

GEOGRAPHY AND ENVIRONMENT

This section relates to area, climatologic, topographic, hydrologic, noise and other geographic and environmental measurements of Hawaii.

The State consists of eight major islands and 124 minor islands with a total land area of 6,425 square miles and a general coastline of 750 miles. Honolulu is 214 miles from Hilo, 1,367 miles from Kure Atoll (the westernmost end of the State), and 2,397 miles from San Francisco. The highest peak in the State is Mauna Kea, 13,796 feet above sea level; the longest stream is Kaukonahua Stream, Oahu, 33 miles in length; the biggest lake is Halalii, on Niihau, 841 acres; and the highest named waterfall is Kahiwa, Molokai, a 1,750-foot cascade. Various measures of air pollution, such as suspended particulate matter, indicate that Honolulu is one of the cleanest cities in the nation. There is also relatively little water pollution: 22 out of 26 major Oahu beaches were rated "A" in 1976 (coliform not exceeding 50 per 100 ml.), only four were rated "B" (51-500), and none was rated "C" (501 or more). Climatically, Hawaii is marked by remarkably balmy temperatures and wide variations in rainfall. The all-time temperature range in downtown Honolulu, for example, is from 57° to 88°F. Normal precipitation, however, ranges from 5.7 inches near Kawaihae, South Kohala, to 486 inches atop Waialeale. The longest volcanic eruption in Island history lasted 867 days, the worst earthquake attained 7.5 on the Richter scale, and the highest tsunami wave reached 56 feet. Water withdrawn for use in 1975 averaged 2,540 million gallons per day, compared with 2.7 billion in 1970, 2.0 billion in 1965 and 1.5 billion in 1960. Among thirty neighborhoods on Oahu, median noise levels ranged from 44.7 decibels (in Pearl City) to 61.5 decibels (in Waikiki).

Important sources of data include the U.S. Geological Survey, National Ocean Survey, National Weather Service, U.S. Bureau of the Census Geography Division, the Division of Water and Land Development of the State Department of Land and Natural Resources, the State Department of Health, and the University of Hawaii Institute of Geophysics. Detailed information is given in *Hawai'i, the Natural Environment*, published by the Department of Planning and Economic Development in 1974. National data are reported in *Statistical Abstract of the United States: 1976*, Section 6.

Table 69.—GREAT CIRCLE DISTANCES BETWEEN HONOLULU INTERNATIONAL AIRPORT AND SPECIFIED PLACES

Place	Distance from Honolulu		Place	Distance from Honolulu	
	Statute miles	Kilometers		Statute miles	Kilometers
Hawaiian Islands:			Other Pacific locations, con.:		
Cape Kumukahi, Hawaii ¹	236	380	Johnston Island	820	1,319
Hilo, Hawaii ²	214	344	Kingman Reef	1,073	1,726
Ka Lae (South Cape), Hawaii	221	356	Manila, Philippines	5,293	8,516
Kailua, Kona, Hawaii	168	270	Pago Pago, Amer. Samoa	2,606	4,193
Kahului, Maui	98	158	Palmyra Island	1,101	1,772
Lanai Airport	72	116	Papeete, Tahiti	2,741	4,410
Molokai Airport	54	87	Suva, Fiji	3,159	5,083
Lihue, Kauai	103	166	Sydney (Port Jackson), Australia	5,070	8,158
Puuwai, Niihau	152	245	Tokyo, Japan	3,847	6,190
Nihoa	283	455	Wake Island	2,294	3,691
Necker Island	520	837	North and South America:		
French Frigate Shoals	556	895	Anchorage, Alaska	2,781	4,475
Gardner Pinnacles	688	1,107	Cape Horn, Chile	7,457	11,998
Maro Reef	851	1,369	Chicago, Illinois	4,179	6,724
Laysan Island	936	1,506	Cristobal, Canal Zone	5,214	8,389
Lisianski Island	1,065	1,714	Los Angeles, California ²	2,557	4,114
Pearl and Hermes Atoll	1,208	1,944	Miami, Florida	4,856	7,813
Midway Islands	1,309	2,106	New York, New York	4,959	7,979
Kure Atoll ¹	1,367	2,200	Portland, Oregon	2,595	4,175
Trust Territory of the Pacific Isl.:			San Diego, California	2,610	4,199
Majuro, Marshall Islands	2,271	3,654	San Francisco, California ²	2,397	3,857
Kwajalein, Marshall Islands	2,443	3,931	Seattle, Washington	2,679	4,311
Kolonia, Ponape, E.C.I.	3,087	4,967	Vancouver, B.C.	2,709	4,359
Saipan, Mariana Islands	3,704	5,960	Victoria, B.C.	2,668	4,293
Koror, Palau, W.C.I.	4,593	7,390	Tijuana, Mexico	2,616	4,209
Other Pacific locations:			Washington, D.C.	4,829	7,770
Apra Harbor, Guam	3,806	6,124	London, England	7,226	11,627
Auckland, New Zealand	4,393	7,068	Bombay, India	8,010	12,888
Hong Kong	5,541	8,915	Ghanzi, Botswana ³	12,417	19,979

¹ The great circle distance from Cape Kumukahi to Kure Atoll—the points farthest apart in the Hawaiian Archipelago and State of Hawaii—is 1,523 statute miles (2,451 kilometers). The distance from Kure Atoll to other extreme points in the United States is: West Quoddy Head, Maine, 5,788 miles (9,313 kilometers); Log Point, Elliot Key, Florida, 5,852 miles or 9,416 kilometers (Kure and Log Point are the points farthest apart in the fifty States). Kure is 2,486 miles (4,000 kilometers) from Tokyo, Japan.

² Hilo is 2,315 statute miles (3,725 kilometers) from San Francisco and 2,447 miles (3,937 kilometers) from Los Angeles.

³ Ghanzi, Botswana is Honolulu's antipode, that is, the point precisely opposite to it on the globe.

Source: U.S. Department of the Interior, Geological Survey, *Elevations and Distances in the United States* (1970), and distance computations prepared for the Department of Planning and Economic Development.

Table 70.—WIDTHS AND DEPTHS OF CHANNELS

Channel	Location	Width		Maximum depth	
		Statute miles	Kilo-meters	Feet	Meters
Alenuihaha	Upolu Pt., Hawaii-Pulule Pt., Maui	29.5	47.5	6,120	1,870
Alalakeiki	Ule Pt., Kahoolawe-Nukele Pt., Maui	6.8	10.9	470	140
Kealaikahiki	Kamaiki Pt., Lanai-Ma Kaala, Kahoolawe	17.6	28.3	...	...
Auau	Kikoa Pt., Lanai-Lahaina, Maui	9.1	14.6	108	33
Kalohi	Wahi Pt., Lanai-Kamalo, Molokai	9.3	15.0	260	80
Pailolo	Lipoa Pt., Maui-Pohakuloa, Molokai	8.8	14.2	800	240
Kaiwi	Ilio Pt., Molokai-Makapuu Pt., Oahu	26.0	41.8	2,000	600
Kauai	Kaena Pt., Oahu-Kamilo Pt., Kauai	72.4	116.5	10,000	3,000
Kaulakahi	Kaunuopou Pt., Niihau-Mana Pt., Kauai	17.0	27.4	2,500	800

Source: Hawaii State Department of Planning and Economic Development, *Hawai'i, the Natural Environment* (1974), p.

Table 71.—AREA AND COASTLINE OF COUNTIES, ISLANDS, AND CITIES

County, island, or city	Total area		Land area ¹		Inland water area ²		General coastline ³		Tidal shoreline ⁴		
	Sq. mi.	Sq. km.	Sq. mi.	Sq. km.	Sq. mi.	Sq. km.	Statute miles	Km.	Statute miles	Km.	
State total	6,450	16,707	6,425	16,642	25	65	750	1,207	1,052	1,693	
Counties:											
Hawaii	4,038.0	10,458	4,037.0	10,456	1.0	3	266	428	313	504	
Maui	1,161.1	3,007	1,160.3	3,005	0.8	2	} 210	338	343	552	
Kalawao	13.3	34	13.3	34	—	—		137	220	234	377
Honolulu	610.9	1,582	595.7	1,543	15.2	39		137	220	162	261
Kauai	627.1	1,624	619.1	1,603	8.0	21	137	220	162	261	
Islands:											
Hawaii	4,038.0	10,458	4,037.0	10,456	1.0	3	266	428	313	504	
Maui	728.8	1,888	728.2	1,886	0.6	2	120	193	149	240	
Kahoolawe	45.0	117	45.0	117	—	—	29	47	36	58	
Molokini	(⁵)	(⁵)	(⁵)	(⁵)	—	—	...	...	...	...
Lanai	139.5	361	139.5	361	—	—	47	76	52	84	
Molokai	261.1	676	260.9	676	0.2	1	88	142	106	171	
Oahu	607.7	1,574	592.7	1,535	15.0	39	112	180	209	336	
Kauai	553.3	1,433	548.7	1,421	4.6	12	90	145	110	177	
Niihau	73.0	189	69.6	180	3.4	9	45	72	50	80	
Lehua	0.4	1	0.4	1	—	—	...	...	...	...
Kaula	0.4	1	0.4	1	—	—	...	3	2	3	
Northwestern Haw'n I. ⁶	3.2	8	3.0	8	0.2	1	25	40	25	40	
Cities:											
Hilo ⁷	298.9	774	298.9	774	—	—	...	...	...	...
Honolulu ⁸	88.7	230	86.6	224	2.1	5	...	...	...	...
On Oahu	85.5	221	83.6	217	1.9	5	...	...	...	...

¹ Dry land and land temporarily or partially covered by water, as marshland, swamps, etc.; streams and canals under one-eighth statute mile wide; and lakes, reservoirs, and ponds under 40 acres of area.

² Permanent inland water surface, such as lakes, reservoirs, and ponds having 40 acres or more of area; streams, sloughs, estuaries, and canals one-eighth of a statute mile or more in width; deeply indented embayments and sounds, and other coastal waters behind or sheltered by headlands or islands separated by less than 1 nautical mile of water; and islands having less than 40 acres of area.

⁴ Figures obtained in 1939-1940 with a recording instrument on the largest-scale charts and maps then available. Shoreline of outer coast, offshore islands, bays, rivers, and creeks is included to the head of tidewater or to a point where tidal waters narrow to a width of 100 feet.

⁵ The area of Molokini is 18.6 acres (0.03 square miles or 7.5 hectares).

⁶ The Northwestern Hawaiian Islands, from Nihoa to Kure Atoll, but exclusive of the Midway Islands (which are part of the Hawaiian Archipelago but not legally part of the State of Hawaii).

⁷ As defined in Hawaii Revised Statutes, Sec. 70-1. As defined for statistical purposes under provisions of Sec. 26-18, Hilo has a land area of 56.1 square miles or 145 square kilometers.

⁸ As defined for statistical purposes under HRS, Sec. 26-18. Includes the Northwestern Hawaiian Islands from Nihoa to Kure Atoll, exclusive of the Midway Islands.

Source: Data from Geography Division, U.S. Bureau of the Census, and U.S. Coast and Geodetic Survey, cited in the Hawaii State Department of Planning and Economic Development, *Hawaii, the Natural Environment* (1974), pp. 9 and 13.

Table 72.—MAJOR SUMMITS
(Elevation of the highest point on each island and other important peaks.)

Island and mountain	Elevation		Island and mountain	Elevation	
	Feet	Meters		Feet	Meters
Hawaii:			Oahu, continued:		
Mauna Kea ¹	13,796	4,205	Tantalus	2,013	614
Mauna Loa	13,677	4,169	Olomana	1,643	501
Hualalai	8,271	2,521	Diamond Head	760	232
Kohala	5,480	1,670	Punchbowl	500	152
Kilauea (Uwekahuna)	4,090	1,247	Koko Head	642	196
Kilauea (Halemaumau Rim) .	3,646	1,111			
Kahoolawe:			Kauai:		
Lua Makika	1,477	450	Kawaikini	5,243	1,598
			Waialeale	5,148	1,569
Maui:			Niihau:		
Haleakala (Red Hill)	10,023	3,055	Paniau	1,281	390
Haleakala (Kaupo Gap)	8,201	2,500			
Puu Kukui	5,788	1,764	Kaula	550	168
Iao Needle	2,250	686	Nihoa	910	277
Lanai:			Necker Island	277	84
Lanaihale	3,370	1,027	La Perouse Pinnacle	135	41
			Gardner Pinnacles	190	58
Molokai:			Maro Reef	Awash	Awash
Kamakou	4,970	1,515	Laysan Island	35	11
Puu Nana	1,381	421	Lisianski Island	20	6
Oahu:			Pearl and Hermes Atoll	—	—
Kaala	4,020	1,225	Midway Islands ³	12±	4±
Konahuanui ²	3,150	960	Kure Atoll	20	6
			Kingman Reef ³	3	1
			Palmyra Islands ³	6	2

¹ Includes 19 cones over 11,000 feet, five of them over 13,000.

² Two distinct peaks. The lower has an elevation of 3,105 feet.

³ Not part of the State of Hawaii.

Source: U.S. Geological Survey data cited in the Hawaii State Department of Planning and Economic Development, *Elevations of Major Mountains in Hawaii* (Statistical Report 52, November 7, 1967), as revised.

Table 73.—MAJOR STREAMS, BY ISLANDS

Island	Feature or stream	Length or ave. discharge
Longest water feature (miles):		
Hawaii	Wailuku River	32.0
Maui	Kalialinui-Waiale Gulch	18.0
Kahoolawe	Ahupu Gulch	4.0
Lanai	Maunalei-Waialala Gulch	12.9
Molokai	Wailau-Pulena Stream	6.5
Oahu	Kaukonahua Stream (So. Fork)	33.0
Kauai	Waimea River-Poomau Stream	19.5
Niihau	Keanaulii-Puniopo Valley	5.9
Largest perennial stream (miles):¹		
Hawaii	Wailuku River	22.7
Maui	Palikea Stream	7.8
Molokai	Wailau-Pulena Stream	6.5
Oahu	Kaukonahua Stream	30.0
Kauai	Waimea River	19.7
Streams with greatest average discharge (million gal./day):		
Hawaii	Wailuku River	184.0
Maui	Iao Stream	54.1
Molokai	Pulena Stream	22.1
Oahu	Waikele Stream	25.7
Kauai	Hanalei River	151.0

¹ Estimated on basis of drainage area rather than stream runoff. Other major streams include Honokohau Stream, Maui (9.4 miles long); Halawa Stream (6.4), Waikolu Stream (4.7), and Pelekunu (2.3), all on Molokai; Waikele Stream (15.3), Kipapa Stream (12.8), and Waiakakalaua Stream (11.8), all on Oahu; and the Makaweli River (15.1), Wainiha River (13.8), Hanapepe River (13.3), and Wailua River (11.8), all on Kauai.

Source: Lengths from Hawaii State Department of Planning and Economic Development, *Hawai'i, the Natural Environment* (1974), p. 15; discharges from Hawaii State Department of Land and Natural Resources, Division of Water and Land Development, data supplied May 27, 1977.

Table 74.—MAJOR DAMS: 1977

Name	Location	Height (ft.)	Length (ft.)	Volume (cubic yds.)	Completed (year)	Volume of water impounded (acre ft.)
Wahiawa Dam	Wahiawa, Oahu ...	98	460	167,000	1906	7,776
Waita	Koloa, Kauai	27	3,050	(NA)	1905	7,350
Kualapuu	Kualapuu, Molokai..	58	3,900	1,267,000	1969	4,290
Alexander Dam	Kalaheo, Kauai	104	700	(NA)	1931	2,490

NA: Not Available.

Source: Hawaii State Department of Land and Natural Resources, Division of Water and Land Development; information supplied March 11, 1977.

Table 75.—LARGEST LAKES, BY ISLANDS

Island	Name of largest lake ¹	Category	Maximum depth (feet)	Altitude (feet)	Area (acres)	Shoreline (miles)
Hawaii	Waiakea Pond	Natural	(NA)	Sea level	27	2
	Lake Waiau ²	Natural	10	13,020	1.5	0.2
Maui	Kanaha Pond	Natural	(NA)	Sea level	41	2
Kahoolawe	None					
Lanai	None					
Molokai	Meyer Lake	Natural	5	2,021	6	1
Oahu	Wahiawa Reservoir	Man-made	85	842	333	11
Kauai	Waita Reservoir ...	Man-made	23	233	422	3
Niihau	Halulu Lake	Natural	(NA)	Sea level	182	3

NA Not available.

¹ Excludes shoreline fish ponds and areas filled only during floods. The largest intermittent lake is Halalii Lake, Niihau (840.7 acres).

² Highest lake in the State and third highest in the United States.

Source: Hawaii State Department of Land and Natural Resources, Division of Water and Land Development, records.

Table 76.—MAJOR NAMED WATERFALLS, BY ISLANDS

Island	Waterfall ¹	Height (feet)		Horizontal distance (feet)	Average discharge (million gal./day)
		Sheer drop	Cascade		
Hawaii	Kaluahine .....	...	620	400	...
	Akaka	442	...	...	...
	Waiilikahi	320	...	...	6
	Hiilawe (3 falls) .....	...	300	200	...
	Rainbow .....	...	80	150	182
Maui	Honokohau .....	...	1,120	500	25
	Waihiimalu .....	...	400	150	...
	Waimoku .....	...	40	50	37
Molokai	Kahiwa .....	...	1,750	1,000	...
	Papalaua .....	...	1,200	500	...
	Wailele .....	...	500	150	...
	Haloku .....	...	500	200	...
	Hipuapua ² .....	...	500	300	...
	Olupena .....	...	300	150	...
	Moaula ² .....	...	250	200	20
Oahu	Kaliuwa (Sacred) ³	80	1,520	3,000	...
	Waihee (Waimea)	80	...	...	8
	Manoa .....	...	200	250	2
Kauai	Waipoo (2 falls) .....	...	800	600	...
	Awini .....	...	480	500	...
	Hinalele	280	...	...	...
	Kapakanui	280	...	...	...
	Manawaiopuna	280	...	...	...
	Wailua	80	...	...	76
	Opaekaa	40	...	...	...
	Puwainui	20	...	...	92

¹Includes the largest named waterfall in each major island, either in height or average discharge; all other named falls 250 feet high or over; and well-known smaller falls. Many unnamed falls have sheer drops of 200 feet or more.

²Average discharge shown for Moaula includes flow from Hipuapua.

³Sheer drop refers to northernmost fall of a cascade of six falls.

Source: Heights from Map Information Office, U.S. Geological Survey, July-October 1969; average discharges from Division of Water and Land Development, Hawaii State Department of Land and Natural Resources, July 1977.

Table 77.—MISCELLANEOUS GEOGRAPHIC STATISTICS, BY ISLANDS

Island	Extreme length (miles)	Extreme width (miles)	Miles of sea cliffs with heights of —		Miles from coast of most remote point	Percent of area within 5 miles of coast
			100 to 999 ft.	1,000 ft. or more		
The State .....	...	...	145	33	28.5	48.6
Hawaii	93	76	50	4	28.5	30.0
Maui	48	26	29	—	10.6	76.1
Kahoolawe	11	6	14	—	2.4	100.0
Lanai	18	13	13	1	5.2	100.0
Molokai	38	10	15	14	3.9	100.0
Oahu	44	30	3	—	10.6	79.0
Kauai	33	25	14	11	10.8	67.0
Niihau	18	6	7	3	2.4	100.0
Island	Percent of area with elevation —		Approximate mean altitude (feet)	Percent of area with slope —		
	Less than 500 feet	2,000 or more		Less than 10 percent	10 to 19 percent	20 percent or more
The State	20.8	50.9	3,130	63.5	19.5	17.0
Hawaii	12.0	68.4	3,950	76.0	20.0	4.0
Maui	24.9	41.4	2,390	38.5	25.5	36.0
Kahoolawe	38.9	0	600	60.0	31.0	9.0
Lanai	24.8	6.3	1,140	61.0	23.0	16.0
Molokai	37.3	17.8	1,150	53.0	21.0	26.0
Oahu	45.3	4.6	860	42.5	12.0	45.5
Kauai	35.6	24.0	1,380	33.5	16.0	50.5
Niihau	78.2	0	530	68.0	19.5	12.5

Source: Hawaii State Department of Planning and Economic Development, *Hawai'i, the Natural Environment* (1974), p.19.

Table 78.—VOLCANIC ERUPTIONS: 1959 TO 1977

Volcano and date of outbreak	Repose period since previous eruption (months)	Duration (days)	Location	Altitude (feet)	Area (square miles)	Volume (1,000 cubic yards)
Mauna Loa:						
1975: July 5	300	<1	Summit	13,000-12,100	5.2	39,200
Kilauea:						
1959: Nov. 14	53.5	36	Kilauea Iki	3,500	0.24	51,000
1960: Jan. 13	0.8	36	E. rift	100	4.1	155,000
1961: Feb. 24	12.2	1	Halemaumau	3,150	0.02	30
Mar. 3	0.2	22	Halemaumau	3,150	0.1	350
July 10	3.5	7	Halemaumau	3,150	0.4	17,300
Sept. 22	2.2	3	E. rift	2,600-1,300	0.3	3,000
1962: Dec. 7	14.4	2	E. rift	3,250-3,100	0.02	430
1963: Aug. 21	8.4	2	E. rift	3,150-2,700	0.06	1,100
Oct. 5	1.4	1	E. rift	2,750-2,300	1.3	9,000
1965: Mar. 5	17.0	10	E. rift	3,000-2,300	3.0	23,000
Dec. 24	9.5	<1	E. rift	3,150-3,000	0.23	1,160
1967: Nov. 5	23.3	251	Halemaumau	3,150	0.25	110,000
1968: Aug. 22	1.3	5	E. rift	2,900-1,900	0.01	176
Oct. 7	1.3	15	E. rift	3,00-2,400	0.8	9,000
1969: Feb. 22	4.0	6	E. rift	3,100-2,900	2.3	22,000
May 24	2.0	867	E. rift	3,150	19.3	242,000
1971: Aug. 14	—	<1	Caldera	3,660-3,600	0.8	12,400
Sept. 24	—	5	Caldera, SW rift	3,740-2,730	1.5	10,500
1972: Feb. 4	4.3	455	E. rift	3,150	13.5	163,800
1973: May 5	—	<1	E. rift	3,340-3,250	0.1	1,600
May 7 ¹	—	187	...	...	0.2	3,200
Nov. 10	—	30	E. rift	3,250-2,900	0.4	3,700
Dec. 12	1.1	203	E. rift	3,150	3.1	39,300
1974: July 19	—	3	Caldera, E. rift	3,600-3,520	1.2	9,000
Sept. 19	2.0	<1	Caldera	3,680	0.4	14,000
Dec. 31	3.4	<1	Caldera	3,600	2.9	19,600
1975: Nov. 29	11.0	<1	Caldera	3,600	0.05	330

¹Listed by the Hawaiian Volcano Observatory staff but not by Macdonald and Hubbard (see source).

Source: Gordon A. Macdonald and Douglass H. Hubbard, *Volcanoes of the National Parks in Hawaii*, 7th edition (Hawaii Natural History Association, December 1974), pp. 14 and 29, as corrected by Dr. Macdonald, May 5, 1976, and updated by the staff of the Hawaiian Volcano Observatory, April 28, 1976, May 21, 1976, and March 25, 1977. Correct to March 25, 1977.

**Table 79.—EARTHQUAKES OF MAGNITUDE 5 OR GREATER:
1957 TO 1976**

Date	Location	Magnitude (Richter Scale)
1957: Aug. 18	E of Hana, Maui	5.6
1961: Sept. 25	Hawaii	5.75-6
1962: June 27	Hawaii	6.1
June 28	Hawaii	5.75
1963: Oct. 23	Hawaii	5.4
1964: Oct. 11	W. of S. Kona	5.3
Dec. 10	Hawaii	5
1969: May 9	Hawaii	5
1971: Aug. 1	S.E. of Hawaii	4.5-5
1972: Dec. 23	W. of Kona	5
1973: Apr. 26	Hawaii	6.2
Oct. 9	Hawaii	4.8-5
1974: Nov. 30	Hawaii	5.5-6
1975: Jan. 1, 2:41 AM	Near Pahala, Hawaii	5.1
Jan. 1, 3:20 AM	Mauna Loa, Hawaii	5.1
Jan. 2	Near Pahala, Hawaii	5.6
Jan. 5	Mauna Loa, Hawaii	5.1
Nov. 29, 3:35 AM	Puna, Hawaii	5.7
Nov. 29, 4:47 AM	Puna, Hawaii	7.2

Source: Augustine S. Furumoto, N. Norby Nielsen, and William R. Phillips, *A Study of Past Earthquakes, Isoseismic Zones of Intensity and Recommended Zones for Structural Design for Hawaii* (University of Hawaii, Center for Engineering Research, June 15, 1972), pp. 16-19; Hawaii Institute of Geophysics, records. Complete to Aug. 31, 1976.

**Table 80.—TSUNAMIS WITH RUN-UP OF 2 METERS (6.6 FEET) OR MORE:
1946 TO 1977**
(Correct to June 16, 1977)

Date	Maximum height in Hawaii		Deaths in Hawaii	Damage in Hawaii (dollars)
	Meters	Feet		
1946: April 1	17.0	55.8	159	26,000,000
1952: Nov. 4	6.1	20.0	—	1,000,000
1957: March 9	16.0	52.5	—	5,000,000
1960: May 22	10.5	34.5	61	23,000,000
1964: March 27	4.8	15.7	—	67,590
1975: Nov. 29	7.9	26.0	2	1,500,000

Source: George Pararas-Carayannis, *Catalog of Tsunamis on the Hawaiian Islands* (U.S. Coast and Geodetic Survey, May 1969); Robert C. Schmitt, "Catastrophic Mortality in Hawaii," *The Hawaiian Journal of History*, Vol. III (1969), pp. 66-86; Hawaii Institute of Geophysics, records; Harold G. Loomis, *The Tsunami of November 29, 1975 in Hawaii* (Hawaii Institute of Geophysics, December 1975), pp. 1 and 10.

Table 81.—WATER USE: 1960 TO 1975
(In millions of gallons per day, unless otherwise specified.)

Subject	1960	1965	1970	1975
Water withdrawn ¹	1,500	2,000	2,700	2,540
Ground water	600	820	920	890
Fresh	580	780	910	890
Saline	21	37	13	2
Surface water	860	1,200	1,700	1,650
Fresh	600	670	850	670
Saline	260	500	860	980
Reclaimed sewage	—	—	66	—
Withdrawn for irrigation	920	1,160	1,280	950
Conveyance losses	100	200	220	450
Used for hydroelectric power	(NA)	360	330	260
Fresh water consumed	410	580	810	600
Per capita use (gallons per day)	2,500	2,800	3,500	3,140

NA Not available

¹Excludes water used for hydroelectric power. Irrigation conveyance losses excluded in 1960 and included thereafter.

Source: U.S. Geological Survey, *Estimated Use of Water in the United States* for 1960 (Circular 456, 1961), 1965 (Circular 556, 1968), and 1970 (Circular 676, 1972), and unpublished 1975 data (1976).

Table 82.—AVERAGE DAILY WATER CONSUMPTION FROM COUNTY WATERWORKS: 1966 TO 1976
(In millions of gallons. For years ended June 30, except where otherwise stated.)

Year	Total	City of Honolulu	Rest of Oahu	Hawaii County	Kauai County ¹	Maui County
1966 ²	89.1	48.4	26.1	5.03	3.15	6.42
1967	(NA)	51.0	28.0	(NA)	3.05	6.22
1968	95.3	51.5	29.1	5.38	3.28	6.06
1969	106.2	56.3	33.5	5.94	3.44	7.06
1970	115.5	59.8	37.0	6.67	4.11	7.94
1971	117.9	60.4	37.7	7.16	4.06	8.55
1972	125.1	62.4	40.7	8.02	4.34	9.63
1973	135.7	67.2	44.4	8.99	4.66	10.45
1974	133.6	65.6	43.0	9.32	5.04	10.69
1975	138.3	65.3	45.9	9.63	5.20	12.29
1976	149.5	68.9	50.9	10.20	5.93	13.56

NA Not available.

¹Water sales.

²Calendar year figure for Hawaii County; January-June average for Maui County.

Source: Honolulu Board of Water Supply, *Annual Report and Statistical Summary* (annual); Hawaii County Department of Water Supply, *Annual Report* (annual) and records; Kauai County Department of Water, records; Maui County Department of Water Supply, *Annual Report* (annual) and records.

Table 83.—WATER QUALITY AT OAHU BEACHES: 1975 AND 1976

Beach	Number of samples		Coliform density (geometric mean, MPN/100 ml)	
	1975	1976	1975	1976
Ala Moana Park (Ewa)	38	35	8.2	11.2
Ala Moana Park (Center)	32	14	3.9	8.3
Ala Moana Park (Diamond Head)	35	20	11.1	12.4
Bellows Air Force Beach	9	—	12.0	(NA)
Elks Club Beach	39	13	20.8	25.7
Ewa Beach	11	10	6.9	14.8
Fort DeRussy Beach	29	12	36.8	83
Gray's Beach	44	35	28.0	13.8
Haleiwa Park Beach	8	3	12.1	25
Hanauma Bay	11	9	4.8	4.7
Hauula Park Beach	10	8	6.4	23.4
Kaaawa Park Beach	10	8	17.6	18.2
Kahala Beach	9	—	46.2	(NA)
Kahala Hilton Beach	9	—	22.4	(NA)
Kahana Park Beach	10	8	228.6	160.5
Kahanamoku Beach	34	14	18.8	9.1
Kahanamoku Lagoon (Ewa)	24	—	288.7	(NA)
Kahanamoku Lagoon (Diamond Head)	36	29	148.4	35.4
Kailua Park Beach	8	8	26.3	20.8
Kalama Beach	8	8	51.3	19.1
Kawela Bay	6	—	12.8	(NA)
Kokokahi Pier	14	8	35.1	56.4
Kuhio Beach	41	14	41.7	45.5
Lanikai Beach	6	—	74.5	(NA)
Makaha Beach	11	11	3.1	3.4
Nanakuli Park Beach	11	12	2.9	5.9
Public Bath Beach	43	33	6.9	6.9
Punaluu Park Beach	10	8	85.3	82.6
Sandy Beach (East)	11	9	3.8	22.4
Sandy Beach (West)	9	—	3.2	(NA)
Tavern Beach	40	13	9.8	5.4
Waianae Park Beach	11	12	5.1	12.4
Waikiki Natatorium	29	—	4.9	(NA)
Waimanalo Park Beach	10	10	6.0	21.5
Waimanalo Surfer's Beach	8	—	9.7	(NA)

NA Not available.

Source: Hawaii State Department of Health, Pollution Investigation and Enforcement Branch, records.

**Table 84.—SUSPENDED PARTICULATE
MATTER, FOR HONOLULU:
1966 TO 1976**

(Sampling conducted from roof of Health Department
Building. Annual mean levels over 80 ug/m³ may affect
human health.)

Year	Mean micrograms per cubic meter
1966	35
1967	38
1968	45
1969	43
1970	37
1971	45
1972	41
1973	34
1974	35
1975	40
1976	34

Source: Hawaii State Department of Health,
Statistical Report (annual) and records.

Table 85.—AIR POLLUTANT EMISSIONS, BY SOURCE AND COUNTIES: 1976

(In tons per year; as of July.)

Counties and sources	Sulfur oxides	Particulates	Carbon monoxide	Hydrocarbons	Nitrogen oxides
Total	66,702	80,166	329,662	94,607	61,524
COUNTIES					
City and County of Honolulu	59,090	45,841	212,255	58,998	44,510
County of Hawaii	3,355	8,925	49,335	14,823	6,860
County of Kauai	1,194	7,291	32,088	10,207	3,710
County of Maui	3,063	18,109	35,984	10,579	6,444
SOURCES					
Transportation	2,761	4,004	239,843	44,471	26,612
Motor vehicles	780	2,402	219,038	35,128	20,644
Aircraft	310	1,122	6,252	3,904	1,584
Vessels	1,436	207	3,530	1,293	1,342
Off-highway fuel usage	235	272	11,023	1,203	3,042
Gasoline handling and evaporation ...	(N)	(N)	(N)	2,943	(N)
Fuel combustion in stationary sources ..	58,117	12,872	4,628	5,991	30,906
Residential, commercial, institutional .	1,044	228	99	73	716
Industrial and agricultural	14,403	9,936	3,725	5,484	6,545
Steam-electric utilities	42,670	2,708	804	434	23,645
Solid waste disposal	299	1,343	6,196	2,998	470
Open burning	41	698	3,704	1,309	262
Incineration	258	645	2,492	1,689	208
Industrial process losses	5,525	39,754	668	15,038	925
Agricultural field burning	(N)	22,193	78,327	26,109	2,611

N Negligible

Source: Hawaii State Department of Health, Pollution Investigation and Enforcement Branch, records.

Table 86.—AEROMETRIC SURVEY DATA FOR SPECIFIED LOCATIONS: 1976
(Carbon monoxide in milligrams per cubic meter; other data in micrograms per cubic meter.)

Subject	DOH Bldg. ¹	Kalihi Kai	Pearl City ²	Barbers Point	Waimanalo	Ala Moana	Kahului, Maui ³	Kihei, Maui ⁴	Hilo, Hawaii	Lihue, Kauai
Minimum:										
Particulate matter	19	27	16	12	12	24	26	21	11	20
Sulfur dioxide	<5	<5	<5	<5	—	<5	<5	—	<5	<5
Nitrogen dioxide ⁵	12	16	11	<5	—	24	<5	—	9	<5
Carbon monoxide, 1 hr.	0.5	—	—	—	—	—	—	—	—	—
Photochemical oxidants	2	—	—	—	—	—	—	—	—	—
Maximum:										
Particulate matter	62	113	83	101	69	130	118	172	64	112
Sulfur dioxide	51	32	50	7	—	7	142	—	<5	<5
Nitrogen dioxide ⁵	63	67	44	29	—	61	39	—	29	17
Carbon monoxide, 1 hr.	24.2	—	—	—	—	—	—	—	—	—
Photochemical oxidants	265	—	—	—	—	—	—	—	—	—
Annual average:										
Particulate matter	34	52	41	40	25	65	64	60	30	37
Sulfur dioxide	23	<5	<5	<5	—	<5	24	—	<5	<5
Nitrogen dioxide ⁵	35	37	26	14	—	45	19	—	20	8

¹ Department of Health, Punchbowl and South Beretania Streets, Honolulu.

² Site moved from the Sewage Pumping Station to the Sewage Treatment Plant in January 1976.

³ Sampled for 8 months.

⁴ Site moved from the Fire Station to the Sewage Treatment Plant at the end of Welakahao Street on May 27, 1976.

⁵ Sampling discontinued at all sites in April 1976.

Source: Hawaii State Department of Health, Environmental Protection and Health Services Division, records.

Table 87.—NOISE LEVELS IN VARIOUS NEIGHBORHOODS ON OAHU: 1974

[Noise measurements were taken at 578 stations distributed over the populated areas on Oahu, except Waialua, Haleiwa and small communities along the north shoreline. Noise readings were not taken in these areas because previous noise measurements in these communities were similar to noise levels in Waimanalo and Olomana areas. The noise measurement stations were randomly distributed over the communities.

Since one of the objectives of this noise survey was to establish the existing ambient and residual noise levels of each community, the noise readings at each station were taken as far as possible away from all heavily used roads and freeways. Loud identifiable noise from nearby traffic, airplane passing overhead, dogs barking and noise from other sources were also measured. The noise readings at any location were taken on three or more widely separated days. This was done to avoid any abnormal noise conditions. In densely populated areas, the noise survey was conducted between the hours of 4:00 a.m. to 10:00 a.m., 9:00 a.m. to 5:00 p.m. and 4:00 p.m. to 2:00 a.m. In less populated areas west of Pearl City, Wahiawa and Mililani Town, the noise readings were taken during the daytime only.]

Neighborhood	Noise level (in decibels) exceeded —		
	10 percent of time	50 percent of time	90 percent of time
HONOLULU			
Aina Haina	53.5	45.0	40.0
Aina Koa	61.0	48.4	42.3
Downtown	67.0	58.0	50.5
Hawaii Kai	57.0	46.5	40.5
Kahala	56.7	45.5	42.0
Kaimuki	59.0	50.7	44.0
Kalihi	58.0	50.2	43.7
Kapahulu	55.0	49.7	44.0
Kapalama-Liliha	63.8	56.0	46.0
Kuliouou	53.5	46.3	40.5
Makiki	64.5	55.0	49.5
Manoa	58.7	45.3	40.0
Moiliili	62.0	55.0	50.0
Niu Valley	57.0	46.7	39.5
Nuuanu	63.0	50.1	45.4
Palolo	58.5	49.4	44.0
Pawaa	65.5	60.0	54.0
Waikiki	69.0	61.5	54.0
Waialae-Iki	60.0	50.5	41.5
Ward to Punchbowl	67.5	60.2	57.0
REST OF OAHU			
Aiea-Waimalu	57.5	47.3	40.5
Halawa Heights, Foster Village, Salt Lake, Aliamanu	57.5	54.5	48.7
Kailua	55.5	45.0	37.5
Kaneohe	54.0	45.5	40.5
Mililani Town	57.5	50.0	45.0
Pearl City	53.2	44.7	38.7
Wahiawa	62.5	50.5	46.0
Waianae	56.5	50.0	45.0
Waimanalo	54.5	50.0	44.5
Waipahu	59.0	51.0	45.5

Source: Survey conducted by Dr. Iwao Miyake for the Hawaii State Department of Health, and summarized by the Noise and Radiation Branch, Department of Health.

**Table 88.—NOISE COMPLAINTS RECEIVED BY THE HONOLULU POLICE
DEPARTMENT: 1973 TO 1976**

Type of noise	1973	1974	1975	1976 ¹
All noise complaints	9,009	8,741	15,536	19,006
Loud party, music, singing, TV, radio, etc.	4,809	4,081	3,255	...
Loud talking, yelling, crying, etc.	909	1,700	6,508	...
Loud vehicle	979	604	763	...
Loud equipment, construction noises	329	231	156	...
Noisy animals	998	788	623	...
Unspecified noises	985	1,337	4,231	...

¹ Not available by type of noise.

Source: Honolulu Police Department, records.

Table 89.—CLIMATIC DATA FOR SELECTED PLACES

Island and station	Ground elevation (feet)	Average temperature (°F)		Extreme temperature of record (°F)		Average annual precipitation (inches)	Average annual possible sunshine (percent)
		Coolest month	Warmest month	Lowest	Highest		
Hawaii:							
Hilo Airport	27	71.0	75.9	53	94	133.57	39
Hawaii Volcanoes Nat. Pk. Hq.	3,971	57.6	63.2	37	85	102.81	...
Kona (Kailua)	30	72.1	77.3	54	93	25.22	...
Puako ¹	10	73.1	79.8	52	98	9.47	...
Waimea (Kamuela)	2,670	62.3	66.8	34	90	40.05	...
Mauna Kea summit ²	13,796	31.1	42.5	11	66	8.08	...
Maui:							
Hana	120	71.3	76.8	50	90	70.65	...
Haleakala summit	9,960	42.6	50.0	14	73	50.69	...
Kihei ³	90	70.9	78.4	49	98	13.79	...
Kahului Airport	48	71.6	78.8	48	96	18.43	70
Lahaina	45	71.5	78.0	52	93	15.51	...
Molokai:							
Kaunakakai	12	...	...	...	...	14.08	...
Molokai Airport	450	70.2	77.6	48	90	29.21	...
Lanai:							
Lanai City	1,620	65.8	72.8	46	88	38.44	...
Oahu:							
Honolulu International Airport	7	72.3	80.7	53	92	22.90	67
Honolulu Federal Bldg. ⁴	12	72.0	78.6	57	88	25.35	65
Waikiki ⁵	10	71.9	80.6	51	93	27.32	...
Manoa (HSPA)	500	69.4	75.2	...	...	158.41	...
Kaneohe MCAS	10	72.9	79.1	58	90	43.88	...
Kahuku	25	71.6	78.8	49	95	41.10	...
Wheeler AFB	826	68.2	75.5	52	89	39.85	...
Waianae	20	72.1	79.7	45	96	20.31	...
Kauai:							
Kilauea	315	68.7	75.6	49	94	68.03	...
Kealia	9	70.2	78.0	44	93	43.28	...
Lihue Airport	103	71.2	79.1	50	90	44.18	56
Poipu (Makahuena Pt.)	52	72.4	79.4	50	93	36.39	...
Kokee (Kanalohuluhulu) ...	3,600	54.9	65.5	31	80	72.25	...
Waialeale	5,075	...	...	...	...	486.	...
Northwestern Hawaiian Islands:							
Midway	10	65.0	78.6	52	89	43.60	...

¹ Temperature data are for Mahukona.

² Based on incomplete and non-continuous data for 1966-1972.

³ Temperature data refer to Puunene Airport.

⁴ Temperature sensors are 87 feet above the ground.

⁵ Located at Honolulu Zoo. Available only from 1965.

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service Pacific Region, data supplied March 17, 1976 and May 2, 1977.

Table 90.—MONTHLY AND ANNUAL CLIMATIC DATA FOR HONOLULU INTERNATIONAL AIRPORT

Month	Normal temperature (°F.)			Extreme temperature (°F.) ¹		Precipitation (inches)			
	Daily maximum	Daily minimum	Monthly	Record highest	Record lowest	Normal total	Maximum monthly	Minimum monthly	Maximum in 24 hours
Jan.	79.3	65.3	72.3	85	53	4.40	14.74	0.48	6.72
Feb.	79.2	65.3	72.3	85	53	2.46	13.68	0.48	6.88
Mar.	79.7	66.3	73.0	87	55	3.18	20.79	0.01	17.07
Apr.	81.4	68.1	74.8	87	59	1.36	8.92	0.01	4.21
May	83.6	70.2	76.9	88	63	0.96	7.23	0.05	3.44
June	85.6	72.2	78.9	90	65	0.32	2.46	T	2.28
July	86.8	73.4	80.1	90	67	0.60	2.01	0.03	1.03
Aug.	87.4	74.0	80.7	91	67	0.76	3.08	T	2.35
Sept.	87.4	73.4	80.4	92	66	0.67	2.74	0.07	1.40
Oct.	85.8	72.0	78.9	91	64	1.51	5.83	0.11	2.81
Nov.	83.2	69.8	76.5	89	58	2.99	14.72	0.03	9.15
Dec.	80.3	67.1	73.7	87	54	3.69	12.09	0.06	8.14
Ann.	83.3	69.8	76.6	92	53	22.90	20.79	T	17.07
Month	Relative humidity (%) ²		Wind (miles/hour)		Percent of possible sunshine	Mean sky cover, sunrise to sunset ³	Mean number of days		Precip. .01 inch or more
	8 A.M.	2 P.M.	Mean speed	Fastest mile			Sunrise to sunset		
							Clear	Cloudy	
Jan.	80	63	9.9	67	63	5.5	9	10	10
Feb.	77	60	10.8	63	64	5.8	7	9	10
Mar.	74	60	11.4	59	68	6.0	7	10	9
Apr.	70	58	12.1	40	66	6.3	6	11	9
May	66	54	12.2	35	69	6.0	7	10	7
June	65	53	12.9	39	70	5.6	6	7	6
July	64	50	13.6	34	74	5.3	8	5	8
Aug.	66	53	13.5	52	75	5.3	8	6	7
Sept.	65	51	11.6	36	74	5.1	9	6	7
Oct.	67	54	10.9	40	67	5.6	8	8	9
Nov.	73	59	11.2	65	59	5.7	7	9	10
Dec.	76	60	11.0	59	59	5.5	8	10	10
Ann.	70	56	11.8	67	67	5.7	90	101	102

T Trace, an amount too small to measure.

¹ For periods October 1962 through December 1964 and September 1971 through December 1976. At other times, temperatures as high as 93° and as low as 52° have been recorded at the Airport.

² Data for 1963, 1964, and 1972-1976.

³ Sky cover is expressed in a range of 0 for no clouds or obscuring phenomena to 10 for complete sky cover.

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service, *Local Climatological Data, Annual Summary With Comparative Data, Honolulu, 1976.*

Table 91.—CLIMATIC DATA FOR THE PERIOD OF RECORD

Subject	Date	Place	Magnitude
Long-term averages:			
Lowest monthly average minimum temp.(°F)	February	Mauna Kea summit	23.3
Lowest monthly average daily temp.(°F)	February	Mauna Kea summit	31.1
Highest monthly average maximum temp.(°F)	August	Waiawa, Kauai	89.7
Highest monthly average daily temp.(°F)	August	Puako, Hawaii	80.7
Lowest average annual rainfall (inches) .....	.....	N. of Kawaihae	5.7
Highest average annual rainfall (inches) .....	.....	Waialeale	486.
Single events:			
Lowest temperature of record (°F)	Feb. 11, 1973	Mauna Kea summit	11.
Highest temperature of record (°F)	April 27, 1931	Pahala, Hawaii	100.
Lowest annual rainfall of record (inches)	1953	Kawaihae, Hawaii	0.2
Highest annual rainfall of record (inches)	1947-1948	Waialeale	624.
Highest wind speed of record (m.p.h.)	Jan. 17-18, 1959 ..	Mauna Loa Obser.	105+

Source: U.S. Department of Commerce, National Weather Service, Pacific Region, data supplied March 14, 1973.

Table 92.—TEMPERATURE AND RAINFALL, FOR SPECIFIED LOCATIONS: 1960 TO 1976

Year	Average temperature (°F.): Honolulu Federal Bldg.			Extreme temps. (°F.): Honolulu Fed. Bldg.		Annual rainfall (inches)				
	Annual	February	August	Lowest	Highest	Honolulu Fed. Bldg.	Hilo Airport	Holualoa Beach	Lahaina	Koloa
1960	75.6	71.9	79.2	60	86	16.23	146.80	18.08	6.62	72.05
1961	76.1	73.7	79.3	61	87	18.40	119.70	31.05	24.00	67.49
1962	75.6	71.7	78.2	58	85	15.47	71.45	20.60	14.90	70.99
1963	75.5	72.6	78.9	61	86	45.51	124.75	35.42	22.56	70.95
1964	75.8	73.5	78.3	62	85	19.96	166.44	28.42	14.57	94.83
1965	75.2	69.3	78.6	60	87	43.85	127.29	39.79	23.85	89.31
1966	75.7	70.9	78.8	58	86	25.54	124.01	23.14	13.01	58.67
1967	76.0	73.5	79.6	60	87	37.63	154.00	31.10	28.48	86.23
1968	77.0	73.0	80.9	63	88	36.24	134.14	48.86	25.87	84.00
1969	74.8	71.9	78.7	59	86	26.71	173.23	32.89	10.09	72.42
1970	75.5	71.7	78.9	59	85	18.35	153.98	20.78	11.95	64.45
1971	75.4	73.5	78.5	59	85	28.61	140.69	37.61	15.93	75.33
1972	75.0	71.2	78.8	61	88	26.72	98.85	33.22	20.21	66.72
1973	74.8	70.8	78.1	62	85	18.66	107.97	14.85	10.13	66.78
1974	75.9	73.8	79.0	63	86	28.24	117.34	40.49	13.01	86.35
1975	74.6	72.1	77.5	61	85	24.63	99.93	25.97	12.19	49.91
1976 ¹ .....	...	71.6	80.6	60	88	...	114.67	25.51	8.86	62.60

¹ December data not available for Honolulu Federal Building.

Source: U.S. Department of Commerce, National Weather Service, Pacific Region, records.

**Table 93.—AVERAGE WATER TEMPERATURES
AT WAIKIKI BEACH**

Month	Morning (F.°)	Afternoon (F.°)
March	75	77
August	77	82

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Local Climatological Data, Annual Summary With Comparative Data, Honolulu, Hawaii 1976*.

**Table 94.—TREES ALONG STREETS OR IN PARKS UNDER THE JURISDICTION
OF THE CITY AND COUNTY OF HONOLULU: 1960 TO 1976**

Date	City and County streets and highways ¹		Trees in City and County parks
	Length in miles	Trees	
1960: April-June	784.0	19,472	(NA)
1965: June 30	815.54	22,475	(NA)
1970: June 30	933.58	46,290	63,500
1971: June 30	958.13	54,146	64,500
1972: June 30	974.30	61,023	65,000
1973: June 30	987.00	70,497	65,500
1974: June 30	999.80	82,635	65,800
1975: June 30	1,022.00	88,654	68,300
1976: June 30	1,035.69	96,658	92,800

NA Not available

¹ Excludes Federal, State, and private thoroughfares.

Source: Harland Bartholomew and Associates, *1960 Survey of Oahu Street Trees, City & Co. of Honolulu, State of Hawaii* (Department of Parks and Recreation, 1960), p. 6; Honolulu Department of Parks and Recreation, Conservation and Beautification Division, records.

**Table 95.—HAWAII AUDUBON SOCIETY BIRD COUNTS OF THE HONOLULU AREA:
1958 TO 1976**

(Counts are made in late December, in a circle, 15 miles in diameter, centered near Nuuanu Pali.)

Year	Species	Individual birds	Species ¹	Individual birds
1958	34	7,457	Endemic species:	
1959	34	4,076	Oahu 'Amakihi	171
1960	34	4,656	Hawaiian Stilt	157
1961	39	3,954	'Apapane	103
1962	39	2,969		
1963	35	7,963	Indigenous species:	
1964	34	10,139	Red-footed Booby	1,940
1965	46	11,820+	Great Frigatebird	723
1966	51	12,557		
1967	51	22,641	Introduced species:	
1968	49	11,024	Barred Dove	2,091
1969	53	13,236	Japanese White-eye	1,960
1970	51	10,454	Common Myna	1,929
1971	50	13,218	Spotted Dove	1,145
1972	52	14,559	House Sparrow	1,068
1973	48	9,574	Cattle Egret	1,032
1974	44	10,263		
1975	54	12,008	Migratory species:	
1976	55	16,393	Golden Plover	785
			Ruddy Turnstone	124

¹ Endemic birds numbering more than 50 individuals, indigenous birds more than 200, introduced birds more than 1,000, and migratory species and stragglers more than 100. Endemic birds are those peculiar to a particular region, in this case Hawaii, and therefore found nowhere else in the world; indigenous birds are those native to a given region, in this case Hawaii, but with a total range of distribution encompassing a much wider area. The classification is that reported in Andrew J. Berger, *Hawaiian Birdlife* (1972).

Source: Hawaii Audubon Society, *The Elepaio* for February 1968-1977.

Table 96.—ENDANGERED, THREATENED, AND EXTINCT SPECIES OF NATIVE HIGHER PLANTS: 1974

Status	Species, subspecies, and varieties	Percent
Total native flora	2,200	100.0
Endangered, threatened, or extinct ¹	1,088	49.5
Endangered	639	29.0
Threatened	194	8.8
Extinct	255	11.6
Not endangered, threatened, or extinct	1,112	50.5

¹ For the other 49 States, 2,099 (or 10.5 percent) of all 20,000 native higher plants are endangered, threatened, or extinct.

Source: 94th Congress, 1st Session, House Document No. 94-51, *Report on Endangered and Threatened Plant Species of the United States*, presented to the Congress of the United States of America by the Secretary, Smithsonian Institution, 15 December 1974, p. 11 (percentages recalculated by DPED).