anyone may call for information about the commission's activities.

Forecasting

Prior to 1974 energy supply and demand forecasting in California was done by the public utilities operating in the state. No state agency had the capability to gather supply and demand data on its own or to verify the estimates of the utilities. However, the Warren-Alquist Act empowers the Energy Commission to make its own forecasts of electricity supply and demand and to issue quarterly fuel and energy supply reports for the state. For the first time a common forecasting methodology would be applied to all the utilities.

Biennial Report

In addition to its fuel and energy forecasts, the Commission is required to prepare every two years a comprehensive report on the state's overall energy situation. The report is to assess state energy use patterns, identify emerging use and conservation trends, estimate

future energy demand, and serve as the basis for a statewide energy policy. The first biennial report was published in 1977.

Conservation

The cornerstone of the Energy Commission's policy is conservation. The Commission perceives conservation as a relatively cheap and easy policy to carry out and one that will delay the need for development of new and costly energy technologies and facilities. Almost since its inception the Commission has been working on a variety of conservation standards and many of the regulations are ready to go into effect this year.

Nuclear Power

In June 1976, the legislature enacted three laws directing the Commission to study the issues of nuclear waste disposal and reprocessing, then report to the legislature whether technologies for handling these problems have been certified by an agency of the Federal Government. If the Commission found that such technologies were not certified and that finding was sustained by the legislature, no new nuclear plants could be built in the state.

That is precisely what happened. On January 25, 1978, the Commission split 4-1 in adopting a decision finding that no safe method exists for disposal of high-level radioactive waste and no technology has been certified as yet by the Federal Government. The findings on fuel reprocessing were less conclusive because of the muddled state of the issue at the national level. In essence, the Commission declared that reprocessing technology exists, but it does not meet all the requirements of the state nuclear safety laws.

Solar Energy

While treading carefully on the nuclear path, the Energy Commission has embraced several forms of solar power. The first biennial report calls for a policy of "maximum utilization of solar energy for direct heat and electric power generation applications wherever economically feasible." Specifically, the Commission advocates programs to maximize economic uses of solar energy for space and water heating in residential and nonresidential buildings, for generation of low temperature process heat in industrial and agricultural sectors, and for generation of electricity by utilities using wind resources and solar thermal electric technology where possible.

Fossil Fuels

Besides being a producer and refiner of oil and gas, California acts as a conduit sending these products to other states. Energy Commission planners foresee an oil surplus building on the west coast in general and California in particular because of large shipments from Alaska. Estimates of the surplus in 1985 range from 600,000 barrels per day to 1.8 million barrels per day. To deal with this problem, the Commission in the first biennial report suggested that an environmentally acceptable pipeline be built to eastern markets and the crude oil exchangers with Japan and Canada be considered to siphon off some of the excess Alaskan oil.

The main issue in the natural gas area today is liquefied natural gas (LNG). In its biennial report the Commission called for legislation to clarify and strengthen the state's planning and regulatory functions with regard to LNG. Such legislation should eliminate regulatory overlap, establish meaningful siting criteria, and promote research and development of siting options.

Geothermal Energy

Residents of the San Francisco Bay Area currently are receiving electricity produced from the nation's only commercial geothermal generating station, the Geysers, operated by Pacific Gas and Electric Company. The Energy Commission, in a recently adopted report, advocates expansion of California's considerable geothermal resources, noting that field development typically is faster than for other power sources, it presents minimal environmental risks that are well understood, and it would boost the state's economy.

To expedite development of geothermal resources, the Commission is considering special power plant siting regulations that would clarify its jurisdiction relative to that of local governments. The proposed rules would encourage filing of one notice of intent (siting request) for an entire geothermal field, where such notice is appropriate. The Commission also favors creation of a single phase, 12-month siting process, while limiting its direct regulatory jurisdiction to the power plant only, not geothermal wells or transmission lines.

Note: The foregoing article is an abridgement of a special report that appeared in the Energy Users Report of May 25, 1978. The article entitled, "State Energy Commission Grapples with Lack of Energy Policy Consensus" is here reproduced and abridged by special permission of the Bureau of National Affairs, Inc., Copyright 1978.

IV-B GLOSSARY

ABATEMENT The method of reducing the degree or intensity of pollution; also the use of such a method.

ACRE-FOOT The quantity of water required to cover one acre to a depth of 1 foot; equal to 43,560 cubic feet, 325,851 gallons, or 1,233,444 liters.

AEROSOLS Either solid or liquid particles in the air such as smoke, fumes, dust, pollen, fibers, or microbial spores.

AGGREGATED SUBREGION (ASR) A group of one or more counties used in water studies by the National Water Resources Council. Formerly called aggregated subareas (ASA).

AIR BASIN A region in which the air quality is determined by the meteorology and emissions within it, with minimal influence on and impact by contiguous areas.

AIR POLLUTION The presence of contaminants in the air in concentrations that inhabit the normal dispersive ability of the air and that interfere directly or indirectly with man's health, safety, or comfort or with the full use and enjoyment of his property (EPA).

AIR QUALITY CONTROL REGION (AQCR) An area designated by the federal government where two or more communities--either in the same or different states--share a common air pollution problem.

AIR QUALITY MAINTENANCE AREA (AQMA) Areas which, due to current air quality and/or projected growth rates, may have the potential for exceeding any national ambient air quality standard within the next 20 years (ARB).

AIR QUALITY STANDARDS The prescribed level of pollutants in the outside air that cannot be exceeded legally during a specified time in a specified geographical area (EPA).

AMBIENT AIR Any unconfined portion of the atmosphere; the outside air (EPA).

ANTHRACITE A high-grade metamorphic coal having a semimetallic luster, high content of fixed carbon, and high density. It burns with a short blue flame and little smoke or odor. Also known as hard coal Kilkenny coal; stone coal.

ANTI-DEGRADATION CLAUSE A provision in air quality and water quality laws that prohibits deterioration of air or water quality in areas where pollution levels are presently below those allowed.

APPROPRIATION (FUNDS) At the federal level, the process whereby Congress enacts a statute permitting expenditure of funds, sometimes repeatedly over a period of several years, for construction of authorized projects or implementation of authorized programs.

APPROPRIATION DOCTRINE The system of water law adopted by (and dominant in) most Western States. The basic tenets of the appropriation doctrine are (1) that a water right can be acquired only by diverting the water from a watercourse and applying it to a beneficial use and (2) in accordance with the date of acquisition, an earlier acquired water right shall have priority over other later acquired rights. The first in time of beneficial use is the first in right, and the right is maintained only by use. Water in excess of that needed to satisfy existing rights is viewed as unappropriated water, available for appropriation by diversion and application to a beneficial use (see also Riparian Doctrine.)

AQCR Air Quality Control Region.

AQMA Air Quality Maintenance Area.

AQUATIC WILDLIFE Any species of fish, crustaceans, aquatic insects or amphibians.

AQUIFER A saturated underground body of rock or similar material capable of storing water and transmitting it to wells or springs.

AREA OF ORIGIN In the case of interbasin water transfers, the area exporting water.

AREA SOURCE In air pollution, any small individual fuel combustion source, including any transportation sources. Area source is defined legally and precisely in federal regulations.

AUTHORIZATION At the Federal level, the process whereby Congress enacts a statute approving construction of a project or implementation of a program, frequently specifying a maximum amount to be appropriated for the purpose (but not appropriating the required funds).

BACKGROUND LEVEL With respect to air pollution, amounts of pollutants present in the ambient air due to natural sources.

BAGASSE Remains of sugar cane after the juice has been extracted by pressure between the rolls of a mill; used to supply the fuel requirements of raw sugar mills.

BARREL (OIL) A volumetric unit of measurement equivalent to 42 U.S. Standard gallons.

BASE GAS The total volume of natural gas in underground storage reservoirs which will maintain the required rate of delivery during an output cycle.

BBL Barrels.

Bbl/d Barrels per day.

BIOCHEMICAL OXYGEN DEMAND (BOD) A measure of the amount of oxygen consumed in 5 days by the biological processes breaking down organic matter in water. Large amounts of organic waste use up large amounts of dissolved oxygen; thus the greater the degree of pollution, the greater the BOD.

BIOMASS Any organic material, with specific reference to organic material that has the potential for use as a fuel.

BIOME A major regional ecological community of plants and animals extending over large natural areas. The plants of land biomes comprise the 'formations' of plant ecologists.

BIOTA The flora and fauna of a region.

BITUMINOUS COAL A dark brown to black coal that is high in carbonaceous matter and has 15-50% volatile matter. Also known as soft coal.

BOD Biochemical Oxygen Demand.

BOM Bureau of Mines, a federal agency.

BOR Bureau of Outdoor Recreation, a federal agency.

BRITISH THERMAL UNIT (BTU) The amount of heat required to raise the temperature of 1 pound of water 1°F at its point of maximum density.

BTU British thermal unit.

BY-PRODUCTS Secondary products which have commercial value and are obtained from the processing of a raw material. They may be the residues of the gas production process, such as coke, tar, and ammonia, or they may be the result of further processing of such residues, such as ammonium sulfate.

CARBON DIOXIDE (CO_2) A colorless, odorless, non-poisonous gas that is a normal part of the ambient air. CO_2 is a product of fossil fuel combustion.

CARBON MONOXIDE (CO) A colorless, odorless, highly toxic gas that is a normal byproduct of incomplete fossil fuel combustion. CO, one of the major air pollutants, can be harmful in small amounts if breathed over a certain period of time.

CEQ National Council on Environmental Quality (established by NEPA).

CEQA California Environmental Quality Act.

CHEMICAL OXYGEN DEMAND (COD) A measure of the amount of oxygen required to oxidize organic and oxidizable inorganic compounds in water. The greater the degree of pollution, the greater the COD.

CHLORINATED HYDROCARBONS A class of generally long-lasting insecticides of which the best known is DDT.

CLIMAX VEGETATION A stable, balanced vegetation community in an ecosystem which will remain in an area if undisturbed. The vegetative types present are determined by the climate.

CO Carbon monoxide.

CO_2 Carbon dioxide.

COAL The natural, rocklike, brown to black derivative of forest-type plant material, usually accumulated in peat beds and progressively compressed and indurated until it is finally altered into graphite or graphite-like material.

COD Chemical oxygen demand.

COKE A coherent, cellular, solid residue remaining from dry (destructive) distillation of a coking coal, pitch, petroleum, petroleum residues, or other carbonaceous material; contains carbon as its principal constituent together with mineral matter and volatile matter.

COLIFORM INDEX An index of the purity of water based on a count of its coliform bacteria.

CONDUCTANCE (CONDUCTIVITY) A common way to express general mineral content of water. It is literally the specific electrical conductance (or electrical conductivity); a measure of the capacity of water to conduct an electrical current under standard test conditions. Conductivity increases as concentrations of dissolved and ionized constituents increase. It is actually measured as resistance but reported as conductivity in micromhos. As a rule of thumb, dissolved solids concentration (in mg/l) is 60-70 percent of specific conductance (in micromhos).

CONSERVATION Those measures of management directed toward perpetuating resources for the enjoyment of present and future generations. Conservation is inclusive of preservation.

CONSUMPTIVE USE Water withdrawn from a supply which, because of absorption, transpiration, evaporation, or incorporation in a manufactured product, is not returned directly to a surface or groundwater supply; hence, water which is lost for immediate further use. Also called "consumption."

COOLING DEGREE-DAY A unit for estimating the energy needed for cooling a building; one unit is given for each degree Fahrenheit that the daily mean temperature exceeds 75°F (24°C).

CRUDE OIL A mixture of hydrocarbons that exists in the liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.

CRUDE OIL STOCKS Stocks of crude oil and lease condensate held at refineries, pipeline terminals, and on leases.

CUBIC FOOT The most common unit of measurement of gas volume. It is the amount of gas required to fill a volume of one cubic foot under stated conditions of temperature, pressure, and water vapor.

DECIBEL The unit of measurement of the intensity of sound.

DECLINING Any species of animal which, although still occurring in numbers adequate for survival, has been greatly depleted and continues to decline. A management program, including protection or habitat manipulation, is needed to stop or reverse decline.

DEPLETED URANIUM Uranium consisting primarily of ^{238}U and depleted of the ^{235}U isotope. Depleted uranium generally contains less than 0.2 weight percent ^{235}U.

DEPLETION The withdrawal of water from surface or groundwater reservoirs at a rate greater than the rate of replenishment.

DISCHARGE The rate of flow of a spring, stream, canal, sewer, or conduit.

DISSOLVED OXYGEN Oxygen suspended in water in the form of microscopic bubbles.

DISSOLVED SOLIDS The total amount of dissolved material, organic and inorganic, contained in water or wastes.

DISTILLATE FUEL OIL The lighter fuel oils distilled off during the refining process. Included are products known as ASTM grades Nos. 1 and 2 heating oils, diesel fuels, and No. 4 fuel oil. The major uses of distillate fuel oils include heating, fuel for on- and off-highway diesel engines, and railroad diesel fuel.

DIVERSION See Withdrawal.

DOE Department of Energy.

DRAINAGE BASIN The land area from which water drains into a river, as for example the Columbia River.

ECOLOGY The study of the interrelationships of living organisms to one another and to their surroundings.

ECOSYSTEM The interaction of living things with each other and their habitat, forming an integrated unit or system in nature, sufficient unto itself with a balanced assortment of life forms.

EFFLUENT A discharge from a pollution source that is relatively self-contained, generally referred to in regard to discharges into waters, but can also mean discharges into air.

EIR Environmental Impact Report.

EIS Environmental Impact Statement.

ELECTRIC POWER PRODUCTIVITY Value added divided by electricity consumed expressed in dollars per kilowatt hours.

ELECTRICITY CONSUMPTION, COMMERCIAL SECTOR Sales of electricity to businesses with a demand generally less than 1,000 kilowatts.

ELECTRICITY CONSUMPTION, INDUSTRIAL SECTOR Sales of electricity to businesses with a demand generally greater than 1,000 kilowatts.

ELECTRICITY CONSUMPTION, OTHER SECTOR Electricity sales to government, railways, and for street lighting, and sales not included elsewhere.

ELECTRICITY CONSUMPTION, RESIDENTIAL SECTOR Sales of electricity for residential and household purposes.

ELECTRICITY PRODUCTION Production at electric utilities only. Does not include industrial electricity generation.

EMISSION Generally used in regard to discharges into air (see also Effluent).

EMISSION FACTOR The average amount of a pollutant emitted from each type of polluting source in relation to a specific amount of material processed. An emission factor for a residential furnace would be a number of pounds of particulates per cubic foot of fuel.

EMISSION INVENTORY A list of air pollutants emitted into a community's atmosphere, in amounts such as tons per day, by type of source. The emission inventory is basic to the establishment of emission standards.

EMISSION STANDARD The maximum amount of a pollutant legally permitted to be discharged from a single source, either mobile or stationary.

ENDANGERED Any species, subspecies or sub-population of animal which is threatened with extinction resulting from very low or declining numbers, alteration and/or reduction of habitat, detrimental environmental changes, or any combination of the above. Continued survival in this state is unlikely without implementation of special measures.

ENERGY CONSUMPTION, ELECTRIC UTILITY SECTOR Real consumption by, apparent demand by, sales to, or deliveries to privately and publicly owned establishments which generate electricity primarily for sale or resale.

ENERGY CONSUMPTION, INDUSTRIAL SECTOR Real consumption by, apparent demand by, sales to, or deliveries to construction, manufacturing, agricultural, and mining establishments.

ENERGY CONSUMPTION, RESIDENTIAL AND COMMERCIAL SECTOR Real consumption by, apparent demand by, sales to, or deliveries to private households, housing units, nonmanufacturing business establishments (e.g., wholesale and retail businesses), health and educational institutions, and public buildings.

ENERGY CONSUMPTION, TRANSPORTATION SECTOR Real consumption by, apparent demand by, sales to, or deliveries to both private and public passenger and freight transportation, as well as government transportation, including military operations.

ENVIRONMENT The external conditions which exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

ENVIRONMENTAL IMPACT REPORT (EIR) An impact report required under the California Environmental Quality Act (CEQA).

ENVIRONMENTAL IMPACT STATEMENT (EIS) A detailed statement setting forth the environmental effects and considerations anticipated by a proposed action, policy or project which has been determined to be a "major federal action significantly affecting the environment" under the provisions of the National Environmental Policy Act.

ENVIRONMENTAL QUALITY The properties of characteristics of the environment, either generalized or local, as they impinge on human beings and other organisms. Environmental quality can refer to varied characteristics or the potential effects such characteristics may have on physical and mental health.

EPA Environmental Protection Agency, which administers the National Environmental Protection Act as well as other environmental legislation such as the Clean Air Act.

ESTUARIES Areas where the fresh water meets salt water. For example, bays, mouths of rivers, salt marshes and lagoons. Estuaries are delicate ecosystems; they serve as nurseries, spawning and feeding grounds for a large group of marine life and provide shelter and food for birds and wildlife (EPA).

EUTROPHICATION Overfertilization of a water body due to increases in mineral and organic nutrients, producing an abundance of plant life which uses up oxygen, sometimes creating an environment hostile to higher forms of marine animal life.

EVAPOTRANSPIRATION Water dissipated to the atmosphere by evaporation from water surfaces and moist soil, and by plant transpiration.

EVAPORANSPIRATION, POTENTIAL The maximum evapotranspiration that would, occur in a given area under a given set of climatic conditions, i.e., the upper limit of evapotranspiration.

EXTIRPATED Any species of animal that has disappeared, as a part or full time resident, from the state. (This is different from "extinct," which means the total loss of the species in the world).

EXTRACTION LOSS The reduction in volume of wet natural gas due to the removal of some of its constituents, such as hydrocarbon products, hydrogen, helium, inorganic materials, and water vapor.

FECAL COLIFORM BACTERIA A group of organisms common to the intestinal tracts of man and other mammals. The presence of fecal coliform bacteria in water is an indicator of pollution and of potentially dangerous bacterial contamination.

FISHING To take fish by any means.

FLOOD PLAIN The land area bordering a river which is subject to flooding.

FLOODWAY The riverbed and immediately adjacent lands needed to convey high-velocity flood discharges.

FLOODWAY FRINGE Lands immediately adjacent to floodways which are still subject to flooding but which are not needed for high-velocity flood discharge and are flooded less frequently and for shorter durations than floodways.

FOSSIL FUELS Coal, oil and natural gas; so-called because they are derived from the remains of ancient plant and animal life (EPA).

FUR BEARER Any mammal of the families Mustelidae and Castoridae.

GAS, NATURAL A naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in porous ecologic formations beneath the earth's surface, often in association with petroleum. The principle constituent is methane.

Associated Free natural gas in immediate contact, but not in solution with crude oil in the reservoir.

Dissolved Natural gas in solution in crude oil in the reservoir.

Liquified (LNG) Natural gas which has been liquefied by reducing its temperature to minus 260°F at atmospheric pressure. It remains a liquid at -116°F and 673 psig. In volume it occupies 1/600 of the gas in the vapor state.

Non-Associated Free natural gas not in contact with, nor dissolved in, crude oil in the reservoir.

GAS, SUBSTITUTE NATURAL (SNG) A gas manufactured from carbonaceous material whose characteristics are substantially interchangeable with natural gas. The resultant gas is composed primarily of methane. At this writing, SNG feedstocks are the light hydrocarbons, propane, butane and the naphthas. Development is underway of processes for production from heavier feedstocks and from coal.

GENUS A taxonomic category that includes groups of closely related species; the principal subdivision of a family.

GEOTHERMAL Pertaining to heat within the earth.

GEOTHERMAL ENERGY Energy derived from the natural temperature gradiant of the earth's crust.

GROSS ENERGY CONSUMPTION The total of end use consumption and losses of energy.

GROUND COVER Grasses or other plants grown to keep soil from being blown or washed away.

GROUNDWATER The supply of fresh water under the earth's surface in an aquifer.

GROUNDWATER MINING The condition when withdrawals are made from an aquifer at rates in excess of net recharge; sooner or later the underground supply will be exhausted or the water table will drop below economic pump lifts. Also referred to as overdrafting.

HABITAT The sum total of environmental conditions of a specific location. Habitat includes the whole complex of physical factors forming the environment.

HARDNESS Derived largely from contact with soil and rock formations, hardness in water is caused by divalent metallic cations, principally calcium, magnesium, strontium, ferrous iron, and manganous ions. Hard waters are as satisfactory for human consumption as soft waters. Because of their adverse action with soap, however, the use for cleaning purposes is quite unsatisfactory, and they produce scale in hot water pipes, heaters, boilers, and other units in which the temperature of water is increased materially.

HAZARDOUS AIR POLLUTANT According to law, a pollutant to which no ambient air quality standard is applicable and that may cause or contribute to an increase in mortality or in serious illness, such as asbestos, beryllium, and mercury.

HC Hydrocarbons.

HEADWATERS The place where a river originates.

HEATING DEGREE-DAYS The departure of the mean daily temperature below a given standard (in this case, 65°F or 18.3°C). One degree-day is counted for each degree of departure below the standard during one day. Degree days are usually accumulated over a month, season, or year.

HEW Department of Health, Education and Welfare, a federal agency.

H_2S Hydrogen sulfide, a type of air pollutant.

HUD Department of Housing and Urban Development, a federal agency.

HUNTING To take any bird or mammal by any means.

HYDROCARBONS A type of air pollution including organic acids, aldehydes, unsaturated hydrocarbons, and aromatics.

INSTREAM USE Use of water which does not require withdrawal or diversion from its natural water-course. For example, the use of water for navigation, waste disposal, recreation, and support of fish and wildlife.

INTERBASIN TRANSFER The physical transfer of water from one watershed to another. On a large scale, the transfer of large quantities of water from one major river basin to another.

INTERSTATE COMPACT In the case of water resources, agreements between two or more States for dealing with water resources problems involving more than one State and beyond the legal authority of one State alone to solve. Such agreements require the consent of Congress. The Federal Government may participate in some compacts, in which case the agreement is called a Federal-interstate compact.

JOULE The unit of energy or work in the meter-kilogram-second system of units.

kWh (KILOWATT-HOUR) The amount of energy equal to 1 kilowatt for 1 hour. It is equivalent to 3,412 Btu.

LACUSTRINE Pertaining to lakes generally as distinguished from other bodies of water such as rivers, oceans, groundwater aquifiers, and estuaries.

LANDFORM All the physical, recognizable, naturally formed features of land, having a characteristic shape; includes major forms such as a plain, mountain, or plateau, and minor forms such as a hill, valley, or alluvial fan.

LANGLEY A unit for measuring insolation and equal to one gram-calorie per square centimeter.

LEASE CONDENSATE A natural gas liquid recovered from gas well gas in a lease separator. Consists primarily of pentanes and heavier hydrocarbons.

LIGNITE Coal of relatively recent origin, intermediate between peat and bituminous coal; often contains patterns from the wood from which it formed.

LIMITED Any species or animal occurring in limited numbers due to a restricted or specialized habitat or the perimeter of its historic range.

LIQUEFIED GASES Propane, propylene, butanes, butylene, propane-butane mixtures, and isobutane that are produced at a refinery, a natural gas processing plant, or a field facility.

LUBRICANTS All lubricants containing more than 50 percent by volume of refined petroleum distillates or specially treated petroleum residium. Includes lubricating greases, lube basestocks, and all grades of lubricating oils from spindle oil to cylinder oil and those used in greases.

MAN-REM A unit of population dose, often the average dose per individual expressed in rems times the population affected.

Mcf An abbreviation meaning 1000 cubic feet.

MEGAWATT One million watts or one thousand kilowatts.

MGD Millions of gallons per day, a measurement of the rate of flow of water.

MMcf Million cubic feet.

MULTIPLE USE Management of natural resources to serve two or more uses simultaneously.

NAAQS National Ambient Air Quality Standards.

NADB National Aerometric Data Bank.

NASN National Aerometric Surveillance Network.

NASQAN National Stream Quality Accounting System.

NATIONAL WILD AND SCENIC RIVERS A Federal system of river designation designed to protect representative portions of the nation's free-flowing rivers.

NATURAL GAS A mixture of hydrocarbon compounds and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in natural underground reservoirs at reservoir conditions.

NATURAL GAS CONSUMPTION, COMMERCIAL SECTOR Deliveries to non-manufacturing establishments including those engaged in agriculture, forestry, and fishing.

NATURAL GAS CONSUMPTION, ELECTRIC UTILITY SECTOR Deliveries to electric utilities for the generation of electric power.

NATURAL GAS CONSUMPTION, INDUSTRIAL SECTOR Deliveries to establishments engaged primarily in processing unfinished materials into another form or product. Includes mining, petroleum refining, and manufacturing.

NATURAL GAS CONSUMPTION, RESIDENTIAL SECTOR Deliveries to private households for heating, cooking, and other household uses.

NATURAL GAS LIQUIDS (INPUT TO REFINERIES) Products obtained from natural gasoline plants, cycling plants, and fractionators after processing the natural gas. Included are ethane, liquified pretroleum (LP) gases (propane, butane, and propane-butane mixtures), natural gasoline, and plant condensate.

NATURAL GAS, MARKETED PRODUCTION Gross withdrawals less gas used for repressuring and quantities vented and flared, measured before the extraction of natural gas liquids.

NEDB National Emissions Data Bank.

NEDS National Emissions Data System.

NEOPLASM An abberrant new growth of abnormal cells or tissues; a tumor.

NEPA National Environmental Policy Act (1969).

NO Nitrogen oxide.

NO_2 Nitrogen dioxide.

NO_x Nitrogen oxide, either nitrogen dioxide or nitrogen oxide, also referred to as nitric oxides.

NO DISCHARGE POLICY The policy which prohibits discharge of any harmful substance into a water body. Strictly applied, the policy would forbid discharges which are within the capacity of a water body to assimilate and render harmless.

NOISE Any undesired audible signal. Thus, in acoustics, noise is any undesired sound (EPA).

NOISE CONTROL The process of obtaining an acceptable noise environment for a particular observation point or receiver, involving control of the noise source, transmission path, or receiver, or all three.

NOISE POLLUTION Excessive noise in the human environment.

NONGAME WILDLIFE All species which are not commonly pursued, killed, or consumed, either for sport or profit, and includes wild mammals, birds, reptiles, fish, amphibians, mollusks, and crustaceans, which are not classified as big game, small game birds or mammals, raptors, furbearers, varmints, or sport fish, sport amphibians, or sport crustaceans or mollusks.

NONPOINT-SOURCE The diffuse discharge of waste into a water body which cannot be located as to specific source, as with sediment, certain agricultural chemicals, and acid mine drainage.

OCEAN THERMAL ENERGY CONVERSION (OTEC) Energy conversion processes which utilize the temperature gradient in the ocean as a source of energy for the generation of electricity.

OIL SHALE A finely layered brown or black shale that contains kerogen and from which liquid or gaseous hydrocarbon can be distilled. Also known as kerogen shale.

ONCE-THROUGH PROCESS The withdrawal of water from a water body for use in cooling or processing and subsequent return of that water, usually at a higher temperature or other altered condition, into the same body of water from which it came. Contrasts with water recycling processes.

O_x Total oxidants.

OZONE (O_3) A triatomic form of oxygen that is an irritating gas of pungent odor. An air pollutant.

O_3 Ozone, an air pollutant.

PARTICULATE Liquid or solid material in the air, either organic or inorganic including dust, flyash, dirt, smoke, soot, and metallic fume.

PERMEABILITY A measure of the ease with which water can pass through the sediment of an aquifer.

PESTICIDE An agent used to control pests. This includes insecticides for use against harmful insects; herbicides for weed control; fungicides for control of plant diseases; rodenticides for killing rats, mice, etc.; and germicides used in disinfectant products; algaecides; slimicides, etc. Some pesticides can contaminate water, air or soil and accumulate in man, animals and the environment, particularly if they are misused. Certain of these chemicals have been shown to interfere with the reproductive processes of predatory birds and possibly other animals (EPA).

PETROCHEMICAL FEEDSTOCKS Refined petroleum product used for processing at a petrochemical plant.

PETROLEUM Crude oil (including lease condensate), refined petroleum products including natural gas liquids, and non-hydrocarbon compounds blended into finished petroleum products.

PETROLEUM CONSUMPTION, ELECTRIC UTILITY SECTOR Domestic demand for all fuel oils at electric utilities.

PETROLEUM CONSUMPTION, INDUSTRIAL SECTOR Domestic demand for petroleum products for use by establishments engaged in processing unfinished materials into another form or product. Excludes industrial space heating.

PETROLEUM CONSUMPTION, "OTHER" SECTOR Domestic demand for miscellaneous products and for some agricultural uses.

PETROLEUM CONSUMPTION, RESIDENTIAL AND COMMERCIAL Domestic demand for petroleum products by private households, and nonmanufacturing establishments. Includes industrial space heating and road paving.

PETROLEUM CONSUMPTION, TRANSPORTATION SECTOR Domestic demand for petroleum products for on-highway use, aircraft and vessel bunkering, and railroad use.

pH A measure of the acidity or alkalinity of a material, liquid, or solid. pH is represented on a scale of 0 to 14 with 7 representing a neutral state, 0 representing the most acid, and 14 the most alkaline.

PHOTOCHEMICAL OXIDANTS A type of air pollution formed by interaction of the atmosphere with nitrogen oxides.

PM Particulate matter.

POINT SOURCE In air pollution, a stationary source of a large individual emission, generally of an industrial nature. Also, a specific site from which wastewater is discharged into a water body and which can be located as to source, as with effluent, treated or otherwise, from a municipal sewage system, outflow from an industrial plant, or runoff from an animal feedlot.

POLLUTANT Any introduced gas, liquid, or solid that makes a resource unfit for a specific purpose.

POLLUTION the presence of matter or energy whose nature, location, or quantity produces undesired environmental effects.

POTENTIAL NATURAL VEGETATION The mosaic of plant communities which would exist in a given area if the normal patterns of vegetational succession throughout the area had not been disturbed by man and his activities.

PPM Parts per million.

PRECIPITATION Any form of rain or snow falling to the earth's surface.

PREVENTION OF SIGNIFICANT DETERIORATION AREAS (CLASS I) Areas designated by the Clean Air Act amendments where in general, deterioration in the quality of the air is not permitted. The term has a precise legal definition.

PRIMARY TREATMENT the first stage in waste water treatment in which substantially all floating or settleable solids are mechanically removed by screening and sedimentation.

PRIMARY ENERGY For the purposes of this report, primary energy is bituminous coal, anthracite coal, lignite, net coke imports, crude oil (including lease condensate), refined petroleum products, natural gas, natural gas liquids, hydroelectric power, nuclear power, and geothermal power.

PRIORITY CLASSIFICATION A system designed to guide the States in allocating resources for pollution control measures; provides an indication of the relative complexity of the required measures.

PROCESSING GAIN The volume by which refinery output exceeds refinery input for a given period. The difference results from the processing of crude oil and other hydrocarbons into a mix of products which have less weight than the crude oil and thus a greater volume.

PROVED RESERVES, CRUDE OIL Proved reserves of crude oil as of December 31 of any given year are the estimated quantities of all liquids statistically defined as crude oil, which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

PROVED RESERVES, NATURAL GAS Proved reserves of natural gas as of December 31 of any given year are the estimated quantities of natural gas which geological and engineering data demonstrate with reasonable certainty to be recoverable in the future from known natural oil and gas reservoirs under existing economic and operating conditions.

PROVED RESERVES, NATURAL GAS LIQUIDS Estimates of proved reserves of natural gas liquids on December 31 of any given year include (1) reserves of liquids which are expected to be recovered from associated and nonassociated gas produced from gas wells and processed through lease separators; and (2) reserves of liquids expected to be recovered from associated-dissolved and nonassociated gas when processed in field facilities or gas processing plants. Estimates of proved reserves of natural gas liquids are based on (1) proved reserves of natural gas on December 31, and (2) rates at which liquids can be recovered from natural gas by using processing equipment of the type currently installed or planned as of December 31.

PUMPED STORAGE A method of energy storage in which excess electrical energy produced at times of low demand is used to pump water into a reservoir. This water is released at times of high demand to operate hydroelectric generators.

RADIONUCLIDE A radioactive nuclide.

RECYCLING The process by which waste materials are transformed into new products in such a manner that the original products may lose their identity (EPA).

REFINED PETROLEUM PRODUCTS Products obtained from the processing of crude oil, unfinished oils, and natural gas liquids. Includes aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, ethane, liquefied petroleum gases, petrochemical feedstocks, special naphthas, lubricants, wax, coke, asphalt, oils, road oil, still gas, and miscellaneous products.

REM A unit of measure for the dose of ionizing radiation that has the same biological effect as one roentgen of x rays. One rem is approximately equal to one rad for x, gamma, or beta radiation.

RESERVES, ENERGY Refers to the bank of natural resources, such as natural gas, natural gas liquids, petroleum, coal, lignite, and energy available from water power.

Estimated Potential Natural Gas Reserves Refers to an estimate of the ultimate finding of natural gas in a specified area, whether or not presently considered proved or recoverable.

Estimated Proved Recoverable Natural Gas Reserves An estimated quantity of natural gas which analysis of geologic and engineering data demonstrates with reasonable certainty to be recoverable in the future from known oil and gas reservoirs, under existing economic and operating conditions. Reservoirs are considered proved that have demonstrated the ability to produce by either actual production or conclusive formation test.

RESERVOIR A pond, lake, aquifier, or basin, either natural or artificial, in which water is stored, regulated, or controlled.

RESIDUAL FUEL OIL The heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are boiled off in refinery operations. Included are products known an ASTM grades Nos. 5 and 6 oil, heavy diesel oil, Navy Special Fuel Oil, Bunker C oil, and acid sludge and pitch used as refinery fuels. Residual fuel oil is used for the production of electric power, for heating, and for various industrial purposes.

RESOURCE A reserve source of supply, such as a material or mineral.

RETURN FLOW The portion of withdrawn water that is not consumed by evapotranspiration and that returns instead to its source or to another body of water.

RIPARIAN DOCTRINE The system of water law historically recognized by the Eastern States. The riparian doctrine protects landowners adjacent to lakes and streams from withdrawals or uses which unreasonably diminish water quantity or quality. Under the riparian doctrine, individuals have a right to make reasonable use of the stream waters flowing by lands they own so long as that use does not substantially diminish either the quantity or the quality of the water passing to landowners downstream. Where diversions or uses have been unreasonable, they either have been rejoined or riparian owners adversely affected have been compensated for interference with their rights (see Appropriation Doctrine).

RIVER BASIN See Drainage Basin.

RUNOFF Streamflow unaffected by artificial diversions, storage, or other works of man in or on the stream channels, or in the drainage basin or watershed.

SALINE Containing salt.

SAROAD Storage and Retrieval of Aerometric Data.

SCS Soil Conservation Service, a federal agency.

SECONDARY TREATMENT Waste water treatment, beyond the primary stage, in which bacteria consume the organic parts of the wastes. This biochemical action is accomplished by use of trickling filters or the activated sludge process.

SEDIMENT Soil or mineral material transported by water and deposited in streams or other bodies of water.

SILTATION The deposit of sediment downstream of the site as a result of erosion.

SIP State Implementation Plan for prevention of significant air quality deterioration as required by the Clean Air Act Amendments of 1977 (PL 95-95).

SITE-SPECIFIC Phenomena which occur under certain conditions at a particular site but which would not necessarily occur at another site.

SMALL GAME Any species of protected wildlife normally pursued for sporting purposes which is not classified as big game, aquatic wildlife, or fur bearers.

SOLID WASTE Useless, unwanted, or discarded material with insufficient liquid content to be free flowing. (1) Agricultural--solid waste that results from the raising and slaughtering of animals, and the processing of animal products and orchard and field crops; (2) Commercial--waste generated by stores, offices and other activities that do not actually turn out a product; (3) industrial--waste that results from industrial processes and manufacturing; (4) institutional--waste originating from educational, health care and research facilities; (5) municipal--residential and commercial solid waste generated within a community; (6) pesticide--the residue from the manufacturing, handling or use of chemicals intended for killing plant and animal pests; (7) residential--waste that normally originates in a residential environment, sometimes called domestic solid waste (EPA).

SOLID WASTE MANAGEMENT The purposeful, systematic control of the generation, storage, collection, transport, separation, processing, recycling, recovery and disposal of solid wastes.

SO_2 Sulfur dioxide, a form of air pollution.

SO_3 Sulfur trioxide, a form of air pollution.

SO_x Sulfur oxides, either sulfur dioxide or sulfur trioxide.

STANDARD METROPOLITAN STATISTICAL AREA (SMSA) An integrated economic and social unit with a large population nucleus. There are over 245 SMSA's in the United States. Each contains at least one central city with 50,000 inhabitants or more, or two adjoining cities constituting, for economic and social purposes, a single community.

STORAGE The impoundment in surface reservoirs or accumulation in underground reservoirs of water for later use or release.

STORAGE, UNDERGROUND the utilization of subsurface facilities for storing gas which has been transferred from its original location for the primary purposes of load balancing, fuller utilization of pipeline facilities, and more effective and economic delivery to markets. The facilities are usually natural geological reservoirs such as depleted oil or gas fields or water-bearing sands sealed on the top by an impermeable cap rock. The facilities also may be man-made or natural caverns.

STREAMFLOW The discharge in a surface stream course.

STRIP MINE An opencut mine in which the overburden is removed from a coal bed before the coal is taken out.

STRIP MINING The mining of coal by surface mining methods.

SUBBITUMINOUS COAL Black coal intermediate in rank between lignite and bituminous coal; has more carbon and less moisture than lignite.

SULFUR DIOXIDE (SO_2) A heavy, pungent, colorless gas formed primarily by the combustion of fossil fuels. SO_2 damages the respiratory tract as well as vegetation and materials and is considered a major air pollutant (EPA).

SURFACE MINING Mining at or near the surface.

SURFACE WATER All bodies of water on the surface of the earth.

SUSTAINED YIELD In the case of groundwater aquifers, the quantity of water which can be withdrawn annually without, over a period of years, depleting the available supply.

TERTIARY TREATMENT Waste water treatment beyond the secondary, or biological, stage that includes removal of nutrients such as phosphorus and nitrogen, and a high percentage of suspended solids. Tertiary treatment, also known as advanced waste treatment, produces a high quality effluent.

THREATENED SPECIES Any species or subspecies of wildlife which is not in immediate jeopardy of extinction but is vulnerable because it exists in such small numbers or is so extremely restricted throughout all or a significant portion of its range that it may become endangered.

TRANSMISSIVITY A coefficient relating the volumetric flow through a unit width of groundwater to a driving force (hydraulic potential). It is a function of the porous medium, fluid properties, and saturated thickness of the aquifier.

TRANSPIRATION The process in which plant tissues give off water vapor to the atmosphere.

TRANSURANIC WASTE Those wastes contaminated with long-lived alpha-emitting radionuclides including ^{233}U and its daughter products, plutonium and transplutonium nuclides (those with atomic number greater than 94) except ^{238}Pu and ^{241}Pu.

TSP Total Suspended Particulates.

TURBIDITY A measure of the degree of opacity of a given body of water. Turbidity provides an indication of the amount of suspended solids in water.

ULTIMATE CONSUMER An individual or firm that purchases refined petroleum products for its own consumption and not for resale. This category includes end users and wholesale purchaser-consumers.

UNDERSTORY A layer of foliage in a forest below the level of the main canopy; also, the trees forming such a layer.

URANIUM A metallic element; highly toxic and radioactive; ignites spontaneously in air and reacts with nearly all nonmetals; used in nuclear fuel and as the source of U^{235} and plutonium.

USGS United States Geological Survey, a federal agency.

U_3O_8 (URANIUM OXIDE) The international standard for the form in which uranium concentrate is marketed.

VALUE ADDED Value of goods sold, less the cost of the necessary materials and power, expressed in 1958 dollars to account for inflation.

WATER POLLUTION The addition of sewage, industrial wastes, or other harmful or objectionable material to water in concentrations or in sufficient quantities to result in measurable degradation of water quality.

WATER QUALITY STANDARD A plan for water quality management containing four major elements: The use (recreation, drinking water, fish and wildlife propagation, industrial or agricultural) to be made of the water; criteria to protect those uses; implementation plans (for needed industrial-municipal waste treatment improvements) and enforcement plans; and an anti-degradation statement to protect existing high quality waters.

WATERSHED A geographic area which drains into a particular water body (see drainage basin).

WATER TABLE The upper level of an underground water body.

WATER YEAR Any 12-month period, usually selected to begin and end during a relatively dry season, used as a basis for processing streamflow and other hydrologic data; the period from October 1 to September 30 is most widely used in the United States.

WELL A hole drilled for the purpose of finding or producing crude oil or natural gas or providing services related to the production of crude oil or natural gas. Wells are classified as oil wells, gas wells, dry holes, stratigraphic tests, or service wells.

WELLHEAD VALUE, NATURAL GAS The value in U. S. cents per thousand cubic feed of natural gas production reported by the appropriate agencies of the individual producing States.

WILDERNESS AREA Areas designated by the Federal Wilderness Preservation Act. These areas are ones in which the primitive, undeveloped, character of the land is preserved through prohibition of most any form of development.

WILDLIFE Any form of animal life generally living in a state of nature.

WIND ROSE A diagrammatic representation of the distribution of prevailing wind directions at a given location; some variations include wind speed groupings by direction.

WITHDRAWAL The diversion and removal of water from a natural watercourse. Also called "diversion."

WORKING GAS The total volume of gas in a storage reservoir which is in excess of the base gas.

IV-C CONVERSION TABLES

TABLE IV - 1
CONVERSION FACTORS

MASS

To Convert	1	2	3	4	5	6	7
To	oz	lb	short ton	long ton	gm	kg	metric ton
From	Multiply By						
1. oz	1.0	0.06250	3.125×10^{-5}	2.790×10^{-5}	28.35	0.02835	2.835×10^{-5}
2. lb	16.0	1.0	5.0×10^{-4}	4.464×10^{-4}	453.6	0.4536	4.536×10^{-4}
3. short ton	32,000	2,000	1.0	0.8929	907,200	907.2	0.9072
4. long ton	35,840	2,240	1.120	1.0	1.016×10^{6}	1,016	1.016
5. gm	0.03527	2.205×10^{-3}	1.102×10^{-6}	9.842×10^{-7}	1.0	1.0×10^{-3}	1.0×10^{-6}
6. kg	35.27	2.205	1.102×10^{-3}	9.842×10^{-4}	1,000	1.0	1.0×10^{-3}
7. metric ton	35,270	2,205	1,102	0.9842	1.0×10^{6}	1,000	1.0

LENGTH

To Convert	1	2	3	4	5	6	7
To	in.	ft	yd	mi	cm	m	km
From	Multiply By						
1. in.	1.0	0.08333	0.02778	1.578×10^{-5}	2.540	0.02540	2.540×10^{-5}
2. ft	12.0	1.0	0.3333	1.894×10^{-4}	30.48	0.3048	3.048×10^{-4}
3. yd	36.0	3.0	1.0	5.682×10^{-4}	91.44	0.9144	9.144×10^{-4}
4. mi	63,360	5,280	1,760	1.0	160,900	1,609	1.609
5. cm	0.3937	0.03281	0.01094	6.214×10^{-6}	1.0	0.0100	1.0×10^{-5}
6. m	39.37	3.281	1.094	6.214×10^{-4}	100.0	1.0	1.0×10^{-3}
7. km	39,370	3,281	1.094	0.6214	100,000	1,000	1.0

AREA

To Convert	1	2	3	4	5	6	7	8
To	$in.^2$	ft^2	mi^2	acre	cm^2	m^2	ha	km^2
From	Multiply By							
1. $in.^2$	1.0	6.944×10^{-3}	2.491×10^{-10}	1.594×10^{-7}	6.452	6.452×10^{-4}	6.452×10^{-8}	6.452×10^{-10}
2. ft^2	144.0	1.0	3.587×10^{-8}	2.296×10^{-5}	929.0	0.0929	9.290×10^{-6}	9.290×10^{-8}
3. mi^2	4.014×10^{9}	2.788×10^{7}	1.0	640.0	2.590×10^{10}	2.590×10^{6}	259.0	2.59
4. acre	6.273×10^{5}	43,560	1.562×10^{-3}	1.0	4.047×10^{7}	4.047	0.4047	4.047×10^{-3}
5. cm^2	0.1550	1.076×10^{-3}	3.861×10^{-11}	2.471×10^{-8}	1.0	1.0×10^{-4}	1.0×10^{-8}	1.0×10^{-10}
6. m^2	1,550	10.76	3.861×10^{-7}	2.471×10^{-4}	10,000	1.0	1.0×10^{-4}	1.0×10^{-6}
7. ha	1.550×10^{7}	1.076×10^{5}	3.861×10^{-3}	2.471	1.0×10^{8}	1.0×10^{4}	1.0	0.01
8. km^2	1.550×10^{9}	1.076×10^{7}	0.3861	247.1	1.0×10^{10}	1.0×10^{6}	100.0	1.0

VOLUME

To Convert	1	2	3	4	5	6	7	8	9
To	$in.^3$	ft^3	gal	bbl	acre-ft	quart	cm^3	liter	m^3
From	Multiply By								
1. $in.^3$	1.0	5.787×10^{-4}	4.329×10^{-3}	1.031×10^{-4}	1.328×10^{-8}	0.01732	16.39	0.01639	1.639×10^{-5}
2. ft^3	1.728	1.0	7.481	0.1781	2.296×10^{-5}	29.92	28,320	28.32	0.02832
3. gal	231.0	0.1337	1.0	0.02381	3.069×10^{-6}	4.0	3,785	3.785	3.785×10^{-3}
4. bbl	9,702	5.615	42.0	1.0	1.289×10^{-4}	168.0	159,000	159.0	0.1590
5. acre-ft	7.527×10^{7}	43,560	325,900	7,759	1.0	1.303×10^{6}	1.234×10^{9}	1.234×10^{6}	1.234
6. quart	57.75	3.34	0.2500	5.953×10^{-3}	7.672×10^{-7}	1.0	946.4	0.9462	9.464×10^{-4}
7. cm^3	0.06102	3.531×10^{-5}	2.642×10^{-4}	6.290×10^{-6}	8.107×10^{-10}	1.057×10^{-3}	1.0	1.0×10^{-3}	1.0×10^{-6}
8. liter	61.02	0.03531	0.2642	6.290×10^{-3}	8.107×10^{-7}	1.057	1,000	1.0	1.0×10^{-3}
9. m^3	61,020	35.31	264.2	6.290	8.107×10^{-4}	1,057	1.0×10^{6}	1,000	1.0

DENSITY

To Convert	1	2	3
To	gm/cm^3	lb/gal	lb/ft^3
From	Multiply By		
1. gm/cm^3	1.0	8.345	62.43
2. lb/gal	0.1198	1.0	7.481
3. lb/ft^3	0.01602	0.1337	1.0

TEMPERATURE

To Convert	1	2	3	4
To	°F	°C	°R	°K
From	Multiply By			
1. °F	1.0	(°F-32)/1.8	°F + 459.7	(°F + 459.7)/1.8
2. °C	1.8(°C) + 32	1.0	1.8(°C) + 459.7	°C + 273.2
3. °R	°R - 459.7	(°R-491.7)/1.8	1.0	°R/1.8
4. °K	1.8(°K) - 459.7	°K - 273.2	1.8(°K)	1.0

VELOCITY

To Convert	1	2	3	4	5	6
To	ft/sec	ft/min	mph	cm/sec	m/min	knots
From	Multiply By					
1. ft/sec	1.0	60.0	0.6818	30.48	18.29	0.5921
2. ft/min	0.01667	1.0	0.01136	0.5080	0.3048	9.872×10^{-3}
3. mph	1.467	88.0	1.0	44.70	26.82	0.8684
4. cm/sec	0.03281	1.969	0.02237	1.0	0.60	0.01943
5. m/min	0.05468	3.281	0.03728	1.667	1.0	0.03238
6. knots	1.689	101.3	1.152	51.48	30.89	1.0

ENERGY, HEAT AND WORK

To Convert	1	2	3	4	5	6	7
To	Btu	therm	ft lb	hp hr	kWh	kcal	J
From	Multiply By						
1. Btu	1.0	1.0×10^{-5}	778.2	3.930×10^{-4}	2.930×10^{4}	0.252	1,055
2. therm	100,000	1.0	7.782×10^{7}	39.30	29.30	25,200	1.055×10^{8}
3. ft lb	1.285×10^{-3}	1.285×10^{-8}	1.0	5.051×10^{-7}	3.765×10^{-7}	3.238×10^{-4}	1.356
4. hp hr	2,544	0.02544	1.980×10^{6}	1.0	0.7455	641.1	2.685×10^{6}
5. kWh	3,413	0.03413	2.656×10^{6}	1.341	1.0	860	3.601×10^{6}
6. kcal	3,968	3.968×10^{-5}	3,086	1.558×10^{-3}	1.162×10^{-3}	1.0	4,187
7. J	9.478×10^{-4}	9.478×10^{-9}	0.7376	3.725×10^{-7}	2.777×10^{-7}	2.388×10^{-4}	1.0

POWER

To Convert	1	2	3	4	5	6	7	8	9
To	Btu/hr	ft lb/sec	ft lb/min	ft lb/hr	hp	kW	kcal/sec	erg/sec	J/sec
From	Multiply By								
1. Btu/hr	1.0	0.2162	12.97	778.2	3.931×10^{-4}	2.930×10^{-4}	7.0×10^{-5}	2.930×10^{6}	0.2930
2. ft lb/sec	4.626	1.0	60.0	3,600	1.820×10^{-3}	1.356×10^{-3}	3.238×0^{-4}	1.356×10^{7}	1.356
3. ft lb/min	0.0771	0.01667	1.0	60.0	3.031×10^{-5}	2.259×10^{-5}	5.397×10^{-6}	225,900	0.2259
4. ft lb/hr	1.285×10^{-3}	2.777×10^{-4}	0.01667	1.0	5.051×10^{-7}	3.765×10^{-7}	8.995×10^{-8}	3,765 •	3.765×10^{-4}
5. hp	2,544	550.0	33,000	1.980×10^{6}	1.0	0.7460	0.1781	7.460×10^{9}	746
6. kW	3,413	737.7	44,270	26,560	1.341	1.0	0.2389	1.0×10^{10}	1,000
7. kcal/sec	14,290	3.088	185,300	1.112×10^{7}	5.615	4.186	1.0	4.186×10^{10}	4,186
8. erg/sec	3.413×10^{-7}	7.377×10^{-8}	4.427×10^{-6}	2.656×10^{-4}	1.341×10^{-10}	1.0×10^{-10}	2.389×10^{-11}	1.0	1.0×10^{-7}
9. J/sec	3.413	0.7377	44.27	2,656	1.341×10^{-3}	1.0×10^{-3}	2.389×10^{-4}	1.0×10^{7}	1.0

SOURCE: GOVERNMENT INSTITUTES, INC., ENERGY REFERENCE HANDBOOK, NOVEMBER, 1977

TABLE IV-2.
ENERGY CONTENT OF FUELS

	Btu Per Unit
Coal	
Anthracite (Penn.)	25,400,000 ton
Bituminous	24,240,000 ton
Blast Furnace Gas	100 ft^3
Briquettes and Package Fuels	28,000,000 ton
Coke	24,800,000 ton
Coke Breeze	20,000,000 ton
Coal Tar	150,000 gas
Coke-Oven Gas	550 ft^3
Coke-Oven and Manufactured Gas Products, Light Oils	5,460,000 bbl
Natural Gas (Dry)	1,031 ft^3
Still Gas	1,500 ft^3
Natural Gas Liquids (Average)	4,011,000 bbl
Butane	4,284,000 bbl
Propane	3,843,000 bbl
Petroleum	
Asphalt	6,640,000 bbl
Coke	6,024,000 bbl
Crude Oil	5,800,000 bbl
Diesel	5,806,000 bbl
Distillate Fuel Oil	5,825,000 bbl
Gasoline, Aviation	5,048,000 bbl
Gasoline, Motor Fuel	5,253,000 bbl
Jet Fuel:	
Commercial	5,670,000 bbl
Military	5,355,000 bbl
Kerosene	5,670,000 bbl
Lubricants	6,060,000 bbl
Miscellaneous Oils	5,588,000 bbl
Refinery Still Gas	5,600,000 bbl
Heavy Fuel Oil	6,287,000 bbl
Road Oils	6,649,000 bbl
Wax	5,570,000 bbl
Natural Gasoline and Cycle Products	4,620,000 bbl
Liquified Petroleum Gases	4,011,000 bbl
Ethane	3,082,000 bbl
Naptha	5,249,000 bbl
Still Gas	6,000,000 bbl
Miscellaneous Petrochemical Feedstocks	5,824,000 bbl

SOURCE: Knecht, R. L. and Bullard, Clark, W., "Direct Energy Use in the U. S. Economy, 1971," CAC Technical Memo 43.

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